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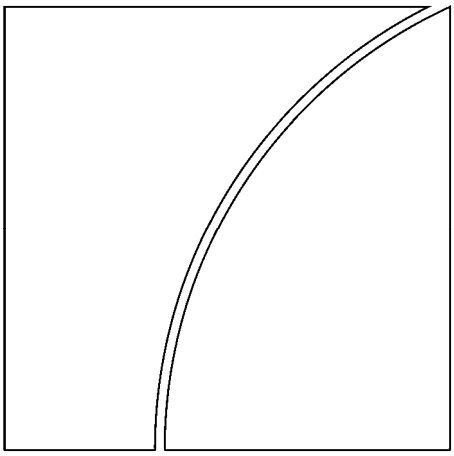

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Contents

IPM84: Measures of flows and stocks in financial accounts

STCPM01 with IAOS: The recording of pension liabilities in the national accounts

STCPM18: Institutional cooperation in statistics: best practices and the way forward

STCPM27 with IAOS: Portfolio investment statistics

STCPM28 with IAOS: Statistics dissemination public service

STCPM29 with IAOS: The relationship with the providers of information for statistical purposes

STCPM31: Accounting for the very rich in household surveys of income and wealth

Invited Paper Meeting 24 with International Association for Official Statistics

Measuring productivity

Chair:	Gilbert Cette, Bank of France
Paper:	Total factor productivity in the G7 countries: a short note João Amador and Carlos Coimbra, Bank of Portugal
Discussants:	Bruno Tissot, Bank for International Settlements John Baldwin, Statistic Canada

Total factor productivity in the G7 countries: a short note

João Amador and Carlos Coimbra[1]

The analysis of the composition of economic growth in the G7 countries has been motivated by the desire to identify regularities that contribute to explaining economic success. Such analysis must be carried out with a long term perspective, and the relevant production function should reflect existing world technology and not just domestic conditions. Moreover, in order to assess the relative performance of each country, economic growth should be broken down such that total factor productivity (TFP) is not determined as a mere residual. The seminal papers in modern economic growth literature are those of Solow (1956), Romer (1986, 1990) and Lucas (1988). The empirical research literature in this area consists of two different strands. One strand decomposes economic growth in a given economy on the basis of factor accumulation and total factor productivity. The other uses cross-country regressions, with a multitude of explanatory variables. In the last few years, progress in computation methods has facilitated the use of Bayesian statistical methods in economic research. Nevertheless, the utilisation of Bayesian inference techniques in growth accounting is still very limited. The exceptions are the initial contributions of Koop, Osiewalski and Steel (1999, 2000), on which we rely heavily throughout this paper. In this paper we use Bayesian stochastic production frontiers in a growth accounting exercise for the period 1960/2005, assuming a dynamic translog production function and using data on 21 OECD economies. The results provide information on the contribution of inputs to GDP growth, on capital and labour elasticities and on TFP contribution. Furthermore, TFP is broken down into technological change (TC) and degree of efficiency. Intuitively, these components represent two different aspects. TC corresponds in general to more *efficient* production techniques. Improvements in efficiency correspond to better institutional and organisational arrangements, ie the more *efficient* use of the current level of inputs and technology. However, in practice it is often difficult to establish a clear distinction as TC and efficiency interact. Thus, not surprisingly, although the statistical method used provided contributions for both components, the degree of precision is smaller than the one associated with the computation of total TFP. In addition, it should be noted that, although it uses less conventional methods, this paper is still a growth accounting exercise. Thus, it does not reveal economic causation channels.

The stochastic frontier approach

Before presenting the model, it is important to discuss some methodological issues. Firstly, contrary to most of the traditional empirical growth accounting exercises, GDP growth decomposition is jointly and simultaneously computed for several economies, under the

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assumption that there is an international production function (IPF). Conceptually, this means that all countries have access to the same technology, implying that if two countries have equal labour and capital endowments the one with higher GDP is more efficient, ie closer to the stochastic IPF. The speed of international dissemination of TC and its implications in terms of growth theory are discussed by Basu and Weil (1998). They argue that the dissemination of TC in production systems occurs at a slower pace than the diffusion of knowledge. In the OECD countries, knowledge diffusion should occur at a very fast pace, generating a common set of potentially available production technologies. Therefore, the time that elapses until a country effectively adopts the technological innovations in its production systems becomes reflected in its relative production efficiency. In addition, if a TC is potentially available for all, the IPF expands over time in some way. We simply assumed that TC evolves according to a linear trend during each period considered. The analysis focuses on eight 11-year periods (10 annual growth rates), for which stochastic production frontiers were computed. The length of the periods is enough to encompass the average duration of economic cycles, thus averaging out cyclical effects on the macroeconomic variables considered. All results of the growth accounting exercise are presented in terms of 10-year average growth rates or contributions. The partition of the sample in sub-periods is necessary because of the assumption on the dynamics of TC. In fact, it does not seem reasonable to assume that technology evolves linearly throughout several decades. Regarding the production function specification, a translog formulation was used. This formulation includes as a special case the (log)Cobb-Douglas production function, though it is much more flexible than the latter. Temple (2006) argues that the assumption of a Cobb-Douglas specification may lead to spurious results in economical and statistical terms. Traditional growth accounting exercises treat TFP as unobservable (omitted variable), limiting specification testing. In fact, if the researcher had identified a good proxy for TFP and the data were actually generated by a translog, a suitably specified regression would accurately recover the parameters of that translog production function, and reject the Cobb-Douglas specification. Classical econometrics allows for the estimation of stochastic production functions, namely through maximum likelihood methods, but relies on asymptotic inference, which may not be supported by relatively small samples. We opted to use Bayesian methods as they have the relative advantage of allowing inferences even when samples are small. Moreover, Bayesian methods make it possible to rationally combine observed data with economically meaningful priors. In practical terms, for each parameter in the model, observed data and initial assumptions (priors) generate a posterior distribution function. The posterior distribution functions of all parameters are derived simultaneously, leading to the posterior distribution function of GDP growth components. The prior for the posterior distribution function of the efficiency parameter is an asymmetric positive distribution. The rationale behind this assumption is twofold. Firstly, this parameter measures the distance to the production frontier, so it should not be negative. Secondly, there is a smaller probability of finding observations as we move further towards the production frontier. This assumption is common in the literature. As to the specification of the distributions, given its relative advantages, we chose a normal-gamma model (normal distribution of the residual component and gamma distribution for the efficiency component).

The model

The model considered for the growth accounting exercise follows Koop, Osiewalski and Steel (1999). The GDP is defined by:

$$Y_{ti} = f_t(K_{ti}, L_{ti})\,\tau_{ti} w_{ti} \qquad (1)$$

where Y_{ti}, K_{ti} and L_{ti} denote the real output, the capital stock and labour in period t ($t = 1, \ldots, T$) in country i ($i = 1, \ldots, N$), respectively. Furthermore, τ_{ti} ($0 < \tau_{ti} \leqslant 1$) is the efficiency parameter and w_{ti} represents the measurement error in the identification of the frontier or the stochastic nature of the frontier itself.

As mentioned above, the basic model assumes a flexible translog production function:

$$y_{ti} = x'_{ti}\beta_t + v_{ti} - u_{ti} \tag{2}$$

where:

$$x'_{ti} = \left(1, k_{ti}, l_{ti}, k_{ti}l_{ti}, k_{ti}^2, l_{ti}^2\right) \tag{3}$$

$$\beta_t = (\beta_{t1}, \ldots, \beta_{t6})' \tag{4}$$

and lower case letters indicate natural logs of upper case letters. The logarithm of the measurement error v_{ti} is *iid* $N(0, \sigma_t^2)$ and the logarithm of the efficiency parameter is one sided to ensure that $\tau_{ti} = \exp(-u_{ti})$ lies between zero and one. The prior for u_{ti} is taken to be a gamma function with a time specific mean λ_t. The contribution of input endowment, technology change and efficiency change to GDP growth is defined in a fairly simple way. The GDP growth rate in country i in period $t + 1$ can be written as:

$$y_{t+1,i} - y_{t,i} = \left(x'_{t+1,i}\beta_{t+1} - x'_{t,i}\beta_t\right) + \left(u_{t,i} - u_{t+1,i}\right) \tag{5}$$

where the first term includes TC and factor accumulation and the second term represents efficiency change. The first term can be further decomposed as:

$$\frac{1}{2}\left(x_{t+1,i} + x_{ti}\right)'\left(\beta_{t+1} - \beta_t\right) + \frac{1}{2}\left(\beta_{t+1} + \beta_t\right)'\left(x_{t+1,i} - x_{ti}\right) \tag{6}$$

The technical change for a given level of inputs results from the first term of the previous eqnarray and is defined as:

$$TC_{t+1,i} = \exp\left[\frac{1}{2}\left(x_{t+1,i} + x_{ti}\right)'\left(\beta_{t+1} - \beta_t\right)\right] \tag{7}$$

and the input change defined as the geometric average of two pure input change effects, relatively to the frontiers successive periods:

$$IC_{t+1,i} = \exp\left[\frac{1}{2}\left(\beta_{t+1} + \beta_t\right)'\left(x_{t+1,i} - x_{ti}\right)\right] \tag{8}$$

The efficiency change is defined as:

$$EC_{t+1,i} = \exp(u_{ti} - u_{t+1,i}) = \frac{\tau_{t+1,i}}{\tau_{t,i}} \tag{9}$$

Ten-year geometric averages are computed for each of these growth components. As mentioned above, we assumed that TC evolves linearly in each decade. Therefore we adopted the following formulation:

$$\beta_t = \beta^* + t\beta^{**} \tag{10}$$

and

$$\sigma_t^2 = \ldots = \sigma_T^2 = \sigma^2 \tag{11}$$

Thus the model can be written as:

$$y = X^*\beta - u + v \tag{12}$$

with

$$y = \left(y_1' \ldots y_T'\right),\ u = \left(u_1' \ldots u_T'\right),\ v = (v_1 \ldots v_T)',\ \beta = \left(\beta^{*\prime}\beta^{**\prime}\right)' \tag{13}$$

where β is a 12 × 1 vector and:

$$X^* = \begin{bmatrix} X_1 & X_1 \\ . & . \\ X_t & tX_t \\ . & . \\ X_T & TX_T \end{bmatrix} \tag{14}$$

where X_t is a 21 × 6 vector.
At this stage, the full likelihood function of the model can be written as:

$$f_N^{TN}\left(y \left| X^*\beta - u, \sigma^2 I_{TN}\right.\right) p\left(\sigma^{-2}\right) p\left(\lambda^{-1}\right) \prod_{t=1}^{T}\prod_{i=1}^{N} f_G\left(u_{ti} \left| 1, \lambda^{-1}\right.\right) \tag{15}$$

where f_N^{TN} stands for a multivariate $T \times N$ normal probability distribution function, f_G stands for a gamma probability distribution function and:

$$p\left(\lambda^{-1}\right) = f_G\left(\lambda^{-1} \left| 1, -\ln(\theta)\right.\right)$$

$$p\left(\sigma^{-2}\right) = \sigma^2 \exp -\frac{10^{-6}}{2\sigma^2}$$

Note that the prior for λ^{-1} assumes a gamma distribution with the first parameter equal to 1, meaning a very flat prior and second parameter such that $(-ln(\theta))^{-1}$ is the prior median efficiency. We assume θ = 0.03 so that the median of the efficiency distribution is 0.75. The robustness of results to this prior was confirmed taking different initial values for θ. As for σ^{-2} we assume the usual flat prior. Given this prior structure the posterior marginal distributions that compose the Gibbs sampler are easily derived. The conditional for β is:

$$p\left(\beta \left| Data, u, \sigma^{-2}, \lambda^{-1}\right.\right) \propto f_N^{2J}\left(\beta \left| \widehat{\beta},\ \sigma^2 \left(X^{*\prime}X^*\right)^{-1}\right.\right) \tag{16}$$

where

$$\widehat{\beta} = \left(X^{*\prime}X^*\right)^{-1} X^{*\prime}(y + u) \tag{17}$$

The conditional for σ^{-2} to be used in the Gibbs sampler is:

$$p\left(\sigma^{-2}\left|Data, \beta, u, \lambda^{-1}\right.\right) \propto f_G\left(\sigma^{-2}\left|\frac{n_0 + TN}{2}, \frac{1}{2}\left[a_0 + (y - X^*\beta + u)'(y - X^*\beta + u)\right]\right.\right) \quad (18)$$

Next, the conditional for u is:

$$p\left(u\left|Data, \beta, \sigma^{-2}, \lambda^{-1}\right.\right) \propto f_N^{TN}\left(u\left|X^*\beta - y - \frac{\sigma^2}{\lambda}i, \sigma^2 I_{NT}\right.\right) \quad (19)$$

Finally, the marginal posterior distribution for the λ^{-1} is:

$$p\left(\lambda^{-1}\left|Data, \beta, u, \sigma^{-2}\right.\right) = f_G\left(\lambda^{-1}\left|1 + TN, -\ln(\theta) + \sum_{t=1}^{T}\sum_{i=1}^{N} u_{it}\right.\right) \quad (20)$$

The sequential Gibbs sampling algorithm defined by eqnarrays 16 to 20 was run with 420,000 iterations for each separate decade, with a burn-in of the first 20,000 iterations to eliminate possible start-up effects. The traditional algorithm convergence criteria were computed and the posterior distributions were analysed.

Database

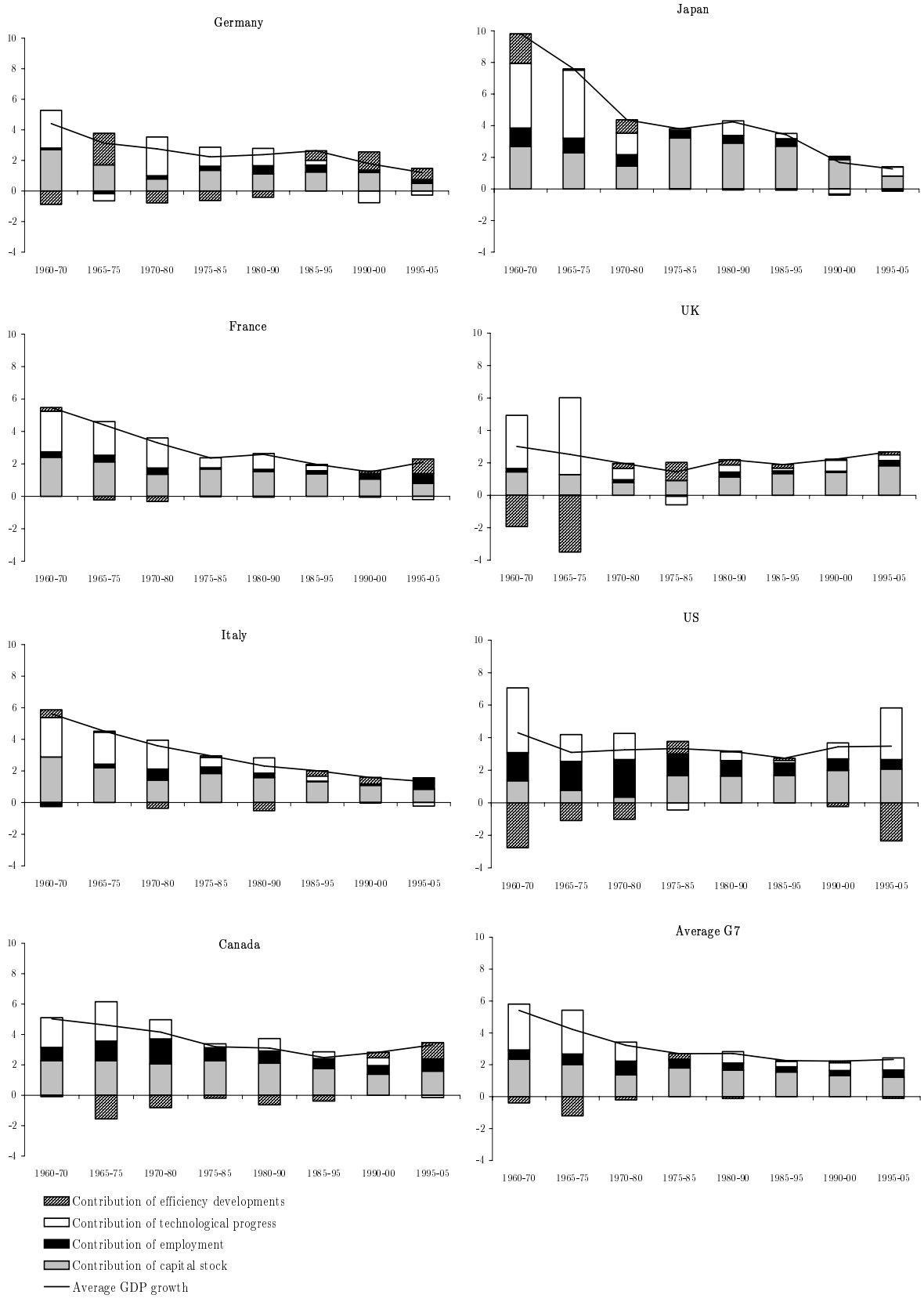
The data used for employment and GDP from 1960 until 2005 was obtained from the European Commission AMECO database (December 2005 version). As for the capital stock, for the first period in the sample, the stock of capital in each country was obtained from King and Levine (1994). These levels were updated using the capital real growth rates in the AMECO database. The reasons for this procedure are twofold. On the one hand, we did not adopt the initial capital stock of AMECO because, as an assumption, it simply corresponds to 3 times the GDP for 1960, which is an obvious limitation. On the other hand, it is not possible to use only data from King and Levine as they end in 1994. Other series of capital stock were tested, but the results do not change qualitatively. It should be noted that, in spite of the international conventions on national accounts compilation, there are important country-specific practices that tend to blur international comparisons. The compilation of value added for some services, namely those associated with general government activities, also poses difficulties in international comparisons. These problems may affect the results obtained, though, we hope, not dramatically.

Growth accounting for the G7 countries – country-specific results

Graph 1 plots the contributions of factor endowments and TFP to the average real GDP growth rates of the G7 countries. The contribution of inputs is separated into labour and capital, using the respective computed elasticities, and the contribution of TFP is broken down into TC and efficiency developments (the numeric results behind this graph as well as other details of the growth accounting exercise can be found in an extended version of this paper, available as working paper on the Banco de Portugal website: http://www.bportugal.pt/root/publish/wp/2007-9.pdf). Next we briefly analyse the results for each country. The US economy presents a relatively stable growth pattern. Firstly, it presents average growth rates around 3 and 4 percent in the decades considered. Secondly, it shows a relatively high contribution of labor to GDP

Graph 1

Growth accounting in the G7 countries



growth during all the periods considered. This partly reflects the entrance of baby boomers to the US labor market during the 1960s and the 1970s and significant immigration flows. Thirdly, the contribution of capital is close to the G7 average, showing some increase in the last decades. As for TC, in the beginning of the sample there were positive but decreasing contributions to GDP growth which reached a negative value in the decade 1975-85, the period when the effect of oil shocks was felt most strongly. After that period the contributions increased, reaching more than 3 percent in the decade 1995-2005. The contribution of TC to GDP growth is strong in the first and last decades. Nevertheless, in both periods the contribution of efficiency was negative, partly offsetting the contribution of technology. We discuss the interpretation of this result in the next subsection. The growth pattern of Canada resembles that of the US in some points. The contribution of employment to GDP growth is significant. The contribution of capital is also important and stable. Nevertheless, the contribution of TC in the last two decades considered is smaller than in the US and there is a considerable contribution from efficiency in the period 1995-2005. As regards the G7 countries that are euro area members – Germany, France and Italy – some differences in the growth patterns are identified. Germany recorded a trend decrease in the average GDP growth rates mostly attributable to a lower TFP contribution. The labor contribution has been low, with the exception of the 1980-1995 period, and the contribution of capital accumulation was lower than in the US and Canada, with the exception of 1960-70. As for TFP performance, the TC contribution decreased after the 1970s, and was negative in the period 1990-2000. This result probably captures the consequences of the German reunification. Conversely, in the period 1990-2005, efficiency contributed positively to GDP growth: although the existing input combination penalised growth, the economy moved closer to the computed production frontier. The French economy shows qualitative behavior similar to the Italian, and, to a lesser extent, to the German. In fact, in the comparison with Germany, two major exceptions are worth mentioning. Firstly, the contribution of technology to GDP growth in the decade 1990-2000 is not negative. Nevertheless, it is close to zero and has shown a significant decrease since the 1960s. Secondly, there is a large contribution of labor input to growth in the period 1990-2005. The Italian economy has recorded a continuing decrease in the 10-year average real GDP growth rate since the 1960s. This decline is mainly associated with the decreasing contribution of TC. This is similar to what was identified for France and Germany, but Italy has not benefited from increased efficiency in the last decade considered. However, like France, it recorded a positive contribution from employment in the 1995-2005 period. The UK shows a poor growth pattern in the period considered, though with some revival in the last decade. Is did not record high real GDP growth rates during the 1960s and 1970s, and recent performance is only slightly better than that of the G7 countries that are euro area members. All factors contribute to GDP growth, with a predominant role for capital. In the period 1960-1975, the contribution of TC was very high, partly offset by efficiency losses. This TFP pattern has been attributed to underinvestment and restructuring in some industries, driving a shift of resources to services. The improved performance recorded in the last decade may reflect some payback from these structural changes. The Japanese economy recorded a golden economic growth period in 1960-1975. The contributions of inputs and, most importantly, of technology gains, were strong. From the 1970s until the 1990s the growth pattern changed, with real GDP growth benefiting mostly from capital accumulation, labor input and some technological gains. In the 1990s the asset bubble crisis translated into a negative contribution of TFP (both technology and efficiency) to GDP growth. In the 1995-2005 period, average GDP growth was low, relying as it did on the contribution of capital and technology.

Growth accounting for the G7 countries – general results

One of our general results confirms that a large part of economic growth tends to be attributable to TFP. This is not news. However,when looking at the contribution of technology and efficiency to overall TFP performance, some results are worth mentioning. Firstly, the contribution of TC is stronger than efficiency improvements. Secondly, periods of high technology gain are frequently associated with negative contributions of efficiency. A possible explanation could be made along the following lines. When new technologies appear, countries may have an input mix that is suitable to take advantage of these gains. However, until these new techniques are effectively adopted, GDP growth will not reflect these potential gains and the contribution of efficiency will be reduced. In addition, it is also true that periods of strong TC imply high adjustment costs that, in our model, would be captured in the efficiency component. Another important result is the changes we have observed in the shape and dynamics of the computed world translog production function. The changes seem to indicate that that new technologies favor higher capital-labor ratios, meaning that the TC and potential TFP gains are centered in sectors with higher capital content. This finding is consistent with the idea that productivity gains are essentially associated with technology and capital intensive economic activities. The changes in the shape of the stochastic IPF have consequences in the elasticities computed for capital and labor in each country. The path of the computed elasticities for capital in the G7 countries was quite similar until 1995-2005. A sharp decrease in capital elasticity can be seen in the 1970-1980 period, when severe supply shocks occurred. In the recent periods, the surface of the stochastic production function seems to have became more convex, setting higher computed elasticities of capital for large economies with lower capital-labor ratios. Finally, a related debate concerns the type of returns to scale. The neoclassical view is based on the principle that capital presents diminishing returns at some point, leaving productivity gains to be explained by TC. However, the new growth theory, based on endogenous growth models, deviates from this result, due to either the existence of spillovers or issues of measurement and quality of the production factors. Departing from a simple growth accounting perspective, our analysis provides some results in this area: the sum of the capital and labor elasticities seems to point to the existence of increasing returns to scale in the G7 countries.

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Discussant comments on session IPM24: Measuring productivity

Bruno Tissot

Measuring and analysing productivity developments – a challenging task

Productivity numbers are volatile, subject to large cyclical effects and substantial revisions. Thus, identifying trends in productivity is challenging, particularly when making international comparisons. Despite the many ongoing efforts to improve our measurement and understanding of productivity, new complications seem to emerge as the tools become more refined. Is this a modern version of the Quest for the Holy Grail?

While following rather different approaches, the papers presented at the ISM24 session provided relatively consistent messages

Cross-country analyses have pointed to the dramatic slowdown in European productivity observed since the 1990s, especially compared to the United States, though this picture may have changed somewhat just recently. A major element explaining this difference has been the productivity of market services (distribution, finance, business services) and the rate of multifactor productivity (MFP) growth, which can be disaggregated into technological change (availability of more efficient techniques) and degree of efficiency (more efficient use of the techniques available).

KLEMS database (Timmer, O'Mahony, van Ark)[1]

The KLEMS project deals with productivity data at the industry level. Its advantage is its ability to more effectively take into account large cross-sector variations. However, a greater degree of detail does not necessarily yield more precision, as difficulties in measurement at the sectoral level often wash out at the aggregate level. Moreover, detailed data are available mostly in the industrial sector, which accounts for about 35% of US hours worked and is split into 18 sub-sectors, while distribution and finance represent a similar portion of the US economy and are divided into only 6 sub-sectors. A second feature of KLEMS is the ability to provide detailed international comparisons on key productivity-related data. The other side of the coin, however, is that it magnifies problems in measurement (eg composition of the labour force, depreciation rates and intermediate inputs).

[1] O'Mahony, M, M Timmer and B van Ark (2007): "EU KLEMS growth and productivity accounts: an overview", unpublished.

OECD productivity measures (Giovannini & Schreyer)[2]

The paper – whose presentation unfortunately was cancelled at the last minute – shows that several simple indicators need to be considered when performing international productivity comparisons. In particular, it is useful to account for the depreciation of capital (net domestic product): the "quality" of productivity gains is different if more capital is depreciated through the production process (and has to be replaced, accordingly, by new investment, leaving less output available for consumption). Similarly, the degree to which the labour force is utilised (using, for instance, GDP per capita) has to be considered. For example, higher structural unemployment in Europe suggests that those more frequently left unemployed are unskilled workers, thus biasing the composition of the working labour force toward higher-skilled workers, with a positive impact on average labour productivity. Another factor to be considered is the share of output that is transferred (or received from) abroad, highlighting the need to look at national income indicators. One could even complement these recommendations with other, perhaps simpler, indicators. For instance, looking at the unit of consumption per capita would avoid the measurement problem related to capital depreciation. Similarly, looking at the unit of GDP corrected for employment rates (ie output produced by number of working-age people) takes into account the underlying use of labour resources and limits the bias referred to above in Europe; in addition, it is independent of demographic effects, whereas the output-per-capita indicator is influenced by the exogenous factor of an ageing population.

Very recent improvement in EU vs. US performance? (Cette)

European productivity may have improved relative to the United States over the most recent years. However, statistical techniques (eg HP filters) are not very good at dealing with end-of-period sample problems, and productivity data are notoriously much revised. Moreover, assessments of productivity trends need to be corrected to account for the effect of the business cycle: there is indeed significant empirical evidence that productivity gains are higher when factors of production are utilised to a greater degree. This may have played a significant role recently in the United States, where demand has been weakened by the cyclical housing slowdown. But whether the correction used by the paper accounted adequately for the effect of the business cycle (or could, on the contrary, have actually amplified this effect) remains debatable. Another qualification is that the trends in productivity gains presented by the paper can vary substantially over several years – a point also open to debate. Finally, it is suggested that the lower rate of declines in ICT prices observed recently could indicate a slower rate of US technological progress; but it could also reflect the recent situation of high US profit margins – consistent with the fact that US ICT investment remains solid compared to that in other regions.

Stochastic frontier approach (Amador & Coimbra)

This paper's approach is highly innovative (cross-country regressions of key productivity variables, using an international production function), especially in comparison with traditional approaches that use mainly time series analyses. However, there are substantial measurement challenges: the authors recognise that "important country-specific practices in

[2] Giovannini, E and P Schreyer (2007): "The OECD productivity database", unpublished.

measuring capital could blur international comparisons" and hinder the determination of countries' positions with respect to the world production frontier. Moreover, the calculations rely on the assumption that productivity gains are constant within successive 10-year periods. Though this assumption was certainly useful in simplifying calculations for the method employed, breaks in productivity actually appear to be somewhat more irregular.

Conclusions

Cyclical influences are important when measuring productivity, and there are significant uncertainties when comparing both productivity levels and gains across countries. However, looking at a period of several decades, one can observe that labour productivity has accelerated in the US and decelerated in the rest of the OECD. The key factor accounting for US performance was less a matter of capital accumulation than of the growing gap in technological progress (MFP) between the US and other large industrial economies observed since the 1980s.[3]

[3] Cf. Skoczylas & Tissot (2005): *Revisiting recent productivity developments across OECD countries*, BIS Working Paper 182, 2005.

Discussant comments on session IPM24: Measuring productivity

John Baldwin

We have before us several papers that either discuss the creation of databases that can be used for the analysis of productivity comparisons or that make use of data from different countries to compare one country to another.

I will discuss these papers both as a statistician and as an economist. As a statistician, I am responsible for putting together the Canadian Productivity Accounts and I can therefore speak to issues that we have encountered as we produce productivity statistics.

Statistics Canada produces productivity statistics as part of a regular production program. It is not something done as an occasional research exercise. The production process is embedded within the National Accounts. The result is a set of data that we refer to as the Productivity Accounts.

These data consist of an integrated set of data on outputs, inputs, labour and capital contributions to the production process. Statistics Canada's Productivity Accounts are built, first, on an integrated set of production accounts – generating GDP from final demand – and, at the industry level, using one set of integrated, coherent accounts. The task of the Productivity Group is to take this integrated set of accounts and produce a set of estimates of labour services and capital services that is consistent with the output estimates. For example, on the labour side, the Productivity Group chooses amongst various source data (there are multiple sources, ie household versus employer surveys, each giving different estimates of labour inputs), makes sure the boundaries of the labour sources agree with the boundaries of the industry data, and produces a set of labour inputs in what is regarded as the best method (by estimating jobs and hours worked separately, and then multiplying them together). In the case of capital services, the Group takes investment data from a survey of investment, reconciles and modifies them to accord with National Accounts boundaries, and then estimates capital services using rates of return derived from the National Accounts estimates of profits or surplus, which in turn are taken from the Input/Output tables.

There are six dimensions that are used to determine whether statistical data are adequate for the purpose at hand – ie whether they pass a "fitness for use" test. These are: accuracy, relevance, timeliness, accessibility, interpretability and coherence. *Accuracy* refers to whether the information correctly describes the phenomenon it was designed to measure. *Coherence* reflects the degree to which data can be brought together successfully with other statistical information within a broad analytical framework.

Statistics Canada's integrated national accounts provide the foundations on which the productivity accounts are based. Because they are integrated across several dimensions – from the demand side, from the income side and from the industry accounts – along with detailed input/output tables, the productivity accounts are built on a solid foundation. For example, estimates of productivity using the demand side are reconcilable to those coming from the industry side.

The Statistics Canada Productivity Program provides quality assurance both by enhancing the accuracy of the Division's productivity estimates and by improving the overall coherence of these products. Analysis in the productivity program, as elsewhere in the National Accounts, is an extension of the particular nature of the production process. In the SNA, this process combines data from different sources. To construct official data series, the production process compares data from one source (for example industry value added) with data from another (for example, labour inputs). In the end, this comparative process serves

to bring a variety of sources into consistency with one another. Data that are generated from production surveys are subject to both response and non-response errors. By examining how one series compares to another (for example, how employment estimates from the Labour Force Survey compare with those from the Survey of Employment, Payroll and Hours), analysts can assess whether the survey error in one or the other data source is particularly large in one period.

Analysis also serves to provide consistency across different data series. Statistics Canada's Micro-economic Analysis Division (MEAD) develops and maintains a large database in support of the productivity program – what some refer to as the KLEMS (Capital, Labour, Energy, Materials and Services) database. KLEMS integrates time series data on gross output, material inputs, service inputs, energy purchases, labour, investment and capital. Each of these data series is calculated in both nominal dollars and real (constant) dollars. Price indices are collected for each of these series. Finally, KLEMS classifies these series using four different levels of aggregation – corresponding to the S, M, L, and W levels used in the Input/Output accounts. The W industry level (the most detailed of the four classifications) includes data on almost 300 industries. The period covered by the database extends from 1961 to the current reference year (2000, at present).

Productivity statistics are important indicators for those who analyse trends in the economy. These users are not only interested in knowing what the rates of productivity growth have been, but also in understanding the underlying causes behind slowdowns or accelerations in observed rates of productivity growth. Only by supporting the productivity program with large databases like KLEMS can these investigations occur. KLEMS thus serves a dual purpose. It is key to the production of productivity statistics. And its analytical capabilities are essential to many in the user community who utilise these productivity statistics.

The productivity accounts serve to improve data accuracy or suitability by contributing to the production of time series that are consistent over time. National Accounts data, if they are to be useful, need to have consistency over time. These data are used primarily for time series analysis. But, by their nature, the survey systems that provide data to the SNA are often not 'time-series' consistent. Industry classification systems have changed from being SIC-based to being NAICS-based. Surveys (such as the Annual Survey of Manufactures) change their coverage. Other surveys are re-stratified. Each of these changes may improve survey estimates at a given point in time, but render analysis over time less consistent. While rough corrections are often provided by survey programs to account for the impact of changes in coverage or classification, the survey programs rarely provide all of the changes that are required for time-series consistency. This is accomplished by using the data for analysis and then communicating the results of this analysis to production divisions.

It is important to note that data that may be fit for one purpose – that meet acceptable quality standards in this area – may not be for others. *Relevance* reflects the degree to which this information meets the needs of users. *Interpretability* reflects the availability of supplementary information necessary to interpret and utilise the appropriate data. And statistics may be developed for one purpose, while outside demand may begin to use them for other purposes, for which they were not designed and for which they may be less than ideal.

The evolution of the productivity statistics program provides an example of just such a transition. Statistics Canada's productivity accounts were originally developed to provide information on productivity *growth rates* in Canada, with regard to labour productivity and to multifactor – what academics often refer to as total factor – productivity. In a world of increasing globalisation, users' demands for international comparisons have increased. But providing estimates that meet acceptable quality standards poses particular challenges.

(a) The first challenge has been to develop data that are conceptually equivalent. Here the United Nations *System of National Accounts* has provided a foundation, and the

OECD's work on developing manuals on productivity estimation have been invaluable for setting standards.

(b) The second is to develop an idea of the quality of the statistics produced by different countries. There are two ways in which this can be done.

(1) First, statistical agencies can devote resources to cross-country studies that attempt to adjust for differences in source data and methodology. In Canada, users have requested guidance on the quality of Canada/U.S. productivity comparisons. Statistics Canada has long provided information products that compare Canada/U.S. productivity *growth* rates, choosing U.S. data sources that are closest to Canadian ones. Despite differences between the two countries, these differences are sufficiently small and sufficiently constant over time that they do not pose a major problem. More recently, Statistics Canada commenced a set of studies that examined alternatives that can be used to estimate the level of relative productivity – both labour and multifactor productivity. Statistics Canada found that despite the relative similarity in the statistical systems of the two countries, harmonisation of data sources and methodology was important. For example, differences existed in the way that labour input was calculated in the official productivity programs of both countries, which led to substantial downward bias in the relative Canadian level of labour productivity.

(2) The second method of ascertaining the quality of the product is to have third parties – such as the OECD and EU/KLEMS – take the initiative. Such efforts will develop estimates for multilateral comparisons, which, if they differ substantially from the national estimates that statistical agencies produce, will force the latter to reconsider their own programs.

(c) The third challenge is to provide guidance on the quality of the resulting estimates. Productivity estimates are essentially analytical concepts. They are derived from underlying data on GDP, labour and capital services that are imperfect. Most of the estimates from these series are usually reported as single points. Yet they all have distributions. Providing some estimates of the confidence intervals is a challenge to the profession. Yet it is an important one. Small differences in rates of growth lead to very large differences in cumulative growth over large periods of time. If the confidence interval around intercountry differences in our productivity estimates is large enough to prevent our being able to say whether large cumulative differences are real, we are doing a disservice to users. Quality of product, as emphasised, involves guidance on interpretability. If those providing estimates of productivity growth rates do not provide this guidance, the quality of their program will be brought into question.

Providing high quality products involves more than simply choosing similar parameters for all countries. As Solow argued, it is not clear that the standard assumptions about well functioning markets (prices equal to marginal costs or constant returns to scale) are equally appropriate across all countries. Nor is it obvious that choosing similar depreciation rates across all countries is equally correct. Or, for that matter, applying similar price indices. Careful examination of price changes in Canada relative to the United States have shown that some prices have very different cycles in the two countries, as a result of oligopolistic price discrimination across exchange rate cycles.

What is required is to gain the interest of the analytical community in many of these areas. And here, there is a need to partner the academic and statistical communities. Naturally, the former will pose many questions that the present data were not created to answer. The latter group will find itself trying to react to new demands and will possess uncodified information on data peculiarities that need to be understood in order to assess the value of the international comparisons being made.

I personally welcome the OECD productivity and EU/KLEMS productivity-related program initiatives, as a start toward providing the impetus for national programs that examine where country data can appropriately be used. To the extent that this expands demand for the product, it will lead to improvements that enhance the quality of the estimates.

Finally, I should like to point to the need to expand the quality of the estimates we provide.

Invited Paper Meeting 65

Statistical tools used in financial risk management

Chair: Richard Walton, European Central Bank

Papers:

A comparison of ECB and IMF indicators for macro-prudential analysis of the financial sector
Anna Maria Agresti and Paolo Poloni, European Central Bank and Patrizia Baudino, Bank for International Settlements

The IMF's work on financial soundness indicators
Armida San Jose, Russell Krueger and Phousnith Khay, International Monetary Fund

Bank liquidity and financial stability
Natacha Valla, Béatrice Saes-Escorbiac and Muriel Tiesset, Bank of France

Bank failure prediction: a two-step survival time approach
Michael Halling, University of Vienna and Evelyn Hayden, Austrian National Bank

Discussants:

Greg Haymes, Bank of Canada
Homero Gonçalves, Bank of Portugal
Filipa Lima, Bank of Portugal

Chairman summary on session IPM65: Statistical tools used in financial risk management

Richard Walton[1]

Ms Armida San Jose (Division Chief, Financial Institutions II, IMF) presented the IMF's framework for Financial Soundness Indicators, which measure the current strengths and weaknesses of a country's banking system, allowing for the monitoring of financial risks and thus providing analysts and policymakers with the opportunity to compare the soundness of the financial systems of different countries. The indicators were intended to measure the soundness of the overall financial system, not the performance of individual units. The highly innovative methodology used to compile these indicators drew on statistical, supervisory and business accounting frameworks. Armida selected three conceptual issues for further discussion: the basis for the consolidation of banks; the valuation of financial instruments; and the recognition of current income and expenses. By way of conclusion, the paper stresses the need for greater convergence and integration in the methodology, and for promoting greater comparability in indicators over time and across countries.

Mr Paolo Poloni (ECB) compared the ECB and IMF approaches to compiling financial stability indicators. He started by describing the ECB approach – one that covers the entire financial system but places special emphasis on identifying the major sources of risk facing the banking sector. The ECB approach collects a wider range of data (including market sources) than does that of the IMF, due to the greater complexity of the European financial system. The ECB indicators are compiled primarily for the EU and euro area and, as a sub-set of these, for each EU country. For this sub-set, comparison with the IMF indicators becomes critical. Paolo identified the issue of consolidation as one in which there are substantial differences between the IMF and the ECB, and offered a proposal for possible convergence. Moreover, unlike the IMF approach, ECB's does not require intra-sector adjustments to the banking sector data. Differences between the two frameworks result in the publication of different figures, and also entail costs for the reporting institutions, particularly when preparing a data series required by the IMF but not required under the European approach.

Discussion on these two papers was stimulated by the comments of **Mr Greg Haymes** (Principal Researcher, Bank of Canada), who also reflected on experiences in the Bank of Canada, which participated in the FSI pilot. The challenges facing the Bank of Canada were (i) the time spent in documenting the detailed metadata and (ii) the degree of collaboration with – and lack of resources among – other government agencies, the supervisor of financial institutions and the national statistical office. At the Bank of Canada, every effort was made to harmonise the data sources used in macroprudential analysis with those of the FSIs.

Regarding the key differences in forms of consolidation, **Mr Greg Haymes** agreed that the ECB proposals for the domestically controlled cross-border, cross-sector consolidation basis were consistent with national supervisory standards, and that the data were more readily available and based on standards by which the banks themselves judge their financial stability. He suggested an approach that would allow for flexibility in using the two types of consolidation, depending on the sophistication of a country's financial system. This approach would also be compatible with the compilation of regional indicators, and would facilitate data

[1] ECB.

produced on a euro area basis. Looking at the FSI conceptual framework, Greg argued that – at a minimum – the Basel framework should be included in the Guide, which should also accept the IAS as the standard on most accounting issues (except for the IAS recommendation to consolidate the parent and all subsidiaries regardless of whether they are financial or non-financial entities). The key lessons for central banks and international organisations in compiling FSIs were described as the need to: (i) establish relationships with senior reporting managers; (ii) ensure that providers realize the value of their data; (iii) target more in-depth relationships with the largest providers; (iv) understand response burden; (v) seek early feedback on new requests; (vi) conduct on-site visits, training and information sessions; and (vii) focus on the long-term benefits of such efforts.

The paper introduced by **Ms Evelyn Hayden** (Economist, Bank Analysis and Inspections Division, Oesterreichische Nationalbank), on Bank Failure Prediction, proposed a statistical method to assess the point in time at which a bank begins to exhibit risk, and a statistical model for survival time analysis of such banks in crisis. This two-step approach was proposed for off-site supervision of banks as a means of assessing the health of banks and to predict bank failure. Management efficiency and size relative to nearby competitors were seen as important predictors of crisis banks. At-risk banks that are among the largest banks in their region face lower risk, while banks with efficient management have a higher probability of surviving periods of financial crisis. Interestingly, there was no evidence that macroeconomic variables play an important role in predicting default in the at-risk sample.

The statistical model for survival time analysis of crisis banks included variables to measure credit risk and banks' ability to cover losses and loan loss provisions. Statistical variables specific to two-step models are used to measure management quality, including staff efficiency, and have been included in the two-step model. One statistic – used only for the sample of at-risk banks – is the ratio of net interest income to number of employees. Another interesting statistic used for the sample of at-risk banks is the bank's total balance sheet relative to the balance sheet total of all banks in the home region, thus measuring its size relative to its geographically closest competitors.

Stimulating the conversation were comments by **Mr Homero Gonçalves** (Financial Accounts Unit, Banco de Portugal), who discussed the relevance of the analysis and the filtering of supervisory data. Mr Gonçalves then examined the methodology and findings of the two-step model in providing explicit time to default estimates. Questions were raised on: (i) the need for additional statistics; (ii) the feasibility of implementing the model in other sectors, such as NFCs; (iii) reasons for the lack of statistical significance of macroeconomic variables; (iv) collection of data by legal entity or on a group basis; (v) whether the approach would influence the behaviour of financial entities; and (vi) implementation of the approach within Supervision Departments.

The paper by **Ms Natacha Valla** (Banque de France) measured a bank's broader liquidity position using stock-based indicators. New asset-based measures of bank liquidity were used in the analysis of gross liquidity flows. This analysis provided data on gross liquidity – purchases and sales of liquid assets by banks – and liquidity growth relative to aggregate trend growth. These concepts were described as "gross liquidity flows" and "idiosyncratic" flows, indicating the degree of heterogeneity among banks when expanding or contracting liquidity. The liquidity measurement used was entirely asset based – cash, inter-bank, repos, securities and net off-balance sheet commitments with credit institutions. This allowed for the measurement of liquidity by legal entity and provided an understanding of a firm's ability to access funds through asset sales. The approach does not use liquidity gaps based on maturity Data collected were from non-consolidated balance sheets, institution by institution, permitting the measurement of liquidity flows across entities within the same banking group. The liquidity dynamics could be assessed against the macroeconomic situation, as well as in relation to individual bank liquidity positions against trend.

Discussion was spurred by **Ms Filipa Lima** (Head of the Methodological Developments Unit, Banco de Portugal), who reviewed the new approaches to bank liquidity and raised questions on: (i) whether improved datasets that include management information were necessary; (ii) whether the approaches could distinguish between centralised and decentralised liquidity management; (iii) the feasibility of making comparisons with firms' liquidity risk management statements; (iv) whether the approach could be used in stress testing for firm-specific shocks; (v) whether there would be any links to the measurement of liquidity risk in the money markets (under current conditions); and (vi) whether the assessment of firms' liquid obligations, by counterpart and by funding channels, as well as by new products and/or markets, could provide further context to assess banks' gross liquidity flows.

A comparison of ECB and IMF indicators for macro-prudential analysis of the financial sector[1]

Anna Maria Agresti,[2] Patrizia Baudino[3] and Paolo Poloni[4]

Introduction

The IMF recently published, on an ad hoc basis, a series of Financial Soundness Indicators (FSIs)[5] based on a common methodology – the Compilation Guide on FSIs (IMF, 2006), henceforth the *Guide* – for 62 countries, including all European Union (EU) countries. The European Central Bank (ECB) has an interest in monitoring the development of the IMF initiative on FSIs in the context of its own work in compiling macro-prudential indicators (MPIs) jointly with the ECB's Banking Supervision Committee (BSC).[6] The aim of this paper is to identify the main similarities and differences of FSIs and MPIs, with particular emphasis on highlighting some methodological issues that need to be taken into account when implementing the *Guide* in Europe.[7] This exercise may also help to explain possible sources of discrepancies between figures appearing in IMF and ECB publications that, on the surface, could be seen as measuring similar concepts. The focus is on indicators covering the banking sector, where the overlap between MPIs and FSIs is most pronounced.

Two main differences between MPIs and FSIs are discussed here: the consolidation approach for banking sector data, and geographical scope (ie countries versus regions). As regards the consolidation approach, the *Guide*'s recommendations are geared towards a treatment of the financial sector that makes it possible to aggregate it with (and keep it distinct from) other economic sectors.[8] Although broadly in line with supervisory and accounting standards, FSI concepts are primarily drawn from macroeconomic measurement frameworks, which have been developed to monitor aggregate activity in the economy. Conversely, the approach to compilation of MPIs focuses primarily on the financial sector,

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1 This paper does not necessarily reflect the views of the ECB, the IMF or the institutions represented in the ECB's Banking Supervision Committee.

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5 The IMF published FSIs for an initial set of countries on 29 January 2007. Data for the remaining countries involved in the Coordinated Compilation Exercise are expected to be published later in 2007 and 2008. As of 8 November 2007, FSIs for 57 countries have been made available. Data for all EU countries have been published.

6 The BSC is composed of central banks and banking sector supervisory agencies of the EU member countries. The ECB Statistics Committee provided support with non-supervisory data used by the ECB/BSC.

7 For the ECB/BSC approach, see Grande and Stubbe (2002), Mörttinen et al (2005) and various issues of the ECB Financial Stability Review. For the IMF, see IMF (2006).

8 The two approaches, as labelled in the *Guide*, are the domestically controlled cross-border (DCCB) consolidation basis and the domestic consolidation (DC) basis (see Section 2).

with the banking sector at its core, and introduces the other economic sectors as sources of counterparty and market risk for banks. Moreover, all economic activity that is headed by a bank is reported under the parent bank. This requires a cross-border and cross-sector consolidation approach, which is also consistent with national supervisory practices and EU standards. The ECB/BSC approach is considered more appropriate for the monitoring of financial stability, because it allows for a complete view of the vulnerabilities and risks building up within banking groups and across the banking sector as a whole. In terms of geographical scope, the supranational perspective on financial systems (eg EU and euro area) is missing in the IMF framework. In Europe, the adoption of a common currency (or, from an EU perspective, the creation of the single market) has fostered new linkages across banks (and markets) operating in the euro area (or the European Union), creating new possibilities for contagion. In this context, national and regional perspectives could be usefully combined to provide fuller assessment of financial stability for other countries sharing crucial cross-border links in the financial sector.

The paper concludes with an investigation of potential areas for convergence between MPIs and FSIs.

Section 1 – ECB/BSC macro-prudential indicators

The ECB/BSC has been developing a framework for financial stability analysis over the past decade, driven largely by increasing integration across European financial systems (see ECB, 2007). An important component of the work has been constructing indicators for assessing the condition of the financial system and its resilience to stress. The ECB/BSC addressed this practical need by creating a set of MPIs that cover the entire financial system, but with special emphasis on the banking sector.[9]

The primary geographical scope of the financial stability analysis conducted by the ECB/BSC is the euro area and the European Union. One factor that has greatly facilitated the regional analysis conducted by the ECB/BSC is that all EU countries collect rather similar supervisory banking data, due to the adoption of the same EU Directives, creating a source of information that could form the core of the quantitative data needed to compute MPIs. Such data are compliant with Basel I (and, from 2008, Basel II) supervisory requirements, which take a consolidated view of banking groups. In particular, this requires consolidation of banking sector data, both across sectors (some subsidiaries of banking groups are not themselves banks) and across borders (some subsidiaries of banking groups are foreign-based), with the data collected by the ECB/BSC having been corrected for double-counting across the banking sectors of EU countries.[10] As for future changes, it has been decided that revisions to the templates for collecting banking data will be carried out in accordance with the recent accounting and supervisory changes made in implementing the International Accounting Standards/International Financial Reporting Standards (IAS/IFRS) and Basel II, respectively.[11] In this regard, as explained below, work undertaken by the EU Committee of

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[9] Mörttinen et al (2005) and ECB (2005a and b) describe the main components of the ECB approach. The ECB publishes the results of its analysis regarding the euro area in the Financial Stability Review and, in cooperation with the BSC, results regarding the European Union in the EU Banking Sector Stability Report.

[10] To the extent that cross-border integration of the EU banking sector deepens, or in the case of countries whose banking sector is mostly foreign-owned, the concepts of a banking sector "operating" in a country and a banking sector "domiciled" in the same country will move further apart. The Basel consolidation approach was still considered more appropriate for providing a full view of risks within the banking sector.

[11] The only major exception in this respect is the limitation of the scope of cross-sector consolidation under IFRS, to comply with the Basel II guidelines (ie consolidation only within the financial sector), and also with

European Banking Supervisors (CEBS) to develop common reporting templates incorporating IAS/IFRS and Basel II is expected to provide a useful benchmark for the revision of MPIs.

The analytical framework in which MPIs are used primarily involves the banking sector, and is composed of three blocks. The first consists of an assessment of conditions in the banking sector, based on backward-looking MPIs such as balance sheet, profitability, asset quality and capital adequacy measures (indicators similar to the CAMELS[12] supervisory ratings assigned by national supervisory authorities). The second block is forward-looking, and is designed to identify major sources of risk facing the banking sector. This analysis is based on several information sources, including market intelligence, contacts with EU national supervisory authorities and central banks, and internal risk assessment conducted by the ECB/BSC. Several MPIs are constructed to summarise the available quantitative information, covering competitive conditions in the banking sector, credit growth and the concentration of banks' exposures, asset price developments, market-based risk assessment, business cycle conditions, and indicators of financial fragility in the counterparty sectors (primarily households and non-financial corporations). Because the analysis needs to focus on a broad range of sources of risk facing the banking sector, the relevant MPIs must provide information on (1) pockets of vulnerabilities building up within the banking sector, including those reflected by the backward-looking MPIs (ie endogenous sources of risk), and (2) risks originating in banks' operating environments (ie exogenous sources of risk). For this reason, the MPIs used in this phase of financial stability assessment go beyond the banking sector to cover general macroeconomic conditions, as well as financial conditions in the household and corporate sectors. The third block is a set of indicators for assessing the resilience of the banking sector, based on its risk absorption capacity given the financial conditions and main sources of risk associated with the first two blocks. While some, primarily market-based, MPIs – eg distance to defaults, earnings-per-share, expected default frequency, price-earnings ratio – have been developed for this block, the overall assessment also draws on qualitative information, including discussion with supervisory authorities, and on an overview of the indicators used in the first two blocks. The third block is the most complex, as it requires combining the backward-looking component of the first block with the forward-looking identification of major risks in the second block.

The ECB/BSC approach to the design and use of MPIs is constantly being refined, independently of the supervisory and accounting changes already mentioned, although the link with Basel II requirements allows for MPIs to provide a consistent framework in which banks and the ECB/BSC measure risk – eg by recognising risk transfers, counterparty credit risk transfers, credit and market risk derivatives and securitisation. Examples of such refinements cover new concepts, as well as new MPIs. An example of the former case is the recognition of the financial system's increasing complexity, and the special role of larger and more sophisticated banks, given the potential impact that the failure of any of them could have on the financial system. This has required the selection of new banking sector population samples by bank size, as well as by the role of banks in national financial systems (ie in terms of so-called Large and Complex Banking Groups, or LCBGs). Indicators based on public disclosures made by LCBGs have become an essential part of the financial stability analysis conducted at the ECB/BSC, and they have the additional benefit of improving the timeliness of the information. Given that LCBGs are often listed on stock exchanges, market-

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respect to profitability, balance sheet and asset quality indicators, which are not otherwise directly affected by Basel II.

[12] The acronym CAMELS stands for Capital adequacy, Asset quality, Management (ie efficiency), Earnings, Liquidity, and Sensitivity to interest rates. See also Evans et al (2000) for an overview of micro-prudential indicators.

based indicators can also be extensively used for gauging market participants' assessment of LCBGs' ability to weather adverse financial disturbances. As regards new MPIs, efforts are being made to develop criteria for monitoring crucial banking sector risks, such as interest rate and liquidity risk, and to devise frameworks for stress testing that can be used to test the resilience of the EU/euro area banking sector in responding to large but plausible adverse disturbances. In this context, MPIs may eventually be used for conducting stress tests at the euro area/EU level.

Section 2 – IMF financial soundness indicators

As a consequence of the 1997 financial crises in Asia and previous global recessions, financial stability became part of the IMF agenda, complementing other initiatives to strengthen financial systems. Following an initial consultative meeting of experts and a survey of member countries, the IMF Executive Board endorsed a list of core and encouraged FSIs in June 2001. In January 2004, the IMF Executive Board approved a compilation *Guide* to develop FSIs for macro-prudential analysis, and finalised the list of FSIs with the specification of core and encouraged indicators. The core indicators concern only the deposit-taking sector (which corresponds to credit institutions in the EU terminology), while the encouraged indicators cover other sectors as well. The distinction between core and encouraged FSIs is helpful, since the availability of a small number of carefully selected indicators (a core set) in all countries could help set priorities for future work. The IMF has organised an initial stocktaking for the compilation of these FSIs. This exercise (known as the Coordinated Compilation Exercise, or CCE) has involved 62 countries, including all 27 EU countries. Since this is a one-off exercise, certain aspects of the methodology recommended by the *Guide* (such as data timeliness and frequency) have not yet been tested. Moreover, it remains to be seen for how many countries the FSI compilation will become a regular exercise.

Nevertheless, the FSIs represent a new body of economic statistics with which to assess the strengths and vulnerabilities of financial systems. The most important characteristic of FSIs is that they are designed to measure the soundness of the financial system as a whole, rather than the performance of the system's individual units. In this way, they differ from the indicators generally used by supervisors. For the purposes of the FSIs, the *Guide* explains how to aggregate and consolidate the data reported by each unit within the sector, in order to produce a total that is representative of the system's strengths and vulnerabilities, and to provide an assessment of the sector's strength. In order to obtain the sector-level data, all positions and flows between units within a group, as well as most positions and flows between reporting entities within the sector, are eliminated. As a result, the total for the FSI compilation is not simply the sum of its parts (eg the sector-wide data on capital and reserves are smaller than the simple sum of data on capital and reserves of all units within that sector). Therefore, sectoral measures of risk, capital adequacy or profitability will not necessarily be simple aggregations or averages of individual institutions' data. The *Guide* defines the deposit-takers and other sectors broadly along the lines of the 1993 SNA classification, which significantly enhances the usefulness of these indicators.

The IMF indicators in the core set are exclusively for deposit-takers, and are broken down into capital adequacy, asset quality, earnings and profitability, and liquidity indicators. Capital adequacy indicators serve to determine the robustness of financial institutions in terms of their ability to withstand shocks to their balance sheets. There are three ratios that serve as core indicators for capital adequacy: regulatory capital to risk-weighted assets, regulatory Tier 1 capital to risk-weighted assets, and non-performing loans net of provisions to capital. For asset quality, there are two core indicators: non-performing loans to total gross loans, and sectoral distribution of loans to total loans. Deposit-takers' asset quality is affected by the performance of their customers and is exposed to risks associated with loan concentration.

In fact, a deterioration in the financial health and profitability of non-financial corporations often contributes to the impairment of deposit-takers' assets, and lack of diversification in loan portfolios can be a significant cause of deposit-takers' vulnerability.[13] Earnings and profitability indicators are used to assess deposit-takers' financial health, and are also important in monitoring the efficiency with which they use resources. Differences in capital structure and business mix highlight the need to analyse the related ratios simultaneously. There are four core indicators for earnings and profitability: return on assets, return on equity, ratio of interest margin to gross income, and ratio of non-interest expenses to gross income. Finally, liquidity indicators are used to detect the level of liquidity, which affects the ability of a banking system to withstand shocks. For instance, a large shock may contribute to credit or market losses, which in turn could cause a loss of confidence in the banking sector. As a result, a liquidity crisis may occur and push solvent banks into insolvency. Two ratios are core indicators for liquidity: liquid assets to total assets (liquid asset ratio), and liquid assets to short-term liabilities.

The encouraged set of indicators, on the other hand, comprises indicators designed not only for the deposit-taking sector, but also for the non-deposit-taking sectors,[14] financial markets and real estate markets.

A crucial feature of the *Guide* is its consolidation approach.[15] The main consolidation approach for deposit-takers recommended in the *Guide* is the domestically controlled cross-border consolidation (DCCB) basis.[16] This approach is recommended mainly because it ensures consistency with national accounts, which in turn facilitates coordinated monetary policy and financial stability analyses. Under this approach, only deposit-takers are consolidated (ie only subsidiaries that are deposit-takers are included). The *Guide* does not recommend including the cross-sector consolidation dimension (ie the DCCBS approach) primarily because this approach would reduce the clarity of the institutional sector information. Similarly, relationships with other non-deposit-taking members of the group are not included, eg connected lending between the deposit-takers and non-deposit-taking affiliates. This could complicate the early detection of emerging weaknesses in the performance of deposit-takers. Also, interpretation of these data might prove problematic, particularly in periods of merger and acquisition activity involving units in different institutional sectors. The consolidation approach recommended by the *Guide* necessitates a number of potentially complex intra-sector adjustments.

The *Guide* recommends further data adjustments, as financial data compiled in accordance with IAS/IFRS do not fully comply with the spirit of the *Guide*. In particular, according to IAS/IFRS, consolidated accounts should include all of the parent's subsidiaries, including financial non-deposit-takers and non-financial corporations. Conversely, as mentioned above, the *Guide* recommends consolidation of deposit-taking entities only. Almost all core FSIs would be affected by this approach to consolidation. A key concern for implementation of the FSIs is that many countries are likely to use data sources consolidated according to IAS/IFRS or Basel principles for the purpose of FSI compilation. Thus, for these circumstances, and as a medium-term objective, the *Guide* recommends applying

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[13] This may be much less the case at present because of the increasingly widespread use of credit risk transfer (CRT) techniques, even though this applies mainly to the more advanced financial systems. Moreover, CRT techniques increase the need for more extensive information on other (sub-)sectors to which risk is transferred, such as hedge funds.

[14] The non-deposit-taking sectors are other financial corporations, households and non-financial corporations.

[15] Compiling data series for calculating FSIs involves two levels of consolidation: intra-group or group-level consolidation, and inter-group or intra-sector consolidation.

[16] The *Guide* also recommends the domestic consolidation (DC) approach as a supplementary approach, as it permits reconciliation of FSIs with national accounts.

adjustments (deconsolidation) in order to converge towards its recommendations. In this context, during the CCE the IMF circulated guidelines and examples illustrating how to adjust data stemming from IAS/IFRS-compliant financial statements and/or from Basel-compliant supervisory returns.

Section 3 – Comparison of the two approaches

MPIs and FSIs have been designed with the same goal: to create useful and sound benchmarks for the computation of quantitative indicators of financial resilience, primarily for the banking sector, that are broadly comparable across countries. Moreover, the FSI methodology and that of the MPIs collected and published by the EU 27 are similar on many points. Both, for instance, are based to a large extent on existing supervisory and accounting standards, and many of the indicators are similar if not identical (especially as regards the core FSIs).[17]

However, there are also a few differences between the two sets of indicators. It is important to identify these differences, given the costs to the 27 EU countries of setting up two different reporting methodologies for MPIs and FSIs. The reporting burden for national supervisory authorities and central banks must be taken into account, especially when considering the provision of new data series required by the IMF and not already used for MPIs. Moreover, a difference between the two series of indicators would require careful explanation, since, with regard to banks, they are designed to capture the same sources of vulnerabilities in the banking systems. Furthermore, the general public may find it difficult to interpret similar indicators of banks' profitability or solvency, which may very well have different numerical values in the IMF and ECB publications in the case of data reported at the country level. Here, we discuss three main differences in the compilation of MPIs and FSIs: (1) the conceptual approach; (2) key methodological aspects; and (3) strategic and legal issues.

As concerns the **conceptual approach**, the IMF strategy presented in the *Guide* aims to create a statistical and conceptual underpinning for a set of macroeconomic statistics on the basis of a methodological framework that, to the extent possible (but not exclusively), draws on existing statistical – and, to some extent, accounting and supervisory – standards, whereas the ECB/BSC MPIs on national banking sectors are based on existing supervisory banking data, which are compiled in accordance with international accounting and supervisory standards. In this context, the ECB/BSC approach is silent on certain detailed methodological issues that the FSI *Guide* addresses, such as intra-sector adjustments to avoid double-counting of income and capital. Ad hoc accounting guidance is also absent in the ECB/BSC approach, as it adopts, almost totally, the EU accounting and supervisory Directives. The conceptual approach devised by the IMF is based on the need to cope with the heterogeneity of financial systems worldwide. However, differences in the European Union are less marked (especially in the euro area), as there are a common currency (for the euro area countries) and a common payment infrastructure as well as rather similar financial systems. Moreover, many data definitions used by the ECB/BSC incorporate a "least common denominator" in several EU Directives, which must be applied by all Member States.

Although until recently the consolidated banking data collected by the ECB/BSC did not use a common methodology, major convergence has recently been promoted by the CEBS, which has developed a reporting scheme for the consolidated accounts under IAS/IFRS

[17] The present comparison applies only for the 27 EU countries, whereas the IMF framework has potential worldwide applicability.

(called FINREP), along with solvency disclosure requirements for banks and other financial institutions (called COREP). While the implementation of FINREP and COREP at a national level, and for supervisory purposes, is a matter of national discretion, most EU countries have indicated that they either are using or will soon be using these common templates. This development will materially enhance the harmonisation of banking data collected by the ECB.

The main **methodological differences** are summarised in Table 1.

Table 1

Main methodological differences between MPIs and FSIs

Differences	MPIs	FSIs
Frequency	Annual	Quarterly
Timeliness	Five to seven months after reference date	One quarter after reference date
Consolidation	DCCBS	DCCB; DC (as a supplement)
Sector-level adjustments	Rejected, except for some implicit deductions for regulatory capital	Yes
Publication of metadata	No	Yes
Geographical scope of indicators	Country level, euro area, EU	Country level only
Accounting guidelines	Link to EU Directives; in future, possible link to CEBS' FINREP/COREP	Yes

Source: ECB.

The methodological differences involve, first of all, the frequency and timeliness of data reporting, as the ECB/BSC requires annual supervisory banking data, with a five- to seven-month time lag, while the IMF criteria are more demanding, but still untested. As mentioned above, the different consolidation approaches recommended by the IMF and the ECB/BSC each have pros and cons. In particular, the ECB/BSC approach permits an aggregate view of risk at the banking group level, taking into account the principle of universal banking underlying EU rules and regulations. Moreover, as also discussed above, the increasing importance of larger banks or LCBGs constitutes further grounds for adopting a consolidated approach, in order to properly monitor all risks relating to the banking sector. Certainly, the adoption of the DCCBS approach complicates the delineation of the other financial institutions (OFIs) sector for FSI purposes, ie this approach does not guarantee symmetrical recording between sectors. This may have a bearing on the monitoring of increasingly important OFI sub-sectors such as hedge funds. A consequence of using the DCCBS approach is the need to make users aware that the OFI and deposit-taking sectors cannot be aggregated, due to double-counting. This is one of the reasons why the current version of the *Guide* does not recommend this approach. In general, when considering the consolidation approach across different sectors, consistency across various FSIs is important for the quality of the CCE –and in the event that the CCE turns into a regular exercise. The goal of the CCE was to identify the extent to which countries could, in fact, compile data consistent with the FSI methodology.

A related implementation issue concerns the extent of the intra-sector adjustments needed to compile internally consistent indicators, which are much more elaborate in the IMF

framework. While, from a theoretical point of view, these adjustments are appropriate, they may give rise to various practical difficulties, due to a possible lack of readily available data. The CCE indeed showed that, to date, only a few countries[18] have been able to make intra-sector adjustments recommended by the *Guide*.

The remaining methodological differences concern the publication of metadata (envisaged in the IMF framework but not yet foreseen by the ECB/BSC), the geographical scope of indicators (which is limited to country level in the IMF framework, but extends to regional level for the ECB/BSC), and the ad hoc accounting guidelines (much more detailed in the IMF framework).

Concerning the **strategic and legal differences** underlying the compilation of MPIs and FSIs, it should be borne in mind that, in the IMF case, the CCE has constituted the first opportunity to implement the approach in practice, while the ECB approach has already been in use for several years. Moreover, while the ECB approach is based on voluntary participation of the national supervisory authorities represented in the BSC, it remains to be seen to what extent the CCE will become a regular exercise, ie whether countries will continue the compilation of FSIs on a volunteer basis and whether in the future FSIs will be included eg in the framework of the Special Data Dissemination Standard (SDDS),[19] Financial Sector Assessment Program (FSAP) or Article IV[20] consultations. A decision on this may be taken later this year by the IMF Executive Board.

Assuming that the compilation of FSIs remains a voluntary exercise, compilers would rely on the *Guide*, which is necessarily rather stringent in addressing strategic and managerial issues. In particular, it recommends that the compilation of FSIs be coordinated by a lead agency, through a system of inter-agency cooperation. This is important to ensure effective coordination on FSIs, to guarantee the consistency of the concepts, definitions and framework used by different agencies in compiling FSI data, and to facilitate the dissemination of FSIs on a single centralised website and in regular publications, as recommended in the *Guide*. The *Guide* also reviews legal and other aspects of data collection, processing and dissemination, such as data confidentiality. In particular, the *Guide* recommends obtaining legal support for data collection, in line with the IMF's Data Quality Assessment Framework. The legal backing for statistical collection should cover a number of dimensions: scope, flexibility, compliance, confidentiality, integrity and confidence.

Section 4 – Can the main areas of divergence be narrowed?

In this paper, we have identified many points of convergence between MPIs and FSIs, but also a number of differences. In this concluding section, we focus on two differences in particular: the issue of compiling indicators on a regional basis, and the consolidation basis to be used.

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[18] Preliminary analysis indicates that intra-sector adjustments have been made by Cyprus, Indonesia, Korea, Lebanon, Malaysia and Malta. Other countries may have made adjustments, albeit not fully consistent with the *Guide*.

[19] The SDDS was established by the IMF to guide countries publishing economic and financial data in the context of access, or desired access, to international capital markets.

[20] The FSAP is a joint IMF and World Bank effort introduced in May 1999 to promote the soundness of financial systems in member countries. Article IV consultation is mandatory for countries that have signed the IMF Articles of Agreement; it consists of regular consultations (usually once a year) between the IMF and member countries.

As for the first issue, the construction of FSIs on a regional basis is not discussed in the *Guide*. For the purpose of the CCE, the concept of FSIs was viewed as a national-level issue, with FSIs to be compiled by authorities in each country. Conversely, MPIs are primarily compiled for economic regions, such as the euro area, and only as a second step are some also compiled for individual EU countries. Indeed, regional MPIs represent a benchmark for national MPIs for the countries in the European Union and are important for the ECB/BSC's assessment of euro area/EU financial systems as a whole.

In general, there are challenges to constructing regional FSIs because data are not fully comparable across countries, especially countries outside the European Union. The consolidation process on a regional basis also imposes the additional burden of requiring information on cross-border positions and transactions within the region in order to carry out intra-regional adjustments for double-counting, as is done by the ECB/BSC in collecting supervisory banking data. Moreover, from a conceptual point of view, conducting financial stability analysis at the regional level requires the identification of meaningful geographical areas for which a regional analysis usefully complements the national-level one. Although the need for a regional approach was indisputable for the ECB/BSC, further study on this matter in the *Guide* would be welcome.

Concerning the consolidation approach, the *Guide*'s recommended approach and that used by the ECB/BSC diverge substantially in that they reflect the different approaches to modelling the macroeconomy and, within it, the financial sector. Moreover, the *Guide*'s attempt to design a fully consistent statistical framework for all economic sectors requires sectoral adjustments, while the ECB/BSC's primary focus on the financial sector makes it possible to dispense with them.[21] Finally, while links to macroeconomic statistics may be favoured by one of the two approaches, opting for either would take account of existing international accounting and supervisory standards and practices while avoiding an undue increase in the reporting burden. A more important factor in the choice is which approach provides the most appropriate information for monitoring fragilities building up within the financial sector, especially at banks. In short, the approach chosen should provide a comprehensive view of the vulnerabilities within the financial sector.

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[21] The importance of adopting sectoral adjustments remains an empirical issue, which requires assessment through analysis of the corresponding data under the ECB/BSC and the IMF approaches.

The IMF's work on financial soundness indicators[1]

Armida San Jose,[2] Russell Krueger[3] and Phousnith Khay[4]

1. Introduction

The Asian Crisis in 1997–98 revealed major gaps in statistical coverage of the domestic financial sector and the external sector that permitted serious vulnerabilities to go undetected. Such gaps meant that national authorities lacked information needed to take timely and appropriate steps to improve conditions, and that the IMF did not have sufficient information for an effective oversight of the economies of its member countries. In response to this situation, the IMF launched several major statistical initiatives to improve coverage of potential financial and external vulnerabilities – the Template on International Reserves and Foreign-Currency Liquidity, External Debt Statistics, and Financial Soundness Indicators. This paper will focus on Financial Soundness Indicators, or FSIs, which are aggregate measures of the current financial health and soundness of the financial institutions in a country and of their corporate and household counterparties. It will briefly describe the history of the FSI project and the development of the FSI methodology; the results of an international coordinated compilation exercise undertaken by the IMF and participating member countries; some key methodological challenges; and possible next steps for taking forward the work of the IMF in this area.

2. History and development of the FSI methodology

The FSI project grew out of the need for better data and tools to monitor financial risks and vulnerabilities of national financial systems. This was a new area of work. The IMF has been collecting monetary statistics from countries, but these statistics do not focus on the compilation of soundness and risk information. Information about bank soundness is available to national supervisors; however, it focuses on the soundness of individual banks. Translating this type of individual bank information to information for the sector was not necessarily straightforward. It called for a careful investigation of the types of information needed to assess aggregate soundness and risk, as well as of data availability. The IMF began this process in 1999 by calling a meeting of a group of experts and officials of countries, regional and international organisations, and standard setters. They confirmed that there was an urgent need for this type of information and identified a number of important indicators that should be compiled. However, they concluded that there was no generally accepted model that identified the types of information to be collected. To gain further

[1] This paper has benefited from inputs and comments from the FSI team in the Financial Institutions Division 2 of the Statistics Department: Andreas Georgiou (team leader), Florina Tanase, Xiu-zhen Zhao, and Agus Firmansyah.

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information, the IMF conducted, in mid-2000, a *Survey on the Use, Compilation, and Dissemination of Macroprudential Indicators*. The survey asked member countries about the types of indicators they needed, the availability of the data, and the standards they used for compiling the data. There was a very strong response from over 100 countries, allowing the IMF to identify a core set of financial soundness indicators that all countries should compile and an encouraged set of important indicators that countries might choose to compile, depending on national circumstances. The survey also provided important information about accounting and compilation practices relating to indicators. On the basis of the survey information and after several rounds of extensive consultation with experts from international agencies, standard setting bodies, and member countries, the IMF completed and published the *Compilation Guide: Financial Soundness Indicators* ("the Guide").[5]

The Guide provides guidance on the concepts and definitions, and sources and techniques for the compilation and dissemination of internally consistent, cross-country comparable sets of indicators that could provide information about the current soundness of the aggregate financial system. The methodology in the Guide was highly innovative, combining elements of macroeconomic frameworks, including monetary statistics, bank supervisory framework, and international financial accounting standards. For example, standards for defining the boundaries of the national financial system and the definitions of the sectors of the economy, the types of financial instruments, and the concept of sectoral consolidation were drawn from monetary statistics. The use of these definitions allowed for ready comparison of FSIs with macroeconomic information about national economies used for economic and policy analysis. Additionally, supervisory standards, as embodied in the work of the Basel Committee on Banking Supervision, provided the definitions of many of the measures of soundness or risk, such as the definition of capital adequacy, exposures to market risk, liquidity, currency exposures, earnings ratios, etc. Much material was also drawn from the International Accounting Standards (IASs), with their greater focus on accrual standards, use of market or fair value accounting, and rules on impairment and provisioning. An integrated underlying framework was developed, drawing on information on bank income, as well as on balance sheet positions.

3. The coordinated compilation exercise

With the completion of the Guide, the focus shifted to promoting compilation of the indicators. The IMF launched a Coordinated Compilation Exercise (CCE) with voluntary participation of 62 systemically important countries. The CCE aimed at (1) developing the capacity of member countries to compile FSIs important to the surveillance of their financial systems; (2) promoting cross-country comparability of FSIs; (3) coordinating efforts by national authorities to compile FSIs; and (4) disseminating the FSI data along with metadata, to increase transparency and strengthen market discipline. The participating countries agreed to compile the 12 core FSIs and could choose to also compile some or all encouraged FSIs. (Please see box on core and encouraged FSIs, below). For comparability, countries were to attempt to apply the methodology in the Guide and to prepare data for a common time period – year-end 2005 for positions data and year 2005 for flows data. In addition, the participating countries were requested to prepare detailed metadata (textual descriptions of the data), including information on data sources and compilation methodology.

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[5] The Guide was released in electronic format in 2004 and issued as an official IMF publication in 2006 (http://www.imf.org/external/pubs/ft/fsi/guide/2006/index.htm). It has been translated into French, Russian, and Spanish. Arabic and Chinese versions are forthcoming.

Table 1

Financial soundness indicators: the core and encouraged sets

Core set	
Deposit takers	
Capital adequacy	Regulatory capital to risk-weighted assets Regulatory Tier 1 capital to risk-weighted assets Nonperforming loans net of provisions to capital
Asset quality	Nonperforming loans to total gross loans Sectoral distribution of loans to total loans
Earnings and profitability	Return on assets Return on equity Interest margin to gross income Noninterest expenses to gross income
Liquidity	Liquid assets to total assets (liquid asset ratio) Liquid assets to short-term liabilities
Sensitivity to market risk	Net open position in foreign exchange to capital
Encouraged set	
Deposit takers	Capital to assets Large exposures to capital Geographical distribution of loans to total loans Gross asset position in financial derivatives to capital Gross liability position in financial derivatives to capital Trading income to total income Personnel expenses to noninterest expenses Spread between reference lending and deposit rates Spread between highest and lowest interbank rate Customer deposits to total (noninterbank) loans Foreign-currency-denominated loans to total loans Foreign-currency-denominated liabilities to total liabilities Net open position in equities to capital
Other financial corporations	Assets to total financial system assets Assets to GDP
Nonfinancial corporations sector	Total debt to equity Return on equity Earnings to interest and principal expenses Net foreign exchange exposure to equity Number of applications for protection from creditors
Households	Household debt to GDP Household debt service and principal payments to income
Market liquidity	Average bid-ask spread in the securities market[1] Average daily turnover ratio in the securities market[1]
Real estate markets	Real estate prices Residential real estate loans to total loans Commercial real estate loans to total loans

[1] Or in other markets that are most relevant to bank liquidity, such as foreign exchange markets.

Source: Compilation Guide: Financial Soundness Indicators.

As of April 2007, 52 CCE countries have finalised their FSI data and metadata, which are now posted on the IMF website (http://www.imf.org/external/np/sta/fsi/datarsl.htm). This site provides the common set of indicators, along with detailed metadata that describe the standards underlying the indicators and the compilation practices. The data and metadata are presented in a uniform manner using a standard format developed under the CCE to facilitate cross-country comparison. More than half of these countries are in Europe; nine are in the Western Hemisphere, and eight are in Asia and the Pacific. The rest are in the Middle East and Africa. Almost 90 percent of the countries reported all core FSIs and all of the rest, except one, reported at least 10 of the 12 core FSIs. Forty-four countries reported encouraged FSIs for deposit takers; the majority of countries reported seven to 12 FSIs, while only six countries reported all 13 encouraged FSIs for deposit takers. Fewer countries reported encouraged FSIs for other sectors.

4. Key methodological challenges

As mentioned above, the FSI work employs an innovative conceptual framework that draws from statistical, supervisory, and business accounting frameworks to construct indicators relevant to assessing the current soundness of the financial system of countries. However, there remain some differences in views on the FSI methodology, and these differences have been reflected in the data and metadata reported by countries for the CCE. These methodological issues were discussed at the plenary meeting of the CCE on May 30–31, 2007 to review the results of, and experience from, the CCE. Nevertheless, the broad scope of the integrated FSI framework and its key elements remain firmly in place. This section will summarise three of the salient conceptual issues of the FSI framework, namely, the consolidation basis and consolidation adjustments, valuation of financial instruments, and recognition of current income and expenses.

4.1 Basis for consolidation (institutional coverage)

The first, and most controversial, issue is the standard to use as the *basis for consolidating* the data of individual reporting banks to obtain the sector-wide data. The Guide describes various consolidation approaches to cover different country circumstances and analytical needs. The *domestic consolidation (DC) basis* consolidates only the data for banks and their branches and subsidiaries that exist within the national boundaries of the country. These data allow linkage to national macroeconomic data and focus on the interactions between the national financial system and current national economic activity. In contrast, the *cross-border consolidation* encompasses the activity of the parent bank and its local and worldwide branches and subsidiaries. This is a supervisory perspective that focuses on the income and capital of the parent bank and the strengths and risks facing the global enterprise. The consolidation includes only banking institutions (*domestically controlled cross-border consolidation – DCCB*), which is the Guide's preferred approach, or, alternatively, it could be on a cross-sector basis (*domestically controlled cross-border and cross-sector consolidation – DCCBS*), which includes diverse types of financial institutions, following the approach of the Basel Committee. The cross-border consolidation could cover all domestically incorporated deposit takers (CBDI) to also capture resident foreign-controlled deposit takers, particularly when they play a significant role in the domestic financial system. The CBDI could also be on a cross-sector basis (CBCSDI). These data could then be disaggregated into separate FSIs for domestically controlled and foreign-controlled deposit takers.

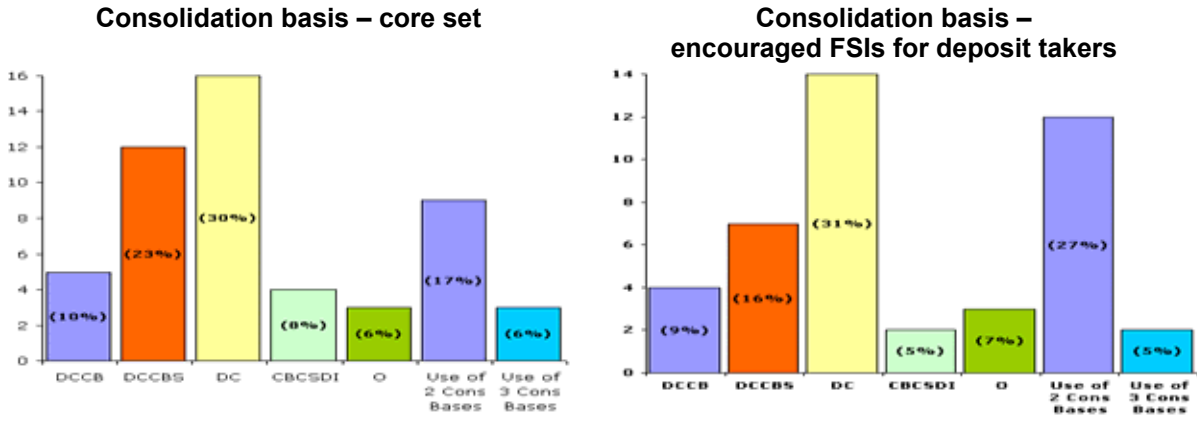
The Guide recommends that the DCCB basis be used to compile FSIs for the deposit takers. For the CCE, however, the countries could choose to use a consolidation basis other than the DCCB basis. The results of the CCE showed that, for the most part, the DC approach

was used, followed by the DCCBS and DCCB basis, respectively. Twelve of the CCE countries used multiple consolidation bases (all 12 countries used a cross border consolidation basis and nine countries used the DC basis). The choice of the consolidation basis in part reflected differences in practices between countries, depending on the sophistication of their financial systems – smaller, less complex economies may need only national data, but financial centre economies need information on the global activity of their banks. It also reflected the attempts made by some countries to move their practice closer to the Guide.

As an increasing number of countries are preparing to implement Basel II and IASs,[6] some countries have proposed exploring ways to use these two international standards as bases for compiling FSI data in order to minimise the compilation and reporting burden.

Figure 1

Consolidation basis used by countries for the CCE



DCCB: Domestically controlled cross-border consolidation basis; DCCBS: Domestically controlled cross-border and cross-sector consolidation basis; DC: Domestic consolidation basis; CBCSDI: Cross-border and cross-sector for domestically incorporated deposit takers; O: other consolidation basis.

Source: FSI metadata submitted by the CCE-participating countries.

4.2 Consolidation adjustment

Because FSIs are indicators for the sector as a whole, all interbank balance sheet positions and income flows, except debts and financial derivatives between unrelated deposit takers, are to be eliminated from the sector-wide data to avoid double-counting of the sector's income and capital. Debts and financial derivatives between unrelated deposit takers in the reporting population are not to be eliminated as they are useful for assessing the contagion risks. The Guide (paragraph 5.1) underscores the significance of these consolidation adjustments in compiling FSIs. Furthermore, it states (paragraph 5.52) that the relevance of each adjustment will depend upon national circumstances. Some adjustments might be generally applicable whereas others may not. Compilers should make a judgment on the costs and benefits of the collection of new data. If available evidence suggests that an

[6] Basel II and IASs apply different consolidation bases. Basel II suggests that the group consolidation should cover all banking activities and other relevant financial activities, excluding insurance activities conducted within a group, while under IASs the group consolidation should cover the parent and all of its subsidiaries, regardless of whether they are financial or nonfinancial entities.

adjustment is not relevant or would be insignificant, the benefits of collecting such information may not outweigh the potential costs to reporters and to the compiling agency.

The results of the CCE showed that while most countries carried out intra-group consolidation adjustments (albeit with less than full consolidation adjustments for some FSIs), intra-sector (inter-group) consolidation adjustments were not made, or were only partially made, by many countries (about two-thirds of the CCE reporting countries). The EU countries commented in a joint statement that, from a statistical point of view, intra-sector consolidation adjustments are appropriate, but noted practical issues, including lack of data for carrying out such adjustments.[7]

4.3 Valuation of financial assets and liabilities

The intention of the Guide is to obtain the most realistic current value of the sector's financial assets and liabilities and capital. Realistic and current valuation is stressed because it provides the best estimate of the actual worth of financial instruments and their availability to provide a buffer against financial risk. This requires that current market or fair values of tradable instruments be used rather than historical valuations, that interest and other accruals be on a current basis, and that any impairment in the realisable value of financial instruments be accurately reflected in current valuations, either through application of market or fair values, or by appropriate provisioning. Concerns about the FSI approach have been that additional volatility will be introduced into the income statement and balance sheet if some held-to-maturity instruments are valued at market/fair value for FSI purposes. It is further noted that the IASs permit amortised cost valuations for held-to-maturity instruments. In contrast, the underlying principle in the Guide is that the volatility is a real reflection of market movements and is an important item of information in itself, and that the current market valuation provides the best actual measure of the condition of the firm and its resilience in the face of economic stress. It may be noted that the new International Financial Reporting Standard 7, paragraph 25, requires disclosure of the fair value of each class of financial assets and liabilities whenever they differ markedly from carrying values. Moreover, the Consolidated Financial Reporting Framework of the Committee of European Banking Supervisors collects fair value information on all financial instruments carried on the balance sheet at amortised cost (loans and receivables, held-to-maturity investments, and financial liabilities measured at amortised cost).

4.4 Recognition of income and expenses

The recognition of income and expenses in general, and the recording of specific income items, such as gains and losses on financial instruments, in particular, are important for compiling income-based FSIs. The intention of the Guide is to capture the relative importance of the current income from the financial assets and liabilities recorded at market or fair value. In contrast to the Guide, IAS39 suggests that some unrealised gains and losses on available-for-sale instruments, and the effective portion of the gain or loss on a cash flow hedge or hedge of a net investment in a foreign operation – and potentially on a hedge for the foreign currency risk of a firm commitment – be recognised directly in equity, a procedure that underestimates gains and losses on financial instruments and net income as defined in the Guide. In addition, under IASs, interest income and expense comprises interest and other income (fees, commissions, and similar charges) directly related to interest-earning loans and other assets used in calculating effective interest rates according to IAS 39.

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[7] This comment was provided in the note attached to the letter from the ECB's Directorate General Statistics, dated September 26, 2006, to the IMF's Statistics Department.

Accordingly, in contrast to the Guide, noninterest income does not include fees and commissions receivable that are directly related to loans, while the interest margin includes such fees and commissions.

5. Future work on FSIs

The results of the CCE were reviewed and discussed at the end of May 2007 in a meeting of regional and international organisations and financial sector standards setters,[8] and at a meeting of countries participating in the CCE. The discussions in these meetings covered the data and metadata produced by countries participating in the CCE, the experiences of the national compilers, methodological and compilation issues, possible changes to the list of indicators, and the feasibility of setting up an ongoing system to compile and disseminate FSIs. The views and conclusions from these meetings will be reflected in a paper to be submitted to the IMF's Executive Board for discussion before the end of 2007[9]. In particular, the paper will report the CCE participating countries' views and experiences in compiling FSIs and the lessons learned in carrying out the exercise. The paper will address whether the goals of the CCE were achieved, along with potential follow-up initiatives. Issues related to follow-up initiatives include (1) approaches to expanding the number of countries compiling FSIs, including modes of technical cooperation; (2) the potential for greater convergence towards the Guide's recommendations, and fostering greater FSI data comparability; (3) addressing the challenges of compiling FSIs in accordance with the Guide in the context of evolving accounting and supervisory standards; (4) modification to the core and encouraged FSIs; (5) amendments to the advice provided in the Guide; and (6) the potential for inclusion of FSIs in the IMF's data dissemination initiatives such as the Special Data Dissemination Standard.

Decisions on the future work of the IMF on FSIs will be largely shaped by the implementation of the IMF's Medium-Term Strategy that focuses on enhanced financial sector surveillance amidst new budget realities for the institution that require work prioritisation, belt-tightening, and streamlining. Regardless of the form and nature of the follow-up initiatives on FSIs, one thing is certain: the data and metadata produced by countries under the CCE and disseminated by the IMF have significantly advanced the knowledge and experience in this new field of statistics, and have set a good foundation for the regular compilation of FSIs by these countries.

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[8] These institutions comprised the Reference Group of the CCE, which was established to provide views on emerging issues in the CCE.

[9] The IMF Executive Board met on November 7, 2007 to review the experience with the work program on FSIs and discuss proposals for taking forward the work on FSIs. Public information notice on the meeting is posted on the IMF website at http://www.imf.org/external/np/sec/pn/2007/pn07135.htm.

Bank liquidity and financial stability[1]

Natacha Valla,[2] Béatrice Saes-Escorbiac[2] and Muriel Tiesset[3]

Introduction

This paper presents new asset-based measures of bank liquidity which capture and quantify the dynamics of liquidity flows within the French banking system between 1993 and 2005. We consider net changes in the "stock" of liquidity in banks' balance sheets as the result of two simultaneous "flows": the purchases and sales of liquid assets. Our flow approach allows us to assess the intertemporal dimension of liquidity fluctuations within the banking system (expansions, contractions and overall reallocation) on the basis of individual bank data.

From a policy perspective, the results suggest that under normal circumstances the cross-checking of liquidity ratios and liquidity flows could prove useful in designing a robust prudential approach to liquidity. Under extreme circumstances, when the provision of emergency liquidity is being contemplated, the traditional concept of "bank liquidity" could be complemented by considering the liquidity of monetary and other financial markets.

1. Measuring bank liquidity

Our analysis of bank liquidity at the aggregate level is presented below. After discussing the concept and measurement of "gross liquidity flows" (1.1), we turn to methodological considerations associated with this concept, (1.2) and then to aggregate liquidity measures (1.3).

1.1 Gross liquidity flows: concepts and measurement

The concept of "gross flows" originates from labour market turnover studies. One key reference in this area is Davis and Haltiwanger (1992). More recently, estimates of gross credit flows have been conducted in a similar way by Craig and Haubrich (1999) and Dell'Ariccia and Garibaldi (2005). Our efforts to measure and quantify liquidity dynamics in the banking sector build on this literature. This approach allows us to describe gross quantities of liquidity flowing in and out of the French banking system's balance sheet, as well as the rate at which overall liquidity is reallocated across banks. These fluctuations lend themselves to an insightful cyclical analysis.

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An individual bank's liquidity expands (contracts) in a given quarter if its liquidity growth is positive (negative). For example, the liquidity of a bank holding € 100,000 worth of liquid assets in 1993:1 and € 110,000 (€ 90,000) in 1993:2 would have expanded (contracted) liquidity at a rate of 10% for the quarter. At the aggregate level, gross liquidity expansion (contraction) is proxied by the sum of the absolute values of all liquidity changes across banks with positive (negative) liquidity growth. Gross rates of expansion and contraction are then computed. For example, if the banking system is composed of two banks of similar size with liquidity expanding and contracting at the same rate, then we consider that liquidity to be unchanged at the aggregate level. A formal definition of those concepts is presented in Box 2.

At the bank level, liquidity contraction (represented by a negative value of liquidity growth) can stem from either active reduction of liquid portfolios, or from the fact that a temporary operation (eg a repo) is not rolled over at maturity, and that there is not a corresponding increase in other liquid items. Either event leads to a reduction in liquidity.

The interpretation of the aggregate series thereby obtained depends on how one measures growth at the bank level. In this paper, we distinguish between gross *nominal* and gross *idiosyncratic* liquidity flows. Nominal flows measure growth in absolute terms, as illustrated above. They reflect nominal liquidity expansion or contraction within the banking system on aggregate. Idiosyncratic flows measure liquidity growth relative to aggregate growth. They are "idiosyncratic" in that they reflect purely bank-specific factors (specific trading strategies, isolated liquidity shocks, changes in corporate governance or internal structures, etc.). For example, if a bank increases its liquid holdings by 10% in a given quarter while the banking industry increases liquidity by 6%, the idiosyncratic component of that bank's liquidity inflow is 4%. Idiosyncratic flows reflect the degree of heterogeneity in banks' expansion or contraction of liquidity.

1.2 Methodological issues

Before describing the proposed liquidity measures in greater detail, it should be noted that they are affected by two major methodological issues. Firstly, they ignore liquidity expansions and contractions that may occur simultaneously within each reporting entity, ie within each bank. This biases our estimates downwards, since liquidity reallocation is likely to occur across a bank's various desks (for example, between the repo desk and the treasury desk). However, our data do account for liquidity flows across entities of the same banking group, since we use the BAFI 4000 Reporting Files, which are collected institution-by-institution on a non-consolidated basis.[4]

Secondly, flow measures may overestimate gross flows by recording unwarranted liquidity reallocations due to mergers and acquisitions. This bias is potentially problematic. We therefore chose to clean the data on the basis of merger files provided by the Banque de France unit (DECEI/CECEI) that registers bank creations, closures and mergers (see Box 2 for details).

[4] Liquidity flows between banks of the same group cannot be isolated from those occurring across different groups. As a result, negative and positive flows across banks that belong to the same group may reflect intra-group reallocation of liquidity. Intra-group liquidity management has gained importance in France – in particular for mutual banks – as the consolidation process has proceeded.

Box 1

Measuring bank liquidity

T two criteria are involved in liquidity management within a financial institution. First, the institution must be sure that appropriate, low-cost funding is available at short notice. This may involve holding a portfolio of assets that can easily be sold, holding significant volumes of stable liabilities, or maintaining credit lines with other financial institutions. Second, liquidity management must meet profitability requirements. Financial stability issues lie precisely at this liquidity/profitability nexus: banks must manage liquidity stocks and flows in the most profitable manner that does not jeopardise financial stability.

In France, bank liquidity is monitored on the basis of a liquidity ratio.[1] The liquidity requirement of the Banking Commission consists of a monthly report on banks' overall liquid assets and liabilities, which include cash positions, claims (including repo-related claims with up to one month of remaining maturity) and negotiable securities, as well as off-balance sheet commitments and available liquidity lines. Based on this information, the Banking Commission establishes a ratio of liquid assets to liquid liabilities, using a weighting scheme to reflect the likelihood of items being rolled over or being available in event of a liquidity squeeze. The weighting scheme thus recognises that liquid assets may be realized only with some delay and at some risk. This ratio must be above 100 percent at all times. The liquidity coefficient used by the Banking Commission belongs to the family of "asset-liability" liquidity coefficients, which are based on measures of both liquid assets and liquid liabilities. These coefficients are traditionally preferred for supervisory purposes on the grounds that bank liquidity management involves not only the liquidity of assets but also the nature and structure of, and changes in, liabilities.

The measure presented in this paper departs from the current prudential approach along two main lines. First, it is exclusively asset-based. Second, it is to some extent "agnostic", in that it does not rely on a normative weighting scheme across asset categories, and no threshold value is proposed to assess whether a bank is "too illiquid". We chose to concentrate exclusively on assets in order to decouple the monitored indicator from fluctuations induced by changes on the liability side of banks' balance sheets. No information based on the current prudential ratio is used in this process. The value-added of our indicator lies in its dynamic (flow) and panel-based dimensions. Our liquidity measure is based on the following asset categories: cash management and interbank transactions, securities bought under repurchase agreements, trading securities and investment securities, to which we add net off-balance sheet financing commitments (ie financing commitments received minus financing commitments made to credit institutions). This measure is one of the "asset-based" liquidity indicators and is independent from the liability structure of a bank's balance sheet.

It should be borne in mind here that our aim is to propose a methodology and assess its performance as a broad-based liquidity measure. Alternative indicators could be generated in turn, and ranked according to their degree of liquidity. For example, one may ask whether investment securities are "liquid enough" to qualify for the construction of a liquidity measure, given that such assets are purchased with the intention of being kept on the books over a substantial period of time. Since investment securities are, however, fixed-income instruments that may be sold promptly in case of emergency need, we decided to take them into account in our measure. An alternative would be to concentrate only on specific sub-items of the chosen liquidity categories (in particular, in the cash management and interbank transactions category, which is rather broad). Although a first check of alternative measures seems to produce outcomes consistent with those presented in this paper, refined applications of this approach would certainly generate fruitful and potentially new insights regarding bank liquidity. In any case, cross-checking such measures with liquidity ratios (such as the coefficient currently monitored by the Banking Commission) may prove informative and robust for prudential purposes.

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[1] The French supervisory authority, the Banking Commission (Commission Bancaire), collects quarterly balance sheet data on an individual and consolidated basis for all banks subject to its regulation. Complete balance sheets are available from 1993:1 to 2005:1.

Box 2

Bank liquidity flows

Using the individual bank balance sheet data described in Section 2, we define l_{it} as the value of liquid assets of bank *i* at quarter *t*. The change in total liquidity is then given by $\Delta l_{it} = l_{it} - l_{it-1}$. The bias introduced by bank mergers (see Section 1.2) is corrected as follows. Consider that bank *i* absorbs bank *j* between *t* and *t* – 1. In the absence of any other change in the structure of balance sheets, the liquidity registered for bank *j* at time *t* will be zero, while that registered by bank *j* will be equal to the sum of its own liquidity plus that of the absorbed bank *j*. Taking into account the changes in liquidity that occurred between *t* – 1 and *t*, the liquidity of bank *i* at *t* will be equal to its own liquidity at *t* – 1, plus the changes in its own liquidity, plus the liquidity of bank *j* at *t* – 1, plus the changes in bank *j*'s liquidity between *t* – 1 and *t*. Correspondingly, the liquidity of bank *j* at *t* will be zero. Without further corrections, the liquidity of *j* at *t* – 1 would be counted twice, leading to an overestimation of both positive and negative liquidity flows. We therefore need to subtract the *t* – 1 liquidity of bank *j* from the *t* liquidity of bank *i*, and add it to the liquidity of bank *j* at *t*. Thus, the formula for our corrected measure $\Delta l'_{it}$ reads

$$\Delta l'_{it} = \Delta l_{it} - \sum_{k=1}^{N} A_{ikt} l_{k,t-1} - B_{it} \Delta l_{it}$$

where A_{ikt} and B_{it} are indicator variables and *N* the total number of banks at time *t*. A_{ikt} takes the value 1 when bank *i* absorbs bank *j* at *t*, 0 otherwise. Bit takes the value 1 when *i* is absorbed at *t*, 0 otherwise. Note that this approach allows for simultaneous mergers where a bank absorbs more than one institution.

The adjusted growth rate of liquidity is therefore given by

$$g_{it} = \frac{\Delta l'_{it}}{(l_{i,t-1} + l_{i,t})/2}$$

for each bank *i*. At the bank level, all liquidity contractions (expansions) give rise to a negative (positive) value of g_{it}. The cross section of gits obtained for each quarter is then aggregated using two simple positive/negative partition rules.

Partition rule 1: nominal gross liquidity flows

Nominal gross flows are defined according to partition around zero. The aggregate liquidity expansion rate between *t* – 1 and t $POS^{nom}{}_t$ is defined as

$$POS^{nom}{}_t = \sum_{i|g_{it} \geq 0}^{N} g_{it} \left(\frac{(l_{i,t-1} + l_{i,t})/2}{\sum_{i=1}^{N} l_{i,t-1}} \right)$$

The term in parentheses weights individual growth rates by the bank's average share of the total liquidity. Likewise, the aggregate liquidity contraction rate $NEG^{nom}{}_t$ is defined over the absolute value of aggregated weighted growth rates:

$$NEG^{nom}{}_t = \sum_{i|g_{it} \leq 0}^{N} |g_{it}| \left(\frac{(l_{i,t-1} + l_{i,t})/2}{\sum_{i=1}^{N} l_{i,t-1}} \right)$$

Nominal measures are principally useful in analysing cyclical properties of liquidity flows.

Partition rule 2: idiosyncratic gross liquidity flows

Idiosyncratic gross flows are defined according to a partition rule around the trend followed by the banking industry as a whole. This relative measure reflects the extent to which each bank distinguishes itself from the industry trend. The latter is proxied using the Hodrick-Prescott filter of the aggregate liquidity growth (noted g_t^{tr}) with a standard quarterly smoothing parameter λ. For

Box 2 (cont)

Bank liquidity flows

each bank *i*, we obtain an idiosyncratic growth rate g_{it}^{id} equal to

$$g_{it}^{id} = g_{it} - g_t^{tr}$$

The idiosyncratic positive and negative liquidity flow rates are defined as

$$POS^{id}{}_t = \sum_{i\left|g_{it}^{id} \geq 0\right.}^{N} g_{it}^{id} \left(\frac{(l_{i,t-1} + l_{i,t})/2}{\sum_{i=1}^{N} l_{i,t-1}} \right)$$

$$NEG^{id}{}_t = \sum_{i\left|g_{it}^{id} \leq 0\right.}^{N} \left|g_{it}^{id}\right| \left(\frac{(l_{i,t-1} + l_{i,t})/2}{\sum_{i=1}^{N} l_{i,t-1}} \right)$$

Idiosyncratic measures are relevant for the analysis of average liquidity flows.

Overall, one should keep in mind that at the aggregate level, negative flows do not necessarily reflect a generalised reduction in liquidity buffers. Likewise, positive flows do not imply an expansion of liquidity buffers. Positive and negative flows may coexist, but only the net measure of liquidity flows can tell whether the liquidity of the banking system's balance sheet has expanded or contracted as a whole. Net liquidity flows are simply defined as

$$NET^{nom}{}_t = POS^{nom}{}_t - NEG^{nom}{}_t$$

and

$$NET^{id}{}_t = POS^{id}{}_t - NEG^{id}{}_t$$

$NET^{nom}{}_t$ shows the net growth rate of gross liquidity, while $NET^{id}{}_t$ reflects the cyclical component of net liquidity growth.

Finally, one may wish to get a sense of the overall reallocation of liquidity occurring between banks. In the nominal case, the total, or "excess", liquidity reallocation needs to be corrected for the net liquidity changes, ie

$$TOT^{nom}{}_t = POS^{nom}{}_t + NEG^{nom}{}_t - \left|NET_t^{nom}\right|$$

In the idiosyncratic case where the trend component has already been adjusted for, the overall reallocation growth $TOT^{id}{}_t$ is simply the sum of the positive and negative flow measures, ie

$TOT^{id}{}_t = POS^{id}{}_t + NEG^{id}{}_t$.

1.3 Aggregate liquidity measures

Gross liquidity flows are constructed as a cross-sectional aggregation of positive and negative changes in stocks as reflected in quarterly balance sheet statements. The positive/negative partition of the cross-sectional distribution is done in two ways, nominal and idiosyncratic. Nominal aggregates are the sums of the individual banks' liquidity growth rates relative to zero, weighted by market share. Idiosyncratic aggregates are the weighted sums of the individual banks' liquidity growth rates relative to the industry trend. The construction of liquidity measures is presented in Box 2.

The two aggregation strategies shed light on different dimensions of liquidity dynamics. Nominal growth rates show the macroeconomic evolution of liquid balance sheet items,

which may be substantial in a context where, for exogenous reasons, aggregate liquidity grows strongly. An example would be the steep growth in bank liquidity witnessed since the start of Stage III of EMU, also reflected in the strong dynamics of nominal monetary aggregates in the euro area. Nominal measures are therefore suitable for studying the cyclical properties of bank liquidity. Idiosyncratic flows reflect, in a banking system that grows along a trend, individual differences in bank liquidity management. These flows are the macroeconomic symptom of heterogeneous bank behaviour at the micro level.

We can also derive net growth rates of liquidity, along with "shadow" measures of liquidity reallocation. Net flows simply indicate whether banks lost or gained liquidity over a quarter. "Shadow" (or excess) flows show the extent to which overall liquidity reallocation actually occurred across banks. For example, a bank whose liquidity grew in net terms by 1% over a given quarter may in fact have actively engaged in liquidity trading to a much greater extent than what the net variation alone would suggest. These effects can be accounted for by looking at nominal reallocation, ie aggregate expansion and contraction in excess of the net liquidity change, and idiosyncratic reallocation.

2. Results

2.1 Gross nominal liquidity fluctuations

Estimates of gross nominal liquidity flows are shown in Chart 1. They show that, on average, positive flows have been greater than negative flows, resulting in net nominal liquidity flows growing by some 1% per quarter. This is not surprising in a context in which bank liquidity is expanding overall. More interestingly, substantial liquidity expansion and contraction take place simultaneously along the sample, in the order of 6% and 5%, respectively, per quarter (Table 1), implying an active market, trading beyond already substantial growth in aggregate bank liquidity. A check of the behaviour of each liquidity subcomponent reveals that this trading intensity has occurred in all market segments involved in liquidity trading (money markets as well as capital markets for liquid instruments).

Negative and net nominal flows reveal that aggregate behaviour may have been atypical on two occasions, in early 1996 and early 2000. In both 1996 and 2000, liquidity outflows markedly – but temporarily – increased, translating into large negative net liquidity adjustments.

Although causality cannot be assessed, it is very likely that developments in 2000:1 reflect a correction of liquidity loadings in anticipation of Y2K.

Explaining the 1996:1 episode is less straightforward. An examination of regulatory events around that time reveals that this quarter coincides with the implementation of a number of European Council Directives aimed at harmonizing banking activities. In particular, the directive authorising the inclusion of legally binding netting agreements for prudential purposes was approved and implemented at that time.[5] However, nothing guarantees that

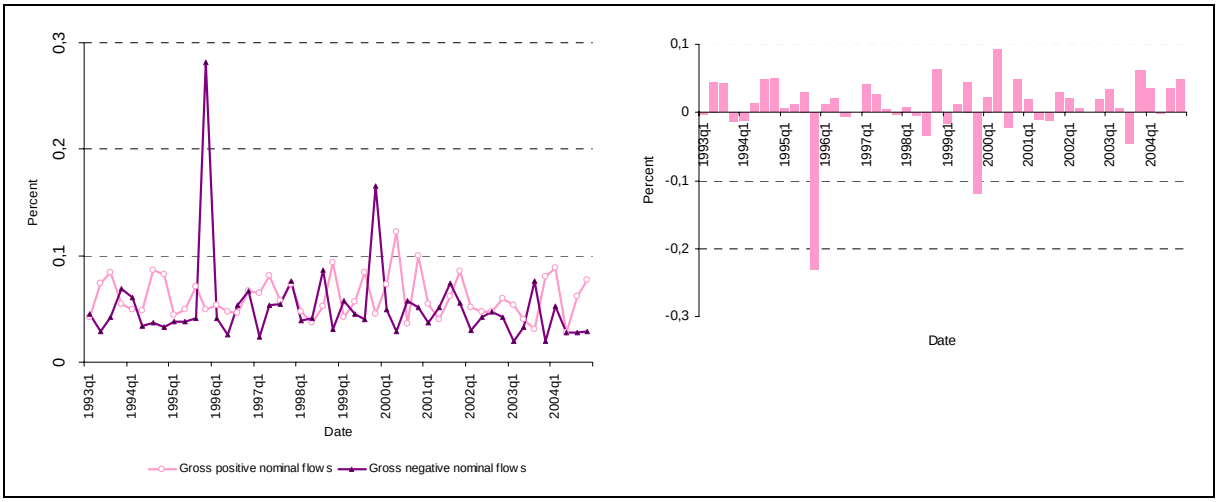
[5] Preparatory work authorising the inclusion of legally binding netting agreements for prudential purposes had led to a common proposal, adopted by the European Council on 5 September 1995. The European Directive was finally approved in early 1995. In parallel, the post-BCCI European Directive, ensuring that control of a credit institution is not dictated by the structure of the group to which it belongs, was adopted by the European Parliament and the European Council on 29 June 1996, and implemented in the first quarter of 1996. At the same time, the Basel Committee on banking supervision finalised its framework on the prudential treatment of market risk (use of own funds to cover market risk, and acknowledgement of internal credit risk models; see Commission Bancaire, 1996). The inclusion of netting agreements in prudential ratios reduced de facto own funds requirements for solvency ratios, since it meant that off-balance sheet interest rate and foreign exchange instruments would be taken into account in net, rather than gross, terms – ie after all contracts with

solvency regulation is the crucial factor here. After all, measures of own funds are usually determined on the basis of liabilities positions with, at best, an ambiguous effect on the sign of liquidity flows. In this light, it is more likely that the prudential acknowledgement of netting agreements simply led to a reduction of liquidity risk exposure for commercial banks, allowing them to hold less liquid assets.

Chart 1

Gross nominal liquidity flows

Percent



Gross excess nominal flows.

Source: Authors' calculations.

Table 1

Nominal and idiosyncratic liquidity flows – descriptive statistics

Flows	Obs.	Average	Std. Error	Min	Max
Nominal					
Positive	49	0.059	0.021	0.000	0.122
Negative	48	0.052	0.041	0.020	0.281
Net	48	0.009	0.049	–0.232	0.093
Idiosyncratic					
Total reallocation	48	0.081	0.022	0.039	0.134
Positive	49	0.041	0.031	0.000	0.175
Negative	48	3.58e-8	3.22e-8	1.02e-8	2.25e-7

Source: Authors' calculations.

a given counterpart had been settled . This type of adjustment would need to appear only once in liquidity growth rates.

Turning to deviations of flows in relation to the industry trend, the idiosyncratic build-up of liquidity is substantial (idiosyncratic and nominal positive flows being at comparable orders of magnitude). This suggests a large number of banks expanding in excess of trend growth. We visually checked whether idiosyncratic positive flows could result from aggregation issues or aggregate structural changes (which could be due to factors affecting the banking sector as a whole) and found that only a small part of aggregate heterogeneity seems to be accounted for by composition effects across liquidity lines, or by differences across banks of different sizes. This conjecture could be investigated more formally.

Finally, total, or "shadow", liquidity reallocation – expansion and contraction in excess of net changes – amounts to about 8% per quarter. In other words, some 8% of the aggregate liquidity in the banking system's balance sheet is reshuffled among individual banks each quarter.

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Bank failure prediction: a two-step survival time approach

Michael Halling[1] and Evelyn Hayden[2, 3]

1. Introduction

The financial health of the banking industry is an important prerequisite for economic stability and growth. As a consequence, the assessment of banks' financial condition is a fundamental goal for regulators. As on-site inspections are usually very costly, take a considerable amount of time and cannot be performed with high frequency, in order to avoid too frequent inspections without loosing too much information, supervisors also monitor banks' financial condition off-site. Typically, off-site supervision is based on different information available to supervisors, which includes mainly balance sheet and income statement data, data on the residual maturity of obligations, and credit register data about loans granted to individual borrowers above a given threshold.

Off-site analysis uses different methods, such as CAMEL-based approaches, statistical techniques and credit risk models. Early warning systems based on statistical techniques reflect the rapidity with which the performance of a bank responds to a changing macroeconomic cycle, the conditions on the monetary and financial markets, and the interventions of the supervisory authority. Therefore, for the time being, statistical techniques like discriminant analysis and probit/logit regressions play a dominant role in off-site banking supervision. They allow an estimate to be made of the probability that a bank with a given set of characteristics will fall into one of two or more states, most often failure/non-failure, reflecting the bank's financial condition over an interval of time implied by the study design, usually defined as one year.

An interesting academic discussion addresses the different advantages and disadvantages of statistical default prediction models as opposed to structural credit risk models. While statistical approaches do not explicitly model the underlying economic relationships, structural models emerge from corporate finance theory. However, there is ample empirical evidence that structural models perform poorly in predicting corporate bond spreads and corporate bankruptcy. Another problem in applying structural models to bank regulation is usually the lack of market data. For example, in the last decade in Austria only about 1% of a total of 1100 existing banks were listed on a stock exchange. Therefore, we focus on statistical bank default prediction in this paper.

There is a quite extensive literature concerning the use of discriminant analysis and logit/probit regressions that distinguish between "good" and "bad" banks. Other statistical

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models that have not received appropriate attention so far are based on survival time analysis. Here the time to default is estimated explicitly in addition to default probabilities. This is an important piece of information in banking supervision, as regulators require information about troubled banks with sufficient lead time to take preventive or remedial actions at problem banks. Bank regulators may prefer to examine the entire survival profile (ie the change in the estimated probability of survival/default over time) for each bank and assess the probability of failure at any point in time in terms of the cost of on-site examinations versus the cost of misclassifications.

The two-step survival time procedure presented in this paper combines a multi-period logit model and a survival time model. In the first step, we determine whether a bank is at risk to default using the output of a basic logit model. We define different criteria to distinguish between "good" and "bad" banks. For banks that become at-risk during our sample period according to the first step of our procedure, we estimate a survival time model in the second step to predict default and estimate the time to default as accurately as possible. The rationale for this approach is based on our belief that the covariates that determine whether a bank is in good or bad shape differ from the variables that explain how long at-risk banks survive.

By following this approach, we extend the existing literature in three ways. First, we propose a statistical method to determine the point in time at which a bank becomes at-risk and, consequently, derive an estimate for a meaningful time to default definition that captures the status of the bank. In contrast, existing papers either assume that all banks automatically become at-risk when the observed sample starts or that banks become at-risk when they are founded. In the first case, the time to default is not bank-specific, does not take into account banks' financial condition, and actually equals calendar time dummies. In the latter case, the measure is bank-specific but independent of the bank's current economic situation. Second, we distinguish between "healthy" and "ill" (at-risk) banks as we expect that different economic relationships may exist between independent and dependent variables in each sub-sample. Third, we use sophisticated survival time models that more closely fit the characteristics of bank failure prediction. The standard model in the literature is the Cox proportional hazards model, which assumes that the observed covariates are constant. However, typical explanatory variables, like banks' balance sheets or macroeconomic data, change with time. Furthermore, banks' financial conditions are not observed continuously but rather at discrete points in time. Appropriate statistical techniques exist to deal with this.

We empirically evaluate our proposed two-step approach by using Austrian bank data. We compare our two-step models with the logit model currently in use at the Austrian National Bank and to a survival time model that assumes that all banks become at-risk when they are founded. Both benchmark models are estimated for the entire sample of banks and, consequently, are one-step approaches. Except for the logit model of the Austrian National Bank, all other models are derived by evaluating the predictive power of 50 explanatory variables – the final contribution of our paper.

We find that the two-step survival time models outperform both one-step models with respect to out-of-sample performance. However, survival time itself is not the main driver of the performance improvement. This results, rather, from the estimation of an individual predictive model for at-risk banks. We find that the models for at-risk banks contain some of the same variables as the benchmark logit model (e.g. ratios capturing credit risk) and some different variables (e.g. bank size relative to its geographically closest peers, management quality and the policy to donate and dissolve loss provisions). This supports the argument that, in comparison to the entire bank population, different variables are required to predict failure for at-risk banks accurately.

The paper is organized as follows: in the next section, we introduce the two-step approach, explain the criteria to determine whether a bank is at risk, and briefly review the statistical

foundations. Section 3 describes the empirical study, the data used, and the way we build the survival time models. Section 4 presents the empirical results, and section 5 concludes.

2. Two-step survival time model

Our goal is to develop a two-step survival time approach to predict bank failure because (a) time to default might be an important type of information for regulators, and (b) predictive relationships might differ between at-risk banks and the entire sample of banks. Given these goals, there are two main challenges: (a) to identify a good measure for the time to default, and (b) to estimate a survival time model that accounts for important characteristics of bankruptcy data.

2.1 Identification of "at-risk" banks (first step)

In order to measure the time to default appropriately and to select the banks that are at risk, we propose using a standard multi-period logit model[4] to determine which banks become at-risk at which point in time. In other words, we use the multi-period logit model's output to assess the health status of banks. The logit model that we use for this purpose is the current major off-site analysis model applied at the Austrian National Bank (see Hayden and Bauer (2004)). This multi-period logit model comprises 12 explanatory variables, including one capturing bank characteristics, four assessing credit risk exposure, two considering capital structure, four measuring profitability and one accounting for the macroeconomic environment (see section 4.1 for more details).

We define the following three criteria based on this model's quarterly output in order to determine whether a bank becomes at-risk at a specific point in time:

- ***At-risk definition 1 (2xLevel):*** a bank is at risk if the output exceeds the (statistically optimized) threshold of 1.6% in two subsequent three-month periods.
- ***At-risk definition 2 (Growth):*** a bank becomes at-risk if the model's output has grown by more than (statistically optimized) 1.1% in the previous period.
- ***At-risk definition 3 (Combined):*** a bank becomes at-risk if definition 1 and/or definition 2 are fulfilled.

At-risk definition 1 (2xLevel) extends over two periods because the logit model output shows some volatility and therefore a criterion based on only one observation would too quickly assign at-risk status to a bank. While definition 1 focuses on the level of the logit model's output, definition 2 (Growth) takes a more dynamic perspective and looks at the change of the model's output between two subsequent periods of time. The argument for this definition is that even for good banks (ie banks with a low model output), a relatively large increase in the model output from one period to the next could indicate that the bank's status has deteriorated and that the bank is at risk.

So far, papers have usually assumed that all banks become at-risk either when they are founded (e.g. Shumway (2001), although he is not estimating a survival time model in our opinion) or when the observed sample starts (e.g. Lane et al. (1986)). We do not think that these two approaches are especially meaningful, for two reasons. First, the time information

[4] Note that what we call a multi-period logit model is called a hazard model in Shumway (2001). Terminology in the literature is not at all homogeneous, as terms like logit models, survival time models and hazard models are frequently used interchangeably.

derived from these models does not capture what we want to capture. If time to default is measured relative to the same point in time (ie the starting period of the sample) for all banks, then the time to default is reduced to calendar year dummies and does not contain any bank-specific information. If, on the other hand, bank age is used as a proxy for time to default, it remains to be shown that this is a good proxy as it ignores any developments since the bank's foundation. Intuitively we question this hypothesis and empirically investigate it in this paper. Second, both approaches consider all banks to be at risk. In our opinion, this does not really fit with one fundamental idea of survival time analysis, namely that different relationships between independent and dependent variables occur within the sample of all subjects and the sample of at-risk subjects. In a medical setting, for example, one would not expect that the best predictors for a person's life expectancy would be identical to the factors that influence the survival time of people suffering from a major disease.

Our approach is also based on an important assumption, namely that no bank is at risk before our sample period starts. However, this assumption will (hopefully slightly) bias our time-to-default variables, while it should not have an influence on the sample of banks that are identified as at-risk. In any case, we believe that our assumption is far less problematic than the previously discussed assumptions. Another challenge of our approach is to determine the appropriate thresholds for defining at-risk banks. Both thresholds used in definitions 1 and 2 were statistically optimized in the sense that they represent the threshold levels with the best performance to correctly classify bank defaults when evaluating the power of different thresholds. Finally, note that once a bank is at risk, it cannot revert to "normal" status, but remains "at-risk". Allowing banks to switch between being at risk and not at risk would represent a potentially interesting but not straightforward extension of our study.

2.2 Discrete survival time model with time-varying covariates

While the Cox proportional hazards model represents the most popular survival time model, we decided to implement a discrete survival time model. We use this model because (a) we observe defaults only at discrete points in time and (b) we have a positive probability of ties. Both these characteristics of our environment conflict with important assumptions underlying the Cox proportional hazards model.

The likelihood function and its logarithmic version of the discrete survival time model are

$$L = \prod_{i=1}^{n} \left\{ \left[h_{i\tau_i} \prod_{k=1}^{\tau_i - 1} \left(1 - h_{ik}\right) \right]^{\delta_i} \left[\prod_{j=1}^{\tau_i} \left(1 - h_{ij}\right) \right]^{1-\delta_i} \right\} \tag{1}$$

$$\ln L = \sum_{i=1}^{n} \left\{ \delta_i \ln \frac{h_{i\tau_i}}{1 - h_{i\tau_i}} + \sum_{k=1}^{\tau_i} \ln\left(1 - h_{ik}\right) \right\}, \tag{2}$$

where n denotes the number of banks, τ_i the default period, and h_i the hazard rate of bank i. The term δ indicates whether a bank defaulted during the sample period ($\delta=1$) or survived ($\delta=0$). Now, we use the logistic hazard function and write the hazard rate as a function of time-varying covariates X:

$$\ln\left(\frac{h_{it}}{1 - h_{it}}\right) = \alpha_t + \beta X_{it} \Leftrightarrow h_{it} = \frac{e^{\alpha_t + \beta X_{it}}}{1 + e^{\alpha_t + \beta X_{it}}}. \tag{3}$$

Note that (3) does not assume proportionality and is therefore able to cope with time-varying covariates. Most survival models presented in the literature on predicting bank or company failure include only a set of fixed covariates.[5] In this case, the estimation of the model and its usage for prediction is relatively straightforward, as the covariates stay constant and as such are known at any point in time in the future. However, it is well accepted and also intuitive that time-varying covariates could potentially improve the accuracy of survival time models.

Therefore, one of the main goals of this work is to develop a specification of a survival prediction model that uses time-varying covariates. Incorporating these covariates in the discrete logit model is generally straightforward. However, one has to carefully consider later prediction applications when planning the estimation process. In the case of time-varying covariates, it is important to distinguish between the frequency of observations of new covariate values (ie three months in our case) and the interval underlying the default probability (ie one year in our case).

From the perspective of a regulator, it would not be appropriate to predict three-month default probabilities because a three-month horizon is too short to perform any corrective action if necessary. One possible strategy to cope with this problem of different updating and predicting horizons is to switch to a yearly frequency of updating the covariates. However, this approach has several severe disadvantages. First, it ignores data that are available and could potentially improve the accuracy of the model; second, it reduces the number of observations and therefore the statistical power of the analysis; and third, regulators then could only update their default prediction once a year.

Therefore, we wish to design and estimate the survival model in such a way that we can predict one-year default probabilities as accurately as possible using a three-month interval to update covariates. For this purpose, we have to lag the covariates for three quarters (or nine months), as illustrated in Appendix 1. The resulting model estimates a three-month default probability, ie the probability that a bank will default at some point in time in the fourth quarter after today. Hence, this probability is conditional on the bank surviving the next three quarters. However, the probability for surviving the next nine months was calculated in the previous three quarters, hence we can calculate a one-year default probability by combining these four predictions.

3. Empirical study description

In this section, we outline the design of our empirical study, describe the data used, and provide details on selecting the explanatory variables, building our empirical models, and evaluating the proposed two-step approach against the two benchmark models.

3.1 Data description

We use the entire sample of Austrian banks in the period 1995 to 2002. This data set comprises 1100 banks and approximately 150 problematic banks within the sample period. As there were no real bank defaults in the sample period, we define the default event as a situation were a bank was facing such serious trouble that it seemed unlikely that it would be able to recover without some kind of intervention, typically in the form of mergers with or

[5] Bharath and Shumway (2004) are a notable exception. They apply a time-dependent proportional-hazards model. Fisher and Lin (1999) discuss potential problems when using this type of model, especially for prediction. Given the other characteristics of our data, ie discrete time intervals and ties of default times, we still believe that a discrete survival time model is more appropriate for the data at hand.

allowances from affiliated banks. In doing so, we follow the definition of problematic banks that was employed for the development of the logit model currently applied by the Austrian National Bank (see Hayden and Bauer (2004)).

As far as explanatory variables are concerned, different data sources have been used. Similar to the definition of problematic banks, we stick to the same data material that has been collected by the Austrian National Bank in order to develop its multi-period logit model. This data pool comprises partly monthly and yearly, but primarily quarterly, data items from banks' balance sheets, profit and loss statements, and regulatory reports. Moreover, additional information on large loans and macroeconomic variables has been used. Based on these data sources, approximately 280 potential explanatory variables covering bank characteristics, market risk, credit risk, operational risk, liquidity risk, reputation risk, capital structure, profitability, management quality, and macroeconomic environment have been defined. The actual data frequency used in this paper is quarterly.

3.2 Model building

With respect to model building and model evaluation, we follow a standard statistical procedure that has been applied similarly by the Austrian National Bank in order to develop its logit model. By doing so, we ensure that the derived models are indeed comparable. Hence, we separate the available data set into one in- and one out-of-sample subset by randomly splitting the data into two sub-samples. The first, which contains approximately 70% of all observations, is used to estimate the model, while the remaining data is left for an out-of-sample evaluation. When splitting the data, it was ensured that all observations of one bank belong exclusively to one of the two sub-samples and that the ratio of problematic and non-problematic banks was equal in both data sets.

The next challenge was to reduce the number of potential explanatory variables, as we started out with a total of 280 variables. After eliminating outliers and testing for the linearity assumption implicit in the logit model,[6] we checked whether the univariate relationships between the candidate input ratios and the default event were economically plausible. At the same time, all variables were tested for their univariate power to identify problematic banks. Only those ratios that had an Accuracy Ratio (AR) of more than 5% were considered for further analysis.

We relied on the AR as it is currently the most important measure for the predictive power of rating models (see, for example, Keenan and Sobehart (1999) and Engelmann, Hayden and Tasche (2003)). It measures the power of the evaluated model to correctly classify defaults relative to the power of a hypothetical model that has perfect information on defaults.

In addition to this univariate AR criterion, we analyzed the correlation structure among the variables and defined subsets of ratios with high correlation. From each of these correlation subsets we selected only the variable with the highest univariate AR in order to avoid co-linearity problems in the multivariate analysis later on. Applying this process reduced the number of candidate input ratios to 50. These 50 variables are defined in Table 1, which also presents the univariate statistics (mean, median, and standard deviation) for these covariates

[6] The logit model assumes a linear relation between the log odd, the natural logarithm of the default probability divided by the survival probability (ie ln[p/(1-p)]) and the explanatory variables. However, as this relation does not necessarily exist empirically, all of the variables were examined in this regard. To do so, the points obtained from dividing the covariates into groups were plotted against their empirical log odds. As several variables turned out to show a clear non-linear empirical pattern, these patterns were first smoothed by a filter proposed in Hodrick and Prescott (1997) to reduce noise and then the variables were transformed to log odds according to these smoothed relationships. Once the covariates had been transformed, their actual values were replaced with the empirical log odds obtained in the manner described above for all further analyses.

for all Austrian banks over the sample period 1995–2002 and postulates the hypothesized relationship to default.

With 50 variables left, we would have to construct and compare 2^{50} models in order to determine the "best" econometric models and entirely resolve model uncertainty. This is, of course, not feasible. Therefore, we use forward/backward selection to identify our final models (see Hosmer and Lemenshow (1989)).

3.3 Model validation

The goal of this paper is to evaluate whether survival time models can improve the performance of statistical default prediction models. In order to apply survival time models in a feasible way, we argue that a two-step procedure should be used that identifies a set of at-risk banks in a first step before the survival time model is estimated.

To evaluate our proposed two-step methodology, we identify two benchmark scenarios: (a) a one-step multi-period logit model that ignores any time information and (b) a one-step survival time model that assumes that all banks become at-risk at foundation. The first benchmark model represents the standard in the industry. The model that we use in our empirical study, for example, represents the model used by the Austrian National Bank. The second approach can be found in the literature (see, for example, Shumway (2001)) and, from a survival time model's perspective, assumes that banks become at-risk at the moment they are founded.

Note that one can think of an additional model specification, namely a one-step survival time model that assumes that all banks become at-risk when the observed sample starts (see Lane et al. (1986), Whalen (1991), Henebry (1996), Laviola et al. (1999), and Reedtz and Trapanese (2000)). However, in this approach survival time equals calendar time and, therefore, does not contain any company-specific information. For this reason, we do not include this model in our analysis.[7]

We want to emphasize, however, that another issue of model validation occurs in our setup, namely the question of whether a two-step approach that splits the entire sample into two data sets generally outperforms a one-step approach. In-sample it is intuitive that splitting the sample and estimating individual econometric models for each sub-sample should increase the in-sample fit. However, estimating individual models for sub-samples bears the risk of over-fitting. Therefore, we doubt that a two-step approach generally dominates a one-step approach with respect to out-of-sample performance.

In general, we use the out-of-sample Accuracy Ratio to evaluate model performance. In addition, we apply a test statistic based on the Accuracy Ratio to test the hypothesis that the two-step model outperforms the benchmark models (see Engelmann, Hayden, and Tasche (2003)).

4. Empirical results

This section summarizes our empirical results. We start by describing the basic one-step multi-period logit model excluding any survival time information, which is the same as the one used by the Austrian National Bank for monitoring Austrian banks. This model is used in our

[7] In fact, we empirically evaluated a bank default prediction model with calendar year dummies and did not find a significant improvement in prediction performance. Given the lack of theoretical motivation and empirical support for this approach, we do not report the results for reasons of brevity and focus.

study for two purposes: (a) it determines whether a specific bank becomes at-risk in the two-step approach, and (b) it represents one benchmark model, against which our proposed two-step survival time approach is evaluated. Next, we extend this basic model by bank age and evaluate if this information improves model accuracy. The resulting model represents another benchmark model for the evaluation of the two-step survival time model. Finally, we report the specifications of our two-step survival time models and present descriptive statistics of in- and out-of-sample predictive performance.

4.1 Basic one-step logit model

The basic logit model that we use in this paper is the one used by the Austrian National Bank as one major off-site analysis tool to monitor Austrian banks. Therefore, we cannot describe this model in full detail. The model consists of 12 variables which are listed in Table 2 together with their effects on default probabilities. The estimated coefficients for the input ratios are, however, confidential and hence not displayed. The column "Effect" in Table 2 shows how a change in the respective input variables influences the output of the logit model, where "+" denotes an increase in the model output (ie in the probability that the bank runs into financial problems) as the covariate rises and "–" signifies a reduction of the model output with an increase of the covariate. Moreover, it is important to note that three variables in Table 2 are transformed before being fed into the logit model because they actually do not fulfill the assumption of linearity underlying the model (for details, see section 3.2 and Table 1). This transformation applies the Hodrick-Prescott filter (1997) and translates the original covariates into univariate problem probabilities, which are then used as input to the multivariate model.[8] In Table 2, the effect of these variables is thus always labeled with a "+", as an increase in the univariate probabilities will also bring about a rise in the multivariate probabilities.[9]

All variables identified in the basic logit model show the expected relationship with bank default. One third of the significant predictive variables measures credit risk – by far the most significant source of risk in the banking industry. Another third of the variables measures the profitability of the banks. Not surprisingly, unprofitable banks have a higher risk of running into financial difficulties. Finally, the last third of the important explanatory variables is more heterogeneous. Two variables measure bank characteristics related to capital structure, one assesses the macroeconomic environment, and the last one indicates sector affiliations. Most interestingly, variables for management quality and bank characteristics like size do not turn out to be significant in the basic logit model.

4.2 One-step logit model with bank age

In a first attempt to include a notion of survival time in bank default prediction models, we extend the basic one-step logit model such that it includes bank age – a variable that had not been available at the point in time when the basic logit model was originally determined by the Austrian National Bank. We estimate two different models in this context: one that includes bank age measured in years since foundation and one that contains bank age dummy variables. The main difference between these two specifications is that by introducing dummy variables we are able to identify non-linear relationships between bank age and bank default. We define the bank age dummies such that they capture buckets of 25 years. The last dummy variable captures all bank observations that happen more than 125 years after bank foundation. Table 2 summarizes the resulting models. As the

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[8] The exact procedures are analogous to those described in Hayden (2003).

[9] Due to their non-linearity, the effects of the original variables change for various value ranges.

coefficients of most variables of the basic logit model do not change much after including bank age information, we cannot report them again for reasons of confidentiality. We report, however, the coefficients on the variables measuring bank age.

When we re-estimate the basic logit model with bank age variables, two of the former significant variables – the macroeconomic variable (47) and the sector affiliation dummy – turn out to be insignificant. Therefore, we remove them from the model. If we include bank age in years as an explanatory variable, a highly significant and negative coefficient is estimated. This implies that, on average, the default risk decreases as banks become more mature. Stated differently, younger banks seem to have higher risks of running into financial problems. If we compare the in-sample and out-of-sample Accuracy Ratios of the extended and the basic logit model, we observe a marginal improvement in both statistics.

If we code bank age in six dummy variables capturing buckets of 25 years each (except for the last dummy variable), we observe a somewhat more interesting pattern. Note that the reported coefficients have to be interpreted relative to the probability of banks in the first bucket (ie with age between 0 and 25 years) to face problematic situations within one year's time. The analysis of the bank age dummy variables shows that banks between 25 and 75 years old have a slightly (but insignificantly) lower default probability than the youngest banks, while banks older than 75 years seem to be significantly safer, ie they report significant negative coefficients on the appropriate dummies. Interestingly, banks with the lowest probability for financial problems are those 76 to 100 years old, as the oldest banks (age above 100 years) have a lower default probability than the youngest banks but a higher one than the medium-aged banks. Hence, the coefficients of the age dummy variables indicate a non-linear, u-shaped pattern.

Comparing the Accuracy Ratios across different model specifications shows that the specification with bank age dummy variables yields the largest in-sample and also the largest out-of-sample AR. Note, however, that improvements – especially in out-of-sample predictability – are rather small and therefore statistically insignificant.

4.3 Two-step survival time model

The main goal and contribution of this paper is the formulation of two-step survival time models. In contrast to the one-step survival time model, the two-step approach uses the model output of the basic logit model to determine the point in time at which a specific bank becomes at-risk. In a second step, a discrete survival time model (ie a discrete multi-period logit model) is estimated only for the at-risk banks, including bank-specific time information relative to the point in time at which banks become at-risk. Note that the included time information in this case has a very particular meaning, as it contains specific information regarding the risk status of a bank. In contrast, in the case of the one-step models discussed in the previous section – including bank age as a predictive variable – the corresponding "survival time" contains only information specific to a bank in general but not specific to its risk status. Even more in contrast to our proposed methodology, the time information in the survival time models proposed by Lane et al. (1986), Whalen (1991), Henebry (1996), Laviola et al. (1999), and Reedtz and Trapanese (2000), who assume that all banks become at-risk when their sample starts, degenerates to calendar year information with no bank-specific information at all.

Table 3 reports the resulting model specifications for the three different definitions of at-risk banks (see section 2.1 for details). There are several important observations regarding these model specifications. With respect to the time dummies, which count years after banks became at-risk, we observe positive coefficients with a peak in period 3. This implies that the default risk increases relative to the first year after the bank is determined to be at-risk and decreases again after the third year, although it stays above the risk level observed for the first at-risk period. Hence, from this analysis the second and third year after becoming at-risk seem to be the most important ones for the survival of banks. Note, however, that the

coefficients on the time dummies are hardly significant. In the case of at-risk definition 1, only the coefficients for time periods 2 and 3 are estimated accurately enough to be statistically distinguishable from zero, while in the case of at-risk definitions 2 and 3, only the time dummy for period 3 is significant.

By evaluating the explanatory variables that have been selected for inclusion in the models by a stepwise estimation procedure, we observe many similarities between the three two-step models, ie they agree to a large extent on the important explanatory variables. We interpret this large overlap in variables as an important result that implies that we succeed in identifying important predictive variables. We also find many similarities between the basic logit model and the two-step models as seven (ie all four credit risk variables, two of the four profitability variables and one of the two variables measuring banks' capital structure) out of the 12 variables reported in Table 2 are also selected for the two-step models. Note, however, that variables measuring the macroeconomic situation and sector affiliations drop entirely out of the two-step models.

In what follows, we discuss the variables that are added to the two-step models estimated for at-risk banks in more detail. Interestingly, four more credit risk variables are selected, which makes a total of eight variables measuring different aspects of credit risk. Three out of the four newly added variables seem to focus more on the banks' ability to handle economically difficult situations by including the capacity to cover losses (variable 11) and loan loss provisions (variables 14 and 15). The latter two variables justify further discussion. We do not have clear expectations about these variables' relationship to the probability of financial problems. Basically, one would think that the donation of loan loss provisions should have a positive coefficient, because this variable should increase in value when the proportion of bad loans, for which provisions must be set up, increases. On the other hand, an increase in loan loss provisions might actually be a good sign, because there is some discretion about the amount of provisions set up by a bank. Consequently, banks in good financial condition could set up more provisions for bad loans, while banks that face severe financial problems cut down the donations to the minimum level required. According to our survival time models, it seems that the second story receives more empirical support as variable 14 receives a significant and negative coefficient. Unfortunately, interpreting the coefficient on variable 15 becomes difficult as the variable has been transformed and therefore is forced to have a positive coefficient.

Another interesting variable that has been added to the two-step models measures a bank's balance sheet total relative to the balance sheet total of all banks in the home region. This seems reasonable as bank size is presumably an important variable to determine a bank's ability to cover losses. Note further that it is not the size of the bank in absolute terms but its size relative to its closest local competitors that influences the bank's survival. The variable's coefficient shows that at-risk banks that are among the largest banks in their region face lower risk.

Finally, variables measuring management quality, especially staff efficiency, are included in the two-step models (variables 44 and 45). This is an interesting result as it indicates that management quality is potentially not an important predictor of financial problems for the entire population of banks but might make a difference for the group of at-risk banks. Banks with efficient management have a higher probability of surviving periods of financial crisis.

Table 3 also reports performance statistics for the three two-step survival time models. Note that the two-step survival time models only generate output for at-risk banks. However, we want to evaluate the performance of our predictive models for the entire set of banks. Therefore, we combine the model output of the two-step survival time models with the output of the basic logit model: the survival time models' output is used for at-risk banks, and the basic model's output is used for banks that are not at risk. Comparing the Accuracy Ratios for the one-step (see Table 2) and the two-step (see Table 3) logit models shows a performance advantage of the two-step models, both in- and out-of-sample. While the better

fit in-sample is an expected consequence of the proposed estimation strategy for the two-step models, the out-of-sample dominance of the two-step approach is an interesting and important result. Note that the performance difference is in fact larger out-of-sample than in-sample. With respect to the basic logit model, the two-step approaches show a considerable increase in out-of-sample Accuracy Ratios of 2.7% to 4.3%. These differences are highly statistically significant, as illustrated in Table 4. This implies that our results are not only due to chance and that the two-step models should outperform the basic logit model in most sample specifications.

As the Accuracy Ratios reported in Table 2 and 3 are relatively aggregated performance measures, Figure 1 illustrates the out-of-sample performance difference between the best one-step model (ie the model including bank age dummy variables) and the two-step survival time models in a more detailed way. They basically illustrate how well one can identify defaulting banks by using the model output, ie sorting all banks from riskiest to safest and calculating the percentage of defaulting banks within different fractions of the total number of banks. In addition, two more lines are depicted. One corresponds to the optimal model that could predict bank default perfectly and as such represents an upper boundary for the prediction accuracy, which can never be reached in reality. The other line describes the random model, where the decision on whether a bank is classified as good and bad is based on some random number and hence represents a lower boundary for the prediction accuracy, as it can be reached without having any information or any statistical model. A careful inspection of Figure 1 reveals small but important differences between the four graphs. In general, the lines based on the two-step survival time models' output stay close to the optimal model for more sorted observations than the line stemming from the one-step benchmark logit model's output. This implies that they identify a larger fraction of all defaulting banks correctly as problematic given that a certain fixed percentage of all banks is classified as risky.

In conclusion, we find that the two-step approach proposed in this paper reveals interesting model specifications – including intuitive patterns of coefficients on time dummies and reasonable, newly added explanatory variables – and outperforms the one-step benchmark models with respect to out-of-sample prediction accuracy. However, the coefficients on the time dummies are rarely statistically different from zero. Consequently, it is unclear whether the performance advantage of two-step models can be attributed to the better definition of survival time or to the two-step procedure itself where a separate model is estimated for at-risk banks. This is an important question that we investigate in more detail in the following paragraphs.

4.4 The value of survival time information

To further investigate this issue, we start by examining the empirical distribution of banks with financial problems across time periods. As presented in Table 5, one can observe a comparable time pattern of defaults for all definitions of at-risk banks: most financial problems occur in periods 1 to 3, then there is a drop in the number of default events for period 4 and 5, and finally a further drop for the last period. For all different at-risk definitions we observe a similar, monotonically decreasing pattern from period 2 to 6.

In general, there could be two potential sources that explain why the two-step survival models outperform the one-step logit models: (a) the additional survival time information, and (b) the fact that separate models are estimated for the sub-sample of at-risk banks. In order to quantify whether the time dummies do add explanatory power to the survival time models, we remove them from the model specifications and re-estimate the models using the entire model building procedure.

Table 6 shows the resulting models. It is interesting to observe that the two-step models without time dummies include the same set of explanatory variables as the two-step models including time dummies. In fact, exactly the same predictive models, except for the time

dummies, come out of the estimation procedure – even the coefficients are quite close. As far as the predictive performance is concerned, it is difficult to identify a clear winner as the Accuracy Ratios do not show a clear picture. Comparing in- and out-of-sample ARs of Table 3 and 6 actually documents that these two types of models perform comparably well. From this result we infer that the time dummies do not add much predictive power to the models. This observation is also confirmed by Figure 2, which shows a more detailed analysis of the predictive performance of two-step models without survival time dummies.

The performance advantage of the two-step models relative to the one-step models, thus, seems to come from the estimation procedure, ie the identification of at-risk banks among the entire set of banks and the subsequent fitting of specific default prediction models for this special class of banks. Recall further that we identified specific explanatory variables that only play a significant role in the models specifically estimated for at-risk banks. Put together, these results consistently suggest that there are different economic relationships in place that explain the survival probability of "healthy" and "jeopardized" banks.

5. Discussion and conclusion

In this paper, we propose and empirically evaluate survival time models to predict bank failure. This question has been addressed before by several papers (see Lane et al. (1986), Whalen (1991), Henebry (1996), Laviola et al. (1999), and Reedtz and Trapanese (2000)). We extend this literature in several ways. First, we apply a survival time approach – a discrete logit model with survival time dummies – that allows for time-varying covariates and interval censored data (ie the information is not observed continuously over time but at discrete points in time). The literature so far uses the Cox proportional hazards model, which is not able to deal with these dimensions of bank failure data appropriately. Second, we propose and empirically evaluate an innovative two-step approach where we use the output of a multi-period logit model to determine whether a bank is at risk. For the sample of at-risk banks we then estimate a survival time model with bank-specific survival times. The existing literature either assumes that all banks become at-risk at foundation or at the same point in time at the beginning of the sample period. While the first approach at least exploits bank-specific information, the latter approach reduces the survival time information to calendar year dummies. We empirically evaluate these two simple approaches but only report results for model specifications with bank age as an explanatory variable in the paper. Our final contribution stems from the use of a comprehensive data set provided by the Austrian National Bank covering all Austrian banks for the period 1995 to 2002 and 50 explanatory variables capturing different potential sources of default risk. Furthermore, we apply the logit model currently used in the Off-Site Analysis procedures of the Austrian National Bank. Thus, we ensure a comprehensive database and a very well estimated logit model that we use twice: (a) as the reference model whose output determines whether a bank becomes at-risk, and (b) as one of the benchmark models against which we evaluate our proposed two-step approach.

Our empirical analysis reveals that the two-step approach outperforms all one-step logit models (ie the basic model and models with bank age as an additional explanatory variable) with respect to in-sample and out-of-sample prediction accuracy for the entire set of banks. This is a very promising result as it indicates that the two-step approach might add value for a regulator who wishes to assess the health status of her banks.

One of our most important results shows that this performance advantage does not, in fact, arise from the inclusion of survival time but from the estimation procedure itself. As far as our evidence on the predictive power of survival time is concerned, we observe a homogeneous and somewhat intuitive pattern, ie default probabilities increase relative to the first year after a bank becomes at-risk and are the largest in periods 2 and 3. However, the identified

coefficients are rarely significant and, thus, do not add much to the predictive power of the models.[10]

In contrast, the fact that our two-step models outperform one-step logit models is strong empirical evidence that different economic relationships explain default probabilities for "healthy" and "jeopardized" banks. In more detail, we document that the two-step models contain some of the same variables (ie mainly variables capturing credit risk and profitability) and some different variables compared to the basic one-step logit model. One of the variables particular to the two-step models tries to capture management quality, especially efficiency, by looking at the ratio of net interest income to the number of employees. The fact that this variable is not included in the benchmark logit model estimated for the entire population of banks but turns out to be highly significant for the sample of at-risk banks might potentially reveal that good and efficient management is especially important in financial crisis situations. Another variable which only matters for at-risk banks measures bank size relative to total bank size in the home region. Similarly, this result might imply that size, especially relative to a bank's competitors, plays an important role once an institution faces financial problems. However, interestingly, we do not find that macroeconomic variables play an important role in predicting default in the at-risk sample as proposed in Gonzales-Hermosillo et al. (1996). In contrast, the only macroeconomic variable included in the basic logit model drops out of the model specification for at-risk banks. We conjecture that these findings might have important policy implications for central banks and their bank monitoring all around the world.

[10] The reasons we fail to identify significant relationships between the time banks are at-risk and the default event could be that the process to identify banks with financial problems and the definition of bank failure itself is imprecise with respect to the exact timing of the event. This issue arises as there has not been any real default in our sample period. Rather, banks run into severe financial problems that they cannot solve without intervention from an affiliated bank. However, the exact timing of the occurrence of such a situation is much more difficult to identify than the timing of a real bank default.

Appendix 1:
Illustrative example for lagging of data

The following example illustrates how we prepared our data set in order to ensure that our model could be used for bankruptcy prediction. Table A1 summarizes a small, hypothetical data set for one specific bank. The column "Covariate" reports a variable useful for default prediction, e.g. banks' earnings. "Default" indicates whether a default event occurred in the following quarter, "At-Risk" identifies the periods when the bank was at risk, "Period" is a counter for the number of years that the bank is at risk, and "L. Covariate" represents the lag operator that shifts values for three quarters of a year.

Table A1

Small data sample

Date	Default	At-risk	Period	Covariate	L. Covariate
12.1997	0	0	.	220	.
03.1998	0	0	.	230	.
06.1998	0	0	.	210	.
09.1998	0	1	0	230	220
12.1998	0	1	0	220	230
03.1999	0	1	0	200	210
06.1999	0	1	0	190	230
09.1999	0	1	1	170	220
12.1999	0	1	1	150	200
03.2000	0	1	1	150	190
06.2000	0	1	1	130	170
09.2000	0	1	2	110	150
12.2000	1	1	2	100	150

Assume that we use the columns "Covariate", "Default", "At-Risk" and "Period" to estimate the survival time model. When employing this model to make predictions, we can only forecast default probabilities for one period (three months), as we need to know the current covariate value to explain default in the next quarter. As we employ time-varying covariates, these covariates will change in the next period, so that today we do not have the necessary information to make predictions for the second period. In contrast, in the case of fixed covariates, one could use the estimated survival model to predict default probabilities for arbitrary periods (captured by the estimation sample).

To deal with this problem, we have to lag the covariates for three quarters as illustrated in Table A1. The resulting model using the lagged explanatory variables estimates a three-month default probability, ie the probability that a bank will default at some point in time in the fourth quarter after today. Hence, this probability is conditional on the bank surviving the next three quarters. However, the probability for surviving the next three quarters was calculated in the previous three periods, hence we can calculate a one-year default probability by combining these four values.

Table 1

Input variables to backward/forward selection process

This table summarizes the final set of input variables used to determine the survival time models. The table reports the mean, median and standard deviation for the entire sample of banks during our sample period of 1995–2002. The column "Hyp." indicates our expectation for the relationship between the respective input variables and the default event. As outlined in section 3.2, some of the input variables are transformed. This is indicated in the table by (T). The coefficients of transformed variables within a survival or logit model will always be positive. However, in the table we report our expectation for the underlying, untransformed variable.

ID	Group	Definition	Mean	Median	Std. Dev.	Hyp.
1	Bank Characteristics	Balance Sheet Total (LN)	11.1370	11.0352	1.3226	–
2		Off-Balance Sheet Positions/Balance Sheet Total	0.1257	0.1186	0.0667	+
3		Number of Employees/Balance Sheet Total	0.0003	0.0003	0.0001	+
4		One-Year Relative Change in Balance Sheet Total	0.0581	0.0519	0.0724	–
5		Balance Sheet Total/Balance Sheet Total of all Banks in Home Region	0.0065	0.0025	0.0129	–
6		Total Liabilities/Balance Sheet Total	0.0882	0.0342	0.1289	+
7	Credit Risk	Total Claims/Balance Sheet Total	0.2241	0.2047	0.113	–
8		One-Year Relative Change in Claims on Customers	0.0624	0.0599	0.0892	–
9		Total Loan Volume/Capacity to Cover Losses	10.992	9.9802	5.3998	+
10		Troubled Loans/Total Loan Volume	0.0393	0.0353	0.0264	+
11		Troubled Loans/Capacity to Cover Losses	1.4548	1.1875	1.1165	+
12		One-Year Relative Change in Loan Loss Provisions	0.1269	0.0967	0.4512	+/– (T)
13		Use of Loan Loss Provisions/Total Loan Volume	0.0022	0.0008	0.0032	+
14		Donation of Loan Loss Provisions/Total Loan Volume	0.0083	0.0075	0.0056	+/–
15		(Donation – Dissolution of Provisions)/Balance Sheet Total	0.0039	0.0031	0.0051	+/– (T)
16		(Donation – Dissolution of Provisions)/Total Loan Volume	0.0046	0.004	0.0043	+/–
17	Credit Risk (Major Loans)	Total Volume in Excess of Loan Limit/Total Loan Volume	0.0069	0.0000	0.0205	+
18		Herfindahl Index for Regional Diversification	0.7036	0.7583	0.2779	–
19		Herfindahl Index for Sectoral Diversification	0.2823	0.2109	0.2135	–

Table 1 (cont)

Input variables to backward/forward selection process

ID	Group	Definition	Mean	Median	Std. Dev.	Hyp.
20	Capital Structure	Assessment Base for Capital Requirement/Total Loan Volume	0.7560	0.7644	0.1734	+
21		Tier 1 Capital/Assessment Base for Capital Requirement	0.1217	0.1047	0.0586	–
22		(Tier 1 + Tier 2 Capital)/Assessment Base for Capital Requirement	0.0214	0.0216	0.0147	–
23		One-Year Relative Change in Total Equity	0.0930	0.0602	0.2115	– (T)
24	Profitability	Operating Expenses/Balance Sheet Total	0.0076	0.0068	0.0047	+
25		Operating Result/Balance Sheet Total	0.0030	0.0028	0.0027	–
26		Profit on Ordinary Activities/Balance Sheet Total	0.0114	0.0076	0.0286	– (T)
27		Annual Result After Risk Costs/Balance Sheet Total	0.0047	0.0041	0.0042	–
28		Profit on Ordinary Activities/Tier 1 Capital	0.1215	0.1157	0.0661	–
29		Quarterly Result After Risk Costs/Tier 1 Capital	0.0859	0.0798	0.053	–
30		Profit on Ordinary Activities/Total Equity	6.4824	2.7202	9.2381	–
31		(Donation – Dissolution of Provisions)/Net Interest Income	0.5799	0.5027	0.5502	+/–
32		Risk Costs/Operating Result	1.2380	0.9542	3.2427	+ (T)
33		Interest Income/Assessment Base for Capital Requirement	0.0080	0.0078	0.004	– (T)
34		Interest Cost/Assessment Base for Capital Requirement	0.0078	0.0069	0.006	+
35		Hidden Reserves/Balance Sheet Total	0.0124	0.0091	0.0108	–
36		Operating Expenses/ Operating Income	0.699	0.6963	0.1753	+
37		Operating Result/Number of Employees	11.7481	10.2857	10.1838	–
38		Absolute Value of Change in Profit on Ordinary Activities	0.4869	0.3345	0.5251	+
39		Absolute Value of Change in Result Before Risk Costs	0.2348	0.1641	0.2288	+
40		Absolute Value of Change in Result After Risk Costs	2.0293	1.1809	2.5287	+

Table 1 (cont)

Input variables to backward/forward selection process

ID	Group	Definition	Mean	Median	Std. Dev.	Hyp.
41	Other Risks	Shares and Non-Fixed-Income Bonds/Balance Sheet Total	0.0048	0.0343	0.046	+/–
42		Current Assets / Current Liabilities	0.6661	0.6938	0.4735	–
43	Management Quality	Administrative Expenses/ Balance Sheet Total	0.0065	0.0060	0.0037	+
44		Net Interest Income/Number of Employees	24.4282	23.7391	9.4697	–
45		Profit on Ordinary Activities/ Number of Employees	31.0810	27.1405	20.8160	–
46	Macroeconomics	Change in Harmonized Consumer Price Index	0.0036	0.0019	0.0035	+/–
47		One-Quarter Relative Change in Consumer Price Index	1.5098	1.0330	0.8174	+/–
48		Number of Cars Registered	94.5983	112.143	26.4256	–
49		Private Consumption Contingent	57.4496	57.2000	0.7800	–
50		Volatility of ATX	1.1347	1.0278	0.2866	+

Source: compiled by authors.

Table 2

One-step logit models

This table illustrates our benchmark models. As outlined in section 3.2, some of the input variables are transformed (T). The coefficient of transformed variables within a survival or logit model will always be positive. For the basic one-step logit model we cannot report specific coefficients as this model is used by the Austrian National Bank to monitor Austrian banks. As coefficients remain comparable for the two extended specifications, we only report the effects for the first 12 variables but real coefficients for added variables.

ID	Variable definition	Basic one-step logit model	Extension by bank age	Extension by bank age dummies
8	One-Year Relative Change in Claims on Customers (8)	–	–	–
10	Troubled Loans/Total Loan Volume (10)	+	+	+
12	One-Year Relative Change in Loan Loss Provisions (12)	+ (T)	+ (T)	+ (T)
17	Total Volume in Excess of Loan Limit/Total Loan Volume (17)	+	+	+
20	Assessment Base for Capital Requirement/Total Loan Volume (20)	+	+	+
23	One-Year Relative Change in Total Equity (23)	+ (T)	+ (T)	+ (T)
26	Profit on Ordinary Activities/Balance Sheet Total (26)	+ (T)	+ (T)	+ (T)
27	Annual Result After Risk Costs/Balance Sheet Total (27)	–	–	–
35	Hidden Reserves/Balance Sheet Total (35)	–	–	–
38	Absolute Value of Change in Profit on Ordinary Activities (38)	+	+	+
47	One-Quarter Relative Change in Consumer Price Index (47)	–		
	Sector Assignment (Dummy Variable)	+		
	Bank age		–0.007***	
	Dummy: bank age 26–50 years			–0.200
	Dummy: bank age 51–75 years			–0.368
	Dummy: bank age 76–100 years			–1.211***
	Dummy: bank age 101–125 years			–0.496**
	Dummy: bank age above 125 years			–0.515**
	In-Sample Accuracy Ratio	**65.9%**	**66.1%**	**66.6%**
	Out-of-Sample Accuracy Ratio	**63.3%**	**63.4%**	**63.7%**

Source: compiled by authors.

Table 3

Model specifications including time dummies for three different at-risk definitions

The table shows three discrete survival time models with time-varying covariates for banks that are at risk. Time dummies are relative to the point in time when a bank becomes at-risk according to one of the three different criteria. Models are determined using stepwise model selection. Italic variables are variables that are also included in the benchmark logit models. Time dummies are forced into the models, ie, they are not eliminated from the model even if their p-values are above the thresholds.

ID	Variable definition	At-risk def. 1 (2xLevel)		At-risk def. 2 (Growth)		At-risk def. 3 (Comb.)	
		Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Period 2	Time dummies indicating one-year periods since a bank has become at-risk.	0.43	0.04	0.26	0.26	0.14	0.49
Period 3		0.50	0.03	0.35	0.08	0.35	0.10
Period 4		0.13	0.60	0.01	0.98	0.01	0.96
Period 5		0.05	0.85	0.05	0.85	–0.06	0.81
Period 6		0.24	0.49	0.23	0.58	–0.04	0.92
5	Balance Sheet Total/B. Sheet Total of all Banks in Home Region	–13.67	0.03			–11.83	0.05
7	Total Claims/Balance Sheet Total	–2.49	0.00	–3.00	0.00	–2.50	0.00
8	*One-Year Relative Change in Claims on Customers*	*–4.66*	*0.00*	*–4.97*	*0.00*	*–4.20*	*0.00*
10	*Troubled Loans/Total Loan Volume*	*6.12*	*0.02*	*8.04*	*0.01*	*5.29*	*0.05*
11	Troubled Loans/Capacity to Cover Losses	0.24	0.00	0.24	0.00	0.28	0.00
12	*One-Year Relative Change in Loan Loss Provisions (T)*	*0.57*	*0.00*	*0.72*	*0.00*	*0.52*	*0.00*
14	Donation of Loan Loss Provisions/Total Loan Volume			–28.22	0.08		
15	(Donation – Dissolution of Provisions)/Balance Sheet Total (T)			0.31	0.06	0.27	0.07

Table 3 (cont)

Model specifications including time dummies for three different at-risk definitions

ID	Variable definition	At-risk def. 1 (2xLevel)		At-risk def. 2 (Growth)		At-risk def. 3 (Comb.)	
		Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
17	*Total Volume in Excess of Loan Limit/Total Loan Volume*	*8.03*	*0.00*	*8.74*	*0.00*	*7.02*	*0.00*
23	*One-Year Relative Change in Total Equity (T)*	*0.39*	*0.01*	*0.40*	*0.01*	*0.43*	*0.00*
26	*Profit on Ordinary Activities/Balance Sheet Total (T)*	*0.62*	*0.00*	*0.36*	*0.03*	*0.60*	*0.00*
27	*Annual Result After Risk Costs/Balance Sheet Total*	*–80.94*	*0.00*	*–74.57*	*0.00*	*–77.38*	*0.00*
30	Profit on Ordinary Activities/Total Equity	–0.07	0.00	–0.03	0.05	–0.03	0.01
39	Absolute Value of Change in Result Before Risk Costs	0.55	0.05	0.53	0.07	0.66	0.01
41	Shares and Non-Fixed-Income Bonds/Balance Sheet Total			2.65	0.08		
44	Net Interest Income/Number of Employees	–0.04	0.00	–0.02	0.07	–0.04	0.00
45	Profit on Ordinary Activities/Number of Employees			–0.02	0.06		
	In-Sample Accuracy Ratio	**67.3%**		**68.1%**		**67.4%**	
	Out-of-Sample Accuracy Ratio	**66.4%**		**67.6%**		**66.0%**	

Source: authors' estimates.

Table 4

Significance test for differences in prediction accuracy

Details on the calculation of the standard errors and test statistics reported in this table can be found in Engelmann, Hayden and Tasche (2003).

Model	Out-of-sample accuracy ratio	Std. Err.	Comparison to basic logit model	
			Test-statistic	p-value
Basic Logit Model	63.3%	6.2%	–	–
Logit Model with Age Dummies	63.7%	6.5%	0.08	0.779
Two-Step Model (2xLevel)	66.4%	6.2%	19.06	0.000
Two-Step Model (Growth)	67.6%	6.2%	22.25	0.000
Two-Step Model (Comb.)	66.0%	6.3%	18.16	0.000

Source: authors' estimates.

Table 5

Distribution of financial problems among time periods after becoming at-risk

Period	At-risk def. 1 (2xLevel)	At-risk def. 2 (Growth)	At-risk def. 3 (Comb)
Year 1	22%	23%	24%
Year 2	27%	30%	25%
Year 3	21%	20%	21%
Year 4	14%	14%	14%
Year 5	12%	10%	13%
Year 6	4%	3%	4%
Total	100%	100%	100%

Source: authors' estimates.

Table 6

Model specifications excluding time dummies for three different at-risk definitions

The table shows three discrete survival time models with time-varying covariates for banks that are at risk. Models are determined using stepwise model selection. Italic variables are variables that are also included in the benchmark logit models.

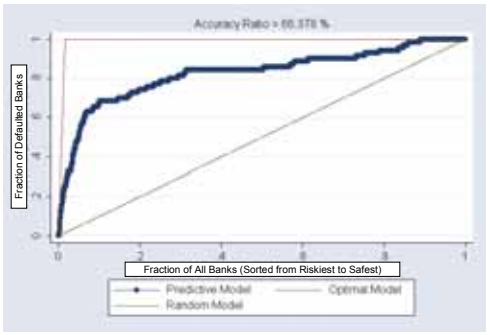
ID	Variable definition	At-risk def. 1 (2xLevel)		At-risk def. 2 (Growth)		At-risk def. 3 (Comb.)	
		Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
5	Balance Sheet Total/B. Sheet Total of all Banks in Home Region	–13.92	0.02			–12.03	0.05
7	Total Claims/Balance Sheet Total	–2.43	0.00	–2.82	0.00	–2.46	0.00
8	*One-Year Relative Change in Claims on Customers*	*–4.65*	*0.00*	*–4.83*	*0.00*	*–4.17*	*0.00*
10	*Troubled Loans/Total Loan Volume*	*6.23*	*0.02*	*8.45*	*0.01*	*5.39*	*0.05*
11	Troubled Loans/Capacity to Cover Losses	0.25	0.00	0.24	0.00	0.28	0.00
12	*One-Year Relative Change in Loan Loss Provisions (T)*	*0.51*	*0.00*	*0.68*	*0.00*	*0.49*	*0.00*
14	Donation of Loan Loss Provisions/Total Loan Volume			–27.61	0.09		
15	(Donation – Dissolution of Provisions)/Balance Sheet Total (T)			0.31	0.05	0.26	0.07
17	*Total Volume in Excess of Loan Limit/Total Loan Volume*	*8.20*	*0.00*	*8.33*	*0.00*	*7.29*	*0.01*
23	*One-Year Relative Change in Total Equity (T)*	*0.38*	*0.02*	*0.38*	*0.02*	*0.42*	*0.01*
26	*Profit on Ordinary Activities/Balance Sheet Total (T)*	*0.63*	*0.00*	*0.33*	*0.04*	*0.60*	*0.00*
27	*Annual Result After Risk Costs/Balance Sheet Total*	*–83.40*	*0.00*	*–77.15*	*0.00*	*–78.80*	*0.00*
30	Profit on Ordinary Activities/Total Equity	–0.06	0.00	–0.03	0.07	–0.03	0.02
39	Absolute Value of Change in Result Before Risk Costs	0.51	0.07	0.51	0.08	0.62	0.02
41	Shares and Non-Fixed-Income Bonds/Balance Sheet Total			2.98	0.05		
44	Net Interest Income/Number of Employees	–0.04	0.00	–0.02	0.07	–0.04	0.00
45	Profit on Ordinary Activities/Number of Employees			–0.02	0.04		
	In-Sample Accuracy Ratio	**67.2%**		**68.3%**		**67.3%**	
	Out-of-Sample Accuracy Ratio	**66.9%**		**67.3%**		**66.5%**	

Source: authors' estimates.

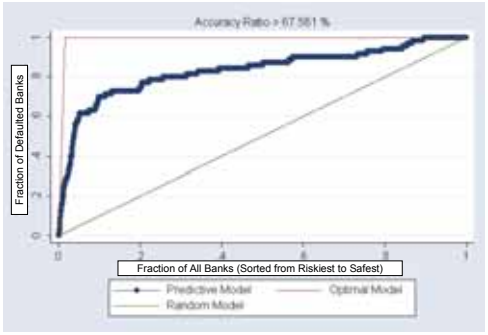
Figure 1

Out-of-sample performance of survival time models

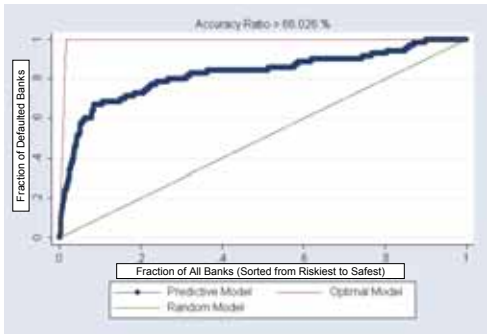
Two-Step Model (2xLevel)



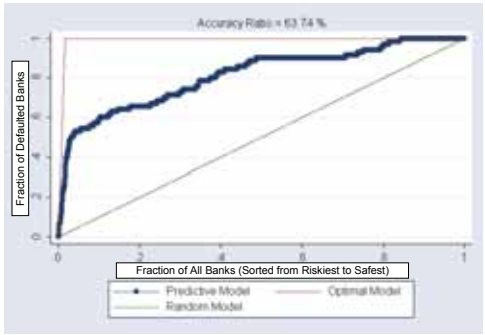
Two-Step Model (Growth)



Two-Step Model (Combined)



One-Step Model with Age Dummies

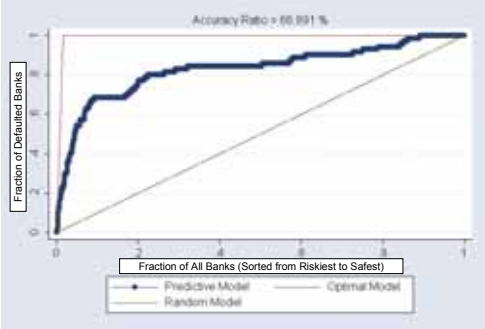


Source: authors' estimates.

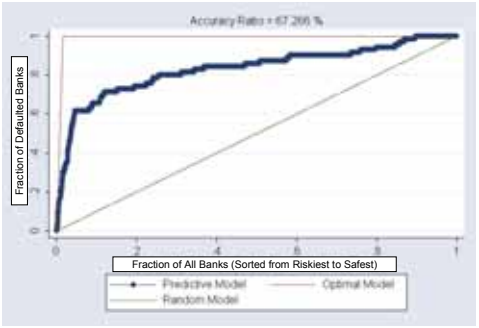
Figure 2

Out-of-sample performance of two-step models excluding time dummies

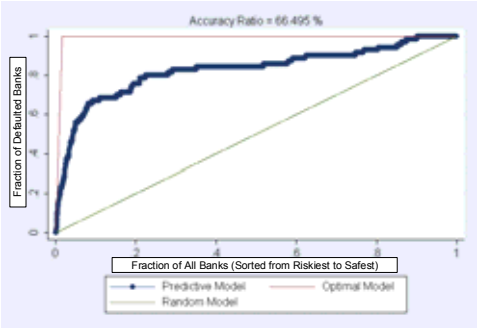
Two-Step Model (2xLevel)



Two-Step Model (Growth)



Two-Step Model (Combined)



Source: authors' estimates.

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Discussant comments on session IPM65: Statistical tools used in financial risk management

Greg Haymes

Let me begin by thanking the IMF and ECB authors for their thorough and thought-provoking contributions on the topic of Financial Soundness Indicators, or FSIs. It is indeed an honour to act as a discussant for these papers. My remarks will begin with some broad observations, followed by key points raised in the papers, and end with some suggestions for the way forward.

The challenge of remaining current on developments in the financial world has never been greater – or more critical – for central banks. Indeed, over the past several years, financial crises have put pressure on central banks to obtain better sources of information on the financial system. For instance, the BIS recently expanded its International Banking Statistics to include exposures on an ultimate risk basis, and several central banks are improving available financial data, such as the ECB's Centralized Securities Data Base (CSDB).

The development of FSIs is another important step that provides a new direction for official statistics – one that can be compared with the development of the System of National Accounts (SNA) and, subsequently, of the GDP, some 50 years ago. The SNA enhanced our ability to measure how our economies were performing and transforming, while FSIs allow us to assess and monitor the strengths and vulnerabilities of financial systems. However, as was the case 50 years ago, prior to the development of GDP statistics, FSI data should be viewed as a work in progress. A cynic might argue that these heroic efforts to develop a comprehensive set of financial stability indicators have overtones of Don Quixote tilting at windmills – noble in intent, but ultimately futile in implementation. However, that view underestimates the various benefits of going through the exercise.

Indeed, the IMF's FSI initiative that began in the late 1990s created huge benefits for the central banking community because it encouraged countries to develop macroprudential indicators to monitor the state of financial systems. To ensure relevance and to cover all risks, these country-specific indicators have evolved over the years to reflect rapidly changing markets. As a result, macroprudential indicators for individual countries can be quite different from the FSIs. In the case of banks, for example, trading-book indicators have become more important for countries like Canada, where banking activity has moved from traditional intermediation to a more market-oriented approach. The implementation of Basel II will result in more detailed information on an institution's security holdings, and future FSI work should take this into consideration.

Both the ECB and IMF papers are broad ranging, yet concise and easy to read. The ECB paper compares the approach used for its macroprudential indicators (MPIs) with that of the IMF's FSIs. Key differences are frequency and timeliness – the MPIs of the ECB are annual and are available 5 to 7 months after the reference date, while the FSIs are expected to be quarterly, with a one-quarter lag. Other differences include: the preferred consolidation approach, accounting standard differences, and the geographical scope of the indicators. The IMF paper, meanwhile, provides background information on the FSI exercise, outlines key methodological challenges, and suggests items to be further addressed in a forthcoming report to the IMF's Executive Board. I concur with its conclusion that the FSI exercise has significantly advanced knowledge and experience in this new field of statistics and has set a good foundation for the regular compilation of FSIs.

Let me now step back and discuss various points raised in the papers.

Canada was among the original 40 countries that volunteered to participate in the FSI pilot, which was later expanded to 62 countries. The FSI Guide provides precise definitions for each indicator. In some cases, however, the lack of available data meant that exact IMF definitions could not be followed. In such cases, countries had to document how their measures differed from the Guide in terms of metadata. Compiling the detailed metadata was, by most accounts, the most difficult and time-consuming part of the project. Indeed, some suggest that the scope of the undertaking was not as clear at the beginning as it might have been. Besides the availability of data and resources, the complexity of the initiative may have been underestimated. With nearly 300 pages, the Guide itself is very comprehensive.

An important issue that FSI coordinators face is the need to collaborate with other government agencies, such as the supervisor of financial institutions and the national statistical office. In Canada, there were challenges in this regard, owing to the lack of available resources in these agencies. In the future, a more formal agreement among parties should be established at the outset.

Despite these challenges, results from the FSI exercise were quite positive, with almost 90 percent of participating countries reporting all core FSIs, 84 percent reporting encouraged FSIs for deposit takers, and about 50 percent reporting encouraged FSIs for other sectors. In addition, FSIs are being incorporated into the financial surveillance work of central banks. At the Bank of Canada, for example, every attempt is being made to harmonize the data sources used in our macroprudential analysis with those of the FSIs. FSIs also allow for a broader awareness of the situation in other countries.

Let me now turn to some of the key methodological challenges.

First, and foremost, is the issue of consolidation. Few countries followed the approach recommended in the Guide, and various opinions have been expressed as to how best to proceed in this regard. It is important to note that increased flexibility in the Guide will lead to diminished cross-country comparability – one of the most desirable features of the FSIs. The analytical needs of countries, however, can vary, depending on the market and its participants. Might there be a case for suggesting two main types of consolidation approaches, depending upon the sophistication of a country's financial system? After all, smaller, less complex economies may need only national data. Such an approach would:

- provide users with a clear direction;
- reflect differences in practices between countries; and
- lead to higher-quality, more comparable data.

On the other hand, by limiting the number of allowable approaches, significant effort and adjustments may be required by certain countries.

The ECB paper puts forth a strong case for the domestically controlled cross-border, cross-sector consolidation basis (DCCBS), given that it corresponds to national supervisory standards and that the data are more readily available. It also suggests that the majority of EU countries support this recommendation. I tend to agree, and would feel more comfortable analysing data based on the standards that banks themselves use to judge their financial security or situation. Another contributing factor, discussed in the paper, is the growing importance of large and complex banking groups, and the impact that the failure of any one of these would have on the financial system, along with the importance of using a consolidation approach that captures all risks to the banking sector.

The ECB paper also suggests that the IMF should compile indicators for various regions – for example, on an EU and euro basis. Besides providing relevant benchmarks, regional data are required for the ECB to fulfil its mandate. The consolidation issues present the greatest challenge in this regard. But, as the paper states, the ECB already does this for bank supervisory data. Perhaps, therefore, if the FSI initiative proceeds, a pragmatic approach can be worked out between the ECB and the IMF on this issue.

A related point is the need for greater coordination among international agencies to harmonize and streamline requests. For instance, the BIS International Financial Statistics provide an important statistical standard for central banks. It would also be helpful if compilers of central bank data were more actively engaged and were consulted in the process of developing new requests.

As the IMF paper indicates, the FSI conceptual framework draws on statistical, supervisory, and business accounting frameworks. Unfortunately, the Basel framework and the use of International Financial Reporting Standards (IFRS) are in transition and, to a lesser extent, so too is the System of National Accounts. The timing of these developments is not optimal for the introduction of a compilation guide involving new financial statistics.

At a minimum, a discussion of the Basel framework should be included in the Guide, along with an acknowledgement of its use as a standard for certain series. In terms of accounting, Canada, like many other countries, will adopt the IFRS by 2011 for all publicly traded companies. Given this trend, and the need for consistency across standards, the Guide should accept the IFRS as the standard on most accounting issues. One exception is the IFRS recommendation to consolidate the parent and all of its subsidiaries regardless of whether they are financial or non-financial entities.

With respect to the issue of "income and expense recognition," perhaps the case made in the IMF paper (and in the Guide) – that realized and unrealised gains and losses on available-for-sale financial instruments should be recognized as income rather than as equity – can be further elaborated and presented to the International Accounting Standards Board (IASB), with a view to promoting a possible change in their standard on this issue. There is, after all, some divergence in their treatment of financial instruments when it comes to foreign exchange: under IFRS, all foreign exchange gains and losses, including those on available-for-sale instruments, are immediately allocated to the income statement.

Through its FSI initiative, the IMF has created a new type of data governance, or framework, that formally establishes standards, processes and structures to ensure that data that are created and consumed are clean, relevant, and fit for use.

There are, however, some challenges.

In particular, as globalisation intensifies and capital markets converge, there is an appreciation among central bankers of the need for a high degree of international consensus on widely usable statistical definitions and norms. In order to achieve broad international comparability of data, it is sometimes necessary that otherwise justifiable national positions be modified. At the same time, experience indicates that in the process of developing international classifications, definitions and recommendations, one must accept the give and take required to establish international norms for statistical activities.

In closing, FSIs provide a greater sense of market and banking system conditions, and their continued use is highly recommended. I would like to conclude with some important lessons for relationship building, as related to the FSI experience, and with the thought that central banks need to work with other government agencies and banks to obtain FSI data. At the same time, international organizations must work with one another, with standard setters, and with the central banks. Key lessons include the need to:

1. establish relationships with senior reporting managers;
2. ensure that providers realize the value of their data;
3. target more in-depth relationships with the largest providers;
4. understand response burden;
5. seek early feedback on new requests;
6. conduct onsite visits, training, and information sessions; and
7. focus on the long-term benefits of such efforts.

Discussant comments on session IPM65: Statistical tools used in financial risk management

Homero Gonçalves[1]

There is great interest today in developing statistical tools to measure financial risk. Deregulation, innovation and globalisation in financial systems have changed the conception of the supervision process, which now centres on the evaluation of financial institutions' risk profile. Prevention has replaced the more reactive traditional approach. The new concepts are evident in the Basel II Capital Accord and have been in the spotlight with the recent sub-prime credit crises.

The authors propose a new bank failure prediction model based on a two-step approach. The first step uses a logit model to determine which banks are at risk. This allows for targeted monitoring, ie supervisors can concentrate on the "problematic" banks. In this step, the definition of "at risk" is crucial, and the authors have tested several options in order to obtain the best statistical solution. The second step involves a survival model, ie it estimates the time to default for at-risk banks. Such information, if available with sufficient lead time, would facilitate preventive action by supervisory institutions, designed to avert bank failure.

Though the authors were able to use a very large number of explanatory variables, based mostly on supervisory data, it could be that additional information covering specific features would improve the results. The issue of whether to collect key information on a legal-entity or group basis also arises, given the interdependency among financial entities.

This type of model can be used for off-site examinations, allowing for greater cost efficiency. Indeed, given that resources for on-site examinations are scarce, it is important to allocate them efficiently. In this case, the level and intensity of supervision devoted to each institution can be adjusted according to the institution's risk profile. This raises the question of whether the model will be implemented in Austria for supervisory purposes, and whether using this approach would influence the behaviour of financial entities.

As regards the authors' major findings, it is worth noting that the 2nd and 3rd years after a bank enters the at-risk category seem to be the most relevant ones in terms of its survival. This type of information would highlight the need for rapid intervention to avoid bank failure. However, there is a certain lack of statistical significance in these findings, perhaps as a result of the definition of "failure" adopted, since no actual defaults occurred in the sample. It could be useful to test an alternative and more practical rule, such as some financial ratio threshold that would define exactly when an incident occurs.

Nevertheless the two-step approach outperforms the one-step model, due to the fact that the variables determining whether a bank is at risk differ from those explaining how long it will survive. An interesting point here is the lack of statistical significance of the macroeconomic variables in predicting default in the at-risk sample, raising the question of whether they are offset by some other variables.

It should also be noted that credit risk is the most significant source of risk in the banking industry.

A final question concerns the feasibility of applying this model to other sectors, in particular to predict failure of non-financial corporations.

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[1] Bank of Portugal.

Discussant comments on session IPM65: Statistical tools used in financial risk management

Filipa Lima[1]

The crux of financial stability issues is the liquidity/profitability nexus: banks must manage liquidity stocks and flows as profitably as possible without jeopardising financial stability.

The authors propose new asset-based measures of bank liquidity. They employ a flow approach, incorporating an intertemporal dimension based on individual bank data, and distinguishing between nominal and idiosyncratic liquidity flows. The focus is on the dynamics of purchases and sales, rather than solely on changes in net positions.

The authors' flow approach incorporates an intertemporal dimension based on individual non-consolidated supervisory data at the micro level. In recent times, banks have been increasing their exposure to off-balance sheet liquidity risk; one wonders whether an improved data set is needed for individual institutions to specifically capture such off-balance sheet risks.

M&A are also taken into account, and it is possible to identify liquidity flows across entities in the same banking group. The Basel Committee on Banking Supervision's Joint Forum on the management of liquidity risk in financial groups studied the degree to which the liquidity risk management function was centralised in groups, and differences attributable to the type of firm dominating a particular group. It would be interesting to assess these differences based on the proposed methodology.

As to the distinction between nominal and idiosyncratic flows, nominal flows measure the liquidity growth in absolute terms (weighted average) and reflect nominal liquidity expansion or contraction within the banking system on aggregate, thus showing macroeconomic change, while idiosyncratic flows measure liquidity growth in relation to aggregate growth, reflecting purely bank-specific factors.

Most financial firms use a variety of metrics to monitor the level of liquidity risk to which they are exposed. These can be grouped into the liquid assets approach, the cash flow matching approach and a combination of the two. It would be interesting to examine whether the idiosyncratic measure can be compared with a firm's liquidity risk policy statement, and whether this proposed quantitative approach can be validated by the internal models used by banks in their liquidity risk management.

A further finding of the paper is that there is a substantial idiosyncratic build-up of liquidity, which suggests that a large number of banks expand in excess of the general growth trend. In the sample, the build-up is related to size of firm, but the finding could raise concerns for the management of liquidity by other firms in the sample.

Other issues that could be considered are cross-border issues in liquidity management – at the country level, the currency level and the affiliate or sector level.

Finally, we should note the possibility of extending stress testing, which could be done at both the macro level (eg output, stock prices and short-run nominal interest rate shocks) and the micro level (ie firm-specific shocks such as downgrading of a bank's rating).

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[1] Bank of Portugal.

Invited Paper Meeting 83

Measures of output and prices of financial services

Chair: R B Barman, Reserve Bank of India

Papers:

Estimation of financial intermediation services indirectly measured (FISIM): Thailand's case
Puntharik Supaarmorakul, Bank of Thailand

Practical issues on the calculation and allocation of FISIM in Korea
Kil-hyo Ahn, Bank of Korea

Measuring output and value of financial services (banking): the case of Indonesia
Triono Widodo, Bank Indonesia

What can we learn from the new measures of bank services in national accounts? The case of the US
Dennis Fixler, Marshall Reinsdorf and George Smith, Bureau of Economic Analysis

Discussant: Steven J Keuning, European Central Bank

Chairman summary on session IPM83: Measures of output and prices of financial services

R B Barman[1]

IPM 83, at the 56th Session of the International Statistical Institute (ISI 2007) in Lisbon, Portugal, provided a professional forum for discussion of conceptual questions and estimation issues in measuring FISIM (Financial Intermediation Services Indirectly Measured). Four papers were presented, covering practices in both developed and developing countries, and were ably discussed by Dr. Steven Keuning of the European Central Bank. The discussions that followed the presentation of each paper furnished useful input for further work. It was my pleasure to chair the session.

As a major component of the financial system, banks generate the bulk of their revenue by providing financial intermediation services between depositors and borrowers, and receive net income from the differential interest rates associated with various financial services, though an explicit breakdown of this is not available. A depositor receives a lower rate of interest than the risk-free or notional interest rate, while a borrower is charged a higher rate that includes a risk premium. Banks' intermediation services include a component that is not an explicit charge, and thus must be measured indirectly. The SNA 1993 classifies these activities as FISIM. It defines financial intermediation as "*a productive activity in which an institutional unit incurs liabilities on its own account for the purpose of acquiring financial assets by engaging in financial transactions on the market*". The estimation of FISIM raises many issues.

FISIM suggests a "reference rate method", which has its origin in a "user cost approach" for measuring output (Fixler 1993, Hancock, 1985). The user cost of a financial product can be calculated as its holding cost minus the reference rate. However, it is difficult to translate this concept into practice for several reasons (Barman and Samanta, 2007). The complexities involved in measuring income begin with the initial conceptualisation of a bank's output set, and continue with the issues involved in pricing various inputs and outputs. For example, is the service of taking deposits an input or an output? What is the price paid by the depositor for indirect banking services such as safe custody and the issuance of cheques? And, as related questions, how are financial services sold? Are they transaction based or money based? The recognition and estimation of output and prices for these components of intermediation services present many challenges, both methodological and empirical, and have come under close scrutiny preparatory to the ongoing exercise of revising SNA 93.

As is well known, although SNA 93 indicates that property income receivable should be excluded from investment of own funds, unlike the case of intermediation services, it is extremely difficult to distinguish own funds from intermediation funds.

To place a value on the intermediation services provided to depositors and borrowers, it is necessary to have a "reference rate", from which risk premium has been eliminated to the greatest extent possible. This is easier said than done, because there is no clear, single way of measuring the risk-free interest rate.

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Briefly, there are four major issues in measuring FISIM: first, measuring the output generated by intermediation services at current prices; second, measuring the same output at constant (ie base year) prices; third, allocating the output thus measured (both current and constant price estimates) to the user sectors/sub-sectors of the economy; and fourth, constructing price and output/quantity indices of intermediation services. While the first three issues are widely discussed in the context of compiling national accounts series, the fourth is also important for constant price estimates of NAS and for measuring inflation.

Banks receive income from many other types of services, such as consulting, payment services, portfolio management, mortgages, etc. An additional portion of bank revenue comes from capital gains. Though these outputs are distinct, the inputs used to generate them are not.

In practice, countries have taken a broad range of approaches. This is mainly because there is divergence in the choice of key parameters such as reference interest rate deflator, internal rates for residents and external rates for non-residents, adjustments required for NPLs, maturity structure of financial assets/liabilities, single or multiple rates for assets/liabilities, inclusion or exclusion of bonds , and the types of institutions and services to be covered.

The four papers published here cover both theoretical and practical aspects of measuring FISIM. They make it clear that some countries still follow SNA 68, due to the fact that SNA 93 compounded the problems of estimating FISIM. Thus, inter-country comparison of banking output has become very difficult. Dr. Steven Keuning succinctly discussed these papers in the session, and offered suggestions for further work to address some of the methodological challenges. In my view, the major areas requiring more work are reference rate selection and determining appropriate deflators for converting output to constant prices. These issues provide considerable scope for further methodological research as a step towards greater uniformity among countries in empirical estimates of FISIM. As mentioned above, consensus is also needed on the selection of other key parameters, with a view to achieving methodological convergence.

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Estimation of financial intermediation services indirectly measured (FISIM): Thailand's case

Puntharik Supaarmorakul[1]

1. Introduction

Financial intermediation services are defined in the System of National Accounts 1993 (SNA 1993) as "a productive activity in which an institutional unit incurs liabilities on its own account for the purpose of acquiring financial assets by engaging in financial transactions on the market" (SNA 1993, para. 4.78). The role of these institutional units, defined in the SNA 1993 to include almost all institutions defined as "banks", is to provide intermediation services by channelling funds between depositors and borrowers. In the process of providing such services, financial corporations incur liabilities and place themselves at risk. To compensate for the risk, financial institutions charge fees for the services provided.

Financial services constitute the output of financial corporations. Fees charged by financial corporations for financial services provided can be both explicitly and implicitly priced. The measurement of explicitly priced financial services poses no difficulties, as the output of these services can be valued based on the actual fees or commissions charged. However, the valuation of implicitly priced financial services requires the imputation of bank service charges, as these fees are embedded in the interest rate margin. Proper allocation of implicitly priced financial services is important and deemed an improvement to the national accounts compilation, since more accurate GDP levels can be obtained. Furthermore, it has the advantage of reflecting the entire output and value added of financial corporations.

The estimation of financial intermediation services indirectly measured (FISIM) for Thailand is at an early stage, and current SNA compilation does not include the estimation of FISIM.[2] This paper focuses on the concept of FISIM based primarily on SNA 1993 and the valuation of implicitly priced financial services provided by financial corporations in the context of Thailand. It also discusses whether the methodology and input parameters recommended by SNA 1993, and those that are used by other countries, can be applied to Thailand's FISIM compilation. For constant price FISIM data series, the paper will discuss how the use of different deflators, and/or the use of single and multiple deflators, can affect the outcome of FISIM. The final section addresses outstanding issues or concerns.

2. What is FISIM?

FISIM is a measure of the value of financial services that financial intermediaries do not explicitly charge for. In principle, FISIM refers to "the total property income[3] receivable by financial intermediaries minus their total interest payable, excluding the value of any property

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[2] National accounts statistics in Thailand are currently compiled by the National Economic and Social Development Board (NESDB), which is in the process of migrating to SNA 1993. The migration process is expected to be completed by the end of 2007. Current estimation of financial services employs the imputed service charge approach.

[3] Property income comprises interest, distributed income of corporations, and reinvested earnings.

income receivable from the investment of their own funds, as such income does not arise from financial intermediation" (SNA 1993, para. 6.125).

The SNA 1993 concept of measuring value on financial services that are not explicitly priced recommends the calculation of FISIM based on the "reference rate approach", ie as the "difference between the actual rates of interest payable (to depositors) and interest receivable (from borrowers) and a reference rate of interest." The theory behind this approach assumes the existence of a reference rate, which is a pure cost of borrowing funds for which the risk premium has been eliminated to the greatest extent possible. As financial corporations pay a lower rate of interest to depositors and charge higher rates of interest to borrowers, the difference between the interest payable and receivable and the reference rate is considered as an indirect charge for intermediation services rendered.

3. Estimation of FISIM for Thailand

The methodology adopted for measuring financial intermediation services in this paper is based on the reference rate approach. Because of the linkage between the reference rate approach and the "user cost approach",[4] certain pre-conditions must be met in order for the approach to be effective in measuring financial intermediation services. Specifically, financial institutions must behave as profit-maximising firms operating in a deregulated environment, facing interest rates that are fully market driven (Barman and Samanta 2004).

In the case of Thailand, as a result of the recent changes to the Thai financial system,[5] competition in the Thai banking system has intensified as the scope of banking business has broadened. Interest rates on financial products, such as loans and deposits, are mostly deregulated, with the sole exception of specialised financial institutions (SFIs). Thus, using the reference rate approach would provide a reasonable estimate of financial intermediation services.

3.1 Determining the scope of financial intermediaries generating FISIM

As defined in the SNA 1993, financial intermediaries generating FISIM encompass institutional units whose role is to channel funds between depositors and borrowers. Under the scope of this definition, financial intermediaries generating FISIM will cover only the transactions of "other depository corporations" (S.122) and "other financial intermediaries except insurance corporations and pension funds" (S.123). Not included in the calculation of FISIM is the output of the central bank (S.121), as central banks do not perform commercial operations and are non-market producers. The main functions of the Bank of Thailand (BOT) are to promote monetary stability and formulate monetary policy, promote financial stability and supervise financial institutions, and print and issue banknotes – all functions that do not generate FISIM as part of its output.

The structure of the Thai financial sector comprises commercial banks, international banking facilities, finance companies, credit foncier companies, specialised financial institutions (consisting mostly of government regulated financial corporations, such as the Export Import

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[4] Schreyer and Stauffer (2002) highlighted the concept of the user cost of financial capital approach, based on extensive FISIM literature, for measuring the economic return to the financial corporation for providing a financial product, where the economic return is the difference between the financial corporation's opportunity cost of money and the holding revenue, in the case of an asset, and the holding cost, in the case of a liability.

[5] The Financial Sector Master Plan implemented in 2004, which aims to rationalise the structure and roles of existing financial institutions to enhance operational efficiency.

Bank of Thailand, Government Savings Bank, Government Housing Bank, etc.) and other deposit-taking institutions such as cooperatives. Thai banks remain the major players, accounting for more than 80 percent of the deposits and loans of financial institutions, with the remaining share attributable to deposit-taking specialised financial institutions, foreign banks, finance companies, credit foncier companies and cooperatives.

This paper will limit its examination of financial intermediaries to commercial banks, international banking facilities, finance companies and credit foncier companies, all of which fall under the supervision of the BOT. Excluded from the calculation are specialised financial institutions, due to the fact that the services provided by these institutions are policy driven, and that most of the interest rates on their financial products are regulated. Moreover, due to limitations in obtaining disaggregated data on cooperatives, transactions of such units are also excluded. Transactions of non-financial corporations are also not covered, as only explicit service charges are deemed to be recorded for such units.

3.2 Determining the scope of financial products generating FISIM

In line with the recommendations made by the Organisation for Economic Co-operation and Development (OECD) Task Force on Financial Services (Banking Services) in National Accounts, concerning the changing nature of financial activities provided by financial institutions, the scope of financial products generating FISIM used in this paper will be based on the new proposed definition for the production of non-insurance financial corporations. The new definition focuses primarily on the output of financial services as a result of risk management and liquidity transformation activities, so as to better describe the activities of intermediation, thereby extending the indirect measure of financial services to incorporate other financial products beyond traditional deposits and loans.

This paper will expand the scope of financial products generating FISIM, moving beyond the recommendation of SNA 1993 to include all financial products classified as deposits and loans, encompassing transactions in bonds and notes. Interest rates on the aforementioned financial products are identifiable. Clear distinctions can be made between the interest rates charged and payable on each financial product. Transactions in other financial instruments do not accrue service charges that need to be indirectly measured.

3.3 Choice of reference rate

Common practice for many OECD countries is to use the “reference rate approach” for measuring indirectly priced financial services. The reference rate represents the pure cost of borrowing funds. It is a rate from which the risk premium has been eliminated to the greatest extent possible, and does not include any intermediation services. The SNA 1993 recommends the use of the inter-bank lending rate as a suitable choice and recommends that the risk-free reference rate used should reflect the maturity structure of the financial assets/liabilities.

In practice, using a reference rate such as the inter-bank rate can lead to negative FISIM for some sectors. An example of this is where the actual interest rate on loans is fixed for several years at a lower rate than the reference rate. Furthermore, the use of the inter-bank lending rate as a reference rate may be volatile. The problem of negative FISIM and volatility in the reference rate can be avoided by using a method suggested in the joint OECD/ESCAP meeting on national accounts in 1998. This involves using the mid-point between the average deposit rate and the average borrowing rate, with the two average rates being calculated as interest payable/receivable divided by outstanding deposits/loans averaged over the period. This method is considered to be practical and is recommended for use by many national statistics offices, international organisations and communities. However, one drawback in using the mid-rate is that the rates may be inadequate in reflecting current economic conditions and corresponding movements in interest rates. Another method

suggested by European Council Regulation No. 448/98 is the use of an internal reference rate and an external reference rate, with the internal reference rate representing the inter-bank lending rate between resident financial institutions, while the external reference rate represents the rate between resident and non-resident financial institutions.

Currently, there is no consensus on which reference rate should be adopted; however, the selection of reference rate should reflect the country's economic conditions and should therefore also reflect the maturity structure of loans and deposits. Based on current economic conditions and the structure of the Thai financial market, interest rates that can be used as a reference rate include: (1) the Bangkok Inter-bank Offered Rate (BIBOR); (2) the 14-day repurchase rate (RP); and (3) the yield on government bonds – all of which are market related.

BIBOR is the average of the borrowing rates quoted by pre-determined banks.[6] The repurchase rate is the interest rate used in the buying and selling of bonds by financial institutions that are members of the repurchase market. The 14-day RP rate[7] had also been used as a signalling device for the implementation of monetary policy under the Inflation Targeting System. As for the yield on government bonds, in the case of Thailand, because the bond market is relatively small in size and not highly liquid, changes in the term structure of interest rates reflect market expectations of future interest rates but, at the same time, can also be influenced by demand and supply factors.

In examining the characteristics of the three types of reference rates, and due to the fact that BIBOR is relatively new and is not quoted for the periods prior to 2005, BIBOR cannot be used in this empirical study. Hence, the estimation of FISIM in this paper will be based on the use of the 14-day RP rate as the reference rate. Furthermore, banks tend to revise their deposit and lending rates in line with the movement in RP rates, although slow pass-through is usually expected.

3.4 Estimating FISIM at current prices

Using the reference rate approach, the spread between the reference rate and the rate on deposits should reflect the implicit price paid to depositors, while the spread between the reference rate and the rate received on loans from borrowers should, accordingly, reflect the implicit service charge. The reference rate method requires data on the average end-period stock of loans and deposits for different sectors of the economy, as well as the interest rates applicable, and can be estimated using a simple equation.

FISIM estimated by this approach is valued at *current prices*.

FISIM = $(r_L - r_r)\, y_L + (r_r - r_D)\, y_D$

Where:

r_r = Reference rate

r_L = Interest rate on loans

y_L = Average balance on loans

r_D = Interest rate on deposits

y_D = Average balance on deposits

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6 BIBOR is calculated based on data obtained from 16 commercial banks. The average rate is derived by eliminating the top and bottom quartiles of the quotes and arithmetic-averaging the remaining rates for the day. BIBOR is a reference rate that is fixed at 11.00 a.m. each working day and published by BOT at 11.15 a.m.

7 Since January 2007, the BOT has changed the policy rate from the 14-day RP rate to the 1-day RP rate.

The choice of interest rate on loans and deposits used in the estimation can affect the outcome of FISIM. To illustrate this, alternative approaches for estimation of FISIM at current prices were reviewed. The first approach uses the effective rate of interest on loans and deposits, which is based on the actual interest flow received and paid by financial institutions. The effective rate of interest is calculated by using the following formulas:

Effective rate of interest on loans = Interest received on loans/Average outstanding on loans

Effective rate of interest on deposits = Interest paid on deposits/Average outstanding on deposits

The second approach uses the market interest rate, which is based on the rate announced by financial institutions, calculated by using the weights proportional to the average balance of deposits and loans.

Chart 2 illustrates the differences in interest rates calculated using the approaches outlined above. The deposit interest rate does not exhibit any significant divergence between effective and market rates. However, in the case of the interest rate on loans, a significant disparity between market rate and effective rate is evident and, to some extent, will have an effect on the value of FISIM.

Using the approaches outlined above and 14-day RP as the reference rate, the resulting FISIM value estimated at current prices is shown in Tables 1 and 2. When the resulting FISIM value estimated at current prices is plotted in Chart 3, it is apparent that the FISIM value obtained using the market interest rate is higher than the FISIM value calculated using the effective interest rate. The differences in value observed are primarily due to the interest rate margin on loans.

The interest rate margin between effective and market interest rate for loans can be attributed to two main factors. The first relates to the practices of financial institutions in reporting interest rates. Financial institutions under the supervision of the BOT are required to file quarterly reports detailing interest rates for both lending and deposits. Using the data submitted, market interest rate can be estimated by applying the weights proportional to the outstanding balances. Interest on loans is assumed to be received on the entire outstanding balance, without deduction of interest on non-performing loans (NPLs).

The second reason for the differences is the exclusion of NPLs in the calculation of the effective interest rate. The effective interest rate is compiled using the interest received that is recorded on the profit and loss statements of financial institutions. This interest accrued excludes the interest on NPLs. As a result, the estimated effective interest rate would be lower than the announced market interest rate. Consequently, the FISIM value calculated using the effective interest rate would also be lower than when using the market interest rate.

The differences in value obtained from the two approaches highlight the importance of the effect of NPLs on the value of FISIM – an issue that, though it has been the focus of many discussion forums, remains unresolved. The Advisory Expert Group (AEG) on National Accounts, in a meeting in Frankfurt in 2006, proposed three options[8] for recording of interest on NPLs. Thus, given the concept on the treatment of NPLs in the SNA 1993, and taking into consideration the options proposed by the AEG on the treatment of NPLs, along with the

[8] The AEG Meeting on National Accounts in Frankfurt in 2006 suggested three possibilities for the treatment of NPLs:

(1) Continue to estimate FISIM on NPLs and allocate it to the corresponding borrowers, but consider how unpaid FISIM is recorded in the accounts in such a way as to increase principal outstanding.

(2) Estimate FISIM on interest received (rather than receivable), ie record interest on a cash, rather than an accrual, basis, so that FISIM is not attributable to NPLs.

(3) Allocate FISIM only to the stock of performing loans.

current economic conditions in Thailand, **FISIM estimation based on the market interest rate best reflects the output of the Thai financial sector**. The rationale behind this is that financial services should be recorded based on the services provided, irrespective of whether or not they are eventually paid for, since (1) the risk of default will have been priced into the interest rate charged by financial corporations; and (2) financial corporations have provided intermediation services in the form of funds channelled to the loan market, thus increasing their output.

Charts 4 and 5 illustrate the FISIM value estimated at current prices for loans and deposits. The overall interest rate movement for the reference period 2004–2006 remained in line with the policy rate; movements are within a narrow range consistent with high liquidity in the financial system. FISIM on loans (Chart 4) shows a decreasing trend, mainly due to the economic slowdown as well as excess liquidity in the financial system. The lending rate remained low in 2004, and was adjusted upwards in 2005–2006. The decline in the value of FISIM on loans was due to the deceleration in credits following the slowdown in domestic demand, particularly in private investment. In contrast, FISIM on deposits (Chart 5) exhibits an increasing trend, due to the increase in both the deposit rate and deposit balances as banks competed to maintain their share in the overall deposit base. For the first half of 2004, the deposit rate remained low and mostly unchanged; however, short-term deposit interest rates were adjusted upwards slightly towards the end of 2004, as reflected in an increase in FISIM on deposits. Continual increases in FISIM on deposits were seen in 2005 and in the first three quarters of 2006.

In addition to the effects of the choice of deposit and lending rates, changes in other input parameters, such as the reference rate, also have an impact on the value of FISIM at current prices. This can be demonstrated through the use of sensitivity analysis, which is the procedure to determine the sensitivity of the outcome to changes in the parameters. In the context of the Thai financial sector, due to the fact that deposit balances are greater than loan balances, an increase (or decrease) in the reference rate by 100 basis points will impact the value of FISIM such that (1) a change in the reference rate at a certain period will affect the value of FISIM by approximately –3% to +3%; and (2) a change in the reference rate for the entire period will have varying effects on the value of FISIM, depending on whether the reference rate increases or decreases. In the case of an increase in the reference rate, the value of FISIM on loans would decrease, while FISIM on deposits would increase, thereby increasing total FISIM. On the other hand, a decrease in the reference rate would result in an increase in FISIM on loans and a reduction in FISIM on deposits, and consequently the reduction of total FISIM.

3.5 FISIM at constant prices

In order to construct constant price FISIM data series, the total balances of loans and deposits would be deflated separately by a general deflator to remove the influence of price changes, which would otherwise feed into the volume measure. The resulting balance would then be multiplied by the base year “price”, which is the difference between the loan rate and the reference rate in the base year and, for deposits, the reference rate less the deposit rate in the base year.

The choice of an appropriate deflator will, to a certain degree, impact the value of constant price FISIM. At present, there is no consensus on which price deflator should be adopted; however, the choice of suitable deflator(s) should take account of the changes in the price of money. Many OECD countries use general price indices such as the price deflator for GDP. In the case of Thailand, there are numerous alternatives for choosing a deflator, such as the implicit GDP deflator, producer price index (PPI) and consumer price index (CPI).

The approach taken in this paper will be twofold. As suggested by much of the literature on FISIM, the first approach will be to use (1) a single deflator (GDP deflator) to deflate the balances on both loans and deposits. The second approach is to apply multiple deflators to

deflate the balances on loans and deposits, with the deflators used consisting of (2) overall PPI to deflate the balances on loans and CPI to deflate the balance on deposits, and (3) deflating the balance on loans using PPI, by product groups, for the manufacturing sectors, and CPI for all other sectors and for deflating the balance on deposits. The rationale for choosing PPI to deflate the balance on loans is justified by the fact that the structure of the loan portfolio for the Thai financial sector is dominated by corporate loans, while consumer loans account for less than 20 percent of the total, of which two thirds are collateralised housing loans. The CPI is used to deflate the balance on deposits, as the structure of deposits is composed mostly of deposits from households. Furthermore, the level of CPI also affects households' propensity to save and consume. Variations of the different alternatives for deflators are given in Table 3. The resulting FISIM value at constant prices, deflated using the GDP deflator, is given in Table 4. Table 5 shows the FISIM value at constant prices, deflated using multiple deflators.

Chart 7 illustrates FISIM at constant prices deflated by using single and multiple deflators, namely (1) the GDP deflator; (2) overall PPI on loans and CPI on deposits; and (3) sectoral PPI on loans for the productive sectors and CPI on loans of other sectors and on deposits. The empirical study showed that there is no significant divergence between the series deflated using a single deflator, such as the GDP deflator, and the series deflated using more detailed multiple deflators, eg using sectoral PPI to deflate loans for the corresponding sectors, CPI to deflate loans of other sectors and CPI to deflate deposits. Moreover, the use of multiple deflators of overall PPI to deflate loans and CPI on deposits tends to give lower values of FISIM at constant prices, as compared to the other two series. This difference may be due to the fact that the weights applied to each PPI product group are not consistent with the proportion of lending made to the corresponding sectors. Nevertheless, due to limitations in time-series data used in this empirical exercise, the results obtained are provisional, and thus require further study in order to substantiate the results.

4. Issues and concerns

Estimation of FISIM based on the reference rate approach requires information on interest rates on loans and deposits, and average outstanding balances of loans and deposits, classified by sector. Data for balances on loans and deposits by sector can be obtained from the balance sheets of financial corporations. However, some data gaps remain, such as:

1. The availability of interest rates on loans and deposits by sector
2. The feasibility of obtaining historical data at the same level of detail and aggregation
3. The availability of a suitable reference rate that can be applied to historical data series
4. The fact that the timeliness of the parameters used may not be sufficient for the compilation of quarterly GDP

There are also some concerns over the theoretical aspects outlined in the SNA 1993. These include the following:

1. Limitation to the definitions in SNA 1993

The definition of financial corporations in the SNA 1993 places emphasis on the activity of financial intermediation and not on the services provided, thus limiting the scope of intermediation services and financial products generating FISIM to the deposit and loan business of financial corporations. However, because of the changing nature of financial activities, financial corporations are able to provide a

greater variety of services beyond loans and deposits in order to attract and invest funds.

Another issue of interest is the role of "own funds" as a resource for financial services. The SNA 1993 states that lending own funds does not give rise to production and should be excluded from the estimation of FISIM. In practice, it may be difficult to distinguish whether the funds available for lending are generated from deposits or own funds. Thus, financial services should be considered to be produced generally from accepting and investing funds, regardless of the origin of the funds.

2. Estimation of trade in FISIM

The reference rate approach can be used to measure trade in FISIM. For countries with foreign exchange controls, such as Thailand, data for balances on loans and deposits by currency may not be too difficult to obtain. However, the difficulty of estimating import and export of FISIM lies in the choice of reference rates and whether to use an external reference rate based on the currencies in which the transactions are denominated or a single reference rate.

5. Concluding remarks

This paper adopted the reference rate approach in estimating FISIM value. Broadly in accordance with the recommendations in the SNA 1993, the approach described attempts to illustrate the effect of using different input parameters, such as interest rates and deflators, on the estimated FISIM valued at current and constant prices.

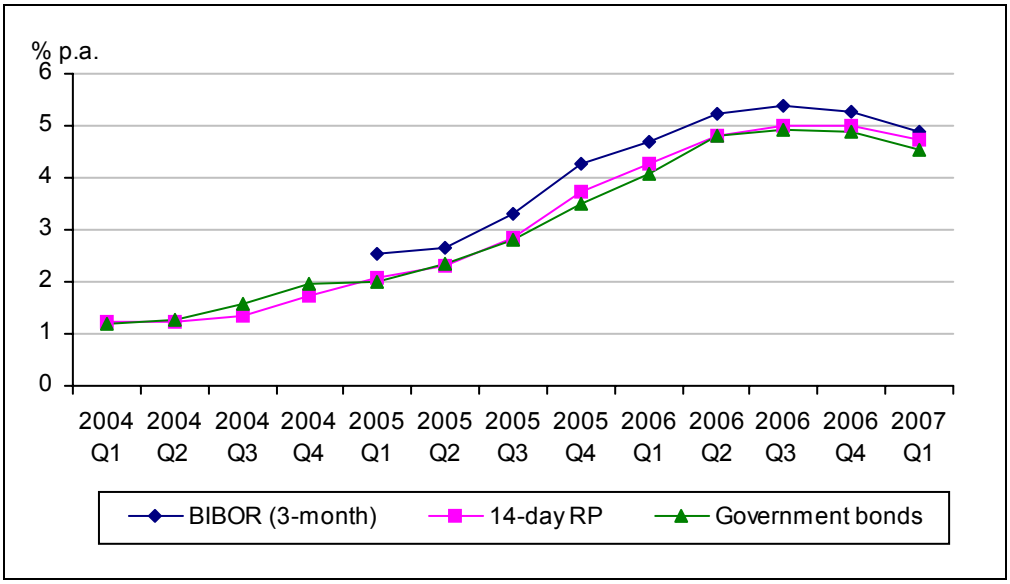
The empirical results obtained are provisional and show that the level of FISIM can be affected by changes in the choice of parameters used in the estimation, such as the interest rate, reference rate and deflators. In the Thai context, the FISIM value estimated using the market interest rate will best reflect the output of financial corporations, since the value of all intermediation services – including figures on NPLs – is recorded. For constant price data series, in order to adequately substantiate the finding of the empirical exercise pertaining to the use of single or multiple deflators to deflate the balances on loans and deposits, more detailed and longer time-series data need to be examined.

Further research and empirical studies in this area are required before the estimation of FISIM can be fully implemented in the Thai national accounts.

Annex

Chart 1

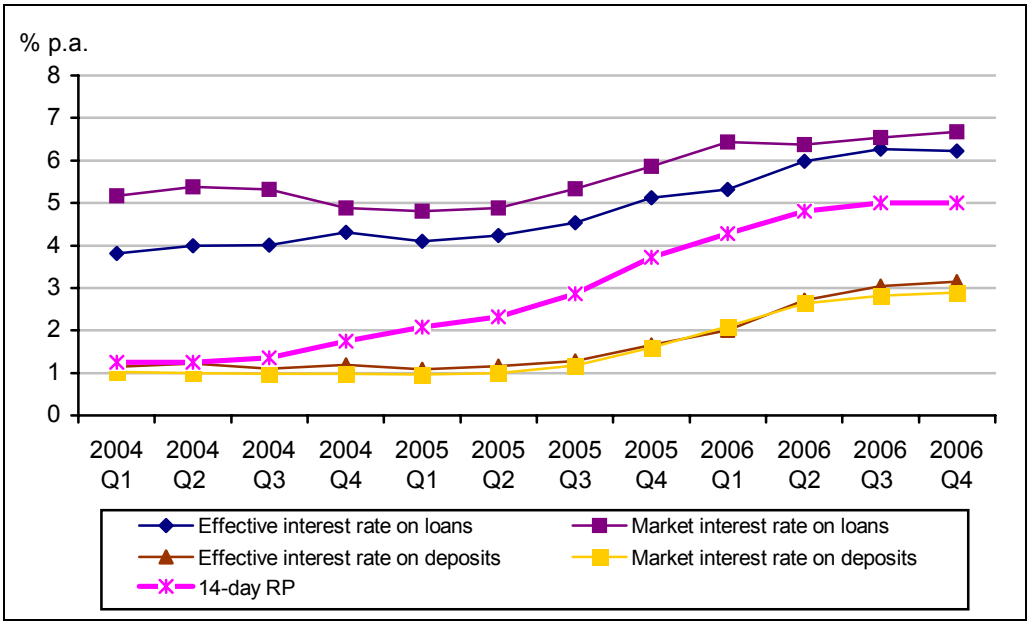
Reference rate



Source: Bank of Thailand.

Chart 2

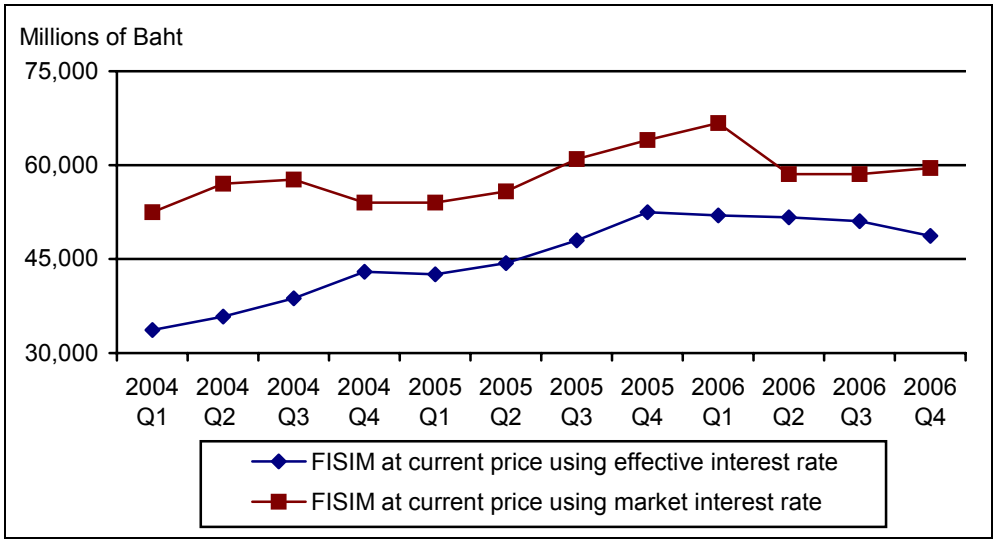
Effective interest rate vs. market interest rate



Source: Bank of Thailand.

Chart 3

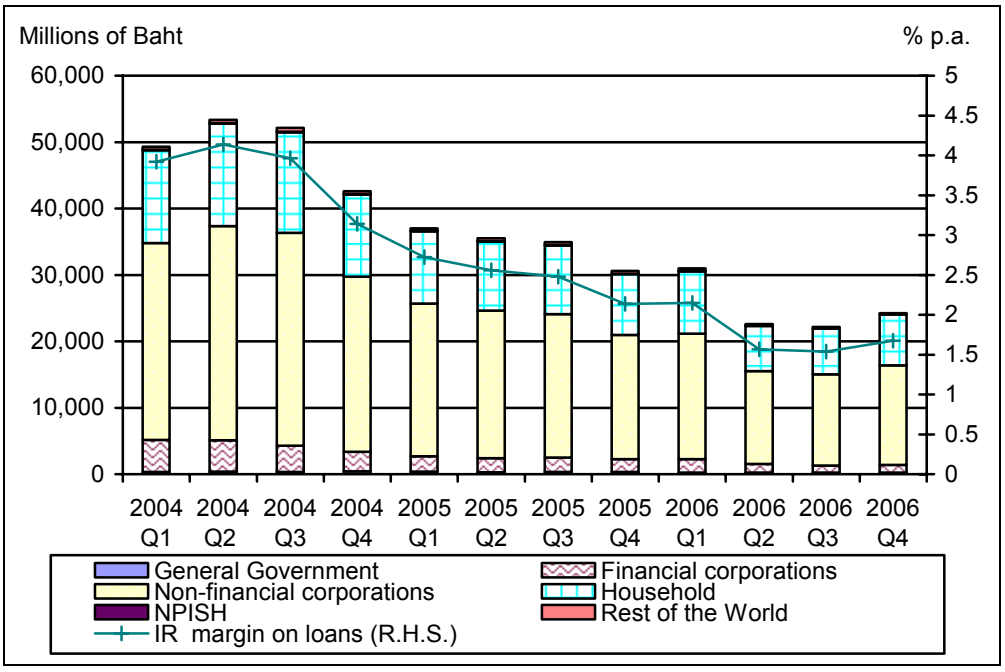
Comparison of FISIM at current prices, calculated using effective and market interest rates



Source: Bank of Thailand.

Chart 4

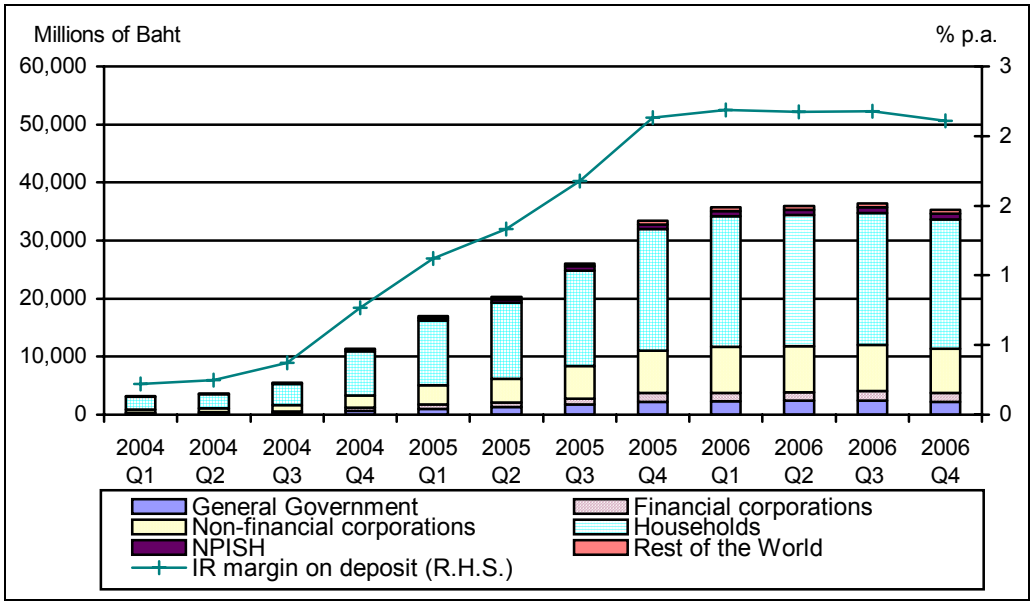
FISIM at current prices on loans (using market interest rate)



Source: Bank of Thailand.

Chart 5

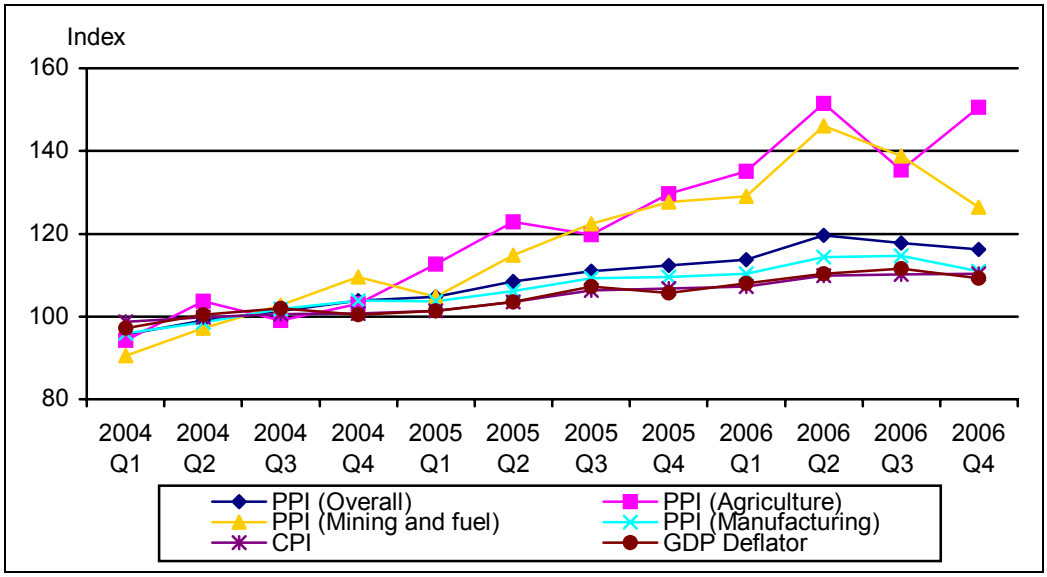
FISIM at current prices on deposits (using market interest rate)



Source: Bank of Thailand.

Chart 6

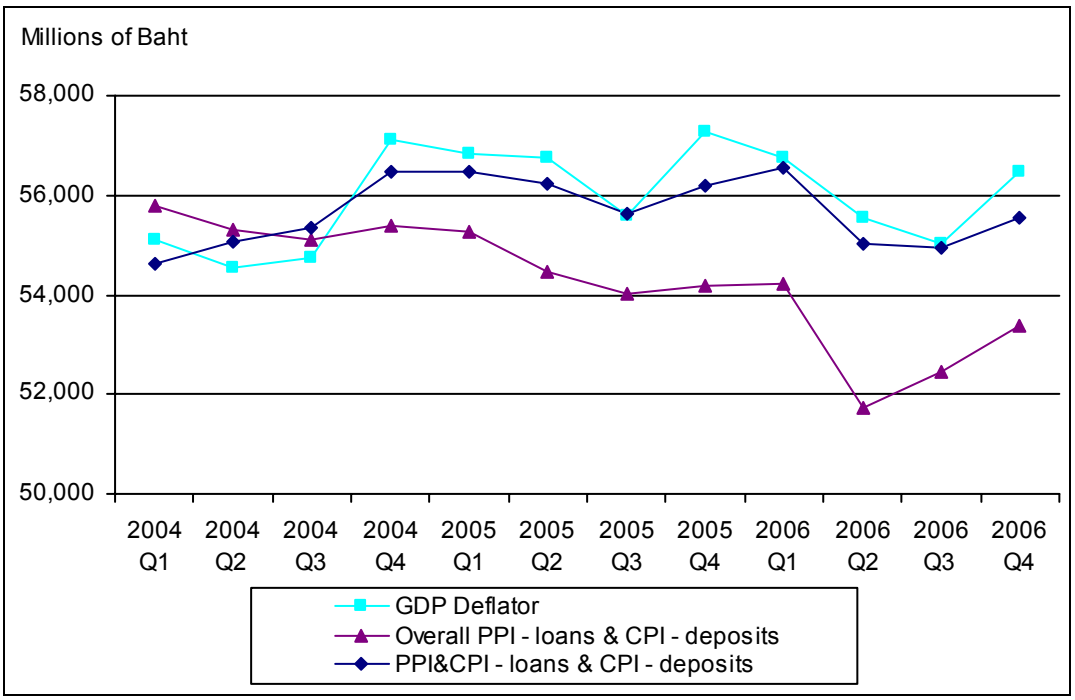
Price deflators (base year 2004)



Source: Bank of Thailand.

Chart 7

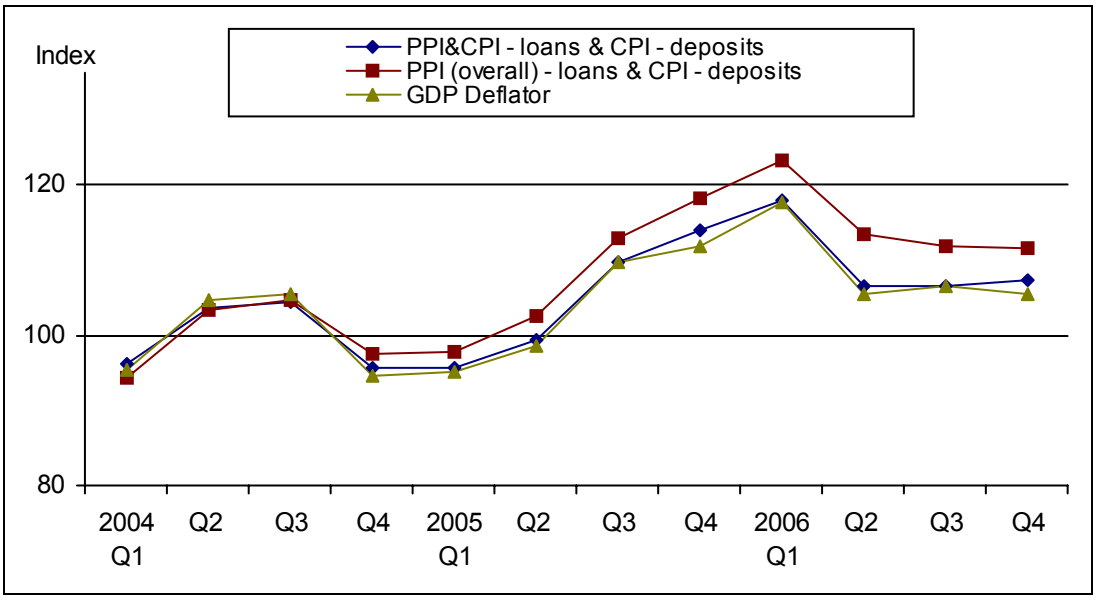
FISIM at constant prices



Source: Bank of Thailand.

Chart 8

FISIM Price Index



Source: Bank of Thailand.

Table 1

FISIM at current prices estimated using effective interest rate on loans and deposits

Unit: Millions of Baht

	2004 Q1	Q2	Q3	Q4	2005 Q1	Q2	Q3	Q4	2006 Q1	Q2	Q3	Q4
Total FISIM	**33,696**	**35,798**	**38,721**	**42,963**	**42,568**	**44,358**	**47,990**	**52,485**	**51,974**	**51,648**	**51,068**	**48,685**
FISIM on loans	**32,234**	**35,337**	**34,966**	**34,677**	**27,466**	**26,576**	**23,636**	**20,106**	**14,947**	**16,959**	**18,348**	**17,677**
General Government	207	251	236	356	284	232	227	209	127	181	180	175
Financial corporations	3,172	3,142	2,654	2,396	1,702	1,569	1,473	1,268	959	961	896	846
Non-financial corporations	19,353	21,342	21,478	21,448	17,084	16,613	14,617	12,284	9,111	10,489	11,395	10,925
Households	9,149	10,237	10,168	10,078	8,074	7,817	6,990	6,043	4,546	5,119	5,684	5,582
NPISH	53	51	45	44	33	31	28	20	8	9	10	10
Rest of the World	300	315	385	356	289	313	300	282	195	198	184	140
FISIM on deposits	**1,462**	**460**	**3,755**	**8,286**	**15,102**	**17,782**	**24,355**	**32,379**	**37,028**	**34,689**	**32,720**	**31,007**
General Government	80	26	222	486	908	1,173	1,619	2,138	2,370	2,322	2,160	1,894
Financial corporations	73	22	180	362	638	672	988	1,469	1,522	1,443	1,514	1,443
Non-financial corporations	267	87	709	1,592	2,970	3,595	5,198	7,088	8,230	7,600	7,085	6,627
Households	978	304	2,481	5,480	9,919	11,531	15,475	20,268	23,331	21,819	20,494	19,652
NPISH	41	13	102	222	402	488	645	841	937	908	862	835
Rest of the World	23	8	62	145	264	323	430	575	637	597	605	556

Source: Bank of Thailand.

Table 2

FISIM at current prices estimated using market interest rate on loans and deposits

Unit: Millions of Baht

	2004 Q1	Q2	Q3	Q4	2005 Q1	Q2	Q3	Q4	2006 Q1	Q2	Q3	Q4
Total FISIM	**52,490**	**57,036**	**57,672**	**53,995**	**54,015**	**55,791**	**60,934**	**64,000**	**66,721**	**58,567**	**58,559**	**59,519**
FISIM on loans	**49,309**	**53,345**	**52,126**	**42,594**	**37,025**	**35,516**	**34,929**	**30,604**	**30,998**	**22,607**	**22,150**	**24,250**
General Government	317	379	352	437	383	310	335	318	264	242	217	240
Financial corporations	4,852	4,743	3,957	2,943	2,294	2,097	2,177	1,930	1,989	1,282	1,081	1,161
Non-financial corporations	29,604	32,217	32,018	26,344	23,029	22,202	21,601	18,698	18,896	13,983	13,756	14,987
Households	13,995	15,453	15,158	12,379	10,884	10,447	10,329	9,198	9,428	6,824	6,862	7,658
NPISH	81	77	67	54	44	41	42	30	17	12	12	13
Rest of the World	460	475	575	438	390	419	444	430	405	264	222	191
FISIM on deposits	**3,181**	**3,690**	**5,546**	**11,401**	**16,990**	**20,275**	**26,006**	**33,396**	**35,722**	**35,960**	**36,409**	**35,269**
General Government	174	209	328	668	1,022	1,337	1,728	2,205	2,287	2,407	2,404	2,154
Financial corporations	158	180	266	498	718	766	1,055	1,515	1,468	1,496	1,685	1,642
Non-financial corporations	580	695	1,047	2,190	3,341	4,099	5,551	7,311	7,940	7,879	7,884	7,537
Households	2,129	2,440	3,664	7,540	11,160	13,148	16,524	20,904	22,509	22,618	22,805	22,354
NPISH	90	106	150	306	452	556	689	868	904	941	959	950
Rest of the World	50	61	91	199	297	369	459	593	615	619	673	632

Source: Bank of Thailand.

Table 3

Price deflators (base year 2004)

	PPI (Overall)	PPI (Agriculture)	PPI (Mining and fuel)	PPI (Manu-facturing)	CPI	GDP Deflator
2004 Q1	95.6	94.2	90.5	96	98.7	97.1
Q2	99.1	103.6	97.2	98.6	99.8	100.5
Q3	101.4	99	102.7	101.8	100.6	102.0
Q4	103.9	103.1	109.6	103.8	100.8	100.4
2005 Q1	104.7	112.6	104.8	103.6	101.4	101.4
Q2	108.4	122.9	114.8	106.2	103.5	103.5
Q3	110.9	119.8	122.4	109.3	106.3	107.3
Q4	112.4	129.6	127.6	109.5	106.8	105.7
2006 Q1	113.8	135.1	129.1	110.3	107.2	108.0
Q2	119.6	151.5	146.1	114.4	109.8	110.4
Q3	117.8	135.4	138.8	114.7	110.2	111.5
Q4	116.2	150.5	126.4	111	110.3	109.2

Sources: National Economic and Social Development Board; Bank of Thailand.

Table 4

Constant price FISIM (deflated using single deflator – GDP deflator)

Unit: Millions of Baht

	2004 Q1	Q2	Q3	Q4	2005 Q1	Q2	Q3	Q4	2006 Q1	Q2	Q3	Q4
Constant price FISIM on loans	49,120	48,632	48,892	51,149	50,816	50,828	49,775	51,330	50,679	49,505	48,985	50,311
Constant price FISIM on deposits	5,996	5,910	5,851	5,966	6,020	5,923	5,817	5,966	6,085	6,040	6,028	6,163
Total FISIM at constant prices	**55,117**	**54,542**	**54,743**	**57,115**	**56,836**	**56,751**	**55,593**	**57,296**	**56,763**	**55,545**	**55,013**	**56,475**

Source: Bank of Thailand.

Table 5

Constant price FISIM (deflated using multiple deflators)

Unit: Millions of Baht

	2004 Q1	Q2	Q3	Q4	2005 Q1	Q2	Q3	Q4	2006 Q1	Q2	Q3	Q4
Constant price FISIM on loans												
PPI + CPI	48,709	49,110	49,411	50,536	50,447	50,315	49,750	50,278	50,438	48,951	48,858	49,440
PPI (overall)	49,873	49,337	49,164	49,442	49,235	48,527	48,157	48,280	48,080	45,678	46,372	47,265
CPI	48,307	48,991	49,555	50,962	50,837	50,825	50,241	50,812	51,040	49,755	49,570	49,793
Constant price FISIM on deposits												
CPI	5,931	5,945	6,023	5,923	5,872	5,906	6,128	6,070	6,100	6,100	5,931	5,945
Total FISIM at constant prices												
PPI&CPI – loans & CPI – deposits	55,341	56,480	56,470	56,238	55,622	56,183	56,566	55,021	54,958	55,540	55,341	56,480
PPI – loans & CPI – deposits	55,095	55,386	55,258	54,450	54,029	54,186	54,208	51,748	52,472	53,364	55,095	55,386

Source: Bank of Thailand.

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Practical issues on the calculation and allocation of FISIM in Korea

Kil-hyo Ahn[1]

1. Introduction

Financial intermediation services indirectly measured (FISIM), as a share of Korea's GDP during the 2000–2005 period, was fairly stable at about 5 percent, and stood at 4.8 percent as of 2005.

Table 1

FISIM as percentage of GDP

Unit: trillion won, %

	2000	2001	2002	2003	2004	2005
FISIM	23.2	30.4	35.3	38.2	37.5	38.4
GDP	578.7	622.1	684.3	724.7	779.4	806.6
FISIM/GDP (%)	4.0	4.9	5.2	5.3	4.8	4.8

Source: National Accounts Data of Korea (unpublished), Bank of Korea

Since March 2003, Korea has calculated the total amount of FISIM and has allocated it to institutional sectors and industries according to the SNA 93 recommendations. The Bank of Korea compiles Korea's national accounts, along with the flow of funds table, balance of payments and input-output table, and is in the best position to gather detailed data on the activities of the financial sectors, with ready access to various types of statistics on loans and deposits. As a result, adequate data can be obtained for calculating and allocating FISIM in Korea.

This paper deals with practical issues encountered in the process of calculating and allocating FISIM in Korea. The discussion will include the coverage of financial instruments that generate FISIM, the sub-sectors of financial institutions (FIs) that produce FISIM, the choice of reference rate and the allocation of FISIM.

2. Calculation of FISIM

2.1 Financial instruments generating FISIM

The coverage of financial instruments generating FISIM has been a critical issue in their calculation. The EU countries and Eurostat decided to calculate FISIM based solely on loans

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and deposits. The recommendation of the Advisory Expert Group on National Accounts (1993 revision) uses the same concept of coverage for FISIM-generating financial instruments. However, Japan is interested in discussing how to deal with its public sector FIs, which procure their funds primarily through borrowing, rather than in the form of deposits. Hong Kong argues that negotiable certificates of deposit should be included in the calculation of FISIM. In Korea, negotiable certificates of deposit are classified as deposits.

Korea has decided that bonds issued and owned by FIs, like traditional loans and deposits, constitute FISIM, since one-year financial bonds[2] (debentures) issued by FIs are means of capturing funds for long-term loans to industry. In addition, financial bonds have characteristics similar to time deposits, especially from the buyer's perspective. On the other hand, bonds owned by FIs were regarded as means of providing funds to bond issuers, even though some bonds are purchased in the secondary bond market. Moreover, Korea's flow of funds table provides quarterly data on the balance of bonds held by FIs, disaggregated by issuing sector. Based on this rationale, bonds have been considered to generate FISIM in Korea.

Such bonds make up approximately one third of total loans and deposits. As of the end of 2006, the ratio of FI-issued bonds to total deposits (deposits plus bonds issued) was 34.9 percent, while the ratio of FI-held bonds to total loans (loans plus bonds owned) was 37.4 percent.

Table 2

Total loans and deposits of FIs
(as of the end of 2006)

Unit: trillion won, %

Total loans			Total deposits		
Items	**Amount**	**Composition**	**Items**	**Amount**	**Composition**
Loans (A)	1,460.6	62.6	Deposits (A)	1,500.0	65.1
Bonds owned (B)	872.0	37.4	Bonds issued (B)	805.6	34.9
(financial)	(290.7)	(33.3)	(financial)	(393.3)	(48.8)
(corporate)	(183.4)	(21.0)	(beneficiary certificates)	(230.4)	(28.6)
(government)	(205.7)	(23.6)			
Total (A+B)	**2,332.6**	**100.0**	**Total (A+B)**	**2,305.6**	**100.0**

Source: Economic Statistics Yearbook, Bank of Korea

Bonds issued by FIs are composed primarily of financial bonds (debentures) and one-year beneficiary certificates,[3] with financial bonds (as of the end of 2006) representing

[2] Financial bonds (debentures) are issued by FIs in order to raise funds for long-term industrial loans. Since they are guaranteed by the issuing FIs, they are less risky than corporate bonds.

[3] Beneficiary certificates are issued by investment trust companies to raise funds for securities investment. They represent equally divided rights to take returns on investments, and in principle, they are bearer bonds. Buyers receive bankbooks, which record their purchase, instead of certificates. It takes three or four days to cash them, because FIs need time to sell them and raise cash in the securities market. In many ways, they are very similar to time deposits.

48.8 percent and beneficiary certificates representing 28.6 percent. On the asset side, bonds owned by FIs are composed mostly of financial bonds, corporate bonds and government bonds. Based on these data, it is possible to allocate FISIM with regard to total loans.

2.2 FISIM-producing sub-sectors

The following sub-sectors have been identified as producing FISIM in Korea. It is generally accepted that S.124, financial auxiliaries, and S.125, insurance companies and pension funds, do not produce FISIM.

- S.122, other depository corporations
- S.123, other financial intermediaries
- S.124, financial auxiliaries

It is assumed, however, that S.124 firms produce FISIM in Korea. S.124 firms include securities companies whose primary business is stock brokerage. At the same time, they take deposits from their customers and lend money to investors to buy securities. This part of the business is assumed to generate FISIM in Korea.

Another distinctive feature of Korea is that S.122 firms have a dominant market share, representing 94.4 percent of total loans and 93.8 percent of total deposits in 2005.

Table 3

Total loans and deposits of FISIM-producing FIs

Unit: trillion won, %

	Total loans		Total deposits	
Year	**2000**	**2005**	**2000**	**2005**
S.122	993 (88.9)	1,366 (93.8)	1,012 (90.0)	1,352 (94.4)
S.123	94 (8.4)	71 (4.9)	84 (7.5)	64 (4.5)
S.124	30 (2.7)	19 (1.3)	29 (2.6)	16 (1.1)
Total	1,117 (100.0)	1,456 (100.0)	1,124 (100.0)	1,432 (100.0)

Source: Economic Statistics Yearbook, Bank of Korea

2.3 Choice of reference rate

According to SNA 93, the reference rate to be used represents the pure cost of borrowing funds – ie a rate from which the risk premium has been eliminated to the greatest extent possible, and which does not include any intermediation services (Paragraph 6.128). The Advisory Expert Group on the SNA (93 revision) recommends that a single rate be used for transactions in the local currency, whereas different rates may be used for transactions in other currencies.

In Korea, three different types of reference rates are applied for the three different FISIM-producing sub-sectors of FIs – S.122, S.123 and S.124. Arguments can be made against having three different reference rates for one domestic currency financial market. But it is assumed that each sub-sector of FISIM-producing FIs in Korea is conducting business in the highly segmented financial markets, and is facing different risks on its loans and deposits.

The reference rate selected in Korea is the average rate of total loans plus total deposits. It is calculated according to the following formula (1): total interest (interest payable + interest receivable) divided by the stock of total loans plus total deposits.

Reference rate (r*) = (I + d) / (L + D) (1)

I = interest receivable, d = interest payable,

L = stock of total loans, D = stock of total deposits

If the stock of loans is equal to the stock of deposits, the reference rate level does not affect the total amount of FISIM. This is explained by the following formula (2).

FISIM = (I – L × r*) + (D × r* – d) = (I – d) – r* × (L – D) (2)

If L = D, then FISIM = I – d.

This means that the total amount of FISIM is obtained, regardless of reference rate (r*), if the stock of loans is equal to the stock of deposits. In 2005, the amount of FI loans in Korea was nearly equal to the amount of FI deposits, with the ratio of loans to deposits being 101.7 percent (see Table 2).

Korea did not choose the short-term inter-bank rate as a reference rate. If the inter-bank rate (call rate) had been selected, a negative FISIM on deposits would have been an ongoing feature. Average S.122 deposit rates have been higher than the inter-bank rate in Korea, but the difference between the call rate and the average deposit rate has narrowed steadily since 2000.

Table 4

Trends in call rate and deposit rate

Annual rate, %

	2000	**2001**	**2002**	**2003**	**2004**	**2005**
Call rate (A)	5.2	4.7	4.2	4.0	3.6	3.3
Deposit rate[1] (B)	6.8	5.5	4.3	3.9	3.8	3.5
FISIM (A – B)	–1.6	–1.3	–1.3	–1.2	–0.9	–0.7

[1] average interest rate of other depository corporations.

Source: Economic Statistics Yearbook, Bank of Korea

Since the Asian financial crisis in 1997, the Korean financial market has developed apace. The interest rate differences between the various financial markets have quickly disappeared. It is expected that the time will soon come when the reference rate will be changed from the average rate of total loans and deposits to a market rate such as the call rate, certificate of deposit (CD) yields or the government bond rate.

The reference rate level in Korea has been steadily declining. However, the margin (loan rate minus deposit rate) has been maintained at about 2.5 percentage points. The level and trend of the current reference rate for the other depository corporations (S.122) have been quite similar to the rate for one-year government bonds. Consequently, the government bond rate will be one of the candidates when selecting a new market reference rate.

2.4 Process of calculating FISIM

The current method of calculating FISIM is a bottom-up process. For the three FISIM-producing sub-sectors, the reference rates (the average rate of total deposits plus borrowings) are calculated first. Then, using the reference rates, the amount of FISIM is estimated for each FISIM-producing FI sub-sector. In terms of calculating reference rates and estimating FISIM amounts, loans and bonds owned, and deposits and bonds issued, are treated similarly. Finally, the total amount of FISIM for FIs is estimated by adding the three different FISIM figures.

Table 5

Trend in reference rates

Annual rate, %

	2000	2001	2002	2003	2004	2005
Loan rate of S.122 (A)	8.8	8.1	7.1	6.8	6.3	5.9
Deposit rate of S.122 (B)	6.8	5.5	4.3	3.9	3.8	3.5
Margin (A-B)	2.0	2.6	2.8	2.9	2.7	2.4
Reference rate of S.122	7.8	6.7	5.7	5.3	5.1	4.7
CD yields (91 days)	7.1	5.3	4.8	4.3	3.9	4.0
Government bonds (1 year)	7.7	5.5	5.2	4.4	4.1	4.3

Source: Interest Rates Data of Korea (unpublished), Bank of Korea

3. Allocation of FISIM

3.1 Allocation of FISIM by sector

At present, Korea has no problem in allocating FISIM by institutional sector – non-financial corporations, financial corporations, general government, household, and all other. The flow of funds table, compiled quarterly by the Bank of Korea, provides the stocks of financial assets and liabilities by institutional sector. This table shows amounts for bonds issued and held, by institutional sector. It also makes it possible to allocate FISIM produced through bonds.

3.2 Allocation of FISIM by industry

The allocation of FISIM on total loans, by industry, has been made based on relatively well-established statistics from “Loans and Discounts of FIs by Industry,” which has long been compiled monthly by the Bank of Korea as an important set of financial statistics. Concerning the allocation of the FISIM on deposits, the relevant data are not available, so data on output and loans, by industry, are used collectively to allocate them. This means that allocation of the FISIM on deposits is more difficult than for the FISIM on loans.

The amount of FISIM allocated to industries should be used to calculate the Gross Value Added (GVA) of the corresponding industries. However, a few industries could not use the allocated FISIM in estimates of GVA, since the use of the allocated FISIM is sometimes found to distort the level of GVA for certain industries, such as manufacturing, wholesale and retail trade, and other services. As for the allocation of FISIM on deposits, the basic data need to be improved and further developed.

4. Concluding remarks

In general, financial instruments producing FISIM are regarded as being restricted to loans and deposits. However, bonds are treated as generating FISIM in Korea. Bonds issued by FIs consist primarily of financial bonds and beneficiary certificates. They have, for their buyers, characteristics similar to time deposits. Bonds owned by FIs are one of the channels used to provide funds, in the same way that loans are used. There are ample data to allocate FISIM on bonds. It seems reasonable to include bonds in the calculation and allocation of FISIM, and it would therefore be better to leave up to individual countries how to handle coverage of financial instruments producing FISIM in the revised SNA 93.

Three categories of financial institutions are assumed to produce FISIM in Korea: other depository corporations (S.122), other financial intermediaries (S.123) and financial auxiliaries (S.124). In general, financial auxiliaries are not involved in financial intermediation businesses. But in Korea, brokerage is the main business carried out by securities companies, which are classified as financial auxiliaries. One of their business activities is to open accounts for their customers, take deposits, and make loans to assist their customers in buying and selling securities. This part of their business constitutes financial intermediation services and thus, like S.122, is considered to generate FISIM.

Three different reference rates have been applied to the three sub-sectors of FIs to calculate FISIM. The Advisory Expert Group on the SNA (93 revision) is recommending a single reference rate in the local currency. But it is assumed that each sub-sector of FISIM-producing FIs in Korea is conducting business in the highly segmented financial markets, and is facing different risks on its loans and deposits.

Korea has not used the short-term inter-bank rate as a reference rate, since it has always been lower than the deposit rate, which would imply a negative FISIM on deposits. So the average interest rate on deposits and loans, ie total interest payable plus receivable, divided by total stock of deposits and loans, has been selected as the reference rate. Recently, the government bond rate has been at a level – and has shown movement – similar to that of the average interest rate. At this point, a change in the reference rate should therefore be considered.

There are high-quality data for allocating FISIM by institutional sector in Korea. The country's flow of funds table provides balances for loans and deposits by institutional sector. However, their allocation by industry is not yet satisfactory, owing to a lack of deposit data by industry.

Measuring output and value of financial services (banking): the case of Indonesia

Triono Widodo

Introduction

It has been longstanding practice in Indonesia for Bank Indonesia (BI), the central bank of Indonesia, in cooperation with Statistics Indonesia, the Indonesian statistical office – hereafter referred to as BPS – to measure financial services output as part of measuring Gross Domestic Product. Bank Indonesia had adopted the method recommended by SNA 1968, known as Imputed Bank Service Charge (IBSC). Under this method, which is relatively simple to apply, the gross value added of the banking sector is calculated by measuring the difference between interest receivable and interest payable. This method has so far provided fairly representative measurements of financial services in Indonesia.

In time, however, with the economic crisis of 1998 and the adoption of more flexible exchange rates, a number of issues arose. The prevailing method, at the time, was not capable of addressing the issue of large revaluations due to exchange rate changes and structural changes in the balance sheets of commercial banks, nor of extremely large negative interest rate spreads. As a legacy of the massive bailout of banks in 1998, a significant number of the balance assets of commercial banks were converted into government debt notes (GDN) and Central Bank Certificates (SBI). Strict application of IBSC, therefore, would only create what would be considered anomalous results.

With the issuance of a new SNA proposed by the UN, Bank Indonesia is considering adopting the FISIM recommended by SNA 1993, allowing for cross-country comparisons and providing a clearer picture of the role of banking intermediation in the economy. Specifically, several variants of FISIM have been tried, including the European Union and the Canadian methods. Simulations using these methods showed that one critical factor in implementing FISIM is the measurement of reference rates.

In the Indonesian case, there are problems with low loan-to-deposit ratios (LDR) and the large share of government bonds on the banking balance sheet – problems that cannot be solved by the FISIM method even if a reference rate is available. Indonesia's problem has not yet been addressed satisfactorily in the SNA Handbook or in discussions with FISIM experts from the UN. Thus, Bank Indonesia has yet to adopt FISIM in measuring financial services output.

A. Gross value added of the banking sector

To date, measurement of the gross value added of the banking sector in Indonesia has been calculated using the Imputed Bank Service Charge (IBSC) method, as recommended by SNA 1968. This method measures the gross value added of the banking sector by calculating the difference between interest receivable and interest payable (imputed services). According to the IBSC method, the components of the gross value added consist of: (1) imputed bank services (interest receivable less interest payable); (2) net foreign transactions receivable; (3) provisions and commissions; (4) other income; and (5) intermediate costs.

Generally, the IBSC method does not pose any problem as long as total revenues continue to cover total expenses. However, problems will occur when total revenues fall below total expenses, as was the case during the Indonesian crisis of 1997–1998. During this period, the credit interest rate rose significantly, from 19.04% (1996) to 32.30% (1998). The higher interest rate led to a higher number of non-performing loans and, eventually, reduced the banking sector's interest receivable. Meanwhile, the deposit interest rate climbed from 16.43% (1996) to 41.42% (1998), creating higher interest payable for the banking sector. In 1998, with total expenses exceeding total revenues, the sector's gross value added turned negative.

The existence of negative value prompted the use of special treatment in measuring banks' value added. Bank Indonesia, in cooperation with the BPS, had to first assume that the operating surplus of the banking sub-sector was zero, which meant that all losses caused by the interest rate situation were covered by the government in the form of a subsidy. The total loss was then recorded in the reconciliation account. By using this treatment, the value added of the banking sub-sector appeared relatively stable, thus avoiding fluctuations in banking output caused by volatile exchange rates (Table 1). The negative value obtained for the banking sector's gross value added during the crises should indicate to us that the IBSC method fails to accommodate such extreme economic phenomena.

Table 1

Output and gross value added of the banking sector

Without Treatment

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Output	34.627	-39.389	43.826	70.970	80.181	87.279	95.633	104.042	116.625	126.856
Gross Value Added	29.491	-61.676	43.826	55.063	64.409	68.307	74.499	78.534	88.287	97.708

With Treatment

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Output	34.627	42.591	43.826	70.970	80.181	87.279	95.633	104.042	116.625	126.856
Gross Value Added	29.491	36.325	43.826	55.063	64.409	68.307	74.499	78.534	88.287	97.708

Source : Bank Indonesia.

In line with Indonesia's plan to implement SNA 1993, the measurement method was to be changed to the FISIM (financial intermediation services indirectly measured) method. Theoretically, under normal conditions, this would capture the rising role of banking intermediation in the economy, as it would take account of value added in other sectors.

B. FISIM

The implementation of SNA 1993 will not be fully successful without the inclusion of FISIM. Using this method, the gross value added of the banking sector is measured as the total interest income received by financial intermediaries, minus total interest payable, excluding the value of any other income receivable from their investment of own funds, since, from a financial intermediation perspective, this is not considered income. The performance of the banking sector, as measured by FISIM, would be determined by the extent of the sector's

role in deposit taking and in activities involving lending to the real sector. By implication, the mere taking of deposits is deemed not to be productive unless the funds are eventually lent to sectors in need.

Bank Indonesia – in cooperation with the BPS – has been conducting a number of simulations by utilising banking account data from Deposit Money Banks (DMBs) and applying either the European Union or the Canadian method. Based on the results of those simulations, as well as technical considerations regarding data cross-checking, databases' ease of use and the characteristics of financial data, the Canadian FISIM method appeared better suited to Indonesia's case, specifically with regard to DMBs.

However, as a central bank, Bank Indonesia's business differs from that of commercial banks, since Bank Indonesia does not provide financial intermediation services. Our simulation resulted in large negative value added for the central bank, thus arguing against use of the FISIM method. The IBSC method therefore remains in use to measure the central bank's value added.

C. The Canadian method, and the simulation using this method

a. Canadian method

According to the SNA Handbooks, the calculation of FISIM using the Canadian methodology measures the differences between all interest receivable and all interest payable, with reference rates excluding banking sector own funds. The FISIM calculation is based on use of financial institutions' balance sheets (Table 2).

The FISIM formula under the Canadian method is:

$FISIM = R_AB – R_LD – [C – (A + B3 – D3)] \times (R_AB + R_LD) / (B + D)$

in which

$B = B1 + B2 + B3$

$D = D1 + D2 + D3$

R_A = the actual average interest rate on assets

R_L = the actual average interest rate on liabilities

The interest rate for banking sector own funds [C – (A + B3 – D3)] is not included in the FISIM calculation and would reduce the total value of FISIM.

If [C – (A + B3 – D3)] is positive, it means that a portion of the credit to debtors is being funded by banking sector own funds.

If [C – (A + B3 – D3)] is negative, it means that a portion of the fixed assets are being funded by third parties.

Since R_AB is interest receivable and R_LD is interest payable, then RAB – RLD is the net interest receivable. Sources of funds other than securities and loans are banking sector own funds (C – A) and net other liabilities (D3 – B3). Thus, the difference between net interest receivable and banking sector own funds plus net other liabilities is computed as follows:

$– (C – A) + (D3 – B3) = – [C – (A + B3 – D3)]$

Finally, – [C – (A + B3 – D3)], as the reduction factor, is multiplied by $(R_AB + R_LD) / (B + D)$, measuring the percentage of total interest (receivable and payable) and total assets and liabilities. This rate is called the implicit interest rate for loans and deposits. In other words, the reduction factor is multiplied by the average of the loan and deposit implicit interest rates.

Thus we can obtain the estimated value of own funds net interest receivable. By taking the difference between net interest receivable ($R_AB - R_LD$) and own fund net interest receivable $[C - (A + B3 - D3)] \times (R_AB + R_LD) / (B + D)$, we can obtain the value of net interest receivable from third party funds.

Table 2

The balance sheet of financial intermediaries (DMBs) and their interest incomes and expenses

ASSETS				LIABILITIES			
		Stocks	Interest receivable			Stocks	Interest payable
A	**Fixed assets, shares and accounts receivable less payable, other equity**			**C**	**Own funds (net worth and shares)**		
B.1.	**Securities other than shares**			**D.1.**	**Securities other than shares**		
B.2.	**Loans**			**D.2.**	**Deposits**		
B.2.1	**Interbank**			**D.2.1.**	**Interbank**		
	- Residents				- Residents		
	- Non-residents				- Non-residents		
B.2.2	**Other**			**D.2.2.**	**Other**		
	- Residents				- Residents		
	- Non-residents				- Non-residents		
B.3.	**Other**			**D.3.**	**Other Liabilities**		
B.3.1	Interbank						
B.3.2	Other						
	TOTAL						

Source : Bank Indonesia.

b. Simulation of the calculation of banking sector FISIM and their value

Banking sector output (Bank Indonesia and DMBs) is measured based on its gross value added. The Imputed Bank Service Charge (IBSC) method is still being used to calculate the gross value added of the monetary authority – Bank Indonesia – based on characteristics of BI's financial data. The main issue in using the IBSC method for Bank Indonesia financial data concerns the Bank's varied functions as monetary authority, banking regulator, and payment system regulator capable of providing financial intermediation services. However, financial intermediation services provided by the central bank are not its principal activities. Therefore, the simulation used only DMB data (Table 3). In the simulation, we calculate the reference rate by using the Canadian formula, which measures the percentage of total interest (receivable and payable) and total assets and liabilities. This rate is known as the implicit interest rate on loans and deposits.

After the crisis, the structure of the banking sub-sector balance sheet in Indonesia changed considerably. The loan-to-deposit ratio dropped sharply in 2002 to its lowest level of approximately 40%. By 2006, it had gradually rebounded to about 60%. Central Bank Certificates, as well as government Recap Bonds, swelled on the balance sheets of almost all of the leading national and private banks in Indonesia. Applying all FISIM formulas to this type of situation would only result in anomalous numbers, thus suggesting the need for an alternative method.

To address Indonesia's problem of having a large volume of BI certificates and government Recap Bonds on banks' balance sheets, various simulations using the Canadian method

were tried. Alternatives for classifying Bank Indonesia Certificates (SBI) and Recap Bonds were used. However, none of these alternatives ultimately changed the value added of the banking sector under the FISIM. These alternatives are as follows:

a. SBI and Recap Bonds in Placements (B2)

b. SBI in Placements (B2) and Recap Bonds in Securities (B1)

c. SBI and Recap Bonds in Securities (B1)

d. SBI in Securities (B1) and Recap Bonds in Placements (B2)

Table 3

The balance sheet of financial intermediaries (DMBs) and their interest incomes and expenses

ASSETS				LIABILITIES			
		Stocks	Interest receivable			Stocks	Interest payable
A	**Fiixed assets, shares and account-receivable less payable, other equity**	**(22,846,195)**	**-**	**C**	**Own funds (net worth and shares)**	**87,883,385**	**-**
B.1.	**Securities other than shares**	**513,152,920**	**18,996,289**	**D.1.**	**Securities other than shar**	**5,975,899**	**1,184,290**
B.1.1	**Interbank**	**6,206,944**	**1,841,142**	D.1.1	Interbank	3,849,632	1,062,832
B.1.2	**Others**	**506,945,976**	**17,155,147**	D.1.2	Others	2,126,267	121,458
B.1.2.1	Securities	17,315,765	585,969				
B.1.2.2	Recaps. Bond	399,204,751	13,509,164				
B.1.2.3	Bank Indonesia Certificate	90,425,460	3,060,014				
B.2.	**Placements**	**490,439,679**	**18,569,001**	**D.2.**	**Deposits**	**797,511,457**	**23,588,419**
B.2.1	**Loans**	**307,618,726**	**11,716,682**	**D.2.1.**	**Interbank**	**11,538,970**	**3,134,592**
B.2.1.1	**Interbank**	**1,096,618**	**180,279**		- Residents	1,978,434	537,447
	- Residents	88,378	14,529		- Non-residents	9,560,536	2,597,145
	- Non-residents	1,008,240	165,750	**D.2.2.**	**Others**	**785,972,487**	**20,453,827**
B.2.1.2	**Others**	**306,522,108**	**11,536,403**		- Residents	780,317,257	20,306,658
	- Residents	306,204,047	11,524,432		- Non-residents	5,655,230	147,169
	- Non-residents	318,061	11,971				
B.2.2	**Others placements**	**182,820,953**	**6,852,319**				
B.2.2.1	**Interbank**	**110,900,235**	**6,063,089**				
	- Residents	48,855,177	2,670,989				
	- Non-residents	62,045,058	3,392,100				
B.2.2.2	**Others**	**71,920,718**	**789,230**				
	- Residents	69,863,359	766,654				
	- Non-residents	2,057,359	22,577				
B.3.	**Others**	**73,694,431**	**7,931,205**	**D.3.**	**Other Liabilities**	**163,070,094**	**10,304,091**
B.3.1	Interbank	19,840,678	6,008,405	**D.3.1.**	**Borrowing**	**29,334,185**	**1,799,818**
B.3.2	Others	53,853,753	1,922,800	D.3.1.1	Interbank	11,737,898	1,645,717
				D.3.1.2	Others	17,596,287	154,101
				D.3.2.	**Other Liabilities**	**133,735,909**	**8,504,273**
				D.3.2.1	Interbank	72,079,699	8,082,544
				D.3.2.2	Others	61,656,210	421,729
	TOTAL	**1,054,440,835**	**45,496,495**			**1,054,440,835**	**35,076,800**

Source : Bank Indonesia.

Based on the simulation, all of the above alternatives record FISIM at Rp 2.531 billion – 24% of the banking gross value added, using IBSC calculations (Rp 10.420 billion). The calculations for each alternative are as follows:

a. SBI and Recap Bonds in Placements (B2)

ASSETS				LIABILITIES			
		Stocks	Interest Receivable			Stocks	Interest Payable
A	Fixed assets, shares and account receivable less payable, other equity	(22,846,195)	-	C	Own Funds (net worth and shares)	87,883,385	-
B1	Securities other than shares	23,522,709	2,427,111	D1	Securities other than shares	5,975,899	1,184,290
B2	Placements	490,439,679	18,569,001	D2	Deposits	797,511,457	23,588,419
	- Recaps Bond	399,204,751	13,509,164				
	- Bank Indonesia Certificate	90,425,460	3,060,014				
B3	Others	73,694,431	7,931,205	D3	Other Liabilities	163,070,094	10,304,091
Total		1,054,440,835	45,496,495	Total		1,054,440,835	35,076,800

Note :

Total B		1,077,287,030	
Total D		966,557,450	
R_A	Dividing the interest receivable by total B	0.042	
R_A*	(excluding the SBI and recap bonds interest rates)	0.049	
R_L	Dividing the interest payable by total D	0.036	
r	reference rate $[(R_AB + R_LD) / (B + D)]$	0.039	
r*	reference rate, excluding the SBI and recap bonds $[(RA*B + RLD) / (B + D)]$	0.043	
R_AB		45,496,495	
R_A*B		53,029,289	
R_LD		35,076,800	
FISIM	$R_AB - R_LD - [C - (A + B3-D3)] \times (R_AB + R_LD) / (B + D)$	**2,531,062**	**(FISIM using reference rate)**
FISIM	$R_A*B - R_LD - [C - (A + B3-D3)] \times (R_A*B + R_LD) / (B + D)$	**9,326,348**	**(FISIM using reference rate exclude SBI and recap bonds)**
IBSC		**10,419,695**	

b. SBI in Placements (B2) and Recap Bonds in Securities (B1)

ASSETS				LIABILITIES			
		Stocks	Interest Receivable			Stocks	Interest Payable
A	Fixed assets, shares and account receivable less payable, other equity	(22,846,195)	-	C	Own Funds (net worth and shares)	87,883,385	-
B1	Securities other than shares	23,522,709	2,427,111	D1	Securities other than shares	5,975,899	1,184,290
	- Recaps Bond	399,204,751	13,509,164				
B2	Placements	490,439,679	18,569,001	D2	Deposits	797,511,457	23,588,419
	- Bank Indonesia Certificate	90,425,460	3,060,014				
B3	Others	73,694,431	7,931,205	D3	Other Liabilities	163,070,094	10,304,091
Total		1,054,440,835	45,496,495	Total		1,054,440,835	35,076,800

Note :

Total B		1,077,287,030	
Total D		966,557,450	
R_A	Dividing the interest receivable by total B	0.042	
R_A*	(excluding the SBI and recap bonds interest rates)	0.049	
R_L	Dividing the interest payable by total D	0.036	
r	reference rate $[(R_AB + R_LD) / (B + D)]$	0.039	
r*	reference rate, excluding the SBI and recap bonds $[(RA*B + RLD) / (B + D)]$	0.043	
R_AB		45,496,495	
R_A*B		53,029,289	
R_LD		35,076,800	
FISIM	$R_AB - R_LD - [C - (A + B3-D3)] \times (R_AB + R_LD) / (B + D)$	**2,531,062**	**(FISIM using reference rate)**
FISIM	$R_A*B - R_LD - [C - (A + B3-D3)] \times (R_A*B + R_LD) / (B + D)$	**9,326,348**	**(FISIM using reference rate exclude SBI and recap bonds)**
IBSC		**10,419,695**	

c. SBI and Recap Bonds in Securities (B1)

ASSETS				LIABILITIES			
		Stocks	Interest Receivable			Stocks	Interest Payable
A	Fixed assets, shares and account receivable less payable, other equity	(22,846,195)	-	C	Own Funds (net worth and shares)	87,883,385	-
B1	Securities other than shares	23,522,709	2,427,111	D1	Securities other than shares	5,975,899	1,184,290
	- Recaps Bond	399,204,751	13,509,164				
	- Bank Indonesia Certificate	90,425,460	3,060,014				
B2	Placements	490,439,679	18,569,001	D2	Deposits	797,511,457	23,588,419
B3	Others	73,694,431	7,931,205	D3	Other Liabilities	163,070,094	10,304,091
Total		1,054,440,835	45,496,495	Total		1,054,440,835	35,076,800

Note :			
Total B		1,077,287,030	
Total D		966,557,450	
R_A	Dividing the interest receivable by total B	0.042	
R_A*	(excluding the SBI and recap bonds interest rates)	0.049	
R_L	Dividing the interest payable by total D	0.036	
r	reference rate [(R_AB + R_LD) / (B + D)]	0.039	
r*	reference rate, excluding the SBI and recap bonds [(RA*B + RLD) / (B + D)]	0.043	
R_AB		45,496,495	
R_A*B		53,029,289	
R_LD		35,076,800	
FISIM	R_AB - R_LD - [C - (A + B3-D3)] x (R_AB + R_LD) / (B + D)	**2,531,062**	**(FISIM using reference rate)**
FISIM	R_A*B - R_LD - [C - (A + B3-D3)] x (R_A*B + R_LD) / (B + D)	**9,326,348**	**(FISIM using reference rate exclude SBI and recap bonds)**
IBSC		**10,419,695**	

d. SBI in Securities (B1) and Recap Bonds in Placements (B2)

ASSETS				LIABILITIES			
		Stocks	Interest Receivable			Stocks	Interest Payable
A	Fixed assets, shares and account receivable less payable, other equity	(22,846,195)	-	C	Own Funds (net worth and shares)	-	-
B1	Securities other than shares	23,522,709	2,427,111	D1	Securities other than shares	1,054,440,835	35,076,800
	- Bank Indonesia Certificate	90,425,460	3,060,014				
B2	Placements	490,439,679	18,569,001	D2	Deposits	-	-
	- Recaps Bond	399,204,751	13,509,164				
B3	Others	73,694,431	7,931,205	D3	Other Liabilities	1	1
Total		1,054,440,835	45,496,495	Total		1,054,440,836	35,076,801

Note :			
Total B		1,077,287,030	
Total D		1,054,440,836	
R_A	Dividing the interest receivable by total B	0.042	
R_A*	(excluding the SBI and recap bonds interest rates)	0.049	
R_L	Dividing the interest payable by total D	0.033	
r	reference rate [(R_AB + R_LD) / (B + D)]	0.038	
r*	reference rate, excluding the SBI and recap bonds [(RA*B + RLD) / (B + D)]	0.041	
R_AB		45,496,495	
R_A*B		53,029,289	
R_LD		35,076,801	
FISIM	R_AB - R_LD - [C - (A + B3-D3)] x (R_AB + R_LD) / (B + D)	**12,341,614**	**(FISIM using reference rate)**
FISIM	R_A*B - R_LD - [C - (A + B3-D3)] x (R_A*B + R_LD) / (B + D)	**20,054,089**	**(FISIM using reference rate exclude SBI and recap bonds)**
IBSC		**10,419,695**	

D. Simulation results

The simulation showed that the most critical factor in calculating the gross value added of the banking sector is determining the value of the reference interest rate. Generally, the reference interest rate for lending is calculated based on the ratio between total interest receivable and total outstanding loans, while the reference interest rate for deposits is calculated on the basis of total interest payable and total outstanding deposits. Our simulation showed that those calculations would not yield a valid result in the case of Indonesia. It gives results significantly different from our traditional calculation under the IBSC method, thus raising questions about the appropriateness of replacing the IBSC with the FISIM. We therefore tried applying our special treatment, in which we exclude the interest rates for SBI and Recap Bonds in measuring the reference rate. By excluding those interest rates, we were able to achieve reasonable results, compared to the old IBSC method. In light of this, the BI and BPS could probably apply FISIM using that special treatment. The FISIM gives Rp 9.326 billion, ie 90% of the banking gross value added arrived at through the IBSC method. We are, of course, keenly aware that the reference rate produced using this method would not reflect the true reference rate in the economy.

In view of the above, further research needs be conducted in this area. While the BI and BPS continue their work on this, further discussion should also take place at the global level. The UN should be able to offer other FISIM implementation alternatives for economies that are experiencing special conditions, as was the case in Indonesia, where the banks had very low loan-to-deposit ratios. Such alternatives should also include means of adopting the FISIM method for measuring the value added of central banks. Since central banks have different characteristics from one country to another, one should expect there to be alternatives for calculation of FISIM that take into account the differing functions of central banks. As with Indonesia's case, the IBSC method will continue to be used in calculating the value added of central banks. However, it can be expected that once alternative FISIM methods are available, improved results will be achieved, providing for a better explanation of the underlying economic – particularly banking sector – activities.

E. Conclusion

In the case of Indonesia, based on the results of simulations, and considering the characteristics of financial data from Bank Indonesia (the country's monetary authority), the FISIM method is only applicable to DMB data, while the Imputed Bank Service Charge (IBSC) method is still recommended in calculating the gross value added of the monetary authority. In addition, the simulation results show that the most critical factor, in calculating the gross value added of the banking sector, is the question of how to determine the value of the reference rate.

To date, Bank Indonesia has yet to adopt the FISIM in measuring the output of financial services. Thus, the gross value added of Indonesia's banking sector is calculated by using IBSC methods that measure the difference between interest receivable and interest payable, based on profit and loss statements.

Due to the negative gross value added during the 1997 crisis, we applied special treatment in measuring the value added of banks. We proceeded on the assumption that the operational surplus of the banking sub-sector was zero, which meant that all losses caused by the interest rate situation were covered by the government in the form of a subsidy. The total loss was then recorded in the reconciliation account.

In the future, if the FISIM method is used to measure the gross value added of banking sectors, the Canadian method, with special treatment, should yield results approximating the real economic situation.

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What can we learn from the new measures of bank services in national accounts? The case of the US

Dennis Fixler, Marshall Reinsdorf and George Smith[1]

Introduction

Countries accounting for most of world GDP have recently adopted or made plans to adopt a reference rate approach for measurement of the implicitly priced output of commercial banks. This change in methods should improve the measurement of GDP and reveal new information about the banking industry's performance and role in the broader economy. This paper examines the performance of the reference rate measures that were introduced in the US national accounts in December 2003. We find that these measures do reflect underlying economic developments.

In calculating GDP, the economic value of a good or service is measured by the price that the buyer pays. In the banking industry, however, sales that take place at explicit prices (or fees) are not intended to cover costs of production, which include labor, the use of fixed capital assets, taxes on production, and intermediate inputs. To obtain a plausible picture of the value added of the banking industry, we must therefore recognize that in this industry adjustments to interest rates substitute for explicit prices for services. The net interest receipts generated by the spread between depositor rates and borrower rates represent sales of implicitly priced output.

The 1993 System of National Accounts (SNA93) terms the implicitly priced output of banks "FISIM" (Financial Intermediation Services Indirectly Measured). It recommends the use of a reference rate to split the FISIM into depositor services and borrower services. The reference rate is based on a transaction type that involves no provision of implicitly priced services. The absence of depositor services makes the reference rate higher than the rate paid to depositors. The absence of borrower services makes the reference rate lower than the rate paid by borrowers.

1. Conceptual framework for measurement of the services of banks

1.1 Price concepts derived from the theory of the user cost of money

The SNA provides no formal theory of the reference rate. However, the concept of the "user cost of money" does provide a theory. It is an extension of the user cost concept that was originally developed to measure the services of fixed capital assets. In a competitive market where economic profits are zero, the rental price for a capital asset must equal the difference between its starting price, p_t, and the present value of its price at the end of the rental period, $p_{t+1}/(1 + r_r)$, where r_r is the reference rate of interest. To derive the user cost formula, set the user cost uc_t equal to the equilibrium rental price $p_t - p_{t+1}/(1 + r_r)$, and let the growth rate of p_t include a depreciation component, δ_t, and an expected general rate of increase in asset prices, π_t:

[1] US Bureau of Economic Analysis.

$uc_t = p_t [1 - (1 + \pi_t - \delta_t)/(1 + r_r)]$

$= p_t(r_r - \pi_t + \delta_t)/(1 + r_r).$ (1)

Alternatively, if the rental price uc_t is paid at the end of the period, then $uc_t = p_t(r_r - \pi_t + \delta_t)$.

The reference rate represents the opportunity cost of the funds invested in the capital asset. For a bank asset, the reference rate is the rate that the bank earns on an asset that entails no provision of costly services.[2] The bank will earn no economic profit on a loan if the interest received covers the costs of providing services to the borrower plus the value of the foregone opportunity to earn r_r. Similarly, if the marginal return on funds invested (net of costs of providing borrower services) is r_r, then the marginal economic profit on a deposit will be zero if the interest rate paid equals r_r less the cost of providing depositor services. Hence, rate spreads compared with r_r can also be used as guide for decision-making in managing bank assets and liabilities.

An expression for a user cost formula for a financial asset with a rate of return of r_A that is parallel to equation (1) would equal the difference between the asset's immediate cash value in period t, assumed to be y_{At}, and the present value of selling the asset for an expected price of $y_{A,t+1} = (1 + \pi_t)\, y_{At}$ in period $t + 1$ after receiving income of $r_A y_{At}$. Here, π_t represents expected changes in asset prices, including those due to changes in creditworthiness in the case of debt instruments. The user cost of holding an asset with a rate of return of r_A then becomes:

$$y_{At}\left[1 - \frac{1 + r_A + \pi_t}{1 + r_r}\right] = y_{At}\left[\frac{r_r - r_A - \pi_t}{1 + r_r}\right] \quad (2)$$

The user cost formula in equation (2) assumes that interest is paid at the end of the period and that the asset and its user cost are valued at the beginning of the period. An alternative formula that values the user cost as of the end of the period is $r_r - r_A - \pi_t$. This user cost formula is also appropriate when data on interest flows that occur throughout a year or quarter are used in conjunction with data on the average stock of the asset during the year or quarter, with interest rates calculated by comparing interest flows to the average stock of the items yielding the flow.

Banks' financial assets usually have negative user costs and their liabilities usually have positive user costs. To make the signs more intuitive, we define the user cost price of an asset as the negative of the user cost, and we define the user cost price of a liability as its user cost. With these definitions, a financial product has a positive price if it contributes positively to economic profits before non-interest expenses. The arbitrary bank asset i has a user cost price equal to:

$p_{Ai} = r_{Ai} - r_r.$ (3)

For liability products, the user cost price is:

$p_{Li} = r_r - r_{Li}.$ (4)

These formulas omit the terms for service charges or other fees because the fees are included elsewhere in the national accounts as explicit sales of bank services. We also omit π_t, the term for expected holding gains or losses, from our user cost price formula for assets

[2] Most applications of the reference rate, including the 1993 SNA, view the reference rate as a risk-free rate, implying that risk-bearing is in services to borrowers. However, Barnett (1978) describes the reference rate as a minimum rate of return that accounts for risk, and Wang, Basu and Fernald (2004) argue for the inclusion of risk premiums in item-specific reference rates.

because we have not yet developed a method for estimating an appropriate concept of expected credit losses.

In equations (3) and (4), the reference rate of interest represents an opportunity cost that banks consider in their deposit-taking and lending decisions. Large banks that are perceived as very safe are able to borrow at approximately the reference rate in securities markets, thereby avoiding the costs of providing services to depositors. For loans, the spread must equal the marginal cost of providing borrower services if the bank is to be indifferent at the margin between investing in the reference-rate asset and investing in higher yielding loans.

User cost prices also have interpretations from the point of view of bank customers. Depositors could dispense with the services of a bank and buy a security paying the reference rate of interest. By foregoing the opportunity to earn the reference rate, depositors pay an implicit price for services equal to the difference between the reference rate and the deposit rate. Loan customers of banks are willing to pay a margin over the reference rate because they need services that are not provided to issuers of credit-market instruments paying the reference rate. For many loan customers, borrowing in capital markets would be very costly or impossible because of the problems of asymmetric information noted earlier, and liquidating assets would not be feasible. However, loan customers at the margin between borrowing from banks and alternatives could either liquidate assets that earn the reference rate or borrow at approximately the reference rate in capital markets. For the marginal user of the borrowed funds, the spread between the loan rate and the reference rate represents an implicit price paid for bank services.

1.2 Broad and narrow definitions of includable assets and liabilities

Express the total implicit financial services of banks, *V*, as the user cost price of assets times the volume of assets plus the user cost price of liabilities times the volume of liabilities, or

$$\begin{aligned} V &= \sum_i p_{A_i} y_{Ai} + \sum_i p_{L_i} y_{L_i} \\ &= \sum_i (r_{A_i} - r_r) y_{A_i} + \sum_i (r_r - r_{L_i}) y_{L_i} \end{aligned} \tag{5}$$

In the last line of equation (5), the first term is the value of implicitly priced services provided to borrowers, and the second term is the value of implicitly priced services to depositors and other creditors of the bank.

Banks must use their own funds for acquisitions of assets not funded by the issuance of liabilities, so in the 1993 SNA, the amount by which assets exceed liabilities is termed “own funds”. Own funds represent the stockholders’ equity that is used to acquire financial assets. In equation (5), *V* equals net interest income minus the user cost of own funds:

$$V = \left[\sum_i r_{A_i} y_{A_i} - \sum_i r_{L_i} y_{L_i}\right] - r_r \left[\sum_i y_{A_i} - \sum_i y_{L_i}\right] \tag{6}$$

If all other interest-bearing assets and liabilities are included along with loans and deposits, and if inter-bank transactions and uncleared checks are properly netted out on the consolidated balance sheet for the banking industry, the last bracketed term in equation (6) measures the amount of lending of own funds. For the US banks as an aggregate, we can be sure that own funds calculated in this way will be positive.[3] The reduction in the total value of implicit services implied by the positive own funds in the last term in equation (6) reflects the absence of services to depositors in the case of own funds. Profits on lending stockholders’

[3] In the US, the FDIC Improvement Act of 1991 requires closure of banks with tangible capital below 2 percent of assets. The Basel II Capital Accords use risk-weighted assets to fix capital requirements, with risk-free assets assigned a weight of zero, but every bank holds some of the assets with positive weights.

equity constitute income distributed to the bank, not an implicit payment for services. These profits equal the receipts of interest on lending of own funds less the costs of providing services to borrowers, so they may be calculated by multiplying the amount of own funds by the reference rate.

We include in our calculations of implicitly priced bank output all bank assets and liabilities that earn interest or imputed interest. An alternative approach (taken in Commission of the European Communities, 2002) would be to include only loans and deposits in the calculation of FISIM. When the definition of in-scope assets and liabilities is narrowed to loans and deposits, the last bracketed term in equation (6) is no longer a measure of own funds, and will often be negative. In practice, however, the treatment of balance sheet items other than loans and deposits usually makes little difference in the results, because the user cost price of such items is usually tiny or zero. (Akritidis, 2007, 31, reports that this is also the case for European countries.) This is not always the case, however: repurchase agreement liabilities to non-bank business customers are the functional equivalent of deposits and have about the same interest rate as a deposit.

Even though the results are mostly insensitive to the choice between the broad and narrow definitions of in-scope assets and liabilities, the broad definitions have some advantages. If just loans and deposits are included, substitution by banks among types of assets or among types of liabilities could distort the measure of change in implicitly priced output. The need to allow for such substitution is more than hypothetical: loans rose from just over 40 percent of interest-earning assets in 1950 to almost 80 percent since the late 1990s, while deposits fell from almost 100 percent of liabilities to about 70 percent. Recently, an important trend has been for banks to bundle loans into tradable securities, some of which are held by banks. Whether or not a loan held by a bank has been securitized should not affect its treatment. Finally, some deposits come from other banks or represent checks that have not yet cleared. These deposits must be netted against the appropriate non-loan class of assets.

1.3 Measures of interest rates

The interest rates used for the estimation purposes can be either market interest rates or book-value rates computed by dividing the interest received on an asset category by the book value of that balance sheet category. The two approaches must not be mixed, however. Market interest rates must be used in conjunction with market values of assets (the “creditor approach”), and book interest rates must be used with book values of assets (the “debtor approach”). Our primary data source (the Call Reports) contains book values for most assets. We found that estimates of depositor and borrower services based on market rates were too volatile and sometimes negative. In contrast, the user cost prices were plausible using book-value rates, as shown in figure 1.

The inter-bank rate of interest is not suitable for use as a reference rate. The main inter-bank lending rate in the US is so low that using it as the reference rate would imply that FISIM is consumed almost exclusively by borrowers. The main type of inter-bank transaction includes an element of liquidity services to the creditor. It is very short term, so the creditor bank can obtain funds from the debtor bank almost without delay. To compute the reference rate, we therefore divide the interest received on Treasury securities by the average book value of these securities in the period during which the interest was received. This method of calculating the reference rate makes implicit borrower services consumed by the Federal government equal to zero by construction. Although imputing no borrower services to Federal government debt may seem inconsistent with imputing services to other types of bond issuers, Federal debt imposes virtually no liquidity or credit-risk costs on the bank.

2. Effect on estimates of GDP and uses of intermediate inputs

Businesses have the largest share of loans and leases, while individuals have the largest share of deposits. Therefore, the use of the reference rate to allocate to borrowers some of bank output that had previously been treated as services to depositors increased the amount of implicitly priced output of US banks classified as intermediate consumption. This reduced the estimated level of GDP. In 2001, the amount of the reduction in GDP caused by the reclassification of bank output from final uses to intermediate uses was US$ 21.3 billion.[4]

Besides improving the estimate of the level of GDP, the reference rate approach provides a more accurate picture than the previous approach of intermediate uses of banking services, and of the value added of the industries using those services. The total value added of the industries consuming implicitly priced bank services is lower under the reference rate approach than under the previous approach, by the same amount as the fall in the estimate of GDP. The new approach shows that, on average, implicitly priced bank services consumed as inputs by private industries (which include owner-occupied housing) have been about 1 percent of GDP, about the same as the final uses of such services. The use by private industries of implicitly priced services of banks in 2001 amounted to about 0.6 of their gross output or just over 1 percent of their value added. Industries where these services are more than 2 percent of value added are agriculture, utilities, and real estate, including rental and leasing.

International comparability of national accounts will be improved significantly by the widespread adoption of the reference rate approach. Previously, the US, Australia and Canada included at least some implicitly priced services of banks in their measures of GDP and intermediate inputs of nonfinancial business. Many other countries instead used the SNA93 option to count implicitly priced output of banks as an intermediate input of an imaginary industry, thereby keeping it out of GDP. In France, which had formerly followed the SNA93 optional treatment, the implementation of the reference rate approach caused a downward revision of around 2 percent to estimates of nonfinancial industries' value added, but an upward revision to estimates of final consumption also increased the estimated level of GDP by an average of 1 percent in 1993 to 2003. The reference rate approach to FISIM is projected to raise the estimated level of GDP in the UK by an average of 1.7 percent in 1993–2006.

3. Measuring the evolving role of banks in the economy

Although the share in US GDP of the value added of the commercial banking industry rose during most of the period from 1960 to 2005, after 1975 weakness in the implicitly priced portion of bank output prevented the industry from keeping up with the financial services sector as a whole (see figure 2). The weak growth of implicitly priced bank output did not occur simultaneously in depositor and borrower services. We can therefore ask whether the differences in behavior between the user cost measures of depositor and borrower services are consistent with the history of the banking industry. If the reference rate provides a meaningful breakdown of banks' implicitly priced output, the timing of the periods of weakness in the user cost measures of depositor and borrower services should reflect historical industry developments.

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[4] This figure excludes intermediate inputs of US$ 1.5 billion used by nonprofit institutions serving households and the reductions for the user cost of own funds and for foreign office deposits used to fund domestic lending.

The period of weakness of deflated depositor services depicted in figure 3, 1975 to 1981, was a time when fierce competition with non-banks for the funds of savers caused disintermediation in the channeling of funds from savers to borrowers. In the mid-1970s, a large gap emerged between regulated rates paid on deposits and prevailing market interest rates, which raised the user cost price of deposits. Investors responded with stepped-up direct purchases of Treasury notes and other debt securities. At the same time, volatility in stock and bond mutual funds generated pressure on mutual fund companies to offer a more stable type of fund. They therefore introduced the money market mutual fund, which was similar to deposits but paid high rates.

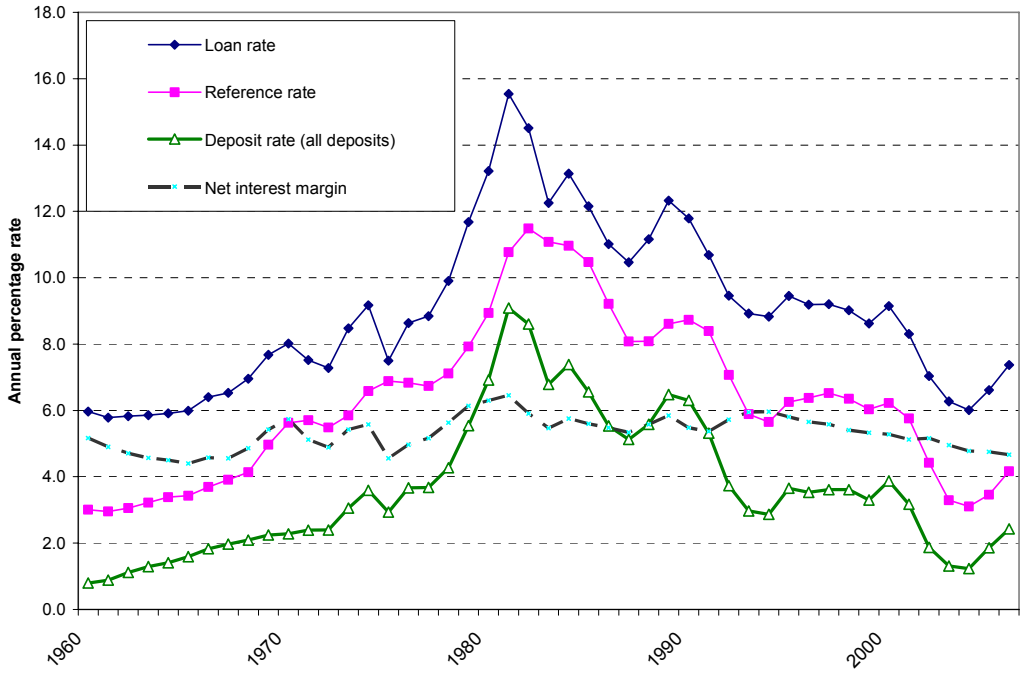
To retain deposits, banks needed to lower the user cost price of depositor services. A gradual process of deregulation of deposit rates began in the mid-1970s, and culminated with the abolition of interest rates ceilings on money market deposit accounts in 1982. But since the rebuilding of deposit service volumes was accomplished by a reduction in the price received for those services, the nominal value of depositor services stayed weak.

The timing of the periods of weakness in the reference rate measure of borrower services (1982–1986 and 1990–1992) is also consistent with historical industry events. In the mid-1980s, the profitability of lending was pressured by regional recessions arising from major downturns in locally concentrated industries such as petroleum, agriculture and defense, by adverse effects of the 1986 tax reform on commercial real estate markets, and by poor loan underwriting decisions. Soon after these problems had depleted banks' capital, stringent capital standards were enacted. Many banks were therefore obliged to curtail lending. A sharp downturn in commercial real estate in New England also contributed to the weakness in borrower services in the early 1990s.

The measures of borrower services and depositor services behave differently over the business cycle. Bank services are pro-cyclical but the borrower component of these services is not (figure 4). One element of borrower services, explicit services excluding trading revenue, leads changes in real GDP rather than coinciding with them. (A regression of the change in real GDP on the change in deflated explicit borrower services has a slope coefficient of 0.143 with a t statistic of 3.4). Changes in explicit borrower services also tend to lead changes in implicit borrower services, probably because many explicit borrower fees are charged at the time of loan origination. The correlation of explicit borrower services with future GDP growth is consistent with the effect of loan supply shocks on the business cycle that has been found in investigations of theories of credit crunches or the lending channel effects of monetary policy.

Figure 1

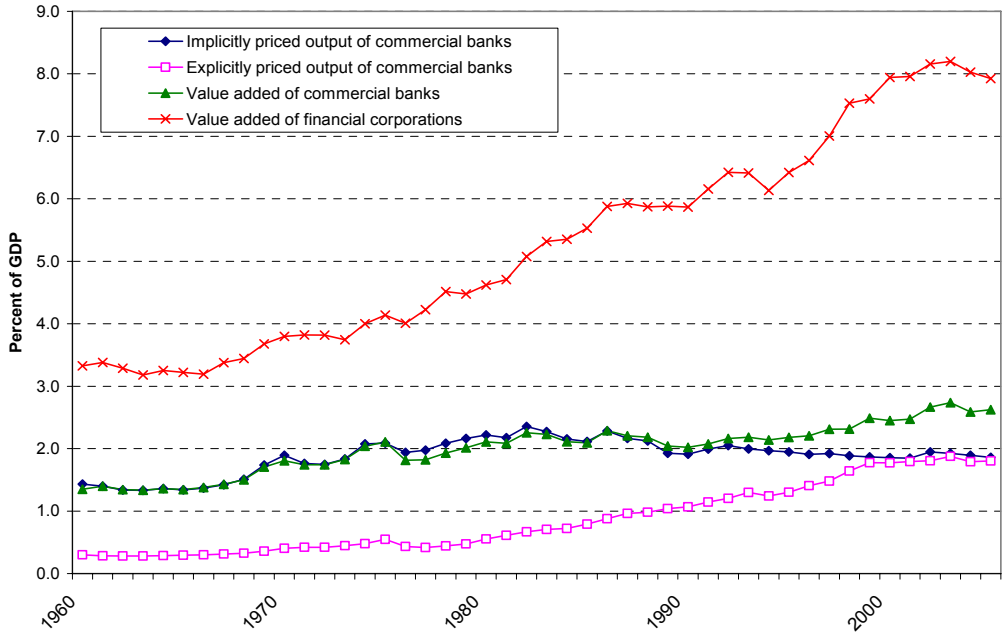
Relation between the reference rate, the loan rate, and the deposit rate



Source: author's calculations from unpublished underlying detail of the US National Income and Product Accounts.

Figure 2

Value added of banks and of financial corporations, and implicitly and explicitly priced bank services

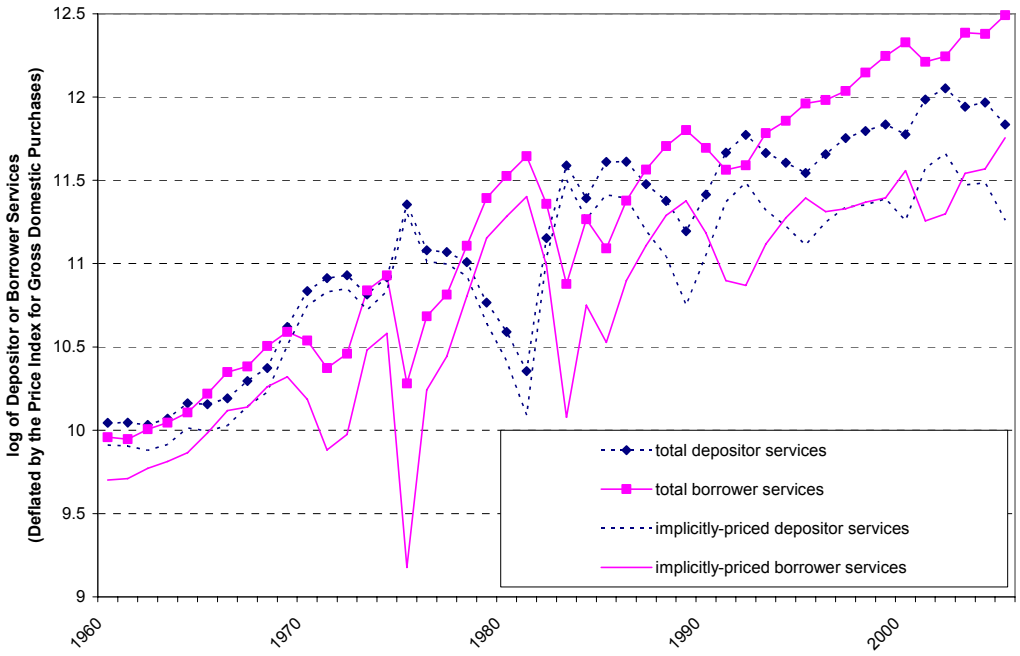


Source: author's calculations from unpublished underlying detail of the US National Income and Product Accounts.

Figure 3

Growth of depositor and borrower services

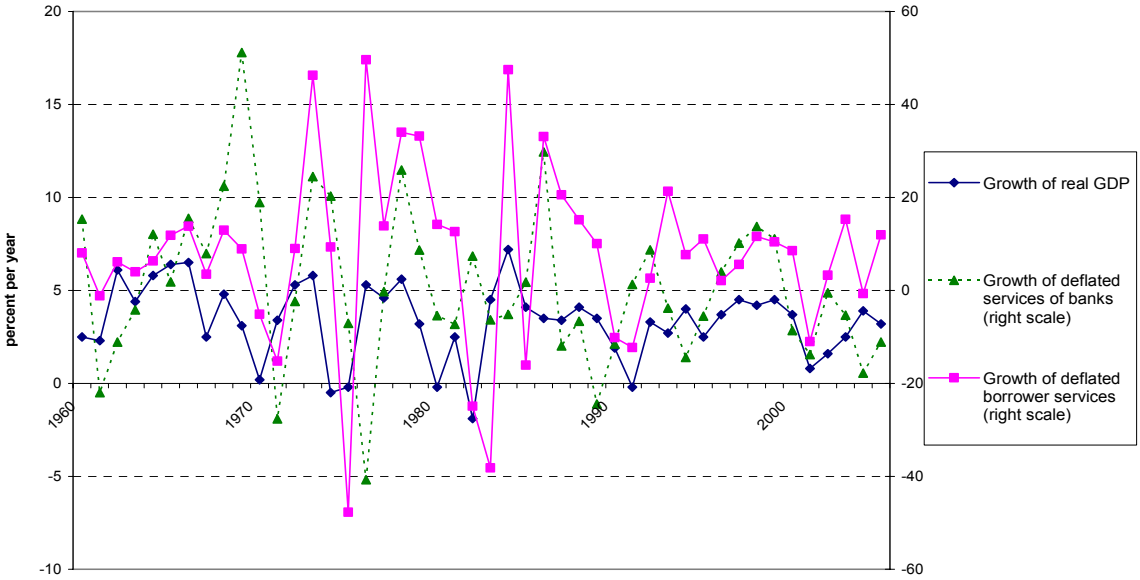
Deflated by the price index for gross domestic purchases



Source: author's calculations from unpublished underlying detail of the US National Income and Product Accounts.

Figure 4

Borrower services are coincident with real GDP



Note: Correlation with real GDP growth is 0.5 for borrower services and 0.0 for all services of banks.

Source: author's calculations from unpublished underlying detail of the US National Income and Product Accounts.

Discussant comments on session IPM83: Measures of output and prices of financial services

Steven J Keuning[1]

General conceptual issues concerning the measurement of FISIM

The organisers of this ISI conference deserve praise for selecting the topic of measuring the output and prices of financial services as the subject of an invited paper session. Undeniably, financial services play a crucial role in all economies today and, concomitantly, their contribution to domestic output and employment is substantial, and growing, in almost all countries. At the same time, the measurement of their output and prices is fraught with conceptual and practical difficulties. Even worse is the fact that the current international standards, in particular the 1993 System of National Accounts (SNA), may provide somewhat misleading guidance, which in turn can lead to outcomes that are not only incorrect, but are also non-comparable over time and across countries. The papers presented in this session richly illustrate these issues and, therefore, the continued need to reflect upon their solution in the revised SNA that is being prepared.

The core issue is well known: Since financial intermediaries often do not charge directly for their services, and because their remuneration for those services is combined with their receipts and payments for property income (as well as with the acquisition and disposal of financial assets and liabilities, and with insurance and pension premiums and benefits), it is not a simple matter to derive the output and price of their services from the available data. Since all papers in this session deal with Financial Intermediation Services Indirectly Measured (FISIM), this contribution will also focus on the implicitly charged output of commercial banks.

In comparison with the 1968 SNA, which recommended computing FISIM as the difference between interest receivable and payable, the 1993 SNA defines it as "… *the total property income receivable by financial intermediaries minus their total interest payable, excluding the value of any property income receivable from the investment of their own funds*." However, this definition ignores the fact that interest receivable on bank loans consists of three elements: (1) a receipt for the "consumption foregone" (the risk-free interest, which should include compensation for expected inflation); (2) a receipt for the risks incurred by the lender (both borrowers' credit risks and specific market-related risks); and (3) a receipt for the services provided by the banks (eg checking the creditworthiness of the borrower). Similarly, interest payable on bank deposits equals (1) the risk-free interest, plus (2) a payment for the risk incurred by the depositor (which may be zero if the deposit is insured), minus (3) a receipt for the services provided by the banks (eg safe storage of the deposit, and enabling money transfers and withdrawals). Remuneration for the risk incurred should not be included in the financial intermediation output, since it is part of the user costs of the funds.[2]

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[2] By contrast, the 1993 SNA states: "The reference rate to be used represents the pure cost of borrowing funds – that is, a rate from which the risk premium has been eliminated to the greatest extent possible and which does not include any intermediation services." The Advisory Expert Group on the review of the SNA has broadly confirmed this definition.

In fact, a recent prominent development in banking has been the rise of the so-called "originate and distribute" business model, at least for large global banks, in which (collateralised) loans are packaged, and asset-backed securities are issued to transfer the credit risk to the purchasers of those securities. In addition, a whole range of other credit risk transfer instruments, such as credit default swaps, has mushroomed. In all of these cases, the risk is transferred to the end-investors, who also reap the remuneration for it (which may sometimes be negative). Alternatively, (large, corporate) borrowers can decide to issue debt securities directly, for which they pay the risk-free interest rate plus a risk premium, but not for the kind of financial intermediation services they use when incurring a loan. Similarly, potential depositors can decide to instead invest their money in debt securities, eg money market funds, and to receive the risk-free interest plus a risk premium, in which case it is not reduced by remuneration for the FISIM linked to a bank account.

When applying the 1993 SNA definition, the remuneration for risk is correctly excluded only if the banks' receipts for the risks incurred on their loans equal their payments for the risks incurred by their depositors. This is unlikely to be the case in practice. In fact, the former tend to be (much) higher than the latter, which implies that the FISIM measurement method advocated by the 1993 SNA (greatly) overestimates bank output. Moreover, in various circumstances it leads to all kinds of implausible and non-comparable outcomes, as is also illustrated in the papers presented in this session.

In conclusion, to arrive at a correct estimate of the financial intermediation services output, it is not only the risk-free interest income that must be subtracted from the property income on each category of loans and deposits, but also the remuneration for the risk incurred.[3] Since this risk may vary over time, across countries and by category of loan (and, to a lesser extent, by category of deposit), the bank output must be estimated (and allocated) separately for these categories.[4] As a by-product, this approach would also solve the problem of negative FISIM that frequently arises when a single (short-term intra-bank business) reference rate is used for all categories of deposits, as well as for all categories of loans (of the same currency), which may in fact have a quite different (average) maturity structure.

Taking the above observations as a point of reference, we now turn to a review of the papers for this session.

Dennis Fixler, Marshall Reinsdorf and George Smith: "What can we learn from the new measures of bank services in the national accounts? The case of the US"

This paper starts out with an exposition of the conceptual framework, and then illustrates the quantitative impact of introducing the reference rate approach in the US, including the evolving role of banks in the economy.

The conceptual framework is based on a theory of the user cost of money. Interestingly, an extended version of the paper contains a discussion on the treatment of how the assumption of risk is compensated, and concludes: "A treatment of risk premiums paid on business loans

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[3] Refer also to Wang (2003) and Basu, Inklaar and Wang (2003) for further theoretical and practical considerations on this issue. In Europe, the German statistical office (DESTATIS) recently proposed a similar approach.

[4] A specific complication concerning the allocation of FISIM is that only institutional units can incur loans and hold deposits. This implies that any allocation to industries, and even demand categories, is rather arbitrary (cf. Keuning, 1990).

as distributions of income to banks has some theoretical advantages. […] For consumer loans, however, such a treatment would result in reductions to personal income, national income and GDP that would be hard to explain. Furthermore, estimation of risk-premium components would be impractical for national economic accounts, because they are subject to stringent constraints of timeliness and replicability. Also, inclusion of risk premiums in the reference rates for measuring depositor services could cause an unwelcome increase in the contribution of imputed depositor services to the volatility of US GDP. [...] In any case, any risk premium component of net interest categorized as income absorbed by banks cannot be too large, or the measure of the banking industry's net operating surplus would become implausibly small."

It may, however, be possible to raise some counterarguments. First, the current approach, which excludes the imputed service charge on consumer loans from household interest payments – treating them as part of household disposable income (and as consumption expenditure) – is difficult to explain to frequent users of national accounts, let alone to the average citizen. Indebted households will not view this service charge as part of their disposable income and, in fact, once they have incurred the loan, they are not free to spend it otherwise. A conceptually preferable reduction of the FISIM on consumer loans, by eliminating the risk premium element, may thus reduce this communication problem.

Secondly, estimation of risk components could indeed be data intensive, but not unfeasible, in view of the timeliness and level of detail of financial statistics collected by central banks around the world. Besides, DESTATIS has suggested a quite straightforward method that estimates the average "financial intermediation service price" as the (absolute value of the) difference between a risk-free (or nearly risk-free) market interest rate on loans or deposits, and the EURIBOR (Euro Interbank Offered Rate). The FISIM would then be calculated as the product of the estimated service price and the outstanding stocks. If applied by all EU member states, this method would at least significantly enhance the comparability of the estimates for this economic activity. At the same time, this method presupposes that the service provided is unrelated to the type of loan or deposit. Potential refinements may include:

- A maturity correction in the computation of the "financial intermediation service price."
- For loans, matching the risk profile of the loans on banks' balance sheets with a security portfolio with a similar risk profile, and comparing the weighted average yield of this security portfolio with the average interest rate on the loan portfolio.
- For deposits, an evaluation of the effect of depositors' insurance schemes.

The estimates that result from this approach can also be subject to some uncertainty, but they would be more accurate than the current ones. Once greater experience has been gained with its implementation, further guidance may be provided to national accounts compilers in a Handbook.

Thirdly, in many countries, the risk premium embedded in deposit interest rates is probably close to zero, in view of the availability of a deposit insurance scheme and the small likelihood that a bank would fail (and that the government would not compensate the depositors). From that perspective, therefore, the impact of shifting to the alternative approach on GDP volatility may be very minor. On the other hand, the risk premiums on loans can be quite substantial, so that the overall impact of the alternative approach to GDP may indeed be non-negligible, and may in fact vary over time (if banks do not adjust their loan portfolios to changing circumstances).

Another conceptual issue raised by the authors concerns the scope of the assets and liabilities to be covered, and they prefer to "... include all bank assets and liabilities that earn interest in our calculations of implicitly priced output." This may indeed make sense, although this approach may be restricted to financial intermediaries (excluding central banks and

insurance corporations and pension funds).[5] Moreover, it remains to be seen whether, in the case of bonds, any FISIM remains if the risk premium is excluded.

The authors' discussion of the empirical implications of their approach is quite interesting. Of particular note is their observation that, over the business cycle, explicitly charged bank borrowing services usher in changes in GDP – a circumstance that may be relevant to policy and to users of the national accounts.

Triono Widodo: "Measure of output and prices of financial services (banking)"

This paper deals with a number of important issues. It describes the Indonesian experience with measuring the output of financial services in general and of FISIM in particular, and elaborates on the estimation of property income receivable from the investment of own funds. It also notes some implausible outcomes in the event that interest received by banks falls short of interest paid, or if the total size of the loans is much lower than that of the deposits. In addition, it touches upon the issue of whether or not the Central Bank also produces FISIM. It concludes: "…the most critical factor in calculating the banking sector gross value added is how to determine the value of the reference interest rate."

The conversion of a significant portion of commercial bank assets from loans into government bonds and Central Bank certificates at the time of the financial bailout in Indonesia in 1998 caused the interest receivable to be lower than interest payable, although much of the interest previously recorded as receivable might never have actually been received. According to the SNA method, this resulted in a negative estimate for value added, which is another illustration of the fact that, for financial intermediaries, an asset and liability concept broader than just loans and deposits may be needed to generate plausible estimates. In addition, accounting for the risk concept outlined above could have revealed that, even before the crisis, the bank output and value added were not as high as had been estimated, because a correct reference rate would have had to include a high risk premium for a significant part of the loan portfolio.

Puntharik Supaarmorakul: "Estimation of financial intermediation services indirectly measured (FISIM) – Thailand's case"

This paper offers a comprehensive overview of the main issues relating to implementation of the 1993 SNA method, such as the selection of the FISIM-producing sectors and the FISIM-generating financial instruments. Again, it is proposed that the latter encompass bonds and notes. The author also discusses the choice of appropriate reference rates and the type of interest rates that should be used for the computation of interest flows.

The paper also devotes considerable attention to the computation of FISIM at constant prices, based either on the use of a general price index such as the GDP deflator, or the use of separate deflators (GDP deflator, CPI, PPI) for various loans and deposits. This is generally consistent with the 1993 SNA guidelines. However, the question arises as to whether the resulting volume index correctly reflects the change in FISIM output volume.

[5] The Advisory Expert Group on the SNA revision has agreed to restrict FISIM to deposits and loans, by convention. At the same time, it would not be appropriate to compute FISIM on bonds held by other sub-sectors, as this would not be related to financial intermediation services.

Instead, a direct volume change measurement, based on the development in the quantity and the quality of the services provided (numbers, values and risk profiles of loans; numbers of deposit and savings accounts, and of the implicitly priced services associated with them, etc.) appears to be a more conceptually sound approach, though various implementation issues remain to be settled.

The author ends with a list of concerns, including the timeliness of the source data used in compiling quarterly estimates, the distinction between funds provided by depositors and "own" funds, and the choice of the reference rates for estimating international trade in FISIM. Again, the empirical results show the substantial impact that the choice of reference rates has on results. All of this demonstrates the need for appropriate international standards. In this regard, concrete guidance may also be expected from the future revised European System of Accounts. Because this Handbook is a legal act and has various important administrative uses in Europe, it will be quite precise and detailed.

Kil-Hyo Ahn: "Practical issues on the calculation and allocation of FISIM in Korea"

This is a well-written paper and provides a good analysis of the Korean methodology for estimating FISIM, in light of the characteristics of the domestic financial system. The methodology applied by the Bank of Korea is broadly in line with the 1993 SNA. Its main peculiarities relate to the inclusion of bonds among the FISIM-generating financial instruments and the inclusion of financial auxiliaries among the FISIM-producing sub-sectors, in addition to banks and other financial intermediaries. These choices are said to better reflect the Korean financial system, in which bonds are viewed as close substitutes for loans and deposits, and in which financial auxiliaries usually accept deposits and provide loans to their customers.

In particular, FISIM is computed for each of the three FISIM-producing sub-sectors according to separate reference rates, calculated as average rates on deposits and loans of the particular sub-sector, and then aggregated. The allocation of FISIM by institutional sector is based on the quarterly flow of funds tables. Some improvements are envisaged in the allocation by industry, which is hindered by a lack of underlying data. Interestingly, if the interbank rate had been selected as a reference rate, the application of the current methodology would have led to a permanently negative FISIM, because the average deposit rates of banks consistently exceeded the interbank rate in Korea.

The application of several reference rates, to reflect various segments of the market facing different risks, partially addresses the criticism expressed above, and could in fact be further elaborated. For instance, as a first step, it may be worthwhile to contemplate the use of different reference rates for deposits, loans and securities.

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Invited Paper Meeting 84

Measures of flows and stocks in financial accounts

Chair: Rudi Acx, National Bank of Belgium

Papers:

Measuring the market value of shares and other equity in the Portuguese financial accounts
Ana Almeida, Rita Biscaya and Anabela Cardoso, Bank of Portugal

Measuring the value of micro-enterprises in financial accounts
Lisa Rodano and L Federico Signorini, Bank of Italy

Money, financial investment and financing
Reimund Mink, European Central Bank

Borrowed securities: implications for measuring cross-border portfolio investment
Leon Taub, Federal Reserve Bank of New York

Discussant: Kazuhiko Ishida, Bank of Japan

Chairman summary of session IPM84: Measures of flows and stocks in financial accounts

Rudi Acx

The presentation and discussion clearly demonstrated that the compilation of flows and stocks in financial accounts still presents many challenges. They also supported the need for further guidelines, as illustrated in a new chapter dedicated to this issue in the draft version of the SNA93 – revision 1.

Macroeconomic sequence, as well as consistency within the overall system of accounts, was discussed by Mr. Mink. It became clear from the presentation and discussion that financial accounts are capable of incorporating financial innovations and, in several inferred formats, provide a very helpful instrument for economic analysis and for supporting policy decisions. The from-whom-to-whom presentation of accounts contributes substantially to the analytical potential.

The actual compilation of financial accounts requires decisions on conceptual approach. In particular, effective tracking of transactions in borrowed securities might require a complex registration process in order to avoid double counting and to determine the ultimate holder of the securities. That process is even more difficult when cross-border transactions are involved. Mr. Taub made concrete proposals on how to address these issues. Of practical significance was data capture among custodians. The audience took away some highly useful suggestions from the experience.

All researchers involved in financial accounts, whether as compilers or users, know that information on the financial wealth of households can be vastly improved. Direct estimates of the financial assets and liabilities of households or enterprises for which no annual accounts are available is preferable to approaches in which their wealth is obtained as a balancing item. In the latter approach, each improvement in the estimates for other institutional sectors leads to reverse effects in the position of households or micro enterprises. Highly promising and innovative methods were presented in the paper by Mrs. Rodano and Mr. Signorini. The annual Survey on Household Income and Wealth (SHIW, by Banca d'Italia) is a unique system for providing direct information on the net wealth of households and of quasi corporations. Different methods, based partly on ratio extrapolation, gave very similar results for net equity of quasi corporations, thus proving the robustness of the estimate.

During the discussion, it was suggested that survey results be compared with available administrative data or indicators (such as banking data), as a kind of reference framework in order to monitor the year-to-year stability.

The use of existing data, and of combinations based on these data – as in the paper presented by Mrs. Almeida – proved very useful in the discussion. The compilation of quarterly figures on unquoted shares and other equity based on balance sheet data, and of figures reported on a security-by-security database – backed by structural information from a registry of business units – substantially improved the quality of the macroeconomic data obtained.

I would like to thank all of the authors for their innovative contributions, as well as the discussant, Mr. Ishida, who provided the authors a very constructive opportunity to comment further on their research.

Measuring the market value of shares and other equity in the Portuguese financial accounts

Ana Almeida, Rita Biscaya and Anabela Cardoso[1]

1. Introduction

From 1997 onwards, international comparisons of debt-to-equity (D/E)[2] and equity-to-Gross Domestic Product (GDP) (E/GDP)[3] ratios tended to show values for Portugal, based on the financial accounts, that seemed to underestimate the equity instrument. The Portuguese D/E ratio was one of the highest in Europe (above 1.1),[4] particularly for the most recent years; E/GDP showed a declining pattern, especially from 1999 onwards, with the figure for Portugal being one of the lowest in Europe (around 1.0).

The historical data on shares and other equity in the Portuguese financial accounts were first estimated on the basis of a constant sample of 10,000 non-financial companies for which data were available in the Central Balance Sheet Database (Central de Balanços, or CB) of the Bank of Portugal (BP), and based on extrapolators calculated by the National Statistics Institute (Instituto Nacional de Estatística, or INE) using fiscal data on own funds for 1997. Among other constraints is the fact that the market value figures available for some companies were not taken into account. In addition, fiscal data were not available on a sufficiently timely basis for the compilation of financial accounts to be reported to international organisations.

To overcome these difficulties, an alternative methodology was then developed for the estimation of liabilities in the shares and other equity category within the financial accounts. Section 2 of this paper presents a summary of the conceptual framework, while section 3 provides the sources of data. Section 4 describes the methodology and estimation algorithm used. The main results obtained are shown in section 5. Section 6 provides a final brief international comparison.

2. Conceptual framework

The European System of Accounts (ESA 95) establishes that the valuation of the shares and other equity category should be based on current prices (§ 7.52). For quoted securities, the value to consider should be the relevant market price in stock exchanges or other organised financial markets (§ 7.53); for unquoted shares (§ 7.54), an estimate should be made with reference to quoted shares, taking into account companies' differences in liquidity, sector of activity, and size; for other types of equity (§ 7.56), the estimate might use own funds or nominal value (of capital).

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2 Measuring the type of financing (own funds or indebtedness) used by companies.

3 Measuring equity as a proportion of domestic economic output.

4 Non-consolidated data from the financial accounts of several countries were used to calculate the ratios, including the following instruments: securities other than shares; loans; trade credits and advances; and shares and other equity.

Given the practical constraints of implementing the capitalisation method, due to differences with regard to the variables mentioned, European compilers[5] recommended using own funds as an alternative. Own funds were considered a good proxy for market value of unquoted shares and other equity, since this allows for international comparisons and is considered easy to implement. Own funds include nominal capital, supplementary capital, reserves and net profits/losses.

The methods used in Portugal for valuation of the "shares and other equity" item, by institutional sector of the issuer, are as follows (see Table 1):

Table 1

Methods for valuation of shares and other equity

	Quoted	Unquoted	Other equity
Non-financial corporations	Market value	Own funds	Own funds
Financial corporations	Market value	Own funds	Own funds
Rest of the world	Market value	Own funds	Own funds

Observed Estimated

Source: Banco de Portugal.

3. Sources of data

The alternative methodology that has been developed to overcome the difficulties mentioned above involves gathering data from several sources: the Directory of Statistical Units (Ficheiro de Unidades Estatísticas, or FUE), the Securities Statistics Integrated System (Sistema Integrado de Estatísticas de Títulos (SIET)) and the Central Balance Sheet Database (CB).

- FUE: This file is based on data compiled by INE for 2003 and is composed of more than 350,000 active non-financial companies resident in Portugal. Data were gathered from this file concerning companies' legal form, sector of economic activity, business turnover, number of employees and nominal capital.
- SIET: This is a security-by-security and investor-by-investor system managed by BP for the purpose of constructing statistics on securities issues and portfolios, which are then used within a set of financial statistics, namely, the financial accounts. The system compiles data relating to published issues of shares in Portugal, including all quoted shares in the Portuguese market (70 companies in 2003) and the nominal capital for unquoted shares (16,725 companies in 2003). The SIET is considered comprehensive for unquoted shares.
- CB: This is a database managed by BP, containing information from non-financial companies that responded to the voluntary annual survey seeking balance sheet and profit and loss accounting data. The database, which includes data from some 18,000 companies (for 2003), has good coverage, particularly for

[5] Eurostat's Working Group on Unquoted Shares and the European Central Bank's Sub-Group on Shares and Other Equity.

large, well performing companies, with a statistical sample for the others. It also includes information from a mandatory quarterly survey conducted in conjunction with INE and drawing on a sample of approximately 3,500 companies each year. Valuation of shares and other equity, for the purpose of the financial accounts, drew on information from this database concerning non-financial companies' sector of economic activity, number of employees, nominal capital and own funds.

4. Methodology and estimation algorithm

4.1 Non-financial corporations

In the financial accounts, the liabilities in shares and other equity of non-financial companies (K_{nfc}) were divided into the following sub-components:

$$K_{nfc} = K_{qs} + K_{nqs} + K_{oe}$$

For quoted shares (K_{qs}), the market value was taken directly from SIET, which includes quotations for all companies listed on the Portuguese stock exchange. For unquoted shares (K_{nqs}) and other equity (K_{oe}),[6] an estimate of companies' own funds was used as a proxy, in the absence of market values.

4.1.1 Yearly estimates

Constructing an estimate for the year 2003[7] was an initial step in developing the methodology. This estimate was then used as an anchor for estimating the set of values for the entire 1997–2005 period.

Base year

In the case of unquoted shares (K_{nqs}), data on nominal capital was compiled from SIET. Own funds were then extracted from the CB for the companies common to the two databases. Given that not all SIET-registered companies with unquoted shares reported their figures to the CB, extrapolators based on ratios of own funds to nominal capital, as observed in the CB, were then applied to SIET non-financial companies not included in the CB.

If the CB sample were representative and homogeneous, one could apply the mean ratio of own funds to nominal capital, as shown in the CB, to the nominal capital shown in SIET, in order to obtain an own funds estimate for SIET-registered companies with unquoted shares not included in the CB. Unfortunately, since the annual survey is voluntary in nature, it was reasonable to assume that responding companies performed better economically and financially than non-responding companies. Thus, it was considered necessary to stratify ratios according to sector of economic activity[8] and company size,[9] rather than using a single

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6 K_{oe} includes (non-financial) real estate assets, such as land and buildings, held by non-residents. This value was extracted directly from the international investment position statistics.

7 The choice of 2003 as a base year was due to the fact that the data in the FUE for that year were considered more complete and broader in their coverage.

8 The thirteen sectors considered were: agriculture, hunting, forestry and fishing; construction; education, health and other community, social and personal services; heavy manufacturing; hotels and catering (restaurants and other); light manufacturing; mining and quarrying; post and telecommunications; production and

ratio. With information from FUE on their economic sectors and numbers of employees, the companies with unquoted shares included in SIET were then distributed according to the various strata defined.

Own funds for unquoted shares were afterwards calculated according to the following expression:

$$K_{nqs} = K_{nqs\_obs} + K_{nqs\_est}$$

K_{nqs_obs} indicates the value of own funds of companies with unquoted shares included in the CB, which accounted for approximately 27 percent of the number of companies with unquoted shares in the SIET universe in 2003.

K_{nqs_est} was calculated according to the following expression:

$$K_{nqs\_est} = \sum_i \sum_j (1 + \alpha_{ij} \cdot \partial_{ij}) \cdot NK_{nqs\_obsSIET\_ij}$$

$NK_{nnqs\_obsSIET\_ij}$ represents the nominal capital of SIET-registered companies not included in the CB, for sector of economic activity i and size category j;

$(1 + \alpha_{ij})$ is the ratio of own funds to nominal capital shown in the CB for sector of economic activity i and size category j, ie

$$1 + \alpha_{ij} = K_{nqs\_obs\_ij} \Big/ NK_{nqs\_obs\_ij}$$

In general, the extrapolators α_{ij} were positive, since nominal capital is one of the components of own funds; however, outliers from companies with ratios above 10 or below zero were excluded.

The coefficients ∂_{ij} were used in order to calibrate the natural bias of the extrapolators α_{ij} arising from the CB sample. They were attributed a variable weight of discrete values – 1, 0.5 and 0 – if the representativeness of the CB sample, in terms of number of companies in each stratum, was over 50 percent, between 50 and 25 percent, or below 25 percent, as compared with the universe of SIET-registered companies with unquoted shares (see Table 2).

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distribution of electricity, gas and water; real estate; rental and supply of services to non-financial corporations; transportation and storage; wholesale and retail trade; repair of motor vehicles.

[9] The five size categories considered, based on the number of employees, were: over 250; 51–250; 9–50; 2–8; 0–1.

Table 2

CB coverage of unquoted shares by sector of economic activity and size category

	Number of employees					
Economic activity sector	**>250**	**51–250**	**9–50**	**2–8**	**0–1**	
Agriculture, hunting, forestry and fishing	100%	67%	28%	8%	3%	17%
Construction	96%	55%	24%	9%	5%	22%
Education, health and other community, social and personal services activities	92%	69%	24%	5%	5%	26%
Hard manufacturing industry	93%	58%	43%	32%	9%	53%
Hotels and catering (restaurants and others)	97%	50%	18%	5%	4%	24%
Light manufacturing industry	95%	68%	32%	14%	5%	47%
Mining and quarrying	100%	65%	37%	17%	8%	37%
Post and telecommunications	93%	83%	50%	22%	43%	52%
Production and distribution of electricity, gas and water	80%	81%	76%	63%	31%	56%
Real estate	67%	61%	34%	14%	7%	10%
Rental and supply of services to non-financial corporations	88%	47%	27%	25%	29%	29%
Transports and storage	95%	58%	38%	15%	12%	38%
Wholesale and retail trade and repair of motor vehicles	88%	62%	32%	12%	6%	29%
	93%	61%	31%	16%	13%	27%

Coverage by number of companies

more than 50% between 50% and 25% less than 25%

Source: Banco de Portugal.

For other equity (K_{oe}), a procedure similar to the above was employed, the difference being that the reference universe was the FUE and not the SIET. For a small proportion of companies (4 percent of FUE companies), own funds figures were directly obtained from the CB, while for the rest an extrapolation was made based on applying the CB ratios to the nominal capital in the FUE. Since the CB sample was less representative for other equity than for unquoted shares, the number of calibrators of nil value was higher (see Table 3).

The final values obtained for both unquoted shares and other equity are presented below. One may conclude that, for both types of capital, the values directly observed in the samples were predominant, as compared with the ones that were estimated (see Table 4).

Table 3

CB coverage of other equity by sector of economic activity and size category

	Number of employees					
Economic activity sector	**>250**	**51–250**	**9–50**	**2–8**	**0–1**	
Agriculture, hunting, forestry and fishing	0%	30%	16%	5%	2%	5%
Construction	75%	25%	7%	2%	1%	3%
Education, health and other community, social and personal services activities	82%	38%	8%	1%	0%	2%
Hard manufacturing industry	77%	36%	14%	5%	2%	10%
Hotels and catering (restaurants and others)	100%	25%	4%	1%	0%	1%
Light manufacturing industry	95%	44%	17%	6%	2%	9%
Mining and quarrying	0%	52%	30%	9%	5%	17%
Post and telecommunications	0%	75%	20%	6%	8%	9%
Production and distribution of electricity, gas and water	100%	28%	39%	17%	24%	27%
Real estate	0%	17%	13%	3%	1%	2%
Rental and supply of services to non-financial corporations	67%	26%	7%	1%	1%	2%
Transports and storage	80%	40%	15%	4%	1%	4%
Wholesale and retail trade and repair of motor vehicles	77%	49%	15%	3%	1%	4%
	78%	37%	12%	3%	1%	4%

Coverage by number of companies

more than 50% between 50% and 25% less than 25%

Source: Banco de Portugal.

Table 4

Estimates of unquoted shares and other equity for 2003

	Unquoted shares		**Other equity**	
Observed values	84 703	84.7 percent	34 215	59.6 percent
Extrapolated values with ∂_{ij} = 1	4 344	4.3 percent	660	1.1 percent
Extrapolated values with ∂_{ij} = 0.5	7 040	7.0 percent	1 336	2.3 percent
Extrapolated values with ∂_{ij} = 0	3 939	3.9 percent	21 193	36.9 percent
Total	100 026		57 404	

Unit: 10^6 euros and percent of total

Source: Banco de Portugal.

In order to validate the ad hoc values chosen for ∂_{ij} , two linear regressions were constructed, one for unquoted shares and another for other equity, according to the following formula:[10]

$$Ln(K - NK) = \alpha \ + \beta_1 Ln(NK) + \beta_2 Ln(NE) + \beta_3 Ln(BT) + \delta_j D_j + \xi$$

The regressions attempted to explain the difference between own funds and nominal capital using the variables available in the FUE, ie nominal capital, number of employees, business turnover and sector of economic activity. After running the regressions for those CB companies for which all data were available, the β coefficients obtained were applied to the remaining companies. The results of the regressions confirmed the overall values of unquoted shares and other equity obtained earlier.

1997–2005 period

For the period before and after 2003, the data compiled directly from the annual surveys were used in the case of companies included in the CB.

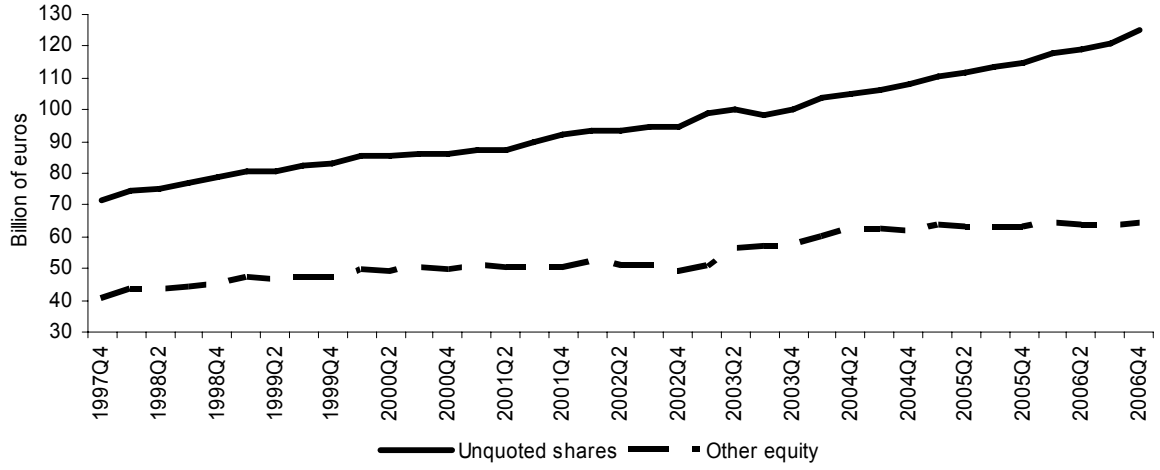
A hypothesis regarding changes in own funds with respect to nominal GDP, as well as with respect to figures computed for the invariant CB sample, was proposed for companies with unquoted shares and companies with other equity not included in the CB sample.

4.1.2 Quarterly estimates

Quarterly figures were obtained from the yearly estimates, using an indicator reflecting the seasonal patterns in companies' own funds. This indicator was constructed using accounting data from the CB quarterly surveys. The indicator's time series were then compiled, following which the quarterly nominal GDP growth rate was applied. The quarterly indicator was subsequently applied to the annual figures for own funds using ECOTRIM, software which employs a quarterly approach. The results show a stable quarterly change in both types of capital – unquoted shares and other equity (see Figure 1).

Figure 1

Quarterly non-financial corporations' liabilities in unquoted shares and other equity



Source: Banco de Portugal.

[10] Where K stands for own funds, NK for nominal capital, NE for number of employees, BT for business turnover and D for a dummy variable representing the sector of economic activity.

4.2 Extension to institutional sectors other than non-financial corporations

After running the exercise of valuing shares and other equity for non-financial corporations, it was extended to liabilities in shares and other equity in other institutional sectors, namely, the financial sector and the rest of the world.

For quoted shares, the prices quoted on the Portuguese stock exchange were used. In the case of the rest of the world, quoted prices of non-resident companies on the respective stock exchanges, gathered through commercial data providers, were also used, although most Portuguese investment abroad is channelled to unlisted companies.

For companies with unquoted shares and other equity, in the case of the financial sector, own funds figures were derived from balance sheets. For the rest of the world, two sources were used. On the one side, the foreign direct investment (FDI) surveys were taken; these surveys are carried out on an annual basis by the compilers of statistics on the balance of payments/international investment position, seeking account data on own funds of non-resident companies and their percentage share of FDI. On the other side, transaction prices reported for securities in the SIET foreign securities portfolios held by residents were taken.

4.3 Transactions estimates

The above-mentioned estimates related to end-of-period positions for shares and other equity in the financial accounts. Estimates for flows were derived as follows: changes in nominal and supplementary capital were considered as transactions; changes in other own funds components were classified as price changes; reinvested earnings from FDI were later added to the transactions; and finally, capital injections made by the general government in public companies with cumulative net losses were removed from the "shares and other equity" item in the financial accounts, since these are classified as non-financial operations.

5. Main results for 1997–2006 period

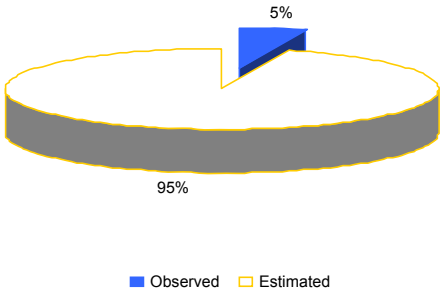
5.1 Number and valuation of non-financial corporations, by type of equity

In 2003, for a certain number of non-financial corporations (approximately 5 percent of the companies in the FUE, which served as the reference universe), 77 percent of the market value or own funds could be observed either in the SIET (quoted shares) or in the CB (unquoted shares and other equity). This meant that for approximately 95 percent of companies, 23 percent of the market value or own funds were estimates (see Figures 2 and 3).

Figure 2

2003

Number of companies

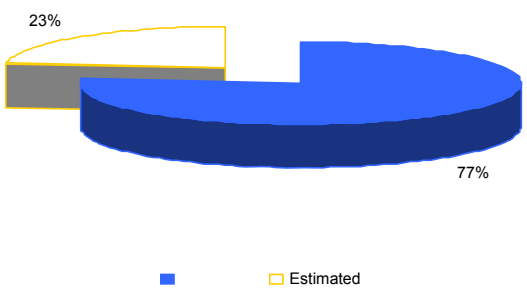


Source: Banco de Portugal.

Figure 3

2003

Market value



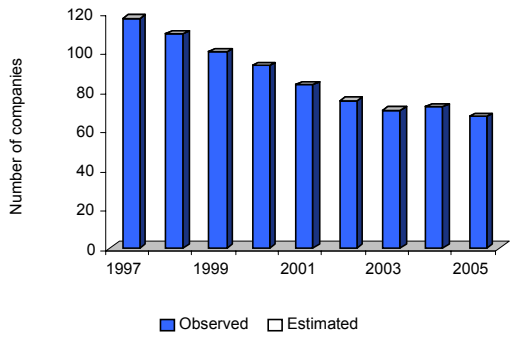
Source: Banco de Portugal.

As regards listed stocks, all figures were based on direct observation in the SIET of stock exchange prices. Most notable here are the market price fluctuations among a few companies (see Figures 4 and 5).

Figure 4

Quoted shares

Number of companies

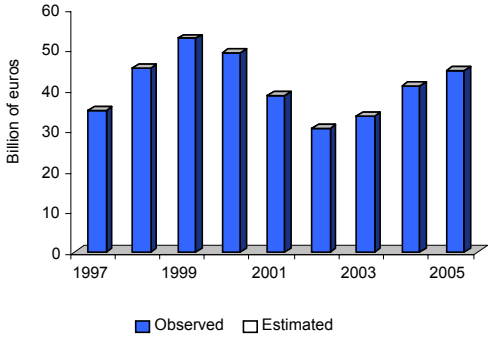


Source: Banco de Portugal.

Figure 5

Quoted shares

Stock market value



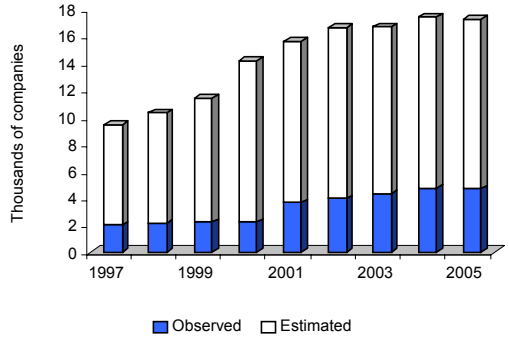
Source: Banco de Portugal.

In the unquoted shares segment, 56 percent of own funds figures were observed in the CB each year, on average, for 23 percent of SIET-registered companies. (Since 2000, the use of a sample has also contributed to greater coverage in the CB.) The salient feature here is that own funds are more stable than stock exchange prices (see Figures 6 and 7).

Figure 6

Unquoted shares

Number of companies

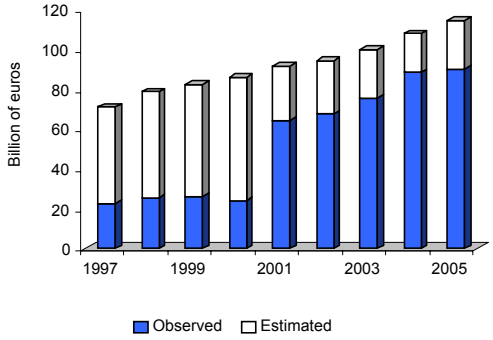


Source: Banco de Portugal.

Figure 7

Unquoted shares

Own funds value



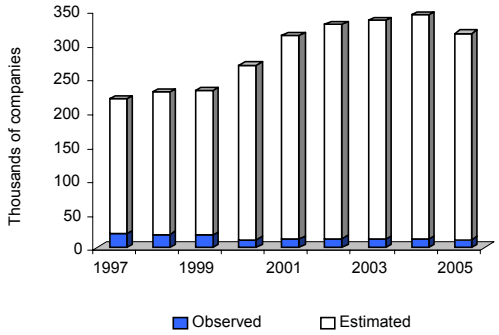
Source: Banco de Portugal.

As regards other equity, 41 percent of own funds figures were observed in the CB each year, on average, for 5 percent of FUE companies. (Since 2000, the use of a sample has also contributed to greater coverage in the CB.) The salient feature here is that own funds are again less volatile than stock exchange prices (see Figures 8 and 9).

Figure 8

Other equity

Number of companies

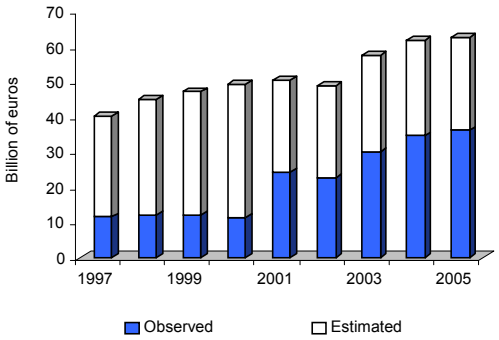


Source: Banco de Portugal.

Figure 9

Other equity

Own funds value

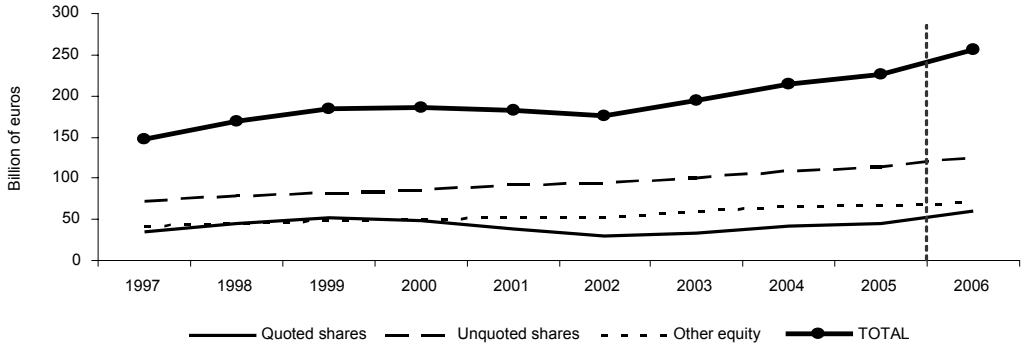


Source: Banco de Portugal.

Changes in the "shares and other equity" item for the non-financial corporations sector in the Portuguese financial accounts, which rose from approximately 148 billion euros in 1997 to almost 226 billion euros in 2005, is attributable primarily to changes in the quoted shares component. This pattern is in line with the stock market peaks of the late 1990s and the drop in the early years of the present century. However, the distribution of liabilities in shares and other equity, by type of equity, still shows unquoted shares as the main component (around half) of the Portuguese equity item (see Figure 10).

Figure 10

Non-financial corporations' liabilities in shares and other equity, by type of equity



Source: Banco de Portugal.

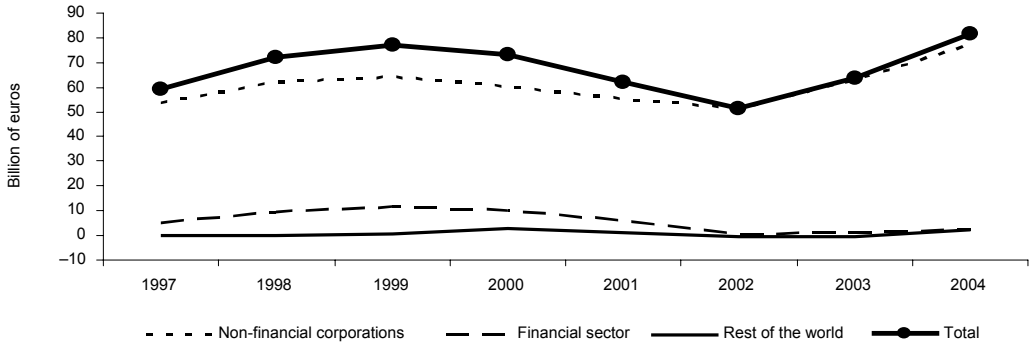
5.2 Total liabilities in shares and other equity in the financial accounts

The results obtained with the methodology presented above, which follows international recommendations regarding market valuation of shares and other equity in the financial accounts, represented an increase of approximately 68 billion euros per year in the Portuguese accounts. This increase was reflected in the stocks' accounts from 1997 to 2005, mainly as a result of price revaluations.

The institutional sector breakdown of liabilities in shares and other equity suggests that the increase in this item for the period under review is primarily attributable to the non-financial corporations sector. This sector's share in the growth of the overall economy has increased to nearly 100 percent since 2002 (see Figure 11).

Figure 11

Changes in liabilities in stocks of shares and other equity, by institutional sector



Source: Banco de Portugal.

5.3 Total shares and other equity in the financial accounts

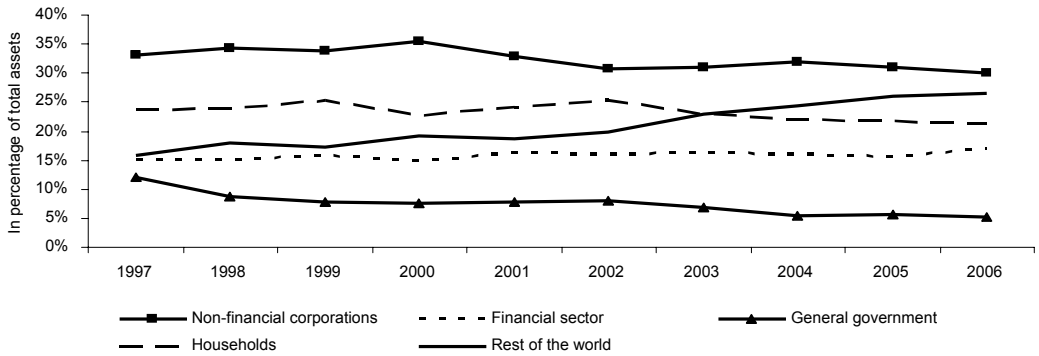
The upward revision in the liabilities in shares and other equity in Portugal's financial accounts naturally led to a corresponding increase in the assets of the same instrument . As a result, the portfolios of the various institutional sectors have become more closely aligned with the respective market values.

For quoted shares, SIET provided market price data for valuing the portfolios' holders on an investor-by-investor basis, while making it possible to attribute them to a given institutional sector. For unquoted shares and other equity, several sources were used. The Ministry of Finance provided information (at nominal value) on general government holdings; statistics on the balance of payments/the international investment position provided information for the rest of the world; financial corporations' balance sheet values were adjusted according to the sector's holdings as a percentage of the total holdings observed in SIET; and non-financial corporations, non-profit institutions serving households, and households were identified as a residual using SIET.

Changes in the breakdown of the assets in shares and other equity by institutional sector shows that the rest of the world's share, as a percentage of the total, grew from 16 percent in 1997 to 26 percent in 2006. In contrast, the general government's share decreased from 12 percent to 5 percent in the same period, a fact that may be associated with privatisations (still) under way in the Portuguese economy (see Figure 12). The average distribution of these assets for the 1997–2006 period, among the various institutional sectors, was as follows: non-financial corporations, 32 percent; households, 23 percent; rest of the world, 21 percent; financial corporations, 16 percent; and general government, 8 percent (see Figure 13).

Figure 12

Holders of assets in shares and other equity – evolution

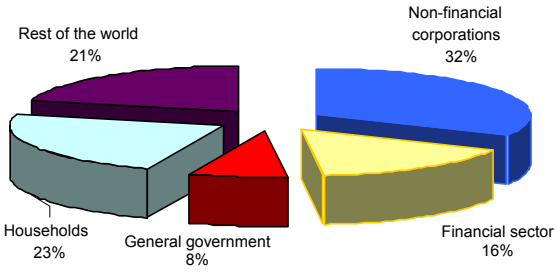


Source: Banco de Portugal.

Figure 13

Holders of assets in shares and other equity – distribution

Average 1997–2006



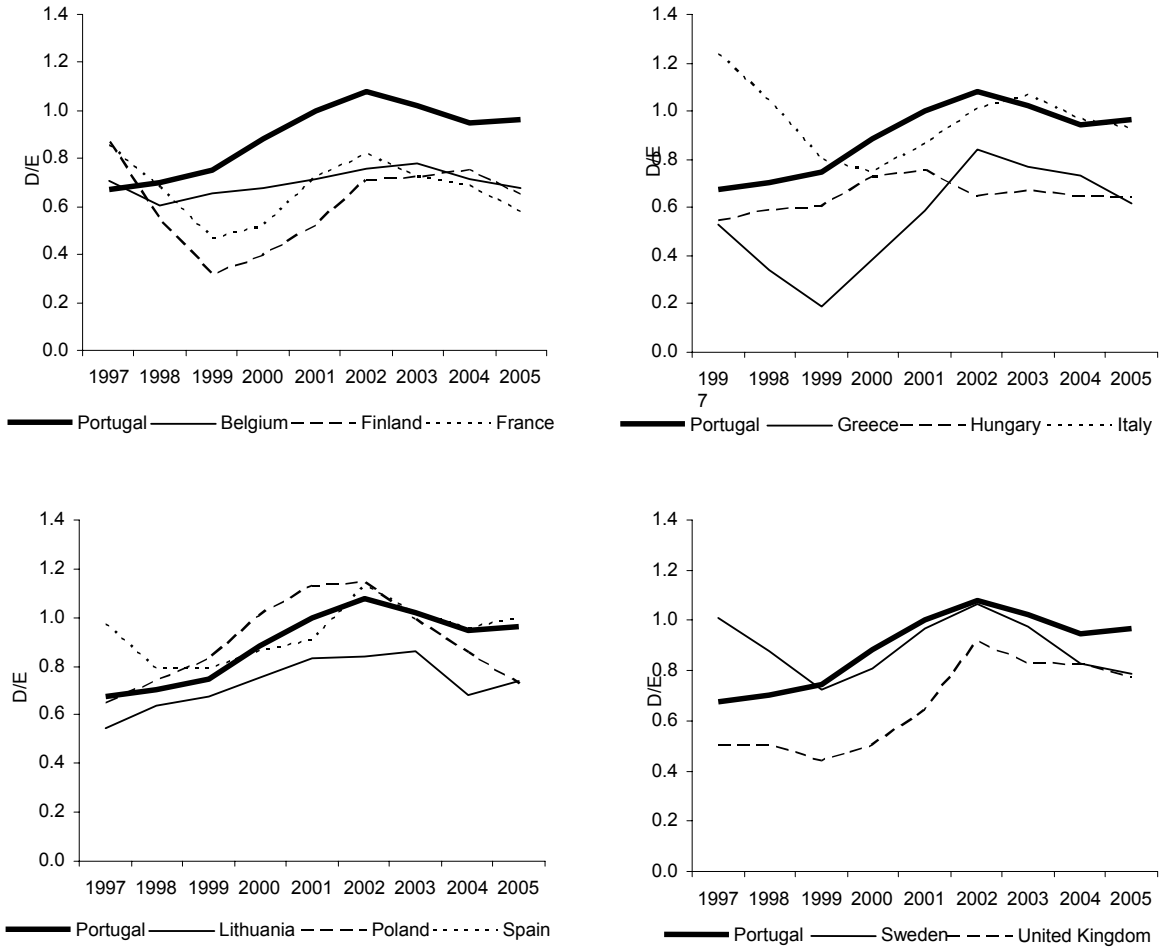
Source: Banco de Portugal.

6. International comparison

Based on international comparison of the D/E and E/GDP ratios, after reviewing the figures of the Portuguese financial accounts, one can conclude that the method for estimating own funds described above yielded values for Portugal that are closer to those of other countries (see Figures 14 and 15).

Figure 14

Debt-to-equity

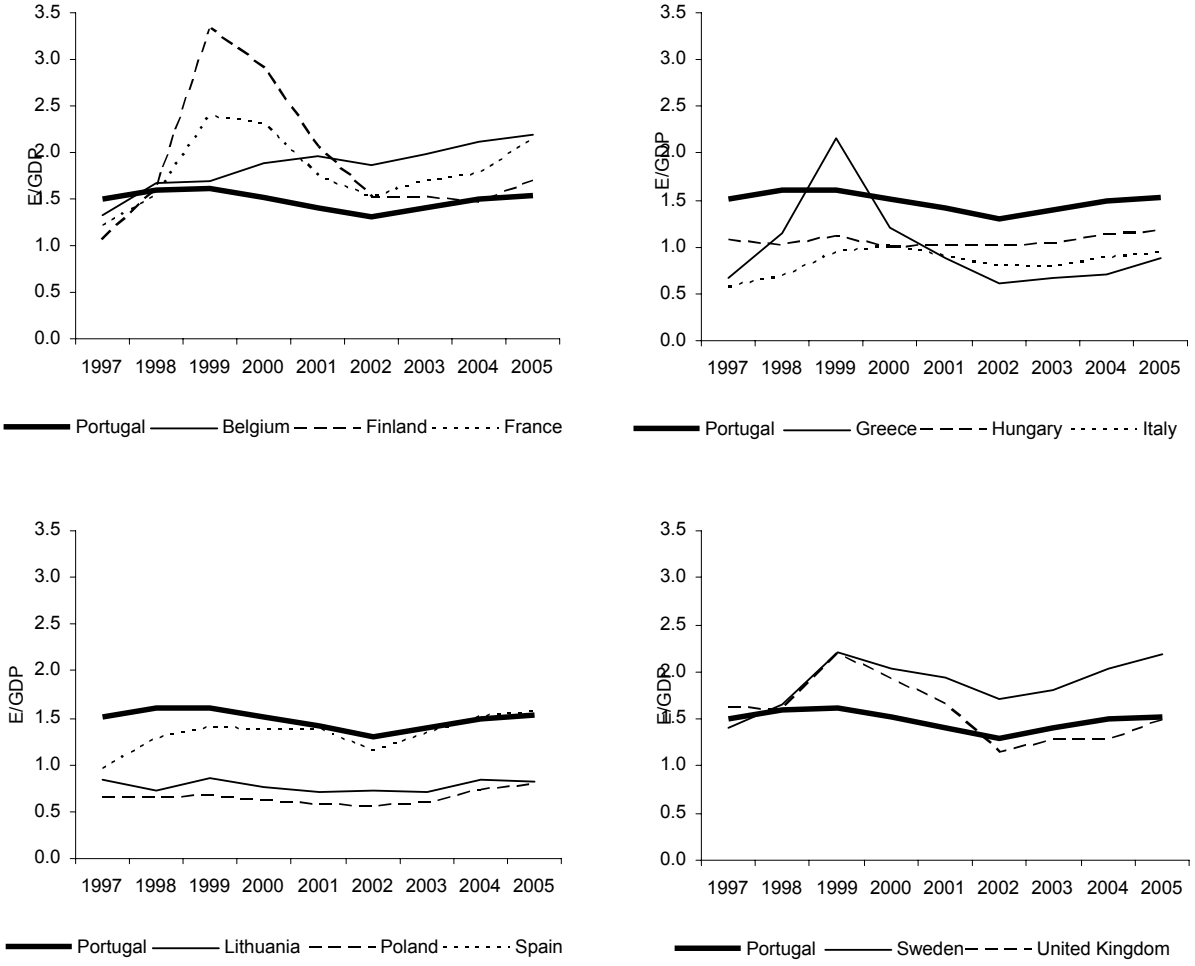


Non-consolidated values.

Source: Eurostat New Cronos.

Figure 15

Equity-to-GDP



Non-consolidated values.

Source: Eurostat New Cronos.

These ratios and others, such as return-on-equity, which is also based on non-financial companies' equity capital, play a role in determining the Financial Soundness Indicators used by the International Monetary Fund.

Measuring the value of micro-enterprises in financial accounts

Lisa Rodano[1] and L Federico Signorini[1]

Introduction and summary[2]

Census data show that in Italy approximately 3.4 million nonfinancial enterprises (out of a total of 4 million) are sole proprietorships or other unincorporated businesses.[3] Virtually all are very small "micro-enterprises". Such enterprises account for just under one half of employees[4] in the nonfinancial sector and therefore contribute significantly to overall economic activity. Likewise, their value is likely to account for a significant share of national wealth. However, the unavailability of direct statistical sources such as balance sheet data makes the measurement of their value a tricky task.

According to international statistical standards, unincorporated businesses belong to either the household sector ("producer households") or the nonfinancial sector ("quasi-corporations"), depending on size and other characteristics. This distinction makes a difference to financial accounts (FA). The financial assets and liabilities of producer-household firms, such as bank accounts or loans received, are recorded in the FA as assets/liabilities of households; on the other hand, the real assets of such firms, such as buildings or machinery, do not enter the financial accounts. The standard is different for quasi-corporations. Since quasi-corporations are treated as separate entities, their total net worth should appear in the FA both in the household sector, as an asset in the form of "shares and other equity", and in the nonfinancial sector, as the counterpart liability in the same financial instrument. However, this component of equity in the FA is usually difficult to estimate and, consequently, it appears to be missing in the published data for many countries – including, so far, Italy.

This paper explains the strategy that the Bank of Italy is developing for estimating the net worth of nonfinancial quasi-corporations in order to fill the gap in the national FA. This strategy is mainly based on survey data from the Bank of Italy Survey on Household Income and Wealth (SHIW), which contains questions on households' equity holdings in all types of businesses. It also makes use of banking statistics and other financial statistics.

Parallel work, based on a similar methodology, is under way concerning the estimation of the value of nonfinancial assets of micro-enterprises that are not quasi-corporations (producer

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[1] Bank of Italy, Economic and Financial Statistics Department.

[2] We are indebted to Luigi Cannari and Ivan Faiella for their useful comments and suggestions. We also wish to thank Gabriele Semeraro and Laura Bartiloro. We remain responsible for any mistakes. The views expressed here are our own and do not necessarily reflect those of the Bank of Italy.

[3] Sole proprietorships are defined in Italian law as "*ditte individuali*". We use the term "unincorporated businesses" to mean "*ditte individuali*" plus all types of business partnerships, as defined by Italian law, in which partners (or some of them) have unlimited liability: *società in nome collettivo, società in accomandita semplice*, *società semplici*, *società di fatto*. Certain types of unincorporated businesses (*società in nome collettivo*, *società in accomandita semplice*) are required to hold a complete set of accounts, whereas others are not. None is required to publish accounts.

[4] In this paper, we use the word "employee" as synonymous with "worker". This usage is somewhat loose, as the employer and his/her family may also count as workers in firms' statistics even if they are not employees. The distinction can make a significant difference among micro-enterprises.

households), with a view to producing a comprehensive account of household wealth. This work does not directly impact the FA and will not be described here.

Using micro data on micro-enterprises for the estimation of macro statistics presents some difficult conceptual and practical problems. We discuss, among other things, issues of definition and the treatment of nonreporting behaviour, as well as the compatibility of estimated totals with independent macroeconomic information.

Background

Italy is a country of small firms. According to census data, the average number of employees of firms engaged in nonfinancial activities was 3.7 in 2001. Approximately 4 million nonfinancial enterprises were actively operating in Italy in the same year, some 90 percent of which had five employees or fewer. Enterprises with up to five employees accounted for nearly 40 percent of total employment in nonfinancial businesses, thus representing a very significant share of economic activity. Figures have been evolving only very slowly over time, with the average number of employees increasing by 0.1 percentage point in four years, with the most recent updates largely confirming this fact. Fully accounting for micro-enterprises in macroeconomic statistics, including financial statistics, is therefore very important. It is also a challenging task.

For financial accounts, it is not too difficult to account for small enterprises, as long as they take the form of corporations. However, a large majority of micro-enterprises are constituted as sole proprietorships or some form of unlimited partnership. Some 3.4 million nonfinancial enterprises are unincorporated; virtually all unincorporated businesses are small. Legally, such entities are not required to publish their balance sheets or even, in many cases, to keep a separate set of accounts in any form. One way or the other, they escape statistical recording, hence their value is unknown and needs to be estimated.

Unincorporated businesses fall into two categories for the purposes of statistical classification. According to international recording standards as set out in ESA95, some of them are called “quasi-corporations” and are included in the nonfinancial sector. Quasi-corporations are defined as organisations not having independent legal status, that keep a full set of accounts, and whose economic and financial behaviour is different from that of their owners. This is a rather general description and it has to be operationalised at the national level. In Italy, the operational definition of nonfinancial quasi-corporations includes all firms with more formal types of unlimited partnerships (*società in nome collettivo, società in accomandita semplice*), regardless of size; it also includes simpler partnerships (*società semplici, società di fatto*) and sole proprietorships (*ditte individuali*), provided they have more than five employees.[5] Enterprises falling within this category are assumed to possess the character of quasi-corporations and are therefore to be recorded in the nonfinancial sector. The rest (ie simple partnerships and sole proprietorships with up to five employees) are to be recorded in the producer households subsector.

This distinction makes a difference to financial accounts (FA) and, more generally, to macroeconomic statistics. In the case of producer-household firms, no separation is assumed to exist between the firm and its owner(s). Consequently, the financial assets and liabilities of such firms, such as bank accounts or loans received, are recorded in the FA as

[5] The five-employee threshold is a national convention. Other countries may use different thresholds and/or criteria.

assets/liabilities of households. On the other hand, the real assets of the same firms, such as buildings or machinery, do not enter the financial accounts.

The standard is different for quasi-corporations. Quasi-corporations are treated as separate entities with respect to their owners. Their total net worth should therefore appear in the FA in the form of "shares and other equity", the financial instrument representing items associated with property rights in corporations and quasi-corporations. In line with double-entry accounting rules, this value has to be recorded twice: as an equity holding (asset) of the household sector, and as the counterpart liability of the nonfinancial sector, ie as the net equity (or own funds) component of the liability side of the micro-enterprise's notional balance sheet. However, the value of the net equity of quasi-corporations is usually difficult to estimate, as its estimation presents some nontrivial conceptual and practical problems. Consequently, it appears to be absent in the published FA for many countries. At the moment, the value of quasi-corporation equity is not recorded in Italian financial accounts.

This paper focuses on quasi-corporations; more specifically, on the estimation of their net worth for the purpose of compiling the FA. A similar methodology to the one we develop here for quasi-corporations can be applied to producer households, in order to estimate the value of the nonfinancial component of the assets of those micro-enterprises that do not qualify as quasi-corporations. As noted above, this component is not included, by definition, in the FA, but it is part of the national private wealth. Parallel work on producer households is therefore under way, with a view to producing a comprehensive account of household wealth. This work will not be described here.

In Italy, according to the national definition, quasi-corporations comprise nearly 850,000 firms, 77 percent of which are "micro-enterprises" with up to five employees. These firms account for one third of total employees in the nonfinancial sector and are mainly engaged in trade and other services. Table 1 presents more data on the significance and distribution of these firms.

Table 1

Quasi-corporations in Italy in 2001

Nonfinancial quasi-corporations	
Number of quasi corporations	849,168
of which:	
– with up to five employees	77.1%
Employees of quasi-corporations	3,465,301
Share of quasi-corporations in total for non-financial corporations and quasi-corporations	
Number of units	58.2%
Number of employees	29.0%
Value of output	22.1%

Source: ISTAT (census data, ASIA archive, national accounts).

Methodology and results

How much are quasi-corporations worth? As we mentioned earlier, balance sheets of unlimited partnerships, as well as those of sole proprietorships, to the extent that they exist at all, are not publicly available. Therefore there is no direct information even on the order of magnitude of their value. In what follows, we examine three independent methods for estimating this value, and suggest an overall strategy that combines two of them.

The first two methods are based on data from the Bank of Italy's Survey on Household Income and Wealth (SHIW),[6] which contains direct questions on the value of households' equity holdings in all types of businesses.

The third method exploits information, available from supervisory statistics, about the financial debt of quasi-corporations towards the banking system, and makes an attempt to assess the value of quasi-corporations in an indirect manner.

All three methods involve consistency checks with available macroeconomic information. Each method has advantages and drawbacks; comparing estimates obtained using different sources and criteria provides the benefit of independent appraisals. It turns out that, for the year 2004, the range of estimates is quite small, which is an encouraging sign that reasonably reliable statistics may be compiled by making use of this information.

Method 1: SHIW-based, net equity per enterprise. In the Bank of Italy Survey on Household Income and Wealth, households are directly asked to give an estimate of the value of any enterprise(s) they own. Since the survey also contains information on the legal type and the number of employees of such enterprises, in principle it is possible to identify the subset *QC* of households whose firms qualify as quasi-corporations, based on the national definition explained above. The total value of quasi-corporations could then be estimated by using the following straightforward formula:

$$Total\ value\ of\ quasi-corporations = \sum_{i \in QC} VAL_i \cdot WGHT_i \ , \qquad (1)$$

where VAL_i is the market value of quasi-corporations owned by household *i*, as declared by the same household, and $WGHT_i$ is the population weight[7] of the household. In other words, once households owning quasi-corporations are identified, the value of their firms is simply expanded to the population total.

However, not all households that declare ownership of a business specify its legal type, therefore it is likely that *QC* is in fact a subset of quasi-corporation owners, and that the estimator (1) has a downward bias. The evidence also points in this direction. The number of quasi-corporations actually reported in the SHIW, once expanded, is 44% lower than the number of active quasi-corporations provided on a macro basis by the National Statistical Institute figures (ASIA archive). It is thus reasonable to assume that the total value of quasi-corporations is underestimated.

Moreover, among those households that do declare the legal type of their firm, there are some that do not report the firm's value, which must be estimated.

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6 Bank of Italy (2006).

7 The population weight is the inverse of the probability of inclusion for a given household in the sample. When it is applied to the whole survey, it reflects the sampling design and reproduces the whole Italian population. See Faiella (2006).

Estimates have therefore to be adjusted for two types of item nonresponse:[8] nonreporting of the legal form, and nonreporting of the value of the business.

There are two ways to adjust the estimates for nonreporting of the legal form: (a) re-weighting the survey data to match the population totals by means of a post-stratification procedure; or (b) imputing omitted responses through hot-deck methods. Both procedures increase the variance of the estimates, but this is unavoidable. In this paper, we use the second procedure.

Hot-deck imputation requires that a subset of eligible "donor" households be identified. "Donors" are households that (a) own a business; (b) did not specify the legal type of their business; but (c) did specify other features of that business (such as type of business, branch of economic activity and number of employees), which are similar to those of quasi-corporations identified for other households. Once a subsample of suitable records is selected, a number of donors are randomly drawn. Random draws are constrained to match the total number and the geographic composition of quasi-corporations resulting from macroeconomic data compiled by the National Institute of Statistics, ISTAT. In this way, a new subset of households is defined, $QC^* = QC \cup$ *randomly drawn "donors"*. Estimates adjusted for nonresponse can be obtained by replacing QC with QC^* in (1).

Concerning the second type of nonresponse, ie declared quasi-corporations with unreported value, we imputed a value given by a weighted average of the value of similar firms in the SHIW, controlled for branch of activity and geographic location.

Table 2 reports the total estimated value of quasi-corporations before and after the adjustments. The estimate is about 108 billion euros before any correction. This rises to 167 billion after the first adjustment and to 187 billion after the second.[9]

Method 2: SHIW-based, net equity per employee. As mentioned above, both hot-deck imputation and post-stratification increase the variance of the estimator (1). An alternative way to estimate the value of quasi-corporations by means of a more efficient estimator involves the so-called "ratio estimation".[10]

As in the previous exercise, the set of households declaring ownership of a quasi-corporation, QC, is selected from the SHIW. Then the average net equity per employee is computed on QC by means of the following formula:

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[8] On nonreporting behaviour in the SHIW, see Cannari and D'Alessio (1993).

[9] As mentioned in the text, the adjustment for item nonresponse necessarily increases the total variance of the estimator. Specifically, the hot-deck procedure adds to the variance of the estimator because of the random draw of "donors". However, it turns out that the additional variability is not large. We performed a Monte Carlo simulation of the variability caused by the hot-deck procedure, by iterating the process of estimation 1,000 times. The outcome is reported below:

[10] Even though slightly biased, ratio estimation can be more accurate than number-raised estimation if the auxiliary variable is correlated with the variable of interest. Basically, the ratio estimator is, in principle, more efficient than the simple estimator (1) because its variance is lowered by the effect of the covariance between the numerator and the denominator. Furthermore, it does not require hot-deck imputation of missing data, as will shortly be explained.

Table 2

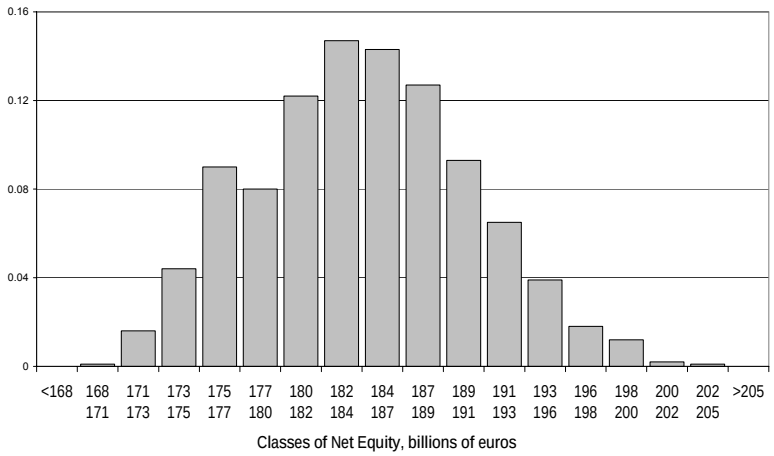
Method 1: estimates

Millions of euros

Total value of quasi-corporations		**2004**
Before any adjustment		107,800
After adjustment for non-reporting of legal type		167,600
After further adjustment for non-reporting of business value		187,800
Memorandum items:		
Geographic distribution of firms	**ISTAT**[1]	**SHIW**
North	58.2%	59.8%
Centre	20.5%	17.4%
South	21.3%	22.8%

[1] Source: ASIA (2004).

Distribution of the outcomes of 1,000 iterations



Source: author's calculations based on Bank of Italy data.

As the chart shows, most estimates are concentrated within a range of 175-195 billion euro, while their distance from the mean is on average 6 billion euro.

$$\overline{\left(\frac{Net\ Equity}{Employees}\right)} = \frac{\frac{\sum_{i \in QC} VAL_i \cdot WGHT_i}{\sum_{i \in QC} WGHT_i}}{\frac{\sum_{i \in QC} EMPL_i \cdot WGHT_i}{\sum_{i \in QC} WGHT_i}} = \frac{\sum_{i \in QC} VAL_i \cdot WGHT_i}{\sum_{i \in QC} EMPL_i \cdot WGHT_i} \quad , \qquad (2)$$

where $EMPL_i$ is the number of employees in quasi-corporation *i*, and other variables are as in (1). Hence the estimated net equity to employees ratio (left-hand side of the formula) is the ratio of two weighted averages: the weighted average value of quasi-corporations in the numerator and the weighted average of the number of employees in the denominator.

In this case, we make no correction for unreported holdings of quasi-corporations. Indeed, unlike under Method 1, such a correction would only be necessary in case of selection bias, ie if unreported quasi-corporations had systematically larger or smaller net equity per employee than reported quasi-corporations. While this cannot be ruled out in principle, there is no obvious reason why this should be the case, nor would there be an indication of the size or even direction of such a bias. On the other hand, computing the ratio on *QC** instead of *QC* would increase the variance of the estimator.

To check whether this procedure gives plausible results, we compute the ratio (2) separately for five size classes, and we compare the results with the same ratio for other types of firms for which the value of the ratio is known. For this purpose, we choose unquoted corporations (which may be assumed to be somewhat closer in their financial structure to quasi-corporations than quoted corporations, so that such a comparison is meaningful). Table 3 reports evidence on net equity per employee.[11]

Table 3

Net equity per employee

Thousands of euros

	Unquoted corporations	**Quasi-corporations**
Firm size (employees)		
1–5	59	59
6–9	43	37
10–30	49	29
31–100	64	31
>100	134	n.a.
Average net equity per employee	94	54

Source: Bank of Italy, SHIW ; CEBI/CERVED for unquoted corporations.

[11] We use Italian Central Balance Sheet Office (Centrale dei Bilanci) data. Balance sheet data do not actually report the number of employees. We estimate their number by means of total compensation per employee.

For all size classes, the ratio is similar in magnitude in unquoted corporations and quasi-corporations, but somewhat smaller in the latter. This seems reasonable; the choice of organising a firm as a corporation rather than as an unlimited partnership, other things equal, is likely to be determined in part by the easier access to capital enjoyed by more structured entities; it is therefore to be expected that corporations should have, on average, a higher capital ratio than simpler partnerships of similar size.

Having established the plausibility of the estimates based on (2), we proceed to estimate the total value of quasi-corporations by multiplying the average value of equity per employee in *QC* by the total number of employees of quasi-corporations given by macroeconomic sources (ie ISTAT's ASIA archive). The results are presented in Table 4.

Table 4

Method 2: estimates

Millions of euros, year 2004

Number of workers in quasi corporations	3,533,670
Net equity per employee[1]	53.7
Net equity of quasi corporations (Method 2)	189,659
Memorandum Item:	
Net equity of quasi corporations (Method 1)	187,800

[1] Thousands of euros.

Source: Bank of Italy, SHIW ; (*) Thousands of euro.

The estimate is very close to that given by Method 1, which is encouraging.

However, one caveat is in order. While the SHIW underestimates the number of quasi-corporations (as explained above under Method 1), it overestimates the number of workers that quasi-corporations employ, compared to the macro-total provided by ISTAT. In other words, those quasi-corporations that households in the SHIW do report in full are, on average, larger than the population mean in terms of number of employees. In principle, this is a further potential source of bias. We leave the investigation of this point to future research.

Method 3. Banking data, equity/bank credit ratio. Methods 1 and 2 both rely on SHIW data. The SHIW is unique in providing direct information on the net worth of quasi-corporations; on the other hand, such information may be biased, as the survey sample is designed to be representative of households, not firms owned by them. Indeed, as shown above, even estimating the number of quasi-corporations or the number of their employees on the basis of the SHIW alone would lead to biased results. In order to provide an independent check of these, it is therefore useful to search for evidence, albeit indirect, that is based on totally different sources.

As banking supervisor, the Bank of Italy regularly collects a rich set of data from credit institutions. This includes information on bank credit broken down by counterparty

(sub)sector. Data on the debt of quasi-corporations towards (Italian-based)[12] banks is thus available.

The idea behind the third approach is to estimate the total value of equity for quasi-corporations from total bank credit, by assuming that the average ratio between the two (which we term, somewhat loosely, the "banking leverage ratio") is the same for quasi-corporations as for some set of corporations that can be assumed to be reasonably similar to them, and for which data are available. Again, we choose unquoted corporations. Given that the average number of employees of quasi-corporations is four, we compute the banking leverage ratio for unquoted corporations with one to five employees, based on balance sheet data.[13] Then we compute:

$$Total\ value\ of\ quasi-corporations = \frac{Banking\ debt\ of\ quasi-corporations}{Banking\ leverage}, \qquad (3)$$

where *Banking leverage* is computed on small unquoted corporations, as just explained.[14] As Table 5 shows, the point estimate (179 billion euros) is again very close to estimates from Methods 1 and 2.

Table 5

Method 3: estimates

Millions of euros, year 2004

Banking debt of quasi corporations	81,419
"Banking leverage ratio"	45.5%
Net equity of quasi corporations (Method 3)	178,972
Memorandum Items:	
Net equity of quasi corporations (Method 1)	187,800
Net equity of quasi corporations (Method 2)	189,659

Source: Bank of Italy, SHIW.

Discussion and conclusions

The main advantage of Methods 1 and 2 is that they rely on the only direct piece of information on the net worth of quasi-corporations that is available, namely the SHIW. Moreover, if the macro estimate of net worth is based on survey micro data, then it is possible to perform microeconomic analysis in a way that is consistent with macro

[12] Given the nature of nonfinancial quasi-corporations, it is unlikely that adding transactions with non-Italian banks would make any difference.

[13] Italian Central Balance Sheet Office (Centrale dei Bilanci).

[14] In fact, we do not use the overall average leverage ratio of small corporations. We compute a weighted average of the banking leverage ratios of small-scale (five employees) corporations belonging to those branches of economic activity where quasi-corporations are typically specialised. However, further refinement of this procedure is under way.

aggregates. It is also possible, in principle, to derive estimates at various levels of disaggregation in a consistent way, though there is a limit inasmuch as the sample size of the SHIW is too small to give reliable estimates for small subsets of corporations (eg by region, industry or size class).

The main weakness of Method 1 is that its results are suspect, as the SHIW underestimates the universe of quasi-corporations. Any correction for this (eg post-stratification or hot-deck imputation) increases the total variance of the estimator.

Method 2 is, in principle, more efficient than Method 1, and it is also more transparent and easier to compute, as it does not require any special manipulation of the data. On the other hand, it also suffers from the limitations of the SHIW as a sample of quasi-corporations. A point that is especially relevant to Method 2 is that the SHIW overestimates the number of workers that quasi-corporations employ. Therefore the estimated net equity to employees ratio may well be biased, although even the direction of any bias is unclear.

A common problem with SHIW-based methods is that the SHIW is available only every two years. Therefore any estimates must be interpolated and updated in some way to serve as input to the financial accounts, which are compiled quarterly.

Method 3 is as simple to compute as Method 2, and it provides a useful independent check on the other two methods. It is also available at high frequency (monthly). However, it relies on the strong assumption that the banking leverage ratio of quasi-corporations is equal to that of corporations with up to five employees. This assumption may not be unreasonable, but there is no direct evidence to corroborate it. Furthermore, while the indirect evidence provided by the comparison with SHIW-based estimates is surely welcome, it is worth noting that estimates based on Method 3 are rather sensitive to the exact definition of the reference set. For example, changing the reference set to unquoted corporations with up to 10 employees (instead of five) would increase the banking leverage ratio by 8 percentage points, from 45.5 to 53.5, and would therefore shrink the estimate of the total net equity of quasi-corporations by 15 percent (about 27 million euros).

All in all, it seems reasonable to use a SHIW-based method as a benchmark. Given that the estimator of Method 1 has, in principle, a higher variance, Method 2 seems preferable. Method 3 can be employed as an auxiliary method for interpolation and extrapolation and, in addition, as a way to cross-check the results.

It is encouraging that, when applied to 2004 data, all methods give very similar results, all in the rather narrow range of 178–190 billion euros. While further robustness checks are warranted,[15] we feel confident that this is a good starting point for developing a method for regular estimation of the total value of nonfinancial quasi-corporations.

Revising financial accounts to insert this estimate would result in significant changes in some important financial aggregates. The total amount of the “shares and other equity” instrument would increase by approximately 25 percent; the value of households’ financial assets would be revised upwards by about 5–6 percent, and that of the nonfinancial sector’s liabilities by 7–8 percent.

[15] By end-2007, data from a new wave of SHIW (2006) will become available.

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Money, financial investment and financing

Reimund Mink[1]

1. Introduction

A three-dimensional system of accumulation accounts and balance sheets, with a breakdown of the financial corporation sector and of the financial asset and liability categories as proposed for the new System of National Accounts (2008 SNA), and a breakdown by counterpart, opens up the possibility of identifying monetary aggregates in a matrix, and thus of analysing monetary developments in the broadest possible financial framework, in a way that makes it easier to relate them to the economic developments recorded in the production and income accounts. The monetary aggregates comprise money stock, and changes in it, and are reflected in the developments of the so-called counterparts of money, derived by exploiting certain accounting identities. All countries measure monetary developments, in many cases considering that monetary growth is related to developments in economic activity and, over the longer term, in inflation, or that it contains valuable information concerning financial stability. Numerous definitions of money are possible; the national choice is likely to be an empirical matter, depending on what measure or measures best relate to developments in the national economy.

This paper develops such a three-dimensional system to identify the relevant holders, issuers and financial assets, and to provide a breakdown of holders into financial and non-financial sectors, since their money holdings may have different implications for economic activity and inflation. The rest of the world is assumed to be money-neutral. Financial assets as monetary variables are considered here to comprise currency (issued by the central bank), liquid deposits with the central bank and other deposit-taking corporations, and marketable short-term debt instruments issued by the money-issuing sector (both with an initial maturity of up to one year), as well as shares or units issued by money market funds. Similarly, counterparts to money are identified in the three-dimensional system as domestic credit and the net external assets of money issuers.

2. Three constituent elements of an integrated system of institutional sector accounts

There are essentially *three constituent elements* of an integrated system of institutional sector accounts. First, the system is built around a sequence of coherent, consistent and integrated macroeconomic accounts and balance sheets. Second, the components of each account are a means of recording uses and resources, or changes in assets and liabilities, during the accounting period, while a balance sheet covers the assets and liabilities at the beginning or end of this period. Third, these accounts and balance sheets are drawn up for all resident sectors of an economy, and for the rest of the world.

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The *sequence of accounts and balance sheets* is shown in Table 1. Transactions are the result of mutually agreed interactions between institutional units. They are represented in the current, capital and financial accounts. Other flows are either revaluations or other changes in the volume of assets. They are recorded in the revaluation account, and in other changes in the volume of assets account.

Table 1

Transactions, other flows and stocks, as presented in the system of accounts

<table>
<tr><th>Transactions</th><th rowspan="2">Other flows</th><th colspan="2">Stocks</th></tr>
<tr><td rowspan="3">Current account
Production of goods and services, generation, distribution, redistribution, and use of income

Capital account
Net acquisition of non-financial assets, saving and capital transfers

Financial account
Net acquisition of financial assets, and net incurrence of liabilities</td><td rowspan="2">Revaluation account
Holding gains and losses in non-financial assets, financial assets and liabilities</td><td colspan="2">Balance sheet</td></tr>
<tr><td>Assets</td><td>Liabilities and net worth</td></tr>
<tr><td>Other changes in the volume of assets account
Other changes in the volume of non-financial assets, financial assets, and liabilities</td><td>Non-financial assets
Financial assets</td><td>Liabilities
Net worth</td></tr>
</table>

The transactions recorded in the financial account and in the capital account, together with the revaluation account and the other changes in the volume of assets account, fully explain the accumulation of assets, liabilities and net worth between the opening and the closing balance sheet for the accounting period (Table 2).

Table 2

Relationship between flows and stocks

Stocks of assets, liabilities and net worth at the beginning of accounting period t

+ flows (changes in assets, liabilities and net worth during period t due to

transactions;

revaluations; and

other changes in the volume of assets)

= Stocks of assets, liabilities and net worth at the end of accounting period t

The financial account shows transactions of each institutional unit or sector in the national economy and of the rest of the world, in each category of financial assets and liabilities. A financial balance sheet may also be drawn up to show only financial assets and liabilities, with net financial assets as the balancing item.

Financial assets and liabilities are classified according to their legal characteristics, liquidity and economic purpose. Table 3 shows the proposed SNA classification of financial assets and liabilities. While financial innovation leads to a need for new types of financial assets, the classification is intended to provide broad definitions that allow for international comparability and for the inclusion of new instruments within the existing categories. Provision is made for subdividing further, particularly according to original maturity and type of instrument.

Table 3

Asset and liability classification

Asset/liability
Non-financial assets (no liability positions)
Financial assets/liabilities
Monetary gold and special drawing rights *(SDRs)* (no liability position for gold bullion)
Currency and deposits (transferable deposits – interbank positions, other transferable deposits – and other deposits)
Debt securities (short-term, long-term)
Loans (short-term, long-term)
Equity (listed shares, unlisted shares, other equity ***and investment fund shares*** (money market fund shares/units, other investment fund shares/units)
Insurance, pension, and standardised guarantee schemes (non-life insurance technical provisions, life insurance and annuity entitlements, pension entitlements, provisions for calls under standardised guarantees)
Financial derivatives (options, forwards) ***and employee stock options***
Other accounts receivable/payable (trade credit and advances, other)

Institutional units are grouped into *institutional sectors*. The proposed SNA classification of institutional sectors as shown in Table 4 includes nine sub-sectors of the financial corporations sector.

Table 4

Institutional sector classification

Institutional sector
Non-financial corporations (NFC)
Financial corporations (FC) (central bank, deposit-taking corporations except the central bank, money market funds (MMF), non-MMF investment funds, other financial intermediaries except insurance corporations and pension funds (ICPF), financial auxiliaries, other financial institutions (except financial intermediaries and ICPFs), insurance corporations (IC), and pension funds (PF))
General government (GG) (central government, state government, local government, social security funds)
Households (HH)
Non-profit institutions serving households (NPISH)
Rest of the world (RoW)

It is not always useful to distinguish all nine sub-sectors at the same time in a system of institutional sector accounts. However, they constitute a flexible set of building blocks for alternative aggregations that can be compiled according to different needs and possibilities. Further disaggregation within one of the sub-sectors may be desirable on occasion – for example, to distinguish different types of deposit-taking corporations or insurance corporations. One useful combination is to treat all financial corporations as monetary financial institutions, thus including the central bank, deposit-taking institutions and money market funds, since they issue financial instruments that are considered to be a constituent of broad money.

3. A system of accumulation accounts and balance sheets with counterpart sectors

The system of accumulation accounts and balance sheets, as described so far, is two-dimensional. They are limited in that they do not reveal counterpart sectors to the transactions, other changes in assets or balance sheet positions. In other words, although they show which sectors are acquiring financial assets, and what financial assets they are trading in, they do not identify the sectors issuing the assets. Similarly, while they make it possible to identify net borrowing sectors, and show how they borrow, the financial accounts and balance sheets do not show which sectors acquired and are holding the borrowing instruments. The same applies for other changes in assets. Thus, a complete picture of the financial flows and positions in the economy is not furnished. We explain below how such a picture may be obtained.

A three-dimensional system of accumulation accounts and balance sheets, with a breakdown of the financial corporation sector and of the financial asset and liability categories, as proposed for the 2008 SNA, and a breakdown by counterpart, opens up the possibility of identifying monetary aggregates in a matrix, and thus of analysing monetary developments in the broadest possible financial framework. The growing importance of financial innovation can be better reflected in this way, as can the distribution of risks and rewards associated with different sources of financing and financial investment options. Financial transactions are also presented in a way that makes it easier to relate them to the economic developments recorded in the production and income accounts.

Full analysis of financing and investment – financial and non-financial – requires additional information on the sources and destinations of a sector's funds. The flow of financial assets through the economy and the financial relationships between sectors can then be traced. For example, it is often important for policy-makers to know not only what types of liabilities (and financial assets) general government is using to finance its deficit, but also which sectors (or rest of the world) are providing the financing. For financial corporations (and those supervising them), it is important to know not only the composition of the financial assets acquired, but also on which sectors these are claims. In addition, it is often necessary to analyse financial transactions between sub-sectors within a sector (central government transactions with local government or social security funds, or central bank transactions with deposit-taking corporations).

Such detailed from-whom-to-whom accounting information is necessary to understand how financing is being carried out, how it is changing over time, and how it is affecting the long-term development of financial markets and institutions. In particular, these from-whom-to-whom accounts and balance sheets can be useful in relating financial transactions to the behaviour of the non-financial economy. Joint presentation of the capital and the financial accounts (showing a complete record of transactions contributing to the net acquisition of assets and the net incurrence of liabilities) provides a tool to combine financial and non-financial investment and the various sources of financing via net saving, net capital transfers and net incurrence of liabilities, thus establishing a link between financial activity and the

"real" economy. For financial projections, the use of time series from relevant parts of the from-whom-to-whom accounts makes it possible to examine the implications of components of an economic projection by means such as testing a number of separately prepared sector or market forecasts for consistency, as well as to study the implications for future financial transactions of a particular set of assumptions about future events (eg interest rates, exchange rates, growth and sectoral surpluses/deficits).

Extending the system of accumulation accounts and balance sheets to include counterpart information requires detailed statistical information on transactions from only one counterpart, which can then serve to improve the accounts of the other counterpart sectors as well. Table 5, extended to reveal net acquisition and net incurrence of liabilities in the form of debt securities by institutional sector, suggests a solution involving the introduction of the third dimension. The table shows that the debt securities acquired by households and non-profit institutions serving households (275) are changes in claims on debt securities issued by non-financial corporations (65), by financial corporations (43), by general government (124) and by non-residents (43). It also indicates that non-financial corporations incurred liabilities in the form of debt securities (147). Similar tables could be compiled for other financial assets, such as loans or deposits. All of the counterpart information revealed in the financial account may be replicated (in terms of outstanding amounts) in an expanded form of the balance sheet.

Table 5

A from-whom-to-whom institutional sector financial account

Debtor sector / **Creditor sector**		**Net incurrence of debt securities by**						
		Non-financial corporations	**Financial corporations**	**General government**	**Households and non-profit institutions serving households**	**Economy**	**Rest of the world**	**Total**
Net acquisition of debt securities by	Non-financial corporations	30	11	67		108	34	**142**
	Financial corporations	23	22	25		70	12	**82**
	General government	5	2	6		13	19	**32**
	Households and non-profit institutions serving households	65	43	124		232	43	**275**
	Economy	123	78	222		423	108	**531**
	Rest of the world	24	28	54		106		**106**
	Total	**147**	**106**	**276**		**529**	**108**	**637**

The counterpart analysis can be extended to sub-sectors, as it may be particularly helpful in spelling out the role of financial intermediaries in mobilising financial resources and making them available to other sectors in appropriate forms, through maturity/asset transformation. Banking transactions and positions, and those of insurance corporations and pension funds, are likely to be of great interest. The further expansion may also reveal a growing (or shrinking) role for other types of financial intermediaries and financial institutions, and shed light on the nature of their business, in terms of the counterparties with whom they deal, as well as the instruments they utilise. Thus, Table 5 may be further expanded to show sub-sectors of the financial corporation sector as creditors of the resident non-financial sectors (non-financial corporations, general government, and households including non-profit institutions serving households) and non-residents. A table showing all debtor/creditor relationships would contain numerous cells, many of which would be blank. For simplicity, therefore, in this illustrative exercise, only some portions of the tables have been expanded. Table 6 is an example of how to show debtor and creditor counterparts where applicable for specific sub-sectors of the financial corporation sector. These counterparts are broken down by type of claim, residency and debtor or creditor sector. Depending on the availability of data, different degrees of detail may be shown regarding, for example, currency and deposits (by creditor sector), loans (by debtor sector), or insurance, pensions and standardised guarantee schemes (by creditor sector).

Table 6

Detailed from-whom-to-whom financial account or balance sheet showing financial assets and liabilities of financial corporations by type of claim and debtor/creditor

Financial assets of financial corporations / **Type of claim and debtor**	**Monetary financial institutions**[1]	**Insurance corporations and pension funds**	**Other financial corporations**
Monetary gold and special drawing rights (SDRs)			
Monetary gold			
SDRs			
Currency and deposits			
Currency			
Transferable deposits			
Residents			
Non-residents			
Other deposits …			
Debt securities			
Short-term			
Non-financial corporations			
Financial corporations			
General government			
Households and non-profit institutions serving households			
Rest of the world			
Long-term …			
Loans			
Short-term …			
Long-term …			

Table 6 (cont)

Detailed from-whom-to-whom financial account or balance sheet showing financial assets and liabilities of financial corporations by type of claim and debtor/creditor

Financial assets of financial corporations / **Type of claim and debtor**	**Monetary financial institutions**[1]	**Insurance corporations and pension funds**	**Other financial corporations**
Equity and investment fund shares			
Equity			
Resident corporations			
Listed			
Unlisted			
Other equity			
Non-resident corporations …			
Investment fund shares			
Money market fund shares/units			
Residents			
Non-residents			
Other investment fund shares/units …			
Insurance, pension, and standardised guarantee schemes			
Non-life insurance technical provisions			
Life insurance and annuity entitlements			
Pension entitlements			
Provisions for calls under standardised guarantees			
Financial derivatives and employee stock options			
Other accounts receivable			
Trade credit and advances			
Other			
Liabilities of financial corporations / **Type of claim and creditor**	**Monetary financial institutions**[1]	**Insurance corporations and pension funds**	**Other financial corporations**
Currency and deposits …			
Currency			
National			
Residents			
Non-residents			
Foreign			
Residents			
Transferable deposits			
by institutional sector			
Other deposits …			

[1] Monetary financial institutions include the central bank, deposit-taking corporations, and money market funds.

The other changes in assets accounts may also be broadened to show the holding gains or losses and other changes in the volume of assets by institutional sector, financial asset or liability, and counterpart sector. Such detailed statistical information could be provided in the future through security-by-security or corporate balance sheet databases.

4. Integration of money in the system of institutional sector accounts

The three-dimensional system of accumulation accounts and balance sheets as described so far opens up with a breakdown of the financial corporation sector and of the financial asset and liability categories, as proposed for the new SNA, and a breakdown by counterpart, opens up the possibility of identifying monetary aggregates in a matrix, and thus of analysing monetary developments in the broadest possible financial framework, in a way that makes it easier to relate them to the economic developments recorded in the production and income accounts. The monetary aggregates comprise money stock, and changes in it, and are reflected in the developments of the so-called counterparts of money, derived by exploiting certain accounting identities. All countries measure monetary developments, in many cases considering that monetary growth is related to developments in economic activity and, over the longer term, in inflation, or that they contain valuable information concerning financial stability. Numerous definitions of money are possible; the national choice is likely to be an empirical matter, depending on what measure or measures best relate to developments in the national economy.

This section sets forth a system to identify the relevant holders, issuers and financial assets, and, among the holders, to distinguish between financial and non-financial sectors, since their money holdings may have different implications for economic activity and inflation. The money-issuing sector is assumed to consist of the central bank, resident deposit-taking corporations and resident money market funds (the monetary financial institutions, or MFIs). Money holders are the remaining resident sectors, including the remaining sub-sectors in the financial corporation sector. Modifications may be necessary in cases where central government is treated as a money issuer and only the remaining government sub-sectors as money holders. Holdings of money by the money-issuing sector itself are netted out. The rest of the world is assumed to be money-neutral. In other words, neither the liabilities of non-residents nor non-resident holdings of money issued by resident money issuers are counted in the national money stock. Financial assets as monetary variables are considered to comprise currency (issued by the central bank), liquid deposits with the central bank and other deposit-taking corporations (with an original maturity or period of notice of up to one year), marketable short-term debt instruments issued by the money-issuing sector (with an initial original maturity of up to one year) and shares or units issued by money market funds.

Table 7 shows, in ***bold italics***, *money holders'* financial transactions in *assets* representing monetary claims on *money issuers*. The outstanding money stock could be identified in a similar way in the financial balance sheet. Similarly, counterparts of money may be identified in the three-dimensional framework. Counterpart analysis uses the balance sheet identity to relate changes in money to other transactions of the money-issuing sector(s) in an analytically useful way. Table 8 shows the counterparts of money. The *domestic credit* counterpart reveals how the change in money is related to lending by money issuers to other residents in all forms, including the acquisition of securities issued by them. This counterpart comprises a portion of the assets of the money-issuing sector: loans to, acquisition of securities issued by, and other forms of lending to all other resident sectors, including other entities in the financial corporation sector. Another component of the assets of the money-issuing sector, net of liabilities to non-residents, consists of the *external* counterpart: the net external assets of the money-issuing sector (in balance sheet terms), or changes in them (corresponding to transactions in the financial account).

Table 7

Monetary aggregates in the framework of institutional sector accounts

Creditor / Type of claim and debtor (MFI)	Non-financial corporations	Financial corporations		General government	Households and NPISH	*Money holders*	Rest of the world
		Monetary financial institutions[1]	Other financial corporations				
Currency and deposits							
– short-term	***50***	60	***5***	***10***	***150***	***215***	60
– long-term	10	20	0	0	30		10
Debt securities							
– short-term	***10***	30	***5***	***5***	***20***	***40***	30
– long-term	5	10	0	0	10		10
Money market fund shares/units	***5***	5	***2***	***0***	***20***	***27***	0
Equity and other investment fund shares/units	0	5	5	0	5		2
Financial derivatives and employee stock options	2	10	10	0	0		10
Other accounts receivable/ payable	1	2	2	0	0		2
Money	***65***		***12***	***15***	***190***	***282***	
Domestic non-monetary liabilities	18		17	0	45	**80**	
External liabilities							124

[1] Monetary financial institutions include the central bank, deposit-taking corporations, and money market funds.

Table 8

Counterparts to monetary aggregates in the framework of institutional sector accounts

Debtor / Type of claim and creditor (MFI)	Non-financial corporations	Financial corporations		General government	Households and NPISH	*Money holders*	Rest of the world
		Monetary financial institutions[1]	Other financial corporations				
Currency and deposits		80					30
Debt securities	*60*	40	*10*	*40*		*110*	60
Loans	*60*		*6*	*20*	*120*	*206*	45
Money market fund shares/units		5					0
Equity							
Other investment fund shares/units	*5*	5	*10*			*15*	5
Insurance, pension, standardised guarantee schemes			*3*	*0*		*3*	0
Financial derivatives and employee stock options	*2*	10	*0*	*0*	*0*	*2*	5
Other accounts receivable/ payable	*0*	2	*0*	*0*	*0*	*0*	5
Domestic credit	*127*		*29*	*60*	*120*	*336*	
External assets							**150**
Net external assets (external counterpart)							26 (= 150 – 24)

[1] Monetary financial institutions include the central bank, deposit-taking corporations, and money market funds.

The transactions and positions of the rest of the world correspond (after some rearrangements) to the balance of payments and the international investment position. Net external assets, summarising the money-*issuing* sector's transactions with the rest of the world, link to money through the banking balance sheet accounting framework. The balance of payments identity may then be used to show how the money-*holding* sectors' transactions with the rest of the world relate to changes in money, since the money issuers' balance of payments transactions must equal all other resident sectors' balance of payments transactions with the opposite sign (for this purpose, it is desirable to have eliminated errors and omissions in the balance of payments when compiling the sector accounts and balance sheets; otherwise they may be attributed to the money-holding sectors). Table 9 provides a simplified example of this relationship.

Table 9

Balance of payments items balancing transactions in the external counterpart of money

Current and capital accounts	Direct investment		Portfolio investment			Other investment		Financial derivatives	Errors and omissions	Transactions in the external counterpart of money
	By resident units abroad (non-MFI[1])	By non-resident units in the economy	Assets (non-MFI)	Liabilities		Assets (non-MFI)	Liabilities (non-MFI)			
				Equity	Debt instruments					
–9	–6	4	–47	32	4	–32	23	–3	6	–26

[1] All institutional units except monetary financial institutions, which include the central bank, deposit-taking corporations, and money market funds.

There are practical challenges in integrating money in the system of institutional sectors. The definition of money is not necessarily based on the classification of financial assets and institutional sectors as described above. One example is the use of different maturity thresholds and valuation methods in money and banking statistics and in the compilation of institutional sector accounts. Another example is more detailed distinctions between money issuers, money holders and money-neutral sectors, with central government often being treated as a money-issuing sector.

5. Money, financing and financial investment

A final step needed is to embed money in a table that shows the financing and financial investment of an economy's institutional sectors and of the rest of the world, based on data provided by the money-issuing sector, along with supplementary data on securities issuances and holdings (Table 10).

The sources of financing (613) provided by the money-issuing sector (MFIs) are broken down into short-term (467), long-term (107) and other financing (39). *Money* can be derived by subtracting the short-term financial investment of the money-issuing sector vis-à-vis money issuers – the intra-sector transactions (95) – and the investment of the rest of the world in money (90) from the non-consolidated short-term financing figure (282 = 467 – 95 – 90). It is also directly shown as the financial investment of the money-holding sectors in monetary variables (currency and deposits, short-term debt securities and money market shares/units). Their investment in *(domestic) non-monetary liabilities* includes net acquisitions in long-term deposits, long-term debt securities, equity and other financial assets. Further, *domestic credit* (336) is shown as financing by the money-holding sector in the form of loans granted by monetary financial institutions (206), debt securities (110), equity (15) and other financial instruments (5), as indicated in Table 10. External assets and liabilities are derived as total financial investment (124) and financing (150) of the rest of the world vis-à-vis the money-issuing sector.

The table provides a somewhat limited view of the financing and financial investment process within an economy. Thus, the table could be expanded to include all sources of financing and uses of financial investment for all institutional sectors. For non-financial corporations, for instance, financing sources that would then be included are the liabilities incurred vis-à-vis other non-financial corporations, non-MFI financial corporations or government. The same is true for the sector's financial investments, in which equity play a rather important role. The inclusion of non-financial investment, saving and net capital transfers (the capital account) would make it possible to carry out a complete analysis of investment, financing and debt by institutional sector.

Table 10

Money as part of a table on financing and financial investment

Financial investment								Item	Financing							
NFC	Other FC	GG	HH/ NPISH	MFI	Econ-omy	RoW	Total		NFC	Other FC	GG	HH/ NPISH	MFI	Econ-omy	RoW	Total
65	12	15	190	220	502	90	592	Short-term	30	3	10	60	467	570	22	592
50	5	10	150	60	275	60	335	Currency and deposits					335	335		335
10	5	5	20	30	70	30	100	Debt securities					100	100		100
5	2	0	20	5	32	0	32	Money market fund shares/units					32	32		32
				125	125		125	Loans	30	3	10	60		103	22	125
15	5	0	45	369	434	22	456	Long-term	95	26	50	60	107	338	118	456
10	0	0	30	50	90	10	100	Deposits					70	70	30	100
5	0	0	10	180	195	10	205	Debt securities	60	10	40		35	145	60	205
				126	126		126	Loans	30	3	10	60		103	23	126
0	5	0	5	10	20	2	22	Equity and other investment fund shares/units	5	10			2	17	5	22
				3	3		3	Insurance, pension, standardised guarantee schemes		3	0			3	0	3
3	12	0	0	24	39	12	51	Other	2	0	0	0	39	41	10	51
2	10	0	0	17	29	10	39	Financial derivatives and ESO	2	0	0	0	32	24	5	39
1	2	0	0	7	10	2	12	Other accounts receivable/payable	0	0	0	0	7	7	5	12
83	29	15	235	613	975	124	1099	Total	127	29	60	120	613	949	150	1099

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[5] “Quarterly Monetary Union Financial Accounts for ECB monetary policy analysis”, Mink, R., IFC Bulletin No 12, 2002.

[6] Draft chapter 26 of the revised System of National Accounts (2008 SNA). http://unstats.un.org/unsd/sna1993/draftingPhase/ChapterIssueMatrix.asp

[7] “Selected Key Issues of Financial Accounts Statistics”, Mink, R., IFC Bulletin No 21, 2005.

[8] “Monetary presentation of the balance of payments”, ECB, MB, Euro Area Statistics Table 7.2.

[9] “Council Regulation (EC) No. 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community” (ESA95), Brussels, 25 June 1996.

Borrowed securities: implications for measuring cross-border portfolio investment[1]

Leon Taub[2]

Section 1: Executive summary

1.1 The borrowing of securities is a very common activity. The Bond Market Association (BMA) estimates that U.S. residents had almost US$ 8 trillion in securities loans outstanding as of June 2004. Of this amount over US$ 2 trillion were lent through repurchase agreements with non-U.S. counterparties. An additional US$ 700 billion were lent through securities lending agreements with non-U.S. counterparties. Securities borrowing activities in Europe are in excess of US$ 2 trillion and are growing very rapidly.

1.2 Most systems for the reporting of portfolio investment positions, including the system used by the United States, are based on data provided by custodians. In these systems, if a borrowed security is used in a subsequent transaction (either re-lent or on-sold), the reporting of positions is likely to be overstated, unless reporters maintain segregated accounts for borrowed securities or track securities borrowings and the outflows of borrowed securities (securities re-lent or on-sold), as well as securities owned. Solving the problem would require reporters to track and match securities lent or on-sold with securities borrowed, which would probably be a significant burden.

1.3 Securities can be lent in a variety of ways, using many types of institutional arrangements. Some of these arrangements can lead to situations in which one or more of the potential reporters will not know that the security has been borrowed or lent. In some cases, only the end-investor will know of the arrangement. In still other cases, only the custodian will know of the arrangement. Finally, in some cases, it may be that only a third party will know of the arrangement.[3]

1.4 Some potential solutions are described, including end-investor reporting, the treating of repurchase agreements on a legal ownership basis, and the reporting of negative positions when a borrowed security is sold. An additional approach, the reporting of two or more "position types," is also described. As few as two position types may be needed, since positions owned can, at least in theory, be calculated as:

Securities Owned = Securities Held or Lent – Securities Borrowed

The reporting of position types by custodians is shown to eliminate biases in positions estimates due to the borrowing of securities when reporters have knowledge of the borrowing transactions. In addition, it would reduce errors in some, but not all, cases when reporters have incomplete knowledge of the borrowing transactions.

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[1] Insightful comments and suggestions, and helpful references were provided by many members of the Federal Reserve Bank of New York, the Board of Governors, and the Bureau of Economic Analysis. Particularly valuable comments were received from William Griever, Debra Gruber, Ralph Kozlow, Ken Lamar, and Charles Thomas. I remain, of course, solely responsible for any errors, omissions, or opinions contained herein.

[2] Federal Reserve Bank of New York.

[3] In addition to an absolute "lack of knowledge," there can be situations in which the arrangement is not coded into a reporter's system for data reporting, even if someone, somewhere in the organization, can identify the transaction and its nature correctly.

1.5 Each of the possible solutions will have significant advantages and disadvantages, including significant implications for reporting burden and compilation costs. If nothing else, reporters' and compilers' collection systems would have to be changed for any of the solutions to be adopted. The next step is to speak with reporters to determine: (1) the cross-border magnitudes of the various types of borrowing arrangements; (2) current reporting (in practice) under the various types of borrowing arrangements; and (3) the reporting burden involved with alternative reporting options. This information is needed to determine whether the costs of any extra reporting can be justified by the magnitude of the likely improvement in data quality, and, if so, the best approach to implement.

Section 2: Borrowing situations with full information

A. Borrowing chains – liabilities

2.1 In the United States, data on cross-border holdings of securities are collected primarily from custodians. U.S. liabilities (foreign residents' holdings of U.S. securities) are reported by the U.S. custodian of the foreign client (either a foreign custodian or a foreign end-investor). U.S. claims (U.S. residents' holdings of foreign securities) are reported by the U.S. custodian dealing with the U.S. end-investor.[4]

2.2 Custodians are instructed to report securities borrowing arrangements (including repurchase agreements which are treated as collateralized borrowing) as if the borrowing had not occurred. For example, the instructions for the most recent U.S. liabilities survey state:

> Securities "sold" by foreign residents under repurchase agreements or buy/sell-back agreements, lent under securities lending arrangements, or delivered out as collateral as part of a reverse repurchase agreement or security borrowing agreement ***should*** be reported as if the securities were continuously held by the foreign resident. That is, the security lender's U.S. custodian should report the U.S. security as if no repurchase agreement or buy/sell-back agreement occurred.

If a security is owned and lent, it clearly should be reported as if it were still held. However, what about a security that has been borrowed and re-lent? The paragraph is ambiguous.

2.3 In the next paragraph, reporters are instructed not to report securities which have been borrowed:

> Securities temporarily acquired by foreign residents as collateral under reverse repurchase agreements, securities lending or borrowing arrangements, or buy/sell-back agreements should NOT be reported. That is, the security borrower's U.S. custodian should exclude the U.S. security as if no resale agreement or buy/sell-back agreement occurred.

2.4 Securities that have been borrowed and are held are thus excluded from reporting. But the situation with respect to securities that have been borrowed and re-lent remains ambiguous. It appears that they should also be excluded. However, to do so, reporters would

[4] However, if the U.S. custodian uses a U.S. sub-custodian and discloses the identity of the U.S. end-investor to the U.S. sub-custodian, the U.S. sub-custodian reports. In addition: (1) U.S. residents that do not use U.S. custodians are required to report U.S. claims; and (2) U.S. issuers that issue securities directly in foreign markets are required to report U.S. liabilities.

have to ignore the subsequent loan, despite the instructions reproduced in Paragraph 2.2, above.

2.5 In some cases, it may be easy to avoid reporting securities that have been borrowed and re-lent. For example, if all borrowed securities are in a segregated account, it is likely that none of them will be reported, unless the reporter makes a special effort to report lent securities. Certainly, brokers that have a business line engaged in borrowing securities from some clients and lending them to others are likely to report the securities as being held by the original customer and not by themselves. However, if the reporter has a customer with multiple purchase, sale, borrowing and lending transactions flowing through a single account, reporting some lent securities and not others could be a very difficult task, as reporters would have to determine which lent securities had been acquired through a borrowing transaction. (In fact, practical difficulties in reporting may be a reason for the historical ambiguity in the current instructions.)

2.6 **Figure 1**[5] illustrates the importance of the distinction between a borrowed security that is held and a borrowed security that is subject to a subsequent lending transaction. In **Figure 1**, Investor A owns a security, originally held with Custodian A, which is lent to Investor B, who in turn lends it to Investor C. Assuming full knowledge, the custodian for Investor A will report the security (as described in Paragraph 2.2) and the custodian for Investor C will not report the security (as described in Paragraph 2.3). The reporting of Investor A as the owner and Investor C as not owning the security is consistent with the economic positions of the investors and with international reporting standards. (A borrowing chain through repurchase agreements is probably the most common situation. However, the type of borrowing does not matter.)[6]

2.7 But what about Investor B? If all of Investor B's borrowed securities are in a separate account, avoiding the reporting of re-lent securities may be easy. In other cases, the custodian for Investor B may report the lent security (as described in Paragraph 2.2), even though it was originally borrowed. To avoid reporting these "phantom" holdings, the custodian would need to track, for each security lent (including securities delivered out under a repurchase agreement), information about how that security was received. If the custodian does not routinely store that information in a form that it can link to the security lent, it would have to prepare a list of each security lent by each customer and compare it, on a security-by-security basis, to each security borrowed, a task which may be complicated by multiple transactions in multiple lots of the same security.[7]

2.8 For simplicity, all of the links of the chain shown in **Figure 1** involve foreign-resident investors and U.S.-resident custodians. However, the residency of Investor A and of Investor C does not affect the analysis. If Investor A is a U.S. resident, Custodian A would not report, but this is correct, as there is no foreign holding. The residency of Investor C does not matter, as Custodian C does not report in either case. The only residency consideration of importance is if a foreign resident (Investor B) borrows a security using a U.S. resident

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[5] Note: In **Figure 1** and the subsequent figures, the flows of cash and securities are usually shown to be between the custodians directly. In actual practice, a number of intermediate or additional flows may occur and the investors may use multiple custody institutions (e.g., one for cash and another for securities).

[6] "… a repurchase agreement is treated as a newly created financial instrument … classified under loans …" SNA 1993, Paragraph 11.32. See also Repurchase Agreements, securities lending, gold swaps and gold loans: An update (IMF, December 2004, SNA/2.04/26).

[7] A less painful way of achieving the same result would be to subtract all borrowings of that security from all lendings of that security, before reporting the lendings as portfolio positions held. However, under this interpretation of the current instructions, a customer-by-customer tabulation would still be required, since other reportable characteristics, such as the country of the foreign holder, must be preserved.

custodian[8] and then re-lends it. If the custodian for Investor B treats the lent security as if it had been previously purchased (rather than borrowed), over-reporting will result.

B. Borrowing chains – claims

2.9 A similar situation occurs when a U.S. resident borrows and lends a foreign security (see **Figure 2**). With full knowledge, the position of the original holder (Investor A) is reported (correctly). Similarly, the position of the final holder (in this case, Investor C) is not reported (also correctly). However, the custodian for a domestic investor that has borrowed and re-lent the security may report a holding that does not exist, unless the custodian tracks the provenance of each lent security.

C. Short sales and negative positions – liabilities

2.10 In many cases, a borrowed security is subsequently sold. Indeed, the primary motivation for the borrowing of a security may be to sell it (engage in a "short sale") with the objective of having a negative economic position in the security.

2.11 It should be noted that, in the common use of the term, a "short sale" begins on the trade date. However, international economic account reporting standards call for positions to be reported on a settlement basis.[9] Therefore, for the purposes of this paper, all negative positions must be obtained through the delivery of a borrowed security. Economically, of course, one is "short" during the period between trade and settlement. However, unless international standards change to trade date reporting, it would be inconsistent to include these short positions in national accounts.[10]

2.12 **Figure 3** describes the same situation as **Figure 1**, except that Investor B, instead of lending the security to Investor C, sells it "short" to Investor C. As in **Figure 1**, for simplicity, all custodians are assumed to be U.S. residents and all of the investors are assumed to be foreign residents. The holding of Investor A is reported correctly, as before. The negative holding of Investor B will not be reported. (The U.S. currently does not require the reporting of the negative economic positions that occur when a borrowed security is sold. The recording of short sales is not currently an international reporting standard, but is very likely to be included as a standard in BPM6.)[11] The holding of Investor C is reported, correctly, by Custodian C.

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[8] If Investor B uses a foreign custodian, the foreign custodian will typically use a U.S. sub-custodian. The complications that result when a U.S. sub-custodian does not have full knowledge of the transactions are discussed in Section 4.

[9] "When all entries relating to a transaction pertain only to the financial amount, they should be recorded when the ownership of the asset is transferred." SNA 1993, Paragraph 11.48. The reasoning for this is presented in SNA 1993, Paragraph 3.109: "One may wonder why nominal holding gains and losses are not calculated over a period beginning at the moment on which two units agree to a mutual exchange of assets instead of the period which starts with the moment on which the assets are acquired … The System, however, regards commitments resulting from a contract as contingent until one of the parties has performed its obligation …"

[10] In addition, there are cases in which negative positions are incurred without the seller obtaining a borrowed security or even the commitment to obtain the borrowed security in order to make delivery. These cases ("naked short sales") are often illegal and are, in any case, a subset of the short sales for which settlement has not yet been made. Thus, they are not considered further in this paper.

[11] In 2001, the IMF Committee on Balance of Payments Statistics accepted the recommendation of a working group to record, as short positions, securities on-sold that were acquired through repurchase agreements (Recommendation A.(iv)) and through securities lending agreements (Recommendation B.(v)) (BOPCOM-01/16). In 2003, an IMF working group recommended that this treatment be expanded to all short positions (BOPCOM-03/15). The Draft Annotated Outline for Revision of the Balance of Payments Manual, Fifth Edition,

2.13 Note that in this example, Investors A and C are each reported to own a security, but both positions result from a single security. There is a temptation to posit that Investor C does not own a "real" security. However, Investor C will receive all interest or dividends or other attributes of ownership from the issuer (through the issuer's agents and Investor C's custodian, of course). Investor C may sell the security without restriction to any U.S. or foreign resident, who will also have full ownership rights.

2.14 It is Investor A that does not have full ownership rights to the security. The only thing that Investor A owns is a promise to be repaid a security from Investor B. Investor A will not receive interest or dividends from the issuer of the security (although Investor A's agreement with Investor B undoubtedly includes some sort of compensatory payment for the lost relationship with the security's issuer). Thus, for the accounts to balance, if Investor A is shown as owning the security, Investor B must be shown as having a negative position in that security.

2.15 Note that the type of loan does not matter. In particular, the situation does not change if Investor B acquires the security through a term resale agreement, not currently due. Because repurchase/resale agreements are treated as loans, if an acquirer uses a delivered security to settle a subsequent sale, consistency requires that we treat the investor as having a negative position in the security, even though, legally, the short seller has no obligation to deliver a security until the term of the resale agreement ends.[12]

2.16 As before, the residencies of Investors A and C do not matter. If Investor A were domestic, current data collection would show only the position of the foreign Investor C. The negative position of any foreign Investor B would still be ignored. As a result, a net liability to foreigners would be shown, even though foreigners, on balance, have a net neutral position in the security. The residency of Investor C also does not affect reporting quality – which is fortunate, because Investor C can on-sell the security to any other (domestic or foreign) investor. (If Investor C is a U.S. resident, no foreign position is shown. However, the negative position of any foreign Investor B would still be required in order to avoid overstating the aggregate net liabilities of U.S. residents to foreign residents for the security.)

2.17 Other presentations are possible. Instead of reporting a negative U.S. liability to Investor B, the U.S. could show a claim on Investor B for the U.S. security. However, the showing of a negative liability may be preferable, since Investor B has an obligation to acquire and deliver a security issued by a U.S. resident, which is an obligation quite different in nature from U.S. claims on foreign issuers. Also, the mechanics of data collection and presentation might be more difficult if the position were considered a U.S. claim, as the claims and liabilities survey would have to be integrated and claims would include negative foreign holdings of U.S. securities.

2.18 Some might suggest that Investor B be shown as having a short-term debt to the U.S. Just as Investor B has a claim on Investor A (for cash), Investor A has a short-term claim on Investor B for the security. By convention, this liability is not shown in the accounts, as it is assumed that the security is merely collateral for the cash loan. However, the cash could just as easily be collateral for the loan of the security. Presentation as a short-term debt to Investor A has some logic, but it is a separate question. The question at hand is the nature of Investor B's obligation relative to the issuer of the security (namely, to pay the

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states (section 6.11(c)): "short positions occur when a unit sells assets (usually securities) that it does not own … the short position will be shown as a negative holding." Since many nations already collect data on at least some negative positions, this statement of intent is very likely to be incorporated into BPM6.

[12] Because market participants may use different terminology (not always considering a sale completed using a security obtained through a resale agreement, particularly a term resale agreement, as a "short sale"), data collection for these types of positions may have to be specified carefully.

obligations of the issuer of the security and to acquire the security before delivery needs to be made). The importance of recording this liability as a security becomes clear when Investor A resides in a country other than that of the issuer, as discussed in Paragraph 2.22, below.

2.19 If the investor borrowing the security to sell it short is a domestic resident (including a U.S. broker/dealer), the situation is different, as a domestic resident would have the liability. **Figure 4** shows a securities flow in which a foreign investor (Investor A) owns 150 units of a security, a U.S. investor (Investor B) sells 100 units (borrowed from Investor A) short, and a foreign investor (Investor C) eventually acquires the security. Under current reporting, the U.S. would show foreign residents (Investors A and C) owning 250 units of the security. Collecting data on foreign residents' negative positions would not have any impact in this situation, because no foreign residents have negative positions in the security. Fortunately, 250 units is, in fact, both the correct number of units held by foreign residents and the correct number of units for which U.S. residents have liabilities.

2.20 **Figure 4** is instructive, because it shows why it is incorrect to calculate foreigners' ownership of a security as a percent of the amount issued and assume that domestic residents own the "remaining percentage". Investors (domestic and foreign) can, and often do, hold aggregate claims for more than 100 percent of the quantity of a security issued. Not all of these positions are effective claims against the issuer, because some of the positions are, in reality, claims against short sellers. The only way to obtain a full picture of the situation would be to collect data on the negative positions of domestic investors as well as those of foreign investors, a very extensive data gathering effort for a country as large as the United States.

D. Short sales and negative positions – claims

2.21 The situation with respect to claims surveys is analogous to that of liabilities surveys. The collection of data on the negative positions of own-country residents would eliminate the current (at least for the U.S.) overstatement of domestic residents' net claims on that security, but does not eliminate the possibility that, as a result of short sales, the quantity of securities available for economic ownership could (and often will) exceed the quantity issued and outstanding.

2.22 In **Figure 5**, the relationships that exist when a security is borrowed and sold short are explored further. A U.S. resident (Investor C) owns a foreign-issued security, which happened to have been sold short by an investor in Country B. (Investor B obtained the security by borrowing it from Investor A in Country A.) With full knowledge of the transactions: (1) the U.S. will show a claim on Country X (as Investor C owns a security issued by a resident of Country X); (2) Country X will show a liability to the U.S. (because Investor C will have a U.S. custodian, with a sub-custodian in Country X); and (3) Country A will show a claim on Country X (as Investor A in Country A "economically owns," but lent, the security). On a worldwide basis, the accounts will balance only if Country B shows Investor B's negative position against Country X. The "negative liability" of Country B to Country X is required even though the debt is to an investor in Country A.[13] (A short-term loan from Investor A to Investor B is, of course, required to be shown in the short-term debt accounts of both Country A and Country B.)

[13] Both the reporting of borrowed positions that are re-lent and the non-reporting of negative positions when securities are on-sold would lead to both worldwide claims and worldwide liabilities being overstated. The extent to which these overstatements offset is unknown.

E. The relationship of borrowed securities and negative positions

2.23 Every negative position is simply a borrowed position that is neither held nor re-lent. As a result, when calculating an investor's ownership, either of the following equations could be used:

Securities Owned = Securities Held + Securities Lent – Securities Borrowed

or

Securities Owned = Securities Purchased and Held + Securities Purchased and Lent – Securities Borrowed and Sold (Sold Short)

However, it would be double counting to subtract both borrowed securities and securities "sold short" from positions held.

Section 3: Selected types of borrowing agreements

3.1 A security can be borrowed in many different ways. Several of these are described below. The agreements differ mainly in the nature of the participants and the way protection, in the case of default, is provided to the security's lender. However, these differences can result in very large differences in legal form and in the knowledge of the transaction by some of the participants. Therefore, the reporting implications of the type of lending agreement used can be significant.

A. Collateralized lending agreements

3.2 Brokers and other financial intermediaries may allow customers to borrow securities by posting cash or other specific collateral. Brokers and other financial intermediaries also may allow customers to borrow a security based on the customer's margin account balance. These agreements often allow the customer to re-lend or sell the borrowed security to a third party. In each case, the financial intermediary shows a (collateralized) claim on the customer and the customer shows a liability to the financial intermediary.

B. Use of a security held in a "street name"

3.3 Securities, particularly equity securities in retail customers' accounts, are often held by the broker, acting as a custodian (or by the broker's custodian), in a "street name". When this occurs, the books and records of the issuer, usually as compiled by a central clearing organization (primarily the Depository Trust Clearing Corporation – DTCC – in the United States), show the broker/custodian as the legal owner. The only record of the customer's ownership is on the books and records of the broker/custodian (which are provided to the customer). Often, the customer and the broker agree that the broker or its custodian may borrow the security ***without the customer's knowledge or specific consent***.[14] A summary of this type of agreement is shown in Appendix A.[15] (Security for the customer is provided by

[14] In fact, the broker/custodian may hold these securities in an undifferentiated account (a "pool"), with brokers' books showing a liability either to the customer or to the pool (and the customer on a pro rata basis). The customer has no knowledge that security was borrowed (and lent or on-sold). The broker/custodian is responsible for providing compensation to the customer for corporate actions (e.g., interest or dividend payments), but as shown in Appendix A, this compensation may not include compensation for less favorable tax treatment (as the broker may have to declare some of the payments to be interest rather than dividends).

[15] See also http://www.nyse.com/pdfs/MarginCustomersKnowYoursShareholderRights.pdf

the broker's assets, a government guarantee (SPIC in the U.S.), or perhaps by broker-acquired private insurance.) Once the broker/custodian borrows the security, the broker/custodian can re-lend or on-sell it.

3.4 The same situation may occur in a non-retail setting. "Re-hypothecation" is the use of posted collateral (by the intermediary holding that collateral), either to lend the security or to post it as collateral for the intermediary's own obligations. The U.K. Financial Securities Authority reports: "Re-hypothecation is a key generator of prime brokerage revenue and is often linked to the terms on which other prime brokerage services are offered to the hedge funds."[16]

C. Reverse transactions

3.5 Reverse transactions (RTs) are transactions, such as repurchase agreements, in which a security is legally sold, but with the seller and buyer both having legal obligations to engage in a subsequent transaction to return that security (or an equivalent security) to the original owner. The second transaction is specified to occur at a defined price, usually based upon the time elapsed between the two transactions. Although the agreement is written as two separate transactions, the economic substance of the agreement is akin to a loan. RTs are treated as loans for current U.S. reporting[17] and for most financial analysis and reporting purposes.[18]

3.6 RTs can be conducted in several different ways.

a. *Delivery vs. Payment Repurchase Agreements*: A bilateral "delivery vs. payment" or ("DVP") repurchase agreement is shown in **Figure 6**. In **Figure 7**, the example is made a bit more complex, as Investor B uses the security to facilitate a short sale. (If one or more of the investors is also a custodian, the flows can be less complicated, but the relationships are the same.) Note that as long as repurchase agreements are treated as borrowings, the situation is, in theory, exactly analogous to any other borrowing used to facilitate short sale (as shown, for example, in **Figure 3**). However, this type of borrowing can be a particular problem for data compilers because: (1) the custodian for the original owner may or may not know that the security was delivered out as part of a repurchase agreement; and (2) the custodian for the short seller may or may not know that the security was acquired through a repurchase agreement. Hence the custodians for Investors A and B may or may not have a record of the loan or of the short seller's obligation to return the security upon expiration of the repurchase agreement. The BMA estimates that U.S. residents' DVP repurchase agreements with non-U.S. counterparties exceeded US$ 1 trillion in 2004 (about half the total).

   Sometimes, end-investors authorise custodians to initiate and carry out DVP repurchase agreements on their behalf (or on the custodian's behalf in return for

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[16] Hedge funds: A division of risk and regulatory engagement (Financial Services Authority Discussion Paper 05/4, June 2005, Paragraph 3.48).

[17] Current U.S. treatment (c.f., "Understanding U.S. Cross-Border Securities Data"; Carol Bertaut, William Griever, Ralph Tryon; *Federal Reserve Bulletin*, May 2006, p. A59) and international standards (SNA 1993, Paragraph 11.32) call for RTs that involve cash collateral to be treated as collateralized loans, created through a financial instrument that is distinct from the underlying securities. Securities transferred as a result of RTs without cash collateral are treated, to the extent the source data permit, as if the securities had not been transferred, which is analogous to their treatment as a loan.

[18] "Repurchase agreement: A form of secured, short term borrowing in which a security is sold with a simultaneous agreement to buy it back from the purchaser at a future date. The purchase and sales agreements are simultaneous, but the transactions are not." (American Banker Online, Glossary)

reduced custodial fees). In some of these cases, the end-investor may not "know" of the repurchase agreements, depending upon the nature of the agreement between the end-investor and the custodian, and the characteristics of the custodian's and end-investor's record keeping systems. This issue needs to be explored further.

b. *Securities Lending Agreements*: A securities lending agreement is similar in concept to a DVP repurchase agreement, albeit different in legal form. In addition, either cash or a security can be given to a counterparty to provide collateral for the borrowed security.[19] In the latter case, the title and voting rights for the "collateral" security is usually not transferred, although it could be transferred. Custodians have told us that, in contrast to the situation with DVP repurchase agreements, they are almost always aware of the nature of positions arising from securities lending agreements. We do not know if the end-investors are always aware of the specific securities lent or used as collateral.

c. *Tri-party Repurchase Agreements*: Repurchase agreements are often carried out on a "tri-party" basis. In this case, a single custodian is responsible for managing the custodial arrangements for both parties to the repurchase agreement, as is shown in **Figure 8**. In a tri-party repurchase agreement, the (single) custodian for both parties will know that the positions result from a repurchase agreement and that the parties have an obligation to engage in the reverse side of the transaction upon expiration of the repurchase agreement. The custodian will also know whether the security acquirer has the security in its account, which is the usual case.[20] We do not know whether end-investors' reporting systems can identify exactly which securities have been lent under tri-party repurchase agreements. The BMA estimates that U.S. residents engaged in tri-party repurchase agreements with U.S. and foreign residents totaling about US$ 1.4 trillion in June 2004.

d. *Central Counterparty (Multilateral Clearing) Repurchase Agreements*: Repurchase agreements can also be carried out using a central counterparty. (The use of a central counterparty is often called "multilateral clearing".) By far the largest central counterparty in the United States is the Fixed Income Clearing Corporation, Government Securities Division (FICC). Trades between counterparties are brought to the FICC by the counterparties (or by an interdealer broker). The FICC substitutes ***two new contracts*** from itself, one to each party, for the contract between the two parties (for at least the next day of the contract between the parties). FICC, as the central counterparty, can then engage in a massive netting operation (estimated to be in excess of 80%), reducing costs and counterparty risk. With custodial reporting, the reporting implications for repurchase agreements carried out using a central counterparty are virtually identical to tri-party repurchase agreements, as the central counterparty has full knowledge of the transactions and the securities typically remain overnight with the central counterparty.[21]

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[19] See http://www.isla.co.uk/sl_fundamentals.asp

[20] The original owner may have an additional "primary custodian" which delivers the security to the tri-party custodian. Less commonly the acquirer may have an additional custodian that takes delivery of the security. These extra flows may affect the information available to custodial (or end-investor) reporters.

[21] In addition, for the U.S., the central counterparty typically deals almost exclusively with domestic residents.

Section 4: Limited information situations

A. Single custodial arrangements

4.1 Conversations with reporters indicate that U.S. custodians generally are aware of the true nature of almost all securities lending agreements, all tri-party repurchase agreements, all multilateral clearing repurchase agreements, most other collateralized loans including all margin account loans, and many DVP repurchase agreements. Given the probable magnitude of these positions, this is a significant conclusion.

4.2 However, for many DVP repurchase agreements – particularly those carried out by an end-investor, by a broker or dealer that the end-investor does not use as a custodian, or through an electronic exchange – there is no reason for the custodian to know that the security was borrowed/lent, as the security could be delivered "free and clear" from the lender's custodian to the borrower's custodian. Other situations might lead to reporters not knowing that a transferred security was, in fact, borrowed. In this section, we build upon Section 2 by dropping the assumption that all reporters have full knowledge of the nature of the transaction leading to a holding (or in the case of a lent security, a "non-holding").

4.3 With custodial reporting, if the custodians do not know that the security was delivered to (acquired through) a borrowing arrangement, a change in reporting to capture overstated liabilities or overstated claims resulting from borrowed securities delivered out will not have an impact, precisely because the custodian does not know that the security was borrowed. Returning to the situations shown in **Figures 1** (liabilities) **and 2** (claims), if Custodian A does not know the security was lent, Investor A's position will (incorrectly) not be reported. If Custodian C does not know the security was borrowed, Investor C's position will (again incorrectly) be reported as a holding. If Custodian B is unaware of the loan nature of both transactions, Custodian B will (correctly) not report. In this case, the net holdings are reported correctly (although for liabilities the country of foreign holder is not).

4.4 However, problems in either direction can arise when one reporter knows of the loan and the other believes that it was a complete transfer. For example, if the reporter for foreign-resident Investor A ***does not*** know that the security was delivered out as part of a borrowing arrangement, but the reporter for foreign-resident Investor C ***does*** know that the security was delivered in under a borrowing arrangement, there is a problem. Holdings of Investor A are understated, but there is no compensating overstatement of the holdings of Investor C. Similarly, if the knowledge position of the reporters is reversed, securities will be double counted. At this time, the direction of bias due to a lack of knowledge of reporters is not known. Custodian B could also misreport in either direction, if it knows of only one of the lending arrangements.

B. Multiple U.S. custodians

4.5 The use of multiple financial intermediaries by investors can affect reporting by limiting the knowledge of custodians, even if the security is lent through a process that normally results in adequate knowledge to the reporters. In **Figure 9**, an example is shown in which a foreign resident, Investor B, borrows a U.S. security from Custodian X and orders delivery to its account at Custodian Y. Custodian Y has possession of the security, but does not necessarily know that it was borrowed. Therefore, quite possibly, Custodian Y will report a foreign holding. However, Investor B does not own the security. Thus, the estimate of U.S. liabilities will be biased upward. This bias occurs even though Custodian X knows the security was borrowed and the security has not been used in a subsequent transaction!

C. Borrowing from a foreign resident

4.6 A possibly common situation is shown in **Figure 10**, in which a foreign Investor B borrows a domestic (U.S.-issued) security from a ***foreign*** custodian (or investor) and sells it short.[22] In this case, the domestic data collection agency will not be able to collect information on either the borrowing by Investor B or the subsequent sale to Investor C. However, this may not be a serious problem for the calculation of domestic residents' liabilities. Although Investor A owns 150 units, the domestic custodian (Custodian A) sees only the 50 units held by the foreign custodian of Investor A. The other 100 units have been delivered out by the foreign custodian to Investor C (or its custodian). Thus, liabilities will be shown correctly, even though the negative position of Investor B cannot be collected and the holding of Investor A is understated.[23]

4.7 The existence of securities lending activities through foreign custodians, however, does provide another source of error in determining the residence of the holder of a domestic security. If Investor B (in **Figure 10**) were to re-lend (rather than on-sell) the security, the domestic Custodian C might not know that the security was borrowed. In this case, Custodian C will overstate the (non-existent) ownership of Investor C. However, this overstatement will offset the understatement of Investor A's position. (The lack of reporting of any position of Investor B is, in this case, correct.) If Investors A and C reside in different countries, however, the country of ownership will be misstated.

4.8 If a domestic resident borrows a domestic security from a foreign investor or custodian and the U.S. custodian for the foreign investor/custodian is unaware that the security is on loan, the understatement of the foreign position will not be offset and domestic liabilities will be understated. However, this error may be offset by domestic residents' loans to foreign residents held at foreign custodians.

4.9 A claims survey may be less affected by a reporter's lack of information of this type than a liabilities survey. When a resident end-investor uses a foreign custodian directly, the end-investor typically will have reporting responsibilities and a lack of information will generally not be a problem. Even if a security held by a resident end-investor is lent by a foreign custodian without the end-investor's knowledge, the end-investor will report (correctly) the ownership of the security. Similarly, a security borrowed without the end-investor's knowledge will be reported correctly (i.e., not at all). If the resident end-investor used a domestic custodian, lending/borrowing by the foreign sub-custodian will certainly not be a problem, as the domestic custodian will continue to show the investor's ownership of the security. However, end-investor arranged loans will continue to be a problem.

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[22] For convenience, the security and cash are shown as going directly to Investor C, but the result would be the same if the flows went to a foreign custodian of Investor C.

[23] In this example, a problem may arise if Custodian A is affiliated with Investor A's foreign custodian. In this case, Custodian A may have knowledge of Investor A's actual holdings. Utilization of this knowledge would, paradoxically, lead to an incorrect total for domestic residents' liabilities, unless it were also possible to capture the on-sale of Investor B (which might be possible, if the Custodian is an affiliate of Custodian A and reports by "looking through" its foreign affiliate). Before designing reporting instructions, this issue would need to be investigated.

Section 5: Possible solutions

A. End-investor reporting

5.1 The reporting of positions by end-investors, rather than by custodians, has been proposed as at least a partial solution to the problems described above.[24] Typically end-investors will know what securities they own. In some cases (e.g., margin loans and indemnified custodial lending arrangements), end-investors may not know the true status of every security. However, even this is not a serious problem. If a custodian of a domestic end-investor lends a foreign security to another person without the end-investor's knowledge, the end-investor will report (correctly) the ownership of the security. Similarly, an end-investor borrower of a security will either know the security was borrowed or will not know of its possession of the security, leading to correct reporting in either case.

5.2 Unfortunately, the direct collection of liabilities data from end-investors is impossible, as these investors, by definition, reside outside the legal jurisdiction of the collection agency. One could estimate foreign holdings of domestic securities by obtaining information on the total amount of securities issued (from issuers or a central securities database) and information collected on the amount held by resident investors (from the end-investors), and subtracting. However, when the volume of securities issued and the quantity of domestic securities held by domestic investors is large (relative to the amounts held by foreign investors), this procedure will be extremely imprecise (as a small number is being estimated from the difference of two large numbers).[25]

5.3 Of course, domestic end-investors would have to be instructed to report short positions (positions borrowed and on-sold), as domestic short positions in domestic securities would need to be added to the amount issued before subtracting domestic holdings, in order to calculate total domestic liabilities to foreign residents. (Foreign short positions could not be gathered, but this defect would affect only the estimate of gross, not net, liabilities). (In addition, domestic end-investors would have to be careful to avoid reporting domestic securities borrowed and re-lent.)

5.4 For an economy with a large number of securities issuers, securities issued, short positions and end-investors, both the reporting burden and the cost to the compilation agency of calculation via subtraction make the procedure very difficult, if not impractical. Also, the process of estimation via subtraction can result in the loss of some valuable ancillary information. For example, U.S. liabilities are currently reported by the type of foreign holder (official vs. other) and by the country of holder. Although this information is known to be extremely imprecise (and biased toward private custodial centers), judging from the interest in these data, they are still felt to be useful for economic analysis.

5.5 For a claims survey, direct end-investor reporting is possible. If end-investor reporting of claims is chosen as the means to ameliorate the issue raised by incomplete knowledge by custodians, the end-investors would have to exclude all borrowed securities and to report their "net economic positions," showing a negative quantity for any securities borrowed and on-sold.

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[24] "In principle, end-investors may provide the compiler with separate information on their repo-type transactions. Thus, the potential distortions these deals could cause to the assessment of portfolio investment mainly affect indirect reporting systems based on custodians …" ECB, Task force on portfolio investment collection systems, June 2002, Paragraph 143.

[25] Even if foreign investors hold large amounts of domestic securities, the estimation of liabilities through end-investor reporting and subtraction could be open to large errors for some securities types. For example, if foreigners hold a large percentage of government-issued securities, but a small percentage of corporate securities, the calculation of foreign holdings via subtraction would yield a very imprecise number for corporate securities.

5.6 Unfortunately, for large countries, which have a large number of end-investors holding foreign securities, the reporting burden, cost, and inherent imprecision associated with surveying numerous, relatively small end-investors makes this procedure both expensive and problematic. In addition, when end-investors have multiple accounts with both positive and negative positions, the reporting burden might be particularly high. End-investors that often do not have sophisticated information technology systems, might simply subcontract the effort to their administrative agents (who might or might not be custodians), resulting in an inefficient, complex process that accomplished little, in terms of obtaining true "end-investor" reporting.

B. Reporting repurchase agreements on a legal ownership basis

5.7 Much of the problem can be "defined away". A large portion of securities borrowing transactions are in the form of repurchase agreements. If the completed leg of each of these transactions were treated in accordance with the corresponding legal structure, each security "delivered in" would be treated just like any other purchased security; each security "delivered out" would be treated like any other sold security. A short sales facilitated by acquiring securities through a repurchase agreement would no longer be considered a negative position.

5.8 If repurchase agreements were treated in accordance with their legal form, reporting burden would be reduced greatly. Firstly, the amount of borrowings would be reduced dramatically, by definition. For example, if the "borrowing chain" example shown in **Figure 1**, were accomplished through repurchase agreements and if each inward delivery were treated as a purchase and each outward delivery as a sale, there would be no borrowing at all. Custodians A and B would have nothing to report and there would be no overstatement of U.S. residents' liabilities. Also, there would be no need for reporters to perform special scans on repurchase agreements delivered or repurchase agreements received. Custodians would merely have to report the amounts actually held for foreign residents.

5.9 Secondly, many of the reporting problems relating to the different and sometimes inconsistent states of knowledge of the various financial intermediaries acting as agents for lenders and borrowers result from the conflict between the legal ownership of securities subject to repurchase agreements and the desired treatment of repurchase agreements based upon economic ownership. If the reporting of repurchase agreements were on a legal ownership basis, these problems would disappear. Each custodian knows and can report exactly how many units of each security it is holding for each investor.

5.10 Arguably, the current treatment of repurchase agreements is a historical artifact. When it was first decided to treat repurchase agreements as collateralized loans, repurchase agreements were very different entities. As stated in the BOPCOM 01/16 discussion, justifying the treating of repurchase agreements as loans:

> The securities often do not change hands, and the buyer does not have the right to sell them. So even from a legal sense, it is questionable whether or not a change of ownership occurs. As a result, in this Manual (and in the SNA and IMF money and banking statistics), a repo is treated as a newly created financial asset that is a collateralized loan rather than an asset related to the underlying securities used as collateral.[26]

[26] BOPCOM 01/16, Paragraph 31.

Also, there is precedent to favor legal form over economic substance. As noted earlier, securities positions are calculated on a settlement date basis, even though the economic substance is transferred on the trade date.

5.11 Transactions facilitated by other types of borrowing arrangements would still be a problem. However, this problem would be much smaller for debt securities (since most debt security borrowings are probably through repurchase agreements). In addition, debt securities borrowed through most other mechanisms (e.g., securities lending agreements) might be relatively easily reportable.

5.12 For equity securities, the use of repurchase agreements may be less common. Fortunately, the problems caused by securities borrowing may be less serious for equities than for debt, both because total loans of equities are likely to be a lower proportion of total positions than total loans of debt securities and because borrowing transactions through securities lending agreements and margin accounts may be more easily reportable. Possibly, data could be collected on equity securities sold short, but this would partially overlap with equity securities borrowed from margin accounts and it would be difficult or impossible to identify the amount of overlap. An alternative possibility would be to use the procedure described in Section C or D below for equity securities, only.

5.13 Perhaps the most serious disadvantage of moving to legal basis reporting of repurchase agreements is that it would result in not collecting data of significant interest to analysts and policymakers: (1) foreigners' economic interests in domestic securities; and (2) domestic residents' liabilities to foreigners, by type of position. Whenever two entities are between "legs" of a repurchase agreement, the calculation of legal basis ownership will attribute the holding of the security (often a very long-term or even equity security) to an investor that only has a short-term (often overnight) position. If the investor subsequently sold the position, legal ownership reporting would result in showing the investor (with very real net liabilities due to its economic short position) as having a neutral position. Similarly, the original investor, which has an economic position in the security, will be treated as not owning the security.

5.14 In addition, if each "leg" of the agreement is treated as an independent contract – which is the essence of legal ownership reporting – it would be inconsistent to show the repurchase agreement as a collateralized loan in the accounts. Thus, loan balances would also be misstated. These problems arise because the parties to the repurchase agreement have agreed not only to engage in a sale, but to a subsequent transaction. If the subsequent transaction were regarded as a contingent arrangement (similar to a trade prior to the settlement date), the economic effect of the arrangement should be ignored. If the subsequent transaction were treated as a futures transaction, a complete, additional data gathering effort would be required, with all of the attendant burden and costs.

5.15 Another disadvantage of treating repurchase agreements on a legal basis is that it puts the accounts further down a "slippery slope" away from economic reality. If repurchase agreements are treated as a sale and purchase, why not treat securities lending agreements (which are a common method of lending equities) in a similar manner? Otherwise, two essentially identical (in an economic sense) transactions would be treated differently. (A securities lending agreement is functionally equivalent to two repurchase agreements, with the cash payment for each agreement matched, i.e. equal and offsetting – a common financial industry practice.)

5.16 In addition, the transition costs of moving to legal basis reporting would be significant for reporters, data compilers, and users. For example, legal basis reporting would result in inconsistencies between historical data and the data collected under the new framework.

5.17 Also, it should be noted that the treatment of repurchase agreements on a legal basis may be inconsistent with end-investor reporting. Earlier it was noted that end-investors might subcontract repurchase transactions to their custodian or to a third party. If this is

done, they may not have accurate records of repurchase agreements on the reporting data in an easily accessible form. If they are to be treated as ***not*** owning securities that they have lent under a repurchase agreement, end-investors may not be able to report properly without excessive burden.

5.18 It has been argued that treating repurchase agreements on a legal ownership basis would move data collection closer to a goal of "one security issued; one holder reported". While this is correct, it is far from clear that this is a desirable goal. As we have seen, market participants can, and often do, hold more securities than have been issued (because some market participants have negative positions in those securities). Therefore, achieving this goal by treating repurchase agreements according to their legal form would move the presentation of the International Investment Position away from economic reality, both in terms of measuring the economic burdens of cross-border liabilities (and the economic benefits of cross-border claims) and in terms of measuring the market, credit, and other risks faced by market participants.

C. Reporting negative positions

5.19 The reporting of negative positions is a relatively inexpensive way to eliminate the double counting that would otherwise result from borrowed securities that have been on-sold. Thus, it could be considered as a partial solution to the problem. However, the recording of negative positions does not resolve the issues associated with borrowing chains. Also, as described in Section 4, limited information situations may reduce the effectiveness of this approach. For example, it may not be easy or even possible for financial intermediaries to identify negative positions that have been facilitated by repurchase agreements (and possibly some other forms of RTs). For debt securities, where the use of repurchase agreements is very common, the problem may be a fatal one for this approach. However, for equity securities, the recording of negative positions may be a useful step, if a more comprehensive solution to the problems raised in this paper is not feasible on a cost/benefit basis.

5.20 In considering the recording of negative positions, it is important to recall that the recording of negative positions is a partial substitute for the recording of borrowings, because negative positions arise from selling a borrowed security. As explained in Paragraph 2.23, if one captures the negative position, it would be "double counting" to capture the borrowings and subtract both borrowings and negative positions from aggregate positions held or lent.

D. Collection of data on borrowings and loans – a simple approach

5.21 In terms of obtaining an accurate measure of net positions, the current system has both: (1) a theoretical issue (that securities borrowed and on-sold are not reported); and (2) a practical issue (that some securities which are borrowed and lent are likely to be reported incorrectly, a situation that may be difficult or impossible for reporters to remedy).

5.22 In **Table 1**, three data collection options are shown. In the first column, the current U.S. data collection system is described. The second column shows how that system would be modified if negative positions were to be collected, in line with likely changes to international standards. This approach eliminates the theoretical issue (although possibly not completely, as a security borrowed under a repurchase agreement and then sold may not be able to be captured as a "negative position"), but not the practical issue. In the third column, an alternative approach is shown: collecting data on all securities held or lent and, separately, data on all securities borrowed. This approach would eliminate the theoretical problem and ameliorate much of the practical problem. With these two position types there would be no need to report negative positions, as net positions could be calculated directly from the collected data, as:

Net Positions (Securities Owned) = Securities Held or Lent – Securities Borrowed

Further, this would be accomplished without a need for reporters to track the provenance of individual securities (as they would have to do if they tried to report securities lent excluding the ones that had been borrowed, as the current instructions could be interpreted to require).

Table 1

Simple system for collecting data on position types

Current data collection	Data collection with negative positions reported	Data collection with borrowed positions reported
A mix of: (a) securities held (but not borrowed) plus securities lent; and (b) securities held or lent (but not borrowed)	A mix of: (a) securities held (but not borrowed) plus securities lent; and (b) securities held or lent (but not borrowed)	Securities held or lent
No other reporting	Negative positions (positions borrowed and sold)	Securities borrowed

Source: compiled by author.

5.23 In theory, the two position types need not be reported separately, as "securities borrowed" could be subtracted from securities held or lent by reporters. (Of course, negative positions would sometimes be reported.) However, in order to maintain data quality, and also to provide useful information on the borrowing of securities, it might be useful to ask for the two position types to be reported separately, with the subtraction performed by the data compiler.

5.24 With full knowledge, the above calculation will provide an accurate measure of net positions owned. For example, in the borrowing chains situation, as shown in **Figures 1 and 2**, Custodian A would report Investor A's loaned security, as before. Custodian B would report both a borrowing and a loan to Investor B, correctly showing a net zero position. Custodian C would report both a holding and a borrowing for Investor C, correctly showing a net zero position. With full reporter knowledge, the net positions arising from short sales of borrowed securities would also be captured correctly. In **Figure 3**, Custodian B would report a borrowing only (effectively showing – correctly – a negative position), and Custodians A and C would correctly show a positive position.

5.25 Even in some limited information situations, the reporting of two position types would eliminate some biases in the collection of positions data. For example, in the multiple custodian situation shown in **Figure 9**, it will be beneficial for the custodian acquiring the security and delivering it out (Custodian X) to report a negative position for Investor B, ***even though there is no subsequent loan or on-sale***. Custodian Y can then safely report the security as being held for Investor B, without worrying about how it was acquired. The result will be a net zero position for Investor B's country, exactly the result desired. Thus, it appears that collecting data on borrowings may ameliorate some of the problems in data collection that arise due to the use of multiple financial intermediaries, even without the complications caused by borrowing chains or short sales.[27]

[27] It could be argued that this bias is not serious, because it is offset by a downward bias that occurs when a foreign resident lends a security. However, a net bias toward the overestimation of domestic liabilities is likely for the U.S. U.S. liabilities due to repurchase agreements are over US$ 850 billion, while U.S. claims due to resale agreements are only about US$ 520 billion. Also, it is likely to be more common for investors to use multiple intermediaries when acquiring a security (because the investor has an asset to protect) than when the

5.26 In other limited information situations, this approach of offsetting calculations will not work as well. For example, if Custodian Y is aware of the borrowing, the reporting of a negative position by Custodian X will bias the estimate of U.S. liabilities downward unless Custodian Y can program its system to ignore that knowledge. Given the multiplicity of custodial relationships, the ability of reporters to identify alternative situations and resolve them with unique reporting needs to be investigated further.

5.27 In the area of single custodian arrangements, a lack of knowledge of the borrowing remains a problem. For example, in **Figure 1**, with limited information, one or more custodians will not be able to report correctly. In the best case, Investor A's U.S. custodian will (incorrectly) fail to report Investor A's holding, but the units acquired by Investor B will not be reported either, resulting in offsetting errors. However, the proposed reporting of the negative positions of Investor B could worsen the situation, if, for example, the custodian for Investor B knows of the borrowing but the custodian for Investor A does not. Fortunately, this may not be a common situation, as it requires a foreign resident[28] to lend U.S. securities through a U.S. custodian, without the custodian's knowledge, to a second foreign resident whose custodian does know of the borrowing.

5.28 This solution would also provide information on the extent to which domestic securities are borrowed by foreign residents and foreign securities are borrowed by domestic residents, information which would be useful for policy analysis and for data compilation and verification. A comparison of positions held and positions borrowed might also provide an indication of short sale activity. (However this would be, at best, a minimum indication, as the positions of multiple end-investors will be aggregated. By contrast, the direct reporting of negative positions would provide clear information on short sales.)

5.29 The solution is not, however, costless. Reporters would have to report some securities twice. This would be a particular burden for reporters (e.g., brokers) that may have segregated accounts for securities borrowed and re-lent. (Currently, these securities need not be reported at all.) The extra reporting would be a particular burden for liabilities surveys (at least for the United States), which already require each security to be reported across a geographic (country for the U.S.) distribution and a holder-type distribution. Some, but not all, of the extra reporting burden could be eliminated by providing an exemption from reporting for securities that are in segregated accounts and are known to be borrowed and re-lent.

E. Collection of data on borrowings and loans – More complex approaches

5.30 If the possibility of expanding the international investment surveys to cover position types is considered, it may make sense to cover more than two position types, particularly for claims surveys. For example, a system with three "position types" for each security could be defined as follows:

- *Securities held* – securities held in custody
- *Securities lent* – securities due to be returned under any type of lending agreement (including a reverse transaction)
- *Securities borrowed* – securities obtained through any type of borrowing agreement (including a reverse transaction)

Positions owned by residents and by non-residents can then each be calculated as:

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investor lends the security. Finally, when the investor is lending the security and multiple intermediaries are used, it may be possible to obtain correct reporting from the third party lender.

[28] If Investor A were a U.S. resident, Custodian A would not be reporting in either case.

Securities Owned = Securities Held + Securities Lent – Securities Borrowed

5.31 Under this scheme, reporters would have to identify securities lent, a category of securities that is now not reported. Since there are many types of lending arrangements and several involve a large amount of securities, the burden may be significant. Compilation costs will also be greater, as the data for the three types of positions will have to be collected, reported separately (at a minimum for internal review purposes), and combined. However, this would provide clear information on securities borrowing and lending.

5.32 Many other frameworks could also be considered. For example, there is a great deal of analytic interest in repurchase agreements and other reverse transactions, as we have very little information on the extent to which the securities involved in these transactions are reported correctly. Also, some people would like to know how positions would look if repurchase agreements (or all reverse transactions) were treated on a legal ownership basis. Therefore, it might make sense to consider these positions separately. The following scheme describes four types of positions:

- Securities held or lent not using an RT
- Securities delivered out under an RT
- Securities received under an RT
- Securities borrowed not using an RT

5.33 If these positions were collected on a security-by-security basis, with an indicator for each position type, positions by security could be calculated as:

Securities held (or lent not using an RT) + Securities delivered out under an RT – Securities received under an RT – Securities borrowed not using an RT

This calculation would provide, to the extent possible, a good estimate of positions on an economic basis. Positions with RTs on a legal ownership basis could be calculated as:

Securities held (or lent not using an RT) + Securities received under an RT – Securities borrowed not using an RT

5.34 The reporting burden under this framework would be significantly greater than at present or under the two- or three-position-type systems described above. However, the additional burden might not be too great, as reporters would probably be able to distinguish reverse transactions from other types of borrowing arrangements fairly easily.

Section 6: Next steps

A. Seriousness of the problem

6.1 The first step is to identify the significance of the issues. At this point, it is known that borrowings are extremely significant. However, more information is needed on the borrowing mechanisms used, the likely counterparties and custodians in each case,[29] and the magnitude of cross-border borrowing/lending positions. Multi-national financial institutions clearly engage in large amounts of these activities. However, the term “foreign” in trade reports is often on a nationality rather than a locational basis. For example, if a foreign institution with a U.S. presence borrows a U.S. security, the borrowing may be housed in the

[29] For example, margin account collateralized borrowing may be exclusively through brokerage accounts. In this case, the broker is likely to always be the borrower and probably has full information on the transactions. However, the common mechanisms for the broker’s offsetting transactions may vary.

U.S. branch or subsidiary, resulting in no cross-border impact on securities holdings (although there could be an intra-company loan to fund the operation).

6.2 The extent to which borrowed securities are subject to subsequent transactions must also be determined. We know that, in many cases (particularly for equity securities and debt securities with a premium borrowing rate), the primary purpose in borrowing a security is to be able to re-lend or on-sell it. However, these cases may only be the "tip of the iceberg". Also, information is needed on the extent to which the use of multiple custodians is leading to excess reporting.

B. Current reporting practices

6.3 Additional information is also needed on current reporting practices. For example, more information is needed on how reporters currently treat securities that have been borrowed and: (a) held; (b) re-lent; and (c) on-sold. For example, are borrowed securities under the various types of arrangements in segregated accounts? Since the answer may depend upon the type of security and the type of borrowing, this information will also have to be gathered for each major security type and each major borrowing mechanism. (To answer these questions, it may be necessary to gather information from large end-investors as well as custodians.) In addition, other information about specific types of borrowing arrangements needs to be gathered/confirmed. For example, when securities are borrowed from a "pool," can the loan be attributed to specific customers?

C. Ability to obtain the data

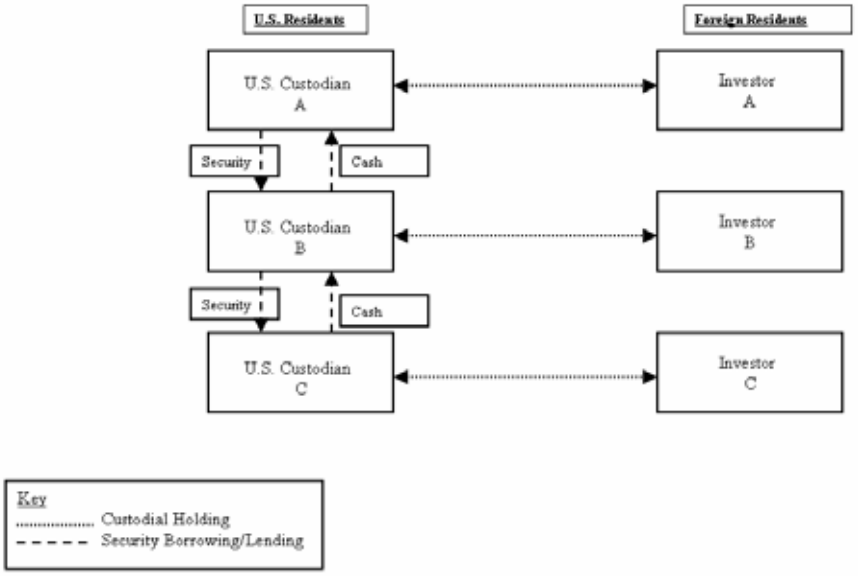
6.4 The ability of reporters to provide information for each of the proposed solutions that are being considered must also be investigated, in order to learn if reporters will have adequate information to substantially reduce current biases resulting from securities borrowing activities. For example, for each type of borrowing arrangement, are borrowed securities and lent securities able to be identified by custodians? How easy would it be to report negative positions, including negative positions that result from the various types of reverse transactions? Do the answers vary by type of security?

Appendix A:
Summary of selected typical margin account terms

XXX can loan securities held in your margin account that collateralize your margin borrowing. In connection with the extension or maintenance of margin credit, XXX may loan securities in your margin account to itself or to others. As a result of these loans, you may not be entitled to receive certain benefits of a securities owner, such as the ability to exercise voting rights and/or receive interest, dividends, and/or other distributions with respect to the securities lent. While a security in your account is lent, you may only be allocated and receive substitute payments in lieu of such interest, dividends, and/or other distributions. Substitute payments may not be afforded the same tax treatment as actual interest, dividends, and/or other distributions, and you may incur additional tax liability for substitute payments that you receive. XXX may allocate substitute payments in any manner permitted by law, rule, or regulation, including, but not limited to, by means of a lottery allocation method. You are not entitled to any compensation in connection with securities lent from your account or for additional taxes you may be required to pay as a result of any tax treatment differential between substitute payments and actual interest, dividends, and/or other distributions.

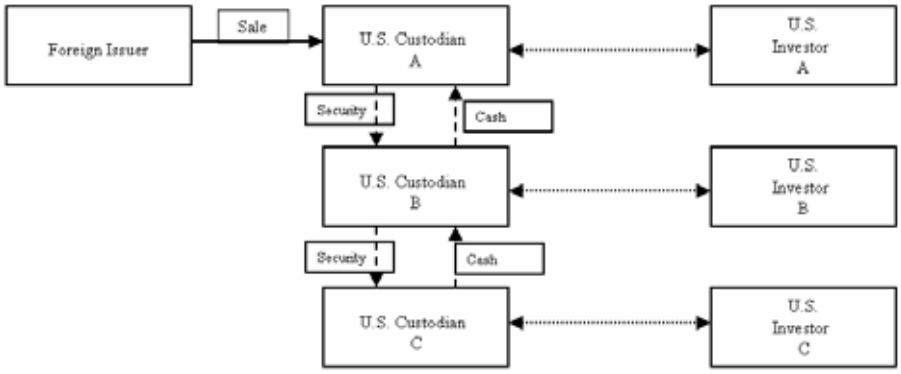
Appendix B:
Figures

Figure 1
A Foreign Resident Borrows and Re-Lends a U.S. Security
(All Custodians are U.S. Residents and All End Investors are Foreign Residents)



Source: Compiled by author.

Figure 2
A U.S. Resident Borrows and Re-Lends a Foreign Security

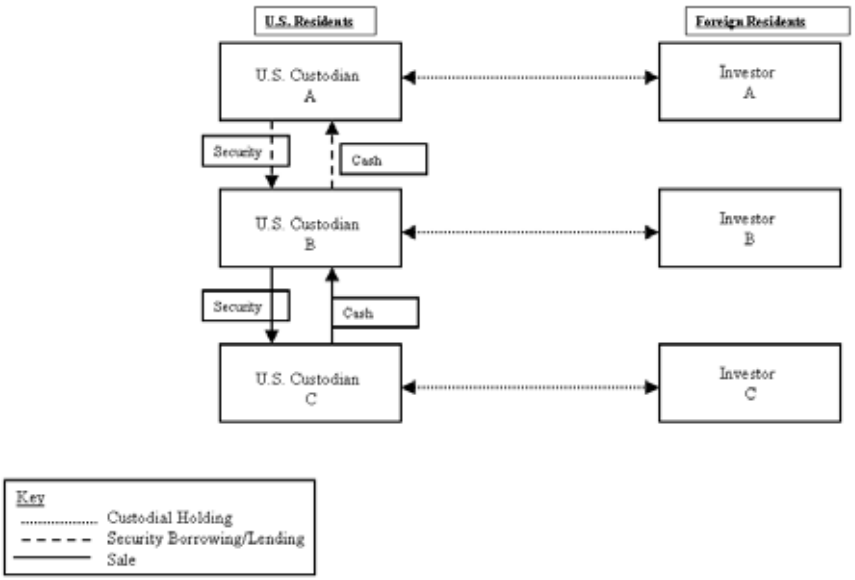


Source: Compiled by author.

Figure 3

A Foreign Resident Borrows and Sells "Short" a U.S. Security

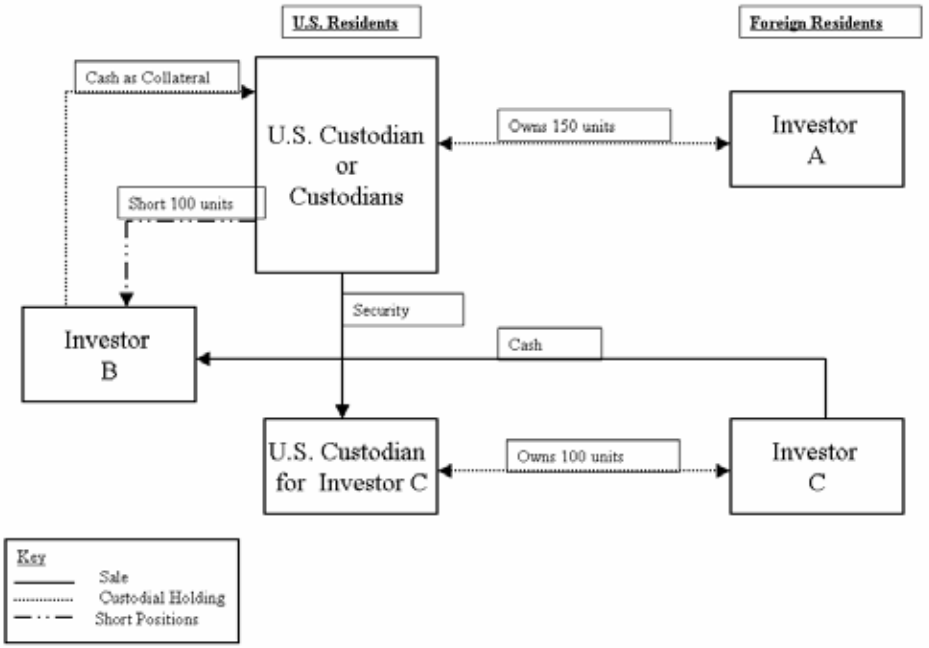
(All Custodians are U.S. Residents and All End Investors are Foreign Residents)



Source: Compiled by author.

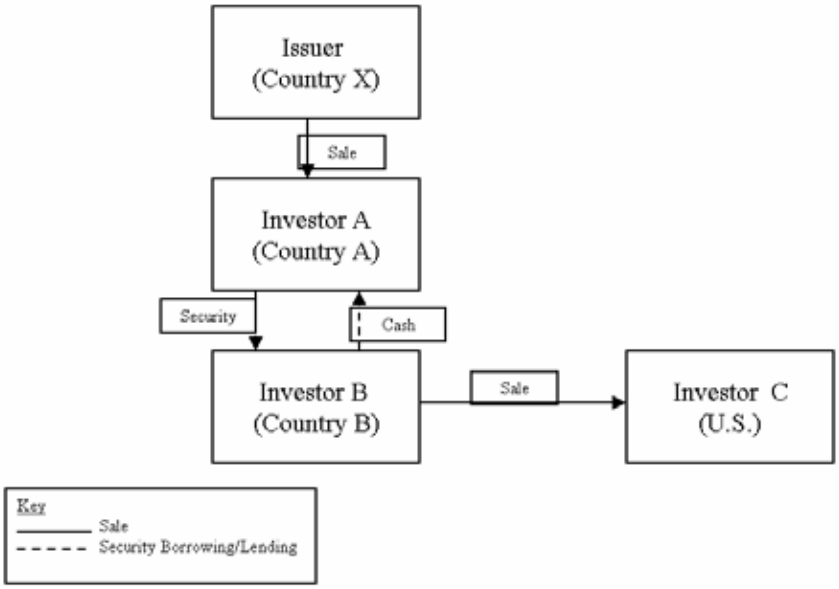
Figure 4

A Short Sale of a U.S. Security by a U.S. Resident



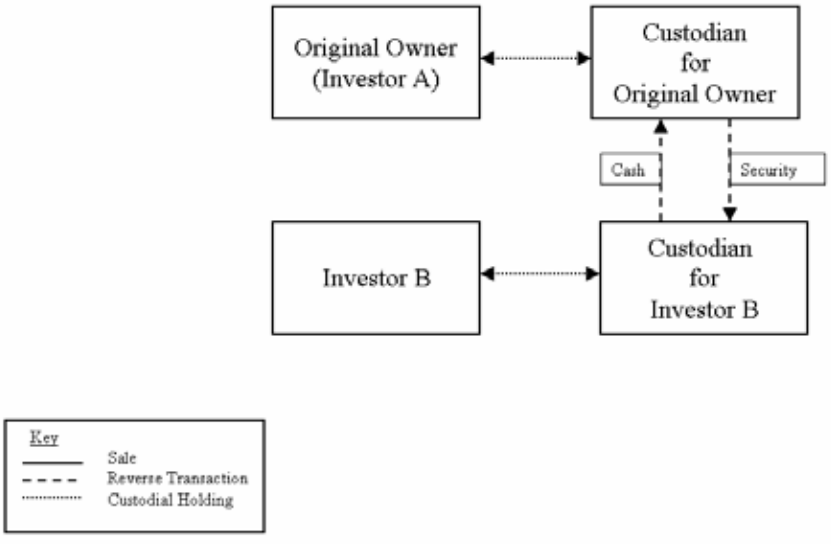
Source: Compiled by author.

Figure 5
A Multinational Borrowing and Short Sale Chain



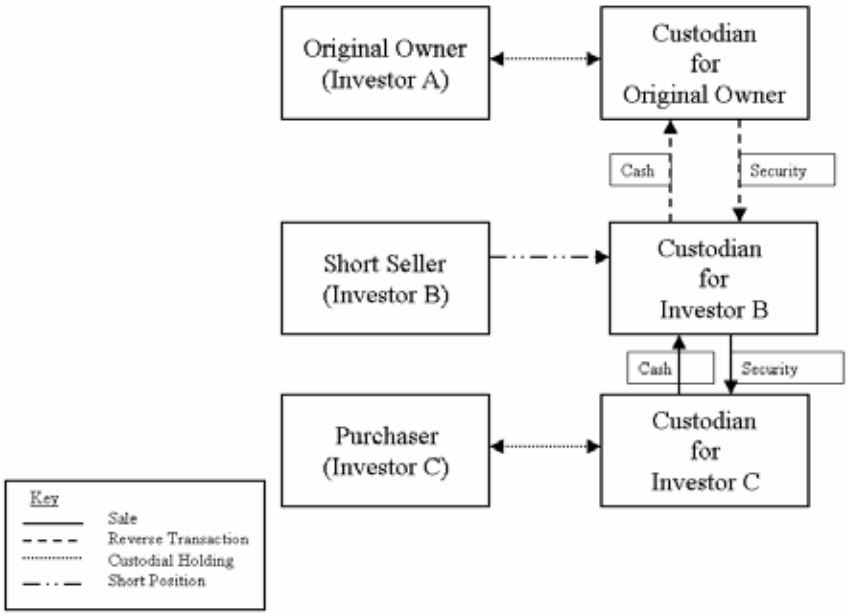
Source: Compiled by author.

Figure 6
A Typical "Delivery vs. Payment" Reverse Transaction



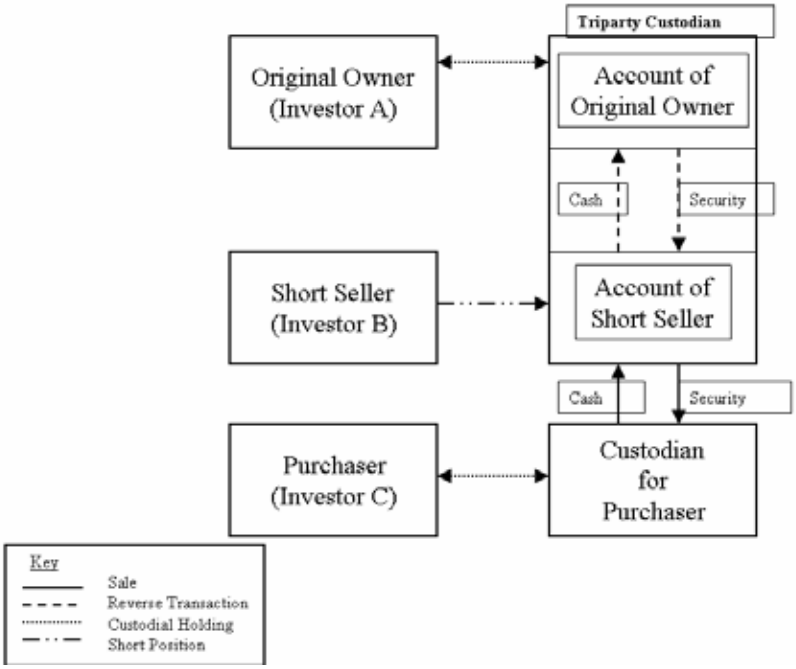
Source: Compiled by author.

Figure 7
A Typical Short Sale Using a "Delivery vs. Payment" Reverse Transaction



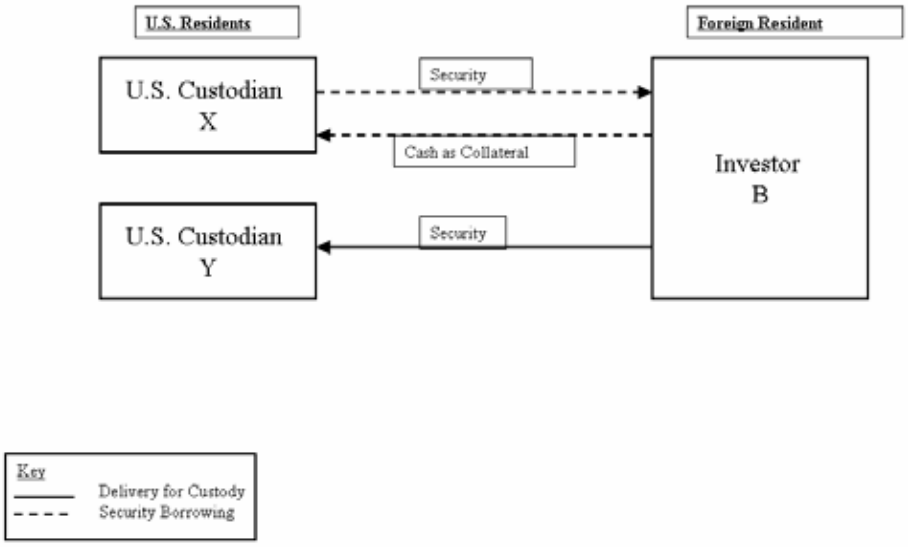
Source: Compiled by author.

Figure 8
A Typical Short Sale Using a Tri-party Repurchase Agreement



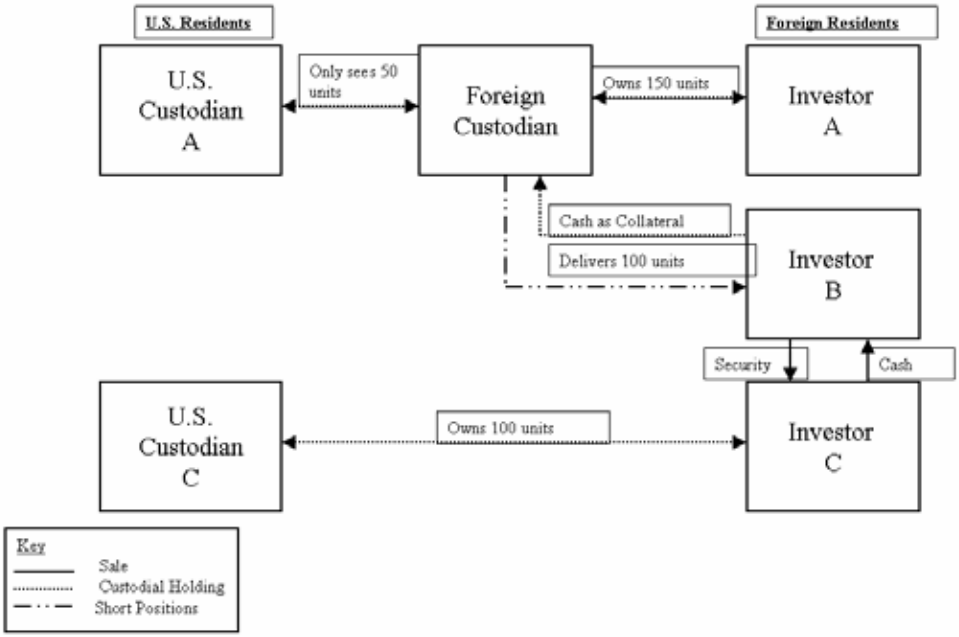
Source: Compiled by author.

Figure 9
A Borrowed Security When the Investor Uses Two U.S. Financial Intermediaries



Source: Compiled by author.

Figure 10
A Short Sale Conducted Through a Foreign Custodian



Source: Compiled by author.

Discussion comments on session IPM84: Measures of flows and stocks in financial accounts

Kazuhiko Ishida

Since the topics of the four papers in this session are so wide-ranging, I will try to relate them to each other as much as possible, and to pinpoint certain common issues. The best starting point for this purpose is the first paper, "Money, financial investment and financing", which proposes a "three-dimensional framework" – ie a breakdown of various financial transactions by financial sectors, assets and liabilities. In addition to the monetary analysis proposed by the author, the framework can be applied to analysis of financial accounts more broadly. However, the most important problem with the proposed framework would be the difficulty of collecting the huge amount of data needed. The other three papers can be seen as addressing this difficulty from different points of view.

The second paper, "Borrowed securities: implications for measuring cross-border portfolio investment", points out the difficulty of measuring investors' securities holdings. The author argues that, given the very common practice of lending and short-selling securities, double counting of securities holdings could easily occur, leading to overestimation of holding positions on a macro level. If these overstated figures are put into the "three-dimensional framework", they will cause significant inconsistencies. The author argues for enhancing data collection to avoid double counting. Although I fully agree that additional data would improve the accuracy of statistics, it is questionable whether such an increase in reporting burdens would be accepted.

The third and fourth papers deal with a very similar topic: how to measure the value of shares or equities of small to medium-sized firms. Since such firms continue to play a significant role in many economies, it is very important that the value of their shares or equities be measured accurately for purposes of the "three-dimensional framework". These two papers, however, take totally different approaches to the problem.

The third paper, "Measuring the market value of shares and other equity: from sample to population", attempts to make full use of the existing sources of corporate data and find the best way of estimating the total population figures. The paper's main argument is that, although each database alone is quite limited in the number or nature of its samples, combining them properly can be a very plausible way of estimating the total population. Since the data collected from firms tend to be reasonably reliable and stable, it may not be surprising that making full use of them leads to improved estimations.

Taking a different approach, the fourth paper, "Measuring the value of micro-enterprises in financial accounts", looks beyond corporate data for sources to use in making estimates. The authors propose three methods, two of which use data from household surveys. The basic idea of the method is to ask households the value of shares of micro-enterprises that they own, and to extrapolate from that a value for the total population. This procedure entails certain risks. Households' valuation of shares may not be as accurate as the assessments by the firms themselves, or by financial institutions. The figures obtained from household surveys tend to be somewhat volatile or unstable. Changes in samples often lead to drastic changes in survey results. Hence, the authors would be well advised to apply the same method to years other than those reported in the paper, and ascertain whether the method can be expected to produce sufficiently stable figures.

Finally, to return to my starting point – the difficulties of collecting the data called for by the "three-dimensional framework" for financial analysis – I would point out that the topics addressed in these three papers represent only some of the difficulties. A large area still remains for future research.

Special Topics Contributed Paper Meeting 01 with International Association for Official Statistics

The recording of pension liabilities in the national accounts

Chair: Richard Walton, European Central Bank

Papers:

General government pension obligations in Europe
Reimund Mink, European Central Bank

An initial assessment of pension entitlements of French households
Dominique Durant and Laure Frey, Bank of France

Pension schemes for (semi-)government employees in the Netherlands – a national accounts perspective
Henk Lub, Netherlands Bank

The recording of unfunded pensions of employees of Australian governments in government accounts and economic statistics
Peter Harper, Australian Bureau of Statistics

Fiscal policy and pension expenditure in Portugal
Cláudia Rodrigues Braz, Bank of Portugal

Chairman summary on session STCPM01: The recording of pension liabilities in the national accounts

Richard Walton[1]

Mr Reimund Mink's (ECB) paper described the economic consequences of ageing as they relate to the pension obligations of European governments, and the progress that has been achieved in the current revision of the system of national accounts in terms of recording pension obligations. Based on work carried out in Europe, the paper took a fresh look at the measurement of implicit pension obligations, which are not recognised in the present system of national accounts. A new presentation would enable users to have a dataset of macroeconomic variables that included all government pension obligations and all household pension "assets". The paper dealt with the dynamics of government-sponsored pension schemes in Europe, most based on the pay-as-you-go principle, whereby current contributions finance current benefits. The paper first examined the ageing of the population in Europe and demographic projections by country. Secondly, it described what we know about the institutional context of pension schemes in Europe. Finally, it discussed progress made, to date, on new statistics dealing with general government pension obligations in Europe.

Mr Henk Lub (Senior Economist of De Nederlandsche Bank) also spoke about the effect of the new rules on national accounts, on the Dutch pension system and on administrative decisions regarding transactions in pension liabilities, with respect to measuring a government's deficit or surplus and measuring government debt. The paper discussed the European national accounts approach to the recording of pension funds, in relation to the criteria for measuring the deficit/surplus of governments in Europe. It also provided clear insight into the features of the Dutch pension system and the changes that have been made to address the consequences of ageing. The Dutch pension system has some special characteristics, the most striking of which is the large share of funded pension schemes, for which government employees are also eligible. Recently, a number of changes, including greater dependence on average pay pensions, have been introduced in order to help the pension system cope with the ageing of the Dutch population. The paper briefly described both structural aspects of the situation and recent changes, focusing on the treatment, in the national accounts, of pension schemes for (semi-) government employees. It also covered the proposed changes in the revised version of the 1993 SNA, and Eurostat's decisions on transactions in pension liabilities with respect to EDP notifications.

Ms Dominique Durant (Head of the Financial Accounts Division of the Bank of France) presented model calculations (referred to in Reimund's paper) designed to provide initial estimates of French social security pension liabilities, allowing for a new assessment of pension entitlements and providing a fascinating comparison of the savings and wealth of French and American households. Following an institutional review of the two countries' pension schemes, statistics were compiled showing that French households hold more real estate and implicit pension assets, while American households hold more financial assets. After taking implicit pension assets into account, the savings rate among French households is dramatically higher, with French households saving more than their American counterparts

[1] ECB.

despite the fact that funded pension schemes play a larger role in the United States than in France. Given that the assumptions associated with different estimates of pay-as-you-go pension entitlements are highly significant, one must be cautious in drawing conclusions. However, these entitlements may be estimated to represent approximately 50% of French households' total assets, as compared with 30% for real estate.

Mr Peter Harper (Deputy Australian Statistician of the ABS) welcomed the enhanced treatment of unfunded pension liabilities in the updated system of national accounts. As Peter pointed out, Australia has in fact been recording government's unfunded pension liabilities as actual government liabilities since 1998. The boundary between social security and government employee pension schemes was not at issue. The paper provided a valuable review of the data available for actuarial estimates of unfunded employee pension schemes, and an assessment of the harmonisation achieved by the ABS with regard to public accounts and official government finance statistics. The paper described how unfunded pension funds are recorded in Australia's macroeconomic statistics, and discussed the availability of data from government accounts, as well as the question of what data would be required to estimate liabilities for unfunded schemes and associated flows, if the information were not available from government accounts.

Ms Cláudia Braz (Head of the Public Finance Unit, Bank of Portugal) explained in her paper on *Fiscal Policy and Pension Expenditure in Portugal* that, at the beginning of 2007, legislation reforming the general social security system was passed, and that this is expected to substantially reduce the long-term risk that, without extraordinary measures, public finances will be unsustainable.

Discussion centred on international comparability, calculations, methodology, dynamics of institutional arrangements, and a strong plea by the IMF that employee pension schemes be recognised as government liabilities.

General government pension obligations in Europe

Reimund Mink[1]

1. Introduction

The population of Europe is ageing. This is not a new phenomenon, but a process common to almost all developed, and most developing, countries. At the beginning of the twentieth century, barely one in ten citizens living in Europe was over the age of 65, compared to more than two out of every ten today. Although population ageing is likely to accelerate over the next 50 years, with three out of ten people being over 65 by 2050, we should recognise that this represents the continuation of a long-term trend rather than an abrupt break with the past.[2]

This ageing process is driven essentially by two separate forces: (i) increasing longevity; and (ii) women's decreasing fertility. Having increased by eight years since 1960, *life expectancy at birth* is projected to rise in the euro area by a further six years for males and five years for females by 2050, with most gains resulting from lower mortality rates at older ages. However, the low *fertility rates* are generally regarded as the main factor in the ageing of the population. In all euro area countries, fertility rates are below the natural replacement ratio (approximately 2.1 children per woman) at which the size and age structure of the population remain stable.

Section two of this paper describes the ageing of the population in Europe and its economic consequences. In section three, it further analyses the economic consequences in relation to the increase in future pension obligations incurred by general government. Such implicit pension obligations are accumulated predominantly by general government-sponsored employer pension schemes and social security pension funds, which are usually organised on the pay-as-you-go principle, whereby current contributions finance current benefits. So far, no obligations have been recorded for such schemes in government finance statistics or in national accounts. However, progress has been made towards recording such pension obligations in the system of national accounts. These new developments are discussed in section four, while section five describes some issues related to the measurement of implicit pension obligations.

2. Ageing in Europe and its economic consequences

Given the overall demographic trends, Eurostat projects, for instance, that Germany's population will shrink from 83 million people to just 78 million, and Italy's from 58 million to 54 million (see Table 1).

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[1] Reimund Mink, European Central Bank, Kaiserstrasse 29, D 60311 Frankfurt am Main. E-mail: reimund.mink@ecb.int. The views expressed in this paper are those of the author, and do not necessarily reflect the views of the European Central Bank.

[2] The forecasts are part of the report on *The impact of ageing on public expenditure*, published by the European Commission in 2006.

Table 1

Demographic projections for the euro area, the UK and the US

	Population (millions)			Working age population, 15–64 years (millions)			Retirement age population, 65+ years (millions)			Number of workers supporting each retiree		
	2005	**2050**	**change**	**2005**	**2050**	**change**	**2005**	**2050**	**change**	**2005**	**2050**	**change**
Belgium	10	11	4	7	6	–8	2	3	65	3.8	2.1	–1.7
Germany	83	78	–6	56	45	–19	15	23	51	3.7	1.9	–1.8
Greece	11	11	–4	8	6	–22	2	4	76	3.8	1.7	–2.1
Spain	43	43	0	29	23	–22	7	15	109	4.1	1.5	–2.5
France	60	65	8	39	37	–5	10	17	74	4.0	2.2	–1.8
Ireland	4	6	34	3	3	14	1	1	214	6.1	2.2	–3.9
Italy	58	54	–7	39	29	–24	11	18	61	3.5	1.6	–1.9
Luxembourg	1	1	42	0	0	10	0	0	87	4.8	2.8	–2.0
Netherlands	16	18	8	11	11	–4	2	4	88	4.9	2.5	–2.4
Austria	8	8	1	6	5	–14	1	3	90	4.4	1.9	–2.5
Portugal	11	10	–4	7	6	–22	2	3	82	4.0	1.7	–2.3
Finland	5	5	0	4	3	–13	1	1	71	4.3	2.1	–2.1
Slovenia	2	2	–5	1	1	–24	0	0	97	4.7	1.8	–2.9
Euro area	**310**	**308**	**–1**	**208**	**174**	**–16**	**54**	**94**	**72**	**3.7**	**1.9**	**–2.0**
UK	60	64	7	40	38	–4	10	17	65	4.1	2.2	–1.9
United States	*298*	*395*	*32*	*200*	*245*	*23*	*37*	*82*	*122*	*5.4*	*3.0*	*–2.4*

Source: European Commission, *The impact of ageing on public expenditure*, 2006.

For several European countries, slight population increases are also forecast, suggesting that the euro area population will start to shrink in absolute terms in about 20 years, though remaining nearly unchanged in 2050. The old age dependency ratio will have reached almost 55% at that time, however, as compared with 27% in 2005 – a situation that will contribute to destabilising the age structure. In contrast, the US population is projected to increase from 300 million to nearly 400 million people over the same period of time.

Ageing in Europe will have important economic consequences. The "slow burn" nature of the demographic changes implies that their immediate effects are likely to be moderate. The effects include changes in the size and composition of labour supply, as the proportion of older workers increases and fewer new workers enter the labour market to replace those leaving it. Under the assumption of unchanged labour utilisation and labour productivity growth, demographic trends imply a decline in real GDP growth from its average 1995–2005 level of 2.1% to around 1% by 2050. Real GDP-per-capita growth will also decline.

3. Impact of ageing in Europe on general government pension obligations

Population ageing will also put acute pressure on general government financing, by driving ageing-related expenditure, as the ratio of pension recipients to pension contributors will rise. In this context, the new Code of Conduct of the European Stability and Growth Pact incorporates guidelines on national strategies to ensure the sustainability of government finances, especially in the light of the economic and budgetary impact of ageing populations.

The most important data set, at present, concerns the results of long-term budgetary projections for all EU Member States' expenditures for pensions, health care, long-term care, education, and unemployment transfers during the 2005–2050 period, as presented in the Commission study mentioned above. Concerns about this are spreading, based on a growing recognition amongst policy-makers that ageing populations will constitute major economic, social and budgetary challenges for the European economies in the coming decades.[3]

According to these projections, the ageing of Europe's societies will impose extra costs. The Commission study calculates that, absent any reform, the demographic change will cause a cumulative increase of more than 3 percentage points in pension expenditures, as a percentage of GDP, for most euro area countries. For the euro area as a whole, the expenditure will increase by 2.6% of GDP, reaching 14.1 % of GDP in 2050.

Increasing pension expenditures have an adverse impact on the pension obligations incurred by general government, especially in Europe. General governments manage pension schemes for large portions of the population, usually based on the pay-as-you-go principle. All euro area countries except the Netherlands, have pension schemes sponsored by general government in the form of social security pensions or defined benefit employer pension plans (eg those for civil servants).

Estimates in the literature highlight the importance of general government pension obligations. Studies conducted ten years ago using the accrued-to-date liabilities concept found general government pension obligations ranging from 70% of GDP for the United Kingdom to 350% of

[3] European Central Bank, Demographic change in the euro area: projections and consequences, Monthly Bulletin, October 2006.

GDP for Italy.[4] While different methodologies and assumptions, notably with regard to discount rates, have a very sizeable impact on the results, the estimates show that these pension obligations generally exceed the stock of outstanding general government debt.

The Commission study points to ageing-induced fiscal burdens equal to an increase of infinite-horizon budgetary cost of more than 4% of GDP for over half of the euro area countries, reaching around 8% for some countries. The conversion of these flow data into a net present value at a discount rate of 5% yields burdens for the euro area of 174% of GDP in 2005. A lower discount rate of 3% increases this figure even further, to 217% of GDP (Table 2).

Table 2

General government pension expenditure and estimated implicit pension obligations

As a percentage of GDP

Country/area	General government pension expenditures			Estimated implicit general government pension obligations[1]					
				Discount rate 5% p.a.			Discount rate 3% p.a.		
	2005	2050	Change (p.p.)	2005	2050	Change (p.p.)	2005	2050	Change (p.p.)
Belgium	10.4	15.5	+5.1	165	201	+35	208	253	+45
Germany	11.1	13.1	+2.0	166	181	+16	207	228	+21
Greece	–	–	–	–	–	–	–	–	–
Spain	8.7	15.7	+7.0	147	194	+47	186	246	+60
France	12.8	14.8	+2.0	190	206	+16	237	259	+22
Ireland	4.6	11.1	+6.5	87	129	+42	110	164	+54
Italy	14.3	14.7	+0.4	207	213	+6	257	267	+10
Luxembourg	10.0	17.4	+7.4	167	217	+50	211	274	+64
Netherlands	7.4	11.2	+3.5	118	144	+26	149	182	+34
Austria	13.2	12.2	–1.0	187	184	–3	232	230	–2
Portugal	11.5	20.8	+9.3	195	257	+62	246	325	+80
Finland	10.4	13.7	+3.3	160	184	+24	200	231	+31
Slovenia	11.0	19.3	+8.3	181	230	+49	228	291	+63
Euro area	**11.5**	**14.1**	**+2.6**	**174**	**193**	**+20**	**217**	**243**	**+26**
UK	*6.7*	*8.6*	*+1.9*	*102*	*116*	*+14*	*128*	*146*	*+18*
United States	***4.7***	***6.5***	***+1.8***	***68***	***70***	***+2***	***85***	***88***	***+3***

[1] Pension obligations approximated by discounting expected future pension expenditures (with discount rates of 5% and 3% p.a.) under a no–policy–change assumption. See European Commission, *The impact of ageing on public expenditure*, 2006. For the United States, the estimates are based on data for old–age, survivors', and disability insurance benefits and veterans' benefits from government as components of personal income (see www.bea.gov).

Source: European Commission (2006), BEA and author's estimates.

[4] R. Holzmann (2004), World Bank Social Protection Discussion Paper No. 403; R. Holzmann, R. Palacios and A. Zviniene (2004): Implicit Pension Debt: Issues, Measurement and Scope in International Perspective, Washington, D.C.

It should be noted that given the somewhat optimistic assumptions of these calculations regarding labour market developments, the actual burdens could be even higher. Furthermore, these estimates are derived from current and future pension expenditure data, which are not a very reliable predictor of pension obligations. Moreover, other factors, such as the "maturity" status of pension schemes, are equally important. Besides maturity, different demographic ageing patterns may affect results. Other things being equal, a higher old-age dependency ratio increases both pension obligations and expenditure ratios, but differences in future dependency ratios impact pension obligations before translating into higher pension expenditure ratios. Such factors have to be taken into account to appropriately measure pension obligations, as described in section 5.

4. Progress achieved on the method for recording general government pension obligations

The 1993 SNA recognises implicit (unfunded) pension liabilities neither as general government or corporate liabilities, nor as financial assets of households. This is due to the fact that such obligations are not viewed as liabilities in a strict sense, since they can be altered unilaterally at any time. Furthermore, their estimation is highly dependent on a series of assumptions, which are subject to major revisions. Since the liabilities of the schemes are not recorded in the 1993 SNA, their impact on the sector's net lending/net borrowing, as reflected in the SNA, is determined only by the amount paid in pensions to retired employees minus current employee contributions. However, to increase comparability between schemes that record pension liabilities and those that do not, the 1993 SNA proposes to show, as memorandum items, the net present value of such obligations in the form of assets of households and liabilities of the scheme. The IMF's Government Finance Statistics Manual (GFSM 2001) even recommends explicitly recording the liabilities of unfunded government employer pension schemes in the government accounts, but not the liabilities of social security pension funds.[5]

The future treatment of unfunded employer pension schemes sponsored by general government in the new SNA was especially controversial, and revealed major differences of opinion worldwide. The UN Statistical Commission, at its March 2006 meeting, took note of this issue, indicating the need for further consultation, and expressed optimism about finding a solution. Intense discussions followed, especially in Europe. A compromise emerged from the IMF's response, on behalf of the Inter-Secretariat Working Group on National Accounts (ISWGNA), to comments on pensions made by the ECB, and from a September 2006 meeting of the newly established *Eurostat/ECB Task Force on the statistical measurement of the assets and liabilities of pension schemes in general government*. The proposed compromise was circulated in October 2006, for worldwide consultation, to the ISWGNA, as well as to the Advisory Expert Group on National Accounts (AEG). This process led to its approval by the UN Statistical Commission in February/March 2007.

In essence, there is now consensus on distinguishing between pension schemes sponsored by general government, which should be recorded in the core national accounts, and schemes that should be recorded only in a supplementary table on pensions. The updated SNA will include such a new mandatory table showing all flows and stocks of all pension schemes. For the benefit of users of the accounts, all countries will be expected to produce the new table, and it was suggested that this table would be compulsory for all European

[5] R. Mink and P. Rother, The statistical recording of implicit pension liabilities and its impact on household wealth and general government obligations, IFC Bulletin No 25, March 2007.

Union Member States, through the ESA regulation that is due to be revised in the coming years.

According to this compromise, it was agreed that (implicit) pension liabilities of social security pension funds will be recorded only in the proposed supplementary table on pension schemes, and not in the core national accounts. The recommendation of the updated SNA regarding the recording of unfunded pension schemes sponsored by general government for all employees (whether private sector employees or government employees) will be flexible. Given countries' different institutional arrangements, the updated SNA will permit countries to opt for recording only a portion of these pension entitlements in the core national accounts. However, they will be required to provide the rationale and criteria for the distinction between those schemes whose entitlements are carried forward to the core accounts and those whose entitlements are recorded only in the supplementary table. The provision of a set of internationally recognised criteria for this distinction has already been placed on the SNA research agenda, and will also be considered during the revision of the ESA.

Recent work at the Eurostat/ECB Task Force has concentrated on the design of the supplementary table for social insurance pension schemes (Table 3). The overall logic of the table is to present the opening and closing stocks of pension entitlements *for all social insurance pension schemes* (including social security), and the transactions and other economic flows during the period that account for the difference between the opening and the closing positions, thus systematically showing *pension obligations* for all of these schemes. This will facilitate international comparability. It is not intended to include social assistance schemes, though the Task Force was concerned that the current definition of social assistance may not be adequate to deal satisfactorily with all observed cases.

The *columns* of the table are first divided by pension schemes, classified as being either in the core national accounts or not in the core national accounts. Under the compromise, the pension entitlements of all pension schemes sponsored by the private sector are recorded in the core accounts, and only schemes sponsored by general government (ie for government employees) may or may not be recorded as such in the core accounts, thus appearing as separate categories in this supplementary table.[6] Second, the pension schemes classified within the core national accounts are either "sponsored" by a non-general government unit or by a general government unit. Third, the employer pension schemes are further split into defined benefit schemes and defined contribution schemes. The *rows* of the table relate to positions, transactions and other economic flows associated with pension entitlements of schemes included in the table.

One of the main functions of the supplementary table is to provide users with a comprehensive and consistent set of statistical data to facilitate compilation of various alternative key macroeconomic variables such as household wealth, excluding or including (implicit) pension entitlements, savings ratios or general government deficit or debt, excluding or including the impact of (implicit) pension obligations. It also provides information on countries' different institutional arrangements concerning the structure of pension schemes, and explains the distinction between those schemes carried forward to the core national accounts and those recorded only in the supplementary table.

[6] National accounts data for social security pension funds will be recorded only in the supplementary table.

Table 3

A supplementary table on social insurance pension schemes

Core/non-core national accounts		Total	Core						Non-core		Counter-parts:[4] Of which: Non-resident households
Sponsor			Non-general government				General government				
Scheme / Position/transaction/other flow			Total	DC schemes	DB schemes and other non-DC schemes[1]	DC schemes	DB schemes[2]	Of which: Classified in general government[3]		Social security pension funds	
#		A	B	C	D	E	F	G	H	I	J
Opening balance sheet											
1	Pension entitlements										
Transactions											
2	Social contributions relating to pension schemes										
	Employer actual social contributions										
	Employer imputed social contributions										
	Employee actual social contributions										
	Employee imputed social contributions/ property income										
	Self employed and non-employed social contributions										
3	Other (actuarial) accumulations of pension entitlements in social security funds										
4	Pension benefits										

For footnotes, see the end of the table.

Table 3 (cont)

A supplementary table on social insurance pension schemes

Core/non-core national accounts		Total	Core						Non-core		Counter-parts:[4] Of which: Non-resident households
Sponsor			Non-general government				General government				
Scheme / Position/transaction/other flow			Total	DC schemes	DB schemes and other non-DC schemes[1]	DC schemes	DB schemes[2]	Of which: Classified in general government[3]		Social security pension funds	
#		A	B	C	D	E	F	G	H	I	J
5	Change in pension entitlements (rows 2 + 3 – 4)										
6	Changes in pension entitlements due to transfers of entitlements										
Other economic flows											
7	Revaluations[5]										
8	Other changes in volume[5]										
Closing balance sheet											
9	Pension entitlements (rows 1 + 5 + 6 + 7 + 8)										
Related indicators											
	Output										
	Assets held by households[6]										

DB – defined benefit; DC – defined contribution.

[1] Such other non-DC schemes, often described as hybrid schemes, have both a DB and a DC element. [2] Schemes organised for general government employees. [3] These are non-autonomous DB schemes recorded in the core accounts. [4] Counterpart data for non-resident households will only be shown separately when pension relationships with the rest of the world are significant. [5] A more detailed split of these positions should be provided for columns H and I based on the model calculations carried out for these schemes. [6] These assets do not include people's pension entitlements or equity from pension schemes.

Source: CMFB Report on Pensions, February 2008 and draft 2008 SNA chapter 17, section on pensions.

5. Measurement of general government pension obligations in Europe

To compile this table, harmonised actuarial compilation methods and data sets will have to be provided. Such statistical work is being undertaken by the Eurostat/ECB Task Force for all EU countries. Two interrelated issues are being investigated: (i) further analysis of the measurement of (implicit) pension obligations for pension schemes sponsored by general government as an input for the new SNA; and (ii) an assessment of the sources and methods for measuring these obligations on a harmonised basis for all EU countries.

The statistical recording of the implicit general government pension obligations in the supplementary table requires that models be used to estimate the outstanding stocks and changes in stocks. In the pension literature, three alternative concepts of (implicit) pension obligations have been proposed, based on the differing scope of obligations included in the estimation: the accrued-to-date liability concept, the projected current worker's and pensioner's liability concept, and the open system liability concept. The usefulness of a particular definition depends on the specific purpose of the estimation. For example, an assessment of the long-term sustainability of current pension arrangements should use the broadest possible estimate of liabilities as a baseline. This suggests using open system liabilities. By contrast, policy questions concerning the possible termination of an operating pay-as-you-go pension system should be addressed on the basis of the first or the second concept, depending on the system's remaining time horizon.

From a statistical perspective, only the *accrued-to-date liability concept* is appropriate for national accounts purposes. It includes in the estimate the present value of liabilities arising from already accrued pension rights. This covers, for example, pension entitlements due to pension contributions already paid by current workers and remaining pension entitlements of existing pensioners. The method is based on observable past events and transactions, such as membership in the pension system, and paid contributions. However, probabilities that current contributors may die or become disabled before reaching the pensionable age need to be estimated. It also covers future changes of the payment stream due to any legislation enacted prior to the year for which (implicit) pension obligations are being calculated. Minimising the role of assumptions on the expenditure side is another reason for using the accrued-to-date-liability concept. Nevertheless, this method also requires some heroic assumptions on future developments, notably regarding the discount rate for future pension disbursements.

For the derivation of actuarial estimates under the accrued-to-date concept, two main valuation approaches have been applied to private pension schemes: the projected benefit obligation (PBO) method and the accrued benefit obligation (ABO) method. The ABO is calculated based on years of service to date and current wage and salary rates, ie future salary increases are disregarded. By contrast, the PBO is calculated including assumptions on employees' career earnings. The PBO exceeds the ABO, with a substantial difference in early years but decreasing towards retirement date. The two methods are neutral in terms of transaction totals, but have different patterns in terms of the time of recording.

While country-specific pension models allow many details of pension schemes to be specified, they lack the common structure – and, often, the common assumptions – for cross-country comparisons. On the other hand, cross-country estimates of pension obligations, to date, have had to rely on stylised presentations of the pension scheme(s) under investigation, rendering the results insensitive to country particularities. Thus, the same model should be used to produce comparable estimates for different countries.

Accordingly, initial model calculations for the compilation of the (implicit) pension obligations of general government-sponsored pension schemes in the euro area have been carried out using the World Bank's "Pension Reform Options Simulation Toolkit" (PROST) computer model, and with the model developed by Freiburg University. Both models are flexible

enough to incorporate most of each country's idiosyncratic pension system features, but also impose a common structure on all countries' pension schemes in the analyses. Wage growth and discount rate assumptions are two important factors in the estimates of implicit pension obligations. Discount rates could vary between two and five percent per annum.[7] Using a higher discount rate clearly reduces the estimated pension obligations. Real versus nominal wage growth is also significant where benefits are price-indexed. Countries differ in their legal indexation rules, and actual implementation often deviates from the rules. The Task Force also plans to collect the estimates based on national pension models and compare them with the results derived from the two models mentioned above.

6. Conclusions

From a user's point of view, there is a need for statisticians and national accountants to provide comprehensive data on pension obligations, especially those of general government, and they should be compiled based on SNA standards. This means no change in current standards for the treatment of pension schemes in the core accounts. As discussed, however, there are plans to compile a supplementary table on pensions, covering the details of pension flows and stocks recorded in the core national accounts, but also including those that are not covered. Thus, a complete view of household pension "assets" will be provided.

It is obvious that the ageing of the population in Europe makes structural reforms necessary. In this context, the financing of future pension expenditures and pension entitlements may need to be reviewed. The new supplementary table on all social insurance pension schemes will provide better information, and will allow consistent comparisons between private and general government pension schemes, as well as coherent assessments of policy adjustments. The table will also show that the predominant, general government-sponsored (unfunded, defined benefit) pension schemes in Europe will lead to increasing general government expenditure and debt if no structural reforms take place.

Policy solutions aside, implicit general government obligations from pension systems are very large for many European countries. The consequences for countries differ, mainly reflecting different demographic prospects and pension arrangements. The order of magnitude of upcoming fiscal burdens is high, even if estimates are sensitive to underlying assumptions on factors such as discount rate and wage growth. From a methodological perspective, estimating general government pension obligations generally requires detailed country-specific data on contribution and benefit arrangements. Therefore, ongoing work is being conducted to generate consistent estimates and, based on these data, homogeneous projections for a large set of countries.

References

[1] "Demographic change in the euro area: projections and consequences", ECB, Monthly Bulletin, October 2006.

[2] "The impact of ageing on public expenditure", European Commission, 2006.

[7] Thus, under the 2 percent discount rate assumption, wage growth and discount rate are the same. This may be considered to represent the rough upper boundary of any estimated implicit general government pension obligations. Discount rates of 3, 4 and 5 percent represent discount rate-wage indexation differentials of 1, 2 and 3 percent, respectively.

[3] “World Bank Social Protection Discussion Paper No. 403”, Holzmann, R., Washington, D.C., 2004.

[4] “Implicit Pension Debt: Issues, Measurement and Scope in International Perspective”, Holzmann, R., Palacios, R. and Zviniene, A., Washington, D.C., 2004.

[5] “The statistical recording of implicit pension liabilities and its impact on household wealth and general government obligations”, Mink, R. and Rother, R., IFC Bulletin No 25, March 2007.

[6] Draft chapter 17 of the revised System of National Accounts (2008 SNA). http://unstats.un.org/unsd/sna1993/draftingPhase/ChapterIssueMatrix.asp

[7] “Council Regulation (EC) No 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community” (ESA95), Brussels, 25 June 1996.

[8] “CMFB Report on Pensions”, February 2008.

An initial assessment of pension entitlements of French households[1]

Dominique Durant[2] and Laure Frey[3]

The main purpose of this paper is to provide an initial assessment of French households' pension entitlements on the basis of currently available data, extended with estimates made by running the World Bank pension model (PROST) on French social security liabilities.[4] In the light of this new information, it examines French household portfolios in terms of risk, as well as household saving behaviour, comparing these realities with those of American households. The United States has been chosen for comparison because employers' pension schemes play a larger role in the US than in France, leading, it has been thought, to different saving behaviours.

The paper is organised in five sections. Section 1 briefly describes the French and American retirement systems; section 2 compares French and American households' balance sheets in the light of their retirement-related asset holdings; section 3 deals with social security pension entitlements in France and in the United States; section 4 focuses on asset structures and wealth effects; and section 5 presents some brief conclusions.

1. Privately funded schemes play a marginal role in the French pension system, but are significant in the American one

1.1 The French retirement system

The French pension system relies heavily on social security, which comprises several mandatory pay-as-you-go multi-employer schemes representing 80.4% of pensions paid and 86.3% of pension entitlements as of 2005 (Annex 1, Table 2). The State's civil servant pension scheme is financed by the State budget but is operated on the same pay-a-you-go basis as social security. It represents 17.1% of pensions paid and 12.3% of pension entitlements.

Significant financial transfers between these different schemes regularly occur in order to compensate for imbalances between contributors and beneficiaries. The State makes annual social security payments that represent more than 10% of its pension payments to civil servants and military personnel.

Two pension reforms were implemented, in 1993 and 2003, with a view to reducing the financing gap in social security and civil servant pension schemes. With these reforms, the number of work years required for a full pension increased from 37.5 to 40. Pegged to increases in life expectancy, it is expected to reach 41.75 years in 2020.

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[1] The opinions expressed in this article are those of the authors and do not necessarily represent the views of the Bank of France.

[2] Bank of France, DESM-SESOF 47-1421. ☏ 33 1 42 92 28 11.

[3] Bank of France, DAMEP-SEMSI 46-1374. ☏ 33 1 42 92 49 53.

[4] See Annex 1, and Holzmann, Palacios, Zviniene (2004).

People are allowed and encouraged to work after the normal retirement age of 60. The full pension is further discounted if the required number of years is not reached before 65. Conversely, any year of work between 60 and 65 beyond the required number of years entitles the worker to a bonus. Furthermore, the reference salary for the private sector is calculated on the highest-earning 25 years instead of the highest-earning 10 years. The 2003 reform gradually brought the civil servants' scheme in line with the private sector in terms of required number of years and retirement age incentives, though final salary (excluding bonuses) remained the reference salary for civil servants.

For a worker in the private sector retiring in 2003 after having worked the required number of years, the replacement rate on net income after the reforms is between 64% for an executive and 84% for other workers. The corresponding rates will be 53% and 73% for individuals retiring in 2050. The replacement rate for civil servants will remain around 69% throughout this period.[5]

Employer pension schemes are still poorly developed. Autonomous employer schemes represent 2.5% of the pensions paid in 2005 and 1.5 % of pension entitlements. They are managed mainly by insurance companies and by the new collective pension schemes created in 2003 (the so-called PERCO schemes, comparable to 401(k) defined contribution schemes in the United States). Personal schemes offered by insurance companies represent an even smaller proportion. Occupational and personal schemes are included in households' financial assets as a component of life insurance reserves and mutual fund shares. In fact, life insurance in France plays the same role as voluntary pension schemes in the United States, functioning as a complement to social security for high earners.

1.2 The US retirement system

The US pension system rests on three pillars: a pay-as-you-go system (social security), employers' schemes and individual retirement savings.

People over 65 rely primarily on social security as a source of income (Graph 1). Nine out of ten retired people are covered, and in 2005 social security accounted for approximately 38% of the income of people over 65. In 2006, the fund paid US $461 billion in benefits to 34 million retired workers, and received US $642 billion in contributions from 162 million people. Nevertheless, according to the trustees' projections, annual deficits will occur starting in 2018, and the fund will be exhausted in 2042 unless a reform is implemented. President Clinton (in 1999) and President Bush (in 2005) failed to pass social security reforms that would promote the development of individual accounts.

Company and union pension schemes are voluntary. According to the US Bureau of Labor Statistics, 60% of workers in private industry had access to employer retirement schemes in 2006, and 51% chose to participate. Of these, 20% were in defined benefit schemes and 43% defined contribution schemes. In 2005, corporate pension funds were significantly under-funded (by more than US $450 billion, according to the US Bureau of Labor Statistics), threatening the viability of the Pension Benefit Guarantee Corporation (PBGC), the federal institution that insures private single-employer and multi-employer defined benefit pension schemes. In response to this, the US Congress passed the Pension Protection Act of 2006, which increases the PBGC premium rate, and requires and promotes adequate single-employer scheme funding. Nevertheless, the estimation of under-funding is highly sensitive to the discount rate used in the calculation of the present value to participants of the pension schemes. Except for some temporary exceptions, this discount rate should be no more than 105% of a weighted average of 30-year treasury bond yields. Thus, the recent increase in long-term rates has provided some relief for pension scheme funding.

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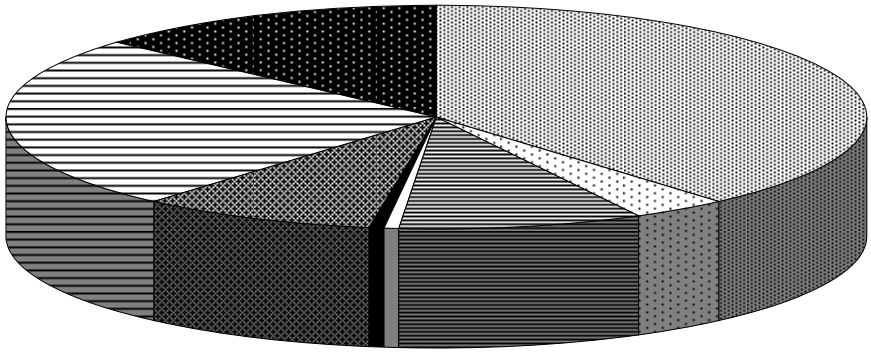
[5] See Conseil d'orientation des retraites (2006), p.142.

Graph 1

Retirement income, by type, for people over 65, in 2005

In thousands of dollars



Social security
Federal, State and Local government retirement
IRAs
Earnings
Other transfers
Annuities
Company or union retirement
Property income

Source: Census Bureau.

Annuities and Individual Retirement Accounts, which benefit from tax exemptions, still account for only a moderate share of the retirement income of people over 65. They held US $4.2 trillion as of the end of 2006 – more, for the first time, than the amount held by defined contribution schemes, which was $US 4.1 trillion.

2. As a proportion of net disposable income, French households hold more real estate and implicit pension assets, whereas American households hold more financial assets

American households are generally assumed to hold more financial assets than French households, and to rely more heavily on private retirement funds. To assess the reliability of such an assumption, it seems instructive to compare the structure of the households' balance sheets in the two countries. Data cover households and non-profit organisations in France and the United States (excluding the self-employed).

To make appropriate comparison possible, (1) durable goods, which are classified as consumption in French accounts, are not included in American household assets; and (2) a net disposable income has been computed for France.[6]

Given these modifications, French and American disposable incomes are still affected by some institutional differences, such as the larger size of pension funds as compared to social security in the United States.[7]

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[6] However, methodologies used by the INSEE and the BEA to estimate capital consumption differ somewhat (see Baudchon and Chauvin, 1999).

[7] "Comparison of household saving ratios: Euro area/United States/Japan" (2004), R. Harvey, Statistics Brief, OECD, June.

Households' pension entitlements include three categories of implicit assets: government employees' retirement entitlements, private pension funds, and life insurance reserves earmarked for retirement. The difference between the total pension entitlements (excluding social security) of American and French households may not be as large as one might expect (Table 1): 1.7 years of net disposable income in the United States versus 1.0 years in France, as of 2006.

Table 1

Pension liabilities

Excluding social security, in years of net disposable income

	France				United States			
	2003	**2004**	**2005**	**2006**	**2003**	**2004**	**2005**	**2006**
Government employees' retirement schemes	1.0	1.0	0.9	0.9	0.4	0.4	0.4	0.4
Life insurance	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3
Pension funds	0.0	0.0	0.0	0.0	0.9	0.9	0.9	1.0
Total pension entitlements	1.0	1.0	1.0	1.0	1.5	1.6	1.6	1.7
Real estate	3.9	4.5	5.1	5.5	2.0	2.2	2.3	2.4
Other financial assets	2.0	2.1	2.2	2.2	2.6	2.6	2.7	2.7
Total assets	7.0	7.6	8.3	8.7	6.2	6.3	6.6	6.8
Liabilities	0.5	0.5	0.6	0.6	1.2	1.3	1.3	1.4
o/w mortgages	0.4	0.4	0.5	0.5	0.8	0.9	1.0	1.0
Net worth	6.5	7.0	7.7	8.1	5.0	5.0	5.3	5.4
Net worth excluding pension entitlements	5.5	6.0	6.7	7.1	3.4	3.5	3.7	3.7

Sources: FFSA, French Ministry of Finance, AFG, Federal Reserve System.

In fact, private pension funds are also voluntary in the United States, and still represent a small share of the source of retirement income for people over 65 (1.0 years of disposable income).

Furthermore, government employees' retirement schemes represent a larger share of net disposable income in France (0.9 years of disposable income in 2006, as compared to 0.4 years in the United States).

As indicated in Table 1, French households' housing assets represent a much greater proportion of their net disposable income than is the case for their American counterparts, and they have smaller home mortgages. In 2006, housing assets represented 5.5 years of disposable income for French households, as compared to 2.4 years for American households. However, the gap in gross real estate wealth between American and French households is smaller when calculated as a per capita ratio rather than as a proportion of disposable income. American households' housing assets at the end of 2006 represented approximately US $94,900 per person over 15 years of age, as compared to US $116,900 per person over 15 in France (using the average 2000–2006 euro/USD exchange rate).

Home mortgages represented 0.5 years of disposable income in France, as compared to 1.0 years in the United States.

3. Social security pension entitlements are greater in France than in the United States

As in most countries, in both France and the United States pay-as-you-go pension schemes are not fully funded, thus creating an implicit liability for government vis-à-vis households (in the form of State schemes for government employees, and social security for non-government employees). Nevertheless, as pointed out in Holzmann et al. (2001), unfunded pension schemes cannot be likened to government bonds, for employees are legally obligated to participate, and pension promises are more flexible, in that reforms may be implemented between the contribution and benefit dates.

Although not recorded as explicit government debt and household assets, the implicit pension debt does have significant macroeconomic implications in terms of household consumption and the government's intertemporal budget constraints.

Van den Noord and Herd (1993) estimated the present value of accrued rights as 113% of GDP for the United States, as compared to 216% for France. As of 2005, the present value of accrued rights has increased to 126% of GDP in the United States, using a 2.9% discount rate in the United States, according to the Treasury Department, and to 3.2 years of GDP according to Blanchet and Ouvrard (2006), using a comparable discount rate of 3%. Our estimate, based on PROST using a 2.9% discount rate, is 3.25 years of GDP. As of 2005, the implicit ex-ante debt over 75 years (open-group) was also far larger in France than in the United States: 107% of GDP according to our estimates, as compared to 32% of GDP in the United States, according to the US Treasury Department.

Even taking account of differences in estimation methods, implicit pension liabilities are much larger in France than in the United States. This is due primarily to the benefit formula, and only secondarily to the population structure. This becomes clear under an "everything else being equal" analysis, running PROST with French parameters for the benefit formula, labour and per capita GDP, but American parameters for population (population by sex and age, fertility, immigration and mortality). The resulting implicit liability per American over 15 is US $105,900 (versus the published figure of US $69,700), while the corresponding figure for France is US $135,600 (using the average 2000–2006 euro/USD exchange rate). All estimates converge, with French households being more fully covered by their pay-as-you-go system than their American counterparts.

4. Taking account of implicit pension assets alters the structure of households' assets and may explain limited wealth effects in France

Taking social security pension entitlements and civil servant schemes as being part of French household assets results in a doubling of the figure for these assets as a proportion of net disposable income (14.6 times disposable income versus 7.5, as of 2005, as shown in Annex 2, Graph 5). In fact, in 2005, these entitlements (7.4 trillion euros) were greater than housing assets (5.3 trillion euros) and financial assets combined (2.4 trillion euros). Pension entitlements offered by insurance companies, included in the latter figure, amounted to only 0.1 trillion euros (Annex 2, Table 2).

However, taking account of these assets does not significantly change households' risk exposure – high-risk assets being defined here as assets whose price may undergo large proportional changes due to market fluctuations). According to this definition, high-risk financial assets include shares and other equities, unit-linked insurance contracts and defined contribution retirement schemes, which represented 23.7% of French households' financial assets in 2005. Social security and government employee pension entitlements should, in theory, not be prone to risk, given that they are defined benefit schemes.

However, it may be argued that households are at risk due to the financing gap, since the scheme may well be unsustainable and require them to pay higher contributions in the future, or may reduce pension benefits to accommodate intertemporal budget constraints. High-risk assets, taking account of the net present value of the financing gap, represent 28.1% of financial assets plus pension entitlements, or 23.7% of financial assets alone (Annex 2, Graph 6). If high-risk housing assets are taken into account, the risk component of households' investments rises to 53.2 % of assets.

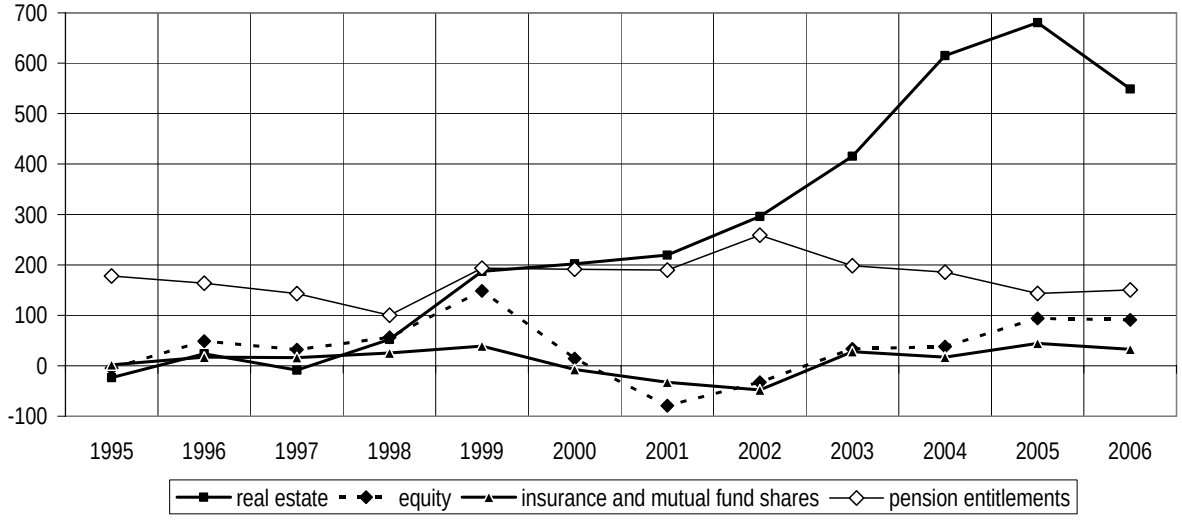
Though housing assets constitute a smaller portion of American households' assets, their investments are much more risk-oriented: 58.7% of their financial assets may be considered high-risk. If real estate is taken into account, the proportion increases to 73.7%.

Another way to gauge the risk exposure associated with household assets is to trace the potential gains and losses in held assets as a result of changing market valuations, even though households may never realise the gains or losses (Graph 2): for tradable assets, the gains or losses are realised only in the case of selling, while for non-tradable assets such as deposits, non-unit-linked life insurance contracts and defined benefit pension schemes, the change in market interest rates impacts the net present value of the future revenues without changing these future revenues themselves. In an actuarial framework, potential holding gains in pension entitlements, as measured by the authors – with PROST for France – are negatively correlated with interest rates as well as with share prices. Since they are also very large, due to the large amount of pension entitlements, they are able to offset potential holding gains and losses on stock and mutual fund shares.

Graph 2

Holding gains of French households

Flows, in billions of euros



Sources: INSEE, Ministry of Finance, Ministry of Labour, CNAM, FFSA, AFG. Authors' calculations.

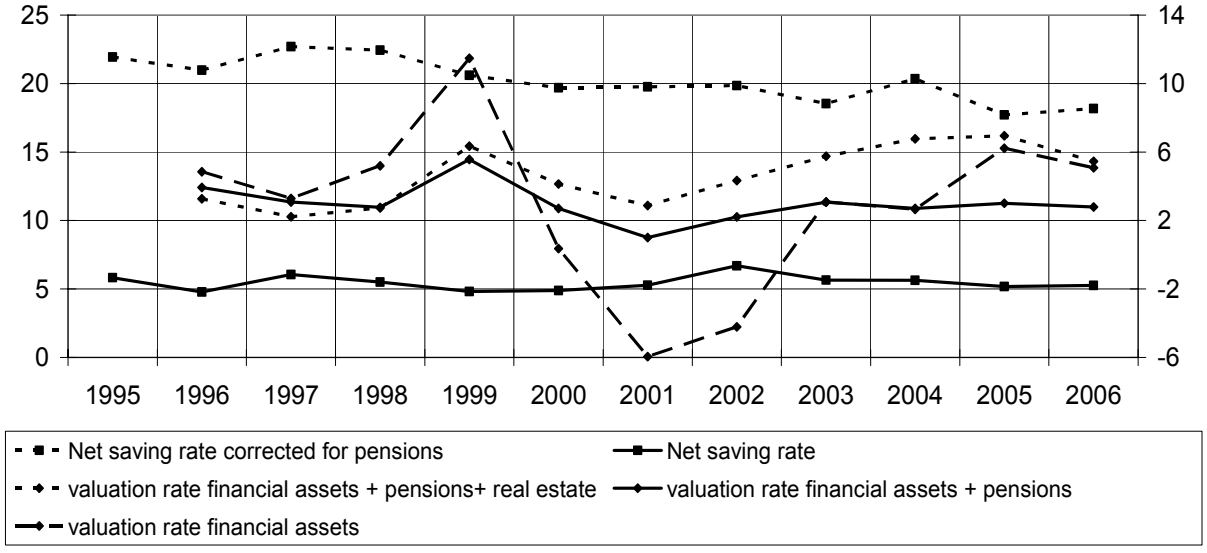
As a consequence, the valuation rate of financial assets plus pension entitlements, computed as the ratio of potential holding gains to the stock of assets, is much more stable than the valuation rate of financial assets alone (Graph 3). This may help to explain why it is usually difficult to identify statistically significant wealth effects in France (Annex 2, Graph 7): the explicit valuation of financial assets, driven by stock markets, registers wide fluctuations, but households may consider that they also hold implicit pension liabilities, with a stabilising affect on the valuation rate of their assets. Thus, there would be a smooth change in the saving ratio, in line with this (implicit and explicit) valuation rate of total assets. In countries such as the United States, where a larger portion of pension entitlements are funded – making their valuations explicit – and where real estate financing channels are quite different, the wealth effect is more significant (Graph 8 in Annex 2).

In actuarial accounting, French households' net financial saving rate is dramatically higher: 18.5% as estimated with PROST, compared to 5.3% for the "usual" financial saving rate (Graph 3). In actuarial accounting for a funded pension scheme, net disposable income is the same as in a pay-as-you-go scheme but saving is much higher, as the amount that households invest in pension fund assets will be returned to them. This return includes the employer contribution that should be invested in bonds today in order to eventually pay the pensions of present workers, as well as the property income owed (minus the pension paid) to anyone investing in assets. For an ageing population, the first of these elements is substantially higher than the actual contributions recorded in a pure pay-as-you-go scheme, which are equal to the pension paid to present pensioners, corrected by the scheme's financing gap or surplus.

Graph 3

Net saving rate and valuation rate

As %



Sources: INSEE, Ministry of Finance, Ministry of Labour, CNAM, FFSA, AFG. Authors' calculations.

Accounting rules aside, however, it is not certain that French households would save much more if their pension scheme were funded rather than pay-as-you-go. The comparison with the United States shows that French households save more than American households despite the larger role of funded pension schemes in the US (Annex 2, Graph 9).

5. Conclusions

There is merit in making implicit pension liabilities data available, in order to make possible international comparisons of households' saving behaviour, regardless of the prevailing pension system in a given country. However, one should remain cautious about drawing conclusions. Pension entitlements are specific assets. Their value is highly sensitive to estimation parameters; they are neither transferable like deposits (or even insurance contracts) nor marketable like securities. They are subject to very specific forms of risk, as explained in this paper. Moreover, households may not consider pension entitlements in the same way as they view financial assets. Though pay-as-you-go schemes and pension fund reserves clearly fulfil the same need – providing streams of payment after retirement – they do not give rise to the same saving strategies. Financial assets and housing may be transferred to heirs, while the transfer of pensions is limited to spouses. Though the above analysis of wealth effects may indicate that French households consider pension entitlements a part of their wealth, this remains to be confirmed, for example through direct surveys exploring households' saving and financial behaviour.

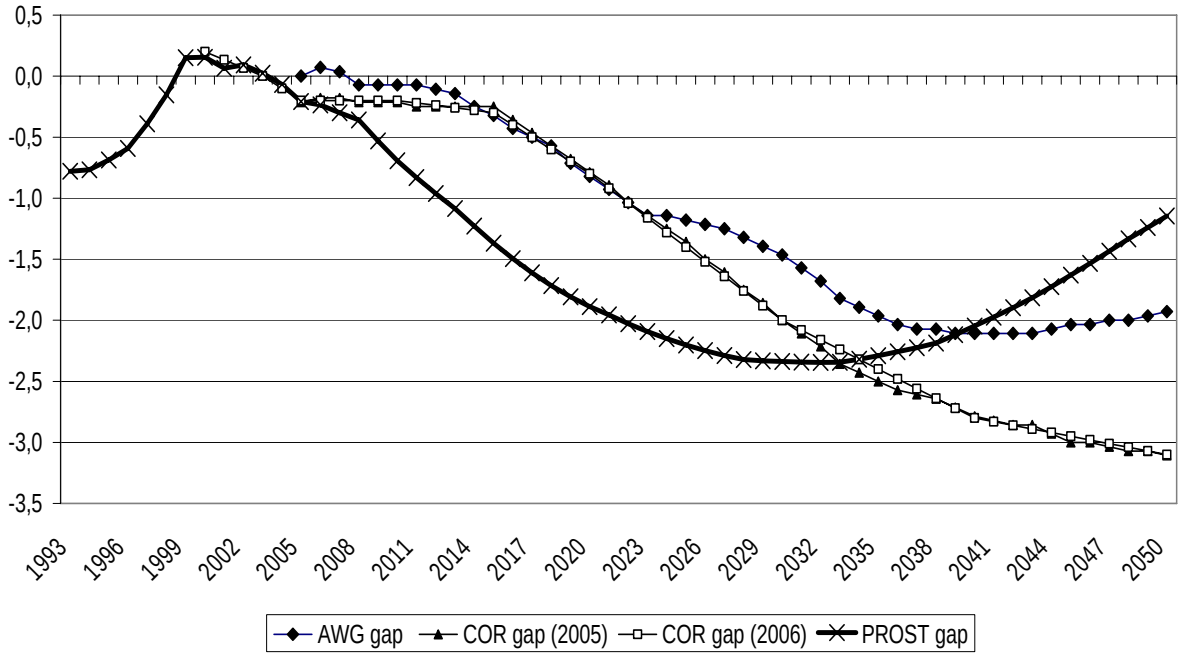
Annex 1:
Estimate of French social security liabilities using PROST

Figures for pension entitlements of French households have been collected from several sources. The accrued pension liabilities of the State civil servants' pension scheme have been calculated by the Ministry of Finance since 2003, with a generational model (Ariane) that considers specific factors for civil servants (career, life expectancy, etc).[8] For social security, the national statistical institute (INSEE) ran a micro-simulation model (Destinie) for 2005 with 2050 as the time horizon.[9] The calculation was based on the benefit formula for the main regime, which covers about 70% of the population. The results were extended to the entire population, using data collected from the social security offices by the "Conseil d'Orientation des retraites" (COR), a public body devoted to monitoring pension reform. Both estimates use the PBO method and provide several scenarios, including several different discount rates. Data for private autonomous pension funds are collected primarily from insurance companies via their professional association (FFSA), and are computed in accordance with their accounting rules.

Graph 4

Four estimates of the financing gap

As % of GDP



Sources: INSEE, Ministry of Finance, Ministry of Labour, CNAM.

In order to complement these data to deal with a longer time span, PROST was run for the French social security system from 1993 to 2050. The benefit formula for the main regime was used, and simply extended to the whole population covered by social security schemes (thus excluding State civil servants). The macroeconomic assumptions for 2005–2050 are

[8] See Direction générale de la comptabilité publique (2005), Pellé (2006).

[9] See Blanchet, Ouvrard (2006), Conseil d'orientation des retraites (2006).

the ones provided to the European Commission's Ageing Working Group (AWG).[10] Mortality tables are those published by INSEE and used by COR. However, the financing gap calculated by PROST was only roughly consistent with the AWG and COR estimates. The reasons for the differences lie mainly in the use of a simplified benefit formula (for example, it was not possible to take into account benefits associated with children) and the use of a unique formula to describe the different situations of the different social security schemes.

[10] See European Commission (2005).

Annex 2

Table 2

	2005	Insurance companies	Civil servants	Social security	o/w PROST	Total
	Contributors	**2 635**	**2 459**	**22 027**	22 058	**24 486**
	Beneficiaries	**2 635**	**1 961**	**12 297**	12 168	**13 900**
1	Pension entitlements (opening BS)	**105**	**956**	6 605	6 156	**7 666**
2	Actual contributions	**8**	**34**	136	141	**177**
3	Taxes and govt. transfers			13	13	13
4	Imputed contributions	5	19	277	253	301
5	o/w property income	2	19	132	123	153
6	Pensions paid	**5**	**34**	**159**	158	**197**
9	Pension entitlements (closing BS)	**113**	**975**	**6 872**	6 406	**7 960**

4 = 9 + 6 -1 – 2 - 3

5 = average pension entitlement discounted at 2% * 2%

discount rate = 2%

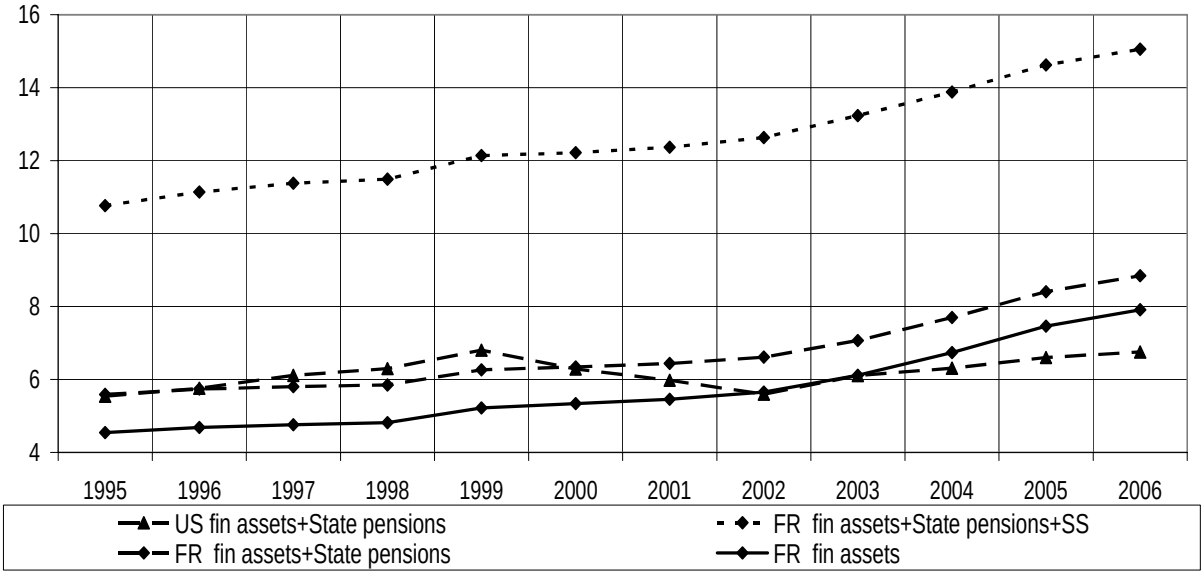
Data in bold are published

Sources: INSEE, Ministry of Finance, Ministry of Labour, CNAM, FFSA, AFG); others are estimates of the authors.

Graph 5

Total assets

As % of net disposable income

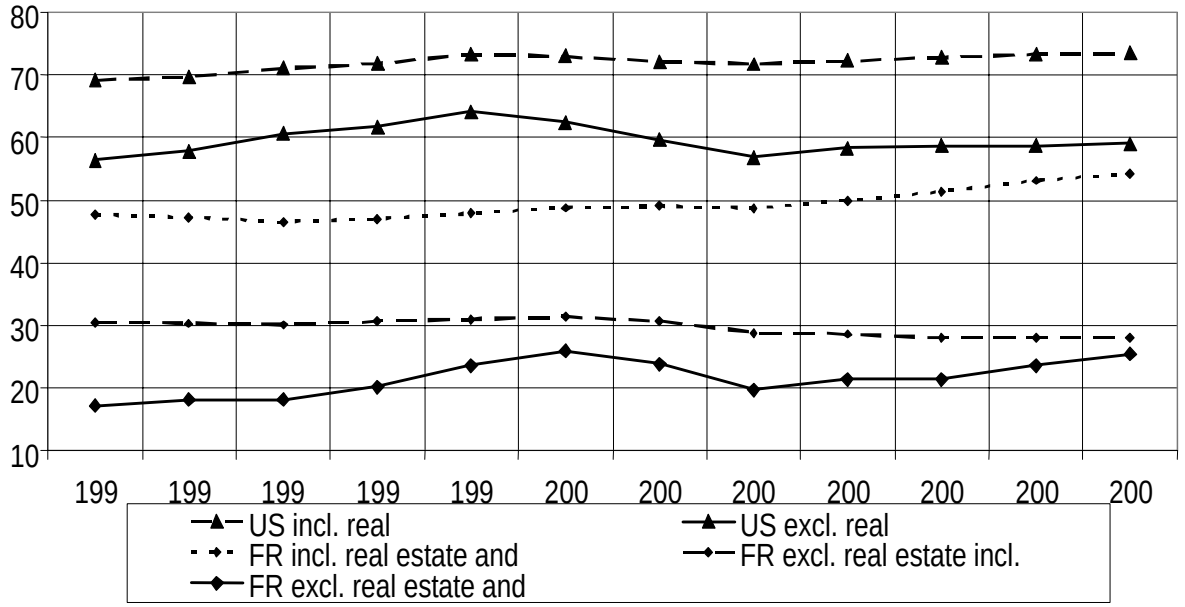


Sources: INSEE, Ministry of Finance, Ministry of Labour, CNAM, FFSA, AFG, Federal Reserve System. Authors' calculations.

Graph 6

High-risk assets

As % of total asset of the same type

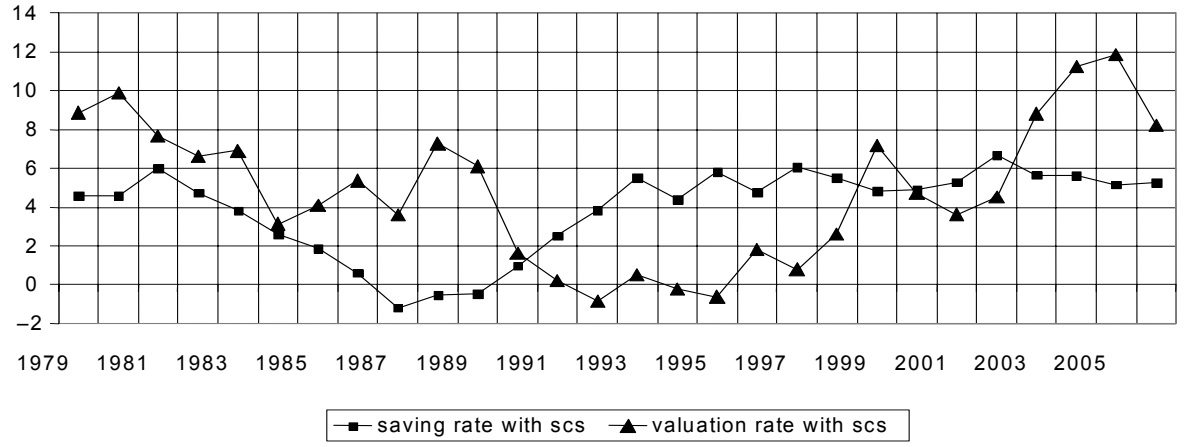


Sources: INSEE, Ministry of Finance, Ministry of Labour, CNAM, FFSA, AFG, Federal Reserve System. Authors' calculations.

Graph 7

France

Ratio as a % of net disposable income



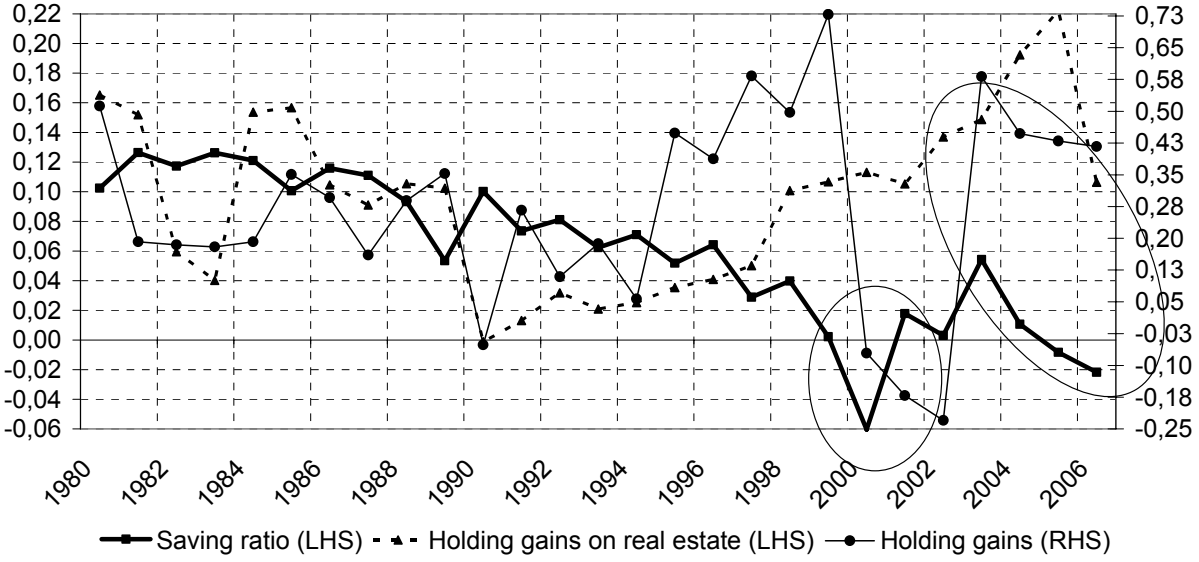
Sources: INSEE, Ministry of Finance, Ministry of Labour, CNAM, FFSA, AFG. Authors' calculations.

In France, saving and valuation effects are, in general, positively correlated over the period 1980–2006, confirming the difficulty of identifying any statistically significant wealth effects.

Graph 8

United States

Ratios as a % of net disposable income



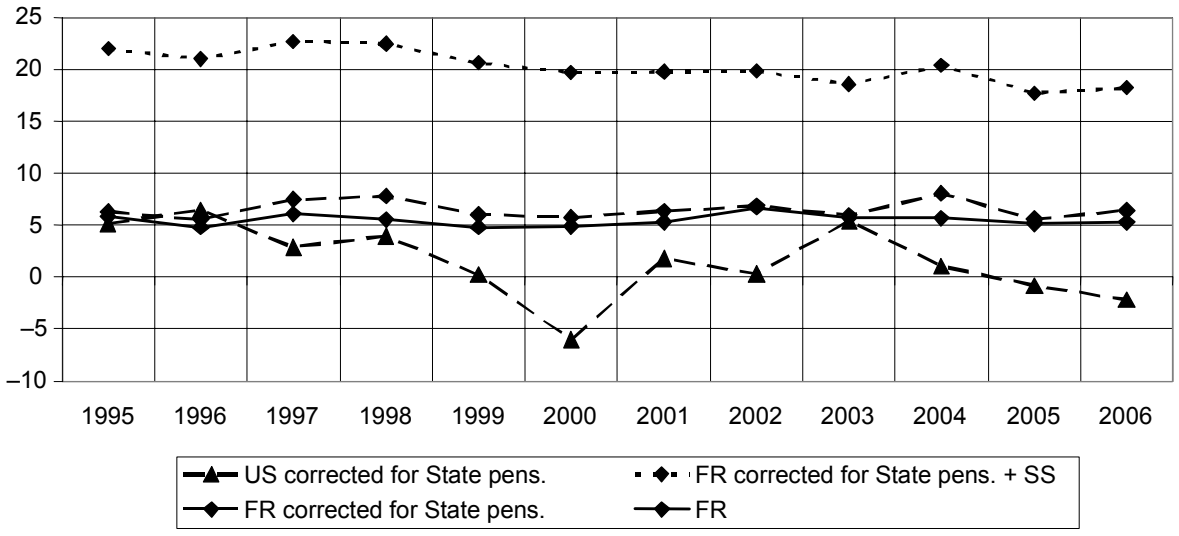
Source: Federal Reserve System.

Over the 1980–2006 period, savings and valuation gains, as a percentage of net disposable income, are, in general, negatively correlated, reflecting the possible existence of wealth effects. Nevertheless, the correlation becomes positive in sub-periods, between 2000 and 2001, and as of 2004. The first sub-period corresponds to a recession associated with the bursting of financial asset bubbles. Indeed, if only housing capital gains are taken into account, the negative correlation becomes larger and holds during these two sub-periods. This is consistent with the assumption that housing wealth effects are larger than financial ones.

Graph 9

Net saving rate

As % of net disposable income



Sources: INSEE, Ministry of Finance, Ministry of Labour, CNAM, FFSA, AFG, Federal Reserve System. Authors' calculations.

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Pension schemes for (semi-)government employees in the Netherlands – a national accounts perspective

Henk Lub[1]

Introduction

The pension system in the Netherlands has some special features, the most striking of which is the large share of funded pension schemes – also applicable to (semi-)government employees. Recently, a number of changes, including greater reliance on average pay pensions, have been introduced to make the pension system better able to cope with the ageing of the Dutch population. This paper briefly describes both structural aspects and recent changes. It focuses on the treatment, in the national accounts, of pension schemes for (semi)government employees, taking into consideration the recent proposals for changes to the 1993 SNA and Eurostat's decisions on transactions in pension liabilities with respect to EDP notifications.

1. The Dutch pension system: structural features

The Dutch old age pension system is normally described as consisting of 3 pillars.

- The first pillar is part of the social security system, and includes pensions based on the Old Age Pensions Act (Dutch acronym: AOW), which are financed on a pay-as-you-go basis. The payment of premiums is integrated in the income tax. The AOW covers the entire population, providing a basic income to everyone beginning at age 65. Individual entitlements depend on the number of years a person has lived in the Netherlands and/or the number of years he/she has paid premiums.
- The second pillar is composed of funded employer pension schemes, which provide a pension that supplements the AOW pension. These schemes cover 90% of all employees, both in and outside of government. This very high participation rate is surpassed only by Denmark (Kakes, Jan and Dirk Broeders, eds., 2006). For the majority of employees, participation in a pension scheme is compulsory, based on collective wage agreements. There are two types of funds for implementing the pension schemes: corporate pension funds, covering single enterprises, and sectoral pension funds, covering all enterprises in a particular business sector. At the request of employer and employee organizations, the Minister of Social Affairs can make participation in a sectoral pension fund compulsory for all enterprises in the sector. Most pension funds are foundations governed by employers and employees (pensioners are conspicuously absent), with premiums being paid by both parties.

Pensions for civil servants and educational workers are covered by the ABP fund, while pensions covering healthcare and social workers are provided for by the PGGM fund. With

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balance sheet totals of EUR 200 billion and EUR 70 billion, respectively, these are giant pension funds.

- The third pillar consists of individually arranged pensions, which are (by definition) funded. These pensions are, in large part, arranged through life insurance companies.
- There is, in fact, a fourth pillar, which is generally neglected because of its rather limited size (pension payments under this scheme amounted to 0.16% of GDP in 2005). These are military pensions, which until recently were fully paid out of the Ministry of Defence budget, amounting to an unfunded system. Since 2000, this has been replaced by a mixed system in which the budget must cover all existing pension entitlements (present and future); new entitlements, however – those earned after 2000 – are funded. Consequently, the Ministry has started paying premiums to the ABP fund.

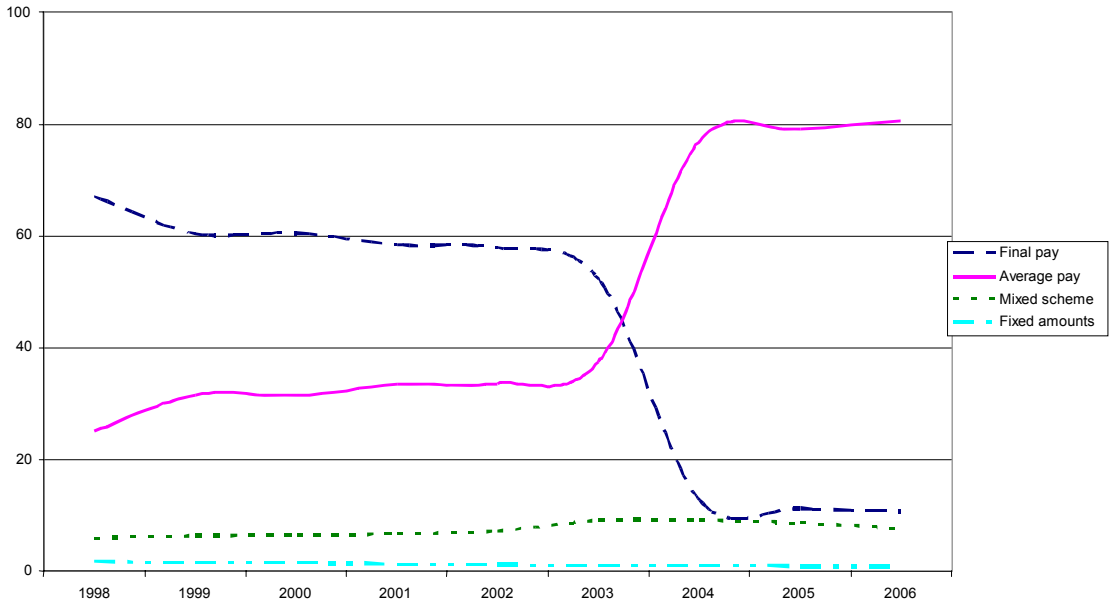
2. Recent changes in the Dutch pension system

In recent years, there has been a shift from final pay to average pay systems (Graph 1). This was one of the measures taken by boards of pension funds, with two purposes in mind: to repair the funds' financial position following the drop in the stock market, and to strengthen the pension system to deal with the ageing of the population.

Graph 1

Types of pension arrangements: the pension base

Percentage



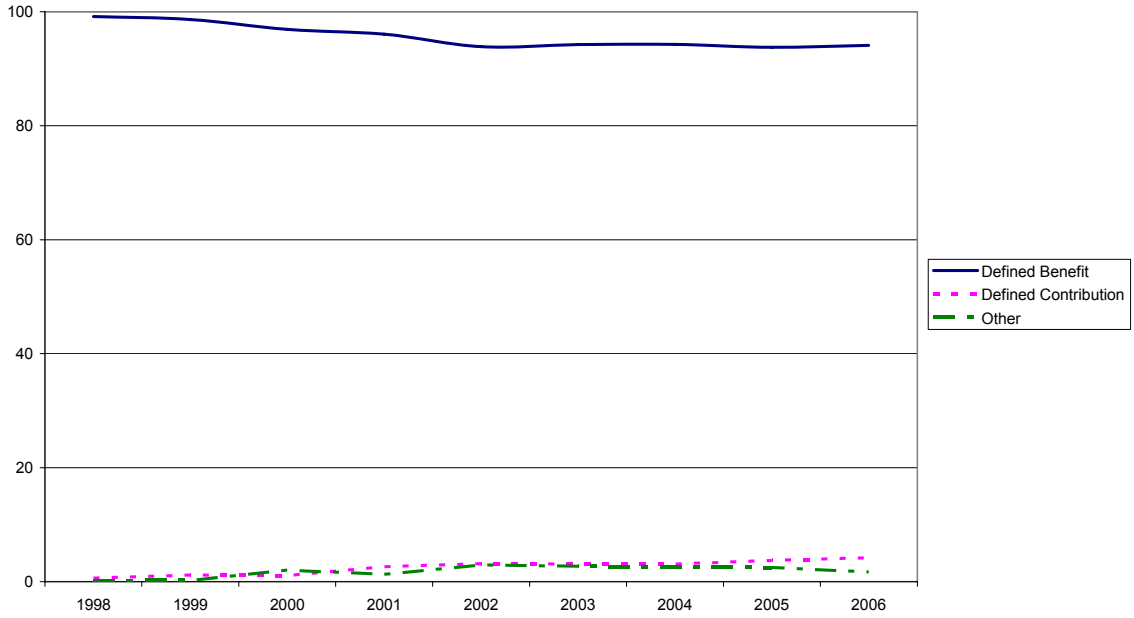
Source: De Nederlandsche Bank, Statistical Bulletin, Table 8.6.

In a substantial number of countries, there was a shift to defined contribution schemes. Although the number of defined contribution schemes as a proportion of all total pension arrangements in the Netherlands has increased slightly in recent years, defined benefit schemes are still the favoured arrangement.

Graph 2

Types of pension arrangements: financing schemes

Percentage



Source: De Nederlandsche Bank, Statistical Bulletin, Table 8.6.

3. Eurostat's decisions on pension funds

Over the past years, Eurostat has taken a number of decisions on the application of ESA 95 rules to the recording of transactions by pension funds in the national accounts. Some of these decisions were strongly contested, both on theoretical grounds and because they strongly affected government deficit/surplus and the government debt figures. Governments of EU countries are required to report the relevant key indicators to the European Commission, in the framework of Excessive Deficit Procedure (EDP) notifications, and they may not exceed certain limits. The government deficit, for example, may not be higher than 3% of GDP.

In October 2003, Eurostat took a decision on the issue of lump sum payments by public corporations concerning the transfer of *unfunded* pension obligations to government (Eurostat, 2003). According to ESA 95 rules, such pension obligations are not recognized in the System of National Accounts. As a consequence, Eurostat argued, the counterpart transaction to the lump sum payment is an unrequited transfer – in this case a capital transfer. The government deficit/surplus is positively affected; government debt is not affected. Not everyone agrees with this reasoning. The justification for the lump sum payment is that pension obligations are transferred to government. The amount of the lump sum is determined by the present value of the future pension claims that are transferred. So in effect, the payment is a financial transaction. Eurostat's decision was identical to the decision it had taken in a notorious case in 1996, which related to the transfer of a lump sum payment by France Télécom to the French government. At that time, however, ESA 79 rules applied.

In February 2004, Eurostat published another decision on a similar issue. This one was related to lump sum payments involving the transfer of *funded* pension obligations (Eurostat,

2004a). Again, Eurostat decided that these lump sum payments should be considered capital transfers. The reasoning behind this decision is slightly more complicated. Clearly, funded pension obligations of public corporations are recorded in the national accounts. However, the pension obligations become unfunded after having been taken over by government. In Eurostat's view, the pension obligations must be deleted in national accounts bookkeeping through an entry in the "other changes in assets" account before the lump sum payment is recorded. To this author, however, it seems more logical to take a different view, in which the lump sum payment is a financial transaction – without effect on the government deficit/surplus – given that pension obligations are transferred from the public corporation to government. Consequently, being unfunded, these obligations are deleted in the government accounts, in conformity with System of National Accounts methodology.

This second Eurostat decision was, in fact, a two-in-one decision. First, as in the decision of October 2003, it determined that the transfer of pension obligations can be an unrequited transfer. Second, it determined the sequence in which entries are to be made. In this case, funded pension liabilities are deleted before becoming the subject of a transaction, because in the National Accounts they are not recognized as a liability for the sector acquiring them. The decision might as well have been to delete them after the transaction, however, and Eurostat does not give a rationale for the treatment it prescribes.

In March 2004, Eurostat published a number of decisions regarding the classification of funded pension schemes in cases of government responsibility or guarantee (Eurostat, 2004b). One of the decisions was that a defined contributions funded scheme cannot be classified as a social security scheme. Another was that where a government simultaneously manages a funded and an unfunded scheme, two different institutional units must be distinguished, each classified according to the applicable rules. These decisions strongly affected the national accounts recording of pension reforms in a number of EU countries. Therefore, Eurostat allowed a gradual introduction of the effects on government deficit and debt figures in the EDP notifications.

Eurostat's decisions on the recording of pension fund-related transactions in the national accounts did not affect the Netherlands, due to the features of its pension system. There are no public corporations or other enterprises with unfunded pension obligations. Thus, there is no possibility of transferring such obligations. Moreover, there is no desire to transform funded obligations into unfunded obligations. The Dutch cherish their funded pension system. If there is any change, it is in the opposite direction, as proven by the change in the funding for military pensions. Finally, defined contribution schemes have gained no popularity in the Netherlands.

It is worthwhile to look more closely at the transformation of military pensions. As an alternative to the present solution, the government might have opted for making a lump sum payment to the ABP in order to fully fund military pensions. In this imaginary situation, it is still not clear how Eurostat's ruling would have to be applied. Would this be a capital transfer, since unfunded pension liabilities are transferred? Or would this be a financial transaction because the pension liabilities that are transferred are funded in the accounts of the insurance corporations and pension funds subsector. One continues to be puzzled about the wisdom of Eurostat's decision. What is lacking is a theory on the sequence of recording transactions and making entries in the "other changes in assets" account. It is unfortunate that Eurostat has not attempted to devise a theoretical approach. The economic rationale for paying lump sum amounts is that the pension obligations that are transferred have economic value. Given this, it is illogical to treat the pension obligations as not existing when they become the object of transactions between different economic sectors. This view is relevant to unfunded pension obligation transactions between different sectors, and more strongly so for transactions in which funded obligations become unfunded (or, alternatively, unfunded obligations become funded) after the transaction.

4. Revision of the 1993 SNA

One of the most important elements of the forthcoming revision of the 1993 SNA is the change in treatment of unfunded pension obligations. The somewhat arbitrary distinction between unfunded and funded pension schemes will be abolished. In this way, national accounts data become more relevant for the analysis of ageing. Moreover, economic statistics and international accounting standards are better harmonized. How this change will be dealt with in the presentation of national accounts data is still under discussion. Some are in favour of implementing the new rules in the core accounts; others – mainly representing EU countries – advocate representing pension obligations of unfunded schemes in supplementary tables only. Pension claims that are part of social security still are not recognized in national accounts.

The effects of the new rules on the recording of Dutch pension schemes will not be significant. With a minor exception, the Dutch pension system is fully funded. So in this respect there is no change. The treatment of military pensions, however, is affected. The unfunded portion, which is covered by the budget, should be treated as if it were funded. A particular feature is that no new pension entitlements are being built up and no premiums are being received by the fund. The benefits paid by the virtual fund are equal to the benefits paid out of the budget. In addition, the rendering of financial services is recorded.

The effect of the new treatment – if fully applied in the core accounts – is to make government deficits/surpluses more comparable. For the EU member countries, this is highly relevant in the context of the EDP notifications. In countries like the Netherlands, where civil servants' pension schemes are funded, the government deficit/surplus has been affected for many years, because premiums are paid to the ABP fund. Compared to a system of unfunded pensions, the effect on the year-to-year government deficit/surplus may be negative or positive. On one hand, premiums may be higher than benefits – more heavily in a phase where pension entitlements are being built up. However, a funded pension fund also receives income from the investment of its assets, and may benefit from price increases in its invested assets. Both of these situations result in lower premiums. Government debt, of course, will tend to be higher to the extent that government has contributed to building up the pension funds' assets.

The new SNA treatment also has consequences for Eurostat's decisions on lump sum payments. As the difference in national accounts treatment of funded and unfunded employer schemes is abolished, the lump sum payments cease to be recordable as a capital transfer, unless the pension obligations transferred become fully a part of social security. However, when it comes to "creative accounting", nothing can be excluded, and therefore it is still worthwhile to devise clear rules for the sequence of recording transactions and making entries in the "other changes in assets" account.

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The recording of unfunded pensions of employees of Australian governments in government accounts and economic statistics

Peter Harper[1]

1. Introduction

One of the features of the updated *System of National Accounts* (SNA) – SNA Rev. 1 – is its enhanced treatment of unfunded pension liabilities. In the 1993 SNA, liabilities for such pensions (and the counterpart assets) are not recorded in the system's balance sheets. However, in the update, liabilities and the counterpart assets can now be recorded. This is welcome news for Australia. The Australian national accounts and government finance statistics (GFS), produced by the Australian Bureau of Statistics (ABS), have recorded the unfunded pension liabilities of governments and the counterpart unfunded pension assets of households since the introduction of SNA93 in Australia in 1998. While this treatment was not consistent with the recommendations of the SNA, the view in Australia has been that these liabilities are actual liabilities of governments, and the issue of whether they are funded or not is not particularly relevant in establishing this position. Interestingly, this view is not only strongly held by the economic statisticians in Australia, it is also strongly held by the governments themselves, the parliaments to which the governments are accountable, and the users of the national accounts and GFS.

In a number of countries, there is concern about the boundary between social security and government employee pension schemes. This is not an issue of concern for Australia, as we do not have any social security schemes in the SNA sense.

2. Government employee pension schemes in Australia

By way of background, Australia is a federation. There is a central federal government, known as the Commonwealth government or the Australian government. There are six states (and two territories that are quite similar to states), each with its own government. Collectively, the Commonwealth government and the six state and two territory governments are known as the "jurisdictions".[2]

Both defined benefit and defined contribution employee pension schemes exist in Australia. The latter type covers the majority of private sector employees. Government employees are typically covered by the former type, although this is not universally so. Some government schemes are a mixture of both types.

In Australia, a range of different types of pension schemes exists to provide retirement income for general government employees. Most governments operate, or used to operate, pension schemes for their employees that are unfunded or only partly funded. A number of general government schemes have one component funded through direct employee

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[2] The term "state government" is generally use to cover both state and territory governments.

contributions, and another (the employer's contribution) that is unfunded. Under such schemes, employee contributions plus investment returns are redeemed upon retirement date, with employer contributions paid in the form of a pension. Other general government schemes comprise only an unfunded employer component. Increasingly, pension schemes for general government employees in Australia are becoming fully funded. The main schemes for the largest general government employer, the Commonwealth government, remain unfunded, except for new employees after July 2005. Typically, defined benefit schemes operated by Australian governments are unfunded, whereas defined contribution schemes are funded.

3. Australian national accounts and GFS treatment of defined benefit pension schemes

The starting point for the Australian national accounts and GFS treatment of defined benefit pension schemes is actuarial based estimates of the net present value of unfunded employee pension liabilities and the associated flows. This information is available from the accounts of the jurisdictions themselves.

The change in the liability position (flows) from one period to the next is disaggregated into the following components:

- imputed employer contributions for new and existing employees
- *plus* imputed property income on the outstanding liability to pay pensions
- *plus* revaluations
- *plus* revisions due to changes in actuarial assumptions and benefits payable
- *less* pensions paid

The recording in the national accounts is as follows:

1. Unfunded pension claims are recorded as a liability on the balance sheet of the general government sector and as an asset on the balance sheet of the household sector.
2. Imputed employer contributions are recorded as compensation of employees in the income accounts of the general government and household sectors and as government final consumption expenditure in the use of income account.
3. Imputed property income (interest) flows are recorded in the income accounts of the general government and household sectors.
4. Changes in technical reserves (imputed employer contributions plus property income less pensions paid) are recorded as the incurrence of a liability in the financial account of general government and an acquisition of a financial asset in the financial account of households.
5. Revaluations (for example, arising from changes to the discount rate) and changes in actuarial assumptions and/or defined benefits are recorded in the other changes in assets accounts.

In the income accounts, Australia does not record the pension benefits and (imputed) contributions and the resultant adjustment for the change of net equity of households in pension funds.

In GFS, a similar recording is adopted, with imputed employer contributions and property income recorded as expenses in the operating statement.

To understand the significance of the recording of government unfunded pension schemes in Australia, at 30 June 2006 the value of these liabilities for all governments stood at AUD 202,736 million,[3] or about 55% of the total liabilities for the general government sector.[4] During 2005–06, the amounts recorded for all governments for the imputed employer contributions and interest flows were AUD 5,815 and AUD 8,485, respectively (1.7% and 2.2%, respectively, of total general government expenses).

4. Availability of data from public accounts

In Australia, the Commonwealth Government, the six state and two territory governments, as well as the 750 or so individual local government authorities, each prepare financial information on the net present value of future benefits and associated flows for budgeting and financial reporting purposes. Financial reporting is also required under Australian Accounting Standards, issued by the Australian Accounting Standards Board. In addition to the information normally available from the public accounts prepared under each government's finance, audit and similar legislative requirements, the Commonwealth and state governments also have an inter-governmental agreement to publish, as part of their budget or related documentation, a core set of uniform financial information based on GFS concepts. The Australian Bureau of Statistics, though not formally a signatory to the inter-governmental agreement, plays a key role in ensuring this uniformity as well as conformity to the GFS standards.[5]

In relation to their respective defined benefit scheme(s), each government has readily acknowledged the legal and contractual nature of its obligation; hence the on-balance sheet nature of its liability has never been under contention. As a result of this acknowledgement and the financial reporting referred to above – especially the reporting on a uniform basis – the key data items relating to the public sector defined benefit schemes are readily available. The estimates of the unfunded liability for defined benefit schemes are regularly available as independently audited information. Moreover, independent professional actuaries also undertake regular reviews of the schemes, typically triennially.

The data items available include: accrued employer contributions (in respect of the current service of employees), cash payments (in respect of the past service of retired employees), imputed property income flows, actuarial adjustments and opening and closing liability balances.

Governments record pension funds in their own accounts, according to Australian Accounting Standard AASB 119 *Employee Benefits*, which is based on and consistent with International Accounting Standard IAS 19. (In Australia, governments are obliged to use the same standards for accounting as businesses, where the business standards are relevant.) The governments have decided not to allow the "corridor" option for dealing with actuarial gains and losses, in order to maximise harmonisation with GFS requirements. The discount rate is fundamental to the calculation of the outstanding liability, service flows and interest costs. All jurisdictions use the Commonwealth Government long-term bond rate as their discount rate.

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[3] About USD 165,000 million.

[4] The next largest component of general government liabilities for all governments was borrowing of AUD 95,724.

[5] These GFS statements produced by the various governments may and do differ from GFS statements that are produced by the ABS, as the ABS reserves the right to prepare GFS statistics that are independent from government. The ABS GFS statements are Australia's "official" GFS statistics.

The method used by all jurisdictions to derive estimates of their unfunded liability is the "projected unit credit method". In this method, the same proportion of the estimated final benefit payable is allocated to each year of service.

5. Data required to estimate unfunded pension liabilities and associated flows

Where data relating to a government's defined benefit employee pension scheme is not available from a government's own accounting records, it may still be possible to compile estimates of the unfunded pension liabilities and the associated flows. The process would require a large volume of input data that would need to be manipulated systematically over multiple periods, with complex calculations and with the output being sensitive to assumptions. However, trained actuaries should be able to readily take the input data and derive estimates. Also, despite any uncertainties inherent in a model-based estimate in the national accounts, it could be expected that the resulting estimates represent a far superior reflection of the true fiscal and economic situation facing governments than a cash-based accounting.

In a defined benefit scheme, the benefits payable on retirement are usually promised or predefined by some formula. The key parameters of the formula are normally the employee's length of service and retirement salary. The nominal values of the total retirement benefits to be paid in the future can be calculated based on assumptions such as expected retirement ages, mortality rates, expected inflation, and expected salary increases. As the calculation would be highly sensitive to these assumptions, they need to be soundly based and regularly reviewed and updated.

The nominal values derived above can then be converted to their present values using an appropriate discount rate, such as that reflecting the particular government's long-term borrowing rate. This present value represents the accrued gross liability at the end of a period in question. In effect, this accrued liability represents the employees' pension entitlements in respect of service already provided to the government.

Over successive accounting periods, the total liability of the pension scheme would change because of the accrual of additional contributions, the payment of benefits to pensioners, changes in the assumptions or variables, and the passage of time. The imputed property expense for a period can be calculated as equal to the increase in the liability resulting from the passage of time, which occurs because the future benefits are discounted over one less accounting period. As unfunded liabilities essentially represent borrowings by the employer from employees, then the general cost of borrowing for the employer should be used to determine the discount rate. In the case of government, for example, an appropriate rate would be the long-term bond rate.

The change in the liability due to changes in assumptions or variables (commonly referred to as actuarial revaluations in accounting terms) may be in the nature of revaluations or other change in the volume of assets.

Fiscal policy and pension expenditure in Portugal

Cláudia Rodrigues Braz[1]

1. Introduction

From the end of the 1990s until 2005 (with a break in 2002), there was a gradual deterioration in the structural fiscal position in Portugal. Favourable economic conditions were not used to consolidate, and few measures were implemented to curb the upward trend in expenditure, particularly on pensions. This contrasted significantly with developments in the euro area as a whole. Indeed, while in the euro area the ratio of primary expenditure to GDP almost stabilised between 1998 and 2005, in Portugal it rose by 6 percentage points. Without taking into account some structural breaks in the delimitation of the general government sector that occurred in Portugal meanwhile, as well as some other differences that may blur international comparisons, this outcome stemmed mainly from the behaviour of social payments. The fact that the social security system in Portugal is not yet very mature is a key factor in explaining these developments.

2. Fiscal policy in Portugal from 1998 to the present

After the beginning of the third stage of EMU, fiscal policy in Portugal followed a pro-cyclical expansionary stance in every year until 2000 (Chart 1). This was characterised by a strong growth in primary current expenditure, in parallel with a rise in the tax burden and a decline in interest payments, which allowed a near stabilisation of the general government deficit at a level close to the 3 per cent threshold (Charts 2 and 3). In 2001, the cyclical downturn and the continuous deterioration of the cyclically adjusted primary balance led Portugal into an excessive deficit situation. In the framework of the Maastricht Treaty and the Stability and Growth Pact, the Ecofin Council recommended that the excessive deficit be corrected by 2004.

In this context, and given the need for a swift reduction of the deficit, some fiscal policy measures were adopted by the Government from the middle of 2002 onwards. These consisted mainly of an increase in the standard VAT rate from 17 to 19 per cent, a significant cut in investment expenditure and a smaller reduction in intermediate consumption, plus some measures of a temporary nature (an extraordinary settlement of tax arrears, the sale of the fixed network for telecommunications and the sale of the toll rights for a motorway near Lisbon). Overall, the fiscal stance tightened slightly in 2002, in a period of low economic growth. In 2003 and 2004, some additional measures were implemented, such as a virtual freezing of the public employees' wage scale and of automatic career progression, tighter controls on the hiring of new public employees and an increase in taxes on oil products. These measures were likewise complemented by temporary measures: a securitisation of tax and social contribution arrears (2003); and transfers of pension funds to general government (2003 and 2004). The overall amount covered by the temporary measures reached 1.3, 2.4 and 2.1 per cent of GDP in 2002, 2003 and 2004, respectively.

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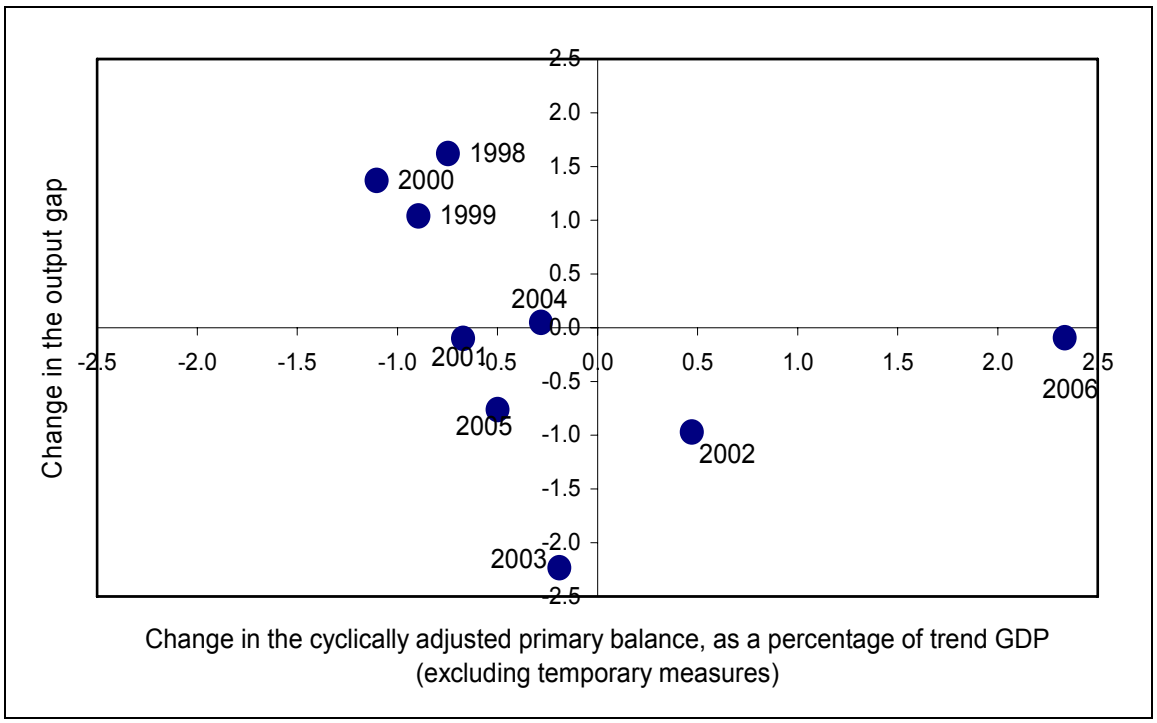
Chart 1

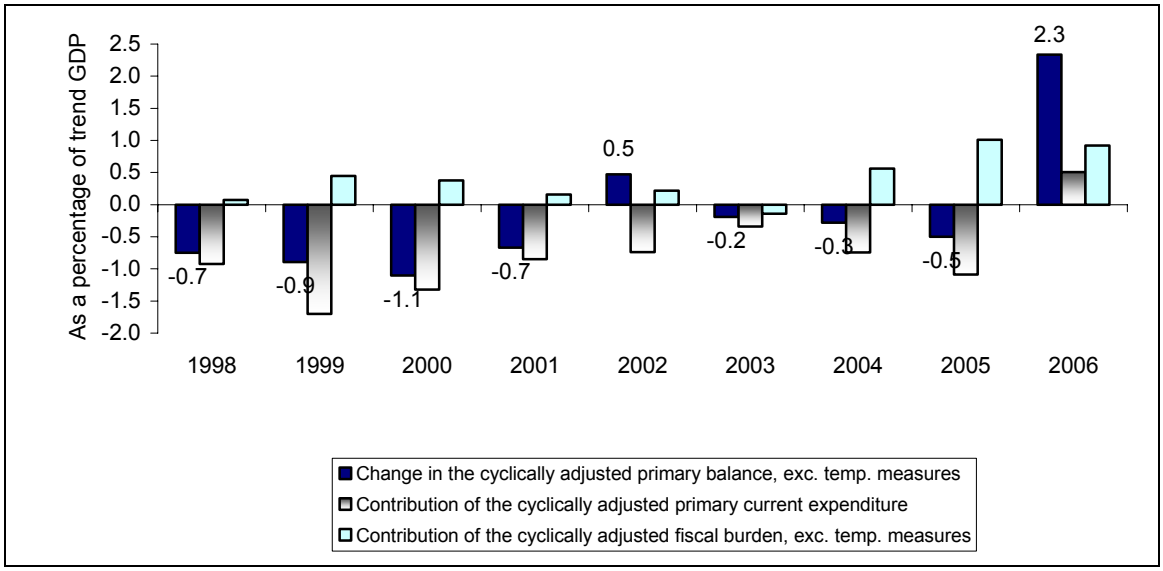
Fiscal stance and cyclical conditions



Source: National Statistical Institute and author calculations.

Chart 2

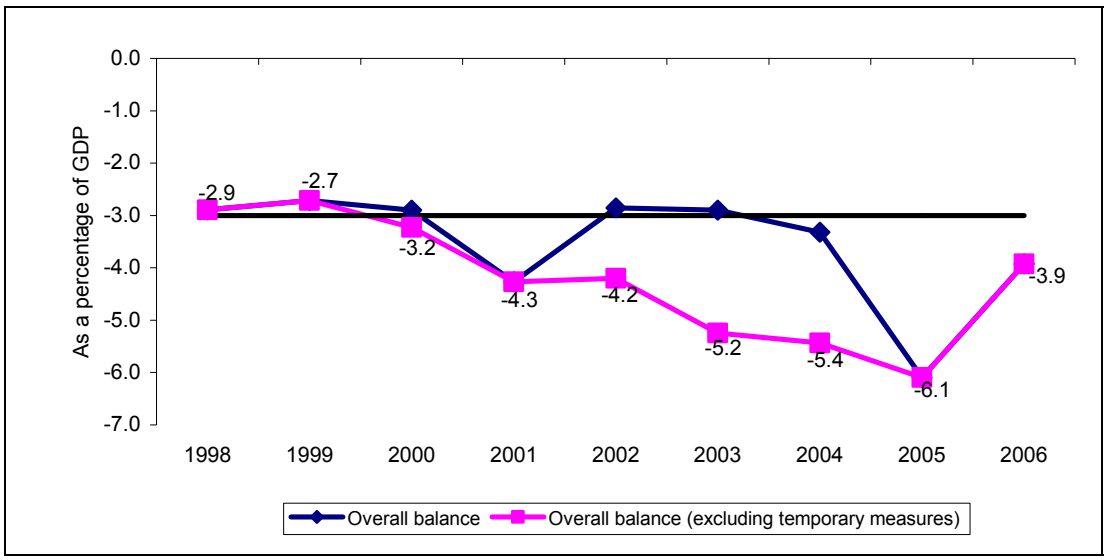
Contributions to the fiscal stance



Source: National Statistical Institute and author calculations.

Chart 3

Overall general government balance



Source: National Statistical Institute and author calculations.

In 2004, based on the data then available, the Council abrogated the decision on the existence of an excessive deficit in Portugal. However, the underlying fiscal imbalances were not eliminated durably. Indeed, from 2002 to 2004, primary current expenditure continued to increase markedly, in spite of the measures adopted. This was largely the result of the sustained strong growth in pension expenditure. In 2005, the deficit reached a peak of 6.1 per cent of GDP and Portugal returned to an excessive deficit position, which the Council recommended be corrected by 2008. The absence of temporary measures, the lagged effect of the 5 percentage point (p.p.) cut in corporate income tax in the 2004 budget, the decline in dividends received by the State and the increase in pension expenditure were crucial to this outcome. However, if the 2005 outturn had not benefited from a new hike in the standard VAT rate to 21 per cent and the considerable gains in the effectiveness of tax collection, estimated at around 1 per cent of GDP, the deterioration in the budget balance would have been much greater.

From 1998 to 2005, cyclically adjusted primary current expenditure increased by 7.7 p.p. of trend GDP, of which 5.3 p.p. were for social payments (2.5 p.p. for pension expenditure) and 1.3 p.p. stemmed from compensation of employees (1.0 p.p. related to employers' actual social contributions – for more details on the recording of social contributions for the public employees' social security system in Portugal on a national accounts basis, see section 3). It is worth highlighting that the composition of primary current expenditure was affected in 2003 by the transformation of some public hospitals into corporations, which led to an increase in social payments in kind and a decline in both compensation of employees and intermediate consumption.

By the middle of 2005 there was already a consensus that a structural curbing of primary current expenditure, in particular pension expenditure and compensation of employees, was crucial for the correction of the Portuguese public finances imbalance. The updated stability programme sent to the European Commission in June 2005 set the fiscal consolidation strategy, which aimed at reducing the general government deficit in Portugal to below 3 per cent of GDP by 2008. In the first stage, consolidation was focused more on the revenue side – the rise in the standard VAT rate mentioned above, the increase in taxes on oil products and the impact of the improvement in the effectiveness of tax collection. But it also aimed at reducing expenditure on a permanent basis, through a broad set of measures

that included the reforms of both the public employees' and the general pension systems (for more details, see section 3), and of the public administration.

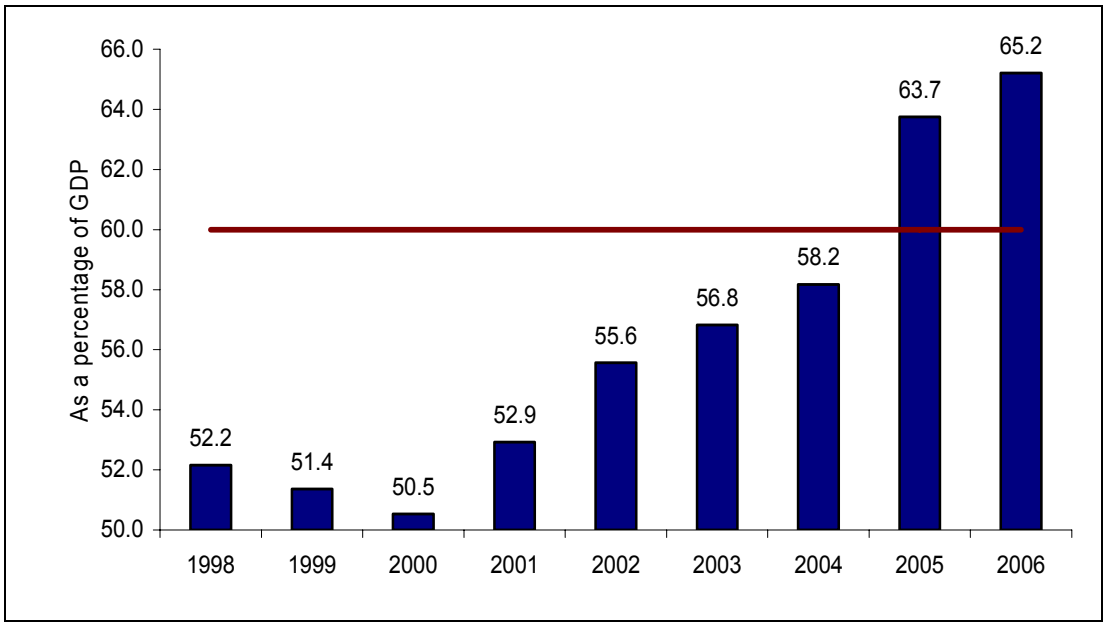
Fiscal developments in 2006 exceeded expectations: the general government deficit stood at 3.9 per cent of GDP, falling short of the 4.6 per cent target. The cyclically adjusted deficit improved by 2.3 p.p. of GDP, fulfilling by a large margin the Council recommendation to reduce the structural deficit by 1.5 p.p. of GDP. This outcome continued to result from an increase in the tax burden but, for the first time since 1997, the ratio of primary current expenditure to GDP declined. In addition, a strong decline in public investment also contributed to the improvement in the fiscal position.

Public finances in Portugal will face a major challenge in the years ahead. For 2007, the Government targets a 3.3 per cent of GDP deficit and, in the context of the Stability and Growth Pact, the excessive deficit should be corrected in 2008, as already mentioned. The medium term objective, a structural deficit of 0.5 per cent of GDP, is foreseen to be reached by 2010, according to the latest update of the stability programme. However, its attainment per se is not enough to fully contain the fiscal impact of an ageing population. In this respect, the recent reforms of the public pensions systems, if consistently implemented throughout the next decades, were a major step in ensuring the sustainability of public finances.

Concerning the public debt ratio, it is worth highlighting that there was still a decrease in the 1998–2000 period, due to the small primary surplus in each year, the impact of economic growth that more than compensated interest payments, and high negative deficit-debt adjustments in 1998, mainly related to privatisation proceeds allocated to debt redemption (Chart 4). This situation reversed in 2001, as a consequence of the primary deficit, the slowdown in economic activity and deficit-debt adjustments contributing to the increase in the debt ratio. Until 2006, the debt ratio kept its growing trend, surpassing the 60 per cent threshold in 2005 and reaching 65.2 per cent by the end of 2006. On a cumulative basis, the stock of gross public debt has increased by 14.7 p.p. of GDP in the last six years, on the basis of the contributions of the primary deficit, the net impact of interest payments and economic growth, and positive deficit-debt adjustments (Chart 5).

Chart 4

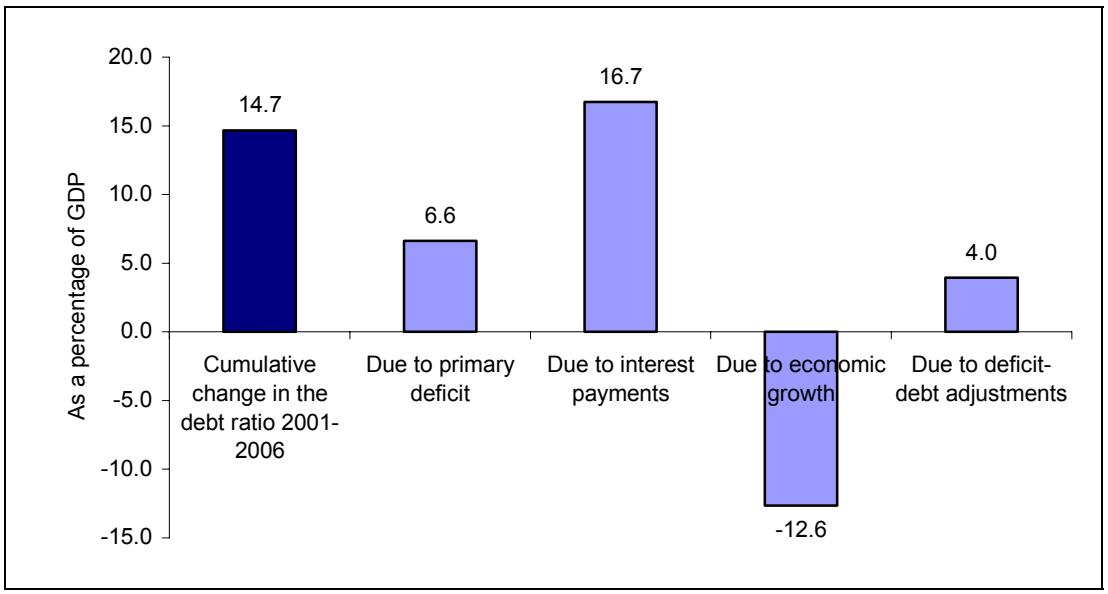
Public debt ratio, 1998–2006



Source: National Statistical Institute.

Chart 5

Cumulative change in the public debt ratio, 2001–2006



Source: National Statistical Institute and author calculations.

3. General government pension expenditure in Portugal

In Portugal, general government pension expenditure involves mainly two subsystems: the public employees' pension system and the general social security system. The rules followed in the two schemes were substantially different in the past.

3.1 The public employees' pension system

The public employees' pension system had very generous rules, in particular until the beginning of 2004; these rules applied to workers that joined general government institutions before September 1993 (for the others, the general system rules would apply). From the beginning of 2004, the initial pension of a retired public employee with at least 36 years of service was reduced from 100 per cent of the last gross wage to 90 per cent. In addition, financial penalties were introduced for those retiring before the age of 60. Still, the new rules were more favourable than the general social security system ones, and in the middle of 2005 it was decided to implement a gradual convergence. The new legislation came into force at the beginning of 2006, and essentially included a regular increase (by six months in each year) of the retirement age from 60 to 65 and of the contributory career for a full pension from 36 to 40 years. In addition, with the reform of the Retirement Statute, the system became a closed one and new public employees hired from January 2006 onwards contributed to the general social security system. These changes led to a significant rise in retirement requests and, as a consequence, pension expenditure did not decelerate in 2006, although it is expected to do so already in 2007. Very recently, additional changes in the public employees' pension system were announced, but still not legislated, in order to ensure full compatibility with the new Social Security Framework Law.

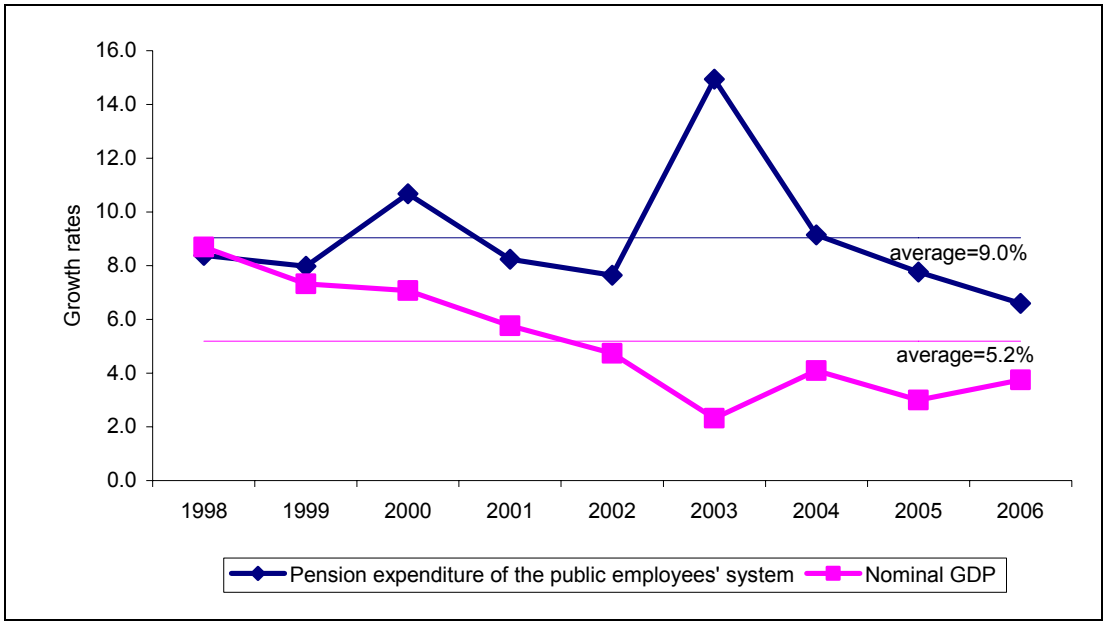
The entity that manages the public employees' pension system is *Caixa Geral de Aposentações*, which is included in the social security subsector in the national accounts. This entity pays pensions and receives, in addition to public employees' contributions, amounts paid by some general government bodies. However, no fixed rate is applied to the

State's contribution as an employer; it corresponds in each period to the amount necessary to keep the system in balance. As pension expenditure has been growing fast in the last few years, this State subsidy to *Caixa Geral de Aposentações* has also increased substantially, contributing to both the rise in social contributions, on the revenue side, and compensation of employees, on the expenditure side, but having no impact on the deficit.

Chart 6 shows the evolution of pension expenditure of the public employees' pension system from 1998 to 2006. As can be observed, pension expenditure in this subsystem grew every year above nominal GDP, contributing to the deterioration of the budget balance, in particular in years of low economic growth. In addition, as mentioned above, it contributed to the increase in the tax burden, on the revenue side, and in compensation of employees, on the expenditure side. The factors that explain this evolution are presented in Chart 7. The number of retirees increased every year, explaining about one third of the overall growth in pension expenditure. This effect results from the demographic structure of public employees still active, as well as from the impact of an ageing population, with longer average life expectancy. The annual update of pensions in this subsystem follows closely that for active public employees, which means that from 2003 to 2006 it was also impacted by the moderation in the update of their wage scale. The residual growth rate represents a composition effect related to the fact that, on average, the new retirees have higher pensions than those that leave the system. In the whole period, this last effect is the most important in the explanation of pension expenditure growth.

Chart 6

Pension expenditure of the public employees' subsystem and nominal GDP

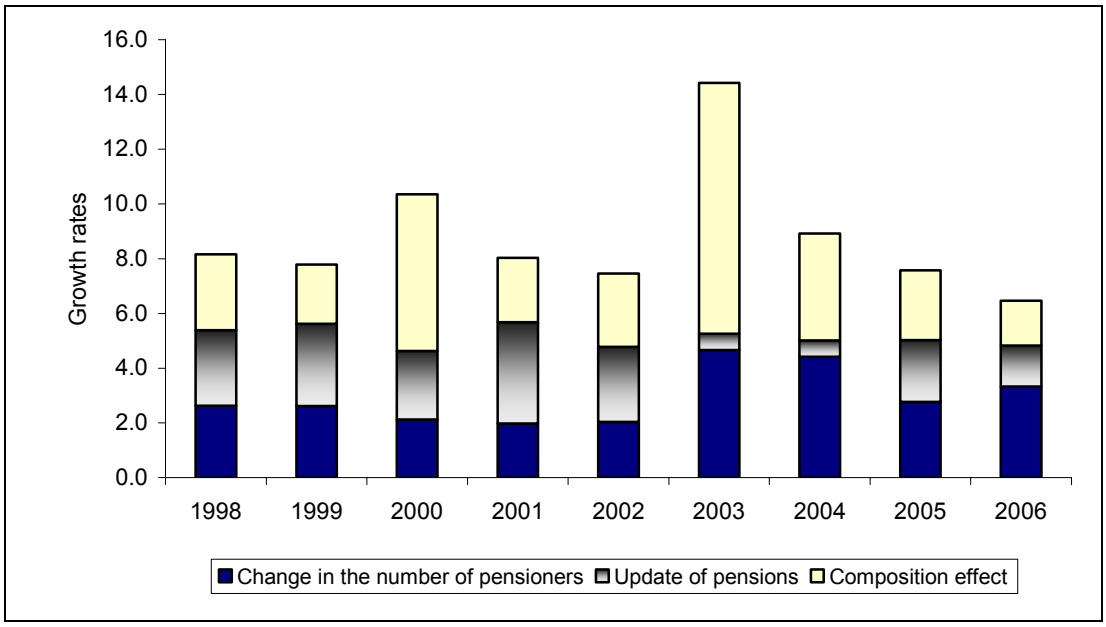


Source: Author calculations.

Chart 7

Pension expenditure of the public employees' subsystem

Growth factors



Source: Author calculations.

3.2 The general social security system

The old-age pension expenditure of the general system has also grown substantially in the last few years (Chart 8). As the general social security system in Portugal is of the pay-as-you-go type, this evolution is a cause for concern, especially given the ageing population. The underlying causes of these developments are represented in Chart 9. The number of old-age pensioners increased rapidly every year, with the exception of 1998 and 1999. Indeed, these years were still affected by the gradual rise in the retirement age of women from 62 to 65, which occurred between 1994 and 1999 (six months per year). Since then, the fact that the system has not yet reached maturity and the ageing population have been the main factors behind the increase in the number of old-age pensioners. These explanatory factors are also valid for the composition effect, justifying why the average pension, besides the impact of the annual update, is growing so fast. Lastly, it is worth highlighting that the average annual update of the pensions of the general system has usually been higher than expected inflation, in particular in the 2003–2006 period, when a gradual convergence of minimum pensions to a proportion of the minimum wage was implemented.

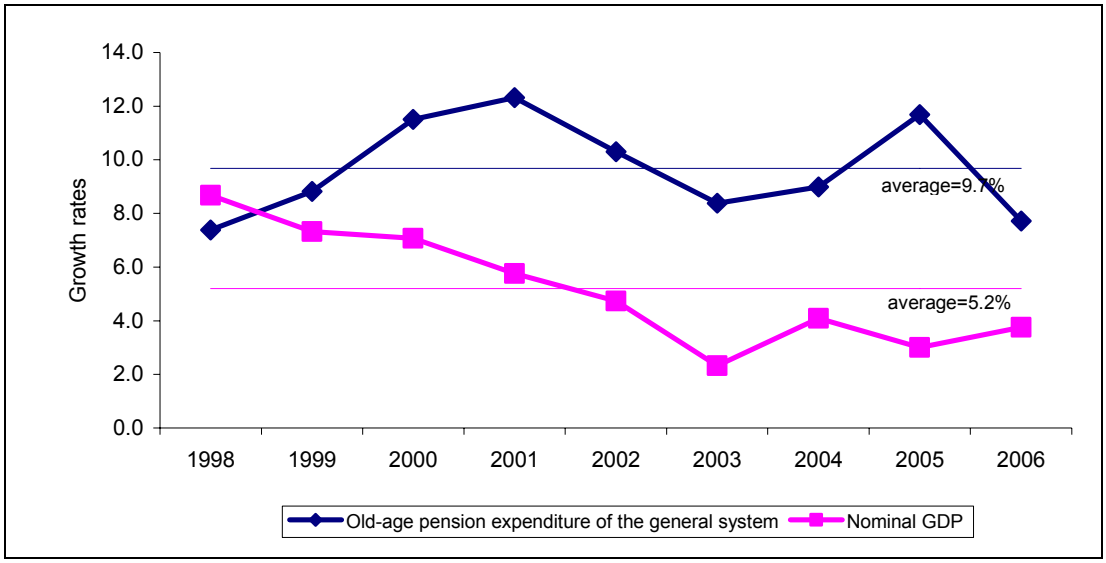
As mentioned in section 2, in mid-2005 the new Government took the view that the correction of the fiscal imbalance should be based on a sustainable reduction of expenditure, in particular pension outlays. As such, during 2006 discussions started with the social partners on a reform of the general social security system; this resulted in a new Social Security Framework Law, published at the beginning of 2007. The main changes introduced by this reform were:

New rules on the annual update of pensions as a function of inflation, real GDP growth and the amount of the pension;

Increase in the financial penalty for early old-age retirement from 4.5 to 6 per cent for each year relative to the statutory age of retirement (only possible for contributors who have at least 30 years of contributory career and are 55 years old);

Chart 8

Old-age pension expenditure of the general subsystem and nominal GDP

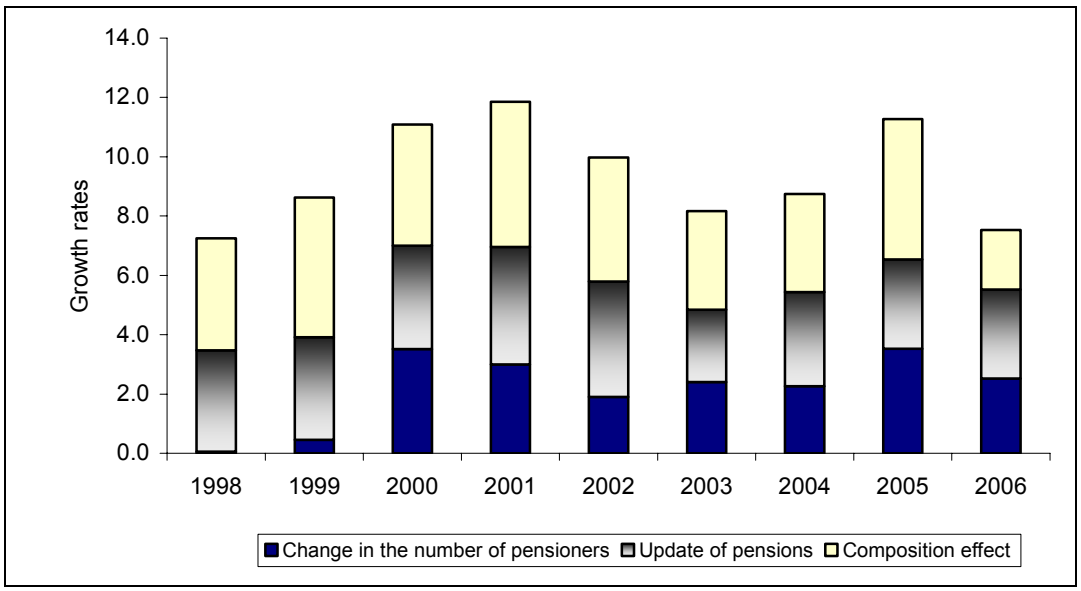


Source: Author calculations.

Chart 9

Old-age pension expenditure of the general subsystem

Growth factors



Source: Author calculations.

Introduction, from 2008 onwards, of a “sustainability factor”, which will reduce new pensions in accordance with the increase in life expectancy at 65 years old;

The transition to a new formula for the calculation of the initial pension based on the wages of all the years of contributory career, introduced in 2002, will be speeded up.

According to some recent calculations by Pinheiro and Cunha (2007), highlighted also in the next subsection, this reform, if implemented consistently, will decrease significantly the risk of unsustainability of public finances in Portugal.

3.3 Long-term projections for public pension expenditure

In the context of the Economic Policy Committee of the European Commission, the Ageing Working Group (AWG) produces long-term projections for age-related expenditure (pension, health and long-term care, unemployment benefits and education). These projections are updated on a regular basis and the last report was published in 2006 (for more details, see EPC and EC (2006)). It is worth noting that a substantial effort has been made to harmonise the underlying assumptions of the projections but the results are not yet fully comparable. The European Commission services use these results to assess the sustainability of public finances in the context of the Stability and Growth Pact.

Pension expenditure projections are essentially elaborated by national experts using their own models, under the guidance of the AWG. Regarding Portugal, taking into account the two public pension subsystems, the last AWG projections pointed to an increase of 9.3 p.p. of GDP in pension expenditure between 2005 and 2050. This result, according to the European Commission, placed Portugal in the group of high risk countries as far as the sustainability of public finances is concerned.[2] However, these projections did not consider the recent reform of the general social security system. According to a recent study by Pinheiro and Cunha (2007), using the AWG underlying assumptions, the effect of the new measures could reduce pension expenditure in the 2005–2050 period by a value between 4.1 and 7.4 p.p. of GDP, placing Portugal in the group of "medium risk" countries as regards the sustainability of public finances.[3] Nevertheless, their impact will be very limited in the short-run.

4. Conclusions

Governments may be tempted to postpone for a while the adoption of unpopular measures of a structural nature to curb public expenditure, in particular in a context of favourable economic conditions. Such measures may even be replaced by rises in taxation, temporary measures or one-off cuts in some expenditure items, in particular investment. However, the absence of measures with a lasting effect will become apparent sooner or later, as the structural trends of current expenditure prevail, and then the deficit may reach a very high level. Very briefly, this is the story behind fiscal developments in Portugal in the 1998–2005 period. The year 2006 was very likely a turning point in this evolution but the years ahead are still a huge challenge, in particular until a sustainable fiscal position is reached.

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[2] The European Commission currently bases the analysis of the sustainability of public finances on two synthetic indicators: the S1 indicator, which is the change in revenue and/or primary expenditure as a ratio to GDP required to reach a debt ratio of 60 per cent in 2050; and the S2 indicator, which is the change in revenue and/or primary expenditure as a ratio to GDP that ensures that the present discounted value of future primary balances equals the current stock of public debt.

[3] The range of results depends on the reaction of economic agents to the introduction of the "sustainability factor": they may opt for the postponement of retirement in order to avoid the financial penalty or they may choose to retire at the statutory age and have their pension reduced. The first option is more favourable in terms of the sustainability of the system.

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Special Topics Contributed Paper Meeting 18

Institutional cooperation in statistics: best practices and the way forward

Chair: Helena Cordeiro, Statistics Portugal and Hervé Carré, European Commission

Papers:

Institutional cooperation between central banks and the statistical offices for producing macroeconomic statistics
Claudia Dziobek and Florina Tanase, International Monetary Fund

Institutional statistical cooperation across borders – the case of the Nordic countries
Hilkka Vihavainen, Statistics Finland

Statistics: the case for institutional cooperation
Manuel Sebastião and João Cadete de Matos, Bank of Portugal

Institutional cooperation in statistics: the case of EU Central Banks
Steven Keuning and Alda Morais, European Central Bank

Official statistics caught between two stools: why a truly European stool might be more comfortable
Hervé Carré, European Commission

Institutional cooperation between central banks and the statistical offices for producing macroeconomic statistics

Claudia Dziobek[1] and Florina Tanase[2]

Introduction

This paper discusses the different purposes and forms of collaboration between central banks and national statistical agencies in the area of macroeconomic statistics. Cooperation agreements may be designed to clarify the division of labor in producing data, or may concern the provision of specialized data to a central bank for policy purposes. Cooperation may also be intended to help national statistical agencies develop their statistical capacity, particularly in countries with relatively weak national statistical agencies. In many countries, cooperation between central banks and statistical offices has evolved from informal to more formal arrangements. This paper deals with formal cooperation agreements.

1. Reasons for formal cooperation and sources of information

Formal cooperation between central banks and national statistical offices can have different purposes. Table 1 presents an overview of various types of contracts and their main features. The information in this table is from a larger study (Dziobek and Tanase, forthcoming, 2008) that brings together the results of a survey with the Fund's experience in providing technical assistance to member countries. The larger study presents country case studies of the various types of cooperation shown in this table.

When both central banks and national statistical agencies play a role in producing certain statistics, as is often the case for external sector statistics, cooperation agreements can serve to clarify the division of labor. An example of this is the memorandum of understanding between the European Central Bank and Eurostat. Generally, the aim in these cases is to specify what data are to be made available by each party and on what schedule, thus contributing to a smoother work process. The agreements take on an added dimension when a country is committed to disseminating data according to a release timetable determined in advance, as in the case of the 64 subscribers to the Special Data Dissemination Standard (SDDS). In some countries, such arrangements are supported in the form of the central bank seconding staff to the national statistical agency. Secondment can help the national statistical agency in countries where the central bank has more experienced specialists. However, there are also cases where secondment of central bank staff can help in developing skills at the central bank.

Agreements between central banks and national statistical agencies can also be motivated by a central bank's need for data that is more specialized than what is currently produced by the national statistical agency. For example, a central bank following an inflation targeting framework may require detailed data on price trends (such as data on core inflation) which

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the national statistical agency would not otherwise compile. Central banks generally refrain from developing such data themselves, in order to avoid a conflict of interest. Under inflation targeting regimes, central bank performance is measured by the ability to meet specified price targets, and hence the credibility of the regime requires that the relevant data be provided by an independent source. In some countries, central banks pay for the provision of such specialized price data.

Table 1

Types of contracts between central banks and statistical offices for the provision of data

Type of contract	Main features of contracts for provision of macroeconomic statistics
Memorandum of understanding	– guiding principles governing primary and shared responsibilities – modalities of cooperation and information exchange
Seconding of staff	– central bank balance of payments statistics staff seconded to national statistical agency to learn about survey technology for Foreign Direct Investment Survey
Annual service contract	– payment for service – specialized data (eg core inflation) provided by statistical agency – specific surveys provided to central bank by statistical agency
Shared responsibilities for statistical program	– central bank provides managerial and technical support to the national statistical agency – central bank represented in the national statistical committee that develops the work program for the national statistical agency

Source: Dziobek and Tanase (forthcoming, 2008).

2. Different forms of cooperation agreements

Table 1 shows some examples of different types of contracts. There are many formal modes of cooperation between central banks and national statistical agencies besides memoranda of understanding. One interesting approach is reimbursement for services provided, a practice employed in industrial as well as emerging-market countries. This approach is particularly germane when statistical agencies are not well funded, as is the case in many countries. The main features of service contracts are to: (1) indicate, where applicable, the payments that a central bank is to make for services provided by the statistical office; (2) set forth each institution's responsibility for producing macroeconomic statistics; (3) provide a framework for the exchange of data; (4) establish the forms of cooperation between institutions; and (5) establish procedures for monitoring the quality of the data exchanged. Similar service, or service level agreements can also be made without direct compensation,

although more indirect compensation may be provided through the budget process, when the statistical agency is able to make a case for the need to produce specific data for policy purposes.

In one instance, the central bank is responsible for monetary and balance of payments statistics, and has an annual service contract with the national statistical agency. The contract sets out the agency's responsibility for conducting various surveys for the central bank (in connection, for example, with a business confidence index, foreign direct investment, family confidence index, remittances or tourism). This approach reflects a recognition of the statistical office's expertise in conducting surveys, and the fact that it has the comprehensive legal framework needed for data collection. The central bank, in return, pays for the surveys.

There are also examples of cooperation on a higher level. In one country, national accounts and price data are compiled by the national statistical agency, but the central bank cooperates in managerial and technical meetings and through joint commissions. The central bank also has a representative in the statistical commission, which oversees the national statistical agency.

Sometimes, the two entities cooperate on developing quarterly GDP estimates. While the central bank provides some research resources and focuses on up-to-date economic monitoring, the statistical agency is charged with producing and disseminating national accounts statistics, since it is responsible for the main data source and is most familiar with the data.

Conclusion

Central banks are pro-active users of statistics and can thus play a role as catalysts for the development of national statistical agencies. Cooperation agreements with national statistical agencies can be highly formalized. In some cases, the agencies provide special data services to central banks for a fee, an approach of great interest in many countries with relatively weak national statistical agencies. This approach can help both parties, as the central bank obtains data needed for policy purposes, while the statistical agency receives support from the central bank to develop its statistical capacities. These examples also highlight the fact that central banks seem to prefer arrangements with national statistical agencies to the alternative of expanding their own data producing activities.

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Institutional statistical cooperation across borders – the case of the Nordic countries

Hilkka Vihavainen[1]

1. Background

Nordic cooperation in the field of statistics has a very long tradition. It was first initiated by national statistical societies in the late 19th century, and institutional cooperation among the national statistical agencies of Iceland, Norway, Sweden, Finland and Denmark was launched after the Second World War, with funding from the governments of the Nordic countries. At the initiative of the Nordic Council of Ministers, a special Statistical Secretariat was established in 1969 to oversee the cooperation and publish, among other things, a statistical yearbook. To support the development of statistics, standing committees were set up for various areas of statistics, with the Secretariat being responsible for overseeing the preparatory work of these committees. The heads of the statistical agencies met once a year to define the focus of the cooperation and to evaluate progress. A Nordic statistical conference met in a different Nordic country once every three years. A regular report was written on the cooperative efforts.

The forms of cooperation underwent radical changes in the early 1990s. A shift in orientation towards broader European cooperation contributed to the withdrawal of government support for the functioning of the Nordic Statistical Secretariat. National statistical agencies were faced with deciding whether to continue Nordic cooperation alongside cooperative efforts taking place within the European Union framework. Many doubted that the statistical agencies would have the drive and will to contribute to this regionally limited cooperation. The Directors General of the statistical agencies decided, nevertheless, to continue cooperative activities and backed this up with a willingness to dedicate their own resources to the undertaking. The modes of action, however, were modernised and streamlined.

The positive experience of the past ten years has confirmed the importance of Nordic cooperation. New topics and forms of cooperation have continued to arise, while some long-established forms have remained significant. Above all, Nordic cooperation in the field of statistics involves sharing best practices among countries that are highly advanced statistically, while working jointly to develop the field of statistics.

2. Basic elements of cooperation

The basic foundation of Nordic cooperation is, of course, the histories that, in part, these countries share, and the similar ways in which their societies have developed. In addition to cooperation on statistics, formal and informal cooperation has been extensive in many spheres of life. Nordic political decision-makers have learned from each other in developing national legislation and creating administrative structures. In many areas, the countries have competed, in a positive way, in the quest for excellence.

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Official statistics hold a prominent position in the Nordic countries. Throughout their history, statistics have been important in supporting societal decision-making on policy issues ranging from general economic conditions and labour to education, social affairs and health. Benchmarking against other – especially Nordic – countries has been regarded as important. Ultimately, the key objective of statistical cooperation has been to improve comparability. Especially in the early days, efforts were devoted to defining classifications so as to improve comparability, and statistical methodologies were harmonised. Another fundamental objective has been the development of entirely new statistics. The Nordic countries are relatively homogeneous in their levels of development, cultural backgrounds and administrative structures, and have therefore found it easy to cooperate, benefiting in many ways from each others' innovations and experiences.

Naturally, the need for comparability covers a much broader area than merely the Nordic countries. Nevertheless, they remain a good place to pilot new methods or statistical concepts, and to test their functioning. If a method or classification cannot be applied in such homogeneous countries, it is unlikely that it will provide comparability among much more heterogeneous countries.

Nordic statistical cooperation is based on all parties benefiting, in what is a "win-win" situation. Cooperation is carried out on a highly professional basis. All parties contribute resources, and all can be certain of receiving benefits, with experts learning from each others' good practices and solutions. One excellent example is the development of a register-based statistical system in all Nordic countries. These countries are the leaders internationally in utilising register data in statistics production, and this is due partly to their long-term cooperation.

Cooperation is voluntary, and is based on principles of equality. While not all parties participate in each cooperative activity, all are permitted to join in. Countries are not distinguished according to size or other characteristics. Many statistics experts consider Nordic cooperation to be the first forum of international cooperation.

Cooperation among these countries is also characterised by regularity and continuity. One key reason for this is the sense of certainty that the cooperation is directed and strongly supported by top management at the statistical agencies.

3. Forms of cooperation

Although cooperation between statistical agencies currently involves a very light administrative structure, it includes many forms of cooperation, as described below.

3.1 Meetings of Directors General

Each country acts as chair for one year. In addition to serving as chair, it functions as the secretariat for the meetings of the Directors General. A one-day meeting is held each year in the chairing country. In addition, the Directors General meet when necessary, generally in connection with the meetings of the EU Statistical Programme Committee. Once every three years, the top management of the statistical agencies comes together for a two-day meeting. Here, the agenda generally includes 4 or 5 different topics, which are prepared jointly. The substantive discussions are conducted during the meeting. On the basis of the issues discussed, the Directors General may decide to launch special studies considered strategically important, defining resources, timetables and tasks for the studies. Examples from the past few years include studies on the use of microdata, the registration of multinational enterprises located in the Nordic countries, and the organisation and costs of interviewing activities.

3.2 Contact networks

In addition to the statistical committees, 40 networks have been set up to cover different statistical areas, with representatives from each Nordic country. The convenor/chair is selected for three years at a time. Most of the networks deal with substantive issues in a particular area of statistics. In addition, there are networks dealing with horizontal issues such as dissemination, databases, quality management, web-master collaboration and research. Most of the time, the members of the networks communicate virtually, ie via email. Joint meetings are also arranged occasionally in connection with a meeting of one of the Eurostat working groups. The networks propose separate meetings or seminars as the need arises. Such expert meetings take place several times a year.

3.3 Seminars

Some of the networks have adopted a habit of arranging a special seminar every other year or every five years. The number of participants is generally capped at 40-50. Significant future-oriented seminars have been organised, on subjects such as labour market statistics and the use of registers. A seminar dealing with methodology and quality issues connected with the use of administrative registers in statistics production will take place in 2007. In addition to the Nordic countries, representatives have been invited from other countries that use government data in compiling statistics.

3.4 The Nordic Statistical Conference

The Nordic Statistical Conference, which convenes once every three years, is a traditional meeting. Nordic countries alternate in hosting it, and local statistical societies participate in the arrangements. In the summer of 2007, the 24th Nordic Statistical Conference will meet in Reykjavik, Iceland. The topic will be measurement problems in statistics. The two-day conference is divided into several sessions, and a joint Nordic group has been overseeing the preparatory work. Roughly 250-300 statistics professionals from all of the Nordic countries are expected to attend.

The practice during the past few years has been to arrange a course on statistical methodology before the conference, targeting, in particular, the younger professionals in the field. Nordic experts have acted as lecturers, and have often been joined by other internationally known experts. This time, the one-day course deals with sampling theory and its applications.

3.5 Joint projects

One project with a long tradition is the Nordic Statistical Yearbook, which is compiled by Statistics Denmark. Its costs are covered entirely by the Nordic Council of Ministers. Other projects funded jointly by the Nordic countries include a project to compile and develop statistics on the information society, and a project on commuting.

Perhaps the result of Nordic cooperation that is best known in the statistical world is the development of the PC-Axis software family. The software is designed for those who maintain statistical databases in statistical agencies, as well as in other organisations offering database services. The project began in Sweden, with Denmark, Norway and Iceland joining later. Statistics Finland began participating in the development work at a subsequent stage. The cooperative effort has since expanded greatly, and development work is now being carried out in over 30 organisations.

Over the years, there have been other projects as well, resulting in products that have found users outside the Nordic countries. Most typically, such projects have dealt with a specific issue, where there was a need to describe methodology and disseminate information on best

practices. The most recent example, a handbook on register-based statistics systems, will be published in the spring of 2007. The authors of the manual are Nordic experts in their field. As there is increasing interest in register-based statistics systems, the handbook will also be published in English by the ECE.

Another type of project investigated the future challenges of the statistical service, and resulted in a booklet entitled, “What Counts in the Future – Challenges of Official Statistics”. The project supported strategic management and planning in Nordic statistical agencies. Many of the future challenges identified were and remain relevant for the broader development of official statistics.

3.6 Export of know-how

Sweden, Norway and Denmark have long been active in development work in the field of statistics, especially within national development assistance programmes. They have their own projects, as well as projects involving two or three countries, which draw on experts from all participating countries. Statistics Finland has participated in EU-funded technical cooperation projects, primarily with the former Soviet republics, new EU member states and the Balkan states. Denmark and Finland have also undertaken several EU-funded twinning projects, in which one country is the leader and the other is a so-called junior partner. Statistics Sweden has also participated in some of these projects. Although the aim of the projects has always been to assist the beneficiaries in developing their own systems, the participating Nordic experts have, in the process, learned about each other’s best practices as well.

The background for this cooperation is the Nordic network, which has functioned in a highly flexible and practical manner. Seamless cooperation in projects targeting third countries has been especially important in cases where a particular country is unable to provide experts at a certain time or for specific tasks. In such situations, experts have been recruited from another country, through the contact persons in the network involved. This practice was agreed upon by the Nordic statistical offices as early as the 1990s.

4. Concluding remarks

Institutional cooperation is often based on agreements, and is therefore sometimes relatively formal in character. Nordic statistical cooperation is based first and foremost on common interests and the importance of sharing good practices. The statistical agencies of the Nordic countries can, and want to, learn from each other, and are also involved in jointly developing new tools. The cooperation is, by its nature, flexible and effective.

The fact that Nordic cooperation continues, despite the many types of international cooperation that are available, is proof of its importance and effectiveness. It is clear that the future of these cooperative efforts depends very much on the commitment and interest of management within the Nordic statistical agencies. As long as the cooperation offers opportunities for think tank-type sessions with colleagues, Directors General appreciate it and see it as beneficial for the development of their own agencies. The relative benefits gained from joint development projects are also significant.

The rise of a new generation of experts at statistical agencies is going to influence the future of cooperation, as the strong international experience among the younger generation may be moulded more by European than by Nordic cooperation experiences. Thus, the new incentives for Nordic cooperation may be different, eg the opportunity to gain work experience with another country’s statistical agency, the benefits of joint training events and the opportunity to participate in joint projects with third countries.

Many areas of statistics offer substantive challenges for the future, and meeting them requires ongoing Nordic cooperation. Borders in the traditional economic sense have lost their importance. What, then, are the regional entities best suited to deal with economic statistics and analysis? The increased integration of economies – especially changes in business, as well as changes in the cross-border labour market – are among the great statistical challenges now facing us.

Nordic statistical cooperation has produced great value added, both in the European context and in the broader international setting. It might be useful, internationally, to draw lessons from many of the forms and models of this cooperation, which have fostered the development of the Nordic statistical agencies.

Statistics: the case for institutional cooperation

Manuel Sebastião[1] and João Cadete de Matos[2]

1. Introduction

Statistics are a public good. They must be produced efficiently if they are to maximize user satisfaction while minimizing overall social costs. Various forms of institutional cooperation can be envisaged in efforts to compile top quality statistics that meet international standards and commitments to national and international organizations. Based on the experience of the Banco de Portugal in this area, this paper illustrates the main dimensions of institutional cooperation in the field of statistics, focusing on those that are most relevant in terms of cooperation between national central banks (NCBs) and national statistical institutes (NSIs).

2. Dimensions of institutional cooperation

A full treatment of institutional cooperation in the statistical area involves several levels, which are a function of the entities that play a role in the various phases of the production cycle.

Reporting agents should be considered the first link in the value chain, rather than as mere providers of raw data. It is particularly important that they regard the final statistical output as their own product, one that is instrumental in pursuing their own interests. This view enhances the quality of the data provided, and simplifies the development and updating of statistical requirements. Within this framework, the Banco de Portugal promotes a number of practices designed to foster cooperation with reporting agents. Among these are regular meetings with major financial groups and mechanisms for ongoing feedback.

Institutional cooperation is also important where national statistical entities are concerned. Best practices in this area have proven particularly successful in terms of reducing the reporting burden and integrating arrays of statistical products.

The Banco de Portugal is active in the High Council of Statistics (HCS), the top entity in the Portuguese National Statistical System (NSS). It serves as a forum for sharing production experience, as well as analysis of important statistical results, with other participating institutions, including the National Statistical Institute, representatives of general government, and those representing producers and users of data, including industrial associations, trade unions and universities.

In this framework, there is close cooperation between the Banco de Portugal and other official entities, in particular the Portuguese NSI (Instituto Nacional de Estatística, or INE). This cooperation takes various forms, with the following initiatives being noteworthy:

(i) In 1998, the Banco de Portugal, the Ministry of Finance and the INE signed a protocol defining the way in which they would coordinate to fulfill Portugal's

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commitment to the IMF Special Data Dissemination Standard (SDDS). This protocol was important in defining individual obligations and implementing the timetable for this Standard. It has contributed decisively to the positive assessment of Portuguese participation in the SDDS over the past 10 years.

(ii) Also in 1998, a protocol was signed between the Banco de Portugal and the INE, relating to implementation of the European System of Accounts (ESA 95). Subsequently updated (in 2001), it defined the two institutions' joint responsibility in compiling the Portuguese national accounts. The INE is responsible for compiling the non-financial accounts, while the Banco de Portugal assumed responsibility for compiling the financial accounts. The institutions' joint work has been based on this protocol, and has made an important contribution to enhancing the quality of the Portuguese national accounts.

(iii) Another protocol was signed in 1999 between the INE and the Banco de Portugal, relating to a joint venture to begin in 2000. The undertaking involved a quarterly survey of non-financial corporations and has been carried out since 1997 by the Banco de Portugal. The main purpose of the initiative was to avoid conducting two similar surveys, and thus reduce the reporting burden for the corporations involved. In 2001, the sample was updated and the questionnaire modified in order to improve the quality of the information collected.

(iv) The Banco de Portugal and the INE signed a protocol to launch a Household Indebtedness and Wealth Survey, which was conducted for the third time in 2006.

(v) In the balance of payments area, two protocols were signed in 2004, with the General Directorate of Tourism and the INE. The aim was to collect additional data for compiling tourism statistics. These protocols focus on two statistical operations. One is a survey of cross-border movements of travelers, while the other is a survey on international tourism expenditures. Initial results for the period 2004–2006 were released in April 2007. These surveys will provide an additional source of data for the compilation of the tourism item in the balance of payments statistics.

(vi) At the beginning of 2006, an institutional cooperation agreement in the field of general government statistics was signed by the Banco de Portugal, the INE and the Ministry of Finance, covering the following areas: (a) definition and updating of the entities constituting the general government; (b) compilation of the general government accounts (financial and non-financial) on a quarterly and annual basis; (c) compilation of public debt statistics; and, (d) a close analysis of the Excessive Deficit Procedure (EDP) report and the corresponding methodological background. For this purpose, a framework of common data sources and procedures has been drawn up by a working group made up of representatives of the institutions.

(vii) Finally, the Banco de Portugal, the INE, the Ministry of Finance and the Ministry of Justice have developed a joint project intended to define a harmonized solution for the collection of annual data from the financial statements of non-financial corporations. This project is known as IES, the acronym for "*Informação Empresarial Simplificada*" (Simplified Corporate Information). It was formally created by Decree-Law no. 8/2007 of 17 January. IES is the system for the electronic submission of accounting, fiscal and statistical information that companies must normally provide to the above-mentioned authorities. IES allows companies to fulfill separate obligations to four different authorities through a single electronic submission. This initiative integrates a set of measures that have progressively streamlined administrative and legal procedures for companies, reducing the current reporting burden.

Another important factor at the national level is cooperation with supervisory bodies. The Banco de Portugal has informal agreements for regular provision of data on entities supervised by the Portuguese Securities Market Commission (the securities markets

supervisory authority) and the Portuguese Insurance and Pension Funds Supervisory Authority.

At the international level, cooperation within the European Union assumes a major role. The Banco de Portugal is part of the European System of Central Banks (ESCB) and as such has been deeply involved, on an ongoing basis, in constructing a harmonized European statistical framework, not only directly with the European Central Bank (ECB) and the other NCBs, but also with the Statistical Office of the European Community (Eurostat) and the national statistical institutes, under the umbrella of the Memorandum of Understanding on economic and financial statistics between the ECB's Directorate General Statistics and Eurostat. This makes it possible for the ECB and Eurostat to apply the same statistical framework to the entire European Union, while taking national contributions into account. There is also close cooperation with other international institutions, in particular the IMF, the World Bank, the BIS and the OECD. This includes both data reporting and discussion of concepts and methodologies.

A final area of institutional cooperation involves technical assistance. This has included sharing of good practices and bilateral visits, as well as organizing and participating in seminars and workshops. This type of initiative has proven particularly fruitful with Portuguese-speaking African countries, Brazil and East Timor.

3. Golden rules for institutional cooperation

Best practices in the field of institutional cooperation must be modeled on certain common rules covering knowledge, understanding and acceptance. The commitment of all parties involved in any cooperation process is a necessary condition if it is to achieve its full potential. Where recommendations are to be followed on a voluntary basis, some cases of non-conformance are likely to arise, posing a serious threat to the effectiveness of the statistical process. It is worth mentioning that both the ECB and Eurostat have adopted a stricter cooperation model, including binding rules and even penalties for major compliance failures. In our view, this signifies a common motivation for obtaining top quality statistics for the European aggregates compiled from national contributions. From the beginning, the Banco de Portugal has been closely involved in this overall process, along with other European NCBs and NSIs, contributing to the development of the European Statistical System, which we believe is internationally recognized as a success story.

One of the most important "rules of the game" is consistency with international standards for concepts, definitions and classifications. Only when this is guaranteed is it possible to make international comparisons and aggregations, and to ensure consistency across different statistical areas, as we seek a perfect match with users' needs.

In addition, all parties involved in this institutional cooperation network need to be fully aware of their responsibilities and areas of authority, both in order to avoid overlapping functions and to fully and efficiently cover the entire statistical spectrum.

4. Conclusion

For authorities with statistical responsibilities, participating in institutional cooperation processes, both nationally and internationally, can only yield benefits. These processes promote efficient use of resources, help prevent duplication of efforts and reduce reporting burdens, thereby benefiting the many agents involved in the production cycle, from data collection to dissemination.

Cooperation also enhances the sharing of best practices through multilateral contacts and bilateral technical cooperation.

Cooperation with other entities at the international level also enables country representatives to explain specific national characteristics in international fora, thus ensuring respect for diversity while at the same time valuing unity.

Moreover, by following international standards, national statistical contributions become part of a single harmonized and coherent system, promoting international comparability and signaling to users the importance of quality.

These can be considered the necessary ingredients for successful ongoing worldwide implementation of a common statistical language.

Institutional cooperation in statistics: the case of EU Central Banks

Steven Keuning[1] and Alda Morais[2]

Introduction

In his closing speech at the Third European Central Bank (ECB) Conference on Statistics,[1] ECB President Trichet noted that "…euro area statistics lie at the heart of the ECB's monetary policy-making. At the same time, these statistics are embedded in and affected by a globalising world. The key to meeting the challenges this poses lies with further enhanced international cooperation among statistics compilers."

Enhanced international cooperation is also instrumental in tackling other current challenges, such as the need to (i) cope with financial innovation; (ii) enhance communication with the users and the public at large; and (iii) rein in the administrative burden for respondents and the resources allocated to the statistical function, while at the same time meeting growing demands.

The first section of this paper deals with cooperation among EU national central bank (NCB) statisticians. The second section addresses cooperation among EU NCB statisticians and those in national statistical institutes (NSIs). The last section elaborates on some possible avenues to promote further cooperation among European statisticians.

Cooperation among EU NCB statisticians

The wide range of high-quality euro area statistics available today for policy-makers, market participants and the public at large have been developed in as little as roughly one decade.[2] This would not have been possible without the successful cooperation between the ECB (and its predecessor, the European Monetary Institute) and the NCBs, mainly via their work within the European System of Central Banks (ESCB) Statistics Committee (STC). Typically, new statistics and new ECB legal acts concerning its statistical requirements (regulations, guidelines and recommendations) are developed and agreed upon after substantial discussions and a formal STC assessment of merits and costs, with the technical assistance of its Working Groups and Task Forces. Traditionally, the STC has dealt with output harmonisation and the production of euro area statistics as an aggregation of national results. In this respect, the traditional division of labour has been for NCBs to identify resident reporting agents and to collect (national) data from them, using national collection systems adapted to accommodate ECB requirements. They then submit harmonised datasets to the ECB in standard formats. The ECB checks the quality and aggregates and consolidates national data to produce euro area statistics.

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Over the last few years, this cooperation has developed further in a number of areas, going beyond the above division of labour. The most notable examples of this enhanced cooperation are:

(i) The development of a *Centralised Securities Database (CSDB)*, an ESCB-wide single database with benchmark information on all individual securities relevant to the statistical objectives of the ESCB. This is intended to be used as a tool to compile and enhance the quality of a wide range of ESCB financial statistics (eg statistics on cross-border portfolio investment and on securities issues). It is also expected to bring important savings to reporting agents because it allows the NCBs to carry out compilation work that otherwise would have been done by the reporting agents. Setting up this database has also required that certain confidential information be shared within the ESCB and with some NSIs.

(ii) The *joint dissemination framework* of the euro area NCBs, which allows for simultaneously releasing euro area statistics and the national contributions to these aggregates on the websites of the ECB and of the euro area NCBs.[3] With this initiative, the ESCB has provided a valuable service to the users, by avoiding the need for them to search different national websites – with different presentations (including languages differences) – whenever they search for information on euro area statistics and the respective national contributions. Indeed, this common dissemination provides exactly the same tables in the particular language of the NCBs concerned, while the consistency of the data is ensured by using a single (ECB) data bank.

(iii) The launch of the *Statistical Data Warehouse* (SDW) on the ECB website,[4] which provides policy-makers, economists, researchers and other users with a more user-friendly and comprehensive online data delivery service for ESCB statistics. This features easy-to-use interfaces that allow users to quickly find, display and download euro area data, including, in some cases, national breakdowns. This has further enhanced ECB communication with users, market participants and the general public. Several NCBs have announced their intention to rely on the SDW for their work, provided that it also includes additional local data. Ultimately, they may rely solely on this and discontinue use of their own internal statistical output databases. This demonstrates their interest in enhancing cooperation in the use of databases within the ESCB, recognising that storing the same data in multiple ESCB databases is clearly inefficient.

(iv) The *ESCB's RIAD (Registers for Institutions and Assets Database)*, containing three datasets that NCBs report to the ECB – exhaustive data on EU monetary financial institutions and on eligible assets and counterparties. The first set is used for statistical purposes, while the other two are used for monetary policy-making. Upon receipt and verification of the data by the ECB, the RIAD system automatically publishes the output on the ECB website, which can be downloaded and used by reporting agents (limited to use of the data on monetary financial institutions) and NCBs.[5] Anticipated improvements include the incorporation of new datasets (eg data on investment funds and financial vehicle corporations) and making the user interface available to all NCBs in order to obviate the need to maintain local databases.

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3 http://www.ecb.int/stats/services/escb/html/index.en.html

4 http://sdw.ecb.int/

5 http://www.ecb.int/stats/money/mfi/general/html/index.en.html and http://www.ecb.int/mopo/assets/assets/html/index.en.html

Cooperation among statisticians in NCBs and NSIs

The ECB (Directorate-General Statistics) and the Commission (primarily Eurostat) cooperate intensively, through bilateral contacts and participation in each other's Committees and Working Groups, thus ensuring a close liaison at all levels. Both institutions also participate in the Economic and Financial Committee's Sub-Committee on Statistics. Among the major joint projects in recent years has been the preparation and annual monitoring of the Action Plan on EMU Statistical Requirements. In this context, the two institutions have cooperated closely in the preparation of a list of monthly and quarterly Principal European Economic Indicators (with a view to increasing the availability and timeliness of the most important economic indicators at the euro area level[3]), as well as in addressing the statistical requirements for structural policies and the need for an appropriate communication policy on the Harmonised Index of Consumer Prices.[4] Another major project, with crucial involvement on the part of NCBs, as well as NSIs, is the joint compilation of a system of quarterly financial and non financial accounts for the euro area. These accounts provide a comprehensive and coherent description of economic and financial developments and can be considered full-fledged "national accounts" for the euro area. The ECB's Directorate-General Statistics compiles the quarterly financial accounts for the euro area, while the responsibility for the euro area non-financial accounts is shared with Eurostat. These accounts are released jointly by Eurostat and the ECB as of June 2007. The general cooperation between the ECB's Directorate-General Statistics and Eurostat is based on a division of labour set forth in a Memorandum of Understanding, thus avoiding overlaps and gaps in the European statistics.[5]

Particularly important in achieving good cooperation among statisticians in NCBs and NSIs is the joint coordination work that the ECB and Eurostat carry out through the Committee on Monetary, Financial and Balance of Payments Statistics (CMFB).[6] This Committee also plays an important role in advising Eurostat on its decisions concerning complex statistical issues related to the Excessive Deficit Procedure. Other joint work covers issues such as balance-of-payments, the measurement of assets and (implicit) liabilities of (unfunded) pension schemes, revisions, and seasonal and working day adjustments.

Intensive, formalised coordination between different statistical authorities, which contributes to enhancing the quality of statistics, economising on resources and avoiding the collection of similar – or even identical – information from reporting agents, also exists at the national level. Ideally, this cooperation should also involve supervisory reporting, so that the same data and metadata (concepts, classifications) are used, with data being shared whenever possible and beneficial. In the euro area, this objective has been achieved, at least to a large extent, in Austria, Belgium, Finland, Ireland, the Netherlands, Portugal and Spain.

A possible way forward

In view of the need to continue compiling high-quality, relevant statistics in an era of globalisation, financial integration and rapid financial innovation, while at the same time limiting response burden and compilation costs, further enhanced collaboration in the EU is indispensable. This could encompass:

- Using more common market data services, IT infrastructures and tools.

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6 www.cmfb.org

- Implementing more online and fully automated statistical reporting, possibly using a common tool, with subsequent sharing of relevant information.
- Gradually developing a European business register and a unique business identifier. Preferably, this would then be jointly maintained by EU NSI and NCB statisticians (and potentially, where appropriate, also by other national authorities), according to a well-defined governance (including tasks distribution) and quality management network structure set forth in a Memorandum of Understanding between the different systems. (Here, the above-mentioned ESCB experience with RIAD could serve as a useful reference model.)
- Sharing more data and metadata (eg on units, concepts and classifications) among statistical (and possibly other) authorities, with strict confidentiality protections, in order to avoid multiple requests for the same information.[7]
- Reducing the reporting burden of (large) multinationals through more uniform reporting of (financial) data.
- In due time, European sampling, supplemented by national samples, when considered necessary, could reduce the number of respondents and increase the timeliness of some European statistics without undermining other quality features.
- Assessing ramifications of the finding that significant economies of scale are associated with the collection and compilation of statistics.
- Finally, all of this could be supported by common training for European statisticians and by a jointly developed communication campaign to increase the financial literacy and numeracy of the public at large.

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[2] "ECB statistics: an overview", ECB, April 2006.

[3] ECB: Review of the Requirements in the Field of General Economic Statistics, 17 December 2004.

[4] "2006 EFC Status Report on Information Requirements in EMU" and "ECOFIN Council Conclusions on Statistics", November 2006.

[5] "Memorandum of Understanding on Economic and Financial Statistics Between the ECB (DG-Statistics) and the Statistical Office of the European Communities (Eurostat)", March 2003.

[7] Because of confidentiality concerns, statistical data usually cannot be shared for non-statistical purposes with other authorities.

Official statistics caught between two stools: why a truly European stool might be more comfortable

Hervé Carré[1]

1. Introduction

In this STCPM, I would like to share with you some thoughts that might help national statistical institutes (NSIs) to better achieve their mission in an ever more demanding and ever more rapidly evolving society. We all know that statistical information needs are becoming more complex and broader while respondents are less willing to participate and NSIs face legal and other constraints as well as a shortage of resources. Official statisticians are apparently caught between two stools, and in several regards at that. This is by no means a very comfortable position, but I am convinced that we can make it a much more comfortable one. My conviction is based on my many years of experience as a user of official statistics and now as Eurostat's DG in charge of Community statistics and a main player in the European Statistical System (ESS).

2. Current situation

Let us to begin by looking a little more closely at the main types of demand and their inherent contradictions. First, there are our users. There are, however, different types of users, and their demands differ too.

- The public at large, normal citizens so to speak, have fairly general interests. What they need is easily accessible and interesting statistics that cast light on key political and social topics and are of relevance to daily life.
- The same applies to a large extent to the media. They are natural partners for official statisticians when it comes to disseminating statistics, albeit with their own agenda as they are always on the lookout for statistics that will allow them to tell a story that will sell or at least attract attention.
- Professionals, in contrast, have very specific interests. They need statistics for their forecasting, planning and decision-making. Timeliness is of the utmost importance, and so is readability, as these individuals have to draw their conclusions as quickly as possible, and hopefully more quickly than their competitors. Reliability and detail are certainly also highly valued, as professionals strive to outdo their peers by being faster, having more detail or being more robust in their conclusions.
- Empirical researchers are usually interested in detailed statistics, and often also in long time series. They need broad coverage and methodological stability, as these increase the analytical value of statistics. They like to look for linkages with other

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sources, and in some fields of research they are interested not so much in statistics as in (anonymised) individual data.

- Policymakers have a need for politically useful statistics. The political process has become ever more numbers-based. Statistics set the perception framework and accompany the whole political process, from the identification of a politically relevant issue through public debate and the testing of alternative solutions to the monitoring of the implementation of policy decisions. Sometimes the decisions themselves are more or less automatically tied to statistical values.

It is obvious that official statisticians have to serve very different masters, but they do so with a lot of energy. We know from Goldoni's Truffaldino that this means a lot of stress, and he had to serve only two masters. Worse, there is no such thing as a "passepartout" statistic; it does not exist, has never existed and will never exist. Instead, each of our masters is entitled to, and will have to be given, all the attention they require. Everybody will have to be served according to their legitimate and publicly/officially recognised needs.

Second, there are our respondents. They are asking – and this has become almost a ritual – for their statistical reporting burden to be reduced. However, this cannot and does not automatically imply a reduction in the reporting volume, as official statisticians attempt to design reporting obligations in such a way as to allow respondents to draw on information already held for other purposes. Businesses, and increasingly also households, are getting more numerate, and many of their files are kept electronically. However, as there are limits to such a conceptual accommodation, it should be borne in mind that official statistics account for only a minute share of the general administrative burden and their significance should thus not be exaggerated.

Third, there are various legal authorities. They can impose limits on the type of questions asked and even the methods used. The data protection authorities' insistence on absolutely watertight data protection, however justified and necessary this is, does not make life easier for official statisticians. In addition, as access to and the linkage of administrative sources might well be hampered by confidentiality concerns, there are also data protection costs. However, these costs cannot be borne by the official statisticians themselves, but are passed on to either their respondents or their users.

Finally, there are the fiscal authorities. Almost all NSIs have seen a considerable reduction in their budgets. Staff numbers had to come down and did come down in recent years, while staff qualifications had to go up and did go up. However successful this austerity policy may have been in the past, it has its limits, and these now seem to have been reached, at least as long as official statistics have to be produced as a public good by NSIs linked through the ESS network.

This pressure has almost always been present in the past, and will persist into the future. Technology and methodology, however, have hitherto enabled official statisticians to cope quite successfully even with often contradictory demands and constraints. Statisticians will in all likelihood continue to draw on that form of support, but it might not be enough. Moreover, such support, both technological and methodological, also has its often overlooked darker side. The objectives of official statisticians and methodological researchers do not necessarily coincide. Sophistication and elegance, decomposition and adjustment, flash estimation and back recalculation all have their scientific value, but give rise to the risk of overburdening both users and producers of official statistics. Similar trade-offs might also apply when it comes to technology, albeit not to the same extent. Technology will definitely help official statisticians reduce the burden on quite a number of their respondents, especially the technologically more advanced ones, but not necessarily all of them. It will also help statisticians to enhance the service they provide to quite a number of their users, but not necessarily the technologically less advanced ones. However, NSIs in their capacity as a public service have to treat their partners equally, irrespective of the latter's sophistication as users or their technological advancement as respondents.

3. The significance of the European Union and the European Statistical System

Some might think that the European Union generates an extra burden both on NSIs and on their respondents. This might be true in isolated cases, but my perception is different and my overall assessment even more so.

The European Union with its ESS network of NSIs offers quite a lot of advantages, especially in handling the many pressures involved. Official statisticians are stronger (politically more robust) and thus better positioned to cope with these pressures:

- when they are united – and the European Union does provide a context that allows them to come together and pursue their needs jointly, enabling their national institutions to profit from this unity;
- when they work from a strong legal base – as is once again the case with Community statistics, but it also applies indirectly to statistics that are mainly national; and
- when they agree on key methodological choices – which is, of course, also the case with Community statistics.

The very success of Community statistics – and a by now firmly established five-year statistical programming process – provides a framework for official statistics in the European Union.

Moreover, you are aware that EU statistical requirements in most cases do not represent an additional burden, but a legally anchored commitment to continue in a harmonised manner with the production of statistics that would in any case be produced for national purposes. This, admittedly, does not make NSIs more flexible; on the contrary, there is a danger of introducing a certain rigidity since they are bound by a legal obligation and have to continue doing their work in the manner agreed upon even if new ways might be more promising (eg more cost-effective or less burdensome).

Finally, the decision-making structures (the Statistical Programming Committee and other committees) supported by a communication infrastructure (miscellaneous working groups, task forces and advisory bodies such as CMFB or CEIES) have helped official statisticians present a united front and work together.

Having said all this, it should be quite clear that other institutions using official statistics (OECD, UN, IMF, etc) have profited from the collective drive of official statisticians in the European Union. No doubt there are cases where they would have preferred us Europeans to have taken our decisions early or differently, but by and large it would have been much more difficult for them to keep their even bigger flock of statistical offices together.

4. Conclusions

What could or should we do now in view of this overall very positive EU experience? From what I have experienced over the years first as an observer and now as a manager of official statistics, I would suggest the following in order to obtain some relief from the pressures outlined above:

- Be more European in our thinking and working

  I am convinced that a formally agreed European work programme (annual as well as multiannual, at European Commission, Council of the European Union and European Parliament level) combined with legal obligations offers highly effective protection against both budget cuts and excessive demand.

Moreover, I believe that the EU-wide comparability of official statistics is their most attractive feature, but one which has perhaps not been sufficiently exploited by professionals, and certainly not by the public at large or the media.

- Be more official in our understanding of our role

  Our core business should be statistics that can only be produced officially (with a legal reporting obligation, register-based sampling framework, legally shaped access to administrative records, etc). We should be very cautious when it comes to opinion polls. Even voluntary surveys have to be handled with care. The reason for this stance is quite clear, at least to me. We should at all costs avoid the risk of being seen as casting "subjective" information into "objective" statistics.

- Be more statistical in our adequation

  Our permanent challenge is to bridge the gap between what is theoretically meant and what is statistically measured. This is what is usually called "statistical adequation". However, the more complex the bridge becomes, the higher the risks will be. We should therefore be aware that it is the observational content that counts in the end and refrain from excessively complex imputations or all too abstract transformations.

- Be more communicative in our work

  Official statisticians have learned that they have to put their statistics into context. Statistics do not speak for themselves; they have to be explained, and their usage has to be guided.

  And when speaking about statistics, we should also have the courage to talk about the negative consequences of statistics that are not available, the so-called "cost of non-statistics".

- Be more legal/official in our actions

  Official statisticians seem to have the tendency to promise everything to everybody, not necessarily for now but at least for later. It is the competitive pressure from all sorts of institutions and businesses that makes them do this, but this is quite dangerous because it might taint the image of official statistics. We should therefore make the carrying-out of statistical work as contingent as possible on explicit political support – and not just development work, but also ongoing work.

- Remain pragmatic in our approach

  Finally, we should avoid overselling our results. They are not absolute truths; they are conventions cast into numbers. This feature is only all too clear for us, the European statisticians, because it is part of our core business, reaching consensus on conventions and on ways of casting them into numbers. We should therefore also allow pragmatism to prevail. A convention is simply what it is: a convention, hopefully the best available. Excessive sophistication, so it seems, can become a kind of disease. Instead, we should remain as close as possible to data and be prudent with excessive condensation through composite indicators or other high-wire acts.

All in all, I am convinced that, despite all our recent difficulties and considerable stress, our profession has a bright future. Our societies are becoming ever more numerate, and this has consequences not only for the economic and social sphere but also for the political sphere. And the European Union is particularly numerate in what it is doing. No doubt others will also come up with statistics, but we, the official statisticians, have by the very nature of our statistics a privileged position, and rightly so. Only if we fail to do what we are supposed to do, namely provide statistics that can be supplied only officially, will we get into real difficulties. So let us recall at all times what we have to do: come up with truly official statistics. And if we manage to do that jointly at European level, we will be all the more attractive and thus much stronger.

Special Topics Contributed Paper Meeting 27 with International Association for Official Statistics

Portfolio investment statistics

Chair: Manuel Sebastião, Bank of Portugal

Papers:

Trends in portfolio investment statistics – India
Agam Prakash Gaur, Reserve Bank of India

The Portuguese experience in compiling PI statistics
Paula Casimiro, Bank of Portugal

Comparable data on bilateral external positions: an insight into globalization
Lucie Laliberté and John Motala, International Monetary Fund

Collecting data on securities used in reverse transactions for the compilation of portfolio investment – how to compromise between theory and practice
R F D D Chaudron, Netherlands Bank

A security-by-security approach to deriving investment fund security transactions data from stock data
Frank Mayerlen, European Central Bank

Integrated statistical systems: evolution or revolution?
Maria do Carmo Aguiar, Bank of Portugal

Discussant: Steven J Keuning, European Central Bank

Chairman summary of session STCPM27: Portfolio investment statistics

Manuel Sebastião[1]

Deepening financial globalisation has increased economies' vulnerability to risks, particularly credit, currency, maturity and instrument composition risks. Supported by technological innovation and financial deregulation, economies have intensified their cross-border financial linkages, sharply increasing their external net liabilities/assets positions.

Different possibilities are available when designing a data collection system for portfolio investment statistics within the balance of payments (BOP) and international investment position (IIP) domain. Systems have differences in terms of the reporting agents they target and their periodicity and level of aggregation. The results will, in turn, vary in regard to implementation and running costs, data availability and quality, and response burden.

Information technology developments have led to a new trend in the way statistics are produced, as traditional aggregated reporting is gradually replaced by security-by-security (s-b-s) reporting. An s-b-s data collection system allows for higher data quality and flexibility than an aggregate data reporting system, as well as providing reduced costs for respondents. It was argued, however, that such systems will be vitally dependent on the availability of unique identifiers for all securities, and that they entail considerable set-up and maintenance costs for statistics compilers. Nevertheless, from a medium-term perspective, the "total cost of ownership" for an integrated s-b-s data collection system may be less.

The Centralised Securities Database system is designed to be the backbone of a pan-European s-b-s data compilation system operated by the European System of Central Banks. Compiling statistics using the s-b-s approach brings special challenges to statistical data compilers. The provision and continuous updating of a "master file" of instrument reference data are a prerequisite. Another important issue is the need to identify securities that are specifically relevant to statistical data production, as opposed to the full set of securities issued in international financial markets.

This session also addressed the challenges in statistical treatment of new products and investors: repurchase agreements and securities lending that involve a change in legal, but not economic, ownership, and special purpose vehicles and investment funds.

It was generally agreed that all countries have a responsibility to compile timely, consistent and comprehensive external statistics. The extent and nature of the financial interdependencies have not yet become apparent from current cross-border portfolio investment statistics. Two main solutions have been put forward. The first consists of developing and maintaining s-b-s portfolio data collection systems and databases, preferably not limited to cross-border flows and stocks, but rather for all transactions and positions. The second solution involves worldwide initiatives: the Coordinated Portfolio Investment Survey (CPIS), the International Banking Statistics (IBS), the Coordinated Direct Investment Survey (CDIS) and the Joint External Debt Hub.

All of these requirements point in the direction of further enhanced international cooperation among statistics compilers.

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[1] Bank of Portugal.

Trends in portfolio investment statistics – India

Agam Prakash Gaur[1]

Introduction

This paper reviews portfolio investment statistics (inflows/outflows) relating to India, and their dissemination through various publications, as well as initiatives aimed at collecting portfolio data for statistical purposes.

The Reserve Bank of India (RBI) serves as the source for information on various components of foreign investments, with data compiled using the Foreign Exchange Transactions Electronic Reporting System (FETERS) and supported by information provided by custodians regarding flows into the accounts of foreign institutional investors. Foreign investment data are released by the RBI on a monthly basis, along with component details (Global Depository Receipts (GDRs)/American Depository Receipts (ADRs), foreign institutional investors (FIIs), offshore funds, etc).

International investment position (IIP) data are compiled at end-March/end-quarter on individual countries' stocks of international assets and liabilities. Net portfolio investments through financial instruments (equity and debt) constitute part of the statement. Under SDDS, data on IIPs, disseminated on an annual basis prior to March 2006, are now being disseminated on a quarterly basis (as of June 2006) through RBI press releases.

India has been participating in the Coordinated Portfolio Investment Survey (CPIS) since 2004 for mandatory items, providing the 31 December position for resident entities, and also covering securities (equity, short/long-term debt). The information is collected from end-investors, which include banks, mutual funds, insurance companies, asset management companies and non-financial companies. Separate surveys are conducted for the banking sector and for these other entities.

International Banking Statistics (IBS), both locational and consolidated, have been collected from banks on a quarterly basis since December 1999, covering international assets and liabilities of banks, along with currency and sectoral breakdowns. India is participating in the IBS system of the Bank for International Settlements (BIS), and data are incorporated in consolidated information, released by the BIS since the quarter ending in March 2001.

A process is being developed to unify data collection for banks through the IBS system, so that BIS, CPIS and other statistics on components of portfolio investments can be used in compiling figures on IIPs and external debt.

1. Portfolio investment includes international investments in equity and debt securities issued by unrelated non-resident entities, excluding any instruments classified as direct investments or reserve assets. Portfolio managers set aside a proportion of their funds for investments in developing markets based on risk/return assessment, and also as part of their portfolio diversification strategy. With the opening of the economy and efforts to integrate with global markets in order to attract funds, India has introduced various liberalisation measures in the fiscal, financial, trade and external sectors.

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2. The Indian economy entered a new era with the introduction, in 1990–91, of stabilisation measures and structural reforms aimed at liberalising trade and opening up the economy. That year witnessed an external payments crisis due to unsustainable macroeconomic balances with very low foreign exchange reserves. Extensive decontrol and delicensing were put in place to create a competitive environment and unleash the productive potential of entrepreneurs, thus putting the economy on a path to higher growth. The objective was to improve the BOP at sustainable levels by liberalising international trade, finance and capital inflows, and by instituting an appropriate exchange regime. In 1994, India accepted the IMF's Article VIII, and the rupee thus became officially convertible on the current account.

3. The economy has been on a high growth trajectory, with average growth of 6.4% from 2000–01 to 2005–06, 7.5% in 2004–05 and 8.4% in 2005–06. The flow of funds has produced comfortable foreign currency asset positions: US$ 145.1 billion in March 2006, rising by US$ 46.8 billion to US$ 191.9 billion as of March 2007.

4. Against the backdrop of continuing integration with the global economy through liberalisation measures, global best practices have been adopted in various sectors of the economy. The Indian financial market was opened up to FIIs in 1992. Foreign funds flows for equity investment through exchanges were attributable to FIIs – including pension funds, mutual funds, asset management companies, investment trusts and institutional portfolio managers registered with the Securities and Exchange Board of India (SEBI). The flow of information to the RBI occurs through custodians. FIIs were allowed to participate in both primary and secondary markets.

5. Portfolio investment includes flows through issuance of ADRs or GDRs, which usually denote ownership of equity and investment by FIIs, offshore funds and others, thus covering the liabilities under portfolio investments.

6. The RBI is the basic source for information on various components of foreign investment. Foreign portfolio investment is compiled by the RBI using FETERS as the principal information source. The RBI also obtains information separately from custodians on a weekly basis, providing the details of flows into/out of the accounts of FIIs. These different components are compiled and consolidated to obtain data on aggregate foreign investment in India. Foreign investments are compiled and presented in US dollars. The RBI publishes foreign investment data on a monthly basis in the RBI Bulletin, which, inter alia, provides component details of portfolio investments (GDRs/ADRs, FIIs, offshore funds, etc).

7. Data on portfolio investment flows published in the March 2007 RBI Bulletin are presented in Table 1, indicating annual investment inflows.

8. The IIP compiled at the end of a specific period (end-March or end of quarter) is a statement of a country's stock of external financial assets and liabilities, including, inter alia, portfolio investment (equity securities and debt securities). Financial assets consist of claims on non-residents, and liabilities include the country's financial liabilities to non-residents. Under SDDS, data on IIPs that, prior to March 2006, were disseminated on an annual basis, are now (as of June 2006) being released as an RBI press release on a quarterly basis, with a two-quarter lag. Data relating to June and September 2006 were released on 24 January and 23 March 2007, respectively. An RBI press release dated 23 March 2007, and available on the RBI website, is the source of the data. Data on the overall international investment position, indicating assets and liabilities, are presented in Table 2.

The significant feature was that net international investment liabilities increased by 14.4% to US$ 47.8 billion from March 2005 to March 2006, and moderated to US$ 45.9 billion in September 2006. On the liabilities side of the IIP, portfolio investment accounted for more than one fourth of total liabilities, whereas on the assets side portfolio investments represented less than 1% of net international assets.

Table 1

Foreign investment inflows

Millions of US dollars

Year	Portfolio investment (a + b + c)	Items			Portfolio and direct investment	% share of		
		a	b	c		col 2 to col 6	col 3 to col 2	col 4 to col 2
		GDRs/ ADRs[1]	FIIs[2]	Offshore funds and others				
1	2	3	4	5	6	7	8	9
1995–96	2,748	683	2,009	56	4,892	56.2	24.9	73.1
1998–99	–61	270	–390	59	2,401	–	–	–
2003–04	11,377	459	10,918	–	15,699	72.5	4.0	96.0
2004–05	9,315	613	8,686	16	15,366	60.6	6.6	93.2
2005–06 (P)	12,492	2,552	9,926	14	20,214	61.8	20.4	79.5

– Indicates outflow.

[1] Represents the amount raised by Indian corporates through GDRs and ADRS. [2] Represents inflow of funds (net) by FIIs.

Source: RBI Bulletin, March 2007.

Table 2

Overall IIP

In billions of US dollars

Period	March 05	March 06	June 06	September 06
	(PR)	(PR)	(PR)	(P)
Net IIP	–41.82	–47.83	–46.44	–45.89
A. Assets	168.21	183.45	191.81	199.86
Including portfolio investment:	0.81	1.29	1.08	1.19
(i) Equity securities	0.4	0.65	0.49	0.54
(ii) Debt securities	0.41	0.64	0.59	0.65
B. Liabilities	210.03	231.28	238.25	245.75
Including portfolio investment:	55.69	64.62	64.82	67.37
(i) Equity securities	43.16	54.74	52.47	54.78
(ii) Debt securities	12.53	9.88	12.35	12.59

Note: PR = partially revised; P = provisional.

[The figures in the table have been compiled on the basis of IIP estimates presented in millions of US dollars.]

Source: RBI Press Release, 23 March 2007.

9. FIIs are from geographically dispersed countries: Malaysia, Australia, Saudi Arabia, Trinidad and Tobago, Denmark, Italy, Belgium, Canada, Sweden, Ireland, etc. Institutions around the globe channelled funds to the Indian securities markets for investments. As of 31 March 2006, the SEBI had registered FIIs from 37 countries. The number of FIIs from the United States was the highest at 342, followed by the United Kingdom (148), Luxembourg (64), Singapore (47), Hong Kong (30), Canada (26), Australia, Ireland and the Netherlands with 23 each, Mauritius (32), etc. Long-term institutional investors such as foreign pension funds continued to show interest in Indian securities markets. Other categories of FIIs registered with the SEBI included traditional institutions such as mutual funds, investment trusts, managers of such funds, and banks. The total number of sub-accounts registered with the SEBI also increased – from 1,889 as of 31 March 2005 to 2,488 by end-March 2006. The increasing confidence of FIIs in the Indian stock market emerged as a major factor, adding to strong macroeconomic fundamentals (increasing economic growth, comfortable forex reserves, buoyancy in corporate sector earnings, etc), a transparent regulatory system, abolition of the long-term capital gains tax, etc. Limits have been set for FIIs' investments in government securities and corporate bonds. They are permitted to trade in derivatives in order to manage risk and return.

Concern has been raised regarding some unregulated entities taking positions in the stock market through participatory notes (PNs) issued by FIIs. The concern regards the sale by the original investors, of PNs issued by FIIs, to other players, many of whom are investing through the "Benami" route – ie disguising the identity of the ultimate beneficiary. Thus, in January 2004 it was stipulated that PNs are not to be issued to any non-regulated entity, and the "know your client" principle is to be strictly observed.

Table 3

Gross purchases/sales by FIIs

Millions of US dollars

Total	Gross purchases	Gross sales	Net investment	Cumulative net investment at monthly exchange rate
(1)	(2)	(3)	(4)	(5)
1993–94	1,783	149	1,634	1,638
1998–99	3,927	4,313	–386	8,898
2003–04	31,494	21,545	9,950	25,755
2005–06	78,086	68,754	9,332	45,259

Source: SEBI.

10. Coordinated portfolio investment statistics (assets): As a step towards globalisation and towards integration of the Indian economy with the world market, the corporates are expanding their business, at the same time acquiring overseas assets, improving their competitiveness in the overseas markets, and increasing outward capital flows – a reflection of increased development. Acquisitions are being funded through a variety of sources: withdrawal of foreign exchange from India, capitalisation of exports, balances held in EEFC, share swaps – ECBs/FCCBs, ADRs/GDRs, etc – with major destinations being the United States, Europe, Mauritius and the Cayman Islands. Substantial investment takes place through SPVs set up for the purpose of investing abroad. Existing WOSs/JVs and SPVs are being used to fund acquisitions through the LBO route, and such transactions are not

captured in overseas investment statistics. Appropriate measures should be adopted to incorporate data on overseas remittances – taking into account innovative funding structures, timeliness, etc – in the system for compiling BOP data.

The limit on mutual funds' overseas portfolio investments in equity and debt securities is being increased to US$ 4 billion from the current US$ 3 billion, allowing for an increase in the scale of operations. The limit on individuals' investments in overseas instruments such as equities, mutual funds, private equity funds and hedge funds has been raised to US$ 0.10 million, and individuals may hedge their risks in overseas investments by participating in forward contracts. Statistics on overseas investment involving portfolio investments are being collected as of the 2004 CPIS survey.

11. India has been participating in the CPIS since 2004 for mandatory items, providing the 31 December position for resident entities, and including securities (equity, short/long-term debt). The 2004 and 2005 surveys have already been completed, and the 2006 survey is in the process of being completed. The information is collected from end-investors – which include banks, mutual funds, insurance companies, asset management companies and non-financial companies – through separate surveys for the banking sector and for the other entities. Only mandatory items, ie securities classified as equity securities, debt securities with an original maturity of one year or less (short-term), and debt securities with an original maturity of over one year (long-term), along with the jurisdiction of the issuer, are covered by the CPIS. In these surveys, data are collected directly from the relevant entities. The survey of mutual funds, insurance companies, asset management companies and non-financial companies is part of the annual 31 March survey of India's foreign liabilities and assets, reporting data as of 31 December. However, data flows from non-financial corporates are behind schedule. Data from high net worth individuals have yet to be covered by the CPIS.

12. IBS, both locational and consolidated, have been collected from banks on a quarterly basis since December 1999, covering international assets and liabilities of banks, and currency and sectoral breakdowns. India is participating in the IBS system of the BIS, and data have been incorporated in consolidated information released by the BIS since the quarter ending March 2001. A process is being developed to unify the collection of banking data through the IBS system, so that BIS, CPIS and other statistics on components of portfolio investments can be used to compile figures on international investment position and external debt.

The Portuguese experience in compiling PI statistics

Paula Casimiro

Introduction

Various alternatives are available when designing a data collection system for portfolio investment (PI) statistics, in the context of balance of payments (BOP) and international investment position (IIP). Such systems differ according to the reporting agents they target, periodicity and level of aggregation, while the corresponding results vary in terms of implementation and running costs, availability and quality of data and response burden.

Until 1999, Portuguese PI statistics relied on an asymmetric system of assets and liabilities. Whereas the data collection system in use since 1991 for the liabilities system used a security-by-security (s-b-s) data model, the absence of a unique and standardized identifier on the assets side precluded use of this method. Thus, data collected from respondents were aggregated by type of security, country of the issuer and currency in which the assets were denominated. Another distinguishing feature of the two systems was the periodicity with which data were collected. While monthly flows were available for both PI assets and liabilities, data collection for end-of-period positions was monthly on the liabilities side but annual for assets.

As mentioned above, the existing data collection system was implemented in the early 1990s, and by the end of the decade, certain changes and adjustments were necessary, mostly due to the need for improved periodicity in end-of-period statistics and for improved coverage of PI asset data.

1. Selection of a data collection model for PI statistics – level of detail

Data collection models for PI statistics may be defined on the basis of several features: the level of detail in the information collected (aggregate versus s-b-s), the type of information collected (on both stocks and flows, or on only one of these variables, in which case the second value is derived from the first), the collection method used (census or sample survey) and the reporting channel used (indirect – i.e., settlement-based or custodian-based – versus end-investor direct reporting).

Aggregate reporting has the advantage for the compiler of reducing implementation and maintenance costs, and of resulting in a relatively small amount of data to maintain. However, it also involves the risk of miscalculation, the problem of different reporting entities using different aggregation procedures, and greater difficulties in cross-checking data and reconciling flows and stocks. Another significant issue is the greater risk of misclassification or double-counting of items that appear as both portfolio investment and direct investment, since the distinction must be made by each individual respondent, and there may be limited information about a given investor's share of a company's equity capital. Also, for respondents, aggregate reporting usually means a greater reporting burden in terms of details and breakdowns to be covered, since an s-b-s database must be maintained (in each respondent's system) to provide the data for such breakdowns, while adjustments must be made in reporting systems every time new or additional output requirements are implemented.

Security-by-security reporting, on the other hand, ensures accuracy and consistency of data, but shifts costs and work from the respondent to the compiler, in the form of aggregation procedures and maintenance of an individual securities database. There is greater flexibility in responding to new requirements and, in some cases, changes in respondents' reporting systems may not even be needed. This type of system can be used to derive flows from high-frequency stock data, reducing the reporting burden for reporting agents and allowing for quality checks at a very detailed level. The reporting burden will also be reduced by the fact that less detail (in terms of breakdowns) needs to be reported by respondents. Finally, s-b-s reporting is useful for calculating interest on an accruals basis, and it may provide synergies in dealing with other statistics, such as money and banking statistics and national financial accounts. The main disadvantages of s-b-s data collection models are the considerable costs of implementing and maintaining them, and their dependence on the availability of unique securities identifiers.

2. Selection of a data collection model for PI statistics – reporting channel

Based on the respondents being targeted, three major reporting channels can be distinguished. The first option is indirect settlement-based reporting by domestic banks for their own transactions and for transactions executed on behalf of their clients. This alternative has the advantage of keeping the size of the reporting population relatively small while providing high-frequency and timely data. It can easily be adapted for s-b-s reporting, and the portfolio/direct investment double-counting problems are minor. The main difficulties have to do with the widespread use of netting and clearing techniques that prevent the collection of gross investment and disinvestment data, and the need for complementary reporting (e.g. for settlements through accounts with foreign banks). Moreover, pure stocks statistics must be collected separately, through one of the other possible channels.

A second option is direct reporting by resident issuers and end-investors, which can ensure full reconciliation between flows and stocks, and the collection of related income data on an accrual basis. Here, the distinction between direct and portfolio investment does not present a problem. The major drawback of this alternative is the potentially large size of the reporting population, especially in the case of households. Also, in the case of some specific sectors, it may be difficult to obtain timely and high-frequency data. The implementation of s-b-s reporting may be more difficult for sectors unfamiliar with this way of reporting and storing information. Finally, statistical principles and methodology may differ from the accounting principles used by a large number of respondents.

The third option is indirect reporting by custodians or other financial intermediaries involved in securities transactions and holdings. This reporting channel has the same advantages as the first alternative (timely and high-frequency data, relatively small reporting population, ease of adaptation for s-b-s reporting, the possibility for micro-checks of data), while permitting full reconciliation between stocks and flows. However, it requires that certain complementary information be collected directly from the end-investors, in the case of securities held in custody abroad. The exclusion of repo-type transactions/positions and direct investment holdings represents an additional challenge.

The selection of a direct or indirect reporting scheme depends, of course, on national characteristics, such as the size of the targeted population and the prevailing reporting practices. Direct reporting is more suitable for banks' own holdings, while indirect reporting may be the only practical approach for households. For other sectors, choosing the most suitable reporting channel depends on a number of factors, including the average size of companies. Indirect reporting has advantages in terms of timeliness, efficiency and ability to adapt to s-b-s. However, it may encounter difficulties in collecting specific data such as repo

transactions, or in distinguishing between portfolio and direct investment, and must be supplemented by direct reporting in some cases, while special care must be taken to avoid gaps (lack of coverage) or overlaps (double-counting).

3. The Portuguese approach

The need to change the portfolio investment data collection system for BOP and IIP purposes led to in-depth consideration of various dimensions of the problem, including selection of the most appropriate level of detail and choice of reporting channel, as described above. The experience of having an s-b-s reporting system (for PI liabilities) side by side with an aggregated one (for PI assets) ultimately led to choosing an s-b-s data model, as the benefits of an s-b-s system versus an aggregated approach became evident. On the compilers' side, the quality of the final statistics and the data control checks are facilitated and enhanced if data are collected on an individual basis. On the respondents' side, the need to aggregate the data means that each has to maintain a database of individual securities and run aggregation procedures, thus increasing the workload needed to produce the statistics by increasing the number of respondents involved. Communication with respondents confirmed that they preferred an s-b-s solution. Moreover, widespread use of the ISIN code, now becoming common in financial markets, eliminates the practical difficulties of implementing such a system as regards residents' investments in foreign securities.

As to selection of the respondents, the existing system was based on indirect reporting by resident custodians, complemented by direct reporting from end-investors holding securities in custody abroad, and this continued to be an appropriate solution, especially in terms of obtaining reliable and timely data.

As mentioned above, one of the major drawbacks of an s-b-s reporting system is the significant cost involved in developing it and maintaining it over time. The solution devised to reduce this cost was to also use the system for other statistics compiled by the Banco de Portugal Statistics Department. Accordingly, the Securities Statistics Integrated System (SIET) was implemented to collect data not only for BOP and IIP purposes, but also for monetary and banking statistics, as well as for the national financial accounts. This option had additional benefits: in extracting information from their systems, respondents did not need to confine themselves to information relevant to BOP and IIP – i.e. residents' investment in foreign securities or non-residents' investment in national securities – but rather could provide data on all investors' transactions/holdings in all securities; certain data needed for financial accounts (residents' investment in national securities) that were not previously available were now accessible; and lastly, an integrated collection system ultimately generated more consistent statistics.

Another interesting outcome of this process is that, although respondents are obliged to report monthly flows and quarterly stocks, the large majority prefer to report both flows and stocks on a monthly basis, believing that this option entails fewer costs for them and reduces inconsistencies.

The data collected through this system are, therefore, very rich in terms of the information they offer compilers and users of PI statistics, providing not only information on traditional variables such as the type of security (in detail), the resident investor/issuer's institutional sector (in detail) and a full geographical breakdown (on the assets side), but also other detailed data useful for analysis, such as the currency in which securities are denominated and the non-resident issuer's institutional/economic sector. Moreover, changes in the underlying methodology can be introduced easily, since the design of the data collection system took account of possible future changes in output requirements.

4. Compiling PI statistics

On the PI liabilities side, the direct reporting option is usually not available, and indirect reporting through resident custodians is limited by the extent to which non-resident investors use the domestic financial system. Neither option is able to provide a geographical breakdown of liabilities by creditor country. The Portuguese system uses a mixed approach, in which PI liabilities are calculated on the basis of the net balance of all cross-border custody holdings among issuers, central securities depositories (CSDs), resident custodians and resident end-investors. The risk of misclassification or of double-counting direct investment is obviated by correlating PI data with direct investment surveys.

The main current limitation relates to the geographical allocation of PI liabilities' end-of-period positions and related income by creditor country. This is a significant concern, since it limits the compilation and dissemination of meaningful bilateral IIP statistics. In this context, an exploratory analysis of Coordinated Portfolio Investment Survey (CPIS) data is being undertaken. Conducted annually since 2001 by the IMF, and with 70 countries reporting as of the 2005 edition, the CPIS is considered a valuable data source for the geographical allocation of PI liabilities. The analysis being conducted is aimed at devising measures to overcome some of the current limitations of the CPIS: the fact that certain confidential data remain unpublished; the lack of information on geographical allocation of securities held as foreign reserve assets (collected through another confidential survey – SEFER); and the absence of data on holdings of countries that do not report to the CPIS.

In regard to PI assets, indirect reporting via custodians may not capture all relevant data, even when complemented by direct reporting of securities held in custody abroad, especially in the case of households. Although this is not considered a significant problem at present, since Portuguese households can generally be assumed to use the resident banking system for their investment decisions, it could become a greater problem in the context of a more integrated European Union (EU) – and, more specifically, euro area (EA) – financial system. A third party reporting (TPR) scheme, therefore, merits further analysis and development at the EU/EA level.

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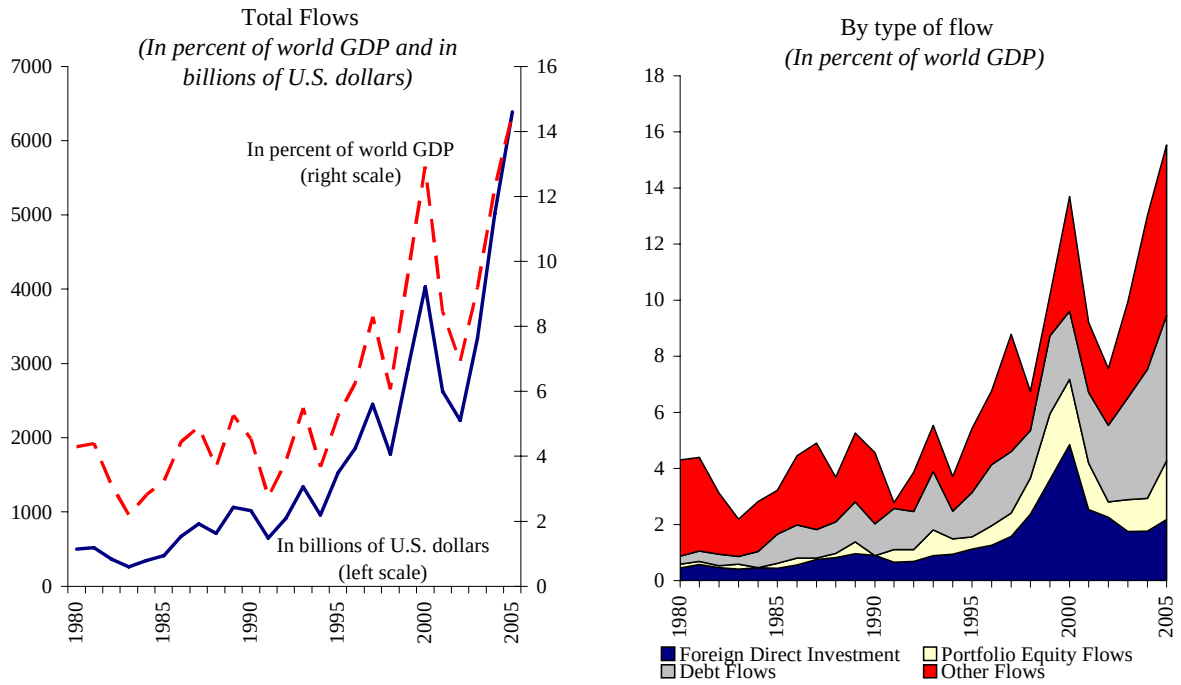
Comparable data on bilateral external positions: an insight into globalization

Lucie Laliberté[1] and John Motala[2]

Introduction

Cross-border financial asset flow accumulation tripled during the past decade (Figure 1). The growing cross-border financial linkages were associated with increased external net liabilities/assets positions (as mirrored in the expanding current account imbalances across economies). A recent study[3] by the International Monetary Fund (IMF) indicated: "Even if greater stability can be expected in the longer run, the process of transformation and the specific conditions under which it occurs may temporarily generate additional vulnerabilities."

Figure 1



Source: IMF staff calculations based on *IFS* and *WEO*.

To shed light on some of these vulnerabilities, this paper focuses on the statistical measurement of "inter-economy" financial linkages. The first section notes that the analytical framework of the balance sheet, based on position data, is especially relevant in analyzing the financial vulnerability of economies vis-à-vis one another. The second section reviews

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[3] Global Financial Stability Report, Spring 2007, page 63.

selected statistical initiatives in the external sector that help populate the balance sheet framework with data. The third section describes how the framework can be used for statistical, analytical and policy purposes.

A. Analytical framework to track the financial powers at play in a globalized world

With deepening financial globalization, economies become more vulnerable to the risks inherent to integrated financial markets, namely credit, currency, maturity, and instrument composition risks. An analytical approach referred to as the balance sheet framework[4] – modeled from the *System of National Accounts 1993* (*1993 SNA*) – may help analyse these risks. Grouping economic agents by broad sectors (e.g. government, corporations, nonresidents, etc.), the framework presents metrics on claims and liabilities on individual sectors with one another. Depending upon the details of the metrics included, the framework facilitates assessments of credit, maturity, currency, and capital structure mismatches, as well as intersectoral linkages and sectoral exposure to liquidity and solvency risks.

This paper calls for strengthening the nonresident sector in the framework, inclusive of its expansion into specific bilateral partner economies. The international economic crises of the last two decades may be analyzed as the spreading of shocks through the networks of interconnected balance sheets across economies, making it important to hone in on the ultimate foreign creditors' and debtors' economies.

B. Comparable data on the non-resident sector for the balance sheet framework

Statistical work on enhancing data on the financial positions of the nonresident sector is proceeding on three fronts – increasing data availability from various sources, creating a platform that brings these data sources together for worldwide dissemination, and harmonizing methodologies to ensure consistency of these various data sources.

In addition to collecting balance of payments statistics, the IMF has been encouraging countries to report international investment position (IIP) data. The number of countries reporting IIP statistics has increased from 37 in 1998 to 107 at present, albeit with varying degrees of component detail. Reporting on external positions was further promoted by the IMF Executive Board's decision to include the IIP data as a prescribed category of the Fund's Special Data Dissemination Standard (SDDS) as of December 31, 2001.

Since 2000, SDDS subscribers have also been reporting additional information on reserve assets in the Data Template on International Reserves/Foreign Currency Liquidity, with 56 economies currently reporting these data. In collaboration with the World Bank, the IMF has also encouraged SDDS subscribers to report quarterly data on external debt positions for inclusion in the Quarterly External Debt Statistics (QEDS); as of February 2007, 58 subscribers participated in the database.

In the mid-90s, the IMF launched the Coordinated Portfolio Investment Survey (CPIS) to improve statistics of holdings of foreign portfolio investment securities – equities and debt securities. The distinguishing feature of the CPIS was the provision of data by partner economies, which permits the derivation of measures of foreign portfolio investment liabilities. The survey has been conducted annually since 2001, with some 70 jurisdictions participating in the 2005 survey. A similar survey of the securities held as official foreign exchange reserve assets and securities held by selected international organizations is also

[4] IMF Working Paper, 06/100, Johan Mathisen and Anthony Pellechio, "Using the Balance Sheet Approach in Surveillance: Framework, Data Sources, and Data Availability".

conducted to supplement the coverage of the CPIS (the bilateral data are released only in aggregate form). Likewise, the IMF approved in 2007 a Coordinated Direct Investment Survey (CDIS), modeled on the CPIS to provide for partner country data. The CDIS, which is targeted for the end-2009 reference year, will be conducted in collaboration with several partners – the European Central Bank, Eurostat, the Organization for Economic Cooperation and Development (OECD), the United Nations Conference on Trade and Development (UNCTAD), and the World Bank. As well, the Bank for International Settlements (BIS) has a long established collection of international banking data on locational and consolidated bases that provides counterpart country information.

In May 2006, the BIS, the IMF, the OECD and the World Bank jointly launched the Joint External Debt Hub (JEDH) to bring together data that they each compile on external debt of economies, providing for worldwide dissemination of these data on a common platform. As of February 2007, the hub contained comprehensive national external debt data provided by 58 subscribers to the IMF's SDDS; external debt data from creditor and market sources and selected foreign assets for over 200 countries/territories; and data descriptions (metadata). Incorporating data from both creditor and debtor viewpoints, inclusive of bilateral data, the JEDH represents a valuable database from which data on the nonresident sector of economies' balance sheet frameworks could be promulgated.

Bringing data from various sources into a common framework, as is done for instance in the JEDH, underlines the importance of data consistency, which means that data are compiled according to common guidelines. The Fund's *An Overview of the System of Macroeconomic Accounts Statistics* (forthcoming) highlights how the *1993 SNA*, on which the balance sheet framework is modeled, has served as the overarching harmonizing framework for the balance of payments, the IIP and external debt datasets and a range of other statistical manuals produced by the IMF and other international organizations. The *1993 SNA* framework does not call, however, for information on the currency composition and remaining maturity positions, metrics that are very useful in a balance sheet analytical framework. It should be emphasized that the monetary and financial statistic[5] published by the IMF provide a currency breakdown between domestic and foreign currencies, in accordance with the IMF's *Monetary and Financial Statistics Manual 2000*. Work is also underway for the new *Balance of Payments Manual*, sixth edition, to introduce currency composition and remaining maturity information into external position data, on a supplementary basis. Technical assistance and training programs also support countries' efforts to harmonize the statistical methodologies across these datasets.

C. Uses of the framework

A key statistical use of the framework is data validation. The nonresident sector, notably its expansion by partner economies in the balance sheet framework, provides a useful tool for validating economies' external data. For instance, in addition to providing the data on assets of a specific economy, the CPIS database can improve the quality of an economy's data on liabilities (especially by residency of counterparty for holders of bearer instruments) on the basis of the other economies' assets data. As such, it can improve not only the coverage but also the geographical breakdown of the liability, as well as validating (and/or improving) transactions data in the balance of payments. Another example of data validation is a recent IMF initiative in which external debt data reported in the World Bank's QEDS database have been assessed against corresponding data series in the IIP reported to the IMF; comparator tables were produced with end-2004 data and, where significant differences existed,

[5] See IMF, *International Financial Statistics, Supplement on Monetary and Financial Statistics*.

economies were asked to reconcile the discrepancies particularly in sector, maturity, and instrument classification. The exercise is being repeated for end-2005 data.

There are a number of analytical uses of the framework, including the study of home bias. Data have suggested a recent decline in investors' tendency to hold securities issued in their home markets – in a larger proportion than theory would indicate.[6] The international financial integration of OECD, emerging, and developing economies increased at a similar, though fairly gradual, pace in the 1970s and 1980s. Starting with the 1990s, there has been a marked acceleration of financial integration among OECD countries, notably in the European market where cultural traditions, legal origin, and common currency (in a currency union) are all factors that reduced home bias. The impact of international financial integration varies across economies, as evidenced by their net external position. Led by the rapid accumulation in reserve and oil fund assets in recent years, the emerging and developing economies show, in aggregate, a net external asset position. This corresponded to higher net liabilities for the United States and, to a lesser extent, other industrial economies, with the notable exceptions of net external assets for Japan and Germany. In terms of external portfolio composition, emerging and developed countries hold most of external assets and liabilities in the form of debt; Japan's external position shows relatively more debt in assets and equity in liabilities. This is in contrast to the United States, whose assets are composed more of equity instruments, while its liabilities are primarily composed of debt instruments.

As regards policy relevance, the two key drivers of globalization – deregulation and technical innovation – led to changes in the financial structure of economies. For instance, the greater availability of funds, such as pension, insurance and mutual funds, facilitated the issuance of securities, displacing some of the more traditional banking loans and deposits. Moreover, nonresidents augmented their share of both banking and security financings in countries. For policymaking purposes, changes in the financial structure affect the transmission channel of monetary policies,[7] and often reflect forces at play that are beyond domestic control.

The balance sheet framework helps to improve data, conduct analysis, and inform policymaking. This paper's objective was to show that its effectiveness for globalized economies can be substantially enhanced by strengthening the nonresident sector, notably with initiatives that can only be conducted at the international level.

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[6] IMF Working Paper, 05/16, Philip R Lane and Gian Maria Milesi-Ferreti, "A Global Perspective on External Positions".

[7] IMF Working Paper, 06/84, Jorge Roldos, "Disintermediation and Monetary Transmission in Canada".

Collecting data on securities used in reverse transactions for the compilation of portfolio investment – how to compromise between theory and practice

R F D D Chaudron[1]

Introduction

Over the years, there has been much discussion regarding the appropriate statistical treatment of reverse transactions (collateralised loans) and their income (property income). Much less attention has been given to the question of what is the most appropriate way to collect data for the compilation of portfolio investment based on economic ownership, in the context of balance of payments statistics (covering both the BOP and IIP), through surveys or other forms of data collection. This paper addresses that question and presents relevant experience in setting up a new data collection system for portfolio investment assets in the Netherlands. First, I shall provide a short overview of market practices and summarise the methodological guidelines.

The mechanics of repurchase agreements and securities lending

Reverse transactions entail the temporary transfer of securities from one party (the lender) to another (the borrower). These transactions can be collateralised using cash (repurchase agreement or sell/buy back), other securities, or other assets (securities lending or borrowing). In legal terms, all types of reverse transactions involve the transfer of absolute title to the securities. In other words, a reverse transaction implies a change in legal ownership. This means that the borrower of the securities also acquires voting rights and other economic benefits (dividend and coupon payments). The borrower will in most cases, however, "manufacture" equivalent payments to the original owner of the security.

There are many ways in which lenders and borrowers of securities come together. Institutions with large enough lending operations of their own will be active in the market themselves. Most institutions make use of an intermediary, which may assume the role of either principal or agent. The main difference between an agent and a principal is that the agent does not act as the counterparty in the reverse transaction itself (though often providing the services to facilitate the transaction), whereas the principal will be positioned between the lender and the borrower of the securities. The use of principal intermediaries actually means that each reverse transaction is divided into two back-to-back contracts: one between the lender and the principal intermediary, and another between the principal intermediary and the borrower. Agent intermediaries include asset managers, custodian banks and specialised so-called third-party agents. Principal intermediaries are usually brokers and dealers that deal for their own account or on behalf of their clients.

Most outright securities transactions are executed through so-called "delivery versus payment" (DVP) transfers, in which a central counterparty matches the transfer of securities

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with the transfer of funds. Securities lending operations are often executed through "free of payment" (FOP) transfers. This is the case even if cash collateral is provided in exchange for the securities. Most settlement systems identify repos and sell/buy backs involving DVP transfers, allowing them to be separated from outright sales, but there remains a lack of standardisation. Dutch custodians have indicated that they can distinguish a client's reverse transaction from an outright sale only when they represent the lender of the securities. The reason for this is that they record an entry in their system in anticipation of the redelivery of the securities, simultaneously with the order to transfer the securities to the account of the borrower. In the opposite case, the custodian of the borrower would register only the receipt of the securities (involving just an FOP transfer) without any additional information. In principle, identification of the security (through its ISIN code), and thereby its issuer and the residence and sector of the issuer, does not appear to be a problem.

Many intermediaries use the securities of a large number of clients to satisfy the demands of securities borrowers. Some intermediaries (mostly custodians) have even developed systems for automatic securities lending. Such systems match the demand for securities with the supply from a pool of client portfolios, and are able to substitute new securities in the case of an early recall. The borrowing is arranged under a fixed contract and, for individual lending transactions, is carried out without the consent of the owner. This means that end-investors will not always be informed whether or which securities are being borrowed from their portfolios.

Methodological guidelines

The IMF Committee on Balance of Payments Statistics reconfirmed in 2001 that reverse transactions should be treated as collateralised loans. Accordingly, since the transfer of securities used in reverse transactions is viewed as the provision of collateral, reverse transactions do not give rise to a change in economic ownership of the securities. International discussion has subsequently dealt with the question of how to exclude reverse transactions from portfolio investment, given the fact that, in legal terms, there is a transfer of title. The market practices summarised above explain the results of research by a number of groups (the repos subgroup of the ECB Task Force on Portfolio Investment Collection Systems (TF-PICS) and the IMF Technical Group on Reverse Transactions (TGRT)). Both groups concluded that the information on reverse transactions is not available from any single group of market participants (either end-investors, custodians, brokers or dealers). The experience in the Netherlands described below provides additional insight into this question.

The Dutch data collection system for assets

The new system set up in the Netherlands in 2003 for portfolio investment assets (Dutch holdings of foreign securities), replacing the ITRS, is predominantly a direct reporting system. Except for the securities held by households, which are covered by a survey of resident custodians, all information is collected from the resident end-investors themselves. The most important factor behind this is the fact that Dutch institutional investors (pension funds, insurance companies and investment funds) and banks often use the services of foreign custodians. A survey of resident custodians would therefore never achieve sufficient coverage. The participation of Dutch institutional investors and banks in securities lending was a second factor.

It was expected that end-investors would use information from their custody accounts, and that they had access to information on all of their reverse transactions. It would therefore not

matter whether the information was collected on the basis of economic ownership or on legal ownership supplemented with data on reverse transactions. It seemed clear that the use of information from custodians alone would not allow for the derivation of economic ownership. Consistency in the design of forms led to a decision to collect holdership information from end-investors on a legal ownership basis (see below). This was supplemented by two separate forms requesting information on positions and changes of positions in the foreign securities used in reverse transactions with non-resident counterparties (the exact type of reverse transaction – repo, sell/buy back or lending – being irrelevant). Portfolio investment assets were then compiled as the legal holdings plus foreign securities lent, minus foreign securities borrowed. The correction applied to legal holdings for foreign securities lent to/borrowed from non-residents was only partial. No information was collected on foreign securities lent to/borrowed from residents, which resulted in a misallocation of holdings between resident sectors, even though the total of resident holdings across sectors was correct.

The experiences with this approach over the following two years proved disappointing, even though the method had been discussed with reporters in advance. The misallocation between sectors turned out to be quite material, and had to be corrected on a macro level using aggregate balance sheet information from the other-MFIs sector to avoid discrepancy with money and banking data. End-investors did not always possess the information on securities used in reverse transactions, or had to arrange for the provision of such data by intermediaries and/or custodians, sometimes at considerable cost. Many declared a preference for reporting their holdings on the basis of economic ownership. There was also confusion on the reporting of coupon payments and interest earned on the securities used in reverse transactions, as well as the interest earned on the reverse transaction itself. A change in the BOP collection system to facilitate reporting for quarterly sector accounts from the beginning of 2006 was used to accommodate reporters' preferences. Since the beginning of 2006, all end-investors report their holdings of foreign securities on the basis of economic ownership (with short positions being reported as negative holdings). They also no longer need to report on the foreign securities used in reverse transactions with non-resident counterparties.

The Dutch data collection system for liabilities

The Dutch data collection system for portfolio investment liabilities (foreign holdings of Dutch securities) established in 2003 is a mixed approach (see §85–89 of the final report of the TF PICS). Briefly, under the mixed approach, portfolio investment liabilities are calculated as the net balance of all cross-border custody holdings between resident issuers, CSDs, custodians and end-investors. Because this approach uses information from direct and indirect reporters, it was all the more important to analyse the information needed on (Dutch) securities used in reverse transactions. If end-investors reported their Dutch securities held with foreign custodians (used as a correction on foreign holdings data collected from custodians) on the basis of legal ownership, the resulting portfolio investment liabilities would also correspond to legal ownership. In order to convert this to economic ownership, data were needed on Dutch securities used in reverse transactions with non-resident counterparts, irrespective of where the securities were/are held in custody before/after the transfer. Since this combined neatly with the information required to correct portfolio investment assets, the Dutch system asked resident end-investors for holdings of Dutch securities with foreign custodians on the basis of legal ownership.

As indicated above in relation to experience with the data collection system for portfolio investment assets, this approach encountered a number of practical problems with end-investors. Along with foreign securities, reporting of Dutch securities held with foreign custodians was shifted to an economic ownership basis as of the start of 2006. In contrast to

the case of foreign securities, however, the compilation of portfolio investment liabilities still required certain information on securities used in reverse transactions. Without going into too much detail, analysis showed that what was now needed was information on whether the securities used in reverse transactions were held with resident custodians, irrespective of the residency of the counterpart.

Table 1

Results from the survey on lending of Dutch securities

Proportion of institutions		MFIs	Insurance companies	Pension funds	Investment funds
Active in securities borrowing (%)	Shares	41.7	0.0	0.0	0.0
	Bonds	25.0	0.0	5.9	0.0
Active in securities lending (%)	Shares	41.7	45.0	64.7	62.5
	Bonds	75.0	60.0	70.6	37.5
Uses an exclusive principal agreement (%)		N/A	25.0	58.8	37.5
Non-resident counterparty (%)		58.3	20.0	17.6	50.0
Net lending (billions of euros)	Shares	–1.2	0.2	1.2	0.3
	Bonds	–5.0	8.4	4.4	0.6
Number of institutions surveyed		12	20	17	8

Source: De Nederlandsche Bank.

Logically, securities lending between residents equals securities borrowing. If most of the lending and borrowing of securities maintained with resident custodians were carried out with other residents (most notably the central bank), information collected on securities used in reverse transactions would largely cancel out. An ad hoc questionnaire was sent out to all relevant groups of end-investors during the fall of 2005 to investigate the value of securities and the counterparties involved. The results of this questionnaire, summarised in table 1, showed that banks were active in both lending and borrowing of shares and bonds. The other groups of end-investors were almost exclusively active in securities lending. The net amounts involved, however, turned out to be very small in comparison with aggregates from the IIP. In the survey, net lending of shares totalled 0.5 billion euros, compared to total liabilities in the IIP of 419.6 billion euros for end-2005, while the figures for net lending of bonds were –8.4 billion euros and 537.1 billion euros. Moreover, only half or less of the reporters were involved in reverse transactions with non-residents (except MFIs) that used securities from resident custody accounts. In the end, the conclusion from the survey was that information on Dutch securities held with resident custodians and used in reverse transactions could be ignored. It was decided to repeat the survey periodically to monitor whether it would be necessary to reintroduce reporting.

Conclusions

The type of system chosen for the collection of information on portfolio investment, direct or indirect, determines whether the data are based on economic or legal ownership. Dutch end-

investors prefer to provide information on the basis of economic ownership. In this case, there is no problem of excluding securities exchanged under reverse transactions from portfolio investment assets. Custodians and other intermediaries are only able to provide information on the basis of legal ownership. For the compilation of portfolio investment liabilities, which requires information from both direct and indirect reporters, adoption of a practical solution proved to be possible, after research concluded that the error from ignoring securities lending and borrowing was immaterial.

Another important lesson is the importance of discussing information needs thoroughly with prospective reporters. Even though this was done in the Netherlands before a new direct reporting system was implemented, the system proved less effective in practice than anticipated. The Dutch central bank has therefore instituted commissions that meet on a regular basis to discuss reporting issues with all of its major reporters.

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A security-by-security approach to deriving investment fund security transactions data from stock data

Frank Mayerlen[1]

Introduction

The concept of security-by-security (s-b-s) reporting represents perhaps the most promising approach to reducing the statistical burden for reporters while simultaneously improving the quality and detail of statistical data. For the compiler of statistics, the processing of s-b-s data requires a substantial change in the production environment, entailing a move away from the simple "adding up" of aggregated information, towards the processing of micro data in relational databases. A further, and perhaps even more important change, from the compilation perspective, is the requirement for securities reference information, in addition to the information provided by reporting agents.[2] The need for appropriate reference data is often seen as an element of s-b-s approaches that could entail risks, particularly in cases where reporting agents are likely to hold "exotic securities" that may not be (fully) covered by the reference information.

This paper proposes a statistical solution for the compilation of investment fund balance sheet and transaction data using an s-b-s approach. In particular, it addresses the problem of incomplete or missing reference information, proposing built-in fallback solutions that would be automatically phased out as reference data improve, to allow for the robust production of reliable statistics at a stage when the reference information may (still) have some gaps.

The paper describes a test application for the compilation of investment fund statistics following an s-b-s approach. Owing to space limitations, some details are not covered, in particular as regards conceptual design and implementation. The most relevant of these issues have been mentioned in the footnotes.

Practical problems with security-by-security approaches

From a conceptual point of view, all data reported using an s-b-s approach will be matched with (enriched by) reference information from a securities reference database, to create a comprehensive basis for further processing or consistent aggregation required in a variety of contexts. In this connection, gaps or errors in reference data are a major practical concern for compilers of statistics, since these data are necessary for classifying statistical information by instrument, currency and issuer's residency and sector. Another practical problem arises when the reporting agent cannot provide a valid identifier for some securities and instead must report aggregate information. This means that the s-b-s compilation

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[2] The European System of Central Banks (ESCB) will be sharing the Centralised Securities Database (CSDB) for securities reference information purposes. This will ensure consistency in the production of Eurosystem statistics.

environment must also be able to cope with aggregated data and make the related revaluation adjustments.

A forward-looking approach to establishing an efficient, robust and sound production system

How "precise" does an s-b-s system for producing macroeconomic statistics need to be?

In developing an s-b-s production system for macroeconomic statistics, user needs – including data accuracy requirements – should be a major driving force. One should usually refrain from requiring overall "book-keeping accuracy", even if theoretically feasible and appealing to some users or producers of statistics. It may be impossible to achieve such a high level of accuracy, given that the reported information and the reference data come from two independent data sources. Moreover, the cost involved in attaining (close to) 100% accuracy and coverage for the reference data would be disproportionate, and rarely justifiable in terms of the increased usability of the statistical data. With a more efficient (but slightly less precise) statistical approach, the data compiled on an s-b-s basis will still be considerably more precise and detailed than almost any statistics that are reported solely as aggregates.

Defining the data to be required from reporting agents

S-b-s reporting allows the use of statistical approaches to data requirements that are much more in line with reporting agents' internal business systems than are the requirements for aggregated reporting. Consequently, the reporting burden can be minimised if this information by itself is sufficient for statistical purposes. On the other hand, s-b-s approaches often provide some additional data at almost no cost when they are available in the business systems.

Therefore, in determining the data requirements for the forthcoming new statistics on euro area investment fund assets and liabilities, it has been agreed that, subject to the views of the compiling institution, reporting agents shall not be required to report transaction data for securities, in the event that they implement an s-b-s reporting framework for reporting stocks. The rationale for this is that often transaction data are not readily available in business systems, and are more efficiently derived by the producers of statistics. At the same time, the reporters agreed in this case to provide price data for each securities position. This is readily available to the funds and greatly facilitates the production of the statistical data. The agreed data requirement is expected to facilitate the production of high quality statistics and is considered to offer a good cost benefit compromise for both reporting agents and compilers of statistics.[3]

Designing the s-b-s production environment

All s-b-s production environments need to make use of both the reported information and the securities reference information. Given that one reference database may be used by several production environments, it is clearly more efficient to invest in a sound procedure for setting

[3] The data requirement may also cover the reporting of deposit (and loan) positions on a "currency-by-currency" basis, but without any revaluation adjustments. Based on these data, accurate transactions can be derived separately for each currency.

default values in the reference database than fixing problems in each individual production environment. However, for guaranteed robust functioning, each production environment should incorporate fallback solutions to remedy any gaps or errors in the reference data that have not been addressed previously. The production environment must, in any event, include a default procedure to provide for those cases in which securities identifiers cannot be matched with reference data, owing to reporting errors or to gaps or errors in the reference data. For the sake of overall consistency among different statistics, it is also essential to ensure that the production system's estimation methods will "switch off" in cases where the reference data are complete.

Technically, the production environment for investment fund statistics must be able not only to process s-b-s information, but also to deal with data referring to other balance sheet categories reported on an aggregated basis, and with aggregated (fallback) reporting of securities positions. Note that because of limited space, the processing of such aggregated data is not addressed in detail here.

The entire compilation procedure may be organised in a layered approach, in which stocks are compiled first, and then the transaction data based on this information are derived.

Calculating stock data

Where data on prices and outstanding amounts are concerned, the production of statistics on stocks of securities by the described s-b-s approach relies entirely on the s-b-s data reported by the investment funds. These data are reported without any further information by instrument category, currency, or issuer's sector or residency, which reporting agents generally consider difficult to provide. These data are instead sourced from the reference database, independent of the actual reporting. Other (non-securities) balance sheet components, eg deposits (and loans), must be reported with the required breakdowns.

Remedying gaps in the securities reference data

Given that the funds report prices as well as outstanding amounts,[4] gaps in reference data affect only the statistical breakdowns (categorisation) of the balance sheet components, not the total value of a securities position. Securities reference data cover (1) instrument category; (2) currency in which issue is denominated; (3) issuer's sector; and (4) issuer's residency. When reference data are "incomplete", either the entire set of relevant securities reference information is missing (ie the security is not covered in the reference database or cannot be matched) or data on one or more individual variables are missing. The proposed estimation method explained below is designed to fill these gaps by deriving *missing* information from the most similar *complete* records, thereby exploiting the information available to the extent possible.

Given the four reference variables for stock statistics, there are fifteen possible combinations of gaps in the reference data, including the case where there are no reference data at all.

[4] In practice, the funds have to report two of the following three variables for each security: (1) price; (2) number of securities or outstanding amount; and (3) total value of the position.

Table 1

Different error types in the reference information

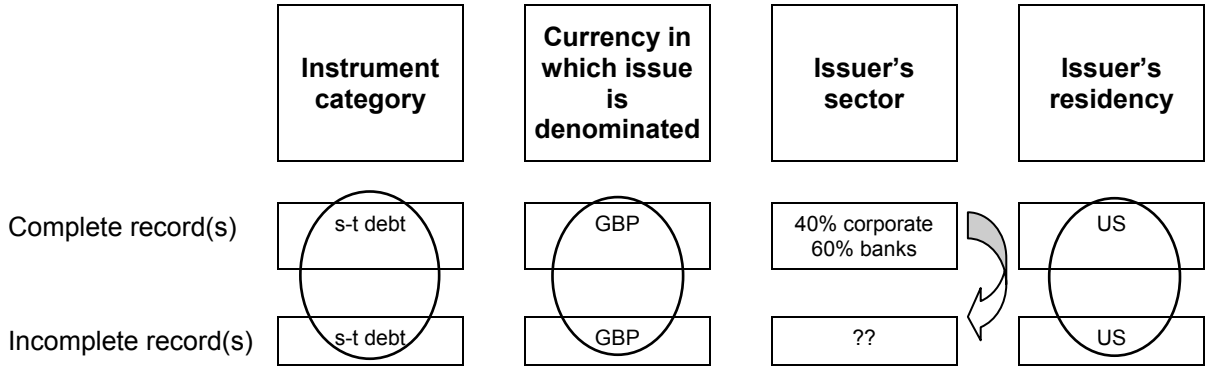
[X marks missing data]

Error type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Instrument category	X				X	X	X	X	X	X	X				
Issuing currency	X	X			X	X					X	X		X	X
Issuer sector	X	X	X		X			X		X			X	X	
Issuer residency	X	X	X	X					X	X	X	X			

After classifying the gaps by "error type", the estimation procedure searches for complete securities records with similar reference information for all fields that are filled in, including the complete and incomplete record. Data are then estimated only for the field(s) with gaps, on the basis of the complete record(s). The advantage of this method is that the estimation, for example, of the issuer's sector for a short-term (s-t) debt security issued by a US resident does not affect data on securities issued by euro area residents. The estimation is carried out separately for assets and liabilities.

Figure 1

Matching of complete and incomplete records for the estimation of reference data



Where there is no matching complete security record in which all complete fields coincide, the incomplete record is downgraded to a record in which all fields are missing (error type 1 in Table 1), and is distributed in a second round of processing, following the overall structure of all complete securities records (again, separately for the asset and liability sides).[5]

The estimation procedure guarantees that the statistical categorisation is applied to all balance sheet categories where this is required. The entire balance sheet can now be aggregated for reporting.

[5] A solution with a stepwise downgrade is also conceivable. The downgrading procedure would in theory also (as a fallback) allow securities positions to be reported in the aggregate without any detailed instrument classification, provided that the amounts are small in relative terms. The statistical classification would then be estimated by the procedure described.

Derivation of transactions and investment income

Conceptual approach

The stock data as presented above form the basis for the derivation of transaction and investment income data for securities following an s-b-s approach (ie separately for each security). Transactions that occurred during a period between t_0 and t_1 will be derived according to the formulae shown below and using the following variables: *EQ* (number of shares); p_{EQ} (price per share in euros); *DT* (debt securities, nominal amount); p_{DT} (debt securities price in euros); *DIV* (dividend per share in euros); *DAYS* (number of days between t_0 and t_1); *ACF* (daily accrual factor for debt).

Securities transactions (equity):[6]
$$TR_{EQt0t1} = \left(EQ_{t1} - EQ_{t0}\right) * \frac{\left(p_{EQt1} + p_{EQt2}\right)}{2} \quad (1)$$

Securities transactions (debt):
$$TR_{DTt0t1} = \left(DT_{t1} - DT_{t0}\right) * \frac{\left(p_{DTt1} + p_{DTt2}\right)}{2} \quad (2)$$

Dividend income (equity):[7]
$$IN_{EQt0t1} = \frac{\left(EQ_{t1} + EQ_{t2}\right)}{2} * DIV \quad (3)$$

Interest income (debt):
$$IN_{DTt0t1} = \frac{\left(DT_{t1} + DT_{t2}\right)}{2} * DAYS * ACF \quad (4)$$

Practical problems

Formulae (1) and (2) above require price information for t_0 as well as t_1. Since price data are reported together with the corresponding stocks, they will not be available from reporting agents where positions are zero at either t_0 or t_1. In such cases, the price information is sourced from the reference database, which also provides the necessary income information (dividends and accrual factors).

In practice, the reference database may lack the income information, and possibly also the price data. In this case, using only the price at t_1 or t_0 to estimate the transactions may not be sufficiently accurate, especially during periods with strong moves in share prices. Moreover, an approach is needed to derive transactions for those positions where the reference information for the stock data has been estimated, ie where no price information can possibly be available on an s-b-s basis, as there is no link to an individual security. The proposal in both cases is to "downgrade" these records to aggregate information (AGG) and to apply price indices derived from those s-b-s records where full price data are available.[8]

Deriving transactions using dedicated price indices

The basic idea behind this approach is analogous to the solution for stock data described above, in which missing information is also derived from the most similar *complete* records.

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[6] If applicable, the number of shares is automatically adjusted for stock splits that occurred between t0 and t1. The relevant corporate action information should be available from the reference database.

[7] If applicable, dividends are automatically adjusted for stock splits that occurred between t0 and t1. The relevant corporate action information should be available from the reference database.

[8] A similar approach may be considered at some stage for income data, where average accrual factors or dividends may be applied to those instruments or positions for which no income information is available.

For transactions, volume-weighted Laspeyres[9] price indices are derived from the records with complete reference data for each equity or debt category (X) of the securities item. These price indices (PR_{Xt0t1}) are then applied so as to price-adjust the aggregate balance sheet positions at t_0 when complete reference information is unavailable (AGG). As a last step, transactions are calculated as the difference in (adjusted) aggregate positions.

Adjustment of positions at t_0: $$AGG_{Xt0\_adj} = AGG_{Xt0} * PR_{Xt0t1} \quad (5)$$

Calculation of transactions: $$TR_{t0t1} = AGG_{Xt1} - AGG_{Xt0\_adj} \quad (6)$$

Aggregation and reporting

Both the directly derived transactions and income data, and the transactions estimated using the indices, are stored in a single table, together with the statistical reference information by sector, residency, currency and instrument category. Based on this information, different (but fully consistent) aggregates can be constructed for the investment fund statistics and, in principle, for other purposes as well, such as external statistics.

[9] From a conceptual point of view, a Fisher price index may be more consistent with the method for deriving transactions according to formula (1).

Integrated statistical systems: evolution or revolution?

Maria do Carmo Aguiar [1]

Evolution: a gradual process of change and development
Revolution: a very important change in the way that people do things[2]

1. Introduction

Information technology developments have led to a new trend in the way statistics are produced: traditional aggregated reporting is gradually being replaced by item-by-item reporting. The advantages of this approach are enormous, ranging from lower reporting costs to greater flexibility in compilation. Although item-by-item reporting requires dealing with large volumes of data, this has become easier with the evolution of network and communication protocols, database systems and multidimensional analytical systems. Consequently, old multiple heterogeneous collection and compilation systems are being replaced by integrated systems.

The statistical data on securities periodically released by the Banco de Portugal are compiled from the Integrated Securities Statistics System (Sistema Integrado de Estatísticas de Títulos, or SIET), which was developed by the Banco de Portugal's Statistics Department to be a single repository housing all of the information needed for compliance with securities reporting requirements. SIET makes it possible to meet user needs at both the national and the international level. Quite ambitious in its aims, the system has been a challenge for data quality managers, and a source of opportunities for data "explorers".

With developments in financial markets worldwide, securities statistics are increasingly important, and the coverage, quality and harmonisation of securities statistics produced in the various countries are of growing concern at the international level, and within the European System of Central Banks (ESCB) in particular. In this context, integrated statistical systems facilitate more efficient and harmonised production of statistical data. SIET, as an integrated system with data on issues and portfolios, and with coverage of all of the economy's institutional sectors, makes it possible to cope efficiently with most information requirements in the field of securities statistics.

This paper provides an overview of SIET's architecture – inputs, processing and enrichment modules, and outputs – examining whether this integrated system represents an evolutionary development from previous disaggregated systems, or whether the new possibilities it creates constitute a revolution. A glance into the near future foresees the integration of information from the Centralised Securities Database (CSDB), which is an ongoing project of the European Central Bank (ECB).

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[2] In "Cambridge Dictionaries Online" (dictionary.cambridge.org).

2. SIET's features and main components

SIET is an information system that stores data on securities issues and portfolios on a "security-by-security" (s-b-s) and an "investor-by-investor" basis, except for investors in the household sector, for which data are aggregated according to the investor's country. This means that data considered relevant for statistical analysis are collected, validated and stored for each security, each issuer and each investor. The existence of a reference database with individual information on securities and issuers allows statistical information to be collected from reporting entities on an s-b-s basis. This reduces reporting costs, since there is no need for reporters to aggregate background information according to multiple criteria. Furthermore, it facilitates better information monitoring and greater flexibility in exploring data and performing statistical analysis.

SIET includes two types of information: information on securities issues, and information on holders of securities. The issues side of the system collects information on securities issued by entities resident in Portugal, whether the securities are issued in the Portuguese market or in foreign markets. The portfolios side of the system collects information on the securities portfolios of the country's resident investors, as well as on Portuguese securities in the portfolios of non-resident investors. In addition, information on foreign securities held by resident investors is obtained from commercial databases.

SIET replaced a relatively extensive set of procedures for the collection of securities data, while expanding reporting to all investing sectors and enhancing quality control. While, on the issues side, procedures for researching and collecting information underwent some evolution, reporting on holders of securities was totally changed. Whereas previous reporting on securities portfolios covered only external transactions and operations conducted by monetary financial institutions (MFIs), today all sectors are covered.

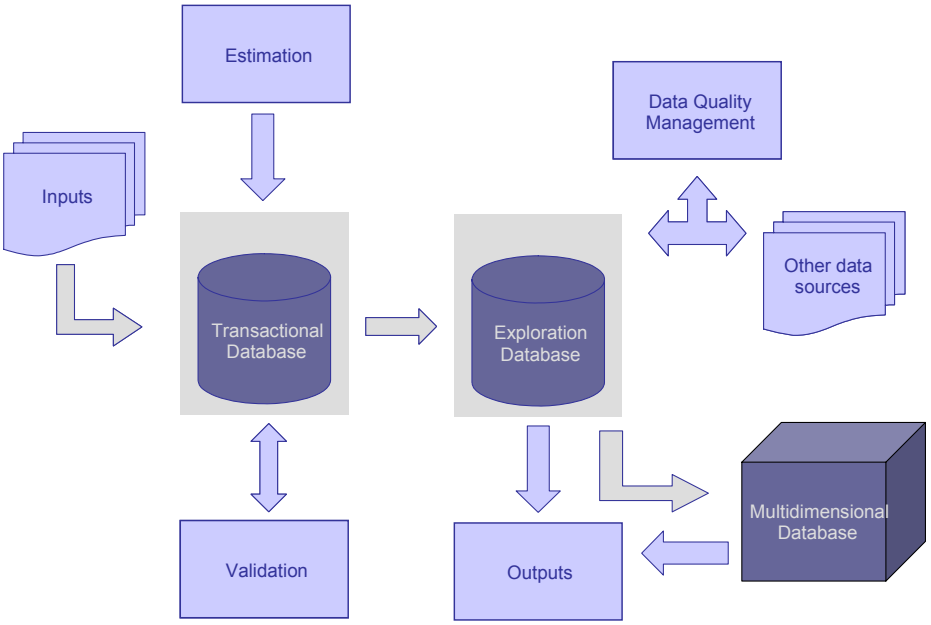
Data on issues are collected from several sources. Under the provisions of Article 13 of the Banco de Portugal charter, and of Article 6 of the European Central Bank Guideline of 6 February 2003 (ECB/2003/2) on monetary and financial statistics, the Banco de Portugal is required to ensure the production of securities statistics covering issues by entities resident in Portugal, and the Bank may require any public or private entity to directly provide information deemed necessary for the compilation of these statistics.

On the portfolios side, information is reported according to a Banco de Portugal Directive on "Securities Statistics – Transactions and Positions". Based on this legal provision, detailed information is collected on investments by residents in domestic and foreign securities, and on investments by non-residents in domestic securities.

Figure 1 illustrates the architecture of the SIET system, which relies on two relational databases and one analytical database. Data are stored and validated (first level of quality control) in the "transactional database", which also includes estimates of missing data. Validated and "enriched" data are copied daily to the "exploration database". A second level of quality control is performed on aggregate data, by means of consistency tests and comparisons with other information sources. Statistical outputs are generated from the "exploration database" as well as from the "multidimensional database". This recently developed analytical database is a powerful tool, since it enables user-friendly multidimensional analysis of the information.

Figure 1

SIET architecture



SIET stores information on type of instrument, institutional sector and residency of issuer/investor, prices (quotations), transactions and positions associated with securities issues (issues, redemptions and outstanding amounts), and transactions and positions associated with securities portfolios (purchases, sales, stocks). Classification of securities and entities follows the European System of National and Regional Accounts (ESA/95), complemented by Annex XIX of Guideline ECB/2003/2. Ideally, securities are identified by ISIN (International Securities Identification Number) code, and resident issuers/investors by NPC (the Portuguese acronym for Legal Person Identification Number). Standard unique identification codes are fundamental for sharing and integrating information from different sources. The ISIN code accomplishes this purpose for securities. Unfortunately, there is no corresponding code at an international level for entities.

3. Opportunities and challenges

SIET was designed to meet all of the Banco de Portugal's needs with regard to statistical information on securities. Developing and implementing the system was a major challenge, and the outcome has been very positive.

During the preparation of the project, reporters were contacted and the new reporting scheme was discussed. One might think that asking reporters to transmit individual information on transactions and positions would represent a burden. However, most reporters were also developing their own information systems, and sending individual information was easier and less expensive than aggregating it according to different statistical criteria.

Compilers at the Statistics Department were required to deal with vastly increased amounts of data. Gradually, methods were developed to rapidly identify errors and discrepancies. As in all new systems, there was a learning curve.

Having an integrated system with individual data provides a number of advantages from the perspective of statistical compilation:

- Classification of information for statistical purposes is handled by statistical experts within a common methodological framework.
- Calculations are performed locally according to internally defined algorithms.
- Valuation adjustments follow uniform criteria.
- Consistency between transactions and positions is monitored in detail.
- Issued and held outstanding amounts are compared at the security level.
- Outputs are compiled according to multiple criteria without reporters being required to do so.

SIET promotes consistency across the statistics produced by the Banco de Portugal, and securities issues statistics are a SIET output. In addition to analysis and release at the national level, these statistics are reported to international organisations – namely the ECB and the Bank for International Settlements (BIS). Moreover, SIET's information is used as input for the compilation of a broad set of statistics produced at the Banco de Portugal, which are also disseminated at the national and international levels:

- In the field of monetary and financial statistics, SIET enables the validation and detailing of the information reported in MFIs' and non-monetary financial institutions' balance sheets, as regards their securities issues and own portfolios. The data are also used to produce investment fund statistics.
- In the area of balance of payments and international investment position statistics, SIET data on external transactions and securities positions are used to generate the portfolio investment item (assets and liabilities).
- Public finance statistics are produced using SIET information on issues of the various general government sub-sectors, and on the share of these securities represented by general government entities (for data consolidation purposes).
- Values reported to the central balance sheet data office on the activity of non-financial corporations are also compared with SIET data for quality control of the information collected by both systems on securities issued and purchased by these entities.
- Finally, for the national financial accounts, SIET data are used to compile assets and liabilities items regarding debt securities and equities, broken down by type of security and maturity, for the economy's various institutional sectors.

SIET is an open system, in the sense that new components may be developed and integrated. The component involved in estimating missing information is currently being enhanced, and in the near future, information on foreign securities will be obtained from the CSDB (see below), taking advantage of improvements in the quality of this information.

In our experience, developing an integrated system for securities statistics led to major improvements and opportunities in this area. Representing more than a gradual change in the production of statistics, it constitutes a very important change in the way things are done, and in that sense could be called a revolution.

4. The near future

Compiling statistical information on securities entails a number of difficulties, both in terms of classification and valuation and as regards identifying holders of securities. The problems are not due to lack of information sources, since several commercial databases provide information on individual securities, and several ESCB central banks maintain their own

databases. In some cases, however, there are gaps, and in others information from different sources is inconsistent. These are the main reasons the ECB is developing a reference securities database with information on a security-by-security basis – the CSDB.

The purpose of the CSDB is to provide a database with complete, consistent, validated and updated information on all securities relevant to the ESCB's statistical objectives. The existence of a single database should promote consistent results and efficient data collection and compilation. The database draws on information from commercial databases and other sources, including national central banks (NCBs) that maintain s-b-s databases. Data quality management will benefit from the cooperation among ESCB members, the BIS and a number of national statistical institutes.

From a statistical viewpoint, the CSDB serves two purposes: supplying information for the compilation of euro area aggregates (eg securities issues statistics), and supplying reference information on securities and issuers to facilitate the collection of statistical information on an s-b-s basis, improving the production of aggregate statistics.

The CSDB is being developed gradually: in phase 1, completed in May 2005, the ECB implemented the system; in phase 2, currently in progress, mechanisms will be implemented to provide online access and application-to-application communication for NCBs.

Several countries are already collecting information on portfolio investment on an s-b-s basis for the production of balance of payments and international investment position statistics. In the near future, all euro area members will be using this approach, employing the CSDB to classify information on securities. In this way, the CSDB will be a major contributor to achieving more efficient production of harmonised statistics.

The Banco de Portugal has actively collaborated in this project since its beginning. Information on Portuguese securities from SIET is being sent to the ECB on a monthly basis. Also, monthly extracts of the CSDB are being used for data quality checks.

Finally, it should be reiterated that recent changes in financial markets as a result of globalisation and innovation have created new statistical challenges and demands. At the same time, technological change continues to create opportunities for developing more highly integrated systems based on "item-by-item" data. These factors, together with increasing collaboration among institutions nationally and internationally, are definitely contributing to the production of more accurate, reliable and comparable statistics.

Discussion comments on session STCPM27: Portfolio investment statistics

Steven J Keuning[1]

1. General issues concerning cross-border portfolio investment statistics

The rapid growth of international financial flows, as a consequence of greater interdependence among economic areas, poses numerous challenges to the compilation of external financial statistics in general and cross-border portfolio investment statistics in particular. Central Banks, in their dual role as users and producers of statistics, are well aware of both the increasing need for such statistics and the growing difficulty of collecting and compiling them. On the one hand, it is difficult for national compilers to obtain accurate information on portfolio investment liabilities that are not settled through domestic custodians. On the other hand, collecting information on the assets side is constrained by the increasingly important aim of limiting the reporting burden.

The papers presented in this session demonstrate very well the two main solutions that have been found to overcome, or at least alleviate, these problems. The first solution is to develop and maintain security-by-security (s-by-s) portfolio data collection systems and databases, preferably not only for cross-border flows and stocks, but for all transactions and positions. This is clearly illustrated in the two Portuguese papers presented in this session. The second solution has been the worldwide Coordinated Portfolio Investment Survey (CPIS), designed to collect data on the (portfolio) holdings of equity and debt securities by residence of the issuer. This important initiative is one of the subjects surveyed in the IMF paper.

The four papers in this session that I have been asked to discuss can be grouped in two categories. The Dutch and Portuguese papers complement each other, since the latter explains the general approach towards portfolio investment data collection, while the former deals with a specific issue in that context. Similarly, the paper from India provides an illuminating example of the framework described in the IMF paper. Thus, I would like to review the papers in that order, before setting out a few general issues for discussion, in light of the recent turbulence in the global financial markets and the "information deficit" that has been highlighted in that context.

2. Paula Casimira Dias: "The Portuguese experience in compiling portfolio investment statistics"

This, in my view, is an excellent paper, reviewing the pros and cons of various options for portfolio investment data collection and arguing convincingly – in little more than three pages – the case for a general security-by-security approach and a mixed indirect-direct reporting system. For that reason, I can warmly recommend this paper to portfolio investment statistics compilers worldwide.

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It demonstrates, in particular, the advantages of an s-by-s data collection system over an aggregate data reporting system, for reasons of higher data quality and flexibility, and reduced costs for respondents. At the same time, the paper argues that such a data collection system is vitally dependent on the availability of a unique identifier for all securities (namely, the currently widespread ISIN code) and entails considerable set-up and maintenance costs for statistics compilers. In that context, however, it is conceivable that even to the statistics compilers, the "total cost of ownership" of an integrated s-by-s data collection system – over, for example, a five-year period – may be less than that of an aggregate data reporting system. This comparison should also take account of the additional running costs of an aggregate data reporting system, since more resources are spent on (a) other statistics (eg securities issues statistics, investment funds statistics, calculations of interest on an accruals basis and financial accounts including from-whom-to-whom data); (b) data quality checking, including further contacts with reporting agents; and (c) changing the collection system if new data needs arise or new international methodological standards are agreed upon. It is more efficient to society if data aggregation is carried out only once, in a central location, rather than separately by each respondent. In addition, it is interesting to learn that in an s-by-s data collection system respondents prefer to report data on flows and stocks at the same (high) frequency.

Concerning the selection of respondents, the Portuguese system has opted for a mixed system, in which indirect reporting by resident custodians is complemented by direct reporting by end-investors on their securities held in custody abroad, and by data from the CPIS. It is acknowledged that the CPIS still has some limitations, including missing data from several countries and the absence of a geographical allocation of securities held as foreign reserve assets – issues on which the IMF may also want to reflect further.

Understandably, the direct reporting system is not applied to households, and this is not viewed as a major issue at present. At the same time, a convincing plea is made for creating an international third-party reporting system.

Another issue that is not mentioned by the author relates to the possible lack of sufficient reference information (eg issuer sector), particularly concerning data on securities holdings provided by direct reporters. Finally, the author touches upon two challenges of this mixed reporting system that may warrant further clarification, namely, how to exclude (a) repo-type transactions and positions; and (b) direct investment holdings. Fortunately, the former issue is the subject of the Dutch paper, to which I now turn.

3. Raymond Chaudron: "Collecting data on securities used in reverse transactions for the compilation of portfolio investment – how to compromise between theory and practice"

This paper complements the previous one by focusing on the complexity of collecting appropriate data on repurchase agreements and securities lending that involve a change of legal, but not economic, ownership. In addition to an overview of the international methodological guidelines, it describes the possible roles of the intermediary in this process, which may or may not also act on its own account, and the fact that securities lending operations are often executed without concomitant payments. An additional complexity is that many of these transactions are settled through foreign custodians.

The paper briefly summarises the Dutch data collection systems for both assets and liabilities, and explains why a reporting system for assets based on legal ownership did not yield the expected results and was ultimately abandoned in favour of a reporting system based on economic ownership, with short positions being reported as negative holdings. This change was implemented at the request of, and in close coordination with, the direct reporters concerned, who no longer needed to exclude the securities exchanged under

reverse transactions from their portfolio asset holdings. At the same time, custodians and other intermediaries are only able to provide information on the basis of legal ownership. However, empirical investigation concluded that in the Dutch case the net amounts involved in cross-border securities lending and borrowing were very small at present, and a decision was therefore taken to ignore the amount of Dutch securities held with resident custodians and used in cross-border reverse transactions.

A specific, topical issue in this context is the extent to which this reporting system is also able to cater for all kinds of new financial instruments, many of which are closely related to reverse transactions. For instance, the paper explains that some intermediaries have developed automated systems for securities lending without the consent of the owner, in which the demand for securities is matched with the supply from a pool of client portfolios, and new securities can be substituted in the case of an early recall. However, this presupposes that such recalls do not all occur at the same time. As recent developments have demonstrated, this condition may not always be met, and in that case the global financial system could be affected. This, then, brings us to the IMF paper.

4. Lucie Laliberté and John Motala: "Comparable data on bilateral external positions, an insight into globalisation"

The IMF paper explains that, apart from the obvious advantages, deepening financial globalisation has increased economies' vulnerability to risks, in particular credit, currency, maturity and instrument composition risks. In order to help analyse these risks, the IMF uses the so-called balance sheet framework, which is conceptually derived from the 1993 System of National Accounts (SNA). The paper specifically calls for strengthening the non-resident stocks and flows in this framework, broken down by specific partner economies, and sketches the important contribution that the IMF's CPIS and forthcoming Coordinated Direct Investment Survey (CDIS) make to this endeavour. In that context, it is essential to identify the ultimate foreign creditors and debtors, which also points to the importance of complete coverage by these surveys, particularly as regards offshore financial centres. The presenter of the paper may want to elaborate on the current coverage of these surveys and on the IMF's plans, if any, to use its leverage to further increase coverage.

In addition, in view of the usefulness of the CPIS for national compilers across the globe, it may be desirable to investigate the feasibility of increasing its timeliness and frequency, as well as its coverage of securitisation, private equity and hedge funds.

Another laudable effort reported upon in the paper concerns the Joint External Debt Hub, in which various international organisations bring together the data that they each compile on external debt and provide for joint external dissemination of these data. The authors underline the importance of data consistency, which they define as data compiled according to common guidelines, ie the 1993 SNA. Needless to say, however, this is a necessary – but by no means sufficient – condition for data consistency. In that regard, it would be interesting if the presenter could inform us about the results of a recent IMF initiative in which external debt and international investment position (IIP) statistics were compared, and in which reporting countries were asked to reconcile major differences. All countries across the globe have a responsibility to compile timely, consistent and comprehensive external statistics, and this effort is illustrated in the final paper that I will discuss, concerning external statistics for India.

5. Agam Prakash Gaur: "Trends in portfolio investment statistics – India"

India constitutes a prominent example of an emerging economy that is changing from a passive recipient of investment to an active player in the world economy, and the statistics of such emerging economies should be developed in accordance with their increasing global role.

This paper presents several external statistics collected and compiled by the Reserve Bank of India and effectively illustrates some recent progress in this field, including the compilation of quarterly IIP statistics. The participation of India and other emerging economies in global initiatives coordinated by international organisations, such as the CPIS and the CDIS, is very welcome and will certainly contribute to the common goal of better understanding the world's cross-border portfolio and direct investment flows and positions.

Although the data already contain some useful breakdowns, the author may want to explain whether there are any plans in India for a full sectoral breakdown of the external statistics, which, ideally, should then be embedded in a quarterly financial accounts framework. Another issue concerns the timeliness of the statistics, since there is still a two-quarter time lag for quarterly statistics.

Interestingly, the author reports that substantial investment takes place through special purpose vehicles set up abroad for this purpose, again underlining the importance of worldwide initiatives to collect the appropriate data, including data from offshore financial centres.

6. General issues for discussion

In addition to the various pertinent issues raised by the papers discussed above, it may be useful to reflect upon the recent events in the global financial markets, which have clearly demonstrated that the current size and dispersion of financial interrelationships can lead to rapid worldwide impact from an event that previously would, at most, have been a national phenomenon, namely the sub-prime mortgage loan crisis in the United States. The extent and nature of the interdependencies had not become apparent from current cross-border portfolio investment statistics. Indeed, in this case even the immediately involved market participants struggled to obtain all of the relevant micro information.

A first tentative conclusion could be that high-frequency, timely, comprehensive statistics on securitisation and on special purpose vehicles are a high priority. Second, there appears to be an urgent need for more transparent data on hedge funds and private equity. Third, the feasibility of collecting more complete, very high-frequency statistics on short-term paper issues (and holdings, if possible), by original and remaining maturity, could be investigated. Fourth, the conceptual and practical issues of better statistical coverage of risk transfers, as embedded in new financial derivative instruments, deserve further reflection in international fora. The value of the statistics would be considerably enhanced if a worldwide coverage of "reporting havens", including off-shore financial centres, could be attained, without creating a disproportionate burden on respondents.

One final conclusion that may already be drawn at this stage is that all of these requirements point in the direction of further enhanced international cooperation among statistics compilers.

Special Topics Contributed Paper Meeting 28 with International Association for Official Statistics

Statistics dissemination public service

Chair: João Cadete de Matos, Bank of Portugal

Papers:

Reaching statistics users in Austria
Aurel Schubert, Austrian National Bank

Thirty years of experience in database management: the BIS Data Bank
Christian Dembiermont, Bank for International Settlements

The ECB Statistical Data Warehouse: improving data accessibility for all users
Gérard Salou, European Central Bank

High-quality statistical dissemination: a strategic goal at the Banco de Portugal
José Faustino, Bank of Portugal

Institutional arrangements for producing macroeconomic statistics in countries subscribing to the Special Data Dissemination Standard (SDDS)
Claudia Dziobek and Florina Tanase, International Monetary Fund

The challenge of disseminating European statistics: the Eurostat experience
Pedro Díaz Muñoz, European Commission

Statistical data dissemination in the Czech National Bank
Petr Vojtisek and Martin Kacer, Czech National Bank

Discussants: Tendani Mantshimuli, Reserve Bank of New Zealand
Rochelle Barrow, Reserve Bank of New Zealand

Chairman summary of session STCPM28: Statistics dissemination public service

João Cadete de Matos[1]

High quality statistics are not only a major tool for all economic and social activities; they are also instrumental in supporting private and public policy decision-making, while increasing decision-making transparency. No effort to produce high quality statistics can be complete without a high quality statistical dissemination system.

In this session, the experiences of both individual countries and international organisations were presented. Dissemination is a core function of official statistics agencies.

All of the presentations made it clear that dissemination of statistics must be carried out in a modern, customer-focused way, taking full advantage of modern, electronic means of dissemination through different media. Modern dissemination systems include: (i) standard data selection tools (filtering, full text or a selection of indicators); (ii) time series displayed in various formats, including charts; and (iii) flexibility for incorporating tables organised according to users' needs, taking due account of the need for the confidentiality of data. User interfaces should be designed to make data easily accessible.

The dissemination of statistical data faces future challenges, such as: (i) providing immediate availability; (ii) meeting the demand for more detailed explanations of data; (iii) dealing with competition from private statistical data providers; (iv) providing access to very large databases; and (v) meeting diverse user needs. Future statistical dissemination systems will also include efficient access for two important categories of users: those interested only in the main statistics, and frequent or expert users.

High quality statistical dissemination systems also maintain comprehensive metadata for all statistics, including detailed information on the concepts, methodology and procedures used.

This session confirmed that statistics in general, and those produced by central banks in particular, are a public good. The cost of producing statistics is borne by taxpayers, and most of the reporting burden falls on banks, businesses and individuals. It is the responsibility and the duty of central banks to make the results accessible to interested users in modern and user-friendly ways. It is also, however, a unique opportunity for central banks to make their value and relevance evident to the public, given that the wealth of central bank statistics represents an enormous asset.

[1] Banco de Portugal.

Reaching statistics users in Austria

Aurel Schubert[1]

Statistics in general, and those produced by central banks in particular, are a public good.[2] Their production is paid for by the taxpayers, with most of the reporting burden falling on banks, businesses and individuals. It is the responsibility and duty of the central banks to make the results accessible to interested users in modern and easy-to-use form. But it is also a unique opportunity for the central banks to demonstrate their value and relevance to the public. The wealth of central bank statistics is an enormous asset.

The Oesterreichische Nationalbank (OeNB), Austria's central bank, views itself, in the area of statistics, as the Austrian Competence Centre for Financial Statistics. As such, its task is not only to produce financial statistics mandated by different national, European or international legal commitments, but also to disseminate the data to different user groups and interested parties. In this regard, the Bank's function relates specifically to monetary statistics, all data concerning banking supervision, interest rate statistics, financial accounts, balance of payments and international investment position, investment fund statistics, and payment system statistics.[3]

The mission statement of the Statistics Section of the OeNB

The OeNB – The Competence Centre for Financial Statistics

Compiling financial statistics is a core task of the Oesterreichische Nationalbank. The OeNB is committed to providing a broad range of current statistics in user-friendly formats to the public, and has established a statistics hotline to deal with statistical inquiries. Given that the OeNB is involved in developing and compiling statistics in accordance with national, European and international standards and rules regarding methodology, consistency and timeliness, it is well equipped to ensure that data are of consistently high quality.

For dissemination of statistics, central banks need to use modern methods and channels, and must be customer oriented, taking advantage of the most up-to-date – especially electronic – means of dissemination. However, different user groups have different data needs and different levels of technical and statistical knowledge. Thus, there needs to be a

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[2] The views expressed in this article are the personal views of the author and are not necessarily the views of the OeNB.

[3] The credit register and the balance sheet office are not part of the statistics function of the OeNB.

mix of various media, so as to reach as many people as possible. Central banks also have to address their respective user groups appropriately, avoiding unnecessarily technical language.

What are the main groups using central bank statistics in Austria, besides policy makers involved in monetary and financial stability policy? From the different customer surveys, we know that bank/financial analysts and researchers are intensive users of our data services. Journalists are also important, as they are the main channel for transmitting information to the general public. In addition, businesses – especially lawyers and notaries – have a professional interest in financial data. University professors and students also constitute a large user group. In short, this is a heterogeneous population with highly diverse data needs.

Therefore, the Oesterreichische Nationalbank uses a wide variety of different distribution channels to get the information to the different user groups. The OeNB website serves as the main channel. On the homepage, the Statistics and Reporting domain (English version) contains the following items:[4]

- Statistics and Reporting
- Statistical Publications
- Statistical Data
- Release Calendar
- Economic Indicators according to SDDS
- Standards and Codes

A particular challenge is determining how to organise the data presented on the homepage so that the different user groups can find what they need. The wealth of data supplied on the OeNB homepage – which also contains data not produced by the OeNB but used intensively for its policy purposes – is organised in ten boxes:

OeNB, Eurosystem and Monetary Indicators
Interest Rates and Exchange Rates
Financial Institutions
Securities
Means of Payment and Payment Systems
Prices, Competitiveness
Economic and Industry Indicators
Financial Accounts
External Sector
International Comparisons

In order to allow for customer queries, we have installed a capability for dynamic queries. In this way, users can build their own tables, mixing different available time series. The strong demand for data is highlighted by the fact that around 40% of the page views on the OeNB homepage are in the Statistics and Reporting domain, and this percentage is increasing.

[4] The German language version contains more subdomains.

Customer surveys have shown that despite the very extensive supply of data on the internet, there is still a demand for print publications. We try to cater for this demand with a quarterly publication that also contains – along with short explanatory articles and longer studies on data developments – data organised in the same ten boxes used on the internet site, though covering only the most recent time periods. The print publication is also available on the internet and can be downloaded. Until about three years ago, we had an integrated publication that contained statistical tables together with economic articles and research studies. After conducting user surveys, we decided that the target groups were quite diverse and that two separate publications, one economics/research oriented and one statistical, would better serve our respective user groups.

A statistics hotline is available for any queries from the public. A very special role in the OeNB's statistical dissemination policy is assigned to the relationship with the media – the main transmitter of information to the general public. More than 40 statistical press releases and some six statistical press conferences per year attempt to service the needs of journalists. The extensive media coverage – from TV and radio to newspapers and journals – shows that we are succeeding in reaching a large portion of the population with statistical information. Speeches, special presentations and seminars to selected groups round out our statistical information services. In order to widen our user base to "non-traditional users", we started a special internet service – "Die aktuelle Zahl" – several years ago. Twice a month, in this forum, we highlight one figure from our data supply and explain it in simple language. This service is not only placed on our website, but is also automatically distributed to subscribers.

Topics of statistical press conferences of the OeNB
Banking and interest rate developments
Balance of payments
Financial accounts
Foreign direct investment
Savings behaviour of Austrian households
International investment position

In order to reach as many users as possible, the statistics department of the OeNB cooperates with several institutions on a regular basis. Among these are the Vienna Stock Exchange, the Austrian Chamber of Commerce, a banking journal and an industry journal, as well as universities.

We are constantly evaluating new initiatives in the area of statistical dissemination. Two such planned initiatives are targeted feedback to reporters, and the contribution our statistical activities make to financial literacy. Reporting agents are a very important and interesting group for statistical data dissemination. They supply the micro data for the statistics and thus feel the reporting burden – and often complain about it. One promising way to reduce the "subjective reporting burden" might be to supply relevant, well targeted feedback information to the different groups of reporters. While this feedback is already well established for the banking sector, more can and will be done for non-financial companies, especially in the area of balance of payments information. As national pensions systems increasingly require private initiatives to fill the "pension gap", the issue of financial literacy and capacity on the part of the general public becomes more important. Basic statistical literacy and the supply of relevant data are important features of such a financial literacy initiative.

One important aspect – besides the quality of the data – is the timeliness of their distribution. As soon as the data are fit for dissemination, they should be placed at the disposal of the

general public, rather than being restricted to internal users in the respective central banks. They are, after all, a de facto public good provided by a public monopoly. Thus, internal analysts represent just one of many user groups, and should not have privileged, ie early, access to the (aggregated) data.

The general usefulness of central bank statistics makes them a very valuable asset not only for policy makers, but also for the public at large. William Poole, the President of the Federal Reserve Bank of St. Louis, summarised it perfectly when he stated recently:

> *Of all things on which we spend money in the Federal Reserve, surely the return on our data services is among the highest.*

This applies to most central banks around the world, whether they have realised it yet or not. Let's open our statistical treasure chests as wide as possible!

Thirty years of experience in database management: the BIS Data Bank[1]

Christian Dembiermont[2]

The dream of every policymaker, economic analyst or statistician is to have access to comprehensive, high-quality, well-documented and timely data. In the early 1970s, the Bank for International Settlements (BIS) and its major member central banks recognised the benefit of working together to share statistical data through a common platform, and established a common database known as the BIS Data Bank. This note focuses on the objectives of the BIS Data Bank and its development over time, describing its main characteristics and operational challenges, then outlining potential future developments.

Background of the BIS Data Bank

Established in 1930, the BIS is the world's oldest international financial organisation. It fosters international monetary and financial cooperation and serves as a bank for central banks. It acts as a forum to promote discussion and policy analysis among central banks and within the international financial community. The BIS is a centre for economic and monetary research, and serves as a prime counterparty for central banks in their financial transactions.

One way in which the BIS has fulfilled its mandate is by regularly organising meetings for central bank governors and other senior central bank officials. Preparing these meetings has always required the collection of a substantial amount of data from the participating central banks. The fact that BIS meetings depended on extensive international comparisons made the need for a database even greater. Central banks, for their part, were interested in data on the economies of their partners in order to conduct their own analysis of international economic and financial developments. Central banks therefore agreed to share their national data with each other through a common platform to be operated by the BIS. Economies of scale were expected, as the need for expensive bilateral data exchanges would be reduced. For the BIS itself, the Data Bank was a natural public service to its shareholders as well as a tool to facilitate its own work.

The BIS Data Bank is probably one of the oldest databases in the central banking community. The decision to set up a consolidated Data Bank of macroeconomic data was taken by the governors attending the BIS Board meeting in March 1975. At that time, many of the experts' meetings held at the BIS had their origins in the Group of Ten (G-10) initiative in the 1960s. Not surprisingly, the first countries covered by the BIS Data Bank belonged to this group of ten wealthy industrial nations.

Central banks requested that the data used for the meetings of BIS Governors follow nationally defined methodologies. To accommodate this requirement, a model of decentralised data reporting was selected, in which each central bank reports its own

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[1] The views expressed in this article are those of the author and do not necessarily reflect the views of the BIS. The author is very grateful to Madeleine Op't Hof, Paul Van den Bergh and Kerry Wood for their comments.

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national data. Confidentiality requirements for certain statistical information also had to be taken into account (for some unpublished series, as well as for data made available prior to official release). Therefore, central banks decided to limit access to their common database to the central bank community. Accordingly, the objective of the BIS Data Bank is to provide a common database that is updated and controlled by the central bank community. This goal is still relevant today, despite the presence of competitive private databases.

Coverage

Currently, 41 central banks associated with the world's main economies report macroeconomic data to the BIS Data Bank. The selection of series to be reported is based on the principle of "representative series". Thus, central banks report those series used by their economists in analysing their national economies.

Over time, several additional data sets have been added to the macroeconomic data set in the BIS Data Bank. In the 1970s, the BIS international financial statistics were the second set of statistics to be developed in response to the information requirements of the various G-10 committees located in Basel. The set comprises international banking statistics, international and domestic debt securities statistics, and foreign exchange and derivatives statistics. From the outset, the G-10 committees had aimed to reach out to the financial and academic world, and to improve the dissemination of financial information outside the central bank community. Therefore, a substantial part of the BIS international financial statistics data set is publicly available on the BIS website. However, unpublished bilateral positions are available only to central banks through the BIS Data Bank. Recently, the payment and settlement systems data set became the third group of series to enrich the BIS Data Bank. Since 1980, these series have been collected by the Basel-based Committee on Payment and Settlement Systems and published in its so-called Red Book. This information is now available and downloadable at the BIS Data Bank.

Characteristics

Participation in the BIS Data Bank has always been voluntary. At its inception, the organisational agreements between the 11 participating central banks were rather informal. One founding rule was the reciprocity principle: a central bank that made its national statistics available to users via the BIS Data Bank received in return access to the information reported by the other participants. Each member was, and still is, free to withdraw from the Data Bank, and no legal arrangement made reporting to the Data Bank mandatory. Participants were expected to organise regular and timely reporting of time series on a best efforts basis. They set up a Data Bank Experts group to oversee the governance aspects of the Data Bank. This group meets regularly to decide on future developments as related to content and technical organisation.

Due to the broadening of country coverage, the need for a more formal agreement increased, though the basic principles upon which the BIS Data Bank had been built remained unchanged. This led, in 2005, to the adoption of a BIS Data Bank Policy by all members. The policy set forth clearly the common understandings and obligations of all parties involved in the Data Bank.

Given that the objective of the BIS Data Bank is to provide central bank users with high-quality statistics, its coverage is naturally driven by users' needs, under the supervision of the Data Bank Experts group. In an ever-changing world economy, the macroeconomic variables that economists use to analyse a country's conjunctural profile vary over time. Therefore, the

content of the Data Bank is constantly evolving. Data Bank users are encouraged to request any macroeconomic data needed for their analyses but not yet included in the Data Bank, as well as additional methodological information on existing series.

The BIS Data Bank benefits from having a consistent code structure in its macroeconomic data set. This enables users to navigate easily across the database in order to find the information they are seeking. Since the code structure is flexible, new series can be added individually to the BIS Data Bank. This feature gives it a strong advantage over other databases, which usually cover a pre-defined set of indicators and cannot easily be extended on a series-by-series basis. The flexible coding structure is also used to identify discrepancies in the definitions countries employ. Although several methodological manuals have been issued by international institutions in recent years, numerous statistical topics do not yet have the benefit of standardised definitions. Therefore, the BIS Data Bank provides its users the nationally defined series, and underlines methodological discrepancies through differences in the series codes.

Another interesting feature of the BIS Data Bank's macroeconomic data set is the fact that it includes a broad range of frequencies – from annual to daily. International public databases generally do not include daily or weekly frequencies. The numerous daily data transmissions to the BIS Data Bank allow smooth reporting of daily series. Participants consider it good practice to report these within 24 hours.

Challenges

Since its creation, the BIS Data Bank has faced various challenges.

Data reliability

Given the fact that 41 countries report high-frequency data to the BIS Data Bank, there is a high probability of storing inaccurate data. Continuously verifying the accuracy of data is a prerequisite for a clean database. The BIS Data Bank already benefits from the intensive checks that central banks perform on their own high-quality databases, but additional checks are performed when data are received at the BIS. The BIS Data Bank has a unique quality control feature in its Updates/Revisions (U/R) file. This is an enormous historical file that records all the vintages of each observation. The new and revised observations received during the preceding day and identified in the U/R file are validated automatically on a nightly basis.

Statistical time series are continuously being revised. In order to measure the historical impact of an economic variable on policy decisions, economists look for the vintage value of this variable at the particular point in time when the policy decision was taken. This information (real-time data) can be retrieved from the U/R file, but is not disseminated online.

Timeliness

The timeliness of updates is often the main criterion that determines users' preference for a specific database. In the case of the BIS Data Bank, updates for macroeconomic series are loaded only a few minutes after they have been received from central banks. The period between the time the data are received from central banks and the time that reported series are available to users through the end-user application is therefore minimised.

It is also important to minimise the time lapse on the side of the reporting central banks. To assist central banks in timely reporting of series, the BIS provides them with fortnightly timeliness reports. Each central bank's report contains a list of the series that should have

been updated, but for which updates were not received. It also lists the series for which updates are expected within the next month. This timeliness report is based on the series reporting calendars provided by the central banks. If the calendar is unavailable, the timeliness report is based on past reporting performance.

Motivation of reporting entities

Given that participation is voluntary, the BIS Data Bank needs to remain attractive for participating central banks. In the case of international banking statistics, central banks are very interested in becoming reporting entities, as this gives them the right to access the individual claims and liabilities data of 40 reporting countries (out of a total of 200 countries). This data set is a unique source of information that is highly useful for the compilation of external sector statistics. In contrast to the international banking statistics, the macroeconomic data set does not enjoy a monopoly position. In addition to the public databases maintained by other international institutions, numerous private commercial databases also provide economists with macroeconomic data that are helpful in analysing current developments in national economies. For the macroeconomic data set to be competitive with the other databases, it has to offer other advantages, such as coverage that can be extended on demand, and the above-mentioned emphasis on national characteristics. It also has to be on a par with private databases in terms of timely updating.

As mentioned above, serious efforts are being made to speed up the reporting process. However, the best way to differentiate the BIS Data Bank from other databases is by effectively motivating those responsible for reporting within participating central banks. The faster they increase the Data Bank's coverage in response to user requests, and the more extensively they address methodological questions, the more attractive the Data Bank becomes. Challenges may arise from the fact that the individuals doing the reporting are usually central bank statisticians working on national data, while users are central bank economists concerned with international data. Moreover, the users and those responsible for reporting do not work at the same central banks. The role of the BIS is to bridge this gap between users and those reporting the data, and to make the reporting network aware of the importance of its role in this exercise in international cooperation.

The viability of a "one-stop data shop" in the internet era

With the proliferation of websites that provide increasing volumes of data free of charge, a central hub with the type of data currently stored in the BIS Data Bank might appear an anachronistic vestige of a time when the internet was but a theoretical concept. Several international institutions associated with the Statistical Data and Metadata Exchange (SDMX) initiative are currently promoting a new model of data dissemination, known as the "pull" model. In this model, the data provider makes the data available via the internet, eg by placing a data file in SDMX-ML format on a website, from which the data collector then retrieves the data he/she needs without storing any data either in his/her own database or in a central hub. The pull model would replace the traditional push model in which the data provider actively sends data to the data-collecting party. The pull model appears very promising, but several factors may still justify the existence of a central hub based on the push model. First, the technology is not yet reliable enough to allow automatic downloading of series across several websites without interruption. Secondly, a definitive classification of internationally homogeneous statistical domains is not yet in place, and a central hub is still needed to organise national data that have been compiled under differing national definitions. Moreover, not all data can be made available on a public website. Some series are confidential, and some confidential metadata might be associated with public data.

Consequently, a "one-stop data shop" providing a local copy of data reported by different countries will remain a viable model for several years to come. The attractiveness of the

central hub is enhanced by a homogeneous code structure for different countries, centralised timeliness and data quality control, and the utility of the BIS Data Bank's help desk function.

Future of the BIS Data Bank

The BIS Data Bank has always aimed to offer users as much historical information as possible. Discontinued time series – ie historical time series that are no longer updated – are maintained in the BIS Data Bank and are available to all users, though only under special codes. The construction of "long series" by linking discontinued series with current series is left to users' discretion. Some users, however, no longer favour this approach, since they increasingly need "ready-made" long series to save work time. In response to this new demand, the BIS Data Bank will gradually be adding long series to the traditional discontinued series.

From a technical perspective, the pull model clearly represents an interesting solution and will be explored further by BIS Data Bank staff. Once internationally defined statistical domains are in place, SDMX technology will offer an opportunity to reduce overlapping storage of data in different institutions.

Conclusion

Over more than 30 years, the BIS Data Bank has provided statistical support to the central bank meetings held at the BIS under the original cooperative model. The objective of providing a central hub of data, updated and controlled by the central banks, remains relevant. Its content has been adjusted to reflect the Bank's move to a more global reach, an increased focus on financial and systemic risks, and the changing needs of users. Technical developments have also been substantial, and the potential move to a decentralised model is certainly the next challenge to be faced.

The ECB Statistical Data Warehouse: improving data accessibility for all users

Gérard Salou[1]

Introduction

The Directorate General Statistics of the European Central Bank (ECB) is responsible for the efficient delivery of statistics needed for the ECB's monetary policy and for the other functions of the Bank, the Eurosystem and the European System of Central Banks (ESCB). In addition, it is responsible for providing statistics to the interested public and to market participants.

In September 2006, the ECB released the initial version of its new online data delivery service via the internet, the ECB Statistical Data Warehouse (SDW). The SDW is designed to address a wide range of euro area statistics users, from one-time visitors searching for the most recent value of a specific statistic or single time series, to more frequent users such as market participants, journalists, analysts and researchers. It features robust and simple-to-use interfaces that provide access to numerous features and functions, designed to make data accessible to users regardless of their knowledge of IT systems or the intricacies of statistics.

The result has been to improve service to all European citizens and members of the world community interested in euro area statistics, while increasing the transparency of the data behind ECB monetary policy decisions. Some 20,000 public users per month access the new SDW internet portal. This compares with only slightly over 200 users weekly for the ECB's previous data tools.

This paper begins with a description of the SDW's content and an explanation of the data and metadata model. It goes on to discuss the main features of the internet portal, focusing on their objectives with relation to the different categories of users they are intended to serve. Finally, information on future development is provided.

Data content

The SDW contains all euro area economic, financial and monetary statistics published by the ECB and Eurostat relevant to monetary policy. In particular, the SDW provides all euro area statistics published in ECB statistical publications, national contributions to euro area statistics calculated by the ECB and published jointly as part of the Eurosystem joint dissemination framework, and access to euro area national statistics or other national statistics published in ECB publications.

In principle, ECB data are available on the SDW at their official, pre-announced release time. In practice, there may be a few minutes' delay for Eurostat data, due to the transfer time between Eurostat and the ECB.

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The full history of revisions is available only internally at the ECB's SDW, though it will be made available to the public in the course of 2007.[2]

Data and metadata model

Metadata consist of information regarding data that users and computers require to locate, retrieve, process, understand, present and analyse data. For statistical data as well as for metadata, the ECB uses the SDMX[3] standard data model. In IT terms, and in terms of data, the SDMX standard is similar to a "star schema". In that model, datasets are organised in hypercubes (or "data cubes"). The dimensions of the different data cubes can be shared across datasets to make it possible to relate data across datasets.

The SDW organises and stores metadata using the following model and terminology:

- *Metadata types* are classified according to an extension of the IMF Data Quality Assessment Framework (DQAF) metadata classification. Additional metadata types are required for some ECB internal processes (eg publication);
- *Metadata elements* are the values that metadata assume, eg a string "excluding shares";
- *Metadata item*: a combination of a type and an element;
- *Metadata*: a combination of a metadata item and any specific part of a data cube (data and metadata item combined).

This model prevents redundancy of "metadata elements" which need to be present in the database only once, labelled with a type and attached to data, when necessary. Also, the model, based on its construction, makes it possible to attach "metadata items" to any level and part of the data structure, eg to an entire dataset, to a particular dimension or to any combination of dimensions, down to the finest granularity, the data point. This data and metadata model provides secure storage of all types of statistical data and metadata that users of ECB statistics need for reporting and analysis.

Technology

The SDW is built by incorporating this data and metadata model in an Oracle database. The system allows the SDW to be fed automatically by statistics-generating systems. Procedures allow easy inclusion of new statistical datasets and new types of metadata when required. The system also provides for timely data delivery and standardised update histories.

Internet users can interact with the Oracle database through a browser. The interface is equipped for use by different browsers and operating systems.

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2 Real Time Data Base.

3 See http://www.sdmx.org.

Types of users

The SDW is designed to address a wide range of users of euro area statistics, from one-time visitors searching for the most recent value of a specific statistic or single data-series, to more frequent users such as market participants, journalists, analysts and researchers.

The user interface has been devised to facilitate access regardless of users' knowledge of euro area statistics, their level of patience with database navigation, and their knowledge of IT tools generally available on the internet for exploring databases.

The SDW has been developed in close collaboration with users, while the ECB internal version was developed with ongoing feedback from a representative user group. For the external version, two different usability tests have been conducted with users representative of relevant professions. These tests have made it possible to significantly simplify the user interface.

Features, by level of expertise

Users searching for euro area data on the internet and unaware of the SDW and ECB websites

For these users, we have designed the SDW so that all its html pages have a URL and, consequently, can be indexed by internet search engines. Searching for "euro area data" and including the economic category of interest generally returns the relevant pages of the SDW in the first page of search engine results, provided that the category being searched appears in the SDW. Users generally enter the SDW at the statistical publications page or at the Quick View, because rich text descriptions lead to those pages.

Users looking for statistics on the ECB web site who are not familiar with the SDW

These users will come across links to the SDW in many places in the Statistics section of the ECB website, in particular on the "key euro area indicators" page, which is constructed automatically from the SDW and includes links to all time series contained on the page.

Users looking for key euro area statistics who are unable or unwilling to navigate the database

The SDW homepage contains an interactive table and chart covering the most frequently requested euro area statistics. Clicking on the radio buttons updates the graph, and clicking on the figures displays a page with the corresponding complete time series, a graph, and the most important metadata associated with that time series. This page is referred to as the Quick View. Each time series contained in the SDW has a Quick View page with a unique URL. The Quick View metadata material includes references to the precise positions of the corresponding time series in the ECB publications in which they appear, along with a one-click link to the appropriate page of the relevant electronic publication. A number of basic transformations can be performed from the Quick View window (eg growth rates and frequency conversions).

Users able and willing to navigate a database

These users may want to navigate hierarchically by economic categories. They will be able to navigate to and select any data contained in the SDW. Time series selected are always accompanied by a reference to the publications in which they appear, so that users can see the context of each series and relate what they select to what has been published. After making the selection, users can view data in tables and charts, perform basic processes, view the metadata and export data to Excel, CSV, SDMX-ML, Excel Pivot tables or PDF formats.

Users familiar with ECB publications or looking for references to publications

ECB statistical publications (Euro Area Statistics Section of the Monthly Bulletin and the Statistics Pocket Book) can be accessed within the SDW. Users can see either updated PDF pages of each publication or the corresponding selections from the database, ready for processing or download.

Users familiar with IT systems but not with statistical classifications or publications

These users may want to use the SDW's search engine, which searches most metadata and returns time series. The algorithm uses a thesaurus, detects typographical errors and suggests alternatives to help users with statistical jargon. Search results are ranked by relevance. For the most part, the relevance of a time series is determined by the number of times it appears in publications.

Frequent and expert users of the SDW

These users may very well use all of the above, in addition to the data basket function, which they can use to customise their access to data and create and store their preferred data groups.

Usage statistics

The number of distinct users accessing the SDW since its launch in September 2006 has increased from 10,000 per month in September 2006 to approximately 20,000 in March 2007. This represents 100 times higher use than occurred with the previous version of the ECB online data service. The most frequently accessed pages are the Quick View pages accessible from the home page. Feedback from various categories of users has been quite positive. The significant increase in the number of users of euro area statistics has also led to a moderate increase in the number of questions related to data content. By contrast, users ask very few questions on the system's functionality.

Next steps

The next steps envisaged are to further enhance access for two important categories of users: those interested only in the main statistics, and frequent and expert users.

For occasional users, the Quick View and the home page will be improved to include greater functionality in the interactive graphs, so as to provide for more detailed analysis of the underlying data.

For frequent and expert users, the intention is to provide direct connectivity to the SDW from analytical applications using web service technologies.

High-quality statistical dissemination: a strategic goal at the Banco de Portugal

José Faustino[1]

1. Introduction

In recent years, there has been an increase in the number of data requests received at the Banco de Portugal, as well as in the detail and complexity requested by the most frequent and expert users, including international organisations.

This new reality is very much welcomed, but it is also highly demanding. While it is good to know that people are paying attention to the data, at times the data are not being used in the most appropriate ways. All of the effort invested in producing high-quality statistics may be completely wasted, for example, when a newspaper presents the statistics with an incorrect analysis of the figures.

Those who produce statistics play a fundamental role in promoting their use and, particularly, in ensuring that people understand and make the most appropriate and meaningful use of the information.

With the release of a completely new statistical dissemination system, BPstat – Statistics online (http://apl1.bportugal.pt/estatisticasweb//Default.aspx?Lang=en-GB), on 19 January 2006, the Banco de Portugal confirmed that high-quality statistical dissemination is one of its strategic goals.

The rest of the paper is structured as follows. The second section aims at presenting the rationale behind developing a powerful statistical dissemination system. The third describes the data, metadata and functionalities available in the BPstat – Statistics online system. The fourth section focuses on the main components of BPstat – Statistics online. The fifth deals with the importance of disclosing all statistical data to the public. The sixth section is focuses on the inclusion of comprehensive metadata in a statistical dissemination system. The seventh, and last, section presents conclusions and the three main near-term goals for BPstat – Statistics online.

2. High-quality statistics – the main component

The Statistics Department of the Banco de Portugal has, from its inception, been closely involved in producing high-quality statistics. The reporting systems have been designed and implemented in cooperation with data reporters. Most collection systems are based on very elementary data, which reduces the burden on data reporters and allows total flexibility and the adoption of extensive quality control systems, which are a fundamental element in assessing and improving the quality of the statistics.

These collection systems made it possible to build databases with enormous volumes of data, which are a powerful instrument for statistical analysis. Having all of this valuable

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information and not disclosing it to the public was a less than ideal situation, particularly in view of the increasing number of statistical data requests that have to be analysed and, when approved, answered. Some progress was made with the addition of more tables to the Monthly Statistical Bulletin, but this is not the most appropriate solution when the objective is to significantly increase the volume of information. Instead of the pre-formatted tables, a flexible form of access to data is more appealing to users.

It was essential to adopt a new statistical dissemination policy designed to create a comprehensive and transparent environment in which all non-confidential data and metadata would be available to all users. However, several barriers must be overcome to achieve this. Besides the technical, financial and operational issues, there are other difficulties involved in having open and comprehensive statistical dissemination systems. First, due to a lack of human resources, it is important to implement sophisticated quality control systems when considering the disclosure of high-quality, detailed statistical information. Second, traditional time-series structures would have to be replaced or complemented by multidimensional structures.

In this sophisticated new environment, there are dozens of tasks to be organised, managed and planned. The level of commitment, motivation and technical skills of the system's support staff are the main components needed to assure success.

3. Making data, metadata and functionalities easily available

BPstat – Statistics online is the outcome of a significant investment that the Banco de Portugal has made to provide a statistical dissemination service on the internet. Its main purpose is to provide quick and easy access to the statistics compiled by the Banco de Portugal, as well as to the statistics and economic indicators published by other institutions.

This new statistical dissemination system is completely free. Registration is not mandatory but is recommended for users to benefit from all of the services. The system permits user-friendly navigation through the statistical information and offers several functionalities and services, namely:

- Easy access to timely data (on time-series or multidimensional analysis) and metadata; information updates at least three times a day; and all relevant statistics available (inflation, monetary and financial statistics, as well as statistics on non-monetary financial institutions, balance of payments, international investment positions, public finance, financial accounts, foreign exchange rates, payment systems, banking systems, the Eurosystem, etc), in addition to micro statistics and macro indicators;
- Predefined analysis for quicker access to the main indicators; creation of favourites; a table design facility (static or dynamic analysis, automatically updated when new information becomes available) to suit users' needs, allowing data from different business areas to be included in the same analysis;
- Access to metadata, presented in a clear, logical and standardised manner, including a data publication calendar, a comprehensive glossary, a news service providing information on the most relevant events, and the ability to subscribe to the alerts service that allows users to receive advance information on the publication of new statistical data related to the various domains;
- Fully bilingual information (all information is available in Portuguese and English and deployed simultaneously in both languages); search facilities; graphic capacities; print and export functionalities compatible with major formats (for both data and metadata);

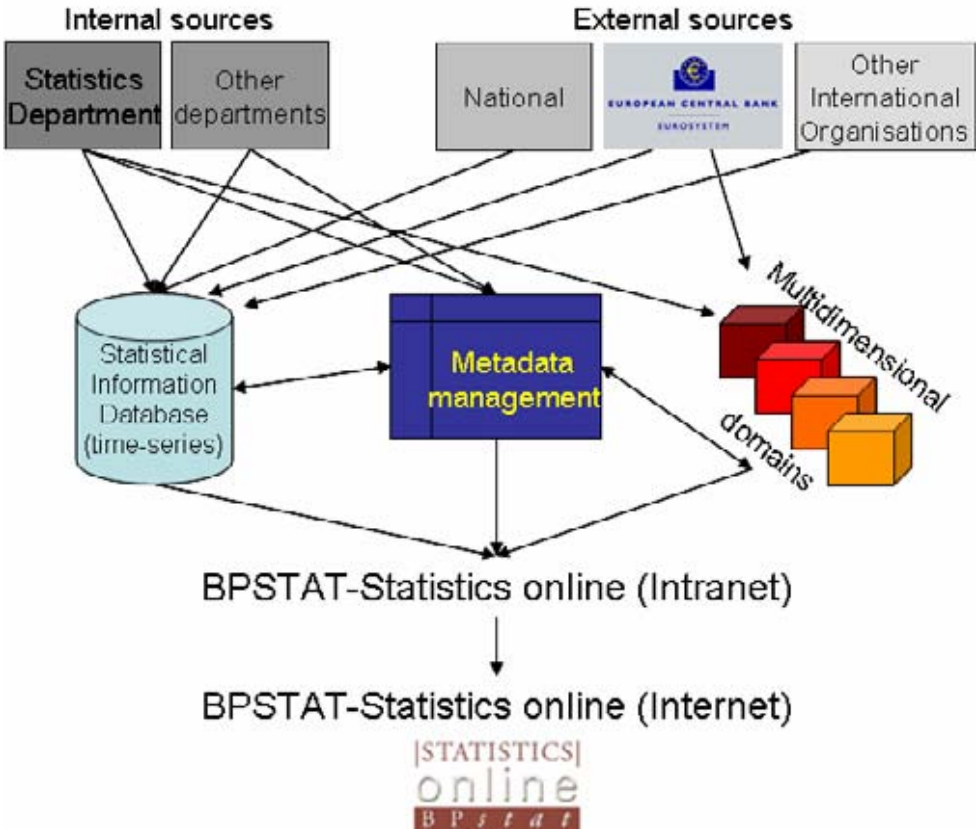
- Help online and through a hot-line during business hours, via various channels – mainly e-mail and telephone; close contact with main users; ongoing investment in recovering historical information and in assessing the quality of the disseminated data; and a record of all instances in which data was accessed and the functionalities used, in order to better understand the demands on the system and how it is being used.

4. Integrated statistical components

Underlying the Banco de Portugal's statistical web service are five integrated and interconnected components. First is a repository of time-series statistics (Statistics Information Database) that includes not only the main statistics produced in-house by all statistical work units, but also those from other institutions that produce statistics. Second, for multidimensional analysis, the cubes are linked to the databases in the statistical production systems, allowing a full and quick "refresh" of data. Third is a metadata management system linked to the automatic update system that refreshes the data and metadata on the intranet. Fourth is the BPstat intranet system, which receives the data and metadata from the three components and performs the final validations. Fifth, after verifying that there are no errors or inconsistencies, data and metadata are copied into the internet version.

Figure 1

The main components of BPstat – Statistics online



Needless to say, the success of a web system depends very much on its performance: the server and communication channels must be prepared to deal with many simultaneous visitors. However, there are associated costs, and it is essential to monitor the system continuously, so as to keep it fully operational, and to determine whether improvements can be made within existing budget constraints.

The increasing number of users overloads the system at certain times, eg on the day the monthly data are released (usually the 15th working day of the month, at 11 am). In order to maintain the credibility of the system, every effort must be taken to ensure that users have no problems accessing the statistics.

5. Full availability of statistical data

An important goal is to make available all non-confidential statistical data. This requires a huge effort, since it is necessary to first identify all of the statistics that each business area can produce and then assess whether there are any confidentiality issues.

In developing a multidimensional analysis in BPstat, all of the dimensions and elements were identified and a data model for dissemination created. Subsequently, all of the combinations of the different elements of all of the dimensions were assessed, in order to build a "security model" in which all possible combinations that could be disclosed to the general public were identified. In implementing the model, it was necessary to ensure that all rules were properly applied – a requirement that needs to be tracked on an ongoing basis. Once the work is completed and the data are placed in BPstat, there will no longer be any reason to send data requests to the Banco de Portugal, since all data and metadata will be readily available on the internet.

All statistical data produced by the Banco de Portugal are first disclosed through ***BPstat – Statistics online***, following a pre-announced timetable, and within a narrow timeframe, to allow users access to the data as soon as possible.

6. Comprehensive metadata

Presenting metadata cannot consist simply of adding information at the end, as in an old-fashioned hard-copy report, or of having it available in static files, but must instead be conceived differently. For instance, at each level of a statistical domain, including at the observation level, any relevant information can be presented in the form of notes appearing as pop-ups. As stated above, metadata must be presented in a clear, logical and standardised manner.

In 2005 there was a huge investment in metadata by all work units of the Statistics Department at the Banco de Portugal. In 2004, based on a discussion of the best way to include metadata in the new internet-based statistical dissemination system, two main groups of metadata were defined: (1) *reference metadata*; and (2) *support metadata*.

In terms of *reference metadata*, it was decided to keep the approach adopted for the Statistical Information Database. This level of metadata covers all of the characteristics of the series (in the time-series analysis) and the elements and dimensions (in the multidimensional analysis).

Support metadata includes all other metadata, and can be divided into three sub-groups: (a) *context metadata*, consistent with the Data Quality Assessment Framework (see the Special Data Dissemination Standard on www.imf.org), providing information on each statistical domain, using standardised international methods; (b) *simple metadata*, which

include small amounts of text (less than 256 characters) reusable by several components (series, elements, dimensions); and (c) *open metadata*, the only sub-group which follows no predefined structure and covers documents, pictures, tables, etc, and can be made available in the BPstat system or, in most cases, via a link to the website of the institution that has produced them (in most cases the Banco de Portugal, the ECB and the IMF).

Two necessary elements are: (1) a metadata management application that allows each statistics work unit to access all metadata and to manage its own metadata (and also manage "news", user profiles, access, and logs); and (2) an established procedure to validate new metadata in order to ensure that it is consistent with the defined standards.

7. Conclusions and prospects

While we are confident in the approach we have adopted regarding statistical dissemination, we are also aware of the work that remains to be done.

BPstat – Statistics online takes account of the needs of less skilled, less demanding users, by employing the traditional time-series analysis, while at the same time including the multidimensional analysis which has been very well received among more intensive users of statistics. Our experience shows that most people learn quickly and are no longer looking for predefined tables, preferring instead to construct their own personal statistical dissemination system using the available functionalities.

There is plenty of room for improvement to add value to statistics, help people understand the figures and encourage them to increase their use of statistics.

BPstat – Statistics online has three main goals for the future: (1) to increase coverage (of data and metadata), mainly in the realm of multidimensional analysis; (2) to expand the functionalities, improving accessibility so that users can make use of the data directly or via their own applications; and (3) to contribute significantly to statistical literacy – eg by strengthening contacts with users and by providing more detailed metadata on the concepts, methodology and statistical processes associated with the production and dissemination of statistics.

Institutional arrangements for producing macroeconomic statistics in countries subscribing to the Special Data Dissemination Standard (SDDS)

Claudia Dziobek[1] and Florina Tanase[2]

Introduction

This paper presents the results of a survey of the institutional arrangements for producing official macroeconomic statistics. The survey results cover 41 countries that have well-developed national statistical systems, and that subscribe to the IMF's Special Data Dissemination Standard (SDDS). It demonstrates the popularity of having multiple institutional responsibilities for producing macroeconomic datasets, with national statistical agencies taking the lead role overall. Most data producing agencies work within well-defined legal frameworks – an important basis for the integrity and professional independence of statistical agencies.

1. Survey on institutional arrangements of SDDS subscribers

A survey of SDDS member countries was conducted in November 2006 to shed light on institutional and legal arrangements for producing and disseminating macroeconomic statistics (Dziobek and Tanase, 2008, forthcoming). Most, but not all, of the countries that subscribe to the IMF's SDDS have well-developed national statistical systems. An important objective of the survey was to better understand the division of labour among data producing agencies in advanced economies, in order to provide some benchmarks for countries seeking to join the SDDS. It is widely recognised that clarity of institutional roles and the professional independence of statistical agencies are core ingredients for producing high-quality and impartial statistics (UN Fundamental Principles; IMF Data Quality Assessment Framework). The survey therefore focused on institutional roles and their legal underpinnings, as well as on interagency cooperation agreements in areas of common responsibility. The survey questions distinguished between responsibilities for collection and those for dissemination of data, as these sometimes reside with different agencies. For example, in many countries, the national statistical agency disseminates data on government finance statistics, while the data are produced by another agency, often the finance ministry. This distinction would appear to be important, since such separations require additional collaboration agreements. Some references are made in the Reports on the Observance of Standards and Codes – which are comprehensive assessments of the quality of macroeconomic statistics – to how well the legal and institutional frameworks of SDDS countries are faring. An extension of this study would involve a more systematic analysis of these quality reports, to provide more conclusive evidence about links between institutional structure and performance.

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Some of the survey results confirm information that is publicly available on the IMF's Data Dissemination Standard Bulletin Board (DSBB), where SDDS subscribers provide contact information and agency designations for each of the datasets covered by the standards, although such contact information does not necessarily imply formal legal responsibility. The DSBB is also a valuable resource for further research on this subject, as the detailed metadata on the institutional and legal arrangements now follow the structure of the Data Quality Assessment Framework, which allows cross-country or cross-topic searches according to the various quality indicators.

The survey questions covered national accounts, consumer price statistics, producer price statistics, general government statistics, depository corporations survey, balance of payments and international investment position. Of the 64 SDDS member countries that were requested to participate in the survey, 41 responded. The main findings are summarised below.

2. Institutional arrangements in the majority of SDDS countries

The national statistical office is the main data producing agency for national accounts and price statistics in about 83% of countries, while the central bank is the main agency for producing banking and monetary data (depository corporations survey) in all SDDS countries, as well as data on the international investment position (in about 83% of countries) and balance of payments statistics (in some 78% of countries). For balance of payments statistics, approximately 22% of respondents indicated that the main producing agency is the statistical office. For general government statistics, the institutional arrangements in the SDDS countries are more diverse. In roughly 68% of countries, the main data producing agency for government finance statistics is the ministry of finance, while it is the statistical office in about 24% and the central bank in about 7% of the countries (see Table 1).

Table 1

Agencies producing/disseminating main datasets in SDDS countries

%

Agency	Data sets										
	National accounts	Consumer price statistics		Producer price statistics	General government statistics		Depository corporations survey	Balance of payments		International investment position	
	Producing agency	Producing agency	Disseminating agency	Producing agency	Producing agency	Disseminating agency	Producing agency	Producing agency	Disseminating agency	Producing agency	Disseminating agency
Statistical office	83	93	88	85	24	32	0	22	27	17	22
Central bank	10	2	5	10	7	12	100	78	71	83	76
Min. of Finance	0	0	0	0	68	54	0	0	0	0	0
Other agencies	7	5	7	5	0	2	0	0	2	0	2
Total percentage	100	100	100	100	100	100	100	100	100	100	100

Source: Dziobek and Tanase (2008, forthcoming)

3. Role of the central bank

As noted above, in the “mainstream” model the national statistical agency is the main producer of economic statistics, while the central bank is responsible for a more specialised set of statistics. Central American countries are an exception, since central banks there are producing all or almost all statistics. A further analysis of the performance of these countries was conducted by consulting results of the Reports on the Observance of Standards and Codes. These suggest that the approach followed in Central America is more the result of pragmatic initiatives by central banks than of design. Central banks appear to have taken on the responsibility for producing virtually all macroeconomic data, in order to fill a void and in a context of weak and poorly endowed national statistical agencies. In these countries, the central banks generally lack a clear legal mandate. Nevertheless, this approach has generated tangible success in producing economic statistics, and it may offer some lessons, particularly for small countries.

4. Interagency coordination

The survey suggests that in most of the SDDS countries firm cooperation agreements are in place between statistical offices and other agencies that supply the data required as input. For the compilation of national accounts, the statistical office often notes that there has been cooperation with the ministry of finance (on data pertaining to government operations), as well as with the central bank or other data contributing agencies. Similarly, for external sector statistics, shared responsibility is prevalent, and special cooperation agreements are in place between the national statistical agency, the central bank, and often the ministry of finance or other agencies that compile external debt statistics. Table 1 shows differences between producing and disseminating agencies only for datasets where these differences are noteworthy. (In the case of national accounts, for example, producing agencies are also the disseminating agencies.) In a number of countries, consumer price indices are produced by the national statistical agency but disseminated by either the central bank or other agencies. Similarly, central banks are more often engaged in producing balance of payments statistics than they are in disseminating them. This suggests that many of the cooperation agreements currently in place are designed to address or clarify these divisions of labour.

5. Legal basis for assigning responsibilities to institutions and for interagency collaborations

The survey responses indicate that specific legislation is the most common legal basis for assigning responsibilities for economic data. The survey responses indicate that a law is the most common legal basis for assigning responsibilities for economic data. This holds for over 90 percent of the statistical offices, central banks, and the ministry of finance. Additional arrangements are noted by 11 statistical offices, 7 central banks and 3 ministries of finance. These arrangements include memoranda of understanding, official agreements, or established practices and, in most countries, supplement the legal framework.

Various mechanisms are in place to foster interagency coordination. The most common mechanism, indicated by about 70% of the SDDS survey responses, is working groups. Another is statistical committees and statistical councils (about 17% of responses). Some other mechanisms described in the survey responses include ad hoc expert meetings, regular meetings, phone consultation, cooperation based on mutual trust, and operational agreements such as memoranda of understanding and official agreements.

6. Can conclusions be drawn regarding a model institutional structure for producing official statistics?

SDDS countries have relatively complex institutional structures for producing economic statistics, but place strong emphasis on clearly defined roles and good governance. The SDDS countries appear to have opted for systems in which a national statistical agency takes the lead, while other institutions, including the central bank, have a subsidiary role. However, there are some noteworthy exceptions where the central bank plays a principal role, and these are worth further study as they may offer lessons for other countries. The role of other data providing agencies, through various existing arrangements, is also important. This mainstream institutional approach appears to recognise, at least in principle, the importance of separating the production and dissemination of statistics from policy making and the consequent independence of official statistics from the sphere of policy and politics. Thus, the principle of integrity establishes some important boundaries for developing effective statistical systems.

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The challenge of disseminating European statistics: the Eurostat experience

Pedro Díaz Muñoz[1]

Introduction

This paper first describes the role of Eurostat in the dissemination of European data – a role at the end of a production chain that begins with the statistical organisations of the Member States. The paper then explains the legal mandate establishing this dissemination role, as well as recent enhancements to it through the European Statistics Code of Practice and the revision (currently in progress) of the basic legal framework for EU statistics. Finally, the paper reflects on future challenges, such as the need for statistics to be immediately available, the growing need for global access to global information, the demand for more explanations of data, competition from private statistical data providers, the issue of access to very large databases and the varied needs of different users. These are the challenges that frame the issues relating to the dissemination of public statistics as this process evolves.

Background

As the Statistical Office of the European Union, Eurostat is responsible for designing, collecting, producing and disseminating European statistics. One important aspect of this responsibility is making European data available to all users, European institutions, national administrations, businesses, analysts, researchers and the general public. The statistical production process begins with the collection and production of data by national statistical organisations, pursuant to standards developed at the European Union level and usually spelled out in binding legal instruments. The data produced by Member States are subsequently transmitted electronically in standardised formats to Eurostat, where they are validated and processed before the European totals are computed. These processed national data plus the European aggregates constitute the official European statistics. As a final step in the production chain, the data are disseminated by Eurostat and the national statistical organisations.

The statistical dissemination process is embedded in the basic legal instrument dealing with the production of European Statistics, and is currently being enhanced in two different ways:

- Revision of the legal framework, which is currently being drafted. It underlines the importance of statistical dissemination and stresses the need for effective cooperation with the European Statistical System, in order to optimise user access to data.
- Two of the principles – principles 6 and 15 – set forth in the European Statistics Code of Practice, which was adopted by the Statistical Programme Committee in February 2005, are devoted to dissemination, emphasising matters such as impartiality, equal access, clarity and accessibility.

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Eurostat dissemination policy

Eurostat's dissemination policy was substantially redefined at the beginning of 2004. An internal Reflection Group led by Michel Glaude, Eurostat's Director of Social Statistics, put forth a fundamental policy document. Its basic principles are that:

1. Information should be available to all users at the same time and under the same conditions. Eurostat is currently drafting an impartiality protocol that clearly spells out the rules governing implementation of this principle. The rules – already, in fact, in place – are based on the requirement that, except in duly justified and publicly explained situations, data shall be made available to everyone at the same time. The only exception to this is the transmission of data, under embargo, to selected institutions in very specific cases.
2. All statistical data shall be disseminated free of charge. At the beginning of 2004, Eurostat decided to make all information on its website accessible to everyone without cost. The website functions as the front end for reference databases that store all of the data to be disseminated, including the electronic versions of printed publications.
3. The main vehicle for statistical dissemination shall be the internet. The Eurostat website, providing full access to all Eurostat data, was made available to the public on 1 October 2004. Since then, online access has been the principal means of access for all users of Eurostat data.
4. Printed publications shall continue to be a vehicle for dissemination. Eurostat believes that there is a need for printed publications. Consequently, a publication programme is being maintained, though the number of titles (currently about 40 per year) has been reduced, with a focus on compendium and thematic publications covering different topics. A large number of analytical information sheets (Statistics in Focus) and rapid data sheets (Data in Focus) are also produced (approximately 250 per year). As mentioned, all of this information is uploaded to the website.
5. User feedback is a cornerstone of statistical dissemination. Eurostat monitors use of the site in various ways (number of visits, page views, number of PDF, data and table downloads, etc). Eurostat also conducts periodic user satisfaction surveys on the web to solicit feedback. Lastly, user support activity carried out jointly with the NSIs is also an excellent source of feedback on user satisfaction and future needs.
6. Cooperation within the European Statistical System should enhance outreach. Eurostat has an ambitious programme of cooperative dissemination activities. Projects include coordinated user support activity, sharing of tools, dynamic links to different websites, exchange of news via RSS feeds and exchange of data in XML formats to customise display on national websites. To track and develop these coordination activities, a Dissemination Working Group with representatives of Member States meets twice a year, while several Task Forces are also active.

Future challenges in disseminating European statistics

As the information age develops and accessibility to information evolves, there are important challenges for statistical dissemination in terms of keeping users accurately informed and providing sufficient information for decision-making by stakeholders. The era when official statistics were the sole source of information is behind us. Official statistical organisations today confront a new paradigm, in which other information brokers also play a role. Let us examine the main challenges to be dealt with.

First, there is a need for data to be immediately available. This is very acute in the case of European statistics, since in many if not all cases the corresponding national data have already been published by the originating country. Since users are aware of this, they are unwilling to accept delays in the publication of the relevant European data. Furthermore, delays may encourage information brokers to compile their own aggregates, which may end up being the framework for economic decisions before the official European statistics are available. The European Statistical System must therefore develop ways to make data available to the entire ESS network as soon as national data become available.

Second, there is a need for global information to be globally accessible. Information needs today transcend borders, and users from any part of the world may be interested in data from any other. The structuring of links must be enhanced to allow users to navigate effectively through the vast amount of information offered by different statistical organisations, and statistics must be presented in a way that is coherent and understandable.

Third, and following from the foregoing point, measures must be taken to facilitate users' access to large amounts of information. Tools must be provided that present information synthetically and dynamically, giving users a rapid overview of large databases.

Fourth, since users are no longer required to go though information brokers to access data, the data must have clear and adequate explanations of their context, purpose and limitations. Therefore, metadata will play an essential role in future dissemination schemes, and navigation and search capabilities must be enhanced so that users will be able to find, on their own, the information they need.

Fifth, just as not all users are the same, neither are their needs. As the information market becomes more global, a wider variety of users become interested in statistical data. Organisations responsible for statistical dissemination today and in the future must therefore understand, and take account of, users' varying needs, motivations and ways of viewing data.

Sixth, researchers' access to data must be optimised. Currently, the richness of the data collected from respondents is not being fully exploited, due to concerns about the confidentiality of data. Current protective measures restrict access too much. The research community could use this information securely if adequate techniques and procedures were put in place to evaluate the risk of disclosure when granting access.

One further challenge facing official statistics organisations is competition from private providers of statistical data. In many cases, statistical data on economic and social phenomena can be obtained very easily through non-official statistical sources, and can be made easily available online. One of the future roles that official statistics organisations must play – and a subject they must carefully study – is helping users to judge the quality, relevance and continuity of such data.

Dissemination in the ESS. Where are we now?

The European Statistical System is already examining several ways of meeting these challenges. For example, there are numerous ongoing projects involving cooperation between Eurostat and the statistical offices of EU Member States. Some of them, such as RSS news feeds and the exchange of XML data for customised presentation, have been mentioned above. There is also an ESS intranet initiative, known as INSITE, which was launched in early 2007, and to which most of the Member States have already subscribed. Great efforts have also been made in creating and upgrading an ESS virtual network.

Another strand of international cooperation projects is designed to address the issue of standardising data and metadata models. This is part of the SDMX (Statistical Data and Metadata Exchange) initiative sponsored by several organisations (IMF, OECD, BIS, UN,

ECB, Eurostat and World Bank). SDMX permits data and metadata to be exchanged and automatically managed by recipients. For this purpose, SDMX employs standard data structures that can be shared by all partners, so that whenever a data set arrives, it can be displayed according to the shared standard structure. SDMX also provides a set of tools that will make it possible to share information placed on the websites of different organisations, so that a user could potentially select data from different data providers and produce a table combining the information – and do so in real time – through a registry system that sends out a notification each time new data are uploaded by one of the partners. Eurostat is currently working on a project called SDMX Open Data Interchange (SODI), which applies this concept, using SDMX for the simultaneous dissemination of short-term statistics.

At present, Eurostat is developing tools for improved access to, and display of, data. By the time this conference takes place, a new generation of maps, graphs and country profiles will be operational on the Eurostat website, and it will be possible to graphically display data from selected parts of the databases. An enhanced user interface for online access to all Eurostat databases will also be operational before the summer of 2007. All of these tools should be seen as the first phase of a new generation of utilities for displaying information stored in large databases, which will gradually be implemented in the next couple of years. Many of these tools are being developed jointly with Member States.

The SDMX initiative also provides an opportunity to develop standards for the structuring and presentation of metadata – another issue Eurostat is working on – using the above-mentioned SODI project as a testing ground. Eurostat has recently reorganised its activities so as to have a specific unit whose primary mission is to improve the content of information.

The new XML publishing initiative is designed to produce publications much faster, and to produce hardcopy and PDF publications simultaneously with their web (HTML) counterparts. Eurostat has launched a task force to study relevant previous experience and to develop a strategy that can then be implemented by both Eurostat and national statistical offices.

Finally, information search utilities must be improved, in order to keep up with increasing demand for faster data search capabilities. To this end, Eurostat is working on improving search engines and navigation tools.

Conclusion

The dissemination of European Statistics has been substantially transformed in the last few years to adapt to new technologies and changing needs. New challenges lie ahead, however, as information becomes more accessible to all users. The ESS must collaborate on developing new tools and policies, in order to evolve in tandem with user expectations and technical progress.

Statistical data dissemination in the Czech National Bank

Petr Vojtisek[1] and Martin Kacer[2]

1. Introduction

Dissemination represents the culmination of the entire process of statistical work, which begins with analysing users' requirements, and includes creating the methodology for different statistics, designing statements, determining the reporting population and collecting the actual information, combined with a compilation process that involves dealing with missing information and conducting grossing-up procedures. The quality of dissemination can either strengthen or weaken the process – as well as the ultimate results – of compiling the various statistics. Thus, the Czech National Bank (CNB) devotes significant effort to this aspect of the statistical process, in which both methodological and technical issues are important. The present paper discusses types of data dissemination at the CNB, and describes the Bank's aggregated time series system.

2. Types of dissemination

At the CNB, we distinguish three basic types of dissemination, which have distinct objectives: internal dissemination, external publication and reporting to international institutions. Access to primary data for CNB's data processing personnel is not considered dissemination in this context.

Firstly, statistics, once compiled, are available to analysts within the CNB, mainly in the form of a time series database.

Secondly, there is external publication, which is done exclusively through the CNB website. The bulk of statistical data are published in this external format, through a time series database. Various publications are also available in pdf format at the statistical site, including the actual figures, as well as graphs and brief comments. Publications include "Monetary and Banking Statistics" and "Balance of Payments Developments," as well as SDDS (Special Data Dissemination Standards) publications, which are provided in a standardised format – currently in the form of a simple (but structured) html table.

Thirdly, reporting to international institutions takes the form of data coded in GESMES/TS format and sent regularly to the ECB, Eurostat and the BIS, at frequencies ranging from daily to annual. Reporting to other international institutions, such as the IMF and the OECD, is mostly in MS Excel format.

All three types of dissemination are integrated at the CNB, within a system known as ARAD (an acronym from the Czech phrase for "aggregated time series"). ARAD provides a data

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storage structure, organises workflow and allocates responsibilities at each step of the processing. Last but not least, it serves as the end-user application for data extraction.

This paper discusses the ways in which statistical data are disseminated, with a special focus on the ARAD system, which represents the core of the entire process.

3. ARAD system

ARAD is a system for storing different statistical data in one central database and presenting them as time series. The first version of this system was created in 1996 in an environment completely different from today's. At that time, data were not available through the internet, and were published only in the form of print bulletins. The most advanced format was MS Excel. We began building the system with some basic, simple goals:

- To provide unified storage of statistical data in the form of time series, using a central database
- To provide interactive access to information, including both data and methodology

Since then, the environment has changed and new requirements have emerged. Two challenges were considered paramount:

1. To establish a unified basis for both publishing and reporting data
2. To create a common data interface for different systems

Simplicity was the dominant idea in the nineties, when the first version of the system was created, and the only way we found of meeting the challenges was to make the process clear and natural, avoiding any special coding or structures. The present system is somewhat more sophisticated, but simplicity remains its basic feature.

3.1 The main concept of ARAD – general principles

The basic idea is to store complete blocks of data (data sources), rather than predefined data series. Blocks of data are organised according to various business areas. Sources are described in the form of metadata, and the relevant methodological sheets are provided. Administrators in each business area are responsible for the data source structure and methodology, and for the actual data. Data sources are merely the first level of the system, and their sole purpose is to serve as a source. They are not normally visible to users. The only exception is access by internal users, who can create their own datasets, and therefore need to have access to the complete structure of the database. Creating datasets is an advanced use of ARAD and enables users to create fully customised views of the statistical data.

The second level, available to all users, consists of the time series of individual indicators, which employ ARAD terminology. Technically, an indicator is the formula which refers to the position of the data in the data source. The formula allows for elementary calculations such as addition or subtraction. Indicators are arranged in groups, ie sets of indicators. Indicators provide a simplified means of viewing the data in the data source.

The ARAD system primarily serves users, and is therefore based on their needs. Since requirements change over time, the database is an open one, and can be added to. The only requirement is that a well-structured order be maintained. A two-level structure allows, to a certain extent, for independently adding data sources and predefined sets of indicators. In particular, new data sources can be prepared without affecting existing data presentations or relationships, and vice versa.

For data input, the system provides a common interface for fully automated uploading of data from different primary systems, external sources and compilation processes. It was found useful as well, however, to support manual data entry not constrained by a strict format. Thus, for manual entry, ARAD is the only place where data are stored in the form of a database. To make manual inputting easier, the application is able to read and process pre-prepared MS Excel sheets.

3.2 User access

All of the tools for the presentation of the time series are based on hierarchical selection – from a general level down to specific details. Navigation is considered the third level of the system. The administrators have prepared sets of indicators for standard ARAD users and have placed them on the respective branches of the hierarchical tree. Such users of ARAD do not, therefore, need detailed knowledge of all of the data sources, and navigation is organised intuitively.

Currently, there are six branches at the first level of navigation in the internet version, reflecting various statistical areas: monetary and banking statistics, balance of payments, financial markets, macroeconomic statistics, other indicators and SDDS. One additional branch – government financial statistics – will be ready soon.

The money and banking statistics branch provides a wide range of indicators concerning monetary financial institutions, from balance sheets (eg monetary and credit aggregates) to interest rates for clients. It also covers information from selected financial sub-sectors (eg collective investment funds and financial corporations engaged in lending).

The balance of payments branch includes standard balance of payments and international investment position items, as well as indicators of foreign indebtedness. Figures on international reserves are also available in the IMF template format.

Financial market statistics provide information on the money, capital and foreign exchange markets, including PRIBOR, long-term interest rates, foreign exchange rates (including nominal and real effective exchange rate indicators) and Prague Stock Exchange indices.

All of the above-mentioned statistics are compiled by the CNB. By mutual agreement, ARAD also contains the information produced by the Czech Statistical Office, consisting of four types: national accounts (GDP), production statistics, prices (both consumer and producer) and labour and wage statistics.

More advanced internal users can create their own sets of indicators (in the internal version only) and store them in the central database. The system's ability to handle methodological changes and data updates is seen as the great advantage of the database format, as compared to maintaining one's own dataset indicators in MS Excel sheets.

3.3 Data access tools

There are currently three versions of user access tools: local, intranet and internet versions. The initial local version is still available, primarily as an application for manual data entry. Even in this case, data are stored only in the central database. The same approach applies to other versions in use.

The CNB intranet version contains, of course, more detailed and confidential data than the public internet version. The intranet version has tools to enable access to confidential or temporarily restricted data. The internet version is accessible at the CNB website via standard internet technologies.

All versions provide standard tools for data gathering, such as filtering by time range, full-text searching and explicit selection of indicators. There are various output formats designed to

meet different user needs. In addition to an html table providing a simple display of the results of a selection in a web browser, MS Excel is available – this being the most popular format for further calculation and analysis – while CSV (comma-separated values), which is also available, serves as the all-purpose format for further data processing. In addition, time series can be displayed in charts for a more complex view of the data history.

As regards metadata and methodology, the application interactively provides additional information on the relevant data, in the form of methodological sheets, news and frequently asked questions. Current data updates are provided directly on the main page. Concurrently, information is distributed through the RSS (Really Simple Syndication) channel, which provides users with convenient monitoring of new publications.

4. Data dissemination through ARAD

As mentioned above, ARAD is the core of the CNB's dissemination system. However, there is another component, namely, the timetable that controls the entire dissemination process. In very simple terms, the timetable contains what must be sent or published – and when – on any given day, plus additional information such as which procedure should be performed and to whom the notification should be sent.

The system maintains two types of time schedule systems. The first is used for managing the time series updates based on information from the data sources; the second is used to orchestrate publication and reporting – with these two levels being independent. While the data update schedule deals with data sources, the publication and reporting schedule concerns the presentation layer (predefined sets of indicators) and must be addressed separately.

A description of the publication day, as it appears on the CNB website, may be the clearest explanation of the publication layer of the system.

Before publication can occur, the timetable must be met, and data must be prepared in the source database. The first step of the process consists of loading data from the source system to the ARAD database. This ordinarily takes place one day before the publication date. The publication process itself usually begins at 8:30 a.m., when the automatic procedure begins to create the html table based on information from the timetable. Fifteen minutes later, the file is transmitted to the Internet Publication System used for managing our website content. At 9:00 a.m., the file is transferred to a protected folder, where the data are accessible only to registered users such as press agencies and journalists. The information, of course, is under embargo until 10:00 a.m. Registered users are concurrently notified of publication by e-mail. At 10:00 a.m., the document is moved to the target folder and becomes available to the public.

The entire process explained here is automated and is controlled by the information from the timetables, with one subsystem passing data to another according to the instructions outlined. At any stage, it is, of course, possible to enter the process and perform the procedures manually. This data publication structure has been successfully used for almost five years.

5. Conclusions

The advantages of our solution have been proved by nine years of failure-free ARAD operation. Naturally, every system has its weak points, but we believe that the advantages of this system outweigh its disadvantages. The fact that all data are reported and published from one main source database is considered a fundamental feature of the system. A further

advantage is that the same data – along with metadata and methodology – are interactively accessible to users.

When we began building the user interface in 1997, the main task was to introduce as simple an application as possible, so that users would not be discouraged from using it. The simplicity began, at one point, to be a limitation, but fortunately users have increased their skills, while technology developments have allowed us to add more sophisticated functions and procedures. When we began doing this, an important decision was taken to instruct and train users to be independent. Instead of preparing personalised outputs for one or several users, we offered users standardised datasets (based on their requirements) and instructed (and sometimes compelled) them to obtain the required data in the most effective way – an accomplishment which, with almost ten years of experience behind us – we now see as one of the greatest successes of the work we have carried out.

Reference

Link to ARAD: http://www.cnb.cz/docs/ARADY/HTML_new/index_en.htm

Discussant comments on session STCPM28: Statistics dissemination public service

Tendani Mantshimuli

Central banks, as institutions funded by taxpayers, have an obligation to provide economic statistics and data to the public. The aim is to increase public awareness of monetary policy, as well as to provide people with time series data and other economic information generated by the central banks themselves or by other institutional partners.

The three papers from the Austrian National Bank, the Czech National Bank and the Bank of Portugal explain these institutions' data dissemination processes. Central banks attempt to provide timely and accurate data to their clients in the most user-friendly way possible. All three banks view themselves – as the Austrian National Bank puts it – as "Competence Centres for Financial Statistics". This means that data must meet rigorous internal quality control tests and be disseminated in such a way that users can easily access it. To be effective, the language used should not be excessively technical.

Users of statistics include policy-makers (eg governments and central banks), economists, lawyers interested in financial statistics, academic researchers and students, and international institutions like the IMF, the BIS, the UN, Eurostat and the OECD.

There are three ways of disseminating data: through central banks' intranets, on the internet and through international institutions. Data distributed through intranets are primarily source data and indicators. Most of this information is confidential and is restricted to internal users. Data input may be manual or may be linked to Excel files for immediate updating. The internet is the main vehicle through which data is disseminated to external users. Once data quality has been ensured, data are published in the form of time series. This enables data to be used according to users' specific purposes. Public data include monthly, quarterly and annual data. Banks may hold press conferences close to the embargo time for release of data, in order to increase awareness of specific data sets through the media. Data sets disseminated on the internet relate to money and banking, balance of payments, international investment positions, government finance, foreign exchange, financial markets, the national payments system and macroeconomics. Central banks also disseminate data generated by other institutions such as national statistics agencies (eg national accounts data). In addition, websites include SDDS and metadata pages. Finally, data from central banks are also disseminated in a standardised global format through international institutions including the IMF, the UN, the BIS, the OECD and Eurostat.

Discussion comments on session STCPM28: Statistics dissemination public service

Rochelle Barrow

The purpose of this session was to share the experiences of various statistical institutions with respect to the dissemination of statistics to the public. Subjects of particular interest included online access to statistics and the development of interactive statistical databases.

My comments focus on four of the papers presented, namely those by Salou, Dembiermont, Díaz Muñoz, and Dziobek and Tanase.

I shall first summarise each of the papers, and then identify key themes and discuss them further.

The ECB Statistical Data Warehouse – improving data accessibility for all users, by Gérard Salou

This paper discusses an online data delivery service developed by the ECB. The Statistical Data Warehouse (SDW) aims to deliver high-quality, timely statistics on the euro area to users with varying needs.

The paper starts with a description of the content of the SDW and the data and metadata model used. The SDW contains economic, financial and monetary statistics published by the ECB and Eurostat that are relevant to monetary policy. The system uses the SDMX standard data model which enables users to locate, retrieve, transform, understand, present and analyse data.

The paper then proceeds to discuss users – in particular how features of the SDW have been developed to meet varying needs. A key objective of the SDW was to develop a user interface that facilitated users' access to statistics, regardless of their level of knowledge of euro area statistics or technology. The ECB worked in close collaboration with users to ensure that this objective was met. The introduction of the SDW has been accompanied by a surge in the frequency of access and usage of euro area statistics, from an average of 200 users per month to a current average of 20,000 users.

The paper concludes with a brief comment on future developments including, the introduction of interactive graphs on the home page. The intention is to continue developing the system in response to user needs.

Thirty years of experience in database management: the BIS Data Bank, by Christian Dembiermont

This paper summarised 30 years of database design, development and management at the BIS.

It starts off by describing the importance of high-quality data in the decision making process – the factor that motivated the BIS to develop the BIS data bank.

The main objective of the BIS data bank is to provide a common database owned, updated and controlled by the central bank community, allowing the data bank to be developed and evolve over time to meet the needs of central bankers around the globe.

Forty-one countries currently contribute to the BIS data bank. This requires a high degree of coordination by the BIS, as well as the use of efficient processes to ensure that users of the data bank receive timely, high-quality data.

There are challenges in delivering database services such as the BIS data bank. The paper discusses a few of these challenges, including ensuring data reliability, delivering timely data, motivating central banks to contribute to the data bank and "competing" with an increasing number of data providers.

The challenge of disseminating European statistics, by Pedro Diaz Munoz

This paper discusses the importance Eurostat places on the dissemination of timely, high-quality European data. It also discusses the challenges Eurostat faces in achieving this.

Eurostat is involved in the design, collection, production and dissemination of European Statistics. These statistics are mostly collected by National Statistical Organisations (NSOs), according to standards developed at a European Union level and spelt out in legal acts, and are disseminated by both Eurostat and individual NSOs.

The paper summarises the Eurostat dissemination policy, which was revised at the beginning of 2004. The basic principles are that:

- Information is available to all users at the same time and under the same conditions.
- All statistical data should be disseminated free of charge.
- The main vehicle for statistical dissemination is the web.
- Printed papers continue to be a vehicle for dissemination.
- Cooperation within the European Statistical System should enhance the dissemination of statistical information.

The objective of ensuring that decision makers are provided with correct and timely information needed to make high-quality decisions is a challenging one. The paper contains a useful discussion on some of theses challenges, including:

- Delivering timely data.
- Providing efficient global access to a significant volume of data.
- Making metadata and contextual information available to users to ensure appropriate use of statistics.
- Understanding and balancing the needs of various types of users.

The paper concludes with a comment on ongoing projects related to dissemination, which include the standardisation of data and metadata models, ongoing improvement in data display and access, and improvements in search engines.

Institutional arrangements for producing macroeconomic statistics in countries subscribing to the special data dissemination standard (SDDS), by Claudia Dziobek and Florina Tanase

This paper presented results from a survey of countries that adhere to the IMF Special Data Dissemination Standard (SDDS) on their macroeconomic statistics dissemination arrangements.

The survey covered 41 countries with well developed statistical systems. It found that a multiple institutional approach to statistical dissemination of macroeconomic statistics was the most popular model, with NSOs taking the overall lead.

The multiple institutional approach makes cooperation and coordination between institutions (e.g. NSOs and central banks) essential. Statisticians have a responsibility to manage data requests and to attempt to minimise their impact on providers. Thus, it is essential for organisations responsible for producing and disseminating macroeconomic statistics to work together. Coordination also helps to ensure that macroeconomic statistics remain relevant and are consistent.

The survey also highlighted the importance of well defined legal frameworks as an important basis for the integrity and professional independence of statistical agencies, and therefore an important part of ensuring that statistics are a public good.

Key themes

The importance of understanding your user

A theme running through all of the papers was the importance of understanding your user. Users are not homogeneous and often have different, and sometimes competing, needs. One user may be willing to sacrifice timeliness for accuracy, while another requires data as soon as possible. One user may simply want a headline number, while another needs access to microdata.

Designing one dissemination tool that meets a variety of needs can be a challenging project. Each of the organisations presenting papers have embraced this challenge and successfully implemented systems that do just this.

In addition to supplying data the BIS paper mentions the role that these systems play in bridging the gap between the provider and the user – in some cases, in a translation role.

Statistical institutions around the world have started to use tools such as audience modelling and personas, to better understand their users. These types of tools can be used to assess the usefulness of new products. Better understanding of the users makes it possible to design and develop products that more effectively meet their needs.

Metadata are essential

Metadata are the glue that holds a statistical database together, giving data a context, making them valuable and ensuring that they are used appropriately.

The papers emphasised how essential it is to have good metadata frameworks in place when attempting to design and implement efficient statistical databases. Documentation on methodology, classifications and commentary are examples of metadata that enhance data for users. The use of this type of information will be driven by users' needs. Ensuring that highly technical users' needs are met, without overburdening the general user with information, can be a challenge.

Technology is an enabler

Technology has enabled us to disseminate statistics globally, to provide access to data that in the past may have resided in volumes in a library. The papers presented illustrate how statisticians have built on technological advances to better meet the needs of users.

However, technology continues to evolve, and this can create expectations. Users expect timely, accurate information at their fingertips. The dissemination practices of statisticians need to evolve in tandem.

Cooperation and collaboration

A number of papers highlighted the importance of working together to ensure that statistics are disseminated in a user-friendly, efficient and timely manner. This may involve working more closely with international agencies, NSOs, central banks and users.

Special Topics Contributed Paper Meeting 29 with International Association for Official Statistics

The relationship with the providers of information for statistical purposes

Chair: António Garcia, Bank of Portugal

Papers:

Data and information exchange between the National Bank of Slovakia (NBS) and financial market participants
Gregor Bajtay and Ján Seman, National Bank of Slovakia

Working together: how good relationships with providers can improve the quality of official statistics
Rochelle Barrow, Reserve Bank of New Zealand

Feedback data flows in balance of payments statistics
Antonello Biagioli and Giovanni Giuseppe Ortolani, Bank of Italy

Increasing respondents' involvement in the statistical process: the experience of the Bank of Portugal in the field of monetary and financial statistics
Luís Teles Dias, Bank of Portugal

The relationship with providers – an essential factor in the quality of financial statistics in Russia
Ekaterina Prokunina, Central Bank of the Russian Federation

High quality data and collection systems through active communication with data providers
Debra L Gruber, Federal Reserve Bank of New York

Requesting voluntary data from non-financial corporations: the experience of the Banco de España CBSO
Manuel Ortega, Bank of Spain

The OeNB's experience cooperating with information providers on Austria's new balance of payments system
Michael Pfeiffer and Patricia Walter, Austrian National Bank

Relationship with survey data providers: the Bank of Thailand's experiences
Chatwaruth Musigchai, Bank of Thailand

Discussants: R Edwards, International Monetary Fund
Greg Haymes, Bank of Canada

Chairman summary of session STCPM29: The relationship with the providers of information for statistical purposes

António Garcia[1]

In order to accomplish their missions, producers of official statistics have to compile significant amounts of data. The statistics are typically used in policy making that impacts the economy, and they provide a service to the community as a whole by meeting many of its needs for statistical data. In this context, fostering a culture of good statistical practices must rank among the top priorities of any highly principled producer of statistics. Solid relationships based on transparency and mutual trust between official statisticians and the respondents who provide their data naturally stand out as one of the main elements of such good practices.

The papers presented in this session come from all parts of the world, and provide a glimpse of an emerging tool in the data compiler's arsenal. Although markets, institutions and data practices differ among these countries, the link between relationship building and high-quality data is consistently evident. All of the papers recognize the importance of high-quality source data in achieving the ultimate objective of producing high-quality statistics. National practices illustrate the importance of building and maintaining trust within the data-providing community, as well as the many ways in which this may be approached.

The experiences discussed include: (i) requesting that users, as well as providers, attend meetings, thus raising awareness of the value to businesses of providing high-quality submissions; (ii) involving respondents from the start in the design of data collection forms; (iii) providing training, manuals and guidelines to those responsible for reporting; (iv) giving ongoing attention to reducing the reporting burden on companies; (v) placing importance on reciprocity: providing reporting firms with feedback in the form of relevant data, in order to ensure that the reported data is also a valuable asset to them, thus reducing the net social cost of the process; (vi) offering on-site company visits, seminars and events for data providers to meet with each other; and (vii) providing data reporters guarantees that their data will be treated confidentially and will be used only for statistical purposes.

The papers all emphasize the importance of maintaining excellent relationships with providers, and of voluntary cooperation, as opposed to coercive measures. It is critical in this connection to ensure that the provider community fully understands that the costs it incurs in providing data are offset by the benefits of the resulting statistics. To safeguard the pivotal role that producers of statistics play in the overall statistical process, however, cooperation with data providers must be assessed on an ongoing basis, and adjustments must be made to efficiently address users' changing interests, while keeping to an absolute minimum the burden on respondents.

[1] Bank of Portugal.

Data and information exchange between the National Bank of Slovakia (NBS) and financial market participants

Gregor Bajtay[1] and Ján Seman[2]

As part of its communication strategy, the NBS has been regularly publishing various sets of macroeconomic indicators while at the same time receiving a set of data from financial market participants. This paper describes the various datasets involved. It first discusses the data published on the NBS website. These include the dataset released for statistical purposes in accordance with the IMF's Special Data Dissemination Standard (SDDS), and the dataset created for banking and financial market supervision purposes. The paper then turns to the data provided to the NBS by financial market participants, and describes the information and communication systems used to compile them.

1. Data published on the NBS website

Most of the data published by the NBS are on its website (www.nbs.sk) and can be divided into data compiled for statistical purposes and data used for banking and financial market supervision.

1.1 SDDS

The statistical data, which are used mainly for the analytical needs of the monetary policy department, derive from monetary and banking statistics, balance of payments information, foreign direct investment data, foreign indebtedness figures and foreign exchange statistics. These data are compiled and published in accordance with the IMF's SDDS. The Slovak Republic joined the project pursuant to a decision by the government on 27 August 1996. The Statistical Office of the Slovak Republic functions as a national coordinator (see national summary data site) and cooperates with the NBS and the Ministry of Finance in collecting the prescribed data. The NBS is responsible for the following categories: Analytical Accounts of the Banking Sector, Analytical Accounts of the Central Bank, Interest Rates, International Investment Position, Exchange Rates, Balance of Payments, Gross External Debt and International Reserves. On 7 October 1999, the IMF issued an official notice on the Dissemination Standards Bulletin Board (DSBB) to the effect that the Slovak Republic fully met SDDS requirements for the coverage, periodicity and timeliness of statistical data, and with regard to advance dissemination of release calendars. In the English language version of the NBS website, the SDDS data categories menu provides a link to the IMF DSBB, with all relevant information on contact persons, and the timeliness, coverage and periodicity of the data available. The Slovak version of the NBS website includes a link to the Statistical Office of the Slovak Republic (SOSR), the national coordinating entity.

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1.2 Banking sector data

One of the largest categories of data published is data on the Slovak banking sector. The data published contain a complete list of all commercial and savings banks, including money market funds, branch offices and representative offices of foreign banks, information on harmonised monetary and banking statistics, surveys of financial sector development, international reserves held by the banking sector, and the country's foreign exchange market. The section on harmonised monetary and banking statistics includes information on the legal framework for ECB and NBS statistical work, as well as methodological information and publications.

Methodology

As to the methodology used for harmonised monetary and banking statistics, the assets and liabilities of monetary and financial institutions (MFIs) are broken down by instrument, maturity and currency, as well as by institutional sector of creditor on the liabilities side and of debtor on the assets side. Individual institutional sectors are defined according to the European System of National and Regional Accounts (ESA 95). The NBS has participated with other central banks in the ECB methodological manuals project, which addresses efforts to conform national statistical standards to ECB requirements. The manuals describe the legal frameworks and methodology used to collect and compile monetary and banking statistics and financial market statistics in individual European countries. As part of its methodological work, the NBS has published a sector manual and revision policy guidelines for statistical data reported and published for 2007 and previous years. The methodological guidelines cover the revision of data contained in statistical reports submitted to the NBS by individual reporting entities.

Harmonised monetary and banking statistics data

Harmonised monetary and banking statistics include data from balance sheet item statistics, as well as data on monetary aggregates and interest rates. Statistical data from the balance sheets of banks and branches of foreign banks are compiled as stocks and flows. Data on stocks are published for the entire banking sector, while NBS data on flows are published only for credit institutions. Flow statistics are used for calculating transactions related to the acquisition/disposal of assets and/or the incurring/repayment of liabilities. Flows are calculated indirectly from the information on non-transactions, which reflect all movements in stocks arising from: (1) reclassifications and other changes; (2) variations in exchange rates; and (3) price revaluations for marketable instruments and write-offs/writedowns of loans. True flow equals the difference in two successive end-month stocks minus non-transactions.

$F_t = (S_t – S_{t–1}) – C_t – V_t – E_t$

F_t = flow
S_t = stock at the end of current period
$S_{t–1}$ = stock at the end of previous period
C_t = reclassification adjustment
V_t = revaluation adjustment
E_t = exchange rate adjustment

The flow values obtained are used to calculate real changes in monetary aggregates and counterparts of monetary aggregates.

Data on monetary aggregates published as part of harmonised monetary and banking statistics have been calculated from MFIs' aggregated balance sheets and their subsequent consolidation. This consolidation process means that all mutual relationships among MFIs are eliminated.

As part of harmonised monetary and banking statistics, the NBS website has also been publishing statistical information on "other financial intermediaries" (OFIs), excluding insurance corporations and pension funds. The main goal here is to provide a complete picture of monetary developments. ESA 95 defines OFIs (S.123) as "non-monetary financial corporations and quasi-corporations (excluding insurance corporations and pension funds) principally engaged in financial intermediation by incurring liabilities in forms other than currency, deposits and/or close substitutes for deposits from institutional units other than MFIs". In terms of OFIs, up to the end of 2006 only statistics on investment funds other than money market funds had been available. In January 2007, the NBS started compiling statistical information from leasing, factoring and consumer credit companies.

Survey of financial sector development

The survey of financial sector development provides information on the number of banks and branches of foreign banks, specialised organisations, associations and other institutions in the Slovak financial sector. It also updates the data on amounts of equity and foreign capital, and on the number of employees in the banking sector.

1.3 Financial market supervision

The banking and financial market supervision data include information on legislation in that area, major methodological information, and the recommendations of the supervisory body. Data on the supervision of the banking sector and securities dealers as well as pension fund managers are available in English on the website. Information on capital market and insurance companies is not currently available, as this part of the NBS website is undergoing reconstruction.

With regard to the supervision of the banking sector and securities dealers, the website offers not only legislative and methodological information, but also analysis of the Slovak banking sector since 2004 at six-month intervals, and regular updates on the fees that banks and branches of foreign banks charge their clients.

2. Data provided by financial market participants

The data from financial market participants have been compiled using the information and communication systems STATUS (for commercial banks) and STATUS DFT (for other financial market participants). STATUS and STATUS DFT provide all financial market participants with not only free access to all inputs and outputs but also online access to reported statistical data, with optional export to Excel for analytical purposes. Each system is composed of two subsystems: STAVYD and STATAN. Access to these subsystems is by means of ID files in which each user's role and reporting code are specified. STAVYD is built on Lotus Notes and serves to compile, process and control data. It also provides for:

- report templates, including links within and between individual reports;
- creation of aggregated data from various reports for selected groups of subjects;
- generation of output according to the needs of the NBS (eg presentations) and for ECB purposes;
- methodological instructions for reporting agents and automated transmission of all methodological changes in reporting; and
- automated sending of "urgent" notices to reporting agents that have not provided the reports requested.

STATAN is built on Oracle Express. The main services it provides are:

- analysis of compiled and processed data (eg comparison of the changes between values in two successive months, and creation of time series); and
- special applications for working with dynamic reports, ie reports with regularly changing numbers of rows.

STATUS was implemented in 1997, and for the last 10 years has been a very reliable channel for statistical communication between the NBS and all commercial banks in the market. STATUS DFT was implemented recently (late 2006), and permits effective exchange of statistical data and data for supervision purposes between the NBS and capital market participants, insurance companies and pension companies.

To determine the extent to which the two above-mentioned channels for information exchange between the NBS and financial market participants are being used (namely, the website and STATUS/STATUS DFT), the NBS has surveyed commercial banks and branches of foreign banks through a questionnaire. The results show that banks prefer the internet to STATUS/STATUS DFT as a channel of communication.

The above-mentioned process of communication between the NBS and financial market participants is one element of the feedback that the NBS makes it a practice to provide for data reporters. Others are personal meetings, operational consultations, IT support and common efforts to find new solutions to more effectively satisfy the information and data needs of all involved.

Working together: how good relationships with providers can improve the quality of official statistics

Rochelle Barrow[1]

Introduction

How does one measure the quality of official statistics? Traditionally, quality in statistics simply meant accuracy. Recently, however, statisticians have widened their definition to include other attributes. The OECD defines quality in statistics as relevance, accuracy, credibility, timeliness, accessibility, interpretability, and coherence.[2]

This paper discusses how statisticians can improve the quality of official statistics by developing good relationships with data providers. While the statistical benefits of good relationships are potentially far-reaching, the paper focuses predominantly on improvements in the accuracy and timeliness of official statistics.

The relationship between data provider and statistician

The role of the statistician is to produce high-quality, timely statistics for use by decision makers. In order to achieve this, statisticians must collect data, which they then transform into statistics for dissemination. A statistician's ability to produce accurate and timely statistics is dependent on the supply of high-quality data, which makes the relationship between statistician and data provider crucial to the production of official statistics.

The process of supplying data can be costly to providers in terms of staff time and system changes or enhancements. Because providers have an incentive to minimise the time and resources spent fulfilling data requests, they sometimes delegate responsibility to junior or new staff with little experience. In addition, the supply of data may be relegated to the bottom of the list of tasks to be completed. Due to the sensitive nature of some data, providers may also have confidentiality concerns.

The relationship between statistician and provider can be strengthened by statisticians' actively moving to minimise the impact of their data requests on providers. This can be achieved in a number of ways, including showing the provider the time saved by supplying high-quality data.

How good relationships can improve quality

Statistical user groups continue to demand high-quality statistics for a variety of purposes. Statisticians have responded in a number of ways to the need for improving the quality of statistics, including developing and implementing sophisticated statistical methodologies and

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[2] OECD (2003), "Quality framework and guidelines for OECD statistical activities", OECD, Paris. www.oecd.org/statistics/qualityframework

reviewing frameworks and classifications. However, to work, initiatives like these must have high-quality data as input.

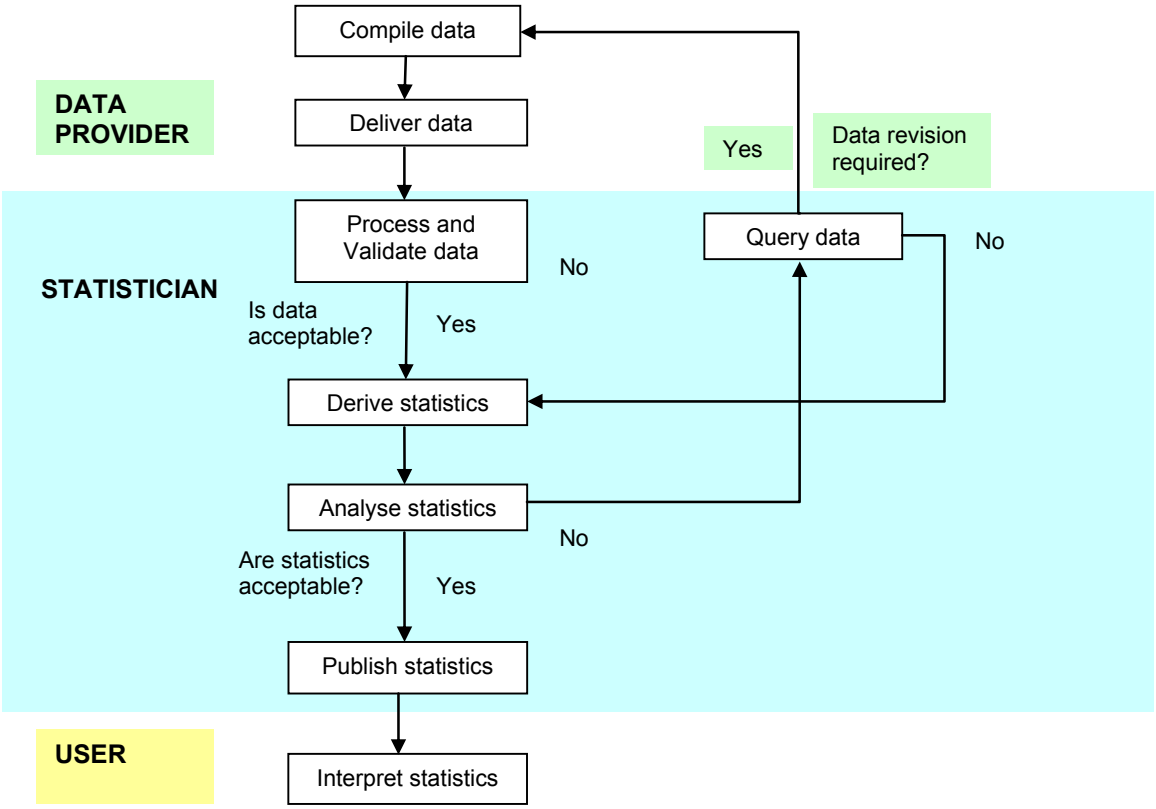
Therefore, when producing statistics, a significant amount of time is spent verifying the quality of the data collected. Over time, statisticians have become more efficient and effective at identifying data that fall short of certain quality standards. This makes it possible to prioritise data in need of further investigation. When deemed necessary, statisticians query providers in order to ensure the integrity of their data.

The querying process can be long and drawn out. Contributing factors may include provider absence, competing priorities and misinterpretation of requests. The accuracy and timeliness of statistics can be improved if the statistician is able to increase the speed at which substantive data issues are identified and resolved.

The diagram below summarises the statistical production cycle and the interaction between data providers and statisticians. There are two main ways of developing good relationships with data providers that can improve the timeliness and accuracy of official statistics:

1. Reducing the need for data queries and
2. Minimising the time required to resolve data queries

Basic query resolution process



Good relationships with data providers can reduce the need for queries by ensuring that high-quality data are delivered at the start. Regular contact with data providers during the process of designing new surveys, time invested in learning about the provider's business, communicating data requirements concisely and providing timely support are all ways to minimise provider misunderstanding and the reporting of inaccurate data.

If data need to be queried, a good relationship with the provider can minimise the time taken to resolve the query. Regular contact at the operational level, face-to-face meetings, and an

understanding of respective commitments can result in more timely responses to data queries. Having a robust managerial relationship in place also ensures that issues can be escalated and resolved quickly if the need arises.

Fewer data issues and faster resolution reduce the time required to process data and transform them into statistics. The time saved may permit earlier publication of statistics or make it possible to reallocate time to more valuable processes in the production cycle, thus improving quality.

Developing good relationships also has benefits for providers. By working with a provider to ensure that high-quality data are supplied in the first instance, the statistician can reduce the burden on the provider, who will spend less time answering queries or revising and resending data. In addition, providers can benefit from an increased understanding of the statistics available for their use.

Relationship-management initiatives at the Reserve Bank of New Zealand

The following section describes some practical initiatives that the Reserve Bank of New Zealand has taken to improve its relationships with providers, so as to in turn improve the quality of the statistics we produce.

We see relationship development as an iterative process that requires continuous effort on our part. While it is difficult to quantify the benefit of investing in relationships with our providers, we do believe that it helps improve the quality of our statistics.

Respondent visits

The New Zealand banking system is predominantly foreign-owned, and is relatively small compared to systems in many other countries.[3] As a result, surveys conducted by the Reserve Bank of New Zealand typically have small sample sizes.[4] The small number of participants and the high concentration makes it easier to visit providers than is true in many other countries.

The aim of our visits is to develop or enhance our relationships with data providers. Visits enable us to learn more about their business and address any concerns that they have. We also use the opportunity to discuss any relevant operational issues. We find that having met face to face with data providers makes ongoing resolution of operational issues much easier.

During our visits, we try to emphasise the benefits of supplying high-quality data – eg the fact that less time will be spent resolving queries. On occasion, providers are also users of the statistics we produce. However, often the person who provides data in the firm is quite separate from the person using the statistics produced. It can be a challenge to communicate how a process that seems costly to the provider actually leads to significant benefits for the business. When visiting respondents, we have found it useful to request that both providers and users attend meetings, so as to raise awareness of the process's value to the business. This practice has often helped create the incentive needed for providers to supply us with timely, high-quality data.

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[3] As of 31 December 2006, there were 16 registered banks, with the main four (all Australian-owned) holding 90 percent of total banking system assets.

[4] Our monthly survey of registered banks has 16 respondents, while the sample size of our quarterly survey of non-bank lending institutions is approximately 55.

Looking forward, we would like to formalise our relationship management strategy. We are also considering running group refresher sessions for our respondents. These sessions would cover a variety of topics, such as questionnaire completion, industry developments, and the range of statistics available for use.

Electronic templates and data supply

All of our surveys are electronic, and most incorporate checks to ensure that simple errors (of addition, for example) are identified by the provider before data are submitted. We find that electronic data supply is more efficient than hardcopy, reducing the burden on both providers and data processing resources.[5] Electronic reporting also reduces the need to contact providers regarding simple errors, enabling statisticians to concentrate on more substantive data issues.

Questionnaire testing

When developing new surveys and data collections, we like to involve providers at very early stages of the process. Discussing data requirements early enhances our understanding of the conceptual and operational issues involved in data supply. Where possible, we actively tailor the mode of delivery to suit the provider and minimise the burden involved.

Availability of support

Ensuring that concise supporting material is attached to questionnaires helps to minimise frustration and misinterpretation among providers. In addition, we make sure that staff are available to answer providers' questions in a timely manner. We have a dedicated email address for queries, and contact information for operational and managerial staff is included on all of our questionnaires.

Customised data supply

Where possible, we attempt to return value to our providers – for example, by supplying them with customised data, which most use to calculate and monitor their market share. In some cases, providers have encouraged us to collect data from them because they are interested in the aggregated market figures, and because they believe that we can ensure the confidentiality and integrity of their data. We are currently investigating other possible ways of returning value to our providers, such as a regular newsletter with useful information.

Challenges

Developing relationships is not cost-free. In the real world, statisticians work with certain constraints on resources and time. This said, we believe that investing in good respondent management can improve the quality of our statistics. Reserve Bank of New Zealand statisticians do, however, face challenges when developing relationships with providers.

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[5] While we prefer electronic reporting, we also cater for respondents who prefer another mode of data delivery.

Avoiding additional burden

Building relationships with providers should not place unnecessary burdens on them. Relationship-building is not only about direct contact with providers. It can be as simple as ensuring that support is available when needed, appreciating and acknowledging commitments and competing demands (such as month-end reporting) and actively trying to improve the data supply process (eg through electronic templates).

Working collaboratively with other statisticians or data collectors to reduce the burden on providers can help strengthen relationships. At the Reserve Bank of New Zealand, we work collaboratively with Statistics New Zealand on a number of projects. Our coordinated approach has reduced the burden on our providers and is appreciated by them. Finding more opportunities of this type is a worthwhile challenge for statisticians.

Appropriate prioritisation of relationship-building initiatives

While there is anecdotal evidence that investing in relationships with data providers can improve the quality of official statistics, proving it empirically is a challenge. Investing in the development of good relationships with data providers is not cost-free. There are a number of other ways to improve the quality of official statistics, so it is up to statisticians to prioritise this type of work within their work programme.

Technological advances in data supply, such as XBRL

XBRL provides an opportunity to improve the efficiency of data collection and significantly reduce the burden placed on data providers. It involves electronic data supply in a standardised format that statisticians can aggregate for their own purposes. While standardisation and automatic data delivery reduce the burden on providers, they can also result in less contact with providers, which may pose a challenge for resolving data queries, and for relationship management in general.

Feedback data flows in balance of payments statistics

Antonello Biagioli[1] and Giovanni Giuseppe Ortolani[1]

Introduction

In recent years, compilers of official statistics have been increasingly concerned about improving the overall efficiency and effectiveness of the production of statistics. Efficiency and effectiveness are interrelated, involving issues ranging from the organisation of statistical institutions to the processes that they manage and the quality of their products. There are many definitions of "quality" in official statistics (IMF, 2001; Elvers, 2003), but "relevance" is a factor in all. Indeed, the production of statistics is justified only insofar as it is relevant to users. In addition, the costs of statistics-related activities must be proportionate to their benefits.

This paper deals with three concepts that are key in assessing the relevance of statistics production in balance of payments (BOP) statistics: products, users and uses. It focuses on the production and use of "micro" statistics (as opposed to "macro" statistics) provided as feedback data flows to BOP data reporters. The issue is analysed in terms of both theory and application, using the experience of Italy's central bank as illustrative.

1. Macro vs micro BOP statistics

Balance of payments statistics are designed to measure the economic transactions – in terms of goods, services, income and financial assets – that residents of one economy engage in with residents of the rest of the world during a given period of time (IMF, 1993). These statistics are fully integrated in the broader set of economic accounts that each country produces. As a result, BOP statistics are closely linked with national accounts and financial accounts statistics.

Hence, BOP has traditionally been a fundamental macro analysis tool for a wide range of users, such as governments, international organisations, private enterprises and researchers. The euro area can be taken as a paradigmatic case. BOP statistics are used by the European Central Bank for monetary policy, by the European Commission for economic policy and trade negotiations, and by national governments for regional analysis of various kinds. In the private sector, businesses and researchers use BOP for analysing the structure and evolution of the general economic framework and, to the extent that detailed data are available, for studies on specific sub-sectors – eg trade in services or foreign direct investment.

While macro uses of BOP data are well established and widespread, micro uses of the same data are not. In this paper, BOP micro data from reporters, bank and non-bank firms, are

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gathered to compile BOP, and are then disseminated back to reporters, after some processing, with a relatively high level of detail. Given this typical cycle of data flow, micro data are referred to here as feedback data flows (FDFs). A distinctive feature of FDFs as defined in this paper is that they allow the reporter/user/enterprise[2] to identify the data associated with the actual reporter. As a consequence, users can analyse the data set in order to, in essence, outline the enterprise's position vis-à-vis the economy as a whole, the industry of which the firm is a part, or a specific market segment, as will be explained below.

Confidentiality criteria, of course, play an important role in defining the level of disclosure of FDFs. Two types of FDFs are possible in this respect:

- Undisclosed FDFs, where the data set disseminated allows the reporter to identify, within the full set, data that the reporter itself provided to the compiler, though it does not enable the rest of the data to be associated with other individual reporters. For example, firm A can "see" and identify the data it reported, but can only see – not identify – the data that firm C reported, since they are presented anonymously. One way of making reporters' data anonymous is to use fictitious, randomly assigned reporter identification codes. In such a system, each reporter would be allowed to identify its own code, but no other code, through a key provided by the compiler.
- Disclosed FDFs, where the data set disseminated to reporters allows the reporter to identify, within the full set, data that the reporter itself provided, and also to associate the rest of the data with the other reporters. For example, firm A can see and identify the data it reported, as well as both see and identify the data that firm C reported. This requires that reporters formally authorise the compiler to disclose their information to other reporters before such disclosure is made.

Obviously, the level of disclosure has a strong effect on the informative potential of FDFs. While non-disclosed FDFs only allow an enterprise to analyse its position in the industry as a whole, disclosed FDFs allow comparisons with individual competitors.

We shall now describe some basic analyses that users can perform on FDF data sets. Let us first attempt a generalisation of FDFs beyond their BOP-specific aspects, as they relate to quantitative measures of the activities of enterprises. In this generalised approach, FDFs provide the following information:

- identification code of the reporting enterprise – fictitious (for non-disclosed FDFs) or real (for disclosed FDFs);
- period of observation;
- a number of qualifying attributes, such as direction of flow (import vs export, inflow vs outflow, etc), nature of transaction (type of good, service or financial asset), partner country, and location of reporting firm;
- the relevant quantitative variable (eg transaction amount, in the case of BOP FDFs).

We use the term market segment to refer to the particular "market" defined by a modality of an individual qualifying attribute or by the combined modalities of two or more qualifying attributes included in the data set. For example, if the data are disaggregated by direction of flow, nature of transaction and partner country, market segments may be "exports to Germany" and "imports of communication services from France". For each reporting firm, with reference to a specific market segment, the following basic indicators can be easily defined:

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[2] These terms are used interchangeably below.

- the market segment value for the reporter ($SV_{r,t,s}$), or the total amount of transactions for enterprise ***r*** at time ***t*** for market segment ***s***;
- then, with ***R*** enterprises, the market segment value for the system ($SVS_{t,s}$), or the total amount of transactions for all enterprises, at time ***t*** and for market segment ***s***, is

$$SVS_{t,\,s} = \sum_{r=1}^{R} SV_{r,\,t,\,s}$$

- and the reporter's market share (MSr,t,s) for enterprise ***r***, at time ***t***, for market segment ***s***, is the ratio

$$MS_{r,\,t,\,s} = \frac{SV_{r,\,t,\,s}}{SVS_{t,\,s}}$$

Calculating rank is also straightforward, rank being the enterprise's position in the list of enterprises arranged in descending order of market share for a particular segment and period. If data on more periods are available, dynamic analysis of changes in market share over time is possible. In other words, the following further indicator can be calculated:

- the change in the reporter's market share ($\Delta MS_{r,t1,t2,s}$) from time ***t1*** to time ***t2***, for enterprise ***r*** and market segment ***s***, is

$$\Delta MS_{r,\,t1,\,t2,\,s} = MS_{r,\,t2,\,s} - MS_{r,\,t1,\,s}$$

Producers of FDFs should account appropriately for mergers and acquisitions to avoid spurious breaks in market share time series. Thus, mergers of two (or more) enterprises should be reckoned retroactively.

Change in market share is a particularly significant synthetic indicator, indicating how the enterprise performed in comparison with competitors. In the case of disclosed FDFs, it can also provide insight into individual competitors' changing market share.

Provided that the data set is sufficiently detailed, ie includes a large number of qualifying attributes, even analysis based on the "core" indicators illustrated above can allow for a systematic, fact-based monitoring of the competitive positions of reporting firms.

Of course, an almost unlimited range of more sophisticated analysis is possible, especially with large, detailed data sets. For example, FDFs can make it possible to:

- conduct a fully detailed analysis of the structure of market segments (number – and, in disclosed FDFs, names – of firms present in each market segment, degree of concentration in the industry/market, etc);
- define competitors' operational profile by identifying the market segments in which they are present and their respective market shares;
- perform more comprehensive studies by combining FDF data with information from other databases, eg information on the structural characteristics of competitors.

2. An application for banks

In the mid-1990s, the Ufficio Italiano dei Cambi (UIC), which, with the Bank of Italy, is jointly responsible for the compilation of Italy's BOP, began producing electronic FDFs specifically for resident banks (IMF, 1995). The source of data consists of reports on cross-border settlements executed on behalf of customers, which banks themselves provide to the UIC for BOP purposes. Two products have been developed. The first one (UIC-MAS) is an

undisclosed FDF designed for all resident banks, while the second (UIC-FIRMA) is a disclosed FDF that addresses only the largest (approximately 150) banks. Given the superior information potential of disclosed FDFs, as mentioned above, we shall focus below on UIC-FIRMA.

Banks included in the sample participating in UIC-FIRMA formally consented to having their data fully disclosed to the other participating banks. Data are broken down by reporting bank, period of observation (half-year or year), nature of transaction, Italian province and partner country. As a result, the market segments, as defined above, include such items as: cross-border settlements that banks carried out on behalf of customers in the first half of 2006 in the province of Milan, for goods transactions with China. For each market segment, each bank's market share and rank are indicated. One feature of the product that is particularly valuable is the fact that it provides intuitive graphics that highlight the change of market share in each Italian province. Bank mergers are dealt with appropriately to preserve time series consistency.

The product is distributed semi-annually on CD-ROM, along with an ad hoc user-friendly application for data browsing. A decade after its introduction, UIC-FIRMA has proven to be a highly valued information tool. Banks, especially the largest, use it extensively in various decision-making and management control activities, such as market analysis and budget planning.

The contents of UIC-FIRMA are periodically reassessed with input from users. Feedback from banks indicates that they are mainly interested in monitoring customers' international settlements in the non-financial area, especially goods and services, with a focus on geographical distribution. Apparently, taking market share away from competitors in this particular field of client operations, in a specific Italian province, is beneficial to the bottom line. It can reasonably be assumed that customers executing "large" current account cross-border settlements also have a prominent position with regard to other areas of banking activities.

3. Private uses of public goods

Both banks and non-banking enterprises bear an increased burden in terms of reporting statistics for BOP purposes. Providing feedback data to reporters can serve as a strategy to offset the costs involved. Thus, official statistics are a typical "public good" – costly to produce, and ultimately distributed free of charge. Increasing the quantity/quality of the private uses of this public good, as proposed here, can significantly increase its value for the collective community.

In particular, microeconomic uses seem feasible in the BOP domain, given the relatively detailed information provided. FDF applications for non-banking enterprises seem, in principle, even more promising than banking applications, since competition in the international marketplace is even more crucial for these businesses. Moreover, the potential of FDFs designed for non-banking enterprises would increase enormously if the production and distribution of the data were centralised at a supranational level. For example, a French firm producing domestic appliances would be able to monitor its competitive position in the Dutch refrigerator market not only vis-à-vis other French companies, but also, and more importantly, with respect to competitors in the Netherlands, Belgium, Germany, etc.

In conclusion, FDFs can enhance the relevance and accuracy of statistics in a cost-effective way, given that:

- they may increase the effectiveness of statistics production by broadening the uses of statistics;

- they may help increase the accuracy of statistics, since they can motivate reporters to provide compilers with more accurate figures so that they will receive more reliable data in return, in a sort of "virtuous circle";
- they are relatively inexpensive, since, as a by-product of compilers' main statistics production, their marginal cost is low.

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Increasing respondents' involvement in the statistical process: the experience of the Bank of Portugal in the field of monetary and financial statistics

Luís Teles Dias[1]

1. Introductory remarks

> *"Nothing is more important for monetary policy than good statistics."*
> Alexandre Lamfalussy, 1996

This famous quotation by the former President of the European Monetary Institute and General Manager of the BIS, stressing the fundamental importance that policy-makers attribute to quality in statistics, has not been in any way tarnished by the passage of time. Central banks have to compile significant amounts of data in order to appropriately accomplish their missions. Their statistics are typically the basis for policy decisions that impact the economy and, ultimately, peoples' lives, providing a service to the community as a whole by fulfilling an important part of its statistical data needs. Therefore, nurturing a culture of good practices in central bank statistics, with a focus on delivering high quality statistical products that meet users' requirements is, indisputably, of paramount importance.

Data quality is often perceived by the public at large as simply the degree to which the statistics correctly describe the phenomena they are meant to measure. Central bank statisticians, however, know very well that such narrow interpretation is insufficient to ensure that the quality of the information is suitable for its intended uses. Under a strategy, such as the one adopted by the Bank of Portugal (henceforth, "the Bank"), which is designed to produce statistics that are "fit for use" (ie suited to users' needs), other dimensions of quality – eg relevance, timeliness, accessibility, interpretability and coherence – must appropriately address users' requirements and priorities.

This paper, however, does not attempt to define data quality or its dimensions. Suffice it to say that we recognise established references in this area, such as the Fundamental Principles of Official Statistics adopted by the United Nations Statistical Commission, the IMF's Data Quality Assessment Framework, the OECD's Quality Framework and the European Statistics Code of Practice, to name a few. Instead of exploring this area, the present paper concentrates on the ways in which a relationship of transparency, cooperation and mutual trust with the respondents who provide data can, based on the Bank's experience, positively affect these various dimensions of quality, particularly in the field of monetary and financial statistics.

2. Wise traditions in central bank statistics

The Bank has been involved in the production of statistics for quite some time. It is safe to say that, so far, the statistical data compiled and disseminated by the Bank have met with a

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high degree of satisfaction on the part of the key stakeholders for whom they were intended. In order to meet users' requests and continually assess whether the information collected by the Bank properly matches changes in their data requirements, close contact with the industry is essential.

Indeed, the quality of the Bank's statistics must be credited, to a certain extent, to the Bank's long-standing policy of actively working with its data providers and fully exploring the possible synergies and mutual benefits of such partnerships – as opposed to a more conservative, or reactive, stance towards respondents. From its inception, this approach has proven to be beneficial.

Good practices include ensuring:

(i) that respondents are thoroughly informed about the reasons why the statistical information is being collected, and the expected uses for the data;

(ii) that the data to be collected from respondents, as well as the practical aspects of reporting, are unambiguously set forth in the Banks' reporting instructions, and that these are complemented by a handbook highlighting elements of a more operational nature (eg, technical specifications for data transmission, linear constraints and consistency tests that can be applied to the data being reported, a number of practical examples meant to facilitate response, and even some bridging tables, tentatively aligning the statistical categories in the reporting scheme with the particular respondent's accounting framework);

(iii) that the Bank provides assistance to respondents (through specific training courses, when called for), so that the time and effort required for them to collect data are kept to a minimum;

(iv) that when the situation requires (eg persistent non-compliance with reporting requirements), the Bank promotes high-level bilateral meetings with respondents to discuss the issues and try to find mutually satisfactory solutions;

(v) that the Bank assumes an informal commitment not to change statistical requirements for a given period of time (typically a 5-year period), thus guaranteeing stability in the reporting scheme.

3. Paving the way for further enhancements in data quality

After the Bank's Statistics Department[2] was created 10 years ago, the Bank's relationship with respondents experienced a remarkable boost.

As a result of this institutional change, a single entity (the Statistics Department) was charged with responsibility for statistical processes that previously had been scattered among different departments of the Bank. This resulted in:

(i) *Streamlining of existing statistical processes* to make more efficient use of available resources, while improving the quality of the statistics. One important outcome was the creation of the Integrated System of Securities Statistics, designed to replace three previously existing systems.

[2] Formerly, the Bank's core statistical functions (eg balance of payments statistics and monetary and financial statistics) were located in the (now defunct) Research and Statistics Department. Other departments of the Bank, however, were also involved in the compilation of statistics.

(ii) *Elimination of redundant data requests* by using alternative sources of information available at the Statistics Department. As a result, the statistics on the distribution of bank credit by region, type of economic activity and certain highly detailed breakdowns by institutional sector, began being compiled on the basis of Central Credit Register data, making it possible to discontinue reporting of this information by the monetary financial institutions (MFIs), which serve as reference reporters for monetary statistics purposes.

(iii) *Regular and systematic cross-checks on the data* submitted by respondents, through so-called overall consistency exercises. These are designed to evaluate the overall accuracy of the information reported for statistical purposes, comparing data from the various sub-systems (eg monetary statistics, securities statistics, balance of payments statistics, financial accounts statistics and Central Credit Register data).

These developments had a major impact on the quality of the Bank's statistics. The first two factors helped lessen the burden on reporters, and led to more efficient use of available resources. The overall consistency exercises, while delivering obvious gains in data accuracy, had an additional noteworthy effect – one that was neither deliberately intended nor entirely expected – on the respondents' internal processes. Faced with the need to justify discrepancies in the data submitted to the Bank for various statistical purposes, respondents (especially larger ones) took the initiative of reorganising their own reporting procedures, particularly by creating stronger links between the different areas contributing to the report and, in some cases, through new organisational arrangements to deal with statistical reporting in an integrated way. Among other interesting outcomes, this led to:

(i) further improvements in data accuracy and conceptual compliance, enhancing the quality of the statistical information reported to the Bank;

(ii) respondents being much better prepared to discuss with the Bank's statisticians any data developments requiring explanation.

Exogenous factors also played a major role. Particularly important were advances in information and communication technologies, which:

(i) allowed for statistical processes to be automated, both at the Bank and among respondents, which in turn facilitated the introduction of computerised data validation and enhanced quality control;

(ii) provided the opportunity for the Bank to develop special computer applications for voluntary no-cost use by respondents – supporting, among other things, preliminary validation (IT tests, coherence and inter-temporal plausibility tests) designed to prevent basic reporting errors, with a view to further facilitating the reporting of statistical data;

(iii) made it possible to change from a reporting scheme based on physical delivery of data (eg on paper or diskette) to a much more efficient electronic reporting system based on an extranet type of communications infrastructure (BPnet) implemented by the Bank. The exchange of information through the BPnet system includes sending and receiving files, messages and documents, along with mechanisms to implement computer-to-computer solutions through an inter-applications dialogue for the exchange of files and messages.

As one would expect, these developments had a very significant impact on the efficiency of the data submission process, and further eased the reporting burden on respondents.

4. Fostering more active involvement by respondents

The above developments were important in enhancing the Bank's credibility with respondents. Nonetheless, a central bank can never afford a complacent attitude concerning the statistics for which it is accountable. The economy is constantly changing. To remain relevant, economic statistics must keep up with the speed and scope of these ongoing changes. The increasing demands for comprehensive, detailed and high-quality statistical data, stemming from Portugal's Economic and Monetary Union membership, suggested that additional steps would have to be taken to maintain – and, if possible, raise – the high standards already achieved with regard to the Bank's statistics.

To deal with new challenges to the Bank's ability to maintain the quality of its statistics in a shifting and more demanding environment, the Bank decided to expand its relationship with respondents by promoting their involvement in the statistical process beyond areas strictly associated with the compilation of statistics – especially by involving them, at a conceptual level, in the development of new types of statistics.

Intuitively, one could argue that, since statistics are essentially compiled from data originating in the respondents' own information systems, it makes sense to join efforts with reporting agents when developing new types of statistics or dealing with changes that need to be made in existing statistics. This could be expected to facilitate convergence toward a data collection method that would be feasible to implement and methodologically sound and efficient, while addressing the need to keep the reporting burden on respondents at an acceptable level.

Other arguments for involving respondents more deeply in the conceptual stage of the statistical process include the following:

(i) *Respondents are also data users*, which means that they have a vested interest in the development of new statistics. The Bank's experience suggests that this interest is not merely theoretical. For instance, some years ago, when the Bank was considering whether to stop collecting data on the geographical distribution of MFIs' credits and deposits, the respondents persuaded the Bank against taking that decision, since the aggregated statistics compiled from these data were useful to the industry.

(ii) *Respondents' participation may help to increase the accuracy of the initial statistical assessment* that usually follows the emergence of a new data requirement. The Bank's assessment traditionally starts with statisticians analysing the extent to which the data already available at the central bank meet users' needs. When, as frequently occurs, the Bank data are deficient, it is sometimes helpful to have a precise idea of the quantitative significance of the new requirements (when the empirical importance of the phenomenon under scrutiny is unclear) to see whether it is reasonable or not to go ahead with the process. Clearly, lack of collaboration with respondents can impede this quantitative evaluation, or even render it unfeasible. Moreover, tentative identification of the most efficient and sound statistical approach to data collection can visibly benefit from respondents' involvement – eg through discussing possible approaches to statistical data collection and assessing whether it is feasible and efficient in terms of meeting the information requirements.

    The Bank's long experience provides abundant evidence of the mutual advantages resulting from a well-established relationship between statisticians and respondents. One interesting example is the classical trade-off that statisticians face between achieving greater granularity in statistical requirements and minimising the burden on respondents. Intuitively, one would expect that requesting more comprehensive data would go against the respondents' interests (in that this would presumably increase their reporting burden), and that they therefore would not willingly opt for more aggregate data. Yet, when the Bank discussed this issue with respondents, it

was clear that they favoured the opposite view. From their perspective, it is easier and less costly to report detailed data than aggregated data. A similar situation occurred in terms of the frequency of the data to be reported. Having a reporting scheme with different frequencies – which involves extra work for the Bank's compilation systems – is also undesirable from a respondent's perspective.

(iii) *Respondents are better positioned to provide an accurate assessment of the costs related to their data reporting obligations.* For those requirements considered technically feasible and relevant, implementation and maintenance costs, both for respondents and for the Bank, need to be assessed and compared with possible benefits. The need to involve respondents in evaluating data reporting costs is obvious and indispensable.

To increase the effectiveness of the relationship between statisticians and respondents throughout the conceptual phase of the statistical process, the Bank opted to create temporary groups of experts wherever possible and necessary. The groups include Bank statisticians and a sample of respondents representative of the potential reporting population, as a means of addressing the technical issues involved in setting up new reporting schemes. The groups are intended to be flexible in the way they operate, and to provide rapid response to any technical problem arising from the development of new statistics, thus facilitating decision-making.

Another crucial factor in involving reporting institutions in the statistical process is the feedback that the Bank provides them, based on the data they have submitted. Individual indicators that make it possible to calculate market share or rankings in specific market segments are recognised by the reporting institutions to be an extremely valuable support to their business decision-making process. The respondents' assistance in shaping the indicators is essential if it is to serve them well. Indeed, in 2000, when the Bank decided to form a monitoring group with representatives of both the Bank and the reporting institutions (and/or their associations) in order to closely monitor the Bank's Central Credit Register and propose possible expansions of its scope, feedback indicators were one of the first issues to be addressed. Creating this monitoring group has proven to be an extremely successful initiative, even in seemingly steady-state situations. Based on the positive outcome of the experiment, the Bank has already approved the creation of similar entities for other statistical domains.

5. Concluding remarks

The combined advantages of cooperative interaction between statisticians and data providers have proven to be a key factor in improving the quality of monetary and financial statistics at the Bank of Portugal.

The Bank's approach to building its data compilation systems deliberately addresses both users' and respondents' concerns, and this has been a vital element in generating high-quality data despite very demanding deadlines. It has also significantly changed the way in which statistical reporting obligations are perceived by respondents, who, instead of perceiving them as an unavoidable and costly burden, view them as a procedure that can be beneficial for their businesses.

The relationship with providers – an essential factor in the quality of financial statistics in Russia

Ekaterina Prokunina[1]

Introduction

Data quality is a key criterion for evaluating official statistics in any country. According to the IMF data quality assessment standard (DQAF), this criterion implies not only having an adequate legal framework for the collection of statistical data, using internationally accepted data compilation standards and making data accessible to users, but also ensuring that initial data are accurate and reliable. The latter depends to a great extent on the effectiveness of cooperation between data-producing agencies and reporting entities, on respondents' understanding the importance of the information requested, on their familiarity with the data compilation methodology used and on their recognition of the need for the timely provision of data.

This paper analyses the Bank of Russia's recent experience in expanding the coverage of monetary and financial statistical data and establishing cooperation with insurance companies and non-government pension funds for the purpose of compiling data based on a survey of financial corporations, pursuant to the requirements of the IMF Monetary and Financial Statistics Manual (MFSM-2000).

Quality prerequisites for individual data used in compiling monetary and financial statistics

The Bank of Russia is the official agency responsible for compiling monetary statistics in Russia. It has full legal powers to require credit institutions to provide the data needed for this purpose. The law governing the Central Bank of the Russian Federation (Bank of Russia) gives the Bank the power to request and receive information from credit institutions on their activities, to demand explanations on the information and to establish compulsory accounting and reporting rules. The law also empowers the Bank of Russia to impose sanctions for failure to comply with reporting requirements, including the revocation of banking licences in cases of significant misreporting.

In compiling monetary data from data provided by the banking sector, the Bank of Russia, like other central banks, has relied on the monthly balance sheets of credit institutions as the main source of data for monetary statistics. To ensure the reliability of the data collected, the Bank of Russia:

- establishes mandatory rules that govern reporting from credit institutions, as well as the compilation of the information reported. These rules regulate the methodological and organisational aspects of data compilation and submission, including definitions, algorithms, links within the reporting form and with related data, point of contact and procedures for providing information in case of misreporting;

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- discusses drafts of new reporting forms and changes in existing ones with the banking community, and conducts pilot tests with a sample of respondents;
- develops the software package that credit institutions use for the compilation, monitoring and electronic transfer of data to the Bank of Russia;
- conducts on-site inspections of credit institutions to verify the accuracy of their reports;
- holds seminars and conferences to explain reporting requirements to credit institutions.

Also important is the fact that the Bank of Russia organises the collection of reports from credit institutions through its branches in the regions where credit institutions are registered and supervised. There is reason to believe that this practice, along with the measures described above, ensures the necessary cooperation with respondent banks, and helps them maintain the quality of individual data used to compile monetary statistics.

Analysis of capabilities for collecting data from other financial intermediaries

As a result of the sustained growth of the Russian economy's financial sector, including banks and other financial institutions, the Bank of Russia found itself having to cover a wider range of respondents in order to further implement the MFSM-2000 principles and compile financial sector survey data. As an initial step, it selected insurance companies and non-government pension funds as the most rapidly growing institutions – entities whose liabilities were likely to include elements affecting the money supply.

The first challenge was how to obtain the necessary data. For this purpose, the Bank of Russia studied the legal and institutional environment and the resources available. As mentioned above, the law empowers the Bank of Russia to request and obtain necessary data from banks. It also has the right to request and receive necessary information from the nation's federal bodies and other legal entities free of charge, for the purpose of compiling monetary and balance of payments statistics, and for analysis of the country's economic situation. This does not mean, however, that these organisations are obliged to provide statistical data to the Bank of Russia, as we shall see.

In contrast to the Bank of Russia, the authority of the agencies that regulate the activities of financial intermediaries (the Federal Insurance Supervision Service for insurance companies, and the Federal Financial Markets Service for non-government pension funds) is limited to compiling information from these institutions obtained as a consequence of their supervisory functions. They also are subject to financial constraints, since all activities of federal bodies, including those relating to information needs, are financed by the federal budget. Since the main functions of the above-mentioned agencies are supervisory, they have no responsibility to obtain information relating to macroeconomic financial statistics.

Thus, the Bank of Russia was obliged to take action itself through its regional branches, in order to obtain and process the necessary data from other financial intermediaries.

To evaluate financial corporations' ability to compile and submit the necessary data, the Bank of Russia requested the top 100 insurance companies to complete a form providing a table of assets and liabilities broken down by financial instrument and economic sector, along with comments on the data.

This study allowed the Bank of Russia to determine in what direction to proceed in order to obtain the necessary individual data, specifically: (1) what methodology to require for break-downs of assets and liabilities by sector; and (2) what legal framework was needed to

compel insurance companies and non-government pension funds to report the data that the Bank of Russia requires to compile financial statistics on a regular basis. The latter proved crucial, given that insurance companies had refused to report to the Bank of Russia on a voluntary basis (only 29 out of 100 insurance companies provided the data requested for the study).

Initial experience of cooperation with financial institutions in obtaining information for the financial sector survey

Confronted with insurance companies' reluctance to report data, the Bank of Russia drafted reporting forms for insurance companies and non-government pension funds, based on the results of the survey. After gaining the approval of the relevant supervisory authorities, the proposed forms were sent to the Federal State Statistics Service (Rosstat) for approval. On 9 August 2005, Rosstat issued Resolution No. 61, which approved these forms and required insurance companies and non-government pension funds to provide the data specified on the forms to the Bank of Russia on a quarterly basis, beginning with the 2005 reports. Pursuant to established procedure, the resolution was published, and the Bank of Russia began internal preparations for collection and processing of the data.

The publication of the resolution provoked an unexpectedly strong reaction. The National Insurers Union (NIU), Russia's largest association of insurance organisations, publicly voiced its objection to the decision requiring insurance companies to report to the Bank of Russia. The NIU argued that the relevant supervisory authority already had all of the necessary information, and that providing additional information to the Bank of Russia would increase insurance companies' costs and lead to a rise in insurance rates. The NIU urged the Bank of Russia to hold consultations with the insurance community to explain why the new data collection form was necessary.

This reaction revealed a serious flaw in the way the Bank of Russia had laid the groundwork. The Bank had concentrated all of its efforts on obtaining approval of the new reporting forms from supervisory authorities and Rosstat, and had made no effort to contact non-banking financial institutions, or to brief future respondents on the plans. To address the problem, the NIU created a working group that included representatives of the NIU-affiliated insurance companies, the Bank of Russia, the Federal Insurance Supervision Service and Rosstat. The Bank of Russia's participation in the working group, and the constructive discussion that took place, helped resolve the pressing issues involved, including the following:

- the insurance community recognised the importance of data collection for macroeconomic decision-making;
- the parties agreed on the specifics of compiling data for the first reporting period (2005), which included the use of expert valuations when necessary internal data were lacking;
- the participating insurance companies familiarised themselves with the Bank of Russia's procedure for receiving and monitoring the reports provided.

The working group's protocols and decisions were soon placed on the NIU website.

This cooperation with respondents, in the framework of the working group, was successful, as it led to the settling all of the parties' differences and ensured effective data collection for 2005. The results for this year were satisfactory: 91% of the registered insurance companies and 88% of the registered non-government pension funds submitted reports to the Bank of Russia.

Specific forms and methods of cooperation with financial institutions in obtaining information for the financial sector survey

The procedure established by the Bank of Russia for insurers and pension funds to report information for the financial sector survey is based on existing procedures for collecting data from credit institutions. Thus, the insurance companies and non-government pension funds report to the Bank of Russia branches in the regions where they are registered, and use the same data preparation and transmission facilities as credit institutions. However, the specifics of the Bank of Russia's regulations on collecting data from banks and other financial intermediaries imply specific approaches to collecting data from insurers and pension funds, as well as to the priorities designed to ensure the quality of the data received.

Thus, the Bank of Russia is now devoting greater attention to the provision of information, and to providing methodological support for the data compilation and transmission process. A special section of the Bank of Russia website, "Reporting by Other Financial Institutions", provides:

- instructions for the compilation and submission of data by insurance companies and non-government pension funds, and for their cooperation with the Bank of Russia's regional branches;
- answers to methodological questions by reporting institutions concerning the completion of reporting forms;
- electronic templates for insurance companies and non-government pension funds, with initial data control functions and user instructions;
- the list of insurance companies reporting quarterly (selected on a "cut-off-tail" basis).

NIU capabilities are also used to provide up-to-date information to respondents and to maintain contact with them. The Bank of Russia provides the NIU with all of the information it needs for its website. In addition, in the framework of the above-mentioned working group, under the aegis of the NIU, the Bank of Russia organised discussion of projected changes in the reporting methodology, when the need for changes became apparent in the course of the 2006 reporting process. We believe that preliminary discussion of such changes with reporting institutions is useful and should be regarded as an indispensable element in ensuring high-quality individual data.

Another important aspect of collaboration with respondents is providing them with the results of the processing and analysis of the data collected. Once it had summarised the results of the 2005 data collection, the Bank of Russia disseminated analytical and statistical material through its official publication, the Bank of Russia Bulletin, and on its website. This includes consolidated data on the banking system and other financial intermediaries, in the form of a survey, as well as separate information on the assets and liabilities of insurers and pension funds disaggregated by financial instrument, currency and economic sector. Made public for the first time, this information drew a positive response from market participants.

Another important point in collecting data from other financial intermediaries is to adopt a more flexible approach to data reporting dates, as well as to the data correction necessary to achieve completeness and to optimise the quality of data. Specifically, the Bank of Russia decided to allow financial intermediaries to report after the end of the established collection period, ruling that reports could be accepted by its regional branches and sent to the central office within three working days following the reporting deadline, or could be sent with the reports provided on the next reporting date. If errors are discovered when the Bank of Russia verifies reports, corrected reports may be provided for the current reporting period or for any of the last four quarters. In terms of its relations with insurers and pension funds, the Bank of Russia has made it clear that it will not sanction them for non-reporting or late reporting, leaving it primarily to its regional branches to ensure that there is the required coverage of respondents and timely reporting.

Conclusion

This paper analyses the experience of the Bank of Russia in creating a database for the compilation of monetary and financial statistics in compliance with international standards. The experience shows that efforts by the compilers of macroeconomic statistical data to ensure high-quality information can succeed only if they are accompanied by measures to build an effective relationship with respondents. We hope that the Bank of Russia's approaches to cooperation with reporting institutions will prove useful to other central banks as well.

High quality data and collection systems through active communication with data providers

Debra L Gruber[1, 2]

Introduction

Thirty years ago, the United States banking system was structured by restrictive laws. Hence, it was relatively straightforward to identify data reporting responsibilities for each type of reporting entity. Financial products were fairly routine, leading to non-complex reporting systems. Over the years, as laws were changed and innovative financial products developed, data reporting has become far more complex. It has become imperative to form partnerships with reporting entities. Discussions of market practices, new financial products, maintenance of static data systems, potential burden associated with proposed accounting rules and changes in reporting are a few examples of information that lay the foundation for effective report form designs and reporting requirements. Our experience is that reporting entities are dedicated to submitting high quality data. Most data reporting problems are the result of requirements that are unclear or that force reporters to implement overly complex systems or manual workarounds, making for systems that are far too costly to implement and maintain. Effective communication brings these issues to light, and many of them can be addressed while continuing to meet users' needs. More importantly, data quality improves, because data can be compiled more effectively.

Building relationships

Open and productive communication is a key to strong relationships with reporting entities. We start by explaining the need for the particular data items that are to be reported, and how they will be used. We also discuss how other data collections fail to provide the necessary data. Proposals for collecting new data items are shared with reporting entities for comments and suggestions. In some cases, the reporting community's suggestions will not produce the data that are needed. Often, however, their suggestions can be implemented. Suggestions tend to focus on aligning reporting requirements with internal management reports and other agency reporting. Reported data that can be used to create internal management reports are far more likely to be of superior quality.

Enlisting the reporting entities in the creation of reporting forms and in changes to current reports creates a powerful alliance. When senior managers of reporting entities participate in the design process, they become more committed to the changes, and to ensuring that the appropriate resources are available for timely implementation. Another positive result of reaching out to reporting entities is an environment where they are comfortable reciprocating. They provide information on new financial products and business lines before implementation is complete, in order to obtain reporting guidance.

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[1] The opinions expressed here are the author's alone, and should not be attributed to the Federal Reserve Bank of New York.

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Another relationship-building tool that we use is our written feedback to senior management within reporting entities. Letters of thanks for high quality data help to reinforce sound procedures, controls, and review mechanisms that have been implemented, while reporting entities that have submitted lower quality data appreciate feedback because it helps them focus their resources to correct problems, and enables them to justify requests for additional resources to implement changes.

We find particularly large and complex organisations to require more in-depth relationships. Large financial institutions tend to be the result of numerous business combinations and changes. Therefore, preparing reports almost always involves multiple manual adjustments and, hence, errors. Over time, reporting entities come to realise that their only way to control the process is to build an integrated system with centralised static data (eg master customer files, securities databases, etc.). When this occurs, we work with them, emphasising that many of their peers are doing the same thing, and that we understand that though this is a multi-year effort, it is the only road to the control that both they and we want to achieve at a reasonable cost. We then have regular checkpoint discussions to monitor progress and ensure that technical points are being thought through correctly.

Data variance discussions

Active discussions are held with reporting entities to discuss questionable data in their current reports, as well as variances between report dates. Trends over time are also reviewed and discussed. Lastly, when reasonable, we compare data items across report forms. The goal is to formulate a story that explains data movements to our users, while perhaps providing insight into future data changes.

We strive to understand the business strategies and changes to the client base that have led to data anomalies. Understanding a reporting entity's business strategies helps to reduce questions, and enables analysts to focus their attention on truly unusual data fluctuations. Providing reporting entities with fewer, more targeted questions is a critical aspect of our strategy. This method enables reporters to conduct more in-depth research on questionable data items, and has led to uncovering systemic problems, the remedying of which improves data quality. The data quality improvements may go far beyond the report that gave rise to the question.

Correspondence

We ask reporting entities to pose questions – especially complex questions – in writing. We encourage this more formal communication because of the greater likelihood of misinterpretation in telephone conversations, especially when information is being relayed to individuals subsequent to the conversation. Our policy is to respond to written requests in writing, which provides a permanent resource in addition to reporting instructions. Frequently Asked Questions (FAQ) documents are maintained in addition to instructions. Common issues that arise from specific reporting entity questions are added to the FAQ as they arise.

Training

Regardless of how well reporting instructions are written, they do not replace face-to-face discussions of reporting requirements. The Federal Reserve Bank of New York (FRBNY) staff devotes a significant amount of time to various forms of training each year, including

formal seminars. About 200 people attend in person, and hundreds more attend via Internet webcast. Small training groups are conducted for reporting entities with similar reporting structures and responsibilities. One-on-one training is conducted to meet the specific needs of individual reporting entities. Problems discussed are followed up in monthly telephone conferences where we discuss the status of outstanding issues and the timeline for resolving them. We emphasise to our analysts that preparing training materials is a key to demonstrating their understanding of the fine points of the reporting instructions – a critical job standard.

Report change process

The Federal Reserve Bank of New York collects a wide range of data to support monetary policy, bank supervision, and the creation of international accounts. Our largest, most complex reporting entities are typically required to file hundreds of reports each year. To ensure that our reporting requirements reflect active data uses and needs, and to reduce unnecessary or duplicate reporting, our Office of Management and Budget (OMB) requires a comprehensive review of each report every 3 years. In addition, when we identify a burden, we act as an advocate to reduce reporting and eliminate inconsistencies.

In conjunction with the formal 3-year review, we must formally announce changes (or absence thereof) through a Federal Register Notice (FRN). When the FRN is issued, any entity or individual can submit comments related to the report that is on notice. All comments are reviewed and addressed by the agency responsible for the report. Each comment and the response to it are included in the final published FRN.

Although formal communication channels are in place, we believe strongly in discussing possible changes with the reporting community before the FRN is published. These conversations either confirm that our changes can be implemented, and that the data can be reported without undue burden, or lead to adjustments in the details of the reporting changes. In both cases, the conversations lead to higher quality data while meeting users' data needs. The conversations also produce further insights into how reporters' back office systems are integrated, as well as the process used to compile data for reporting.

Instruction clarifications

At times, reporting guidance provided in written instructions needs to be clarified due to changing market terminology, or because original instructions were unclear. If reporting requirements are not changing, instructions may be updated without going through the FRN process. Reporting entities that specialise in the area of the instructions being clarified, or entities that found the original wording of the instructions confusing, are requested to provide comments on draft instructions.

Conclusion

Active communication takes many forms. Whether a communication is initiated by FRBNY staff, as in the case of training and report proposals, or by reporting entities, as may occur through correspondence, the resulting dialogue gives both parties an opportunity to learn, and to improve data quality. Building relationships with reporting entities leads to open, two-way communication. Open communication in turn leads to obtaining detailed information, which ultimately produces higher quality data.

Requesting voluntary data from non-financial corporations: the experience of the Banco de España CBSO

Manuel Ortega[1]

1. Introduction: voluntary collaboration, a challenge for the Banco de España CBSO

In 1984, the Banco de España, in collaboration with other public and private institutions (Ministry of Economy, Ministry of Industry, Spanish Entrepreneurs' Association and a number of regional universities), decided to create a Central Balance Sheet Data Office[2] to improve knowledge of the non-financial sector of the economy. In creating the CBSO, incomplete studies on the results of Spanish non-financial corporations being conducted by the above-mentioned public and private institutions were discontinued.

A strategy of direct contact with major large non-financial corporations was defined, based on:

- ***Use of information (annual accounts) provided directly by non-financial corporations***: A questionnaire was designed in the context of the existing legal accounting framework and the language normally used by companies, ie their annual accounts (balance sheet, profit and loss account, cash flow, notes to the accounts, etc). However, some items in the questionnaire (employment, etc) – required as the data are used for various types of research – are beyond the scope of accounting issues.
- ***Confidentiality/voluntary nature of requests***: Requests for information from the reporting firms was not based on any legal obligation, but on persuading firms that reporting was in the common interest of both the firms and the Banco de España. The information obtained is thus never published on an individual basis, in accordance with an agreement with the corporations to treat their data confidentially.
- ***Reciprocity***: In exchange for its cooperation, each company was provided with specific information on the company, the sector in which it was active and other matters.
- ***Direct contact***: Telephone contact with reporting firms was considered essential in the confirmation process, in order to ensure the quality of the data. Thus, company managers are contacted directly by phone each year to clarify the information provided to the CBSO.
- ***Public dissemination of results***: Given that other related information collection activities were discontinued with the creation of the CBSO in 1984, the Banco de España assumed the obligation of making its databases available to the general public – in aggregate form only, in order to preserve the confidentiality of the data. Individual company data are widely used internally by several of the Bank's departments (Statistics, Supervision, Regulation, Operations and Research).

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[1] Head of Central Balance Sheet Data Office (CBSO) Division, Banco de España.

[2] The CBSO is one of the two divisions of the Statistics and Central Balance Sheet Data Office Department, which is a part of the Directorate General of Economics, Statistics and Research at the Banco de España.

Since 1984, the number of companies contributing to the initial database, known as the CBA (see Chart 1.1), in which large corporations are over-represented, has grown to nearly 9,000 firms, accounting for over 30% of the economy's GVA. At the same time, other databases have been created at the CBSO to provide a more complete picture of the non-financial corporate sector:

- In 1990, an agreement was signed with the Ministry of Justice to use information derived from accounts required to be filed with the Mercantile Registries, known as the CBB database (see Chart 1.2). With the addition of these data, the CBSO began to acquire more extensive information on small companies and the service sector. By 2004, the CBB was maintaining data on approximately 450,000 small firms.
- In 1994, the CBT database was created, based on a quarterly survey. The results of the survey are published in the Banco de España's quarterly Economic Bulletin in April, July, October and January (see http://www.bde.es/cenbal/informes/cbqr.pdf). The CBT is currently collecting information on approximately 1,000 large companies.
- In 1998, the CBA (covering medium-sized and large companies) and the CBB (for small companies) were merged to create what is known as the CBI database. A grossing-up process is used to obtain data that are meaningful from a National Accounts perspective. These are used by our Department as one of the sources for producing the financial accounts of the Spanish economy, in line with the CBSO's primarily statistical orientation.

Summary charts

1. Coverage

Chart 1.1

Number of CBA corporations and coverage

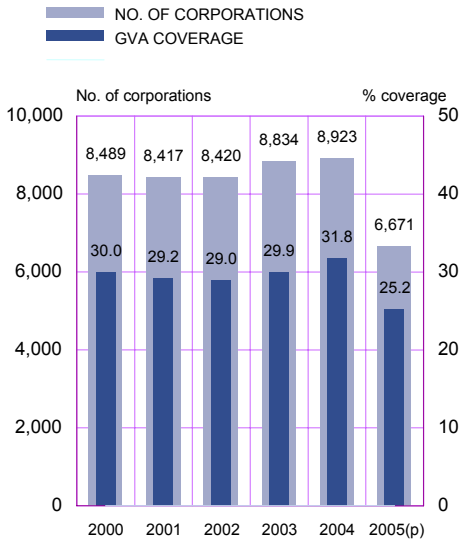
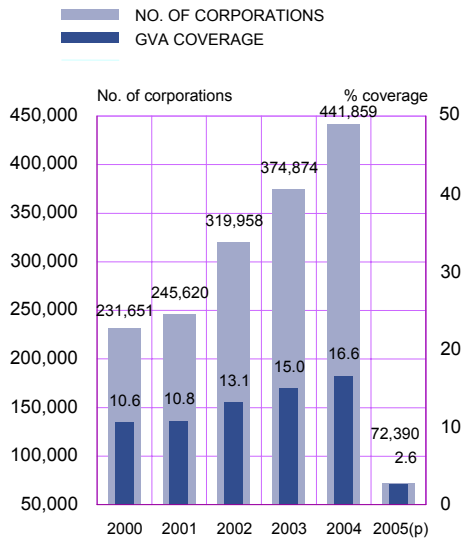


Chart 1.2

Number of CBB corporations (small) and coverage



Source: Banco de España (Central Balance Sheet Data Office).

As mentioned above, these databases have become important for various uses, both within the Banco de España (risk assessment, economic indicators, financial stability analysis, monographic reports on sectors of activity, etc) and externally, through regular publication of

non-financial Spanish firms' annual and quarterly results, and provision of aggregate data to the respective regional governments on the performance of non-financial corporations in their region. The main challenge of the Banco de España's CBSO over the past 23 years has been that of obtaining data from contributors. Section 4 of this paper focuses on the information that reporting firms receive in return for their cooperation – most importantly, the individual reports that compare each company's activity with overall activity in its sector, thus providing them key information. While the absence of any legal obligation for firms to provide data to the CBSO is a handicap, it also functions as an incentive for CBSO staff to find new services they can provide to the companies.

2. Reducing the reporting burden: the right to request needed information

Statisticians and other users of non-financial corporations' annual accounts are under pressure to reduce the reporting burden that their activities place on companies. The Brussels European Summit of 20-23 March 2003 mandated that we perform our work in ways that gradually reduce this burden to the lowest level possible – which, in the opinion of some (the reporting companies) could even be zero.

Provided that we are seeking necessary information – ie neither more nor less than what is required to produce the statistics that government needs – we can exercise our right to obtain the information. This right is clearly established in European legislation. Corporations whose shareholders enjoy limited liability are obliged to publish their financial statements (see Fourth Council Directive of 25 July 1978: paragraph 2 of Introduction, and Section 10, which deals with publication). On this basis, the population of non-financial enterprises in Europe can be divided into two large blocks:

- Those business owners liable, to the extent of their total wealth, for losses arising from their productive activity, ie all sole proprietorships and a small minority of corporations.
- Those engaged in productive activity through a corporate body, thus limiting their liability to the equity they have invested in the company,[3] so that their personal wealth remains beyond the reach of the company's creditors.

For firms in the second category, there should be presumed to be an obligation to provide information to clients, suppliers, employees, lenders, tax authorities, statisticians and others, since publication of their financial statements is a corollary to the limited liability they enjoy. More than 95% of the total population of non-financial corporations, which account for nearly 80% of the European economy's total employment (see Table 1), benefit from limited liability. It should be noted that quoted corporations constitute a negligible proportion of the total number.

[3] Here, we refer principally to: the Aktiengesellschaft, the Kommanditgesellschaft auf Aktien and the Gesselschaft mit beschränkter Hafturng in Germany and Austria; the société anonyme, société en commandite par actions and société de personnes à responsabilitié limitée in Belgium, France and Luxembourg; the aktieselskaber, Kommanditaktieselskaber and ampartsselskaber in Denmark; public companies limited by shares or by guarantee, and private companies limited by shares or by guarantee, in the United Kingdom and Ireland; the societá per azioni, societá in accomandita per azioni and societá a responsabilitá limitata in Italy; the naamloze vennotschap, the besloten vennootschap met beperkete aansprakelijkheid in the Netherlands and the sociedad anónima, sociedad en comandita por acciones and sociedad de responsabilidad limitada in Spain.

Table 1

2003 data

Non-financial enterprises in Europe (9 countries)[1]	Agents		Employment[2]	
	Number	Percentage	Number	Percentage
All legal forms	10,785,372	100.00	38,442,981	100.00
Personally owned	5,995,513	55.58	8,172,856	21.26
Corporations	4,789,859	44.41	30,270,125	78.74
of which, quoted corporations	3,816	0.04	na	na

[1] Data available for Denmark, Finland, non-financial corporations Italy, Luxembourg, Norway, Portugal, Spain, Sweden and United Kingdom. [2] Data not available for United Kingdom.

Source: Eurostat and European Securities Exchange Statistics.

3. Reducing the reporting burden on companies: making do with less, and finding other means to obtain what is needed

Granted the right, in principle, to request needed information from non-financial corporations, the moral obligations of the requester (ie our obligations) should be defined. A sort of "Ten Commandments" should be applied to new survey projects. Some of these "commandments" are questions that requesters should ask themselves; others are general requirements. All would certainly help reduce the reporting burden on companies. They are as follows:

- Is this the minimum information we need?
- Is this information available from another public source?
- Is there any redundancy involved in the information request?
- Is there any possibility of collaboration among different information requesters, so as to create synergies and reduce overlapping demands?
- Have we given consideration to the way in which information is to be prepared by the corporations?
- If the information is available in the corporations' computer systems, have we asked software vendors to ensure that the data can be obtained directly through the companies' accounting software packages?
- Do we have a proactive approach to promoting the use of harmonised electronic solutions such as XBRL?
- Finally, do we have a proactive approach that ensures that we provide sufficient feedback to non-financial corporations in exchange for their efforts?

Which of the following approaches, then, should be taken to reduce the reporting burden?

- Requesting less information than is necessary.
- Verifying whether the information being requested is necessary, making it easier to file our questionnaires, and reducing the cost for companies without sacrificing valuable data.

The Spanish CBSO endorses the second option, and has oriented its efforts accordingly in recent years.

4. The reciprocity principle: providing information and services to contributing firms

Probably the best way of demonstrating to reporting firms that their information is necessary, and of addressing our goals while at the same time honouring our obligation to reduce the reporting burden, is by first, and most importantly, disseminating the results we process to the reporting firms.

As mentioned in the first section of this paper, the CBSO is committed to the interests of non-financial corporations that voluntarily provide data. Aggregated results are disseminated not only to the general public without charge, through the Banco de España website, but to the individual reporting firms themselves, which are provided annually with individualised studies that compare their figures with aggregate benchmarks. At the same time, firms are given access to a hotline where they may request all public statistical data available at the Banco de España. Following is a brief summary of how the individual study has changed over the last 23 years:

- In 1991, the statistical charts and ratios were reduced from more than 40 pages to 20, with a reduction in ratios from 44 to less than 20.
- Also in 1991, the time series analysis was limited to the last 5 years. Some tables were removed and replaced by summary charts.
- In 1995, selection of aggregated figures was made more accurate by identifying sectors of activity at the 4-digit NACE level, rather than the 3-digit level, and since then companies have been compared only to others of comparable size (small/medium/large).
- Beginning in 1997, a software package was provided to non-financial corporations so that they could select their own aggregates for comparison and print their individual studies.
- Since 1999, two files with detailed information on each firm's sector of activity and size have been provided to the firms prior to producing the benchmark study. Reporting firms can choose between "all companies available" and the "best" companies in the aggregate (in terms of profits).
- Although the Banco de España does not provide reporting firms with a performance assessment, a new graphic approach was developed to show the companies where they are positioned in relation to their competitors (statistical distribution).

The two charts below illustrate this new approach, which provides less information, but more suited to its purpose.

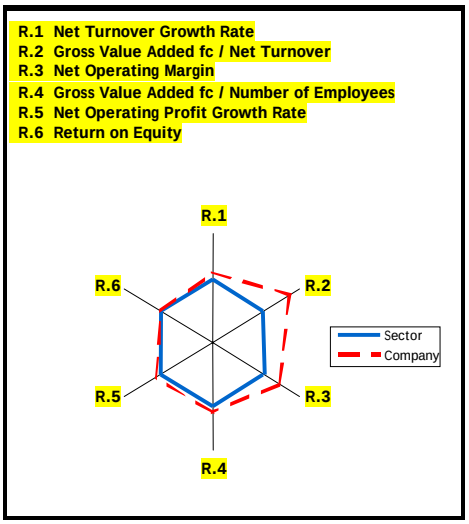
In summary, after 23 years of collaboration, the widespread voluntary cooperation of Spanish non-financial corporations is a reality. The positive experience that has resulted is based on the ongoing investment made to provide better studies in exchange for this cooperation, and on our efforts to increase electronic exchange and harmonisation (the Spanish XBRL Association is hosted by the Banco de España). Our perseverance in approaching corporations every year to collect their data and request their collaboration has undoubtedly been an additional contributing factor.

Summary charts

2. Individual study (example of charts provided)

Competitive situation

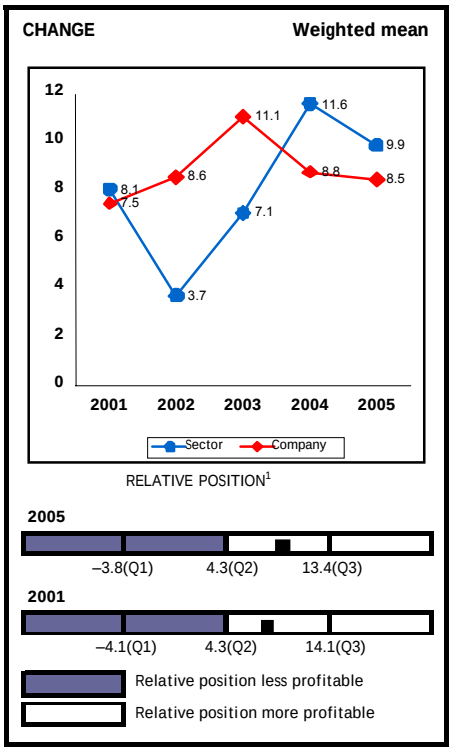
Company, Sector, Year 2005[1]



[1] Sector values (median of statistical distribution of individual ratios) are represented in the hexagon vertexes. Company values are represented on the vertexes of the irregular polygon: the further away from the inside hexagon they are, the better the company's situation in comparison with the sector.

Net turnover

Growth rate



[1] In the quartile distribution of the sector.

The OeNB's experience cooperating with information providers on Austria's new balance of payments system

Michael Pfeiffer and Patricia Walter[1]

1. Introduction

In January 2006, the Oesterreichische Nationalbank (OeNB) switched to a new system for compiling the Austrian balance of payments. Specifically, this involved shifting the reporting population away from financial intermediaries towards financial and nonfinancial corporations, households and public authorities engaged in foreign transactions. The OeNB's decision to introduce a direct reporting system, rather than continuing to compile cash data on payments, represents a growing trend in Europe today, triggered mainly by the introduction of the euro and by the strong increase of in-house cash centres run by subsidiaries.

Historically, nonfinancial corporations in Austria, unlike the so-called MFI sector, did not regularly report to the central bank. Yearly direct investment surveys and quarterly reports on external accounts were exceptions. When developing the concept, four years ahead of the intended date of implementation, the OeNB therefore placed special emphasis on establishing solid channels of communication with firms classified in the nonfinancial sector of the Austrian economy. This paper describes the communication concepts chosen, and the experience of introducing the new balance of payments system, a project that was divided into three phases, namely (i) a planning phase; (ii) a rollout phase; and (iii) a stabilisation phase.

2. Planning phase

The leitmotif that the OeNB's board of directors put in place to guide the transformation of the Austrian balance of payments system was "to make reporting as easy as possible" for firms. The OeNB's balance of payments division was asked to search out potential institutional synergies, and to make the utmost use of available register and administrative data. The OeNB's efforts to keep the reporting burden to a minimum were considered a precondition for achieving high response rates and ensuring the soundness of reported data within the new compilation framework. Another prerequisite for establishing close cooperation with reporting agents to ensure sound results was a strong ongoing commitment on the part of the OeNB to the confidentiality of individual data – efforts that were focused on the statistical input. However, the planning phase was also meant to raise reporting agents' awareness of the central bank's statistical tasks, and of the national and individual benefits that official statistics provide.

To achieve these objectives, the OeNB pursued two different organisational approaches during the planning phase. First, it took advantage of established contacts with selected

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Austrian firms to carry out on-site tests as a means of ascertaining how well existing accounting records conformed with the statistical requirements imposed by international standards. Second, the OeNB committed itself to cooperating closely with the Austrian Chamber of Commerce. This resulted in the creation of different working groups, including representatives of the central bank, business lobbies and firms, to review statistical, fiscal and accounting standards. A case in point was the two working groups established at the Austrian Association of Insurance Companies, which drew on the expertise of the Austrian Financial Market Authority.

As an institutional prerequisite to implementing a direct reporting system in Austria, the OeNB concluded a master cooperation agreement with Statistics Austria, the national statistics institute (NSI). By combining the expertise of Statistics Austria in documenting real transactions with the OeNB's expertise in documenting financial transactions, the OeNB was able to capitalise on synergies in the field of external statistics, including harmonisation with the national accounts, the use of varied NSI data sources, and making use of well-established NSI contacts with the non-financial business sector. This master agreement is supplemented by a contract for compiling information on services imports and exports – a subject on which the NSI collects data from nonfinancial companies, while the OeNB collects such data from insurance companies and banks.

The efforts of the planning phase resulted in enactment of the 2004 foreign exchange law. Unlike former legislation, the new law gives the OeNB the same legal status as the NSI as regards the use of statistical information and of register and administrative data. The law also mandates the confidentiality of individual data. Two reporting regulations adopted in association with the law specify individual reporting items, periodicities and reporting dates, and designate terms and concepts. In accordance with the OeNB's leitmotif, reporting agents may choose from a range of reporting media, and the central bank has assumed responsibility for carrying out comprehensive calculations and estimations on its own account, in order to make the greatest possible use of accounting records, as well as fiscal and supervisory information. Finally, to minimise the reporting burden for Austrian firms, a set of samples validated on the basis of type of transaction and business sector was created.

3. Rollout phase

The legislative foundation for the new Austrian balance of payments compilation system was created without undue delay, and without domestic political or lobbying resistance. The OeNB attributes this to the transparent and cooperative approach taken. The next stage was the rollout phase, which was aimed at informing the reporting population in a comprehensive and pre-emptive manner, in order to minimise friction during the actual transition period. Here again, the OeNB attached great importance to communicating the national, as well as individual, benefits of the balance of payments statistics. Since the BOP division holds a yearly balance of payments press conference on behalf of the OeNB, the available data were edited specifically to answer questions on how foreign trade affects the national welfare, Austria's international competitiveness, and the advantages that its location gives it as an industrial power – from a national, regional and sectoral perspective.

This information campaign was primarily targeted to the general reporting population, taking the form, most commonly, of a series of lectures in all of Austria's regional capitals, given by statistical experts from the OeNB and Statistics Austria. Outside advisers, as well as the OeNB's public relations department and regional branches, were involved in organising these events. The 2004 series concentrated on communicating the reporting requirements for compiling the financial account, while the second series, one year later, dealt with the compilation of the current account, focusing on the survey of firms designed to elicit information on services imports and exports.

To complement the lecture series, the OeNB created a website designed to answer any questions on the new balance of payments system. Besides the legal fundamentals, the website provided a preview of what were then the new electronic reporting media. The website itself was designed to be incorporated in the OeNB's general balance of payments website once the transformation was complete. Response to direct questions was also facilitated, through a hotline service supported by the statistics experts at the OeNB and Statistics Austria. In addition, the OeNB created a newsletter to keep reporting agents informed about progress during the countdown to the introduction of the new system on 1 January 2006. The general part of the rollout phase was completed with advertisements in major national and regional newspapers, and with briefings for journalists.

Along with the general portion of the information campaign, however, there were special events targeting the various economic sectors individually. Statistical experts from the OeNB and Statistics Austria gave lectures at the different branches of the Austrian Chamber of Commerce; articles were published in various professional journals, ranging from regional media and chambers of commerce, to the trade newspaper of the Austrian electricity industry. Further efforts by the OeNB were designed to produce multiplier effects among professionals such as accountants, tax consultants, financial auditors, lawyers and notaries. Firms providing special software solutions for reporting purposes in Austria were also briefed in detail, and on-site consultations were offered for firms subject to reporting obligations vis-à-vis either the OeNB or Statistics Austria.

Evaluation of the rollout phase suggests that there were definite benefits from personal contacts established with reporting agents, that learning was stimulated on both sides, and that transparency and understanding were furthered. In addition, the networking between the balance of payments division and other departments of the OeNB, as well as its networking with the Austrian media and other institutions, was instrumental in ensuring the success of the information campaign. During this phase, both of Austria's statistics providers, the OeNB and Statistics Austria, recognised and committed themselves to the growing importance of close communications with reporting agents and with the general public, as a major prerequisite to the cooperation envisaged. Inevitably, there were some problems, the most important of which were the high cost to the OeNB, in time and effort, of organising a nation-wide information campaign, and the sometimes limited success that it had in reaching the target audience. Focusing communication efforts on specific target groups may be superior to broad-based initiatives, but it inevitably generates follow-up expenses for consulting and support services.

4. Stabilisation phase

At present (early 2007), the OeNB is finalising the balance of payments statistics for the first reporting year of the new compilation system. Overall, the transition may be described as a success. For example, Statistics Austria concludes that the introduction of the new survey on services imports and exports was quite effective in terms of the number of respondents and the plausibility of the initial results. Both institutions attribute the positive experiences to the enormous efforts to communicate with firms, directly or through intermediaries. Data from before the first revision of the reporting year 2006 are stabilised by means of recalculations, reconciliation of hybrid data sources (eg for travel), and continued work to increase the plausibility of the model's assumptions and configurations. On the insurance company side, a service agreement modelled on the master cooperation agreement with the NSI is currently being concluded with the national Financial Market Authority.

A second important element of the stabilisation phase is feedback to the reporting population, in order to ensure continued high-quality data in the future. The OeNB is organising regular events with different respondent groups, varying the events according to

the type of economic sector and report involved. Besides providing an opportunity for dialogue on the development of technical applications and on the revised list of annotated terms and concepts, this should set the stage for providing detailed figures for Austria's balance of payments to economic and reporting agents, and for discussing data plausibility issues with them. When the previous settlement system was in effect, the OeNB developed this type of framework – particularly for communicating with the nation's banking sector. The OeNB's experience shows that offering such feedback to information providers encourages an appreciation of the individual benefits of official statistics, and highlights joint responsibility for the quality of the statistics.

The additional reporting costs that the new compilation system entails for firms is justified, arguably, by the improved quality of statistical results, which better reflect economic trends, are more closely comparable with international statistics and the national accounts, and provide additional detail. The result is improved data, not only for economic analysts and researchers, but also in providing comprehensive data relevant to firms' commercial objectives. Already during the rollout phase, the OeNB has seen evidence of such increased utility to users, and it considers the cooperation with the Austrian Chamber of Commerce of vital importance in this respect. Both institutions intend to conclude a master cooperation agreement and provide mutual support. This should not only assist the OeNB in communicating with firms as reporting entities, but also facilitate cooperation for commercial events such as the export initiative "Going International". Thus, information regarding data needs is shared, while access to individual data is obtained.

The OeNB in general, and the balance of payments division in particular, have a long-standing tradition of communicating detailed statistical findings. In accordance with the leitmotif of the OeNB – namely, being "a competence centre for financial data" in Austria – the OeNB supports the general public as well as researchers and firms in interpreting the data, and offers various services such as press conferences, communication via the Internet, and the Statistics Hotline. In the coming years, the OeNB will strengthen these activities as part of its long-term strategy to be a competence centre for Eastern European countries ("Going East") and advance the cause of financial literacy in Austria. For businesses, special analyses will be provided on regional market share, international competitiveness, export opportunities and the attractiveness of Austria as a business location, furthering close links between the central bank and other actors in the economy. Different statistical, register and management data will need to be combined to provide this information. Under the 2004 foreign exchange law, the OeNB can make use of these data, as can the NSI. Given the continuing firm commitment to the confidentiality of individual data in Austria, the opportunities for general publication of commercial analyses are limited.

The aim of enhancing the services offered by the OeNB is in line with a trend seen today in international organisations such as the IMF and the OECD, as well as among the world's national statistics agencies, institutes and central banks. The steadily growing data needs of the modern information society are increasing the costs of compiling statistics, both for compilers and for economies. The quality of individual reports, and hence of macroeconomic data, can be assured only if individual entities perceive official statistics as useful. A concrete example is the use of balance of payments data by Austrian consultants in connection with an export initiative. A working group was created by the Chamber of Commerce to study the export potential of knowledge-based services. The group includes representatives of the OeNB, Statistics Austria, the Ministry of Finance, the Ministry of the Economy, and the country's economic research institutes. The OeNB has supported the work by providing detailed information based on historical time series. The new balance of payments data facilitate much more detailed analysis of services exports. Also, the necessary legal foundations have been laid to enable the OeNB's in-house experts to cooperate with outside researchers in developing special models to explore the above-mentioned export potential of knowledge-based services. This Austrian export initiative by consultants illustrates the mutually complementary information needs of statistics producers and economic agents, and

demonstrates the practical basis for official statistics activities today, while highlighting the growing integration of users and respondents with statistics agencies.

Conclusions

It appears essential for official statistics agencies to be service oriented vis-à-vis reporting agents, and to assert their regulatory authority as little as possible. It is of paramount importance – although sometimes difficult and time-consuming – to convince firms of the benefits that can accrue to them from reporting high-quality data in a timely fashion. Accordingly, the OeNB will continue and increase its efforts to foster extensive dialogue with the reporting population, in order to optimise data results while keeping reporting burdens to a minimum.

Relationship with survey data providers: the Bank of Thailand's experiences[1]

Chatwaruth Musigchai[2]

Introduction

The Bank of Thailand (BOT) collects various economic and financial data by conducting surveys. Indeed, during recent years, surveys have played a major role in the BOT's data collection. The BOT conducts most surveys on a voluntary basis; thus, feedback from providers and an emphasis on mutuality and building trust in relationships with providers are key to satisfactory response rates and high-quality results. This paper discusses the BOT's responsibilities in this area, and offers an overview of its data collection survey activities, as well as describing some of the major concerns encountered during the survey process, which include the lack of a proper legal mandate, data inconsistency due to high staff turnover among providers, lack of incentives for providers to cooperate, etc. Concerns from respondents' perspectives are also described. These include burdens and resource constraints, data sensitivity issues, etc. Some strategies employed to strengthen and enhance mutual communication and relations with data providers are also discussed in detail. These cover matters such as on-site company visits, seminars and more informal events for providers, data confidentiality, etc. The concluding section outlines the BOT's future plans, which focus on increasing the efficiency of surveys through a relationship-building programme with key data providers, and options to address the problem of the lack of a legal mandate.

The role of the Bank of Thailand in data collection

One of the interesting features of statistical data collection in Thailand is our decentralised system. While the National Statistics Office (NSO) is endowed with full authority to conduct population censuses and demographic exercises, and the National Economic and Social Development Board (NESDB) is responsible for collecting data on social and selected economic variables, the Bank of Thailand (BOT) collects economic and financial data that are not compiled by any other agencies, or that are compiled with different data scope and coverage. Economic and financial statistics are available from several sources, including government records (eg trade data from the Customs Department), foreign exchange settlement data (ie the International Transactions Reporting System, or ITRS), data from monetary and financial institutions (MFIs), and reports from government organisations, including surveys on private non-financial enterprises.

As the country's monetary authority, the BOT has full access to MFI data, as well as to data on private companies engaging in foreign exchange-related transactions. At present, data collected from MFIs are submitted electronically to our internally developed Data Management System (DMS), while data pertaining to State enterprise and government sectors can be obtained from various full-coverage reports. However, the BOT's legal

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1 The views expressed herein are the author's and not necessarily those of the Bank of Thailand.

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mandate does not extend to financial data disclosure and submission from other private non-financial enterprises for statistics compilation purposes. This significantly affects our data collection practices, making these data very difficult to obtain, and hence requiring other collection approaches, such as surveys.

The Bank of Thailand's surveys

Since the financial crisis of the 1990s, the BOT has given increased attention to the availability of comprehensive, timely and reliable financial and economic statistics. There is an increasing demand for detailed data on a non-consolidated intra-sector level, and for industry breakdowns. Moreover, with all of the international guidelines to be implemented – eg the IMF's Special Data Dissemination Standard (SDDS) and the Report on the Observance of Standards and Codes (ROSC) – it becomes a major challenge for the BOT to comply with these standards. In addition, existing data collection approaches must be able to accommodate such requirements without compromising the detail, quality and utility of the data.

In recent years, there has been a clear overall shift towards a survey-based methodology in many countries. This is because surveys offer compilers an alternative data collection approach that, if properly designed, is more cost-effective, less burdensome for reporting agents and more able to meet demands for increasingly detailed data. Before the crisis, most BOT surveys focused principally on real sector statistics, such as survey series on agricultural and manufacturing products. Later, with financial liberalisation, some important economic and financial data became more difficult to obtain, and several surveys were conducted to assess these gaps. Lack of a proper legal mandate in relation to the non-financial business sector, however, obliges us to conduct our surveys on a voluntary basis. Some surveys are designed to obtain position data on financial account variables – eg the International Investment Position (IIP) Survey and the Survey on Foreign Investments Through Resident Custodians, Brokers and Sub-brokers – while others aim to capture "qualitative" or "opinion" types of data as input for the construction of selected economic indicator series (eg the Business Sentiment Survey). Some ad hoc surveys are also carried out on special topics. Examples are the Household Survey on Savings Behaviour and Financial Services, which is conducted in conjunction with the National Statistics Office.[3]

Concerns from respondents' perspectives

As most of our surveys on the non-financial sector consist of voluntary reports, maintaining constant two-way feedback and communication, and building relationships of mutuality and trust with data providers are key to satisfactory response rates and high-quality results. Each BOT survey form has a supplemental section for additional comments by respondents. These comments point to several concerns that providers have with our surveys. One of the major complaints relates to data sensitivity. Since most of the data sought tend to be difficult to obtain and rather sensitive, they are generally viewed as being outside the scope of the Central Bank mandate, and respondents sometimes hesitate to provide the data. This issue is quite clear, especially in some survey series involving financial position data (eg the International Investment Position Survey).

[3] For a more detailed summary of the Bank of Thailand's data collection surveys, please see the attached table.

Providers also complain about the complexity of the questionnaires. In fact, the BOT has designed the survey form carefully to make it easy to understand. Nevertheless, most of the surveys do involve complex financial and economic variables, and require some basic understanding of economic concepts.

Providers also mention time and resource burdens. Extra resources must be allocated specifically to fill out the questionnaires (staff, budgetary resources, new software, etc). In addition, some providers complain of short deadlines for completing the form. This concern is particularly evident in surveys with relatively high frequency, such as the monthly survey on Business Sentiment.[4]

Concerns from the BOT's perspective

As mentioned earlier, the primary concern that has arisen for the BOT in relation to surveys is the institution's lack of legal mandate to collect information directly from businesses for statistical purposes. Proper regulations authorising the BOT to collect data for statistics is crucial for economic surveys, since it would enable the institution to assess and examine records, protect the confidentiality of the information reported and facilitate the publication of data, while allowing us to utilise our resources more efficiently.

Even, however, in the case of some Thai statistics compiling agencies that are in fact endowed with a full legal mandate to enforce data disclosure from businesses, response rate nevertheless remains, at times, far from 100%. A number of surveys conducted by Thai government agencies enjoy a full legal framework, but still achieve rather modest overall response rates. Investigation reveals that non-response tends to be due to the burdens imposed and to light sanctions for non-compliance, while the authorities are not allocated sufficient resources for intensive follow-up measures or hotline assistance.

We also find that providers sometimes lack incentives to cooperate, due to a lack of awareness of the significance of their contribution. Survey results suggest that, especially in some of the BOT's monthly survey series,[5] a mere 30% of providers, on average, are willing to complete and return the survey form to the BOT by the deadline, leaving the overdue remainder to be dealt with through follow-up phone calls, fax reminders, etc. The response rate has proven significantly lower for survey series involving greater data sensitivity and more complex questions.

Frequent turnover of provider staff also affects the consistency of our survey results. This is the case, for instance, in the Survey on Business Sentiment and in the Hotel Survey. The BOT would need additional time and resources to establish relationships with new provider staff, and to offer them appropriate training.

Possible solutions and strategies to strengthen relationships with data providers

The BOT places great emphasis upon strengthening relationships with providers. Our experience indicates that face-to-face communication facilitates survey work. Accordingly,

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[4] Interview with staff members of the Real Sector Statistics Team, Data Management Department, Bank of Thailand.

[5] Interview with staff members of the Real Sector Statistics Team.

the BOT has spent significant time and resources on enhancing the relationship between compiling personnel and providers, and makes regular visits to companies providing data, both in Bangkok and in provincial areas.

On-site company visits are not only an opportunity to get to know our providers in person, but also give us insight into what kind of economic data and information we could potentially collect from each provider, and whether the provider is capable of providing the data we seek. We also become familiar with their views on the Thai economy and business conditions, and learn what kind of economic data/reports they are interested in receiving from us. Sometimes we bring them complimentary items as a token of our appreciation for their considerate and consistent support in providing data.[6] Also, during visits compilers answer questions from the providers regarding the survey forms. This on-site visit strategy is quite a significant contribution to our survey work, especially when we plan to launch new surveys, pre-test new forms, or need to identify new providers of data for existing surveys.

As for data sensitivity and confidentiality, we emphasise strongly that all data collection is conducted strictly for internal use and academic purposes, and that only aggregate data are published. Statements confirming this appear clearly on the front cover of each BOT survey form, and before each survey an official letter is sent, explaining the need for data collection, the type of data being collected, the frequency of the survey, etc, along with supplemental explanatory notes and guidelines for completing the questionnaire. Ultimately, providers trust in the institution's provisions regarding confidentiality and publication.

We also arrange comprehensive staff training sessions on a regular basis to ensure that each staff member can carry out the survey work efficiently. The training programmes address both "technical" and "soft" skills. The technical skills centre on the details of questionnaires, how to complete the forms, and the basic economics knowledge required to complete the questionnaire. The "soft" skills involve how to approach providers, conduct company visits, handle phone conversations, and follow up with automatic fax reminders, etc. Each year, the performance of the staff involved is assessed, based partly upon providers' satisfaction as reflected in feedback and internal surveys of BOT data users gauging user satisfaction.

We offer providers the convenience of different data transmission channels. There has been a clear shift away from traditional channels such as hard copy and fax, towards electronic transmission channels (eg email or uploading of survey forms to the BOT website).[7]

From time to time, we also grant special privileges for consistent providers. This consists of special services to facilitate providers' requests for specific data, foreign exchange control matters, economic updates and reviews, and even requests for commemorative banknotes on special occasions, among other things.

As for survey form design, we place top priority on minimising the burden to providers. We attempt to minimise the complexity of the questions and make minimal use of technical terms. The questionnaires are continually revised and updated to make them easier to complete, without compromising data quality. Meanwhile, each revised or new survey form is

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[6] In addition, we express our appreciation to consistent responders through commemorative plaque certificates, New Year's cards, diaries, etc, which are sent through the mail.

[7] For more information regarding the BOT's survey forms, please visit http://www.bot.or.th/bothomepage/General/Survey/Survey_T.htm (available in Thai).

pre-tested[8] to obtain feedback prior to implementation. Direct hotline assistance is also available to providers when they have additional questions about completing questionnaires.

The BOT realises the importance of providing a two-way channel for feedback, and considers feedback tremendously helpful. For each survey, aggregate results are compiled and reported back to providers to enhance awareness that their responses are a contribution to the Thai economy, and that survey results can guide them in future operations.[9] The feedback also helps respondents understand that all data must be reported with great care and accuracy, since the BOT uses survey data for economic and monetary policy making, and misreported data can mislead policy makers and ultimately have adverse affects on respondents' operations.

The BOT also devotes very significant resources to hosting training seminars, workshops and, from time to time, a range of informal events (relating to semi-formal topics), both in Bangkok and in provincial areas. The events provide a meeting ground where the BOT and respondents can discuss their data contributions and get feedback from each other. Survey forms, economic developments, our ongoing economic survey work and upcoming plans are all subjects of dialogue. For instance, the recent "Visit BOT" project, conducted at the BOT itself, gave providers a chance to learn about the BOT's responsibilities and operations, financial regulations and foreign exchange controls, as well as providing an opportunity to lunch with the BOT's top executives.[10]

Future developments

As surveys have become more significant tools for the Bank of Thailand's economic data collection, our future plans will place more emphasis on increasing the efficiency of the survey process. There has been much discussion of the fact that survey effectiveness and relationships with respondents could be further enhanced by more intense contact with key data providers. A major focus is on a relationship building programme in which both providers and compilers take a long-term view of data reporting and data, as they learn, face to face, about each other's needs. Such a programme would create an environment in which we interact with each organisation on its terms – eg by using its language and information processes so as to minimise confusion and reporting burden. The programme also provides other benefits, such as addressing the staff turnover issue, effectively dealing with confidentiality concerns through personal communication, etc.

More importantly, the programme to strengthen contact with providers emphasises the development of a standard report format/survey template, along with a dataset related to respondents' data needs, so as to create mutual benefits for compilers and providers. For example, use the of the XBRL[11] reporting format may serve as a solution for both the BOT and reporting agents, by enabling reporters to integrate requests from different authorities into a single application, improving cost effectiveness and contributing to the consistency of

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[8] The pre-testing of a new form is conducted by sending the form to pre-selected major data providers. Sometimes the pre-test is conducted during on-site visits, so that the compilers can answer questions that providers may have.

[9] For more information regarding the survey results and general economic data, please visit http://www.bot.or.th.

[10] Our next get-together event is planned tentatively for late 2007. The main participants will be senior officers from the BOT's data provider companies. The event's major objectives are to strengthen relationships with data providers, monitor their needs, obtain feedback and solicit their views regarding the Thai economy.

[11] The XBRL (eXtendible Business Reporting Language) format provides a standard language for defining and reporting common financial data.

data. Despite the advantages of a standard reporting format and supporting dataset, implementation may encounter problems, in that this will require substantial up-front investment in IT infrastructure. Payoffs, however, should offset such concerns in the long run.

Our future plans also call for addressing the legal mandate issue, for which we have explored several possible solutions. For instance, major emphasis has been placed upon revision of the Bank of Thailand Act (B.E. 2485) to officially assign the BOT the additional role of collecting and compiling selected economic and financial data series. Some proposals for revising the act have been made, and more time is required to complete the process. In addition, we are seeking cooperation from agencies with related missions whose legal frameworks might accommodate our survey exercises. In 2006, for instance, a memorandum of understanding (MOU) was signed by the BOT and the Department of Business Development (part of the Ministry of Commerce) to incorporate our International Investment Position Survey with the MOC's annual direct report form on companies' financial data (under the legal aegis of the Ministry of Commerce). The MOU strengthens the execution of our IIP survey by improving data coverage and lowering operational costs. The possibility of operating under the National Statistics Act (B.E. 2508) has also been given serious consideration, but bringing the act and our survey process into line with each other proved difficult and problematic, as a result of various protocols and the need for a royal decree. Nevertheless, a new draft of the National Statistics Act is in the works, though it would require official approval from the Ministry of Information and Communication Technology. Although the final status of this draft proposal remains unclear at present, the revised legal mandate, if fully approved, would greatly support our future survey work.

Appendix 1:
Overview of the Bank of Thailand's surveys

Areas/ domains	Frequency/ conducted as from	Data collection technique	Population (type and size)	Selection criteria/number of respondents	Elements covered	Remarks
External debt and offshore lending/ deposits	Quarterly/1997	(1997 to Q4 2006) Census (Q1 2007 to present) Cutoff tail	Private non-bank enterprises with external debt (approx. 3,500 firms; company names obtained from ITRS records)	3,500 Companies with over US$ 1 million in outstanding debt, ranked every quarter. 1,700 companies (including approx. 90+% of aggregate population value)	Resident borrowing abroad, foreign currency borrowings from domestic lenders, resident lending offshore, foreign currency and deposits, debt securities held by non-residents.	The survey captures detailed information on outstanding debt, with a detailed breakdown by instrument type, maturity, borrowing conditions and repayment schedule. For bank, government and State enterprise sectors, BOT collects external debt data via direct reports. Transactions data can be estimated from ITRS.
Private-sector International Investment Position (IIP) Survey (Annual)	Annual/2002	(2002 to 2006) Cutoff tail (2007 to present) Census	All private companies with foreign equity participation of more than 1% (approx. 20,000 firms)	Top listed and privately owned companies with high market capitalisation or NAV with foreign shareholdings (min. 35 million Baht for FDI and 10 million Baht for DI abroad). 1,600–2,500 firms (representing over 90% of aggregate population value). 20,000	Stock data on external claims and liabilities of private non-bank corporations, including retained earnings and off-balance sheet items (year-end position data).	Since 2002, the survey has been conducted on a voluntary basis. The initial population was derived from Ministry of Commerce records, with regular updating from other secondary sources prior to each survey. With the help of the legal framework for data reporting by the Ministry of Commerce, the IIP surveys from 2007 onwards will be conducted in conjunction with MOC's annual direct report form on companies' financial data. Transaction data could be obtained from BOP data and/or ITRS records.

Areas/ domains	Frequency/ conducted as from	Data collection technique	Population (type and size)	Selection criteria/number of respondents	Elements covered	Remarks
Private-sector International Investment Position (IIP) (Quarterly)	Quarterly/ Q1 2007	Cutoff tail	Same as in Annual IIP survey	Top listed and privately owned companies (same as in pre-2007 Annual IIP survey). Approx. 500 firms.	Same as in Annual IIP survey, with emphasis on equities (end-quarter position data).	This quarterly supplemental survey will target only the largest companies, with a focus on equity data. Potential candidates for the quarterly survey include selected listed companies and large companies based on FDI and DI criteria. The survey results to be extrapolated to population Q-IIP position data using structure at previous year-end as benchmark, and transaction data estimated from ITRS for period covered by the survey.
Survey on Foreign Investments drawing on resident custodians, sub-brokers and nominees	Annual/2002	Census	All resident custodians, sub-brokers and nominees that are members of the Thai Securities Depository Centre and engage in transactions on behalf of non-resident client accounts	43	The annual supplemental Foreign Investments survey of resident custodians, sub-brokers and nominees collects information on foreign interests in equity and debt securities not captured under the IIP survey.	Since 2003, following the relaxation of BOT's foreign exchange controls, this survey was extended to also encompass other claims of Thai residents abroad, eg offshore assets, Thai investors' holdings of foreign debt securities and debt buybacks, etc. As of 2008, BOT plans to collect this information via direct reports from custodians, sub-brokers and nominees.

Areas/ domains	Frequency/ conducted as from	Data collection technique	Population (type and size)	Selection criteria/number of respondents	Elements covered	Remarks
Business Sentiment Survey	Monthly/1997	Sample survey; fixed sample	Selected establishments registered with Ministry of Labour, Ministry of Commerce, Ministry of Industry and stock exchange (approx. 7,600 firms)	Criteria based on high registered capital and number of employees. Approx. 860 establish-ments.	Harmonised questionnaire on production, business conditions, employment, financial position, etc.	This survey is the continuation of the pre-1997 Commerce and Construction Sector Survey. Survey data are used to calculate the monthly Business Sentiment Index (BSI). Fixed units are preferred, to ensure time series data consistency. Those fixed units that respond poorly, or that regularly fail to respond, will be replaced by new units with similar characteristics, economic contribution and size.
Manufacturing Data Survey	Monthly/1987	Sample survey, random sample	Manufacturing businesses with high value-added in GDP. Names obtained from Board of Investment and Ministry of Industry	Approx. 440 factories.	Production, domestic sales, value added.	Survey is used to calculate Manufacturing Production Index (MPI) and Capacity Utilisation (CapU).
Hotel Survey	Monthly	Cutoff tail, *fixed units*	All major hotels in Bangkok and provincial areas. Names obtained from Thai Tourist Authority)	Major hotels with 4-star ranking or above. 175 major hotels.	Number of rooms, room rate, occupancy rate.	Calculation of Occupancy ratio. Hotel ranking system follows the Thai Tourist Authority's ranking.
Construction Area Survey	Monthly/1985	Census	All government units responsible for registration of construction permits	88	Areas of construc-tion, geographical location, types of buildings.	Data are used to compile Investment Index and Property Price index.

Areas/ domains	Frequency/ conducted as from	Data collection technique	Population (type and size)	Selection criteria/number of respondents	Elements covered	Remarks
Household Survey on Savings Behaviour and Financial Services	Ad hoc/ Q4 2006	Sample survey, fixed sample (by NSO)	All households	Criteria: pursuant to NSO survey, which conducts household sample surveys. Units are selected based on household average incomes & family size, and are partitioned by clusters and geographical locations, with weights assigned to representative units. 12,000 households. (Survey was conducted in 1 quarter)	Household income, expenditures, financial assets & liabilities, savings behaviours. Household response to external shocks such as natural disasters, sharp interest rate fluctuations, etc.	This survey is conducted in conjunction with the National Statistics Office (NSO). The sample includes approximately 40,000 households. NSO divides this survey into four quarters, with approximately 12,000 households surveyed each quarter (approx. 46,000 in the course of a year). Questions are different in each survey period, depending on particular issues of interest to the Bank of Thailand. Ad hoc, but with some plan to repeat every 2 years.
Trade credit	Annual/2007	Cutoff tail, units partially fixed (see criteria)	All private companies conducting import & export activities through Thai Customs Dept. in course of year (51,000 import firms and approx. 28,000 export firms)	The 500 largest firms (fixed) represent over 70% of population value (on both import and export sides), while another 1,000 sample units are partitioned in separate stratifications and are randomly selected. Approx. 1,500 selected samples.	Outstanding data on trade credits, import/export payment method.	Data collected in domestic currency.

Source: Data Management Department, Monetary Policy Group and Money Market Group, Bank of Thailand.

Discussant comments on session STCPM29: The relationship with the providers of information for statistical purposes

R Edwards

Good afternoon colleagues.

It was a pleasure for me to accept the invitation from the Bank of Portugal to participate in this important session – all the more so because of the interesting papers that have been produced for the session. My task is to review the five papers describing the European experience with relationship management.

A number of common themes emerge from the five papers. All recognise the importance of high-quality source data in achieving the ultimate aim of high-quality statistics – or to look at it from the other perspective, in avoiding the "garbage in, garbage out" phenomenon in statistical work.

Central banks typically collect data from providers for one or both of two purposes – prudential supervision and statistics. I will confine my comments to issues involving the second of these.

All of the papers recognise the importance of building and maintaining trust among those in the provider community, and the many ways in which this may be approached have been well described. Critical in this regard is the ability to convince the provider community that its costs in providing the data are justified by the benefits to be derived from the resulting statistics. I want to focus a little on this cost/benefit ratio and on how the five European agencies have sought to tilt this ratio more in favour of the providers. (I should add that the compiling agencies, in so doing, may actually have increased their own costs.)

Initiatives to reduce provider costs

Various initiatives have been taken:

- electronic data reporting/potential use of XBRL
- methodological instructions/alignment to accounting systems
- feedback to respondents/providing assistance
- stability of reporting requirements for defined periods, eg five years (I suspect that this is difficult to honour in practice, and I would welcome participants' views on the subject)
- eliminating redundant reporting requirements
- supporting computer applications
- collecting data at the level of detail best approximating the respondents' accounting systems
- using data from register and other administrative sources
- collaborations/data sharing arrangements – under well-prescribed conditions
- consultation with, and support for, providers
- more generally "making reporting as easy as possible", as emphasised in the Austrian paper.

Initiatives to improve provider benefits

Here the challenges are much more difficult, but the papers provide some interesting examples:

- A number of the papers refer to customised reports to providers containing analyses on issues such as market share – how a particular provider fares in its market segment. The Italian paper is particularly interesting, describing arrangements whereby a provider can compare itself with individual competitor businesses. (Personally, I am surprised that businesses would agree to having their commercial affairs disclosed to competitors, and would be interested in knowing what proportion of businesses agree to this.)
- The Portuguese paper describes the positive benefits that businesses derived in attempting to improve their own management information systems to better align them with statistical reporting needs.

The papers all stress the importance of sustaining excellent provider relationships, and of emphasising voluntary cooperation rather than compulsion. Indeed, it is unclear from the papers whether any legal authority to compel provision of data is ever exercised.

Based on my own past experience, it is clear that response rates would decline substantially if the Australian Bureau of Statistics (ABS) did not have the legal power to compel provision of data, even though that legal power is used very sparingly. Typically, business survey response rates in Australia approximate 90 percent. What sort of response rates are being achieved in European surveys?

Two other issues come to mind from the papers. First – again drawing on my Australian experience – there was a government edict for the ABS to reduce business provider load; the agreement was for a 20 percent reduction over about a five-year period. Are there similar pressures in Europe? If so, how are they being handled?

Second, there is no mention in the papers of business provider load being measured. Each survey form in Australia asks how many staff hours it took to complete the form, and the ABS Annual Report publishes information on total provider hours over the year. Is this active monitoring of business provider load being carried out in Europe? If so, what are the trends? Is provider load increasing, decreasing, or remaining about the same? Is provider load at the level of the individual business monitored?

Thank you once again for the opportunity to comment.

Discussant comments on session STCPM29: The relationship with the providers of information for statistical purposes

Greg Haymes

The topic for this session, "relationships with data providers", is one that I find very interesting. Having presented on the topic at the 2005 ISI conference, I am pleased to learn of the response that this session received from presenters. My remarks here will begin with some broad observations, followed by specific feedback for each presenter.

Any framework that aims to describe and explain certain phenomena can be regarded as a form of art. As markets and institutions evolve, so too must the statistical programs through which we study them. Hence, the art of gathering statistics is continuously changing to include new reporting requirements and tools. Tools include data delivery and manipulation systems, human resource requirements, and, increasingly, the ability to foster healthy relationships with data providers. Through statistics, we are able to point to interesting economic facts, developments, trends, and configurations. They allow us to tell a story and to make decisions. As major compilers and users of statistics, central banks and international agencies are leaders in this art form.

Four fascinating papers from different parts of the world provide a glimpse of a new tool that is emerging in the data compiler's arsenal. Although markets, institutions, and data practices differ among these countries, the link between building relationships and having high-quality data is evident. Whether through holding face-to-face meetings or by ensuring proper methodological support, these institutions are actively pursuing strategies to enhance their statistics.

The New York Fed paper outlines the many forms of communication that it engages in with banking system participants. As one would expect from the most advanced market in the world, various levels of communication are utilized to gather information on market practices and innovations. More in-depth relationships are required for large and complex organizations, while formal correspondence serves to address common data-related issues. I like the idea of sending thank you letters to senior managers for submitting high-quality data.

Although the New York Fed lacks a formal program to enhance relations with large data suppliers, its use of various modes of active communication is thought to be effective. Indeed, the New York Fed's approach to relationship building and, consequently, high-quality submissions, may contain valuable lessons for others responsible for data collection in large and complex financial markets.

The Bank of New Zealand paper discusses how good relationships can improve the accuracy and timeliness of official statistics. It outlines several initiatives taken to improve relations with banks. One involves meeting with respondents face to face to address issues of mutual concern and to emphasize the benefits of supplying high-quality data. A novel approach presented in the paper is to request users, as well as providers, to attend meetings, thus raising awareness of the value to businesses of providing high-quality submissions.

In the future, it would like to formalize its relationship-management strategy. If it proceeds in this way, I would suggest focusing on the four largest banks, which hold 90 percent of total banking assets. We face a similar situation at the Bank of Canada, and we limit our formal Reporting Managers (RM) Program to seven of the largest banks, of which five are headquartered in Toronto and two in Montreal. In doing so, we reduce costs and optimize

outcomes. We also continuously explore ways to deepen our relationships. In September, reporting managers and their staff will be visiting Ottawa to learn first-hand about our data practices.

I found the paper's discussion and illustration of the query process quite useful, but would add a few comments. First, providers often obtain data from multiple systems and, hence, must engage in a certain amount of query activity before delivering the data. Second, in interpreting the statistics, users often make queries regarding certain elements, and that process may lead to another round of queries with the provider.

In its paper, the Bank of Thailand discusses its increasing use of surveys since the Asian crisis. Over the last decade, the central bank has introduced seven new surveys in the areas of balance of payments, non-financial corporations, and household assets and debts. The paper also highlights an international trend to initiate formal agreements with related government agencies. By pursuing such a strategy, the Bank of Thailand is improving certain statistical areas and reducing survey costs. Moreover, these agreements solidify key relationships. Most noteworthy is the support the bank provides to the National Statistical Office for its quarterly wealth survey of 12,000 households.

Mirroring the action taken by the Bank of Thailand, the Bank of Canada signed a Memorandum of Understanding (MOU) with Statistics Canada in 2006 to gain access to its business and household micro data, for research purposes. Indeed, it is interesting to note the Bank of Thailand's longstanding history of surveying non-financial corporations involved in manufacturing, construction, and tourism.

Future work at the Bank of Thailand includes developing a program to build relationships with data providers. If it targets the largest providers, the initiative has great potential. In fact, significant progress has been made in recent years through on-site visits, training sessions, and efforts to change the institution's legal mandate.

The fourth paper, from the Bank of Russia, discusses a valuable experience in the utility of relationships. In particular, it outlines the failure of early attempts to collect data on insurance and pension funds to comply with new IMF guidelines.

The experience began with a pre-test involving 100 of the country's largest insurance companies, more than two-thirds of which failed to respond. As a result, the Bank of Russia worked with the National Statistical Office to establish a data collection procedure. However, Russia's largest insurance association publicly criticized the move. Shortly thereafter, a working group was formed involving all relevant parties. The group provided a forum in which the insurance community could gain a better understanding of the importance of their data in the decision-making process, and through which it could become familiar with the Bank's data collection procedures. In addition, the central bank increased its methodological support to the insurance companies, made certain deadlines more flexible, and decided not to impose sanctions for late reporting. Results have been extremely positive, with its initial survey receiving a 90 percent response rate. When the insurance and pension fund statistics were made public, market participants did indeed appreciate having more information on their respective industries.

The Bank of Russia should be commended not only for taking steps to adhere to international statistical standards, but for sharing its challenging experience, which demonstrates the importance of building relationships with respondents. Moreover, it highlights the need to obtain buy-in and co-operation.

The four papers presented today demonstrate the considerable efforts being made by central banks to communicate with data providers. International organizations and other central banks will learn from their experience.

Future work should continue to explore relationships with government agencies and commercial vendors, particularly in connection with security statistics and household financial data. Through its Financial Soundness Indicator initiative, the IMF is leading the charge in

obtaining certain financial system data. In closing, as data compilers we need to remain vigilant and alert to market developments and to the potential for improving our statistical programs. In the end, advances in the art of gathering statistics will have ripple effects in our economies.

Special Topics Contributed Paper Meeting 31

Accounting for the very rich in household surveys of income and wealth

Chair: Luigi Federico Signorini, Bank of Italy

Papers:

Oversampling of the wealthy in the Spanish Survey of Household Finances (EFF)
Olympia Bover, Bank of Spain

The role of over-sampling of the wealthy in the survey of consumer finances
Arthur B Kennickell, Board of Governors of the Federal Reserve System

How to generate macro data using survey micro data on household wealth
Carlos Coimbra, Luísa Farinha and Rita Lameira, Bank of Portugal

The under-reporting of households' financial assets in Italy
Leandro D'Aurizio, Ivan Faiella, Stefano Iezzi and Andrea Neri, Bank of Italy

Why should inequality researchers care about the rich?
Daniel Waldenström, Research Institute of Industrial Economics

Discussant: Carlos Sánchez Muñoz, European Central Bank

Oversampling of the wealthy in the Spanish Survey of Household Finances (EFF)

Olympia Bover[1]

1. Introduction

One distinctive characteristic of the EFF (Encuesta Financiera de las Familias, or Survey of Household Finances), which follows the example of the SCF (Survey of Consumer Finances) in the US, is that it oversamples wealthy households. The distribution of wealth is heavily skewed; moreover, some types of assets are held by only a small fraction of the population. Therefore, it was considered important to have a sample that would be representative not only of the population but also of aggregate wealth, and that would facilitate the study of financial behaviour at the top of the wealth distribution.

This paper describes oversampling of the wealthy carried out in the Spanish Survey of Household Finances (EFF). This was achieved through a collaboration involving the National Statistics Office (INE), the Tax Authorities (TA), and the Banco de España (BE), employing an elaborate coordination mechanism that enabled the TA's strict confidentiality requirements to be observed at all times. A complex procedure for replacing non-responding households was incorporated in the sample design to ensure oversampling in the final result. Details are given, below, on the degree of oversampling in the final sample and on some practical problems encountered, along with examples of the benefits of oversampling.

2. Designing the sample

Basis for oversampling of the wealthy

Spain has a wealth tax ("Impuesto sobre el Patrimonio"), and the EFF oversampling is based on data from the individual wealth tax files. This is in contrast with the SCF, where a wealth index is constructed by drawing on information about asset income from individual income tax files, since there is no wealth tax in the US. In 1999 (the tax year used in selecting our sample), people subject to the wealth tax in Spain were those with taxable wealth of over 104,000 euros. In 1999, approximately 980,000 individuals (some 700,000 households) filed a wealth tax return.

The wealth strata were defined on the basis of households' percentile positions in the wealth tax distribution. We defined eight strata, which were oversampled at progressively higher rates. Strata 2 and 3 capture slightly less than half of the distribution of taxable wealth. Strata 4, 5 and 6 capture the third and fourth quartiles, except for approximately the last percentile and a half, which fall within the last two strata.

Finally, in Navarre and the Basque Country, there was no oversampling of the wealthy, since the National Tax Office does not maintain personal tax file information for those regions.

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Confidentiality guarantees

The Tax Office is subject to very stringent confidentiality requirements, and is not permitted to release any personal tax information (even in the form of intervals) to anyone, including the Statistics Office. To overcome this problem and allow for wealth tax oversampling while preserving confidentiality, the National Tax Office volunteered to select the random sample itself, following the sample design requirements specified by the Banco de España and the National Statistics Office.

As a result of the collaboration of the Statistics Office and the Tax Office, there is a unique population framework for the sampling: the mid-2001 Regular Municipal Census, in which the units consist of households, as defined by address. With this information from the Statistics Office, the Tax Office constructed three variables for each address, based on both wealth and income tax information. These data served as the starting point for the sampling.

The first variable, the wealth stratum indicator, is based on total household declared taxable wealth, which was obtained by adding up the returns of all relevant household members. The second variable, applied to those filing income tax but not wealth tax, indicates the quartile, in the national taxable income distribution, to which the household belongs. Finally, information on household per capita income was added. The income variables were helpful in the selection of sample replacements (as we shall see below) and in ensuring that households from all income levels were included in the sample. This inclusion was achieved by using random start systematic sampling in an appropriately ordered data frame. Furthermore, the income quartile indicator was used to correct for non-response in large cities. The tax information available at the time was dated 1999, which created a limited degree of mismatch between the two sources.

Sampling

First wave

The sampling design varied for each of the three following cases:

1. Municipalities with over 100,000 inhabitants. For large towns, the sampling was random within the eight wealth strata.
2. Municipalities with 100,000 or fewer inhabitants. For small municipalities, the sampling was based on a two-stage cluster design, with the primary sampling units (PSUs) being selected first, with probabilities proportional to their population. Within PSUs, the selection of households differed according to the number of wealth tax filers in the PSU.
3. Finally, in Navarre and the Basque Country, where no oversampling of the wealthy was possible because the National Tax Office does not maintain personal tax file information for those regions, the sample was selected according to a two-stage stratified cluster design, with six strata defined according to size of municipality.

For reasons of confidentiality, stratum and cluster indicators cannot be provided. To calculate appropriate variance formulas, however, replicate weights are provided instead.

Second wave

The second wave of the EFF was designed as a panel with refreshment sample by wealth strata. The general principles used in the first wave of the survey were followed in the second. Specifically, the aim was to re-interview the 5,143 households that participated in the EFF2002 and to complement them in such a way as to obtain a sample representative of the 2005 population, while preserving oversampling of wealth.

For large municipalities, the refreshment sample required to obtain the desired 2005 sample was selected by wealth strata. For small municipalities there was no oversampling of the wealthy for the refreshment sample. In these cases a two-stage sampling design was performed for the same PSUs used for the EFF2002.

Replacements

Another important aspect of the EFF sample design was the replacement scheme. To preserve the oversampling scheme as much as possible, tightly controlled replacements were chosen. The use of controlled replacements is similar to post-stratification and weight adjustments done within cells when data collection is completed. In our case, having controlled replacements was an important advantage in that, since we had no indication of the wealth stratum to which the sample households belonged, no "directed" effort could be made during the field work, if we discovered particularly low response rates for certain strata.

Specifically, up to four replacements were provided for each household originally in the sample, and these were to serve as replacements for that household only. The replacements selected were the two households immediately above and the two immediately below the household's ranking based on income quartile (for non-wealth tax filers), wealth stratum, and per capita household income. Replacements had to belong to the same income quartile (for those not paying a wealth tax) or wealth stratum as the sample household. This was carried out within municipalities in the case of large cities, and within PSUs in the case of small ones, to ensure that replacements would not be too distant geographically from the original sample household. In some cases this meant that fewer than four replacements (in a few instances, none at all) were available. In Navarre and the Basque country, a more standard scheme was applied, in which a pool of eight replacement households was used, providing potential substitutes for eight sample households (within the same PSU).

3. Non-response

One of the characteristics of wealth and income surveys, due to the nature or difficulty of the questions asked, is a high unit non-response rate.

Could not establish contact (never at home)

The number of households for which the interviewer was unable to find anyone at home (having confirmed with neighbours etc that the household address was correct), despite at least five attempted visits, was very high. The number of these failed contacts as a proportion of the total number of attempted contacts varies with wealth stratum in a way that is not entirely random. Use of multiple residences was considered a possible reason for failure to establish contact with high wealth people during the fieldwork.

Refusal

There is a clear non-random component in cooperation rates – defined as completed/ (completed + refused) – which decrease as we move up the wealth strata, falling from 53.6% to 29.4%. It is clear from this pattern that overall cooperation or response rates are not very informative in the case of oversampling, since they are dependent on the degree of oversampling. To establish some meaningful comparison, we constructed cooperation rates by strata for the 1992 SCF. These cooperation rates for the list sample ranged from 52.6% for stratum 1 to 20.1% for stratum 7.

Adjusting sample weights to correct for unit non-response

To compensate for differential unit non-response, sample weights are adjusted within the cells defined by the various sampling frame variables, including, in particular, wealth strata and income quartiles. Given the above-mentioned confidentiality restrictions, sample and non-response weights are calculated by the Tax Office pursuant to detailed instructions from the Statistics Office.

4. Oversampling, and its usefulness, in the final sample

Degree of oversampling in the final sample

Before concluding, let us examine some figures indicating the degree of oversampling in our final sample.

Overall, slightly over 40% of the households that completed the interview are wealth tax filers (a figure obtained, due to confidentiality constraints, with the assistance of the Tax Office). Furthermore, aggregate tax return information indicates that 0.4% of the population of households hold 40% of total taxable wealth. We would therefore expect to have at most 20 such households in a random sample of 5,000 – an upper bound, since it assumes a non-differential rate of response. In contrast, our sample contains over 500.

In terms of actual net worth in the 2002 EFF data, we calculate oversampling rates at various points in the distribution. The oversampling rate is defined as the ratio of the number of observations actually in the sample for a specific percentile range of the distribution to the number of observations one would expect if the sample were randomly drawn from the population. A progressive oversampling of the wealthy was achieved. Specifically, while for the bottom 50% the rate is less than 1% (0.73%, to be precise), for the wealthiest 1% we have over seven times the number of observations we would have with a random sampling. In between, the rates are 0.94% for the 50th to 90th net worth percentile group, 1.67% for the 90th to 95th, and 2.55% for the 95th to 99th.

Some examples of the benefits of oversampling

We know from the EFF2002 that the wealthiest 10% of households hold 42% of net wealth in Spain, and invest 10% of their financial assets in unlisted shares. However, only 10% of these actually hold unlisted shares. Therefore, in a random sample of 5,143 (which is the size of the EFF2002 sample) we would expect to have 52 households owning unlisted shares, whereas the EFF2002 actually contains 292 such households. In the case of fixed income securities, the expected number would be even smaller, since only 4.5% of the households hold such assets. Hence we would expect around 23 households to represent that group, whereas there were 104 in the EFF2002.

Oversampling is also essential for precision and hypothesis testing in cross-country comparisons of certain routinely reported wealth statistics. For example, the percentage of wealth held by the top 1% is 13% in Spain. The standard error of this figure (with oversampling) is 1.6. If we calculate the bootstrap standard error that would have resulted from randomly sampling the Spanish population, the figure is 5.3.[2] In that case, the 95% confidence interval would be as large as the international variation of 20 percentage points found in the literature.

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[2] Spanish population obtained from the EFF2002 sample and its population weights.

The role of over-sampling of the wealthy in the survey of consumer finances

Arthur B Kennickell[1]

The Survey of Consumer Finances (SCF) is intended to be a survey of the assets and liabilities of U.S. families, but there is a particular need to come as close as possible to representing accurately the full distribution of wealth. To this end, the survey employs a dual-frame sample, one part of which is based on area-probability sampling, with the other using information from administrative data to over-sample people likely to be wealthy. The over-sampling serves two main functions. First, it provides more precise estimates of wealth in general and of narrowly held assets than would be possible with a less-structured sample of larger size. Second, the structure of the over-sample provides a means of correcting for non-response, which is differentially higher among the wealthy. This paper provides a brief discussion of the SCF sample and gives examples of the gains from over-sampling, by comparing estimates and standard errors of estimates derived using the full sample with those obtained by using the area-probability sample alone.

1. Design of the survey of consumer finances

The Survey of Consumer Finances (SCF) is a triennial cross-sectional survey of U.S. households, sponsored by the Federal Reserve Board, in cooperation with the Statistics of Income Division (SOI) of the Internal Revenue Service. Since 1992, data for the survey have been collected by NORC, a social science and survey research organisation at the University of Chicago. The survey began in 1983 and underwent a substantial revision, in both the questionnaire and the sample design, in 1989. Since that time, the survey has changed marginally, usually in reaction to developments in the financial marketplace or in response to measurement problems.

The SCF is designed primarily to collect information on the assets and liabilities of U.S. households, their use of financial services, their employment history and pension rights, as well as their demographic characteristics, attitudes and other characteristics.[2] The survey is widely used to study a range of issues for which wealth and financial data are important. In some cases, such research focuses on the behaviour or experience of individuals, but in other cases the focus is more on overall market outcomes. Because of the range of purposes for which the SCF data are used, it is particularly important that the survey adequately represent the full distribution of wealth in the U.S. Because the wealthiest one percent of households is estimated to hold about a third of all household net worth, it is critical that the SCF pay particular attention to that rarefied group.[3] At the same time, the survey is expected to provide adequate representation of much less wealthy households as well.

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[2] For a review of some highlights of the 2004 SCF and references to technical documentation, see Bucks, Kennickell and Moore (2006).

[3] See Kennickell (2006) for an extended discussion of the wealth distribution in the U.S.

The sample design for the SCF is the most basic foundation for the data collection (see Kennickell (2005a)). The survey employs a dual-frame design, including an area-probability and a list component. The area-probability (AP) sample is selected from a geographically based national frame developed by NORC at the University of Chicago (O'Muircheartaugh et al. (2002)). The AP sample is selected in three stages. At the first stage, areas of the country (metropolitan areas and rural counties) are selected using a stratification scheme to balance the sample along key dimensions. At the second stage, sub-areas are chosen, again using stratification to balance the sample. Households are chosen using systematic sampling from address listings within the sub-areas, such that every household in the overall sample has an equal probability of being selected. The AP sample provides robust coverage of the nation and good representation of behaviours that are broadly distributed in the population. About two thirds of the ultimately completed cases derive from this sample.

The list sample is used to over-sample households that are likely to be relatively wealthy. The basis of the sample is a set of specially edited individual income tax returns developed by SOI, primarily for use in modelling to support tax policy by the Office of Tax Analysis at the U.S. Treasury and the Joint Committee on Taxation of the U.S. Congress, as well as by various other researchers. The individual records contain much of the information that would be present on the forms submitted as a part of the annual reporting of income for tax purposes. The SCF selects observations in two steps. In the first stage, observations in areas selected for the first stage of the AP sample are selected; this is a practical accommodation intended to control costs for the survey.[4] The remaining cases are stratified using a model of wealth conditional on the variables in the SOI data, blending two approaches. One part models wealth as a simple grossing-up of capital income flows. The other part is actually estimated using an anonymised match of sample and survey data for the previous round of the survey. An important detail is that three years of data are used for each SOI case in order to smooth out transitory variations in income that might otherwise distort the estimation of the model. Similarly, the most current three years of data are used in computing both parts of the wealth model. A "wealth index" is calculated for all tax filers by blending the two estimates, and this index is used to classify the cases in the sampled areas into seven strata, which are defined using percentiles of the distributions of the index to ensure consistency of the stratum boundaries over time.[5] Cases within the areas selected for the AP sample are selected using a systematic sampling approach within each stratum. Higher strata are sampled at progressively higher rates.[6]

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[4] Wealthy households appear not to be distributed the same way as population in general (Frankel and Kennickell (1995)). Although a substantial number of unusually wealthy people live in relatively thinly populated areas, they are more concentrated in the largest metropolitan areas than are people in general. Nonetheless, the available evidence suggests that the first-stage selection of list sample cases does not induce serious distortions in the survey.

[5] The sample specifically excludes people who are listed as being members of the *Forbes* list of the 400 wealthiest people in the U.S. According to Kennickell (2006), if the data for this group are taken at face value, they account for about 2 percent of household net worth. However, the Forbes data may have measurement problems that complicate their use. Some of the figures they report are amounts owned by extended families or by charitable trusts controlled (but not legally owned) by a person. SCF data suggest that they also miss some people who are as wealthy as other people included in the list. The argument for excluding this group from the SCF sample is that because such people are typically surrounded with levels of staff intended to keep other people away, they would be extraordinarily expensive to attempt to interview, and the success rate could reasonably be expected to be quite low. Moreover, because these people are so well known, it would be almost impossible to protect their confidentiality without destroying the statistical utility of the data they would provide.

[6] Neither the stratum boundaries nor the sampling rates can be revealed. However, it can be said that the highest three strata correspond approximately to roughly the wealthiest two percent of tax filers.

Only the larger geographic overlap is common between the AP and list samples. Otherwise, selection is entirely independent. Although this independence raises some complications at the weighting and analysis stages, it provides a useful means of examining the list sample's importance to the survey. The remainder of the paper focuses on a few key contributions of the list sample.

2. The contribution of the list sample

The list sample serves two main functions. First, it provides a basis for more precise estimates of wealth in general and of narrowly held assets than would be possible in a less-structured sample without a much larger sample size. Second, the structure of the over-sample provides a means of correcting for non-response, which is differentially higher among the wealthy; thus it provides a means of correcting for non-response bias in wealth estimates.

About 98 percent of SCF cases with at least US$ 5 million of net worth in 2004 derived from the list sample; more than 85 percent of cases with at least US$ 1 million of net worth and about 75 percent of the cases with at least US$ 500,000 dollars came from this sample. Thus, it is clear, in an informal sense, that the list sample adds substantially to analysis that depends on good representation of the upper tail of the wealth distribution. Such a gain might, in principle, be attained if the AP sample were sufficiently large or if there were a reliable way of screening households for their wealth. The efficiency gain will be quantified at a later point.

Virtually all non-mandatory surveys suffer from non-response. If the distribution of outcomes for non-respondents is the same as the distribution for respondents, then non-response has only the effect of reducing the sample size available for analysis – similar to the effect of random subsampling of the original sample. In some cases this may be true, but it is, at least, a questionable assumption in the absence of evidence. In a wealth survey, the sensitivity of the subject and the time cost of being interviewed, for people with complex assets, should be enough to raise *a priori* concerns. For the SCF, there is evidence (Kennickell (2005b)) of complex systematic effects. For example, response rates decline with capital income and rise with age and with amounts of charitable contributions made. In the stratum of the SCF list sample that contains the respondents likely to be the wealthiest, the overall response rate is only 10 percent. The survey has often been criticised for this low cooperation rate. Regrettable as this rate is, the fact that it is known is actually a strength of the survey. Presumably, other surveys also have a similar problem, but absent some means of identifying it, they will fail to correct for an important source of bias in the estimation of wealth.[7] In the SCF, the original frame data for the list sample provide a rich basis to use for adjusting the sampling weights to compensate for non-response.

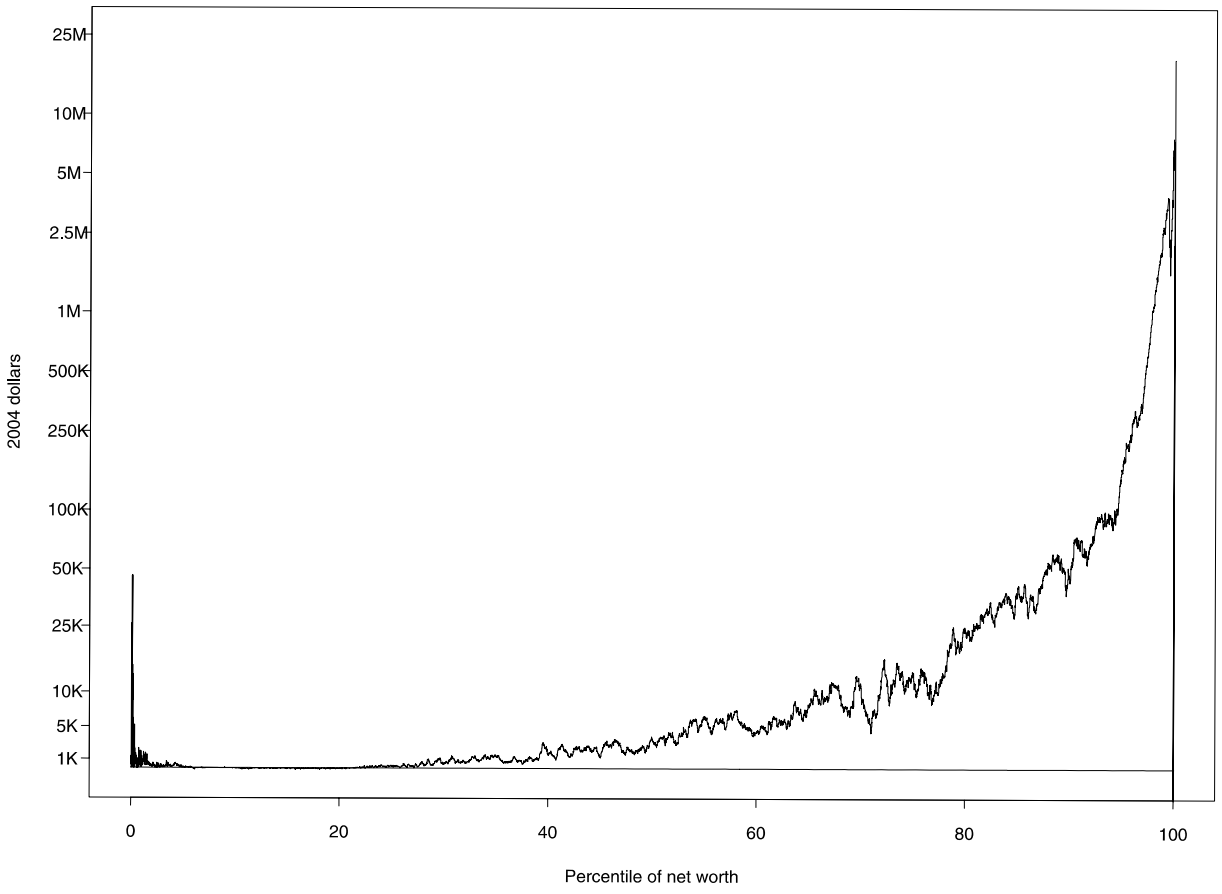
A good sense of the importance of the bias correction is given by the information in figure 1, which shows the difference, at each point in the distribution of net worth, between the distribution estimate using only the AP sample – with weights for the AP sample adjusted using all factors available for that sample – and the distribution estimate using the full sample with the full set of non-response adjustments. For very low values, the addition of the list sample appears to make the distribution become more negative. However, closer examination of the values in this range reveals that the plot is merely reflection noise in that

[7] Because, as a part of its interviewer training and field procedures, the SCF devotes substantial time and money to dealing with cooperation problems among the wealthy, the success rate for other less specialised approaches would likely be lower than in the SCF.

region, with no systematic effect there. From about the 20th percentile upward, the level of net worth at each percentile under the combined AP and list samples is higher than under the AP sample alone. The approximate increase in the level of the wealth distribution from integrating the list sample is US$ 250 (1.9%) at the 25th percentile, US$ 3,500 (3.9%) at the median, US$ 13,600 (4.3%) at the 75th percentile, US$ 43,600 (5.5%) at the 90th percentile and US$ 2,661,000 (74.0%) at the 99th percentile. At the top of the distribution, the list sample fills a niche that is very thinly populated with AP sample cases. By "displacing" the top of the estimated AP distribution downward, the inclusion of the list sample would tend to raise the values associated with lower percentile points. If one "synthetic case" with a weight equal to one percent of the population and a net worth equal to the 99th percentile value under combined samples is added to the AP sample, this is sufficient to approximately reproduce this pattern. However, the list sample does not simply displace the top one percent of the distribution; it also affects the distribution by recalibrating the percentiles of the distribution, inasmuch as it adjusts for under-representation of households in regions below the very top.

Figure 1

Distribution of net worth in 2004, based on full sample minus distribution based on area-probability sample only, 2004 dollars, by percentile of net worth



Source: 2004 Survey of Consumer Finances.

The second benefit of the list sample is that it makes possible more stable estimates of quantities that are relatively strongly affected by the upper tail of the wealth distribution. If the SCF were only concerned with such estimates, it would attempt to sample each dollar of

wealth (or some other such variable) with equal probability. But the survey must serve a number of different purposes, including addressing issues largely relevant to the lower part of the wealth distribution. Thus, the definitions of the list sample strata differ from what would emerge from an optimal stratification calculation based on total wealth. Table 1 shows the estimate of the shares of total net worth held by different groups defined by percentile ranges of the distribution of net worth, along with standard errors for those figures. The estimates are presented for the full sample and for the AP sample alone. The standard errors for the AP sample estimates have been rescaled downward to account for the overall difference in the sample sizes of the two samples. Despite the large difference in the levels of wealth at the top of the wealth distribution under the two samples, the *shares* of the wealthiest one percent are very similar – about one-third of the total. But the standard errors are quite different – 5.1 under the AP sample and 1.2 under the combined samples. The differences in standard errors are less pronounced for other groups, but the standard error under the combined sample is uniformly smaller.

The list sample also makes possible analysis of portfolio patterns that could only be supported by an enormous AP sample, assuming the absence of non-response bias. For example, in the 2004 SCF, only 1.8 percent of households had direct holdings of government bonds (other than savings bonds) or commercial bonds. Out of the approximately 400 cases with such bonds in the combined samples, only about 10 percent of the cases were from the AP sample.

Table 1

Net worth shares in 2004 for various percentiles of the net worth distribution; area-probability sample only and combined area-probability and list samples

Percent

Net worth group	AP sample only			AP and list samples combined		
	Share of group	SE of share[1]	Number of observations	Share of group	SE of share	Number of observations
Lowest 50%	2.9	0.3	1,642	2.5	0.1	1,741
50%–90%	30.9	2.8	1,097	27.9	0.9	1,343
90%–95%	12.9	1.1	132	12.0	0.7	269
95% – 99%	19.7	1.4	109	24.1	1.2	454
Highest 1%	33.6	5.1	27	33.4	1.2	715
All	100.0	0.0	3,007	100.0	0.0	4,522

[1] Standard errors for the area-probability sample estimates are reduced by √3007/√4522 (0.817); see text for discussion.

Source: 2004 Survey of Consumer Finances.

3. Conclusion

Because the sample design for the SCF includes both an area-probability sample and a separate list sample that over-samples wealthy households, it is possible to use the survey to

distinguish the key effects of the inclusion of the over-sample. This over-sampling is shown to serve two main functions: it enables far more precise estimates of wealth than would be possible with a less-structured sample of the same size, and it provides a framework for correcting for non-response, which is differentially higher among the wealthy. A manifestation of the correction for non-response bias is the progressively higher estimated level of wealth corresponding to points in the distribution from below the median to the top of the distribution of wealth.

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How to generate macro data using survey micro data on household wealth

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I. Introduction

Information on the level, composition and distribution of wealth across households is an important element for both economic analysis and economic policy.

The lack of information on real assets and on the distribution of wealth across households is the reason for producing a survey conducted by the central bank in association with the National Statistical Institute (NSI) designed to study the wealth of Portuguese households. The survey is known as the *Inquérito ao Património e Endividamento das Famílias*, or IPEF.[4] This survey is the only statistical source that makes it possible to link information on household income, expenditure, financial assets, real assets and debt. The micro data obtained from the survey have been used to study the heterogeneity of households' behaviour in terms of the share of risky assets they have in their portfolios and the size of their debt, in relation to characteristics such as income, education level, age and region. The survey results were also useful in clarifying some puzzling issues in macroeconomic analysis, which will be discussed further on, and in making inferences as to the average size and structure of households' wealth.

The paper is organized as follows. The second section provides a brief look at the survey's benefits and shortcomings; the third section presents an example of how the survey results were important in understanding macroeconomic developments in the Portuguese economy; the fourth section comments on macro data from the survey regarding the average size and structure of household wealth; and the final section offers some concluding remarks.

II. IPEF benefits and shortcomings

The IPEF has been conducted by the central bank and the NSI as an additional module in an existing survey.[5] The central bank provides financial support, collaborates in designing the questionnaire and offers technical training for the NSI interviewers. The NSI monitors all of the fieldwork and produces the database combining the wealth data with information from the

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[4] The IPEF has been conducted three times to date: in 1994, 2000 (the results of this survey are the ones used in this paper) and 2006/2007 (the data from this survey were not yet available when this paper was written).

[5] The IPEF was associated with the employment survey in 1994 and with the household budget survey in the other two cases.

associated survey. After being subjected to an anonymisation procedure, this database is then provided to the central bank.

Thus, the IPEF has not been an entirely independent statistical operation. The principal reasons for conducting it as a collaborative venture were (i) the opportunity to cross-reference information on wealth with information on other socio-economic characteristics provided by the other survey; (ii) the relatively large sample size (over 6,000 households in the 2000 survey, expected to increase to over 8,000 in the latest); and (iii) the fact that the survey is monitored by the NSI, thus ensuring greater credibility and integrity than if it were conducted by a private entity.

However, the survey does have one important drawback: the sample is not designed with the specifics of wealth surveys in mind. The resulting problems are well documented in the literature,[6] and include the following: (i) since wealthy households are a small fraction of the population, the probability of being selected in the survey sample will be drastically disproportionate to their share of total wealth; (ii) wealthy households are less likely to respond to surveys on wealth; and (iii) wealthy households are more likely to underreport the level of owned assets (particularly financial assets). Additionally, without adequate incentives, interviewers may not expend the extra effort needed for overcome these impediments. All of this would suggest a need to "over-sample" wealthy households.

However, the relatively large size of the sample and the availability of information on some benchmark variables tend to compensate for the above-mentioned problems. Moreover, the difficulties associated with the under representation of wealthy households do not seem to have the same impact for all types of assets and liabilities. In fact, some real assets, such as principal residence and related debt, appear to be less affected.[7]

III. The use of micro data in macro-economic monitoring

In the second half of the 1990s in Portugal, there was a sudden and notable rise in household indebtedness, to unprecedented levels (from 36 percent of disposable income in 1995 to 85 percent in 2000). This reflected falling interest rates, as well as changes in the supply side of the credit market that allowed more households to obtain credit (see Ribeiro, 2007). This is an important factor in understanding why private consumption continued growing faster than GDP after Portugal's EMU accession. The results of the IPEF provide evidence of a significant lowering of liquidity constraints on households' expenditures in that period. Chart 1 presents the survey data broken down according to monthly household income and the age of the household member interviewed.[8] Comparing the 1994 and 2000 results for all age and income categories considered, there was a substantial decline in the average debt burden. Micro level survey data were very useful in distinguishing the growing number of indebted households from the increase in their average debt. According to the survey data, the rise in household indebtedness at the aggregate level was not achieved at the expense of increased debt at the individual level. Rather, they indicate that households were able to smooth out consumption across the business cycle. Since 2000, aggregate indebtedness has continued to rise steadily, so that a more recent picture of household debt at the micro level is of utmost importance.

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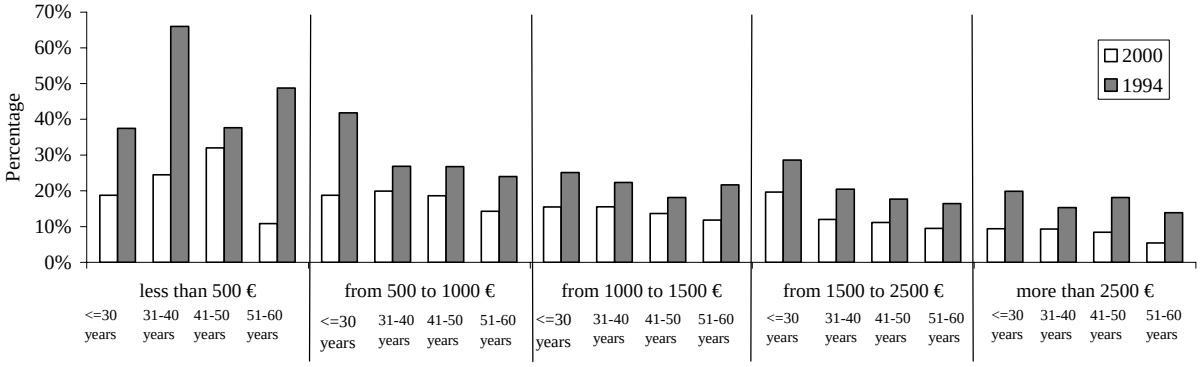
6 See, for example, Kennickell, 2005.

7 In Portugal most households own their residences and tend to have associated mortgages.

8 For details, see Farinha (2004).

Chart 1

Average debt burden by IPEF sub-sample – income and age



Source: IPEF2000; Banco de Portugal/Statistics Portugal; authors' calculations.

IV. Macro data derived from the survey

The above example demonstrated the importance of distributional considerations (only possible with micro data) for understanding the behaviour of macroeconomic variables. Micro survey data may also be very useful in complementing the usual sources for compiling aggregated data. In this section, some estimates of population averages for some key variables are presented. The estimates were calculated from the 2000 survey results after adjusting the original sample data to reduce the consequences of under representation of wealthy households due to sample design and incidence of non-response. The sub-section below briefly describes the methodology followed.

IV.1 Methodology

The methodology used in this paper applies a special type of adjustment to the original micro data.[9] This special type refers to the class of generalised regression estimators (GREG). It makes use of known population values for some of the variables that are potentially correlated with non-coverage and non-response. The relation between each variable of interest and these auxiliary variables is parameterised using standard linear regression in a multivariate context. For each variable of interest, the proposed estimator for the population average is given by:

$$\bar{y}_{\text{GREG}} = \bar{y}_S + (X_P - \bar{X}_S)\hat{B}$$

where $\bar{y}_S$ is the sample average of the variable of interest, X_P and $\bar{X}_S$ are, respectively, the vectors of population and sample values of the auxiliary variables, and $\hat{B}$ is a vector of estimated coefficients obtained by the following regression model:

$$\tilde{y}_i = \tilde{X}_i B + \varepsilon_i \quad i = 1,\ldots,N_S$$

[9] For a survey on these methods, see for example Kalton and Flores-Cervantes, 2003.

where, for household i, $\tilde{y}_i$ is the weighted level of the variable of interest, and $\tilde{X}_i$ is the vector of the weighted levels of the auxiliary variables. N_S is the number of sample elements.

To obtain the population reference values for the auxiliary variables, the following sources were used: (a) 2001 census data on age, educational level and number of persons per household, by geographical location; (b) national accounts data on disposable income; and (c) Banco de Portugal data on credit to households, with geographical breakdown.[10] The variables of interest correspond to the main groups of assets (real and financial) and liabilities.

IV.2 Results

Table 1 presents the results obtained for those variables, for 2000, before and after the adjustment. In addition, it includes the results for Italy reported by Brandolini et al. (2004), as a general frame of reference for our results.[11]

Table 1

Household net worth in 2000 – euro and percent

Wealth component	Portugal				Italy			
	Unadjusted survey data		Adjusted survey data		Unadjusted survey data		Adjusted survey data	
	Mean	Share	Mean	Share	Mean	Share	Mean	Share
Total tangible assets	99322	94,2	157076	90,3	164200	87,1	195500	72,5
Principal residence	62194	59,0	86055	49,5	94500	50,1	101600	37,7
Other real estate	23577	22,4	52405	30,1	30900	16,4	52400	19,4
Other tangible assets	13551	12,9	18615	10,7	38800	20,6	41500	15,4
Total financial assets	11479	10,9	25845	14,9	27800	14,7	77900	28,9
Transaction and savings accounts	8628	8,2	16661	9,6	13100	6,9	30600	11,3
Other financial assets	2851	2,7	9184	5,3	14700	7,8	47300	17,5
Total assets	110801	105,1	182921	105,1	192000	101,8	273400	101,4
Debt	5383	5,1	8902	5,1	3400	1,8	3700	1,4
Net worth	105417	100,0	174019	100,0	188600	100,0	269700	100,0

Source: IPEF2000; Banco de Portugal/Statistics Portugal; authors' calculations; Banca d´Italia.

[10] Data from Banco de Portugal central credits register, which has information on all loans granted by credit institutions and includes several characteristics on each debtor, namely its location.

[11] To facilitate this general comparison, the same terminology was adopted.

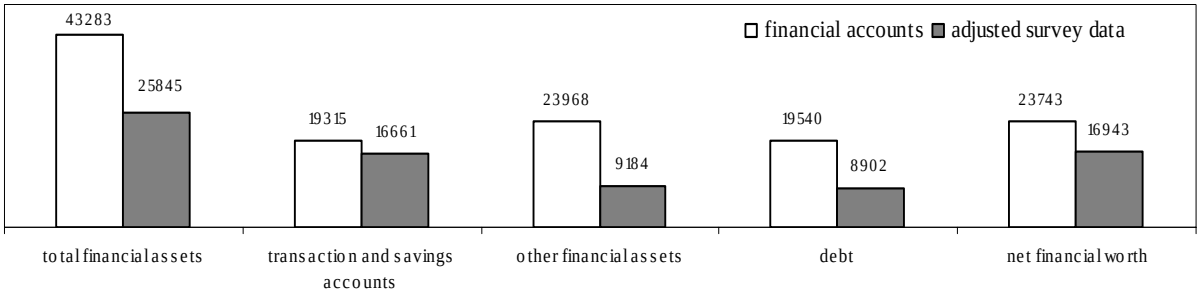
According to the adjusted figures, the average net worth of Portuguese households in 2000 was nearly 175,000 euros. In terms of its composition, tangible assets were clearly predominant, with the principal residence being by far the main asset. Financial assets consisted mainly of deposits. These results should be taken with caution, given the significant statistical limitations associated with the adjustment method. In particular, the experience with the IPEF suggests an underestimation of both "Other financial assets" and "Debt", even after the adjustment. On the other hand, "Other real estate" may be overestimated.

Chart 2 compares the adjusted survey data with financial accounts (FA).[12] As can be seen, the figures obtained from the survey are lower, in terms of both assets and liabilities. The main differences occur in "Other financial assets" (bonds, shares and other equity, investment trust units) and in "Debt", which could indicate that the adjustments made in the original IPEF data, although considerable, still underestimate the population values. The difference in net financial worth is less pronounced.

Unfortunately, there is no information on total real assets of households, unlike information on financial wealth. However, a recent study by Cardoso and Cunha (2005), using the perpetual inventory method, estimated housing wealth to be nearly 50,000 euros per household in 2000. Nevertheless, according to the survey, the unadjusted average value of principal residence alone is higher than that. This discrepancy may in part reflect different valuation criteria, but its magnitude suggests the need for further work in estimating the stock of capital attributed to households. This is an important insight from the survey, since the stock of capital is a key variable in most macroeconomic structural models.

Chart 2

Average financial position of households in 2000 (in euros)



Source: IPEF2000; Banco de Portugal/Statistics Portugal; authors' calculations.

V. Concluding remarks

In conclusion, it should be noted that: (i) the survey micro data, even without any type of extrapolation, are useful for macroeconomic analysis, as the example of households' debt burden has shown; (ii) although under representation of wealthy households is a problem, its impact can be moderated by using population benchmarks; (iii) the adjustment exercise

[12] In order to render the comparison more accurate, some adjustments were made in FA (eg emigrants' deposits were excluded).

pointed to an average net worth of Portuguese households close to 175,000 euros in 2000, although this value should be taken with caution given the limitations of the methodology; (iv) despite the adjustment made, households' average financial wealth in fact remains downward biased in comparison with FA; (v) finally, in the case of real estate, the survey results point to a possible underestimation of Portuguese households' capital stock.

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The under-reporting of households' financial assets in Italy

Leandro D'Aurizio, Ivan Faiella, Stefano Iezzi and Andrea Neri[1]

1. Introduction

The main sources of information about Italian households' financial wealth are the quarterly National Financial Accounts (NFA) and the biannual Survey on Household Income and Wealth (SHIW), both produced by the Bank of Italy. The two sources are independent, and differ in that the first is aggregate, whereas the second is based on micro data collected from a representative sample of Italian households. As a result, they do not provide consistent information, even accounting for differences in definitions and evaluation criteria (Bonci et al., 2004). As previous studies have shown (Brandolini et al., 2004), two important reasons for those differences are the low propensity of wealthy individuals to participate in the survey (D'Alessio and Faiella, 2002) and the under-reporting behaviour of participants (Cannari and D'Alessio, 1990).

This paper focuses mainly on the second issue. Nonetheless, the two aspects are closely related, since under-reporting is more common among the rich. In the present analysis, under-reporting refers both to inaccurate statements about the ownership of a specific asset and to errors in the declared amount owned. We propose a method for dealing with such problems, using data from a customer survey conducted by a leading Italian banking group as a supplementary source of information.

2. The extended supplementary sample

The "extended" supplementary sample (ESS) comes from a survey carried out in 2003 by a leading Italian banking group. In order to maximise data comparability, the survey design and implementation were set up to be as similar as possible to those of the SHIW.[2] The reference population consists of customers who authorised the disclosure of their data for research purposes, as required by Italian privacy law.[3] The population is stratified according to geographical area of residence, size of municipality and, more importantly, financial wealth held at the bank. The survey collects data on 1,834 households. The overall response rate was 18%, but the presence of financial wealth brackets as a stratification variable makes it possible to re-weight each observation to control for selection bias due to non-response among wealthy households.

The main feature of the ESS is that data were linked with the bank's administrative databases by an exact matching procedure, "extending" the information collected. Each

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[1] Bank of Italy – Economic and Financial Statistics Department.

[2] The survey design was developed in collaboration with the Bank of Italy's Economic Research Department, which produces the SHIW. The same market research firm managed the survey field, using, as far as possible, the same interviewers as for the SHIW. A Computer Assisted Personal Interviewing (CAPI) methodology was used for data collection and the same software was used to develop it.

[3] The target population consists of the bank's current account holders and excludes customers under 20 years of age and over 80, and those holding less than 1,000 euros or more than 2.5 million euros.

respondent answers regarding his or her financial assets held at the bank, and therefore the self-reported wealth is comparable with that shown in administrative records. Financial data were available for six aggregate financial assets (deposits and repos, government bonds, private bonds, quoted shares, mutual funds and managed savings) and for financial liabilities.

Assuming that ESS respondents are representative of customers of other banks, the information can be extrapolated to the 2002 SHIW data.[4] In order to control for the different demographic composition of the two samples, the sampling weights were post-stratified to reproduce the distribution of the Italian population of bank customers.

3. The adjustment method

The econometric framework used is based on the *hurdle model* (Wooldridge, 2002). The approach consists in separately modelling the decision about whether or not to invest and the decision about the amount to invest. It represents an alternative to regression with censored variables, typically carried out with Tobit models (see Maddala, 1983). The adjustment procedure comprises three steps.

The first step is to estimate under-reporting on ownership. The response variable, obtained from the administrative records, is a dummy for the effective possession of an asset at the household level. The probability of under-reporting is estimated by including among the covariates a dummy for the asset ownership declared in the interview. The analysis is carried out separately for the six financial assets and for the financial liabilities.

Step 2 models the under-reporting on the amount held, defined as the ratio between the actual and reported amount for each asset class. The ratio is computed at the individual level, and is assumed to be a proxy for reticence at the household level. The log of the ratio is regressed on the household's declared amount, its squared value, and a set of social and demographic characteristics.

The third and last step fits the preceding estimates to the SHIW data. We assume that the models estimated in the previous steps hold for all Italian households. For each financial instrument, the estimated probability of holding a given asset is fitted at the household level. A random experiment is then used to impute ownership to households that are likely to possess an asset,[5] whether they declare it or not. For each asset, we reconstruct the amount owned by the households to which the experiment attributes ownership, even if they did not declare it. Finally, the estimated coefficients of misreporting on amounts are fitted to the SHIW data to obtain an inflation factor (or, less often, a deflation factor) for the declared amount.[6]

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[4] Since the ESS respondents know that the survey is being conducted by their bank, they might be less reticent than the SHIW respondents. This would imply that the adjustment method proposed would not fully correct for the under-reporting. Unfortunately, the data at hand do not enable us to test this hypothesis.

[5] Symmetrically, the same mechanism attributes the status of non-possession of an asset to households unlikely to possess it, even if they declare the contrary to be the case. This is justified by the fact that over-reporting, albeit on a small scale, is present in the ESS data.

[6] To ensure the consistency of the estimated coefficients, they are first multiplied by an adjustment factor derived from an auxiliary regression (see Wooldridge, 2002). Such a correction is necessary whenever predicted values are derived from a regression with a logarithmic transform as dependent, in order not to under-estimate the true value.

4. Main results

The respondents' reticence, measured by the percentage of sample units failing to declare ownership, varies according to the financial instrument, ranging from a minimum of 5–6% for managed savings and government bonds to a maximum of 22–27% for mutual funds and private bonds. As to the under-reporting of amounts, reported values tend to be 50% of the corresponding administrative ones. This percentage drops significantly for private bonds (16.8%), whereas it ranges from 40% to 60% for mutual funds, managed savings and government bonds.

Under-reporting is higher for elderly, retired or less educated heads of household, in particular for government and private bonds and for mutual funds. Self-employed heads of household are more reticent in declaring shares and private bonds. People of low educational level primarily under-report government bonds, while the well-educated under-report shares. Furthermore, under-reporting is higher for households residing in the northern regions or located in the upper tails of the income and tangible wealth distributions.

Fitting the previous results to SHIW data significantly increases Italian households' financial wealth and the complexity of their portfolios. The percentage of households owning at least one financial asset increases from about 74.3% to 79.4% (Table 1). The share of those with private bonds jumps from 6.4% to 23.9%. Similarly, the diffusion of mutual funds increases from 11.2% to 29.3%. At the same time, the percentage of households with financial liabilities increases from 21.3% to 25.9%. The adjusted total financial wealth is about 2.7 times the original value, inflating the unadjusted value of 22,000 euros to 59,000 euros.

Looking at the distribution of the financial assets, the adjustment replaces zeroes or low values with values closer to the cell average values, thereby reducing the concentration: the Gini coefficient decreases from 0.790 to 0.721 (despite the fact that under-reporting is more common among the rich), and the decrease is significant when sample variability is taken into account. There is a similar effect for liabilities, although on a smaller scale (the corresponding Gini coefficient goes from 0.925 to 0.914).

We can produce a synthetic view of the effects of the adjustment by showing how the percentages of households with increasingly riskier portfolios vary (Table 2): the quota with low-risk portfolios (only deposits and repos) decreases from 56% to 31%, whereas riskier assets become more widespread (from 19% to 42%).

The adjustment procedure allows us to account for a large part of the gap between the SHIW and the NFA. As shown in Table 3, the sample estimate for total financial assets increases from about 31% to around 85% of the NFA amount. The corresponding percentages for liabilities are 47% and 65%.

Table 1

SHIW: effects of the adjustment on the estimates

Assets	Starting values	Step 1	Final step
	(percentage of owner households)		
Deposits and repos	73.4	73.4	73.4
Government bonds	9.4	12.2	12.2
Private bonds	6.4	23.9	23.9
Shares	10.1	17.3	17.3
Mutual funds	11.2	29.3	29.3
Managed savings	2.0	4.5	4.5
Total financial assets	**74.3**	**79.4**	**79.4**
Financial liabilities	21.3	25.9	25.9
Average amount	*(euros)*		
Deposits and repos	11,115	11,115	15,316
Government bonds	2,426	3,166	5,810
Private bonds	1,836	6,979	18,736
Shares	1,844	3,183	3,703
Mutual funds	3,071	7,883	10,715
Managed savings	1,395	2,868	4,221
Total financial assets	21,687	35,194	58,502
Financial liabilities	6,428	6,666	8,941
Total financial assets	**21,687**	**35,194**	**58,502**
Financial liabilities	6,428	6,666	8,941
Gini coefficient (total financial assets)	0.790	0.727	0.721
Gini index (financial liabilities)	0.925	0.914	0.914

Step 1: adjustment for non-reporting; Final step: adjustment for misreporting on amounts.

Source: Compiled by author.

Table 2

SHIW: households' portfolios sorted by increasing levels of risk

Percentage of households

	Starting values	Final step
Deposits and repos only	56.2	31.2
Deposits and repos + government bonds	5.9	2.4
Deposits and repos + government bonds + other risky assets	4.7	10.4
Deposits and repos + other risky assets	18.9	41.6

Source: Compiled by author.

Table 3

Comparison between the SHIW and the Italian National Financial accounts: 2002

Assets[1]	**Starting values**	**Step 1**	**Final step**	**National Financial Accounts**[2]
Average amount	***(Index. Financial accounts = 100)***			***Billions of euros***
Deposits and repos	55.5	55.5	76.5	421
Government bonds	28.7	31.3	57.4	213
Private bonds	11.2	38.4	103.1	382
Shares	31.1	51.2	59.6	131
Mutual funds	25.5	54.3	73.8	306
Total financial assets	**31.4**	**51.0**	**84.7**	**1.453**
Financial liabilities	46.6	61.0	64.9	290

Step 1: adjustment for non-reporting; Final step: adjustment for misreporting on amounts.

[1] Financial accounts do not produce a separate figure for managed savings. The relative sample estimate has accordingly been attributed to the other assets, using external information on the portfolio composition of financial intermediaries (published in the Statistical Bulletin of the Bank of Italy). [2] The following assets are not included: currencies, insurance technical reserves and postal deposits and unquoted shares.

Source: Compiled by author.

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Why should inequality researchers care about the rich?

Daniel Waldenström[1]

1. Introduction

In recent years, interest in understanding the evolution of top incomes and top wealth has increased markedly among economic inequality researchers. A number of studies by Thomas Piketty, Anthony B. Atkinson and Emmanuel Saez, followed by many others, have provided new and intriguing insights into the long-run links between development and inequality.[2] The recent literature uses data on personal income tax returns from the beginning of the twentieth century to create comparable estimates of top income shares for the entire period up until today. This has yielded for the first time a consistent set of really long series of economic inequality which are also reasonably comparable across countries. While limited in their coverage of the population, the series are sufficiently detailed and rich, in particular in terms of income composition, to address the theories of Kuznets (1953, 1955) and others about changes in inequality over the path of development.

This short paper has three objectives. First, it highlights some of the main arguments for analyzing top wealth and incomes in inequality research. Second, it presents recent empirical evidence over the long run in the case of Sweden. And third, it suggests some considerations for future work.

2. Why should inequality researchers care specifically about the rich?

There are a number of reasons why researchers into income and wealth should take notice of the income and wealth of the rich in society.

First, there is a pragmatic fact concerning the availability of historical data. At least before World War II, only high income earners paid income tax in most countries (the same is true for wealth taxes). This means that inequality estimates based on top income or top wealth shares promise considerably longer homogeneous time series than any other of the common inequality measures used.[3]

Second, the available empirical evidence suggests that there is great heterogeneity between different groups within the top of the distribution. Such detailed knowledge about the top is crucial for distinguishing between different explanations of what drives inequality – for example, to differentiate between theories which, on the one hand, focus on changes in the relative wages of skilled and unskilled workers and those that, on the other hand, stress the importance of savings and capital formation.

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[2] See, e.g., Piketty (2001, 2003), Piketty and Saez (2003), Atkinson (2004, 2005), and the new volume of Atkinson and Piketty (2007) presenting evidence from ten Western countries.

[3] In fact, it was dissatisfaction with the scattered data points in most inequality datasets that spurred Thomas Piketty to write his book on French inequality (Piketty, 2001) which started this new wave of research.

Third, the income and wealth of the very richest are important components of the variation in broader measures of inequality, especially the Gini coefficient, and, obviously, in decile- or quintile-based analyses. In practice, this means that when analyzing trends using the Gini one should control for the impact from variation in the top shares, not least to see if this has varied over time (which is likely) – in particular as the coverage of the rich in household income and wealth surveys is likely to be imperfect, either because of an underreporting of wealth or because of selective non-response (Johansson and Klevmarken, 2006 suggest the latter after having double-checked with tax-based registries). Whatever the reason, this has a potentially huge impact on measured inequality.

Fourth, the rich are an important group in society, possessing a disproportionate share of economic influence, forming a large part of the tax base and often being owners of the corporate sector, with direct or indirect political influence. Hence, in order to fully understand the forces of economic and political change one needs to carefully characterize the status of those with the highest incomes and wealth holdings.

3. Income and wealth concentration in an egalitarian society: Sweden

This section provides some of the most important findings from recent empirical investigations of top incomes and wealth in Sweden, allegedly one of the world's most extensive welfare states.

3.1 Top incomes in Sweden over the twentieth century

Roine and Waldenström (2008) study the evolution of Swedish top income shares over the twentieth century. Figure 1a shows how the share of the top income decile declined secularly up to the early 1980s, with most of the decrease taking place before 1950, i.e., before the expansion of the welfare state. After 1980, the top shares increase when one includes realized capital gains, making Sweden's experience resemble that of the U.S. and the U.K. with their sharp increases in top incomes. Excluding capital gains, Sweden looks more like the continental European countries, where top income shares have remained relatively constant.

The Swedish evidence is in line with previous studies in finding a notable heterogeneity between groups within the top income decile. In Figure 1b, the long-run trends of the lower half (P90–95) and the next four percentiles (P95–99) appear to be basically flat whereas the top percentile (P99–100) decreased in much the same way as the whole top decile (Figure 1a).[4]

The heterogeneity within the top is also seen in the composition of top incomes. Capital income (interest earnings and dividends) matters most in the top percentile whereas wages are almost all of the income in the bottom half (P90–95).[5]

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[4] Taken seriously, this result suggests that some commonly used inequality metrics, in particular P90/P10 and P90/P50, do a poor job in capturing the relative incomes of "the rich". A more informative analysis would be achieved if they were to be accompanied by similar measures of the very top, such as P99/P50 or even P99.9/P10.

[5] Notably, the increasing share of capital incomes in the level of total income is not uniform across countries. For example, Piketty and Saez (2003) find that today's top income earners in the U.S. are primarily represented by high wage earners.

3.2 Long-run trends in Swedish wealth inequality

The distribution of wealth in Sweden has been the subject of several studies.[6] Recent work includes that of Ohlsson, Roine and Waldenström (2008). They analyze the long-run trends in wealth inequality and their determinants over the twentieth century, with a specific focus on comparing multiple wealth concepts.[7] Their main series are displayed in Figure 2.

The long-run trend in wealth concentration in Sweden over the twentieth century is that the top decile has seen its wealth share drop substantially, from around 90 per cent in the early decades of the century, to around 53 per cent around 1980, then recovering slightly to a level around 60 per cent in recent years. Looking just at this general trend is, however, incomplete if one is to really comprehend the evolution of wealth concentration. As in the case of income, decomposing the top decile and looking separately at the top per cent (P99–100) and the nine per cent below that (P90–99), we see that the majority of the top decile actually experiences substantial gains in wealth shares over the first half of the century. The overall drop in the top decile share is explained by such dramatic decreases in the top percentile share that this outweighs the increase for the P90–99 group. In the period 1950–80 both groups experience declines in wealth shares but the decrease is larger for the top percentile; after 1980 the trend is again the same for both groups, but now the gains in wealth shares are somewhat larger for the top percentile.

4. Some suggestions for future top income and wealth data collection

Based on the empirical results from recent studies of the long-run evolution of income and wealth concentration in Sweden, the following lessons for the future work are worth emphasizing:

The top income decile is quite heterogeneous in terms both of trends over time and of the com-position of incomes. It is important to draw distinctions when making statements about the rich in society. For example, P90/P50 and P99/P50 will most likely give entirely different answers to the same question concerning the relative income of “the rich”.

- The role of (realized) capital gains deserves more attention in research on economic inequality. In particular, since 1980 there has been a surge in asset prices in both housing and financial markets. Understanding the determinants of inequality, not least in the top of the distribution, depends on the collection of good data on capital gains.
- Wealth data from wealth tax returns has no future since wealth taxation is disappearing throughout the developing world (the Swedish government decided in April 2007 to abolish the tax from the following year). If one wishes to use official registries for the construction of micro-data evidence on personal wealth, the main remaining source that is available in most countries is estate data (as is already used in the U.K.). Another good aspect of this source is that estate records are available for a long period in history, and indeed have already been used by

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6 See, e.g., Spånt (1979), Statistics Sweden (2000) and Klevmarken (2004).

7 They use three different measures of wealth inequality: tax-assessed values of net worth from wealth tax returns, market values of net worth in wealth tax returns (only since 1975) and estate tax material for 1873–77, 1906–08, 1954/55, 1967, and 2002–03. Previous comparisons of the effect of different definitions and sources of wealth on measured inequality were undertaken by, e.g., Atkinson and Harrison (1978), Davies and Shorrocks (2000) and Sierminska, Brandolini and Smeeding (2006).

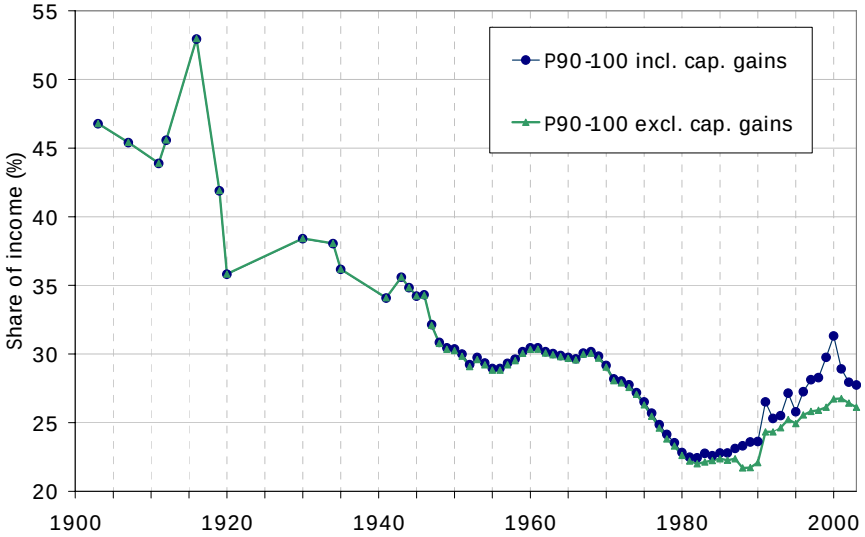
researchers to construct long-run series of wealth inequality (e.g., Kopzcuk and Saez, 2004 for the U.S. and Piketty, Postel-Vinay and Rosenthal, 2006 for France).

- The coverage of top wealth data in household surveys depends on efforts to ensure the rich respond. Where they do, recent estimates from Sweden indicate that they disclose fairly accurate numbers (Johansson and Klevmarken, 2006).
- Pension wealth may be notoriously difficult to measure for a number of reasons. However, it is too large in relation to people's other personal assets and, more importantly, it differs systematically across countries in ways that invalidate comparative analyses of cross-country wealth inequality if left unaccounted for. Hence, those responsible for collecting personal wealth data should always aim at collecting the broadest measures of pension wealth possible.

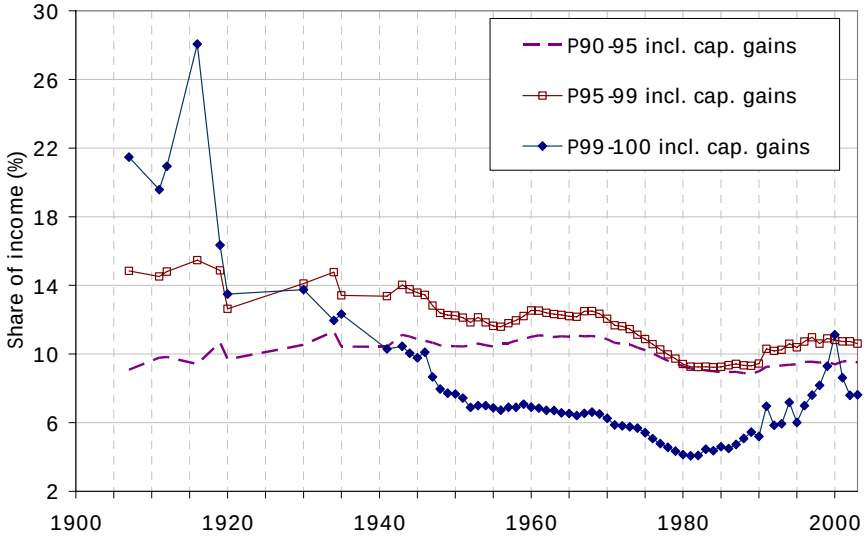
Figure 1

Swedish top income shares (incl. and excl. realized capital gains), 1903−2004

(a): P90–100



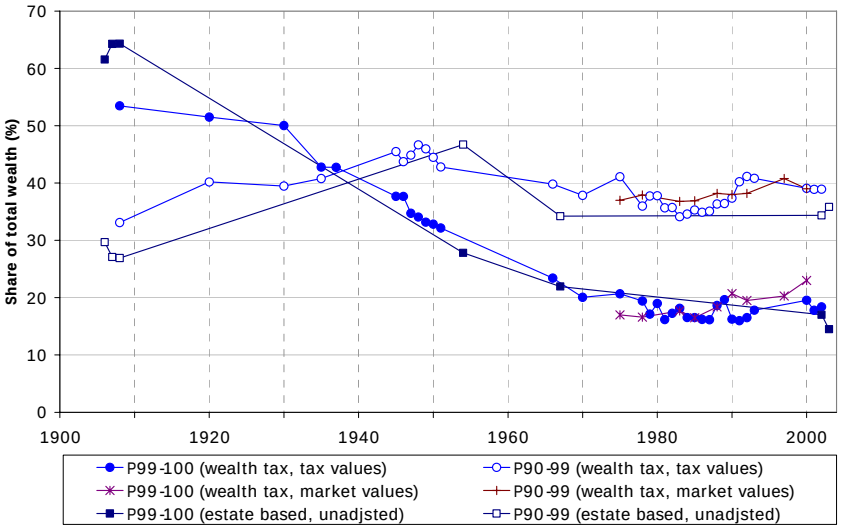
(b): P90–95, P95–99, P99–100



Source: Roine and Waldenström (2008).

Figure 2

Wealth concentration in Sweden 1906–2002



Source: Ohlsson, Roine and Waldenström (2008).

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Discussion comments on session STCPM31: Accounting for the very rich in household surveys of income and wealth

Carlos Sánchez Muñoz[1]

I would like to start by thanking the organisers and Federico for inviting me to offer comments on these five very interesting papers. To provide a framework for my comments, let me mention an ongoing initiative that is closely related to the main theme of this session. The European Central Bank and the national central banks composing the Eurosystem are currently collaborating on the design of a survey on household finances and consumption, which, if finally approved, will be conducted across the euro area in the near future. The initiative is designed to provide a multidimensional picture of the financial decisions taken by households in multiple areas such as indebtedness, financial holdings, real estate, consumption, income, savings, future pension entitlements, intergenerational transfers, etc. Such an ambitious undertaking requires a careful analysis of the conceptual and practical difficulties linked to survey design and future field work. How to oversample wealthy households was one of the most challenging issues in this regard, especially since the decision on whether to oversample, as well as the choice of method, could affect cross-country comparability.

In analysing how to overcome such difficulties, the experience of existing surveys has proved to be extremely useful. Among the surveys currently in place within the euro area, the three authors in today's panel provide examples of ones being conducted by the Banco de España, the Banca d'Italia and the Banco de Portugal. In terms of efforts under way outside the euro area, Arthur Kennickell (who also provides consultancy advice to the network of experts currently developing the Eurosystem survey) spoke today about the survey that the Fed has been conducting since the 1980s. Finally, although not present today, Daniel Waldenström, from Sweden's Institutet för Näringslivsforskning, has also provided a paper for this session on which I would like to offer a few comments.

Turning to the main theme of this session, the papers presented in this session have provided good arguments for why an adequate coverage of the wealthy in this kind of survey is indispensable. To illustrate how important this can be, let me select a couple of figures from the papers. According to Olympia Bover's paper, 0.4% of the population of Spanish households holds 40% of total taxable wealth in Spain, while according to the Spanish survey (EFF), 10% of the population holds 42% of total wealth. This wealth concentration is also present in the US, where roughly 1% of the population holds one third of total wealth. In analysing how such an accumulation of wealth may affect the selection of a proper sample for income and wealth surveys, Arthur Kennickell's paper notes that in a sample randomly selected from US households, based purely on geographical criteria, only 27 cases out of more than 3,000 observations would correspond to the wealthiest 1% of households in the US. In the light of these various statistics, it could be assumed that such a sample would provide rather poor results for purposes of a wealth survey.

In this regard, one of the first and most basic questions is which variable to use to identify wealthy households. One of the difficulties of identifying this group is that the most essential

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variable (ie household wealth) is, paradoxically, the very one that these surveys are intended to measure. Consequently, other approaches are required in order to determine which doors to knock on – the starting point of field work for wealth surveys.

Olympia Bover's paper outlines what I would describe as a nearly ideal situation. Benefiting from the existence of a wealth tax in Spain, the Banco de España has collaborated with the tax authorities (as well as with the Statistics Office) to design a sample frame that makes it possible to oversample the wealthy. It can always be argued that wealth surveys should attempt to obtain from respondents information that they may be reluctant to reveal to tax authorities, ie tax information may not be the best means of identifying the wealthy – or, at least, of identifying all of the wealthy. However, the existence of this wealth tax in Spain – which is the subject of periodic political debate as Daniel Waldenström also notes in the case of Sweden – and the successful collaboration between the Banco de España and the Spanish tax authorities is an enviable situation. Since a panel component has been introduced in the latest wave of this survey, I would be interested to know whether it has been substantially more difficult convincing the wealthy to participate in the second wave of the survey than is the case with other wealth classes – a factor that seems to be relevant to the absence of a panel component in the US Survey of Consumer Finances (SCF). Perhaps the author can provide some preliminary results as an answer to this question.

In contrast to the Spanish case, countries that do not have this type of wealth tax, such as the US, must find alternative approaches. The paper presented by **Arthur Kennickell** describes the relatively sophisticated method applied by the Fed to select the sample population in the US. This combines a national frame, based on geographical areas, with a list sample designed to oversample households that are likely to be relatively wealthy. To select such households, information on capital income flows, obtained from individual income tax returns, are used in collaboration with tax authorities (as in the case of the Spanish survey). These are subsequently complemented by anonymised data from previous rounds of the survey. In speaking of "households that are likely to be wealthy", the author implicitly accepts the potential lack of correspondence between (capital) income and wealth. The correspondence between income and wealth was recently analysed in a presentation made by Markus Jäntii, Eva Sierminska and Timothy Smeeding at the Luxembourg Wealth Study conference, held in Rome in July 2007. The presentation, entitled "Presenting joint distributions of income and wealth", was based on data relating to five countries (Sweden, Italy, Germany, Canada and the US) and concluded that despite substantial differences in the range of variation from one country to another – especially large in the case of the US – the correlation between disposable income and net worth was substantially higher in the US than in the other countries. From this one could conclude that, while highest levels of (capital) income might be an acceptable proxy to identify the wealthiest in the US, it may not work as effectively in other countries. Another interesting feature revealed by Arthur Kennickell's paper is the low response rate from the households selected through the second approach (ie the "list sample"), which seems to confirm the idea that convincing the most relevant respondents (the wealthy) to participate in these surveys is no small challenge.

While recognising the importance of oversampling the rich, the paper prepared by **Rita Lameira, Carlos Coimbra and Luisa Farinha** indicates that such an approach has not as yet been adopted by the Banco de Portugal, due to the fact that there is no stand-alone wealth survey. Instead, questions on wealth are introduced as an additional module in already existing surveys. It is hoped that a relatively large sample of respondents in these other surveys will, in part, compensate for the shortcomings – noted in the paper – such as the proportionally higher non-response rate and the tendency to underreport, typically associated with wealthy households. The paper provides good arguments for the need to look beyond macro data to understand the factors underlying spending behaviour and indebtedness by households in Portugal. The authors also make an attempt to adjust the survey results via a methodology that utilises additional information from census data, from national accounts and from the Bank of Portugal's loan-by-loan register of households'

borrowing. The survey figures, after the adjustment, still fall significantly below those provided by financial accounts (from approximately 60% of households' total financial assets to less than 47% of households' liabilities), as also appears to be the case in similar comparisons carried out in other countries such as Italy, Spain and the US. Users typically find it difficult to know which of the two sets of figures should be considered more accurate.

In the case of the comparison carried out in Portugal, do the authors suspect that there was insufficient adjustment for non-response and underreporting, or are there alternative explanations for such divergent figures? Given the potential benefits that oversampling the wealthy may have for such surveys (as acknowledged in the paper), it would also be interesting to know whether there are any plans to implement such a procedure in future rounds of the survey.

The paper authored by **Leandro D'Aurizio, Ivan Faiella, Stefano Iezzi and Andrea Neri** also begins by comparing macro (financial accounts) and micro (survey) figures, and attempts to explore one of the reasons behind the differences observed, namely, the natural tendency of respondents who agree to participate in the survey to underreport amounts. Such a tendency was confirmed by an exercise carried out with a sample consisting of customers of an Italian banking group. By comparing the banks' administrative data and the results of the survey, it became evident that respondents intentionally or unintentionally tend to undervalue their assets and liabilities. The fact that these results arose from an exercise in which, as I understand it, the volunteers were made aware of the fact (or at least had reason to suspect) that their data could be cross-checked with data available to their banks raises the serious possibility that the underreporting in the case of the Italian Survey on Household Income and Wealth may be substantially more acute. Another interesting feature of the exercise is that, in addition to an analysis of the phenomenon based on financial instruments and different social classes (ordered by age, education, income, etc), it also makes it possible to isolate the effect of not declaring certain holdings (ie declaring zero holdings) from other cases in which respondents admit to holding certain assets but report lower amounts than actually held. This distinction might be important in gaining a sense of the difference between intentional and unintentional underreporting. Such a distinction may prove especially useful since one clear risk of such a complicated survey is that the increasing fatigue that presumably comes into play as the interview proceeds may cause respondents to (intentionally) deny that they possess certain assets, simply to shorten the duration of the interview. If non-response proves to be more intentional than unintentional, such a conclusion should trigger additional efforts, on the part of those responsible for designing the questionnaire, to find ways to lessen the substantial burden imposed on respondents.

Finally, the paper prepared by **Daniel Waldenström** looks at income and wealth concentration from a user perspective. It is interesting to see that, while the share of wealth corresponding to the richest 1% of the Swedish population has decreased substantially over the twentieth century (especially prior to the 1980s), thus contributing to a more widespread distribution of wealth, the same cannot be said for the population in the 90–99% range, whose share has remained much more constant over the period under study, confirming the importance of studying in detail the behaviour of different wealth strata. Additionally, the paper points out that, while the wealthy are primarily affected by changes in stock exchange prices, the rest of the population in the upper half of the wealth distribution is affected mostly by changes in real estate prices (a fact also confirmed by Rita Lameira's paper on average Portuguese households). Without decomposing the analysis to a high level of detail (ie without accessing micro-level information), the resulting conclusions could be deemed incomplete and even somewhat distorted. One of the conclusions of the author is that realised capital gains have a role in economic inequality – a subject on which further information needs to be made available to researchers. Unlike the author, my view is that by measuring assets (as well as liabilities) at market prices and thus including both realised and unrealised capital gains (and losses) in households' wealth, there should be sufficient

information for researchers to assess wealth (in)equality. Finally, the author defends the need to consider public and private pensions as part of wealth measurement – a point on which I would fully agree. In fact, the future Eurosystem survey that I mentioned at the beginning will indeed attempt to cover future pension entitlements, despite the difficulties posed by considerable differences in pension schemes across euro area countries.

I should like to end by thanking the authors for these very interesting papers, as well as today's audience for your kind attention.