

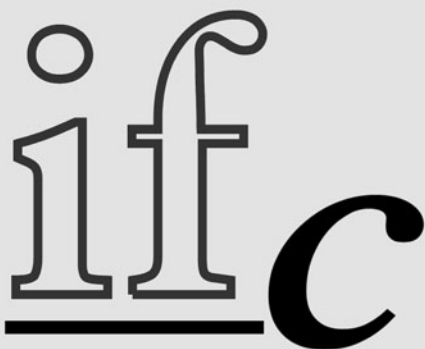
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IRVING FISHER COMMITTEE  
ON CENTRAL-BANK STATISTICS

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*ifc Bulletin*

No. 22 • September 2005



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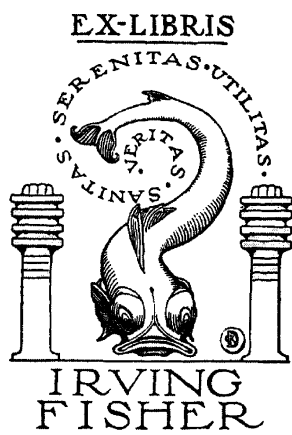
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**IFC's Contribution to the  
55th ISI Session, Sydney, 2005**

*Proceedings*  
**IFC Conference Basel, 2004**





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# ifc Bulletin

No 22 – September 2005

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## What is the IFC?

The Irving Fisher Committee (IFC) is a forum for discussion on statistical issues that are of interest to central banks. The Committee, which derives its name from the great American economist and statistician Irving Fisher, is part of the International Statistical Institute (ISI).

## Objectives

By providing a forum for discussion, the IFC aims at:

- participating in the discussion on adapting statistical systems to changing requirements;
- promoting the adoption of international statistical standards and methodologies;
- sharing experience on the development of new statistics and the implementation of new methods of collecting, compiling and disseminating statistical information;
- exchanging views between central bankers and academics on statistical methods and techniques;
- facilitating personal contacts between central-bank statisticians.

## Strategy

To achieve its objectives, the IFC organizes conferences, which take place both inside and outside the framework of the ISI's biennial Sessions. The first "outside" conference – on the challenges to central bank statistical activities – is scheduled for summer 2002 at the Bank for International Settlements in Basle.

The conferences are supported by the publication of the IFC Bulletin, which contains the conference papers and other articles.

The IFC has a Web site (<http://www.ifcommittee.org>), on which an electronic version of the IFC Bulletin can be found.

## What kind of topics are discussed?

Any kind of theoretical or practical statistical subject that has a relationship with the activities of central banks can be considered for discussion. The subjects will mostly be in the area of monetary, financial and balance of payments statistics.

## Membership and Structure

Central banks and other institutions interested in statistical systems and statistical techniques that have a bearing on the collection, compilation and distribution of central-bank statistics can become members by simple application. Members are entitled to appoint delegates

to participate in the IFC's activities and to contribute to its conferences by presenting papers.

The prime decision-taking body is the assembly of members' delegates at the "administrative meetings" that are organized during the conferences. Here the IFC's strategy is determined. At these meetings an Executive Body is elected, which is charged with the committee's day-to-day business and with the preparation of the "administrative meetings". Likewise, at the "administrative meetings" topics are proposed for future conferences.

## A Short History

The Irving Fisher Committee (IFC) was established on the initiative of a number of central banks statisticians who were attending the ISI Corporate Members Meeting at the 1995 ISI Session in Beijing.

In 1997, during the 51st ISI Sessions in Istanbul, the IFC held its inaugural meeting. At the "administrative meeting" held during that Session an Executive Body was established and it was decided to start publishing the IFC Bulletin devoted to the activities of the IFC. Two years later, at the 52nd ISI Session in Helsinki, the IFC's presence was further strengthened. In 2001, at the 53rd ISI Session in Seoul, the IFC presented a programme comprising an invited papers meeting on "Financial Stability Statistics" and several contributed papers meetings.

In 2002, a conference on "Challenges to Central Bank Statistical Activities" was organised in co-operation with the Bank for International Settlements (BIS), which hosted it at its premises in Basle. 160 statisticians representing 73 countries participated. Some 50 papers were presented. In 2004, another IFC "Basel Conference" was held in cooperation with the BIS. Some 150 statisticians, mainly central bankers, and originating from 65 countries, discussed "Central Bank issues regarding Financial and National Accounts" in three sessions and eight workshops.

In 2003, at the 54<sup>th</sup> ISI Session in Berlin, the IFC participated with nearly 40 papers, presented in two Invited Papers Meetings and three Contributed Papers Meetings. The General Assembly of the ISI accorded to the IFC the Status of an independent ISI Section on a provisional basis up to the 55<sup>th</sup> ISI Session (Sydney, April 2005).

## IFC Bulletin

The IFC Bulletin is the official periodical of the Irving Fisher Committee. The Bulletin contains articles and the text of papers presented within the framework of the ISI Conferences. Institutions and individuals active in the field of central-bank statistics can subscribe to the Bulletin free of charge.

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## Keynote Address

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# The changing statistical needs of central banks

*G.R. Stevens (Deputy Governor, Reserve Bank of Australia)*

It is a pleasure to speak to you today about central banking and statistics, and particularly to see such a large gathering of statisticians, including from central banks, here in Sydney. It will be interesting to see whether there is a statistically significant impact on economic activity in the Sydney region as a result of your conference. I suppose that will depend on whether your rate and type of expenditure differs in a statistically significant way from that of the various other groups who occupy this precinct from week to week.

Today's proceedings are organised by a committee named for Irving Fisher. Reading just a little about his life, one is struck by the breadth of his endeavours. These were covered very nicely in a speech some years ago by Hans van Wijk, former chair of the Irving Fisher Committee.<sup>1</sup> Fisher worked on monetary theory, and on understanding the determinants of the rate of interest, saving and investment. The distinction between the nominal and real rate of interest – second nature to economists today – was first made by Fisher. He worked on index-number issues – the 'Fisher ideal index' is named after him. And he worked on understanding the nature of business cycles. A particularly insightful analysis of the role of asset price and credit fluctuations in propagating business cycles appeared in the 1930s.<sup>2</sup> I have noticed that this has been quoted with increasing frequency in recent years, as similar issues have resurfaced (a theme to which I want to return shortly). So it seems particularly apt that either as central bankers or as statisticians, or both, we remember Fisher.

Moreover central banks have long been intense users of statistics. Using the RBA as an example, our Economics and Financial Markets areas track several thousand individual economic and financial time series on a monthly or quarterly basis, for the purposes of making an assessment of current and prospective economic conditions as background for the Bank's monetary policy decision process. The majority of these data, particularly those seeking to measure the 'real' side of the economy and prices, are produced by other bodies, usually the official statistical agencies, both in Australia and abroad. Let me say at this point how much we, in the RBA, value the professionalism and assistance of the Australian Bureau of Statistics. The willingness of ABS officers to help our staff understand the nuances of the various series is a great help as we try to put together the various pieces of the jigsaw that make up the Australian economy, in order to decide what we should do to preserve macroeconomic stability. I am sure that in other countries this relationship is equally vital.

Central banks are also major compilers of statistics in their own right. The bulk of central banks, for example, put together data on the balance sheets of banks and other institutions. This is usually a by-product of regulatory powers, a result in many instances of legislation for increased oversight of the banking system after the economic and financial collapses which happened in the 1930s, when Irving Fisher was at the peak of his career. Hence it is natural that it is usually central banks which publish measures of money and credit, as well as series for official interest rates, exchange rates and so on. A good many central banks publish data on the balance of payments as well, which I suspect is often a legacy of exchange controls. In many less-developed countries, the central bank is often one of the most capable and best-resourced institutions, and so is called on to bear additional statistical responsibilities. So central banks have a major interest in compiling, disseminating and using statistics.

I want to suggest, however, that the statistical needs and interests of central banks are changing, as is the data environment in which they operate. I will elaborate on this theme under three general headings:

- The growth of the financial sector, and especially of the size of the **balance sheet of the household sector** in the past decade or more, has significant implications for the way the

<sup>1</sup> Available at <<http://www.ifcommittee.org/FisherBiogr.htm>>.

<sup>2</sup> 'The debt-deflation theory of great depressions', 1933, *Econometrica*, 1, pp 337–357.

economy is likely to behave in the future, for the kind of analysis central banks conduct and therefore for the sorts of statistics they need to have.

- New emphases in the mandates of central banks – in particular the explicit focus on **financial system stability** (as opposed to prudential supervision of individual institutions) – carry implications for data collections and the way we process them.
- The changing data environment, and in particular more **private provision of data**, provides both opportunities for central banks to exploit that information, but also some potential pitfalls.

### The financial sector and balance sheets

For a long time, data from the 'real' side of the economy were of primary interest to macroeconomic policy-makers. This presumably followed the intellectual currents in economics. The development of national income accounting in the 1940s, and the growing optimism about the capacity of macroeconomic policy to deliver consistently high levels of output and employment, emphasised the measurement, forecasting and control of aggregate demand. The various partial indicators of economic activity, culminating in the quarterly estimates of national income and spending, were the raw statistical materials with which generations of economists learned to work their trade. Of course, central bankers always paid a good deal of attention to financial data like interest rates, lending, credit and money data, but even in central banks I suspect that until the mid 1970s most of the prestigious analytical jobs were in the areas dealing with the real economy. This period was also the heyday of large-scale macroeconomic model building, usually with great detail on the expenditure side of national accounting and with associated data requirements. It's worth noting, incidentally, that these models typically failed to capture adequately the inter-linkages between the real and financial sides of the economy. For some time, of course, the financial side was seen as just a passive add-on – many people thought that changes in balance sheets didn't matter much, and that movements in asset prices were of second-order importance. A common view for many years, in fact, was that monetary policy didn't matter much.

As the intellectual battle raged over what activist stabilisation policy could, in fact, achieve, the economic and financial upheavals of the 1970s ushered in a period in which financial variables were suddenly seen as much more important – money did matter after all – and discussion focused much more on financial quantities. There was the observed correlation between measures of the money stock and the price level. Irving Fisher's Equation of Exchange,  $MV=PQ$ , made an appearance here, as the quantity theory of money was turned into a policy prescription of beguiling simplicity: if only central banks could control 'M', they would in due course stabilise 'P'.

That idea seemed very appealing in the mid 1970s, but as we all know, the policy process turned out to be more complex than that. Today is not the time to explore all that again. It suffices to say that, despite tremendous efforts in developing and analysing a host of measures of money, attempts to impart stability by targeting closely the money stock were much less successful in practice than in theory. Most countries have moved away from that idea towards some sort of implicit or explicit targeting of the ultimate objective, prices, using the short-term nominal interest rate as the instrument.

Yet it would be a mistake to think that this shift signifies that the behaviour of the financial sector has once again come to be viewed as unimportant to the economy. On the contrary, the way in which the financial system responds to financial prices, to regulation (or deregulation) and to the demand for products by the household and business sectors, and the way in which it is constantly innovating, has a major bearing on the path of economic activity. Moreover, the importance of these links is growing.

Opinions vary on whether or not this is a good thing. It has been claimed, for example, that the growth of derivatives markets potentially enhances economic stability, insofar as risks inherent in life can be shifted from those who do not wish to run them to those who do. It has also been claimed that such innovations are highly dangerous – 'financial weapons of mass destruction' was one colourful description.<sup>3</sup> Either way, an interaction of financial processes with the real economy is in mind; what is at issue is where the risks inherent in economic life are ultimately borne, and whether the people running them understand them and have been paid an appropriate price to do so. This is an area where the statistical collections find it hard to keep up, particularly with the proliferation of financial activity which crosses national borders or occurs off-balance sheet.

3 Available at <<http://www.berkshirehathaway.com/letters/2002pdf.pdf>> (Chairman's letter, p 15).

Another trend which is playing a powerful role in the modern economy is the growth in the household sector's assets, occurring in parallel with the increase in households' access to credit. The growth of aggregate wealth, together with the constant search for new products and new business by financial intermediaries, has seen the increasing collateralisation of the housing stock. Your home was always the collateral for a mortgage loan, of course, but these days you are much more likely to be using it as collateral for a loan for some other purpose as well. Possibly you are doing so at a stage in life when you would traditionally have been debt free. If you are at all creditworthy, moreover, there is no shortage of institutions lining up to lend to you.

This is a major issue in several countries, and we have seen extensive (and as yet largely unresolved) debates about what amount of household debt is 'sustainable'. Perhaps the trend towards larger and more leveraged household balance sheets has largely run its course. Certainly for Australia, our analysis of its main underlying causes has tended to suggest that it should be a one-time portfolio adjustment, not a permanently different trend rate of growth in debt. But it is also possible that we are some time from seeing any end to that adjustment process since, in principle, there is no obvious reason why a much higher proportion of the housing stock might not yet be collateralised. If it were, there would be a lot more borrowing ahead. Either way, with the stock of household wealth now twice as large, relative to the flow of current income, as it was in the early 1980s, and the equity contained therein much more accessible via products such as redraw facilities and home equity loans, and more recently reverse mortgages, these changes have the potential to exert bigger influences on economic performance than in the past.

Yet the statistical information about some important elements of these phenomena is poor. Take dwelling prices, a key ingredient in estimating aggregate household wealth. In Australia, there are five series that are routinely used. Because dwellings are far from homogeneous, and change hands only infrequently, getting a good representation of the true change in price of existing dwellings from one quarter or year to the next is much more difficult than, for example, getting a reasonable index of changes in share prices. A major problem is that compositional effects on the observed mean or median price of dwellings can be very large if transactions shift between high and low-value parts of the property market between one observation and the next. Another problem is that most series tend to be dated from the time a property settlement is advised to official records, which may be some months after the sale and price were agreed. Some series try very hard to overcome these sorts of problems, but at the cost of being either untimely or highly prone to revision (or both). Other series are more timely but are unable to overcome technical flaws and so contain a high degree of short-term variability. Memo to statisticians, in central banks or elsewhere: policy-makers need better data on housing prices.

In Australia, the ABS is responding to this challenge with efforts to improve their house price series. The RBA very much welcomes this, and has been pleased to have the opportunity to be involved in the discussions that the ABS has had with various interested parties. In an ideal world, we would perhaps collect data from real estate agents at the time that sales and prices are first agreed. This would offer near-universal coverage and a high degree of timeliness, and allow collection of more data on the characteristics of each house, allowing more control for compositional effects and quality changes. However, for cost-benefit reasons, including considerations of reporting burdens, the ABS has decided instead to collect data from financial institutions providing finance for transactions. Although this may not be quite as comprehensive or as timely as an ideal data set, it will still be a major improvement compared with collecting data from state governments after the settlement of transactions. We look forward to being able to use the new series in due course.

Better data on house prices will be valuable, but central banks also need a good sense of people's behaviour in response to changes in asset prices. How do we get this? Traditionally, this sort of question has tended to be addressed by using time series for spending and wealth to estimate 'wealth effects', with the answer usually being that for every dollar of wealth change, there is an effect of a few cents on spending. But such estimates could well be hopelessly outdated given the immense increase in the capacity to borrow against collateral that has extended even to people of fairly modest incomes in the past decade. Hence there are demands for direct answers to questions like:

- What do people actually do with the equity extracted from dwellings through borrowing?
- How are debt and wealth distributed across the population by income, or by age or region?
- How is changed borrowing behaviour likely to affect the inter-generational transfer of wealth?

There is growing tendency to look to direct surveys of the population for the answers to these questions. Here let me make mention of a survey that the RBA is currently working on, which focuses on the extent to which households used mortgage finance for non-housing purposes over 2004. The Bank engaged a private research firm to conduct the survey, which was

designed jointly, drawing on the Bank's existing knowledge about household debt, and the research firm's expertise in questionnaire design. The main field work was undertaken in January and February this year and the Australian public were generally very co-operative. Indeed, Reserve Bank staff took a number of calls, emails and letters from people taking an active interest in the survey (though also, it must be said, a number of calls telling us to mind our own business!). The results will be published later this year.

An earlier example of using customised survey data to address a specific issue was the survey of hedging practices of Australian enterprises in late 2001. This was conducted by the ABS with major input and funding from the RBA. It was motivated by the fact that while Australia had very substantial foreign liabilities, the foreign currency exposures reported by the financial sector were very small (as would be expected given that such exposures carry capital requirements). Clearly these entities engaged in substantial hedging, but we knew little about the other sectors of the economy. Hence we approached the ABS to carry out a survey to fill in the missing pieces. What we found was that even though net liabilities to foreigners were (and still are) substantial, the Australian community as a whole had, at end 2001, a modest net *foreign currency asset* position. The difference is of course due to the fact that foreign demand for Australian dollar-denominated assets was substantial, which has remained true in the period since. Hence while absorbing substantial resources from abroad, Australian entities were not, by and large, accumulating large foreign currency risks. This was a very important fact to know, and I think it has had a significant impact on the views various observers, including ratings agencies, have formed about the country's external accounts. Work is currently under way in the ABS for an update of this survey, with substantial funding support from the RBA.

These are just two examples of the use of one-off surveys. In due course, regular statistical collections may well adapt to provide more information on some of these questions, but that takes time. Hence, I think there could well be more of this sort of approach by central banks in future: use of customised survey information to address specific questions which arise because of fast-moving structural change in the economy.

An implication of this for central bank statisticians could be, I suppose, that a somewhat different set of skills might be required. Time series expertise – I can recall in the past reading, or trying to read, lengthy papers on the X-11 seasonal adjustment technique as applied to monetary data – might be relatively less in demand, and knowledge of how to design, implement and interpret surveys giving a cross section or panel data set, more in demand. Central banks might of course need to contract out for that expertise – and may well use official agencies for that purpose, though there is ample competition from private firms.

## Changing mandate

Not unrelated to the growing size and complexity of the financial sector of the economy is the rise in emphasis on financial system stability as a 'charter item' for central banks. Financial stability as an objective has, of course, been around for as long as central banking. The lender of last resort function – to liquefy the system in times of crisis – was in fact a major part of the *raison d'être* of the modern central bank. But we have seen in the past decade or so a clearer focus on identifying potential threats to system stability and working to reduce them. This has been reflected in the structure of some central banks, as for example in the 'stability wing' of the Bank of England, and the creation of a System Stability function in the RBA. It has also been reflected in the advent of regular publications about stability issues by central banks, in our case the *Financial Stability Review* now published twice each year.

In this audience it is worth asking: what is the data set needed for this task?

Thus far, in our own experience and, as best I can tell, that of some other central banks, the data used by the work on system stability overlap to some extent with those used by the macro-economists in their monetary policy work. In our case, aggregates for credit, household sector debt-servicing burdens, risk spreads and so on are commonly used for both types of work. That is because the ranking question of late has been whether the extent of additional household leverage amounts to a risk to financial stability. It turns out that this pretty much depends on whether it constitutes a risk to macroeconomic stability first. That is, our assessment is that high household debt is unlikely, of itself, to lead directly to distress for lenders, or to a growth slump. Where there is a risk is that some other contractionary shock might be amplified by high levels of debt, with potential impacts on the economy. That might affect financial firms' profitability indirectly.

Thus far, then, the data sets used by the macro policy people and those by the financial stability people have been similar. As our work on system stability issues continues to develop,



however, I suspect we will need different sorts of statistical tools. There are likely to be two dimensions.

First, while to date stability analysts have mostly been content to work with aggregates – that is, *mean* outcomes – they are becoming much more interested in the *dispersion* of experiences around the mean. The question will be not just how much debt is there, but who has it, and what are their other characteristics? To take one example, the household debt-servicing ratio in Australia is higher now than it has been before. But the implications of this may be quite different if it is mainly high-income earners who have the largest debts (for which there does seem to be some evidence) compared with what would be the case if the debt is concentrated unduly in people of low incomes. Similarly, on the side of exposures to risk in the financial sector, the question will be: where does it reside? The apparent total amount of risk could look quite acceptable but the concentration might not be.

Second, there will be intense focus on the inter-linkages – the *correlations* – between institutions, portfolios and markets. In a full assessment of the resilience of the financial system in the face of an event which affects housing prices, for example, the direct effect on a bank's portfolio of housing loans of lower house prices and/or higher unemployment is only part of the story. Other elements would include how the bank's portfolio of *business* loans would be affected by the same event, including through the second-round effects of households' spending responding to the deterioration in their financial position. A shock large enough to cause the household sector significant problems in servicing mortgages would presumably be associated with some belt tightening for business borrowers too. Hence there could be a correlation between the two portfolios, and not necessarily the same one as in the past.

These interrelationships point to stress testing, for individual institutions and systems, as the way in which assessments of stability and resilience need to be conducted. The raw materials for the required data sets here are the historical loan portfolios, defaults experience and so on of the individual lending institutions. For the most part, these are in the hands of the institutions themselves and the bodies which collect the prudential data. The processing of these raw data to produce a fully-developed stress test of the system will be in the hands of the institution responsible for assessing the stability of the system – which is usually the central bank. This points to the need for arrangements which foster close co-operation, particularly where the central bank is not the bank supervisor and hence may not collect data directly (as is the case in Australia).

The kinds of analysis needed for a robust treatment of system stability also require substantial analytical and statistical skills in central banks: it's not just a matter of having the right data but being able to use it. Many countries have found this to be the case when participating in the Financial Sector Assessment Programs, or FSAPs, run jointly by the International Monetary Fund and the World Bank. This is a comprehensive process which assesses the strength of a country's financial system, and often involves stress testing which moves well beyond the single-factor sensitivity tests which banks and their supervisors usually conduct. Australia will begin our own FSAP later this year, and the Reserve Bank is chairing the stress test exercise, working with APRA, the Treasury and the private sector.

### Changing data environment

A third feature of the statistical landscape today is the proliferation of data collected and disseminated by private sector entities. One of the most common examples is industry associations or individual firms compiling data on aspects of business conditions. At last count there were, for example, some thirteen nationwide and several regional surveys of business conditions in the Australian economy or major parts of it. Another area is measures of housing prices, where private associations or research companies produce four of the five recognised series.

Some of these private data sets command, rightly, the attention of economists and policy-makers. The issue of quality of data is key, however. Where an entity which has a vested interest is releasing data, upon which they then base claims for advancing their own opinions or agenda, we should take care. Some private surveys one occasionally sees could only be described as crude advertising or propaganda. Not so long ago a new series for housing prices in Australia was launched, with great fanfare, by a lending institution. It turned out that the prices used were based mostly on potential borrowers' own subjective valuations of their own houses, rather than any actual transactions. The index was compiled by the lending department of the institution in question and appeared to be a marketing tool rather than a serious attempt to measure prices. Somehow it was not surprising that it showed significant rises in prices, when the better-known series were tending to show a decline. These sorts of series don't deserve to be taken seriously.

Part of the art of policy-making is developing a sense of how to distinguish noise and signal from this mass of 'information'. Before placing too much weight on an indicator, some knowledge of how it is put together is obviously important. To this end, it is often worthwhile for people in the policy analysis process to develop a good dialogue with the compilers of these data. On occasion, well-trained people in the bureaucracy have been able to suggest methodological improvements to privately-compiled surveys.

No survey of economic conditions should have much weight attached to it until we have seen its performance over a period of time long enough for some business cycle fluctuations to be observed. I grant that, in Australia, a very long expansion means that this test is getting a bit demanding. But even within an expansion there are fluctuations in the pace of growth and a good business survey should pick these up. Most surveys will be found, in my experience, to have given some false signals as well as some genuine ones. This issue of type I versus type II errors can be critical in judging the state of affairs at key points in the business cycle, using survey data.

It is in the area of financial prices where the proliferation of private data is perhaps most marked. The vast bulk of data on pricing of financial instruments is privately compiled, a result of the size of private financial markets and their continuous nature. Where financial instruments are traded on exchanges, their prices are easily observed, and there are relatively few challenges associated with compiling pricing data. However, with the increasing shift towards over-the-counter (OTC) and non-standard products, this task is more difficult and it becomes necessary to rely more on financial institutions' proprietary data. There is no real alternative to this, but of course we need to take care to be satisfied as to the accuracy and impartiality of the data and it is incumbent on private providers of data to be prepared to provide some assurance here. As central banks increasingly use such data sets to infer market attitudes to risk and expectations about the future (a process which incidentally requires increasingly sophisticated analytical skills), all these issues seem likely to grow in importance over the years ahead. Many challenges will surely come our way.

## Conclusion

Central banks are heavy consumers of information, and hence of statistics, and always will be. But the nature of the information we need to do our job, both in the monetary policy field and the financial stability field, is changing. The larger and more dynamic role played by the financial sector, and the greater prominence and impact of swings in household balance sheets, raise as many challenges for our statistical collections, and for the way we process them, as they do for policy itself. Just as supervisors of financial institutions or markets need to keep pace with developments, the challenge before our statisticians is to keep the nature and coverage of our collections fresh and relevant in a changing world. This is particularly pertinent for financial data. Just as important, a capacity to use relevant data to calibrate previous and potential future correlations between portfolios, institutions and markets is key to a sound assessment of stability and resilience of the system as a whole.

This is a big task, which will never be finished. Let us grapple with it with vigour. But first, enjoy the rest of your visit to Sydney.

*G.R. Stevens (Deputy Governor, Reserve Bank of Australia)  
Address delivered to the Irving Fisher Committee for Financial Statistics  
of the International Statistical Institute  
Sydney*

# Cost, quality and relevance of financial statistics

Chair: Coen Voormeulen (De Nederlandsche Bank)

Papers: **Cost, quality and relevance of the BIS international financial statistics**  
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# Cost, quality and relevance of the BIS international financial statistics

*Paul Van den Bergh (Bank for International Settlements)*

A financial system consists of three basic building blocks: financial institutions which provide a wide range of services to their clients, financial infrastructures through which these institutions and their clients interact, and financial markets in which prices are determined for various financial assets. As financial systems evolve and mature, the diversity within the different blocks tends to become greater.<sup>1</sup> The interrelationships within and between these building blocks also tends to become more complex over time.<sup>2</sup>

The complexity of the modern financial world increases further when observing the global international financial system that integrates the national systems of a large and growing number of jurisdictions.<sup>3</sup> However, the three basic building blocks can also be identified at the international or cross-border level.<sup>4</sup>

Whereas it is already a challenge to keep track of the evolving geography of the financial system of an individual country, the monitoring of the international financial system poses additional challenges. The global picture is indeed the sum of various national components complemented by information about cross-border interrelationships between the national components.<sup>5</sup> The BIS and the various groups that operate under its aegis, have been at the forefront to collect, compile and disseminate statistics on the international financial system. As can be seen from Table 1, the BIS statistics comprise a wide variety of statistics on core elements of each of the major building blocks of the international financial system. Put together and analysed carefully, including by looking at complementary information available from other international and national sources, a picture can be obtained from the global financial system that allows policy makers and other analysts to understand the environment in which they operate, which they supervise or regulate, or which they want to study.<sup>6</sup>

- <sup>1</sup> *In many countries financial institutions no longer only comprise traditional "banks" but also securities firms, custodians, (re)insurance companies, pension funds, other fund managers, hedge funds, leasing companies or other specialised firms providing specific financial services. Financial infrastructures become more varied with, for instance, separate clearing and settlement systems for large-value and retail payments, securities depositories and securities settlement systems, various open outcry and electronic trading platforms, netting and collateral arrangements, and specialised service providers for communicating financial messages and prices. Finally, the panoply of financial instruments, and their corresponding markets, continues to expand from traditional equity and securities markets to sophisticated markets for foreign exchange, derivatives, and credit risk transfers.*
- <sup>2</sup> *Banks, for instance, often provide non-traditional banking services, participate in different trading and payment and settlement systems and trade actively in a broad range of financial markets. Prices in these markets determine the value of the portfolios of the banks and their clients and affect the value of collateral pledged in clearing and settlement systems.*
- <sup>3</sup> *The UN currently has 191 members. Most of these are identified also in the BIS international financial statistics.*
- <sup>4</sup> *Financial institutions operate in different jurisdictions and offer services to residents of a wide range of countries; there are specialised international trading, payment and settlement systems; and financial instruments are traded simultaneously across various jurisdictions and time zones. A number of very large financial institutions are active in many countries, many infrastructures and markets on a 24-hour basis.*
- <sup>5</sup> *In many cases it may be misleading to simply aggregate domestic statistics and this would often double-count counterparties in financial transactions that operate from different jurisdictions. Another example of difficulties with aggregating national statistics is the need to convert these into a single currency unit and to take account of the effect of exchange-rate changes when looking at global statistics over time.*
- <sup>6</sup> *As an example, the total cross-border lending by internationally active banks amounted to around 17.3 trillion US dollar at the end of June 2004, of which 6.1 was to non-banks. The latter was about 10% of their total (domestic and international) claims on non-banks. The outstanding stock of international debt instruments issued by non-banks reached 2.6 trillion by end 2004, equivalent to about 10% of such securities issued worldwide (domestic and international). Within these totals, developing countries owed USD 1.1 trillion to international creditor banks and had issued international debt of a total amount of USD 0.6 trillion. The average daily turnover in the global foreign exchange market in April 2004 equalled 1.9 trillion, of which 31% was traded in the UK, 19% in the US and 14% in the eurozone. The notional value of derivative contracts traded daily over the counter worldwide equalled about USD 1.2 trillion. For those traded on regular exchanges the amount was about USD 4.6 trillion. Together with other financial transactions, these foreign exchange and derivatives trades are cleared and settled in the domestic payment systems of the countries whose currencies are being used. The total daily value of the so-called large-value fund transfer systems in the major financial centres roughly amounts to USD 5.7 trillion (this is the equivalent of more than half of the value of all the goods and services traded globally every year).*

Table 1 – Summary overview of the BIS international financial statistics\*

Statistics	Periodicity	Since	Sources	Characteristics	Comments
“Locational” cross-border banking.	Quarterly	1977	38 reporting central banks.	Cross-border assets and liabilities of internationally active resident banks. Breakdown by major currency, main economic sector and 190 vis-à-vis countries.	Include also forex positions vis-à-vis residents.
“Consolidated” international banking.	Quarterly	1983	30 reporting central banks.	Consolidated international exposures of domestic banks. Only international assets/claims. Breakdown by maturity also.	
Signed syndicated loans.	Quarterly	1992	Commercial databases.	International syndications, where at least one bank’s nationality is different from that of the borrower.	Currently includes 40,000 + loans.
International debt securities.	Quarterly	1966	Commercial databases.	Issues by residents and non-residents in foreign currencies or in domestic currency targeted at non resident investors.	635,000 + issues at end-September 2004.
International equities.	Quarterly	1983	Commercial databases.	Issues by international syndicates on international markets.	11,100 + issues at end-September 2004.
Domestic debt securities.	Annual Quarterly	1989 1994	National sources.	Domestic security instruments issued by residents aimed at resident investors.	National totals for 44 countries.
Exchange traded derivatives.	Quarterly	1986	Commercial databases.	Number of contracts and their notional amounts, by market risk category and type of contract.	5,000 + individual derivatives contracts.
OTC derivatives.	Semi-annual	1998	G10 central banks.	Notional amounts and gross market values, by market risk category, type of instrument and counterparty, maturity and currency. Will include data on credit default swaps as from June 2005.	Covers about 60 major dealers.
Global foreign exchange market activity.	Triennial	1986	52 central banks and monetary authorities.	Turnover in global foreign exchange markets.	Measures of turnover in April of the respective year.
Global OTC derivatives.	Triennial	1989	44 central banks and monetary authorities.	Amounts outstanding of various types of OTC contract; breakdown by instrument for each type of contract.	Measures of amounts outstanding at end-June of the respective year.
Concentration measure in derivative markets.	Semi-annual	1998	G10 central banks.	Index for forward rate agreement, interest rate swaps and options.	Herfindahl index based on data from individual reporters of OTC derivatives.
Joint statistics on external debt.	Quarterly	1999	Creditor data from IMF, OECD, World Bank and BIS.	Use of BIS data together with other creditor sources.	Database covers more than 175 countries.
Statistics on payment and settlement systems.	Annual	1980	G10 central banks and monetary authorities of HK and Singapore.	National statistics on large-value and retail payment systems and securities settlement systems.	The so-called “Red Books” include data from key cross-border systems.
Statistics on reinsurance markets.	Annual	2003	7 insurance supervisors.	Includes measures of various business indicators of reinsurance companies, including their involvement in credit derivatives. markets.	Covers about 40 reinsurance companies.

\* Statistics on reinsurance markets are from the International Association of Insurance Supervisors which is an independent international organisation operating from the BIS in Basel.

Table 1 also shows that the BIS statistics have two sources. A limited number of data are compiled on the basis of commercial databases, eg those for international securities or syndicated loans, or publicly available sources, eg those for domestic securities and exchange traded derivatives. Apart from the cost of purchasing or collecting the statistics, the major cost is borne by the BIS in terms of cleaning the raw data, compiling and publishing the global aggregates and accompanying the data with appropriate explanations and analysis. Though other organisations could, in principle, develop a similar set of statistics, the expertise of the BIS ensures that the data are a unique source of information for financial market analysts.

Most of the BIS statistics are based on proprietary data that are not available from any other source. The data are collected by individual central banks participating in the respective statistical exercise from banks or dealers in their jurisdiction and passed on as national aggregates to the BIS, which in turn calculates and publishes global statistics.<sup>7</sup> The compilation of such comprehensive global statistics on the international financial system is a major endeavour for the BIS, its member central banks and the reporting institutions involved. There are indeed considerable costs involved in distilling the data from banks' and dealers' internal reporting systems, transmitting them to the respective national central banks which check them and aggregate national totals, and providing the national data to the BIS which calculates world totals. Technology helps, of course, but IT systems and telecommunication facilities do not come for free. It should also be noted that the BIS makes all its statistics and publications, accompanied by a commentary, available free of charge.<sup>8</sup>

The BIS has used the IMF's Data Quality Assessment Framework (DQAF) to carry out a self-assessment of the quality of its international financial statistics. The DQAF is broader than the traditional framework focusing on accuracy, ie "getting the numbers right". It spells out the multiple dimensions of data quality, including integrity; methodological soundness; accuracy and reliability; serviceability; and accessibility. The assessment has shown that the BIS statistics meet generally accepted best practices. Moreover, the BIS makes constant effort to improve the coverage, timeliness and dissemination of its statistics.

What ensures that the benefits of the BIS statistics, in particular the BIS's proprietary data, outweigh the costs involved in compiling them? The starting point are the various Basel-based groups that identify and analyse policy issues relating the development and functioning of the global financial system. These include the Committee on the Global Financial System, the Basel Committee on Banking Supervision, the Committee on Payment and Settlement Systems, the International Association of Insurance Supervisors and the Financial Stability Forum.<sup>9</sup> These "user" groups decide whether it would be useful to engage in a particular data collection effort. They will contact, through their national representatives, the financial institutions from whom the data would be requested to seek their views.<sup>10</sup> Careful consideration is given to the potential analytical value of any new statistics<sup>11</sup> and whether any new information could be obtained or approximated from other data sources, including commercial ones. An important question is also whether market participants themselves would benefit from the exercise by obtaining an overview of the global market in which they operate.<sup>12</sup>

<sup>7</sup> The data on the reinsurance market are collected in the same way by a number of national insurance supervisors from reinsurance companies in their jurisdiction and passed on to the Secretariat of the International Association of Insurance Supervisors, which is operating from the BIS in Basel. Regarding data on payment and settlement systems, only national data are available.

<sup>8</sup> The costs for the BIS itself are the staff costs of eight economists/statisticians who coordinate the regular reporting exercises, compile world totals and improve the quality of the data and provide guidance to internal and external users of the data. By renewing its data processing systems regularly (the 4th new system within 20 years is currently being introduced), the BIS has managed to address ever-growing statistical demands with almost unchanged staff numbers, although the economic and statistical qualification of staff has increased significantly over time. As a sponsor of the initiative, the BIS also intends to use the emerging SDMX standards to facilitate the collection, compilation and dissemination of its international financial statistics (see [www.sdmx.org](http://www.sdmx.org) for more information on these data exchange standards).

<sup>9</sup> Information on the mandate and activities of these international groups can be found in the BIS Annual Report and the BIS website, [www.bis.org](http://www.bis.org)

<sup>10</sup> In various countries, any initiative to collect additional information has to go through a formal cost/benefit analysis.

<sup>11</sup> For an overview of the uses of the BIS international financial statistics see BIS Paper no 14 from February 2003 (pp. 35–43) as well as various special features articles in the BIS Quarterly Review.

<sup>12</sup> In many cases the BIS exercises provide the only authoritative source of information of particular elements of the global financial system. This allows not only the authorities but also the market participants to identify particular trends and to identify their own competitive position in the global market. The triennial Central Bank Survey of Foreign Exchange and Derivatives market activity offers a good example. Because these markets are essentially global in nature, individual market participants and central banks can only ever gain a partial picture of market dealings, while their participation in the global survey organised by the BIS provides comprehensive, standardised information at comparatively low cost. An added benefit of this global survey is that it provides significantly more instrument and transaction detail than is normally collected at the national level. Thus the survey also serves as a benchmark for other data collection activities in this area.

To keep costs limited, efforts are generally made to use accounting or regulatory data that banks already have and/or already make available to their national authorities. These data are often not fully comparable so the BIS develops common methodologies in consultation with reporting central banks and reporting dealers. By adjusting reporting requirements over time to these methodologies, global reporting becomes standardised without increasing the reporting burden for financial institutions. Moreover, new data collection initiatives to keep track of financial innovations are often an expansion of existing reporting and dissemination exercises, rather than an embarkation on a completely new exercise.<sup>13</sup>

Significant attention is being paid by the BIS and the community involved in its financial statistics to ensure that the data are compatible with other relevant statistical exercises. For instance, the methodologies for the BIS statistics are kept in line with those for national and financial accounts (particularly the BOP Manual) and international accounting standards. Most recently, the BIS has worked actively with other experts to ensure consistency between its statistics and the IMF's new Financial Soundness Indicators. The BIS also cooperates with other international organisations in the so-called Inter-Agency Task Force on Finance Statistics. The latter has produced a manual on External Debt and operates a joint web hub that bring together creditor data on external debt available from the different organisations. The BIS banking and securities statistics are a major component of this dataset.

To conclude, the BIS international financial statistics are widely recognised to be a unique and authoritative source of information on key components of the global financial system.

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<sup>13</sup> *The introduction of the consolidated banking statistics in 1983, for instance, was a refinement of the earlier locational banking statistics. Improvements in the consolidated banking statistics have gone hand in hand with improvements in risk management and accounting techniques in reporting institutions. More recently the decision was taken to include data on a new set of financial instruments called credit default swaps in the existing reporting format for the OTC derivatives statistics. The recently introduced concentration measures for OTC derivatives are based on available reports from individual dealers.*

# The potential impact of Basel II on central bank data requirements in Jamaica<sup>†</sup>

*Myrtle D. Halsall and R. Brian Langrin (Bank of Jamaica)*

## 1. Introduction

The abrupt proliferation of financial crises in developing countries, beginning around the 1980s, highlighted the absence of effective risk management in financial institutions. The Jamaican 1996–98 financial crisis was one of the most severe cases, with a cost of over forty per cent of GDP. Similar to other developing countries, one of the root causes of the crisis was the lack of proper management of credit risk. In particular, Jamaican banks were over-exposed to their *de facto* unregulated insurance company affiliates. Hence, there were significant debt obligations spillovers to the banking sector following the collapse of the insurance sector. This paper examines the formidable challenges posed by the New Basel Accord (Basel II) on central bank data requirements in Jamaica, particularly in relation to improving the shortcomings associated with the current assessment of credit risk. The establishment of a Public Credit Register (PCR) at the Central Bank of Jamaica (BOJ) is proposed as a practical solution. Centralizing the credit ratings scale in Jamaica would alleviate technical hitches, similar to those faced by most developing countries, chiefly concerning the implementation of the Pillar 1 of the Basel II framework. Jamaica is compliant with 12 of the 25 Basel Core Principles (BCPs), 5 more than the average developing country, and largely compliant with 10. The country's pre-requisites for Pillar I implementation include: (1) full implementation of BCPs; (2) improving the IT infrastructure; and, (3) the adoption of Pillars II and III of Basel II.

## 2. Basel II

The Basel Committee on Banking Supervision (BCBS) have revamped the original 1988 Basel Accord (Basel I). This transformation is geared towards reducing the distinction between regulatory and economic capital. Basel I, in effect, assigns one of four 'risk weights' to broad categories of bank assets, ranging from zero to one hundred percent. The Accord requires that banks maintain a minimum of eight percent capital to risk-weighted assets ratio. However, Basel I is inundated with critical drawbacks including the application of single, fixed risk weights to very general asset categories as well as its disregard for portfolio diversification effects.

In an attempt to address the shortcomings of the original Accord, the BCBS proposed a new Basel framework, which focuses on the application of 'three pillars': Pillar 1 recommends a new, more sophisticated approach to minimum capital requirements; Pillar 2 requires the development of a process of supervisory review; and Pillar 3 advocates the enhancement of market discipline (see BSBC, 2004). Pillar 1 contains the most comprehensive improvements on Basel I, particularly as it relates to the treatment of credit risk. One of the main objectives of the Basel Committee is to encourage large, internationally active banks to advance their development of proprietary risk management systems. Pillar I advocates that regulators supervise these banks in using their proprietary credit data and internal ratings methodologies for the determination of capital requirements, instead of using the traditional 'rules-based' Basel I Approach. The Internal Ratings Based (IRB) Approach will allow for the computation of forward-looking loan loss provisioning (expected losses, *EL*) and minimum capital requirements (unexpected losses,

<sup>†</sup> *The views expressed by the author does not necessarily reflect those of the Bank of Jamaica.*



$UL$ ), which would be equivalent to the banks' Value at Risk (VaR). The expected and unexpected losses in the credit portfolio is defined as:

$$EL_t = EE_t \times PD \times (1 - \rho) \quad (1)$$

$$UL_t = CAR_t \times PD_t \times (1 - \rho) \quad (2)$$

where:  $PD_t$  denotes the probability of default at  $t$ ;  $\rho$  refers to the fractional recovery rate;  $CAR_t$  represents the credit at risk; and,

$$EE_t = \int_{-\infty}^{+\infty} \max(x, 0) f(x) dx \quad (3)$$

is the expected value of the asset replacement value,  $x$ , at  $t$ .

As a simpler alternative to the IRB Approach, the Standardized Approach (SA) was proposed by the Committee, which would allow banks to use private credit rating agencies, as well as the ratings from official Export Credit Agencies when applying risk-linked capital requirements. This alternative still poses a problem for developing countries given the minimal access by their banks to credit agencies that would enable a comprehensive association between economic risk and capital.

### 3. The Public Credit Register solution

In lieu of the IRB and Standardized approaches, a popular proposal advanced by Powell (2004) is to centralize the credit ratings scale by way of a PCR. PCRs are typically owned, wholly or in part, by the central bank. Under the Centralized Rating Based (CRB) Approach, banks' rating of their borrowers are mapped into default probabilities, but the regulator determines the rating scale. These default probabilities may be mapped to provisioning and/or capital requirements. This would greatly ease the modern supervision of risk-based capital adequacy, relative to the IRB or SA Approaches. Forward-looking provisioning would then equal the VaR minus the Basel II SA capital requirement (see Majnoni *et al.*, 2004).

PCR data have been used in banking sectors around the globe for the monitoring of banks' loan portfolio quality. PCRs administered by central banks have required supervised financial institutions to periodically provide detailed data on all borrowers' default exposure vis-à-vis the financial system. Aside from essential data such as tax identification number, legal name or trademark, address, currency and economic sector, PCR data collected pertain to both 'negative' and 'positive' information. Negative data include delinquent loans, overdrafts, credits write-offs and defaults. Positive data refers to information on borrowers in 'good standing' including amount of credit outstanding, repurchase agreements, mortgages, leases, maturities, interest rates, non-default rating and availability of collateral.

### 4. The case for additional Bank of Jamaica data requirements

The BOJ regulates and supervises all commercial banks, merchant banks and building societies domiciled in Jamaica. BOJ regulations require that their licensed financial institutions surrender aggregate credit portfolio information in accordance with the following classifications, inter alia: *Standard* – Credits with repayments under one month in arrears (including credits with no arrears); *Potential Problem/Special Mention* – Credits with repayments in arrears for one month and under 3 months; *Sub-Standard* – Credits with repayments in arrears for 3 months and more; *Doubtful* – Credits with repayments in arrears for six months and under 12 months; *Loss* – Credits with repayments in arrears for 12 months and over.

The BOJ also requires a minimum level of specific provisions against the 'estimated net loss' for individual credit as the greater of 1 percent of total credit or 20 percent of estimated net loss for 'sub-standard' credit and the greater of 1 percent of total credit or 100 percent of estimated net loss for credit classified as either 'doubtful' and 'loss'.

The estimated net loss reflects the net exposure remaining after deducting the 'net realisable value' (NRV) of collateral (in accordance with strict but static specifications) from the total credit balance. Table 1 illustrates the weaknesses associated with the current static requirements for the computation of the NRV. A general provision is also required for the aggregate dollar value of all credits that are classified as 'standard' or 'special mention' as well as the other classifications not subject to special provisions. The general provisioning requirements are fixed at

Table 1 – NRV computation sheet for specific assets

Age of valuation (V) (months)	Commercial real estate (NRV)	Residential real estate (NRV)	Motor vehicles (NRV)	Plant or equipment (NRV)
<3	1.0V	1.0V	1.0V	1.0V
3–6	1.0V	1.0V	0.9V	1.0V
6–9	1.0V	1.0V	0.8V	1.0V
9–12	1.0V	1.0V	0.7V	1.0V
12–24	0.8V	0.9V	0.0V	0.5V
24–36	0.7V	0.8V	0.0V	0.0V
>36	0.5V	0.5V	0.0V	0.0V

Table 2 – Provisioning requirement as assessed by BOJ examiners

Account/Borrower	Total exposure	Collateral security held	Adjusted collateral values	Collateral excess/ (Shortfall)	Provision required	Provisions made by licensee	Additional provisioning required by BOJ	Months in arrears	Comments
	\$		\$	\$	\$	\$	\$		

0.5 percent of the total credit value in the case of residential mortgages and 1.0 percent of the total credit value for all other credit.

In addition to ensuring adherence to the regulatory procedures concerning ‘sub-standard’ credits, BOJ examiners conduct on-site examinations, at least annually, for other motives. For instance, BOJ examiners sample about 30 percent to 60 percent of the credit portfolios of all licensees, depending on its size and regardless of whether or not the specific credit is classified as substandard. That is, BOJ examiners collect both ‘positive’ and ‘negative’ credit-related data. The major objective of the on-site sampling is to assess the overall credit risk exposures including credit concentrations and connected party lending. This information is collected manually and maintained electronically in a pseudo-credit registry at the BOJ. Table 2 shows the template used to record provisioning requirements as assessed by BOJ examiners. Additional information is sometimes required on individual credit items regarding the name of the customer, inspection date, interest rates, type of business, principal owners, guarantors, affiliated entities and statutory violations.

The BOJ is currently assessing the appropriate future application of Basel II to account for provisioning and capital adequacy concerning credit risk in the banking industry. The CRB approach appears to be a feasible ‘way forward’ for the Jamaican banks in their transition toward Basel II. However, there has been no significant penetration of rating agencies in Jamaica. Ongoing advancements in technology at the BOJ, includes the introduction of modern data warehouse infrastructure by the end of 2005. The new warehouse technology will have the ability to collect, store and distribute the necessary PCR data from BOJ licensees and calibrate the regulator-determined credit ratings scale to obtain the expected and unexpected losses linked to forward-looking loan loss provisioning and minimum capital requirements (see equations 1–3, above). Credit-scoring econometric techniques such as logit/probit models, discriminant linear analysis or neural networks would be built-in the warehouse technology to assign the appropriate rating per borrower. This will make the establishment of a PCR to conform to the basic requirements of Basel II, relatively straightforward.

Consistent with the Basel II requirements, the BOJ’s PCR should define at least seven rating ‘buckets’ for differing levels of credit risk for loans not in default, with at least one bucket representing loans in default. The range of rating scales from the PCRs of some countries, such as the Central Bank of Brazil (see Central Bank of Brazil, 2003) provide excellent models for the BOJ to implement. In the major PCRs, all credits, PDLs and provisioning are classified into a number of risk levels. The BOJ could increase its current grades for credit risk with, for example: grade AA for the prime borrowers; grades A, B and C for other borrowers with a low probability of default; grades D, E, F, G for borrowers with higher risk levels; and grade H representing the highest level of default. The rating process would be based on: (a) analysis of

Table 3 – Credit risk rating scale

Grade of borrower	AA (%)	A (%)	B (%)	C (%)	D (%)	E (%)	F (%)	G (%)	H (%)
Default Probability Interval	0.00–0.90	0.91–1.09	1.10–2.50	2.51–3.68	3.69–5.42	5.43–7.94	7.95–10.97	10.98–20.00	20.01–100.00
Risk weight	10	15	17	20	25	30	40	50	100

the borrower, including credit worthiness, indebtedness, capacity to generate cash to repay its debts, quality of earnings, quality of management and internal controls, punctuality, economic activity and level of commitments; and (b) analysis of the credit transaction including the kind of transaction, the collateral provided and the amount of the debt.

The centralised credit risk rating scale computed by the BOJ could then be used by banks to rate borrowers accordingly, in their determination of capital and/or provisioning. Table 3 provides an example of a rating scale, which BOJ could update regularly. Further, if Jamaica adopted the SA approach, it would still be fully Basel II compliant under the CRB proposal. In particular, the difference between the CRB computed VaR and the SA capital charge could be employed to calculate forward-looking provisioning requirements.

Along with the provision of inputs in ‘early warning’ systems of bank failure, PCR data can also be used to enhance macroeconomic research. Useful information can be generated for credit survey analysis by economic sector, which would be important for the monetary transmission process, the assessment of macroeconomic risk and the formulation of economic growth strategies by policy makers.

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## Résumé

*Cet étude examine le défi formidable posé par le nouvel accord de Basel sur les données de crédit requises par la banque centrale de la Jamaïque. L'établissement d'un registre de crédit public dans la banque centrale est proposé en tant que solution pratique. La centralisation de l'échelle pour la cote de crédit allégerait les petits problèmes techniques qui surgissent dans la mise en application du cadre de Basel II. Ces petits problèmes sont similaires à ceux confrontés par la plupart des pays en voie de développement.*

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# Future challenges in compiling balance of payments and international investment position

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## 1. Introduction

In Denmark one custodian transmits clients' end-of-month holdings of securities just 11 minutes after the end of the month. Data, which are on a security-by-security basis, are retrieved and transmitted in one fully automated process. The quality of data is high and the respondent costs are low. Thus, data can immediately be put to use in the production of Balance of Payments (BoP), International Investment Position (IIP), Financial Accounts and Securities Statistics.

Compilers everywhere face the challenge of collecting, processing and reporting information more accurately, timely and cost efficiently. The above example illustrates that it is possible to remove – the traditionally perceived – trade-off between costs and quality. This is the topic of the article.

## 2. Experiences from the Danish central bank – a learning process

Between 1998 and 2003 The Danish Central Bank expanded both the scope and the detail of its financial statistics, particularly with a view to complying with statistical obligations in relation to the European Central Bank (ECB). During that process, also information on external sectors were integrated in the various reporting formats. For instance, when the statistics on monetary and financial institutions, MFIs, were extended (with transactions and interest-rate statistics), and the mutual fund statistics developed, it was already evident that settlement data sooner or later would become inadequate for future BoP statistics. Therefore, the needs of BoP and IIP statistics were integrated into the general reporting requirements of these sectors from the very beginning.

Once completed the financial statistics included a considerable amount of relevant BoP/IIP information, and constituted a natural point of departure for the subsequent major overhaul of the BoP collection system. A change from the present settlement-based collection system to an integrated system for the financial accounts of BoP and IIP<sup>1</sup> were underway for nearly 2½ years. The new collection system became operational in January 2005.

A reduction in the burden of respondents has been an important strategic goal in developing the new BoP/IIP collection system. Using already existing financial statistics as much as possible meant that both the number of respondents and the amount of information to be reported by non-financial entities could be reduced dramatically.

Overall, building upon the MFI and the mutual funds statistics, which combined account for around one third of the total BoP financial transactions and IIP statistics, there remained basically two major additional sources to be developed, namely: (1) an extension of the reporting from custodians on clients' holdings of foreign securities, which together with information on foreign holdings of Danish securities from VP Securities Services (VP – the Danish securities centre) account for another third of total output, and (2) a survey of large non-financial entities, which will supply the remaining third of the BoP/IIP information.

*The securities area:* A monthly, high quality and timely statistics based on data from VP already existed in relation to foreign holdings of domestic securities on a security-by-security basis. Custodians on the other hand reported aggregated domestic holdings of foreign securities on a quarterly basis. Therefore, it was necessary to upgrade their reporting to comply with the needs of BoP and IIP statistics.

<sup>1</sup> *It has been agreed that in future Statistics Denmark collects data on trade in services, whereas The Danish Central Bank is responsible for the financial account of BoP and IIP statistics.*

A consultation process with custodian banks was started. Early, it became clear that the custodian banks had a preference for security-by-security reporting, primarily because they wished to achieve more stability in their reporting requirements over time. Also, it allowed them to base their reporting, more or less, on the same detailed register, which they need to maintain in any case to record clients' holdings of individual securities. So, by choosing security-by-security reporting the custodian banks could, actually, combine their own business needs with reporting requirements. However, given the large volume of data involved and the need for timely and high frequency data, it was necessary to develop an electronic reporting system that would allow fully automated system-to-system feeds. An open IT solution was constructed to allow for an exchange of data, regardless of the software platforms of custodian banks, thereby minimising their initial IT investments. Hence, the large volume of data was not at all an issue.

Basically, the reports contain information on individual holders of the various ISIN codes in custody. Since the ISIN code is a recognised international standard for identification of internationally traded securities, The Danish Central Bank is able to calculate portfolio transactions and investment income, broken down by type of security, country and sector, by combining the reports from the custodian banks with supplementary information on the specific characteristics of the securities.<sup>2</sup>

The shift to security-by-security reporting by custodian banks has improved the quality of data. The detailed reporting has revealed inaccuracies in the classifications of the previous aggregated reports. Based on stocks, also transactions, accrued interest and revaluation can now be calculated with great precision. Further, the collection model is *adaptive* in the sense that it can accommodate changes in output requirements as well as differences in the classification of securities between various statistics, without necessarily affecting the data extraction of respondents. Equally, reporting has become both more frequent and timely: data are reported on the 4th banking day each month – although most custodians deliver earlier – against previously on the 8th banking day in each quarter.

To sum up: For the respondents the new system meant providing more information, but at lower running costs. For the compiler it meant investments in IT and insourcing of tasks, but accompanied by higher data quality and timeliness. Thus, the exercise succeeded in removing the traditionally perceived negative trade-off between costs and quality.

*Non-financial companies:* The switch to a survey based reporting system will alone reduce the respondent burden by about 2/3, compared to the present situation where international payments are reported on an individual basis.

To further reduce the respondent burden of companies, when developing the electronic reporting forms, a consultation process was started with companies, accounting firms and software providers. This led to several improvements. Most importantly, the reporting requirements were adapted to accounting concepts. Moreover, control features – logical as well as quality checks – with instant feedback to the respondents were built into the electronic reporting forms. Finally, the business community clearly preferred one uniform reporting scheme, even though it means providing more information on a monthly basis: All information is reported on a monthly basis rather than combining a detailed quarterly report with a less detailed monthly report.

However, as we learned, more is required in terms of standardisation of concepts across the various reporting obligations to the public sector at large, if companies are to fully automate their reporting process. At this stage, it was simply too costly for entities to develop the necessary data extraction programs.

### 3. Factors in meeting the future challenges of cost and data quality

Compilers are increasingly focussing on costs of the respondents and quality of data. Our experience points to at least two key factors, which can alter the trade-off between cost and quality significantly. First, we should endeavour to ask for information, which comply with respondents' own business needs and to focus on developing broader data standards. Second, we should use an IT technology, which is compatible with a variety of IT platforms. Eventually this could reduce, or even eliminate, the classic dilemmas of compilers.

It is important to appreciate the difference between technological and data standardisation. The difference can be illustrated by a fax. The fax is a technological standard but the content is

<sup>2</sup> *Supplementary information is acquired from a domestic commercial data provider. Once ECB's Centralised Security Database (the CSDB) becomes operational, costs and data can be shared across EU countries, and data quality and coherence of financial statistics across EU countries can be improved.*

not standardized. The most commonly known shared data standard is the Universal Price Code (UPC), which is used on almost all retail products – similar to the ISIN code for securities. This code can be used for different purposes: inventory, cash registers, etc.

Should compilers be in the business of choosing or providing software that respondents can use, or should they establish a reporting platform, which is compatible with different software packages? By focusing on technology, the reporting process will be subject to frequent disruptions in trying to accommodate technological changes and new information needs. With recognised data standards, however, it is not necessary to dictate a certain technology. Again, this can be illustrated by the example of the UPC code. There are many devices on the market – based on different technologies – which can read this code. When the respondents are a diversified group – like non-financial companies – an open IT standard allows software providers or the respondents to develop reporting solutions that fit each individual company, irrespective of their software platform.

In many data compilation systems, these two approaches are entangled. A certain format and technology is often demanded, e.g. to report a given information in an Excel spreadsheet. In a truly standardized reporting model, the data standard should be decoupled from the technology and the focus should be on developing common data standards.<sup>3</sup> However, a format, which the respondent cannot use for other purposes as well, such as tax filing or financial statements, does not constitute a genuine standard.

#### 4. What could be ahead?

To us the process of designing and implementing the new BoP/IIP collection system has indeed been a learning process. New problems were discovered, and new ideas and solutions emerged over time.

The results in terms of reducing the costs of respondents and, at the same time, improving the quality of statistics are important. Notably, it should be explored whether similar results, as the ones in the securities area, can be achieved in other fields of financial statistics.

One area of particular interest would be the developments in the future reporting obligations of monetary and financial institutions. At present, reporting requirements are rather aggregated and, thus, very sensitive to changes in statistical requirements. With Basle II a worldwide regulatory standard for banks with real-time disclosure may well be developing, and could eventually offer a possibility to alter the statistical trade-offs fundamentally also in this field. A side effect would be increased availability of data from monetary financial institutions in the future.

For non-financial companies a similar important driver towards changing existing trade-offs could be a rapid acceptance of XBRL<sup>4</sup>-reporting. Indeed, from 2005 it will be possible for Danish companies to file their financial statements to authorities in this standard format. This may similarly increase the availability of data from non-financial companies, particularly in relation to IIP statistics.

Finally, turning briefly to the international dimension. For BoP and IIP statistics, a good point of departure would be to actively utilize the convergence of accounting standards internationally. The leverage could potentially be quite strong because of their statutory nature and their close relationship with companies' own business needs. This raises the question to which extent statistical output requirements, as set out in the various international statistical manuals, could and should adapt further to international accounting standards? In our view there is little doubt as to which direction we ought to take in the future.

#### Summary

*The increasing problems facing balance of payment collection systems, based on settlements of cross-border payments, are well known. The Danish Central Bank decided in Summer 2002 to radically reform the collection of data for the compilation of the Danish balance of payment and international investment position. The new system entered into force in January 2005.*

<sup>3</sup> The same line of arguments can be made in relation to strengthened coordination in the field of data dissemination. Also here there is scope for improving the coherence, both in terms of data definitions and IT standards, between published statistics across countries.

<sup>4</sup> The format is in XBRL (eXtensible Business Reporting Language). It provides a standard-based language for defining and reporting common financial business data. It does not establish new accounting standards, but it makes better use of the existing ones by defining a shared standard by tagging data.

*The paper first describes the fundamental strategic choices, which were made to improve quality and reduce costs for respondents. Then a more forward looking approach is taken by arguing that compilers of statistics, in the future, should adapt to globally accepted standards in other areas, e.g. accounting standards and open IT standards.*

*By doing so data quality (accuracy and timeliness) will increase because data will become much more closely linked to the data needs of respondents. Also, it will be more cost efficient because data will become more accessible.*

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## Résumé

*Le problème croissant, qui face les systèmes de collection de la balance des paiements, basée sur les règlements des paiements, est bien connu. La Banque Nationale de Danemark a décidée en été 2002 de réformer radicalement la collection des données pour la compilation de la balance des paiements danoise et la position extérieure du Danemark. Le nouveau système était applicable dès Janvier 2005.*

*L'article commence par décrire les choix stratégiques fondamentaux, qui étaient fait pour améliorer la qualité et réduire les couts des répondants. Après une approche de regard plus avant est prise en utilisant l'argument que les compilateurs des statistiques, dans la future, doivent adopter des standards globalement acceptés dans d'autres domaines, comme des standards des comptabilités et des standards d'informatique ouverts.*

*En faisant cela, la qualité des données va augmenter parce que les données seront plus près liés avec les besoins des répondants. Egalement, il sera plus coût-efficient du fait que les données seront plus accessibles.*

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# Accounting standards and their impact on financial statistics

Chair: Michel Stubbe (European Central Bank)

Papers: **A comparison of the main features of accounting and statistical standards and review of the latest developments in the field of accounting standards**

Paolo Poloni and Patrick Sandars  
(European Central Bank, Directorate General Statistics)

**From general ledger towards financial statistics**

Johan Lammers (Statistics Netherlands)

**The impact of the introduction of accrual accounting by Australian governments on government finance statistics**

Peter Harper (Australian Bureau of Statistics)

**Monetary and financial statistics: the role of accounting standards**

Rob Edwards and Randall Merris (International Monetary Fund)

**The impact of accounting standards on financial statistics – comments on invited papers**

Jean Cordier (Banque de France)

**Comments on the paper related to accounting standards and their impact on financial statistics**

Satoru Hagino and Michelle Hassine (Bank of Japan)



# A comparison of the main features of accounting and statistical standards and review of the latest developments in the field of accounting standards<sup>1</sup>

*Paolo Poloni and Patrick Sandars  
(European Central Bank, Directorate General Statistics)*

## **1. Framework for comparing accounting and statistical standards**

### **1.1 Conceptual framework**

For the purpose of this paper, it is important to establish a conceptual framework within which to assess the relationship between financial accounting standards and macroeconomic statistical standards.

The framework for statistical standards is founded on the System of National Accounts 1993 (SNA 93), which provides guidance on the construction of harmonised statistics for production, income, and accumulation accounts, as well as for balance sheets showing the stock of assets and liabilities for the individual sectors of the economy. The objective is to provide a consistent framework for the systematic and detailed description of the whole economy, both national and regional, its component sectors and relations with other economies.

Conversely, accounting standards are designed to provide rules for the preparation of harmonised financial statements in the form of balance sheets and income accounts that provide the necessary basis for an assessment of the financial condition of individual (groups of) units, measure their income and solvency, and determine the shareholders' entitlement to that income. International Accounting Standards (IAS) are established by the International Accounting Standards Board (IASB) and aim at achieving the objectives of fairness, accuracy and transparency. The standards are supported by a series of interpretations of the IAS developed by a Standing Interpretations Committee (SIC) and approved by the IASB.

### **1.2 Main features of accounting and statistical standards**

The links between statistical standards and business accounting are briefly described in the SNA 93, paragraphs 1.58 to 1.63.<sup>2</sup> As explained therein, the fundamental principles of national accounts are similar to those long used in business accounting.

Accounting and statistical standards have in common the overall objective of compiling data that follow the double-entry bookkeeping system and are comparable over time and across individual institutions or economies. Indeed, from an investor point of view, it is important to monitor the development of a company's performance over time and in comparison with its competitors.<sup>3</sup> This comparability over time and across institutions is also essential for macroeconomic statistics inasmuch as it facilitates the construction of consistent time series and the process of aggregation.

1 *An earlier version of this paper was presented to the 55th Session of the International Statistics Institution, Sydney, 5–12 April 2005.*

2 *For a review of conceptual and practical aspects of linking business accounts to national accounts on the basis of countries' experiences, see UN (2000) 'Links between business accounting and national accounting' ([http://unstats.un.org/unsd/publication/SeriesF/SeriesF\\_76E.pdf](http://unstats.un.org/unsd/publication/SeriesF/SeriesF_76E.pdf)).*

3 *According to the IASB Framework for the Preparation and Presentation of Financial Statements (cf. F.39–42), users must be able to compare the financial statements of an enterprise over time so that they can identify trends in its financial position and performance. Users must also be able to compare the financial statements of different enterprises. Disclosure of accounting policies is essential for comparability. An overview of the IASB framework can be found at [www.iasb.org/uploaded\\_files/documents/8\\_63\\_fw-sum.pdf](http://www.iasb.org/uploaded_files/documents/8_63_fw-sum.pdf)*

This implies that where business accounts and national accounts have to treat new phenomena they may come to the same general conclusions when applying these general principles. However, it is crucial to note that the standards do not share the same overall objectives, meaning that it cannot be ensured that the two standards will measure phenomena in the same way.

A clear objective of statistical standards is to ensure that operations are recorded in accordance with their substance or nature, such that the same operation or phenomenon is measured in precisely the same way by entities both in the same economy and across all economies worldwide. This contrasts with financial accounting standards, where a phenomenon is generally to be recorded according to the purpose for which the operation is undertaken or the instrument issued or held. This has the important consequence that, as long as the accounting principles are consistently applied, the use of alternative methodologies and presentations is possible in financial accounting standards. By contrast with the SNA 93, financial accounting standards do not aim to provide a standardised dataset for the presentation of financial statements. Hence, the high number of options in accounting standards means that, in practice, accounting data do not permit easy aggregations and comparisons.<sup>4</sup> The flexibility provided by the IAS is the result of a set of principles which have been reached by international consensus. However, it presents some difficulties for statisticians if they are unable to obtain information for each company on the accounting option chosen.

Furthermore, because accounting standards are geared to the goal of measuring the performance and solvency of individual institutions, they do not aim to ensure that the same transaction is recorded symmetrically by two counterparties with respect to its valuation and timing.<sup>5</sup> Conversely, statisticians devote significant efforts (e.g. in the field of balance of payments) to ensuring that transactions between counterparties belonging to different sectors or countries are recorded according to quadruple entry accounting, in a consistent manner.

### 1.3 Implications for balance sheets and valuation

The following is an example of the above-mentioned differences between standards. In the International Accounting Standards, IAS 1 currently requires that minimum line items be disclosed in a company's financial statements. More detailed requirements for banks and similar financial institutions are specified under IAS 30.<sup>6</sup> IAS 30, paragraph 18, requires financial institutions to present a balance sheet that groups assets/liabilities by nature and lists them according to their relative liquidity. The SNA 93 contains similar requirements, although there are important differences of detail.

The IASB is proposing to replace IAS 30 with a new International Financial Reporting Standard (IFRS)<sup>7</sup> which, among other things, requires a breakdown of financial assets and liabilities by maturity. However, the draft IFRS does not require specific maturity bands to be applied but only offers examples, whereas the ESA95 and MFI balance sheet statistics have very precise specifications. Precise groupings in terms of maturity bands would permit data aggregations and facilitate comparisons. Furthermore, IAS 30 requires a breakdown by residual maturity, whereas the ESA95 requires original maturity to be applied and, for the MFI balance sheet statistics, periods of notice in the case of savings deposits where maturity is not a relevant concept.

It is against this background that efforts are being made – inter alia within the European Union, as is evidenced by the recent opinion of the Committee on Monetary, Financial and Balance of Payments Statistics (CMFB)<sup>8</sup> on the IASB's exposure draft on financial instrument disclosures (ED 7)<sup>9</sup> – to achieve a reconciliation with the breakdowns requested for statistical purposes. This is considered necessary for several reasons. First, statisticians will deliver better quality statistics where there is a close link with the data that companies prepare for accounting purposes. Second, where phenomena can be measured for statistical purposes in the same way

4 For a list of alternative accounting treatments in IFRS, see 'Quick guidebook to IAS/IFRS', III Working Group of the European Committee of Central Balance Sheet Data Offices (2003).

5 Cf. N. Wellink in 'Statistics and their use for monetary policy purposes', ECB, March 2005.

6 For a detailed reconciliation between the SNA 93 and IAS, see Appendix IV of the IMF Compilation Guide on Financial Soundness Indicators, p. 66.

7 Cf. the IASB's Exposure Draft 7 entitled 'Financial Instruments: Disclosures'.

8 The CMFB is an advisory committee established in 1991 to assist the European Commission in drawing up and implementing work programmes concerning monetary, financial and balance of payment statistics. It consists of senior managers drawn from national statistical institutes (NSIs), national central banks (NCBs), the European Commission (Eurostat) and the ECB.

9 Cf. CMFB opinion of 21 October 2004, published on the CMFB website ([www.cmfb.org](http://www.cmfb.org)).

as for accounting purposes, the (marginal) costs of statistical reporting can be kept down. Third, where statisticians have little if any legal power to address potential respondents with specific requirements for statistical purposes, such a reconciliation would permit financial accounting data to be used for statistical purposes, thereby extending the range of source data available to the statistician.

In addition to the differences in the presentation of financial information, there are differences in the approach taken to measurement (valuation). The IASB's aim has been to move accounting standards towards the application of market or fair value to entities' financial instruments. As long as this valuation method applies to securities portfolios and to positions in financial derivatives, this is broadly consistent with statistical standards and data user requirements. For both statistics and financial accounting, it has become totally inappropriate to apply cost accounting to financial derivatives. While the cost value is in general zero, the exposure/risks on one side and gains on the other side may be huge.

A potential difference between statistical and accounting standards concerns the valuation rules applied to non-negotiable financial instruments. More specifically, IAS 39 would generally require them to be recorded at cost, which is in line with statistical standards, but does permit the application of fair value. For this reason, the CMFB drew attention to this discrepancy and recommends that the IASB amend IAS 39 'by introducing a clear separation between negotiable and non-negotiable instruments and by allowing only the former to qualify for fair value accounting'.<sup>10</sup>

## 2. Prospective developments in IFRS

The IASB is carrying out a number of projects with relevance to statistics. These projects range from accounting standards for small and medium enterprises to business combinations, from convergence with US GAAP to employment benefits.<sup>11</sup> For the purpose of this paper, it is important to draw attention to two particularly important projects: the project concerning the measurement of financial instruments and, more generally, the move to fair value accounting, and the project on performance reporting.

### 2.1 Move to fair value accounting (FVA)

The issue of valuation lies at the heart of current accounting developments. The IASB does not consider the current version of IAS 39 to be the final step in the development of the IAS for financial instruments. Indeed, the ultimate objective has, at least until recently, appeared to be the application of full FVA.<sup>12</sup>

This objective was clearly stated in the consultative document on the application of fair value accounting (FVA) to the banking sector entitled 'Draft Standard and Basis for Conclusions – Financial Instruments and Similar Items' issued in December 2000 by the Financial Instruments Joint Working Group (JWG) of Standard Setters.<sup>13</sup> This JWG document aims to promote extensive use of FVA as the basis for the valuation of all financial instruments in a bank's financial statements. The ECB published an opinion on its website<sup>14</sup> in response to this consultative document. The ECB's stance on the application of FVA to loans and other non-negotiable instruments ('banking book') as well as to the liability side of banks' balance sheets was, both for supervisory and statistical reasons, fairly negative.<sup>15</sup> The Federal Reserve (Fed) has commented along the same lines.<sup>16</sup>

10 Cf. CMFB opinion of 9 July 2004, published on the CMFB website ([www.cmfb.org](http://www.cmfb.org)).

11 For a summary of these projects, see [www.iasplus.com/agenda/agenda.htm](http://www.iasplus.com/agenda/agenda.htm).

12 The IASB intends to avoid mandatory accounting changes at least for a "period of calm" between 2004 and 2006.

13 The JWG was established by the IASB and other national accounting standard setters to develop an integrated and harmonised standard on financial instruments. The work of the JWG is linked to the IASB's long-term strategy to introduce a comprehensive framework for the recognition and measurement of financial instruments.

14 See <http://www.ecb.int/pub/pdf/other/notefairvalueacc011108en.pdf>

15 For statistical purposes, the reporting of non-traded instruments at their nominal value is of major importance for several reasons. First, the reporting of these instruments at nominal value is required by the international statistical standards. Second, the analysis of current monetary and credit developments requires a consistent valuation of the stock of loans and deposits of the money-issuing sector vis-à-vis the money-holding sector, which is why users prefer nominal values. Third, permitting but not requiring fair values to be applied would add to the heterogeneity of the statistical information obtained from reporting agents, which can be avoided if nominal value reporting is required.

16 See [www.iasb.org/docs/fijwg/in121.pdf](http://www.iasb.org/docs/fijwg/in121.pdf)

More recently, the IASB has moved away from full FVA, having recognised the merits of a mixed accounting approach where certain items are recorded at historical value.<sup>17</sup> This is reflected in the prospective medium-term improvements to IAS 39 that are now being discussed within the Working Group on Financial Instruments (WGFI) recently established by the IASB.<sup>18</sup> The WGFI has a strategic focus in that it advises the IASB on the most appropriate accounting standards for financial instruments in the long run. To this end, it is anticipated that over the next few years the group will work on addressing fundamental issues such as the choice between mixed accounting and the full fair value model. It is also expected that the WGFI will address measurement issues and issues related to hedge accounting.

The extent and pace of the move to fair value measurement for accounting purposes could be of importance in the ongoing discussion on valuation in the international statistical standards.

## **2.2 Improved performance reporting**

This IASB project addresses the presentation in financial statements of all income and expenses, with those due to actual transactions and those due to remeasurements being shown separately. The items in the proposed 'statement of comprehensive income' are broken down by function: operations, financing and investment activities, income taxes and discontinuing operations. The aim of the single performance statement is to categorise and display all income and expenses for the period in a way that enhances users' understanding of an entity's performance and assists them in forming expectations of future performance.

Currently, IAS 1, Presentation of Financial Statements, permits, but does not require, a single comprehensive performance statement. This project might lead to changes to the IASB Framework in addition to IAS 1. This project is being conducted in partnership with the UK Accounting Standards Board. The next step will be to issue a Discussion Paper in 2005.

With a move towards greater use of fair value accounting, this project may be of importance in facilitating the identification of the valuation adjustments that are to be excluded from the measurement of transaction flows and to be shown separately within the statistical accounts.

## **3. Conclusion**

This paper has shown that the principles underlying accounting and statistical standards are similar, but that their application does differ, making it difficult to maintain reliable and robust linkages between the two. Nevertheless, at the conceptual level, recent accounting initiatives to review valuation rules for financial instruments (in the context of the potential move to adopt fair value accounting) and to improve performance measurement are very relevant for statistical purposes. Furthermore, statisticians face the practical reality that statistics are very often sourced from accounting data and that consistency between statistical and accounting standards reduces compliance costs. The process of developing the IFRS into a truly global standard to match the worldwide status of the SNA has further increased the importance of work on reviewing the consistency of accounting and statistical standards.

From a European perspective, this work has become all the more urgent in view of the mandatory imposition of IAS for consolidated reporting by listed companies as from 2005. Certainly, improving the consistency of accounting and statistical standards despite all the problems involved is a worthwhile objective that will permit more statistical data to be delivered, at higher quality and lower cost. For this reason, European statisticians are already taking initiatives to ensure that accountants and statisticians engage in a constructive dialogue. These initiatives mirror similar steps taken at the international level. A further broadening of these initiatives and a closer involvement on the part of accountants in the work of statisticians (and vice versa) should be encouraged.

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<sup>17</sup> See IASB Chairman Tweedie's written statement to the Committee on Economic and Monetary Affairs of the European Parliament.

<sup>18</sup> The WGFI is composed of around 20 representatives of the main constituencies interested in accounting standards for financial instruments, notably the banking industry, auditors, corporate treasurers, users and the academic profession. International and European organisations (including the ECB) attend as observers.

**Résumé**

*Ce rapport fournit un cadre de référence permettant de comparer les normes comptables et statistiques, en décrivant les évolutions récentes dans le domaine des règles comptables et en expliquant comment les statisticiens s'adaptent à ces évolutions.*

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# From general ledger towards financial statistics

*Johan Lammers (Statistics Netherlands)*

## 1. Introduction

Collecting data to compile enterprise statistics is part of an information supply chain. This chain consists of all the activities and processes necessary to create business information that satisfies both business needs and regulators needs. A business needs the information to manage the business. A regulator needs the information to practise its legal purpose. As regulator needs diverge from business needs, the effort to create and report the additional information becomes response burden. There is an increasing pressure both internationally and nationally to decrease this burden and to optimize the efficiency and effectiveness of the information supply chain. Both targets will be met if it is possible to substitute the manual, error prone, process to fill questionnaires by an automated process, directly linked with the accounting system of the enterprise. This study concentrates on the relationship between general ledger information and statistical data capture. The topic is strongly related with the development of XBRL as a language to exchange business information. The results of the study originate from a researchproject conducted and sponsored by Statistics Netherlands, executed in the second half of 2003 and the first half of 2004.

## 2. The business case

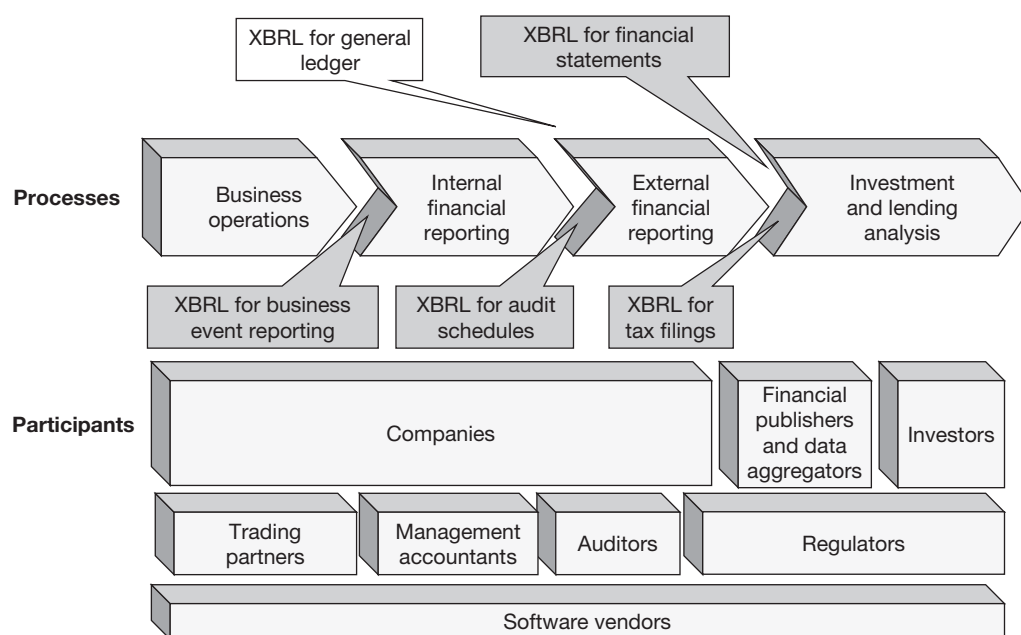
With this research we aim to get acquainted with the language XBRL, and with the fit between information from the general ledger of an enterprise on the one hand and the information defined as statistical items for data capturing on the other hand. All three aspects will afterwards be used to define a program for research and development.

XBRL as a language is under development. Syntax and semantics are defined as XBRL-specifications and as XBRL-taxonomies respectively. All these definitions follow a process of standardization and acceptance. A statistical office (as one of the regulators in the information supply chain) has to participate and to anticipate in this process. Knowledge of the definitions is a necessary condition. A taxonomy of major importance is based on the IFRS (International Financial Reporting System). This is an international standard for financial reports. The IFRS-taxonomy can be extended with taxonomies on a national level, a branche level, a domain level and even on an individual company-level.

Information from the general ledger of enterprises is not standardized in The Netherlands. It should conform to commonly accepted behaviour in commercial practise. Financial reports, like balance sheets and profit- and loss-accounts, are more standardized by law. A specific legal basis exists for reports for the tax-office. Enterprises are obliged to send their annual reports to the tax office and to facilitate the auditing of the validity of this information. The audits concentrate mainly on the general ledger. For the purpose of facilitating the audit process, the tax office has defined a standardised export of the general ledger-information. This standard is called the XML-auditfile. One of the major advances of this definition is the facility to link a general ledger-account with an element from an XBRL-taxonomy. Although the XML-auditfile is not a standard for the content of the general ledger, it offers opportunities to examine the content more efficiently and more effectively. We used a predecessor of the XML-auditfile (the auditfile financial, ADF) to analyse the general ledger-information from enterprises in practise.

Statistical items are defined to compile economic statistics. A majority of the items are typed as financial variables. Our aim was to get a fit between these financial variables and the information from the general ledger. 'Financial statistics' should therefore be interpreted as statistics compiled with financial variables. To fit the information from the general ledger with the statistical items we analysed three types of methods: the use of the links with taxonomies, the use of text recognition and the use of structures/patterns in the accounting information. The results of this research will be presented in par. 4.

Figure 1 – The information supply chain (source: XBRL International)



### 3. The information supply chain

Our central theme is the information supply chain. Figure 1 shows the major elements from the chain, the processes, the participants and the relationship with various XBRL-initiatives.

The starting point is the birth of the first element of information, for example generated by a business transaction, and the end is the final use of the last element. The figure indicates the role and importance of XBRL in this chain. The aim to improve the information and the efficiency within the chain will be better served with an exhaustive contribution of XBRL throughout the process. All the processes in the chain should use the same language.

We concentrated on the use of XBRL as a language for the exchange of external financial reports (examples: tax filings, annual statistical reports). Usually these types of reports are standardized by content for each individual regulator. The challenges in using XBRL as a reporting language are the standardization by content for all the regulators together, the validation of the reports, the mapping with the business accounts and the process of exchanging the XBRL-messages.

In the second place we focused on the development of XBRL for General Ledger. This type of XBRL is called XBRL-GL. XBRL-GL is standardizing for terminology in business accounting. In XBRL elements (words) like 'total assets' or 'research costs' are defined while XBRL-GL concentrates on elements like 'account entry' and 'account type'. From this point of view, the XML-auditfile is similar to XBRL-GL. On behalf of the improvements for the information supply chain it is necessary to link both definitions. This link is available in the XBRL-GL-definition with elements like 'xbrltaxonomy' and 'xbrlelement'. An account within the general ledger can thus be linked with an xbrl-element. This mapping should be registered in the accounting system. For XBRL-GL it is essential to develop tools for auditing, analysis, consolidation and mapping.

Finally one area gets only minor attendance of the XBRL-community: XBRL for business event reporting. Various types of transactions (orders, purchases, sales, transactions about changes in staff, wages etc) however are standardized and developed with the use of XML.

### 4. XML-auditfile and statistical data capture, research results

Mappings of (XBRL-GL-standardised) information from the general ledger on the items to compile 'financial' statistics can be analysed in several ways. The ideal starting point is the use of the links between an account and an element from a known, generally accepted XBRL-taxonomy. The latter is clearly defined and therefore relatable with the statistical item. Unfortunately, we suffer from a lack of links and a lack of generally accepted taxonomies that cover the whole area to be captured. Our research had to concentrate on the relationship of those taxonomies that are

available and the statistical items our office would like to capture. We compared the IFRS-taxonomy with the items from our annual enterprise survey. Those comparisons are made more often within other projects. The results from all these researches unanimously indicate that the IFRS-taxonomy only fits to a small though core part of the statistical regulator needs.

The research gave input for the development of taxonomies to extend the IFRS-taxonomy. The set of common elements regarding the Dutch regulators is the first basis on which to determine this extension. This is the main topic in the creation of the Dutch taxonomy. Finally the architecture from both the IFRS and the Dutch taxonomy can be extended by taxonomies with specific statistical elements. The process to determine those taxonomies will be influenced by the effort enterprises are prepared to make to fulfill the regulators needs.

From the enterprises' point of view, the business needs are heterogeneous, depending on the type of the enterprise. Existing literature and our own research indicate that about 20 main types of business needs can be distinguished. A firm in gross-trade has other needs than a restaurant or a leather factory. Business needs can therefore be separated into a common part and a part typical for the type of business.

In an effort to interpret business accounts we did research on textual recognition, concentrating on the similarities between titles/descriptions of business accounts and the definitions/descriptions of the variables to be captured. Within the general ledger more textual information is available, but, in the Dutch situation, not well standardised. Accounts from the general ledger are described with a short string (20–50 characters), frequently containing abbreviations. The descriptions of the statistical variables are derived from the question-texts and the explanatory notes. We concentrated on the simple textual recognition-methods. We compared the strings with methodology based on trigrams and on largest common subsequences. Results from this research were not positive. Only a small portion of the links (about 20%) could be established automatically. This percentage can be increased to 35% by adequate determination of descriptions and synonyms for the statistical variables, but this seems a maximum in the Dutch situation.

Textual recognition by itself is not sufficient to automate the mapping process and to improve the information supply chain. On the other hand, it can help to improve the processes: contributions to initial mappings and quality-assurance for existing mappings.

The cases we studied came from enterprises with retail-trade, wholesale-trade, restaurants and car brokers. All the enterprises came from the middle-sized segment, between 5 and 200 persons employed. We expected the accounts to be less complex because these enterprises don't have an industrial transformation process. These expectations were partly confirmed.

Half of the enterprises have to consolidate information for the statistical report. This consolidation is mainly based on the combination of accounting information from individual legal units. The general ledger-information is not consolidated. Since the process for consolidation is situated at the end of the internal reporting process, the presence of sufficient information within the general ledger to support the consolidation is essential. In our cases this information seemed to be present, but this is not standardized well enough to apply it within automated processes. Legal units within the consolidation are either addressed by one or more accounts, described as the changes in the accounts or are customers/suppliers for the legal unit. Unfortunately, comparison with the actual statistical report was not possible. We did not have access to the auditfiles of all the legal units within the whole group and we did not have all the statistical reports (sampling).

For cases without consolidation and with comparable statistical reports the mapping could be made manually with acceptable differences between the statistical report and the 'general ledger'-report. At least for the variables with a financial nature. The statistical variables concerning volumes (amounts of production, employment, use products etc) can not be filled with the use of the general ledger. Information for statistical variables for the specification of the turnover (types of products, types of customers etc) is sometimes available.

## 5. Conclusions

XBRL is a development with many opportunities to improve the information supply chain in general and statistical data capture more specifically<sup>1</sup>.

The major advantage of XBRL is the adaptability to the ongoing changes in (European) accounting standards.

<sup>1</sup> *One of the practical examples for this conclusion is the development of a taxonomy for waterboards, which is implemented successfully in the process to send statistical reports to Statistics Netherlands. This was one of the main arguments to grant the price to the waterboards as 'most open regulator' in the Netherlands.*



The language Statistics Netherlands uses to speak with her respondents seems to be translatable into XBRL.

The research based on XBRL-GL showed that an effective implementation of XBRL requires contributions of all the participants in the process. The mapping between the accounting information and the XBRL-elements requires knowledge from the accounting system: effort to invest by the enterprise. Taxonomies should be specified accurately and with relevant components. For common elements (IFRS, Dutch taxonomy) the effort the enterprises have to invest will be paid back quickly. Non-common, specific statistical elements are situated in the 'negotiation area'.

A successful use of XBRL depends on the future development of XBRL-specifications. How to support the consolidation-process and how to validate the reports? In the Dutch situation, XBRL should support the construction of entities and the consolidation of financial elements. Fortunately, this is also a requirement with respect to the internal financial reporting process. The validation of the reports are supported in the current specification with, relatively simple, calculation rules. More complex validation rules should be implementable with the use of the recently developed XBRL-formula-extension.

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# The impact of the introduction of accrual accounting by Australian governments on government finance statistics

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## 1. Introduction

The Australian system for producing government finance statistics (GFS) was changed in 2000 from a cash basis to an accrual basis of recording, with the first set of Australian Bureau of Statistics (ABS) GFS statistics on an accrual basis being those for the financial year 1998–99. This followed the adoption of accrual accounting by the Australian Government and most of the state governments<sup>1</sup>, and coincided with revision of the international statistical standard – the IMF’s Government Finance Statistics Manual – to incorporate accrual recording<sup>2</sup>.

## 2. Background

There are two main accrual-based standards for public sector budgeting and reporting in Australia. They are:

- The ABS accrual GFS, which is an economic standard based on relevant international statistical standards.
- The Australian Accounting Standard *Financial Reporting by Government* (AAS31), which is the relevant accounting standard for financial reporting by governments in Australia. It is based on generally accepted accounting principles (GAAP).

GFS and AAS are equally valid systems. The conceptual differences between them mainly reflect the economic focus of the former and the accounting focus of the latter.

The ABS produces a range of GFS publications, including:

- Government Finance Estimates, which provides estimates for the upcoming year based on information from government budgets. In this publication, estimates for the operating statements and cash flow statements are provided for the general government sector for each jurisdiction<sup>3</sup>.
- Government Finance Statistics (annual), which provides operating statements, cash flow statements and balance sheets for each jurisdiction for general government, non-financial public sector and total public sector, as well as detailed information on expenditure.
- Government Finance Statistics (quarterly), which provides operating statements for each jurisdiction for the general government sector, and the operating statement for the all governments public non-financial corporations sector.

The ABS estimates are Australia’s ‘official’ GFS estimates and, as such, are the estimates reported to the IMF and other international agencies. As well, they are a key input into Australia’s national accounts.

1 *Australia is a federation of states. There are six states (New South Wales, Victoria, Queensland, South Australia, Western Australia and Tasmania) and two territories (Northern Territory and the Australian Capital Territory) that are similar to the states in their responsibilities. The term ‘states’ is used in this paper to cover both the states and the territories.*

2 *The accrual version of the IMF GFSM was released in 2001.*

3 *The term ‘jurisdiction’ is used to cover the Australian and state governments.*

Since 1992–93, under an inter-governmental agreement, the Australian governments themselves have also presented in their budgets and other documents information on a GFS basis<sup>4</sup>. The information presented by each jurisdiction is compiled with the advice and the assistance of the ABS and generally conforms to the standards applied by the ABS. However, there can be differences between the jurisdictions' GFS estimates and those of the ABS.

The frequency with which governments prepare their accrual accounts varies from jurisdiction to jurisdiction. The Australian government produces monthly accounts. Most states produce quarterly accounts. The South Australian Government only produces annual accounts<sup>5</sup>.

### 3. The differences between cash and accrual

The differences between cash and accrual accounting can be grouped into two categories – those involving the recognition of transactions and those involving the timing of transactions. Some economic transactions, such as grants in kind, never involve cash and as such are not captured in a cash-based system. In other cases, such as with goods purchased on credit, the payment of cash takes place at a different point in time to the underlying economic event.

For Australian governments, the more significant areas of difference between cash and accrual accounting are:

- Unfunded superannuation (pension) expenses, where the cash flows can take place many years after the expense has been accrued. In 2002–03 the accrued superannuation expense, including interest, for all Australian governments was \$16.2 billion, whereas the cash expense was \$7.1b.
- Depreciation, which is recorded in an accrual system but not in a cash-based one. In 2002–03 the depreciation expense for all Australian governments was \$12.0b.
- Public debt interest, where interest accrued, but not yet paid, is recorded in the accrual system. In 2002–03 the public debt interest expense for all Australian governments was \$7.4 billion, whereas the cash expense was \$7.1b.

### 4. Issues in implementation

The implementation of accrual GFS by the ABS was greatly assisted by the adoption of accrual accounting by Australian governments. This was a major undertaking by the governments, which had to convert their cash-based accounting processes to accrual-based ones. Also, in many jurisdictions, the introduction of accrual accounting was accompanied by other financial reforms, which further complicated the implementation process. The first set of GFS statistics produced by the ABS on an accrual basis was labelled as 'experimental', and while this label was removed shortly after it was some years before systems and processes associated with accrual accounting were fully bedded down.

The ABS worked very closely with jurisdictions, particularly to ensure that jurisdictions were prepared to produce accrual GFS as distinct from the preparation of accrual accounting statements based on AAS31. An Exposure Draft on the proposed changes was prepared and extensive training in accruals GFS was provided to jurisdictions.

The ABS was also very concerned that users of its GFS statistics were aware of the proposed changes. In 1997 it produced an information paper *Developments in Government Finance Statistics* which foreshadowed the implementation of accruals GFS. Another information paper – *Accruals-based Government Finance Statistics* – was released in 2000 to provide further details on the changes. These information papers were accompanied by seminars around Australia. In 2003 the ABS issued an accrual-based GFS *Concepts, Sources and Methods*.

A factor that complicated the implementation of accrual GFS by the ABS was that not all jurisdictions had moved to an accrual basis for accounting at the time the ABS switched over. The ABS worked with those jurisdictions that remained on a cash basis to convert the cash numbers to an accrual basis. However, this process was selective and the quality of the "accruals" information for these jurisdictions was lower than that for those actually on an accrual accounting basis<sup>6</sup>.

4 Prior to the introduction of accrual accounting, there was no standard approach taken by the jurisdictions in preparing their financial statements. In the early 1990s the jurisdictions agreed to present information on a GFS basis to ensure that comparable information was available across jurisdictions. Since the introduction of accrual accounting the jurisdictions have continued to produce their own GFS statements.

5 The ABS conducts a quarterly survey of key South Australian government agencies in order to obtain information necessary to compile quarterly GFS statistics for that state.

6 Since 2002–03, all jurisdictions have prepared their accounts on an accrual basis.

A key issue for implementation was the maintenance of a time series of GFS. The ABS maintains cash-based GFS back to 1961–62 and many users are interested in monitoring the economic performance of governments over long periods of time. Because of this the ABS continued to produce, for fiscal policy purposes, cash statistics following the move to accrual GFS, while recognising that the main focus of GFS would move to the accrual statements. This has ensured that users have a long and continuous time series available to them.

The ABS also aspired to presenting an alternative series back to 1961–62 on a basis that approximated accrual accounting, by making adjustments to the cash-based series to account for depreciation, accrued superannuation expenses and other accrual adjustments where possible. However, in 1999 the ABS decided that an accruals converted historical series was not of sufficient quality and, in consultation with the jurisdictions, it decided not to release the derived historical series. However, some of the work that had been done, particularly with regard to modelling historical superannuation expenses, was utilised in the Australian System of National Accounts with the implementation of the 1993 System of National Accounts.

Prior to the introduction of accrual accounting, the ABS had compiled government net debt series. These series had been compiled independently of the cash GFS system. After the introduction of accrual GFS these series have continued to be compiled, as a by-product of the compilation of the accrual GFS balance sheet.

The ABS does not currently compile seasonally adjusted quarterly GFS series (although it plans to do so in the future). There are, however, quarterly seasonally adjusted estimates of various government transactions in the national accounts that are based on GFS series. It had been expected that the shift from cash to accrual GFS would see a 'smoothing' of patterns of expenditure. However, now that sufficient data are available on an accrual basis to determine a seasonal pattern, this has generally not been the case. Prior to when the new pattern could be established, the quality of seasonally adjusted estimates of government transactions in the national accounts deteriorated.

Consolidation – that is, deriving estimates for groups of sectors within a jurisdiction or deriving estimates across jurisdictions – has always been an important feature of ABS GFS. However, the introduction of accruals greatly complicated the process. To achieve consolidation considerable clerical efforts are required in follow-up action with jurisdictions to ensure that transactions involving two government entities are consistently recorded. The majority of imbalances are resolved in this way but final 'balancing' is achieved by applying a set of 'business rules' which gives one transactor precedence over another, based on data quality judgements.

## 5. Contemporary issues

Accrual accounting is now firmly established within the governments, and the compilation of accrual GFS by the ABS is now well bedded down. There are, though, some residual issues that require further work.

The presence of two sets of accrual reports for government financial reporting – one on an AAS basis and one on a GFS basis – is confusing to users and increases significantly the compilation burden on the jurisdictions. A project commenced in late 2001 to harmonise the two systems. The aim is to produce a revised accounting standard that enables both the financial and economic performance of government to be determined from the one set of statements. The ABS has been heavily involved in this project. Australia will shortly adopt international accounting standards and this will lead to greater alignment. To assist in reconciliation the ABS is pursuing changes to GFS as part of the current efforts to upgrade international macroeconomic standards. It is hoped that the remaining differences, which will be kept as small as possible, will be dealt with by way of an explicit reconciliation in the accounting statements. There still remain issues off detail to be sorted out by the accounting standard setters, but the outlook appears to be promising. The work in Australia is mirroring similar work that is occurring internationally. If a revised accounting standard for governments is adopted then this should greatly assist the ABS in its own GFS compilation. However, it will mean that the jurisdictions' own GFS estimates will be auditable, which is not the case now, and this will require the ABS to work with auditors to train them in GFS matters<sup>7</sup>.

The ABS has not been able to implement the full set of GFS tables recommended in the IMF GFSM. The statement of stocks and flows, which provides a full reconciliation between the

<sup>7</sup> *The ABS will continue to reserve the right to publish its own GFS estimates based on its own interpretation.*

operating statement and the balance sheet, is currently not produced because of quality problems with the source data from the jurisdictions. The ABS is working with the jurisdictions to overcome these problems with the view to being able to produce the statement as soon as possible. The Australian Government provides a statement of stocks and flows in its own GFS presentations.

The GFS and the SNA have very similar conceptual bases, but there are some differences. Also, the particular way in which accrual GFS has been implemented in Australia causes some differences between the ABS's GFS and national accounts statistics; for example in the areas of the depreciation and the recording of taxes. We would like to see the differences eliminated, but there are challenges that have to be overcome to achieve this.

## **6. Conclusion**

The experience of the introduction of accrual accounting by Australian governments and the related adoption of the accrual basis for recording in Australia's GFS statistics demonstrates that accountants and economic statisticians can work together in order to achieve better outcomes from both a financial management and statistical perspectives. When working together, accountants and statisticians gain a better appreciation of each other's situation. This can lead to improvements in both accounting and macro-economic statistics systems, which have many elements in common. Harmonisation of the systems to the greatest extent possible should be a goal. This can in turn lead to better quality statistics, easier statistical compilation processes and reduced provider load, all of which are laudable goals.

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# Monetary and financial statistics: the role of accounting standards<sup>1</sup>

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## 1. Introduction

Monetary and financial statistics are inexorably linked to the accounting standards of countries (also known as financial accounting standards, financial reporting standards, or generally accepted accounting principles). The forthcoming *Compilation Guide for the Monetary and Financial Statistics (Guide)* – a companion to the IMF’s *Monetary and Financial Statistics Manual (MFSM)* – will recommend that the source data for the monetary and financial statistics should be obtained, to the extent possible, from institutional units’ accounting records that are based on the accounting standards of the country in which a unit has its center of economic interest.

The *Guide* keys on the International Financial Reporting Standards (IFRSs) – issued by the International Accounting Standards Board (IASB) – as the general framework for explaining the relationship between accounting data, as based on national standards, and the source data for the monetary and financial statistics. IFRSs have the following attributes:<sup>2</sup>

- *Applicability.* IFRSs apply directly to the many countries that have adopted or will adopt the IFRSs as their accounting standards, or have been harmonizing their accounting standards with the IFRSs.
- *Compatibility.* IFRSs contain many asset/liability classifications, valuation principles, and other accounting rules that accord with the *MFSM* methodology.
- *Adaptability.* IFRSs provide a foundation for the development of monetary and financial statistics that, though not subsumed within the IFRS requirements for financial statements and disclosures, can be built into an IFRS-based accounting system by means of additional data disaggregation, revaluations or other data adjustments, and provision of supplementary data.

## 2. The IFRSs and the *MFSM* methodology

The *IASB Framework* (¶12) states: “The objective of financial statements is to provide information about the financial position, performance and changes in financial position of an enterprise that is useful to a wide range of users in making economic decisions.” This statement applies equally well to the monetary statistics, if applied to the macroeconomic context of the financial position, performance, and changes in financial position of *the financial corporations sector and its subsectors*, rather than of *an enterprise*. The financial statements – the data and informational output from the IFRSs – are (1) a balance sheet; (2) an income statement; (3) a statement of changes in equity; (4) a cash-flow statement; and (5) statements of accounting policies, explanatory notes, and disclosures (see *IAS 1 Presentation of Financial Statements*). Though core requirements pertain to financial statements on an annual basis, the IFRSs cover the optional preparation of less detailed semiannual or quarterly financial statements (see *IAS 34 Interim Financial Reporting*).

The “financial statements” of the monetary statistics are (1) the sectoral balance sheets (stock and flow data) of the central bank, other depository corporations, and other financial corporations; (2) the surveys (stock and flow data) – the Central Bank Survey (CBS), Other

1 *The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF or IMF policy.*

2 *The Guide references numerous International Accounting Standards (IASs) within the IFRSs, but most often those pertaining directly to financial assets, liabilities, and off-balance-sheet items of financial corporations – IAS 30, Disclosures in the Financial Statements of Banks and Similar Financial Institutions; IAS 32, Financial Instruments: Disclosure and Presentation; and IAS 39, Financial Instruments: Recognition and Measurement, as well as Guidance on Implementing IAS 39, Financial Instruments: Recognition and Measurement.*

Depository Corporations Survey (ODCS), Other Financial Corporations Survey (OFCS), Depository Corporations Survey (DCS), and Financial Corporations Survey (FCS); and (3) the memorandum items that accompany the sectoral balance sheets. As recommended in the *Guide*, the sectoral balance sheets for the central bank and other depository corporations (ODCs) and the associated surveys – CBS, ODCS, and DCS – are to be compiled on a monthly basis; the sectoral balance sheet for other financial corporations (OFCs) – (other financial intermediaries, insurance corporations and pension funds, and financial auxiliaries) – are to be compiled on a quarterly basis or, at the option of the reporting country, on a monthly basis.

The financial statistics are synonymous with the financial components of the *System of National Accounts 1993 (1993 SNA)* – the Financial Account (measuring financial transactions), Revaluation Account, Other Changes in Volume of Assets Account, and related statements (flow-of-funds accounts and SNA balance sheets). As recommended in the *Guide*, compilation of the financial statistics on a quarterly basis is applicable to countries that already have quarterly data for the SNA current accounts and capital account, or that are currently migrating from annual to quarterly national account statistics. For other countries, the periodicity of the financial statistics may need to be specified as annual, until such time as quarterly SNA data have been developed.

The IFRSs and *MFSM* (and *Guide*) are consistent with respect to broad methodological principles – treating enterprises as going concerns, economic reality over legal form, use of accrual accounting, market valuation for many types of financial assets/liabilities, restrictions on offsetting of assets against liabilities, etc. – and data quality assessment criteria. The IFRS dimensions for data quality, though differing in terminology, agree in substance with the quality dimensions for monetary and financial statistics (and macroeconomic statistics in general), as contained in the generic module of the IMF's *Data Quality Assessment Framework* (July 2003).<sup>3</sup>

The IFRSs and the *MFSM* methodology differ significantly in several areas:

- *Periodicity and timeliness.* In the IFRSs, timely preparation of annual financial statements is specified as within 6 month after the reference date/period – a much longer lag than is deemed appropriate for the reporting of monetary statistics.
- *Sectorization of financial assets and liabilities.* In the *MFSM* methodology, stock and flow data for financial corporations need to be disaggregated into separate categories for the central bank, ODCs, OFCs, the central government, state and local governments, public nonfinancial corporations, other nonfinancial corporations, other resident sectors (households and nonprofit institutions serving households), and nonresidents. Sectoral disaggregation is not specified in the IFRSs.
- *Symmetry of debtor/creditor recording.* The *MFSM* methodology specifies that debtor's and creditor's records should agree in amount and time of recording of all transactions and revaluations. These issues do not arise in the IFRSs, which focus exclusively on the financial records of individual enterprises.
- *Balance-sheet presentation of loans on a gross or net basis.* Both *IAS 39* and the *Guide* take account of reduction in realizable values of loan portfolios, arising from bad and doubtful loans. In *IAS 39*, loan asset values are directly adjusted for expected loan losses, or are presented as gross loans less allowances (i.e., provisions) for loan losses. In the *MFSM*, loan asset values are presented on a gross basis, but supplementary data are to be provided for calculating the realizable values of loans.
- *Accounting rules.* The *MFSM* methodology and *IAS 39* differ with respect to market-versus-cost valuation of some assets/liabilities and the accounting treatment for some types of transactions costs, accrued interest on some securities, some embedded derivatives, and asset/liability hedges (mainly, using financial derivatives).

### 3. Compilation and collection of monetary and financial statistics

Compilation of monetary and financial statistics is facilitated by what the IFRSs *do not prescribe*. In the past, and to the present day, accounting standards in some countries have delved into the recordkeeping by including a chart of accounts – in effect, specifying a major component to a financial enterprise's information system. The IASB, wisely in our view, has stayed away

<sup>3</sup> *Broad quality dimensions in the IASB Framework are understandability, relevance, reliability, and comparability of data, whereas those in the DQAF are assurances of integrity, methodological soundness, accuracy and reliability, serviceability, and accessibility.*

from the general and subsidiary ledgers – and, more generally, the information systems – of the enterprises to be covered by the standards.<sup>4</sup>

A financial enterprise's information system can be tailored to provide both (1) the monetary and financial data – disaggregated by financial instrument and economic sector in accordance with the *MFSM* – and (2) the data needed for a multitude of other purposes, including the production of IFRS-based financial statements. These are separate functions to a significant degree. The Statistics Department (STA) of the IMF has a longstanding tradition of assisting a country in revising the central bank and/or other depository corporations' information systems (primarily, charts of accounts) to meet the monetary statistics requirements. This assistance will expand and intensify, given that:

- STA recently has provided the member countries with standardized report forms (SRFs) – a major initiative for assisting in their implementation of the *MFSM* methodology and for improving the efficiency of monetary data reporting.<sup>5</sup>
- The SRFs, like previous reporting to the IMF, covers only end-of-month stock data. In the future, as countries implement the flow-data dimensions of the *MFSM* methodology, assistance will be provided. Although charts of account contain both balance-sheet and profit-and-loss accounts, the past focus has been on financial instrument and sectoral disaggregation of balance-sheet accounts for obtaining stock data. In the future, emphasis will be placed on disaggregation of profit-and-loss accounts – a rich source of flow data, particularly for asset/liability revaluations.

The SRFs are designed for reporting of monthly data that, to the extent possible, are obtained directly from data based on the IFRSs or similar accounting standards. However, some data adjustments are required. For example, adjustment entries and contra-entries are required if the *MFSM* methodology specifies market valuations, but the accounting records are cost-based valuations. In contrast, compilation of financial statistics requires a stricter adherence to the *1993 SNA*, necessitating that financial corporations report supplementary data for adjustments to be made at the level of the national compilers. For example, supplementary data are needed for the estimation of accrued interest by the SNA-based debtor approach for all securities other than shares; such adjustments may be impractical, if not infeasible, for the monthly monetary statistics.

#### 4. Looking ahead

A major challenge for the coming months will be the implementation of the new data reporting framework by more than 160 countries and territorial entities that report data for the IMF's *International Financial Statistics (IFS)*. Following all-country implementation, the *IFS* presentation of country data will be revised in line with definitions, asset classification, and economic sectorization in the *MFSM*. In the interim, the *IFS* presentation will remain unchanged, and the revised presentation of the monetary data for countries already reporting SRF-based data will be published in an *IFS Supplement*.

Implementation of the *MFSM* methodology and SRFs should be easiest for financial corporations that have adopted the IFRSs or similar accounting standards that prescribe market-price valuation for most securities. Financial corporations subject to other accounting standards should be able, possibly with some initial difficulties, to provide securities data that have been adjusted to market values.

#### Resume

*This paper deals with the methodological nexus between countries' accounting standards and the monetary and financial statistics. It is argued that a country's accounting standards based on, or harmonized with, the International Financial Reporting Standards (IFRSs) have a rightful place within financial corporations' information systems that provide the data for monetary and financial statistics, as well as for*

<sup>4</sup> In fact, the IFRSs provide considerable latitude for the asset and liability classifications in the financial statements to which the IFRSs directly relate. Indicative of the IASB philosophy, IAS 39 (¶11) states: "This Standard does not address whether an embedded derivative shall be presented separately on the face of the financial statements." Other examples could be cited.

<sup>5</sup> SRFs do not apply to European Economic and Monetary Union (EMU) member countries, which have a separate reporting format.



*audited financial statements. However, IFRS-based data often need to be adjusted or supplemented for use in the monetary and financial statistics.*

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# The impact of accounting standards on financial statistics – comments on invited papers

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The four invited papers I have been given the honor to comment on, accurately cover the wide range of concerns that can be raised when assessing the impact of private accounting standards on public statistics. The successive presentations suggest that the apparent trend of greater convergence between the two sets of standards does not produce benefits in a pure mechanical way. There is a long route from general principles to efficient implementation. We should be grateful to the authors for having addressed implementation issues beyond pure methodological concerns.

1. Paolo Poloni and Patrick Sandars [2005], from the ECB, reflect on the fear that the current process of updating private accounting standards may affect major inputs in the compilation of national accounts:

- the implementation rules of the new International Accounting Standards may be very loose and are far from being harmonized across the different countries so that comparability will certainly not be improved for some years to come;
- private accounting standards are used as communication tools vis-à-vis the private investors and may neglect the basic needs of official statistics, by for instance paying more attention to wealth simulations than to the records of effective flows of income and spending.

Then it is very important for the public statistics to restate carefully its needs, in the language of private accounting. Is this so difficult to do?

2. This is exactly the issue addressed by Johan Lammers [2005], from Statistics Netherlands. He stresses the importance for a statistical office of being very pro active in the definition of the information supply chain. He makes a strong case for setting up an automated process directly linked to the accounting system of enterprises. The ambition consists of settling an explicit bridge between the general ledger of enterprises' accounting system and the data set required by business statistics and different regulators. In this research, the XBRL language has been tested as a specific translation device.

From this very ambitious approach, one major lesson can be drawn. The International Financial Reporting Standards (IFRSs) deserve to be complemented by very clear and comprehensive taxonomies which are most important in practice. Moreover, making reference to a specific IT language (whatever it is, XBRL or another one) imposes a very fruitful discipline. It provides statisticians and regulators with an opportunity to clarify the basic data they need. And the deeper they dig into the companies' information system, the greater the likely economies of scale (in data management and in staff management and training).

But we understand that this is a huge initial investment for all the partners. And this also requires that the public statisticians and regulators can agree on a core set of accounts which would meet common needs. It is possible to guess that, at some stage, a regulation, or the threat of it, can be required to speed up the process. Another pending question is related to the cost sharing of the whole investment between the different partners in the process: the initial cost should not put any brake to the whole process. Finally the approach supported by Johan Lammers should be very fruitful. But ambitious as it is, it would deserve a strong policy commitment in the investment stage with a large coordination between statisticians and regulators.

3. Peter Harper [2005], from the Australian Bureau of Statistics, presents the real live experience of implementing accrual recording in the accounting of Government institutional units. He very frankly lists the implementation issues that were overcome and those which are

\* *The comments expressed herein are those of the author and do not necessarily reflect the views of the Banque de France.*

still pending. This makes clear that one good idea in methodology, say “accrual” in the current case, should not be implemented without pragmatism.

As usual, an ideological or systematic approach would incur high transition costs.

- A new concept cannot simply replace an older one: it is clear for instance that the cash basis is still an operational reference for the management of units and cannot be simply exchanged against the accrual one.
- Implementing a new concept deeply at the level of individual units has involved important transition costs in terms of regulation, control, training . . .
- Introducing a new concept may cause consistency problems: back data are difficult to compile when there is a changeover of concepts implemented at the level of basic original data; besides, consolidated data may become more unstable as they are more sensitive to the practical implementation modalities at the level of different individual units.

On the other hand, it appears that, despite the important effort conceded to implement the new concept, the methodological change has had a significant impact on very few items only.

All these clues may eventually let us think that a more centralized approach could perhaps have been adopted. To accommodate for a new concept, it is sometimes more advisable to keep already existing basic series and to build up the new ones on this existing ground with a limited addition of complementary information. Overall, we should recommend the reading of Peter’s paper to international organizations, usually so keen to force new concepts into existing frames rather than besides. Some feedback information from the battle field is worth considering.

4. In contrast, Rob Edwards and Randall Merris [2005], from the International Monetary Fund, offer a paper which looks like a fairy tale. Comparing the main features of the IFRSs and the Monetary and Financial Statistics Manual (MFSM), they find much similarity but outline that IFRSs are far from matching MFSM with regard to five important aspects: periodicity and timeliness; sector counterparts; symmetry of debtor–creditor recording; presentation of loans on a gross basis; some valuation rules (market-versus-cost).

To my surprise I discovered they would not be much upset if the IFRSs were pretty loose. But the reason is obvious: they think it is then easier for the IMF to impose its own standards as the main reference. Indeed they describe a perfect paradigm: public statistics (IMF statistics of course!) both imposes its standards and assists private firms (banks in this case) to build up their information supply chains. Certainly in such an ideal world for public statistics, the implementation problem is immediately settled. But there are two conditions they do not mention: the process should start from scratch and the cost should be covered by some “helicopter drop” in a world without conflict of interest.

Once more, the basic message I draw from their paper remains that statistics has to contribute to the shaping of a core set of private accounts which would fit into its requirements.

\*

So finally, let me restate the same basic and useful messages I have drawn from the four papers, whatever their initial viewpoints:

- designing statistical standards per se is far from being sufficient as many of the final results depend on difficult implementation issues;
- public statistics has to make a step further and to clearly state its needs in term of private accounting, speaking the language of private accounting; with the background idea that its needs very likely match those of the average representative economic agent, public statistics can be entitled to represent the general public interest (“l’intérêt général”) in the discussion about private accounting standards;
- public statistics should contribute to the making of the information supply chain, promoting a deep cooperation with the individual reporting units;
- political and financial support is a dimension which is not made fully explicit in the papers but which of course is essential in the success of the implementation of new standards and the achievement of long run efficiency gains.

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# Comments on the paper related to accounting standards and their impact on financial statistics

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In applying accrual accounting to statistics and using international accounting standards to harmonize the classification and valuation methods of statistics, it is important that accounting and statistical treatment are fully harmonized. Among the areas for harmonization, we would like to point out the issue of reinvested earnings. Discussion is currently made whether income should be recorded on an equity basis in macro-economic statistics for related units that operate in different sectors. There is a strong opinion that compilers of statistics should resolve the inter-sectoral inconsistencies created by the reinvested earnings in balance of payments statistics by applying the treatment beyond the rest of the world sector, namely to all sectors of the national economy. More specifically, this argument urges government finance as well as monetary and financial statistics to record changes of retained earnings of subsidiary financial, public non-financial and other nonfinancial corporations as transactions and to attribute them to entities that hold those subsidiary corporations.

Based on our experience of compiling reinvested earning data in Japan's balance of payments statistics, we lean towards skepticism as to the consequences of this argument for a number of reasons:

First, we tend to consider that reinvested earnings reach beyond the concept of transactions. In fact, the disbursement of dividends are at the discretion of direct investment companies and direct investors, and therefore it is not appropriate to view an increase in retained earnings of direct investment companies as a dividend payment. According to *SNA93*, transactions involve interactions between institutional units by mutual agreement. This condition is not observed for reinvested earnings. We believe that statistics compilers should realize the difference in approaches between recording transactions in macro-economic statistics and recognizing revenue in business accountings. For business accounting purposes, retained earnings can be recognized as revenue of parent companies for the sake of demonstrating the performance of their business groups, irrespective of whether or not mutual agreements do exist.

Second, we believe that recording reinvested earnings reduces the analytical usefulness of income data. *SNA93* limits the recording of nonmonetary transactions because the economic significance of nonmonetary flows is very different from that of monetary flow, and the inclusion of large amounts of nonmonetary flows could obscure what is happening in the markets and reduce the analytical usefulness of the data. Indeed, recording reinvested earnings in Japan's balance of payments statistics as transactions is criticized by many statistics user for this very reason; these users include senior officials of the Bank of Japan. They indicate that the inclusion of reinvested earnings in income makes it difficult to analyze the trend of dividend payments of direct investment companies abroad and obscures the linkage between amount of current account surplus and foreign exchange rates. In addition, Japan's balance of payments recorded negative reinvested earnings from September 1999 through August 2000 for receipts and from June 1997 until May 2000 (except for January 1998 until May 1998) for payments. Although it turned out that this is because direct investment enterprises in foreign countries suffered large losses, we could not explain the economic meaning for negative dividends in a convincing manner.

Third, it is difficult to record reliable data for reinvested earnings. In Japan's balance of payments statistics, reinvested earnings data are compiled using reports on retained earnings of overseas direct investment enterprises submitted by Japanese parent companies and annual reports on retained earnings of direct investment enterprises in Japan submitted by the subsidiaries of foreign companies. Since those reports are submitted only annually with a time lag of three to four months, monthly figures have to be estimated by prorating annual changes of stocks and recorded retroactively. The time lag of the data could stretch up to 18 months. We do not consider that this estimation method is quite sound and reliable, but we need to maintain it as long as we record reinvested earnings as transaction flows. In thinking about the use of

business accounting data compiled on an equity-method basis, it should be noted that only groups that consolidate their balance sheets for accounting purposes are able to provide a full picture of retained earnings. In addition, the scope of direct investment companies (with the criteria of 10% ownership) is different from that of subsidiaries to which the equity method is applied (20% ownership), and the Balance of Payments Committee indicated that the definition of direct investment should not be revised from 10% ownership to 20% ownership.

In conclusion, we strongly believe that not recording reinvesting earnings as transactions in all sectors of economy would be the best policy to improve intersectoral consistency.

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# Optimal method for data quality improvements in financial statistics

Chair: Luigi Federico Signorini

Papers: **Data quality control with ARIMA filtering**

Augustín Maravall (Banco de España)

**The use of sample data to improve the quality of financial statistics**

Giovanni D'Alessio and Ivan Faiella (Bank of Italy)

**Assessing the quality of financial statistics**

Carol S. Carson (IMF)

**Discussion of G. D'Alessio & I. Faiella and C. Carson**

Arthur B. Kennickell (Federal Reserve Board)

**Robust analysis of the term structure of interest rates**

Elvezio Ronchetti (University of Geneva)

**Comments to Ronchetti**

L.F. Signorini

# Data quality control with ARIMA filtering

*Augustín Maravall (Banco de España)*

An application of a program for error detection in incoming data for data bases of time series is presented. It provides an answer to the question: when new data is reported, which of the new observations are likely to contain an error? The observation is suspicious if it is far from what could have been expected from the past history of the variable.

Without considering the new observation, and using a fully automatic procedure, a regression-ARIMA model is identified for the series, which may have missing observations and be contaminated by outliers. Calendar and, more generally, regression effects can also be present. The new observation is compared to the (out-of-sample) forecast obtained with the model and, if the forecast error is clearly unreasonable, the series is considered suspicious (the automatic outlier detection facility can be, of course, exploited to investigate possible former errors). The program, named TERROR, is a particular application of program TRAMO, freely available (for different platforms) at the Bank of Spain web site ([www.bde.es](http://www.bde.es)), together with documentation. The program is reliable and efficient for very large scale applications. A summary of the results for a set of 376 monthly series of 152 observations each is presented. The series are the Spanish Customs registers of exports and imports, classified by type of product and use. TERROR is applied to detect possible errors in the last observation (August 2004), with all parameters taking their default value, and adding pretests for Trading Day and Easter effects. Execution of the program on the 376 series took 25” in a laptop with a 1.9 Gh processor and a RAM of 512.

The series in the set are highly volatile. A few display a relatively regular structure (Figure 1a); the vast majority display a non-regular behaviour (Figure 1b), and often show the need for outlier adjustment (Figure 1c) or present regime shifts (Figure 1d). On occasion, the series has a non-linear structure (Figure 1e), or evidences the forecasting difficulty (Figure 1f).

Some of the output produced by the program is illustrated. First, the list of series that are suspicious of containing an error. This list can be increased or decreased by changing the threshold for the t-values associated with the standardized forecast error. When  $4 < \text{abs}(t) < 5$ , the series is classified as containing a “possible” error in the last reported observation; if  $\text{abs}(t) > 5$ , the series is classified as “likely” to contain an error.

The aggregate results of the automatic modelling for the in-sample period are summarized. The following table presents some of them. (For a description, see Caporello and Maravall, 2003.)

Figure 1a

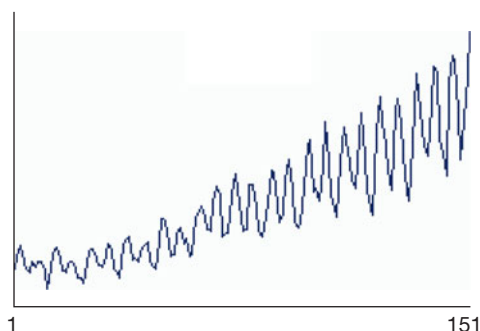


Figure 1b

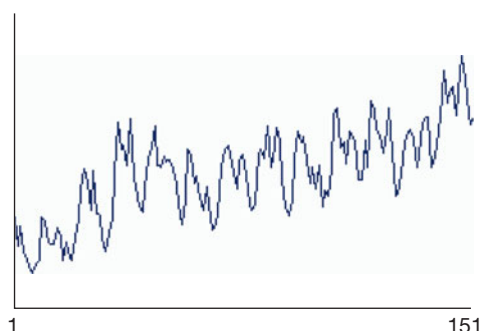




Figure 1c

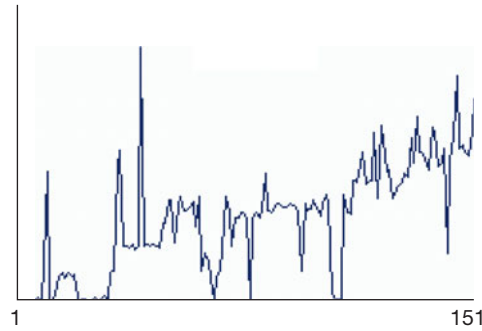


Figure 1d

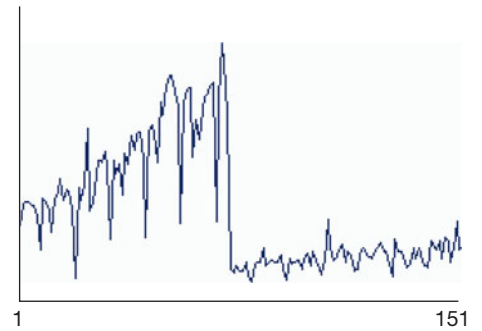


Figure 1e

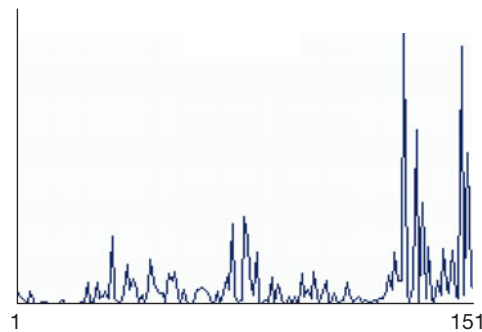


Figure 1f

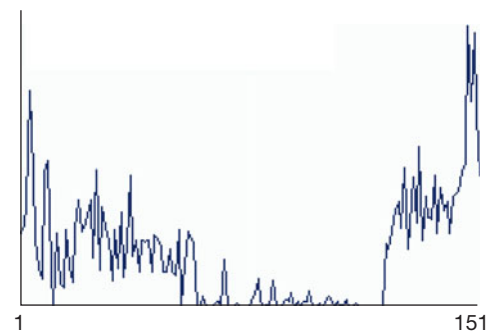


Table 1 – Terror Tsw series list (Date tested: 8/04)

Series title	New value	Forecast	Diff.	StdDev	T-value	Results
39M15AI	1.562.150	1.030.925	0.4205949(*)	0.0998827	4.21	Possible
148M342C	0.8835000	1.800.792	-0.917292	0.2248348	-4.08	Possible
153M35AI	0.1854000	1.372.065	-1.186.665	0.2086855	-5.69	Likely
162M35DE	1.907.600	0.6169537	1.163.914(*)	0.2649798	4.39	Possible
167M36AI	1.453.360	2.990.993	-1.537.633	2.400.159	-6.41	Likely
186M98I	8.721.800	3.038.279	-2.166.099	2.742.708	-7.90	Likely
208X11BT	2.594.850	2.987.277	-3.924.270	0.5645003	-6.95	Likely
277X252C	3.450.320	2.540.946	9.093.742	1.962.164	4.63	Possible
309X30C	0.1400000	0.0037923	0.1362077	0.0072173	18.87	Likely
318X32AE	4.745.610	6.925.698	-2.180.088	3.149.316	-6.92	Likely

(\*): logs were used.

376 Series were tested.

4 Releases were suspicious (possibly wrong).

6 Releases were very suspicious (likely wrong).

0 Series produced a Run-Time EXCEPTION.

6 Series did not match *TERROR* memory constraints. (Not enough observations or Too Many M.O.)

360 Series passed the plausibility tests.

Several graphs with histograms are available. Some are displayed in Figure 2.

Individual results for each series are provided: First, the main statistics describing the fit; second, a summary of the deterministic effects; third, the estimates of the ARIMA parameters, the outlier effects, and the calendar effects. The first rows of these tables are shown below.

Table 2 – Aggregate results

Series in file/processed: 376/370.

Frequency of observation: monthly; NZ = 151.

- **LEVELS/LOGS:** 134/236
- **DIFFERENCING:** None: 11; Only regular: 60; Only seasonal: 33; Both regular and seasonal: 266
- **AVERAGE NUMBER OF ARIMA PARAMETERS PER SERIES:** 2.1
- **AVERAGE NUMBER OF OUTLIERS PER SERIES:** Total:3.7  
[AO: 1.9; TC: 0.9; LS: 0.9]
- **PERCENT OF SERIES WITH CALENDAR EFFECT:** Total: 64.9  
[TD: 61.6; EE: 24.1]

• <b>DIAGNOSTICS:</b>	MEAN	APPROX. 1% CV	% THAT PASS TEST (99%)
Residual AC ( $\chi^2_{22}$ )	23.3	40.30	99.5
Normality ( $\chi^2_2$ )	5.7	9.21	92.7
Skewness (t)	0.6	2.58	93.2
Kurtosis (t)	0.4	2.58	96.5
Residual seasonality ( $\chi^2_2$ )	3.2	9.21	98.9
Nonlinearity ( $\chi^2_{24}$ )	26.6	43.00	91.4
Random residuals sign (t)	0.0	2.58	98.1

Figure 2

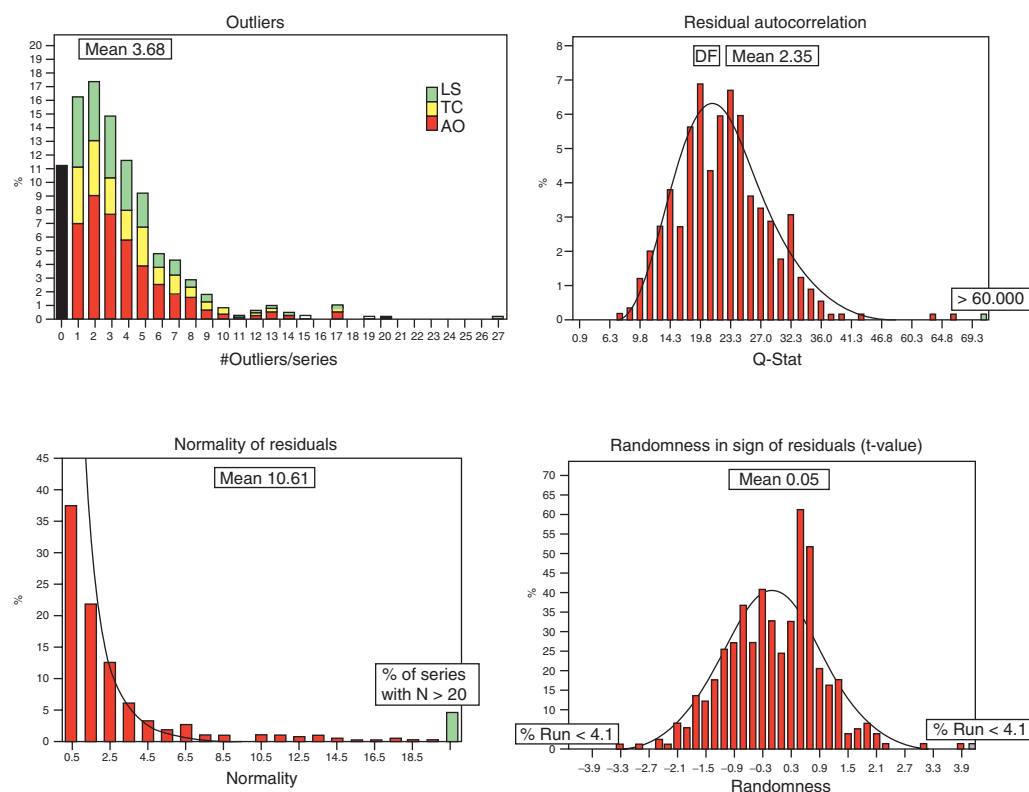


Table 3 – Individual results

<b>1. Model And Diagnostics</b>																		
n	TITLE	Lam	Mean	P	D	Q	BP	BD	BQ	SE(res)	BIC	Q-val	N-test	SK(t)	KUR(t)	QS	Q2	RUNS(t)
1	“1M01AC”	1	0	0	1	1	0	1	1	10.03394	4.69708	16.93	2.18	0.907	-1.17	0.	29.79	-0.51
2	“2M01AI”	0	0	0	1	1	0	1	1	0.1420778	-3.73299	18.04	2.12	0.610	1.32	0.034	21.74	-0.35
3	“3M01AT”	0	0	0	1	1	0	1	1	0.1180897	-4.13100	17.34	2.84	1.03	1.33	0.042	9.792	1.56
4	“4M01BC”	0	1	1	0	0	0	0	0	0.2042107	-3.04474	23.20	4.63	-1.36	1.67	2.52	43.60	-0.33
5	“5M01BE”	1	0	1	1	1	0	1	1	0.8975408	-0.05725	27.78	0.007	-0.01	0.080	0.280	14.73	0.689
<b>2. Arma Parameter</b>																		
n	TITLE	PHI1	(t)	...	TH1	(t)	...	BTH	(t)									
1	“1M01AC”	-	(-)	...	-0.48807	(-6.4)	...	-0.74292	(-8.7)									
2	“2M01AI”	-	(-)	...	-0.55551	(-7.5)	...	-0.62906	(-7.4)									
3	“3M01AT”	-	(-)	...	-0.44024	(-5.7)	...	-0.66687	(-8.2)									
4	“4M01BC”	-0.50337	(-7.2)	...	-	(-)	...	-	(-)									
5	“5M01BE”	-0.49282	(-11.)	...	-0.78988	(-18.)	...	-0.72391	(-8.3)									
<b>3. Deterministic Effects</b>																		
n	TITLE	TD	EE	#OUT	AO	TC	LS											
1	“1M01AC”	1	0	0	0	0	0											
2	“2M01AI”	1	0	3	1	1	1											
3	“3M01AT”	1	1	2	1	1	0											
4	“4M01BC”	0	0	3	1	1	1											
5	“5M01BE”	0	0	2	1	0	1											
<b>4. Outliers</b>																		
1	“1M01AC”																	
2	“2M01AI”	AO01(0800, -4.06)			TC01(1292, -4.11)			LS01(0397, 3.47)										
3	“3M01AT”	AO01(0800, -4.02)			TC01(1292, -4.11)													
4	“4M01BC”	AO01(0192, -4.20)			TC01(0393, 4.09)			LS01(0196, 30.69)										
5	“5M01BE”	AO01(0200, 8.06)			LS01(1200, -3.98)													

Lam = 1 levels, 0 logs; (P D Q) (BP BD BQ) = Orders of ARIMA model; Q-val = Residual autocorrelation; N = Normality; SK = Skewness; KUR = Kurtosis; QS = Residual seasonality; Q2 = Nonlinearity; RUNS = randomness in signs; (MMYY, t) = (Month Year, t-value); AO = Additive outlier; TC = Transitory change; LS = Level shift.

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# The use of sample data to improve the quality of financial statistics

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## 1. Introduction

Financial Accounts (FA), mostly based on information collected at the macro level, provide the most comprehensive statistical framework on financial assets. Given the high cost of collecting detailed data for the whole population, FA statistics focus on a few key data on stock/flow volumes.

More detailed information about financial instruments and their holders can be obtained through sample surveys at a reasonable cost<sup>1</sup>. Through sample data one can see “what is behind” aggregate figures (disaggregation by subgroups, distribution, concentration, etc.). Micro data can be used to study agents’ heterogeneity in allocating financial portfolio, e.g. the risk preference of certain sub-populations.

This note briefly reviews ways to use survey data to improve the information available at the aggregate level. We focus mainly on households’ financial assets. After comparing the pros and cons of micro and macro data, we explore the critical links between the two sources, and suggest possible developments. To illustrate certain points, we make a reference to data and analysis provided by the Bank of Italy.

## 2. Macro and micro data

### 2.1. Information content

Financial accounts show the composition of households’ financial savings and wealth, the amounts raised by corporations and the general government, the value of financial transactions/positions vis-à-vis the rest of the world, and the evolution of the financial structure. They do not provide breakdowns by sub-categories, such as size, branch or location of firms, that are relevant for economic analysis. For instance, the structure of firm liabilities may differ by branch (e.g. cyclical vs. non-cyclical), location (e.g. good/bad law enforcement), firm size or firm legal status. Similarly, the share of risky assets in households’ financial portfolios may differ by sub-populations defined, say, by age, occupational status, or overall wealth. All this is relevant to the use of financial data both for purposes of both research and policy, including monetary policy.

For understanding the structure and evolution of an advanced economy it is necessary to complement macro with microeconomic information (Ruggles and Ruggles, 1987). Only through micro data can financial assets’ distribution<sup>2</sup>, diffusion<sup>3</sup>, and use (consumption, inter-generational transfers, bequest) be studied. Also, micro data are needed to analyse portfolio choice (Guiso et al., 2002)<sup>4</sup>. More generally, a more intense use of micro data is a logical

1 *Micro-level data can be gathered from administrative archives (e.g. supervisory reports of banks or insurance companies) as well as from sample surveys. Administrative data have usually serious shortcomings from the viewpoint of statistics, such as insufficient coverage of the relevant population, unreliability of information, absence of key explanatory variables. Moreover, administrative records typically lack flexibility, and are thus not well suited to provide information on complex phenomena that evolve rapidly and have ill-defined boundaries.*

2 *Distributive considerations may change the perception even of nation-wide phenomena. Comparing household net wealth in Italy and the United States, Faiella and Neri (2004), using sample data, show that, while households’ mean wealth is higher in the US (confirming what the FA say), median wealth is higher in Italy.*

3 *By diffusion we mean e.g. the share of households that hold a certain type of assets, say deposits or shares, or of liabilities. One illustration of the use of such data is the following. In 1997–2002, according to FA data, the value of households’ liabilities increased in Italy by 60 per cent. However, sample data show that the number of indebted households remained almost unchanged. Thus the increase in household debt was due to a higher average debt burden, rather than more indebted families. This may have policy implications.*

4 *For example, micro data have been used to explore the implications of wealth variations for consumer spending (Poterba 2000; Case et al. 2001; Paiella 2004), again a topic of interest for monetary policy (ECB 2000, 2002).*

consequence of recent developments towards “micro-founded” macroeconomics (Sawyer, 1989; Musu, 1989).

## 2.2. Standards

The FA are an integral part of the national accounts (NA) and as such they are covered by international statistical standards. In Europe, their content and methodology are based on ESA95; FA are considered a “shared responsibility” between Eurostat and the ECB, in view of their monetary policy relevance and the role central banks play in their compilation.

In contrast, survey data are collected by diverse institutions (statistical institutes, central banks, universities and others), with no comprehensive standard regarding coverage, definition of instruments, or valuations and estimation methods.

Moreover, sometimes micro and macro definitions of the same concept are not identical. For example macro data often disregard relationships that net out within a sector (such as debts/credits between households). Also, the notion of “current” versus “one-off” transactions changes when one switches from the micro to the macro point of view (think of lottery wins or insurance refunds)<sup>5</sup>.

International comparisons of NA/FA macro aggregates are much more meaningful than comparisons of survey-based micro data. This is still largely true despite attempts to standardise income data (the Canberra group) and wealth data (the Luxembourg Wealth Study<sup>6</sup>) in surveys.

## 2.3. Measurement errors

A well-known problem of surveys is that interviewees tend to under-report, consciously or not, their wealth (and sometimes income). A further problem is the high concentration of wealth and the low probability of including the wealthiest in the sample (Davies and Shorrocks, 1999). Finally, estimates can be affected by a downward bias due to non response behaviour (selection bias) because affluent households are less willing to participate in sample surveys (D'Alessio and Faiella, 2002). All of this tends to bias survey-based estimates downward.

FA data, too, rest on many measurement hypotheses and are subject to errors<sup>7</sup>. The aggregate financial balance sheet is especially uncertain for the household sector. Financial holdings of this sector are often calculated as a residual, by deducting the holdings of all other sectors from the total (Antoniewicz, 2000; Bonci et al. 2004).

Survey-based and macro data can be used to improve each other. Macro data supply an aggregate benchmark that can help to correct biases in survey data. Survey data, in turn, supply information on sectors and instruments for which original aggregate data do not exist, so that macro amounts have to be estimated or imputed with high uncertainty.

## 3. A bridge between macro and micro data: work under way at the Bank of Italy

In Italy, data on households' financial assets are provided by the FA (macro, quarterly) and by the sample Survey on Household Income and Wealth or SHIW (micro, every two years)<sup>8</sup>. Both sets of statistics are compiled by the Bank of Italy. Despite this, methodological gaps between them have traditionally been large, as in other countries. We have now an ongoing project to increase the comparability of the two sources and improve the quality of each in the process.

As usual, the sample-based estimates are almost always lower than the corresponding FA aggregates. One issue is definitions. Differences in sector boundaries and variable definitions mean that data are not fully comparable. For example, the FA definition of (consumer) households

5 D'Alessio and Gambacorta (2004). Such transactions are not considered as wealth variations in the National Accounts but are obviously a one-off event from the point of view of the household involved.

6 The Luxembourg Wealth Study (LWS), promoted by the Bank of Italy and other institutions, is an ongoing project aimed at creating an international database with harmonised micro-data on wealth from various national household surveys.

7 In the latest revision of the Italian FA, e.g., the use of a more comprehensive source on unlisted companies led to a more than 30 percent reduction in the value of equities held by households in 1995 (Bank of Italy, 2003).

8 For details of the SHIW see Bank of Italy (2004).

includes non-profit organisations and the institutional population, which are not covered by the SHIW<sup>9</sup>. Another issue is valuation. Survey respondents evaluate assets and liabilities using different criteria from those used for aggregate statistics<sup>10</sup>. Bonci et al. (2004) show that standardising the valuation of certain financial instruments reduces the difference between FA and survey estimates strongly. A third issue is bias: in the past, a study was devised using auxiliary information, in order to gross-up survey estimates to Financial Accounts figures (Cannari et al., 1990)<sup>11</sup>.

On the other hand, data that are not available at the aggregate level can be estimated using surveys. In Italy this appears particularly promising for non-financial assets, not covered by the FA. SHIW has collected micro-level data on family holdings of tangible assets since the 1960s. Despite the familiar problem of under-reporting, which can be corrected to an extent, this is a very valuable source of information (Cannari and D'Alessio, 1990; Cannari and Faiella, 2004). A recent study, which uses sample data supplemented by models and auxiliary information, provides a comprehensive estimate of the overall wealth of Italian households (Brandolini et al., 2004).

#### 4. The way forward

Ideally, sample surveys should play a major role in the compilation of financial statistics, through a strong link to the main framework based on macro estimates. For this link to work, sample surveys would have to be harmonised (i.e. definitions must be brought as close as possible to national accounts), complete (i.e. cover all the main macroeconomic aggregates), and reliable<sup>12</sup>.

This sounds simple in principle but is not easy to implement. In practice, each survey has specific features, which differ across countries. Closer international co-ordination of methodologies used for sample surveys, similar to standards used in national accounts, is needed.

The Bank of Italy has recently begun work on harmonising the definitions of its household survey with those of the financial accounts. It is also promoting an international project to create a harmonised database of micro information on household wealth in different countries (the LWS).

Related work, that cannot be described here, is under way for data on the non-financial business sector. Two issues of particular interest are trade credit, now insufficiently covered by the FA, and the unincorporated businesses sub-sector(s), on which precious little is usually known. To take care of this we are making use of data from firm and household sample surveys, and from balance-sheet registers. The Centrale dei Bilanci (an independent company participated by the Bank of Italy) plans to start collecting the balance sheets of unincorporated businesses, a development which will help fill a major gap in financial statistics.

#### Résumé

*Les Comptes Financiers (CF), essentiellement basés sur des informations macroéconomiques, représentent le cadre statistique le plus complet sur les actifs financiers. En considération du coût élevé du recueil des données détaillées pour la population entière, les CF se concentrent sur certaines données importantes concernant les volumes de stock/flux. Des informations plus détaillées sur les instruments financiers et sur leurs détenteurs pourront être obtenues à travers des enquêtes-échantillon à coût raisonnable. Grâce à ces données-échantillon, il est possible de voir "derrière" les données macroéconomiques (désagrégation en sous-groupes, distribution, concentration). Les microdonnées peuvent être utilisées pour étudier l'hétérogénéité des agents dans l'allocation du portefeuille financier comme, par exemple, les préférences de risque de certaines sous-populations. Idéalement, ces enquêtes-échantillon devraient jouer un rôle important dans la compilation des statistiques financières, étroitement liées au cadre principale basé sur des macroestimes. C'est pour cela qu'elles devraient être harmonisées (c'est-à-dire, leurs définitions*

<sup>9</sup> Bonci et al. (2004) estimate that non-profit organisations hold a minor share of the sector's assets (about 2 per cent).

<sup>10</sup> Interviewees "might fail to include the interest on deposits accrued . . . but not yet paid; they rate durable goods at their price in the second-hand market, or perhaps at their historical cost, whereas national accounts apply substitution prices . . .; they value their house at a subjectively-perceived realisation price while national accounts would use actual market prices; and so forth" (Brandolini et al., 2004).

<sup>11</sup> The authors corrected SHIW data for non-reporting and under-reporting of financial assets, devising a method based on the outcome of a statistical matching of the SHIW data for 1987 with the micro-data from a survey carried out in the same year by a commercial bank on a sample of its customers. At present, an upgrading of that research is under way.

<sup>12</sup> Micro-simulation can provide a means of linking micro and macro information (Orcutt et al., 1986). The Bank of Italy is also pursuing this line of research.

devraient être rapprochées le plus possible de celles de la comptabilité nationale), complètes (elles devraient comprendre tous les principaux agrégats macroéconomiques), et sûres – tâche apparemment simple, mais dont la réalisation n'est pas du tout facile. En réalité, du moment que chaque enquête suit ses propres lignes, selon les différents pays, il faudrait poursuivre une plus profonde coordination internationale entre les méthodologies utilisées dans les enquêtes et les standards utilisés dans la comptabilité nationale.

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Giovanni D'Alessio and Ivan Faiella (Bank of Italy)



# Assessing the quality of financial statistics

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## 1. Introduction

Over the last four years, the IMF Statistics Department conducted assessments of 48 countries' monetary statistics using its Data Quality Assessment Framework (DQAF). Drawing on this experience, this paper will consider three topics: What messages might be found in the ratings that have been assigned in these assessments? Has the DQAF served the roles that it was originally envisaged that it would serve? How might the DQAF evolve to maintain its relevance for the statistics of an ever-changing financial sector?

Before turning to these topics, it will be useful to set the stage. In the wake of the financial crises of the late 1990s, the international community put in place a program to assess country practices against a group of international standards and codes (Clark and Drage, 2000). In the field of statistics, the IMF was asked to assess country practices against its Special Data Dissemination Standard (SDDS) and General Data Dissemination System (GDSS). In 2001, the IMF introduced the DQAF as the basis for these assessments. This paper can afford only a bare-bones sketch of the DQAF, but a fuller description is readily available in a Fact Sheet on the IMF website ([http://dsbb.imf.org/vgn/images/pdfs/dqrs\\_factsheet.pdf](http://dsbb.imf.org/vgn/images/pdfs/dqrs_factsheet.pdf)) (IMF, Statistics Department, 2004). In brief, the DQAF identifies internationally accepted standards, guidelines, and good practices with respect to governance, processes, and products. It is organized around a set of prerequisites of quality (e.g., the legal and institutional environment) and five dimensions of data quality: Assurance of integrity, Methodological soundness, Accuracy and reliability, Serviceability, and Accessibility. For the prerequisites and for each quality dimension, the DQAF identifies 3–5 elements of good practice (a total of 22 elements). Then, for each element, it identifies several indicators, and, in a cascade, it provides more detail and more concreteness tailored to the dataset. The IMF has developed DQAFs for the major macroeconomic datasets, including, of course, monetary statistics.

Assessments of monetary statistics, together with assessments of other datasets, comprise a Report on the Observance of Standards and Codes. Forty data module ROSCs are already published on the IMF website, covering developing countries, transition countries, and industrial countries. The published assessments provide commentary about the extent to which country practices meet the internationally accepted good practices embedded in the 22 DQAF elements. A summary table shows ratings of “observed,” “largely observed,” “largely not observed,” and “not observed” for each element.

## 2. The ratings: Are there messages?

One message from the ROSCs is that monetary statistics on average receive higher ratings than national accounts, balance of payments, and government finance statistics; of the datasets assessed, only price statistics receive higher ratings. For monetary statistics, more country practices are found to be in observance of the standards, guidelines, and good practices than is the case for the other datasets. This message confirms the conventional wisdom, which is qualitatively visible in the metadata posted on the Dissemination Standards Bulletin Board for the 57 countries subscribing to the SDDS and the 77 countries participating in the GDSS.

Within the assessments of monetary statistics, a starting point in looking for messages is to identify the elements for which countries do not observe, to varying degrees, practices that

<sup>1</sup> *The commitment to and preparations for this paper were made while the author was Director of the Statistics Department, IMF. The opinions expressed in the paper are those of the author and do not necessarily reflect the views of the IMF. She wishes to thank Edgar Ayales, the staff of Financial Institutions I Division, and Lucie Laliberté for assistance in compiling the underlying information and for helpful comments.*

are consistent with good quality. For three elements, many of the countries assessed – 60 to 80 percent – received ratings of less than “observed.” Most of these ratings were “largely observed,” so the situation is not as dire as these percentages might suggest. Two of the three elements were within the dimension of Methodological soundness. (Hereafter, the names of the elements are in bold.) For **classification/sectorization**, often the classification of instruments was not detailed enough to conform broadly with the recommendations of the IMF’s *Monetary and Financial Statistics Manual (MFSM)*. In particular, financial derivatives were not identified. With respect to sectorization, often the private sector was not sectorized as called for in the *MFSM*, the residency criterion was not applied appropriately, and some misclassifications were made. For **basis for recording**, the ratings reflected the deviations from recording at market value, on an accrual basis, and on an appropriate net/gross basis. The third element where many countries received a less than “observed” rate was **consistency**, within the dimension of serviceability. The main issue was lack of consistency with other datasets, specifically between monetary statistics and corresponding aggregates in balance of payments and in government finance statistics. Of course, issues related to classification/sectorization and the basis for recording may well be sources of apparent inconsistency between datasets.

Very roughly half of the countries assessed received ratings of less than “observed” for seven elements, spread across the prerequisites and the five dimensions. For the element **relevance**, within the set of prerequisites, a number of countries did not follow the practice of explicitly consulting major users about the extent to which current statistics met their needs and about future needs. For **transparency**, an element within Assurance of integrity, countries were found not to observe one or more several practices. They often did not make publicly available the terms and conditions under which monetary statistics were produced, did not identify internal government access to statistics before their release, and did not give notice of major changes in methodology. The ratings for **scope**, within the dimension of Methodological soundness, reflected less than full coverage in statistics of other depository corporations—that is, the likes of credit unions, money market funds, and building societies were not covered. This result for this element, the above-noted results for **classification/sectorization** and **basis for recording**, and a sizable number of less than “observed” ratings (roughly 40 percent of countries assessed) for **concepts and definitions** combine to make Methodological soundness the dimension that overall was least observed.

For **source data**, an element within Accuracy and reliability, the comments mirrored the comments about **classification and sectorization**, noting the lack of detailed information in the source data. For **revisions policy and practices**, within the dimension of Serviceability, most of the comments noted that the public was not made aware of the revisions policy (and even that an explicit revisions policy did not exist). Within the dimension of Accessibility, both data accessibility and metadata accessibility yielded “observed” ratings less than half of time. In fact, metadata accessibility yielded more “largely not observed” ratings than any other element, suggesting the severity of the problem.

On the other end of the spectrum, two elements yielded “observed” ratings for all countries. Both are within the dimension of Assurances of integrity. For **professionalism**, the statement of good practice against which countries are assessed is that “Statistical Policies and practices are guided by professional principles.” The assessors look for evidence that statistics are produced on an impartial basis, that choices of sources and methods and decisions on dissemination are made on purely statistical grounds, and that the statistical entity is entitled to comment on erroneous interpretation and misuse of statistics. For **ethical standards**, the statement of good practice is that “Policies and practices are guided by ethical standards.” The assessors look for evidence that guidelines on ethical behaviour are in place and well known to staff and that staff are made aware of the ethical standards.

Are any of these results surprising—particularly at the ends of the spectrum? It is probably not surprising that **classification/sectorization** and **basis for recording**—and more broadly, the other elements that make up the dimension of Methodological soundness—are the elements where country practices differ most often from the standards that are identified with “quality.” Country practices existed long before the *MFSM*, published in 2000, and some time will be needed for them to come into conformity with the guidelines in the *MFSM*.

It is surprising, however, given the widespread concerns about governance, that to date not a single rating less than “observed” was given for **professionalism** and **ethical standards**. At a minimum, this result would seem to suggest that the DQAF or its application should be strengthened so that there is some gradation in the ratings for these important elements. As an analogy, if all the students get the one grade of “A,” the teacher might consider modifying the grading system to include the possibility of getting an “A+,” and “A,” and an “A–.”

### 3. Has the DQAF served its intended roles?

From the outset, it was foreseen that the DQAF could serve several roles. They boil down to serving three groups:

- IMF staff, to guide in preparing the data module of ROSCs, in designing technical assistance, and in the use of data in policy evaluation,
- Countries, to guide their efforts, e.g., in preparing self-assessments, and
- Data users, to guide in evaluating data used for policy analysis, forecasts, and economic performance.

With respect to guiding IMF staff, it is difficult to imagine how the assessments of data mandated by the international community in the late 1990s could have been conducted without a structured framework such as the DQAF. Of course, other lists of characteristics of quality and other structures could be, and have been, developed. But, with some differences, they have much in common (Laliberté, Grünwald, and Probst, 2004). The DQAF, with the update in July 2003 and the likelihood of similar updates in the future, is proving robust as the tool underlying the data module of the ROSC. Further, the DQAF is increasingly serving as the structure within which to evaluate the need for, and prospects of success of, IMF technical assistance in statistics. As well, it is likely that future reports on technical assistance will be structured using the DQAF framework, thus making it easier to store and search this valuable body of information.

The DQAF is known to have been used by several countries to conduct self-assessments of one or more datasets. For example, the Census and Statistics Department of the Hong Kong, SAR experimented with the use of the DQAF to do an assessment of its balance of payments statistics, and the Banque du Liban has used it to prepare self-assessments. As well, it is likely that more countries have conducted preliminary self-assessments but kept them as internal documents; IMF staff encourages such “quiet” assessments as a way of building statistical capacity and confidence.

By and large, the references so far in the paper have been to how statisticians have found the DQAF useful. There is less evidence that the DQAF has guided non-statistician users of data, either within the IMF or externally. One comment about the DQAF as it is embedded in data modules of ROSCs is that the documents are too bulky and too technical for most data users. In early 2004, the IMF staff began using a streamlined format. To date, no ROSC using this format has been published, so the verdict is still out. A more far reaching approach would be to use analyses of ratings for all datasets, paralleling the analysis that was the basis of Section 2, to identify a supplementary “DQAF lite.” Such a DQAF could be limited to those elements that either were considered absolutely essential in assessing data quality, serve as proxies for other elements, and/or yielded a range of ratings in the past (and thus differentiated among countries). A “lite” supplement might give data users the quick overview of data quality for which they seem to be yearning.

### 4. How should the DQAF evolve to maintain relevance in assessing financial sector statistics?

A little over a decade ago, “quality” in statistics was usually defined as synonymous with “accuracy.” This point should serve as a reminder that frameworks, such as the DQAF, will have to be updated from time to time, in line with developments in statistics and their use, to maintain their relevance. Looking ahead, two developments suggest the directions in which the DQAF for monetary statistics might evolve.

First, in many countries, financial corporations in addition to central banks and other depository corporations—e.g., insurance corporations and pensions funds—play large and/or growing roles within the financial sector. However, the DQAF covers only the statistics for the central bank and other depository corporations (i.e., the financial intermediaries that issue liabilities that are included in the national definitional of broad money). In time, especially given that the *MFSM* provides guidance for the whole financial corporations sector, it may be appropriate to widen the DQAF coverage. Doing so would make the resulting DQAF more parallel with the DQAFs for government finance and balance of payments, which provide coverage for the complete “sector,” and it would facilitate checks of consistency with other datasets.

Second, there is increasing recognition of the links between accounting standards and statistical standards. Given recent developments in accounting, including the attention being given to qualitative characteristics of financial statements that are included in the International Accounting Standards Board’s Framework, it may be possible to extend the DQAF to drill down

more into source data by drawing on assessments of the underlying accounting that might become available.

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## Résumé

*Au cours des quatre dernières années, le Département de la statistique du Fond Monétaire International a évalué les statistiques monétaires de 48 pays sur la base de son Cadre d'évaluation de la qualité des données (CEDQ). Puisant de l'expérience acquise, ce document traite trois sujets: quels messages se dégagent des évaluations qui ont été données aux pays? Est-ce que le CEDQ a bien servi les rôles pour lesquels il a été établi? Comment maintenir la pertinence du CEDQ pour les statistiques d'un secteur aussi changeant que le secteur financier?*

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# Discussion of G. D'Alessio & I. Faiella and C. Carson\*

*Arthur B. Kennickell (Federal Reserve Board)*

These two papers give me an opportunity to comment on a range of issues concerned with data quality. The D'Alessio and Faiella paper addresses the development of linkages between survey data and aggregate data. The Carson paper concerns the construction of a system of standards to guide the production of statistics in a large number of both developing and developed countries.

In my view, the essential point of the D'Alessio and Faiella paper is that with proper understanding at both the micro and macro levels, one can use such data together to learn things that could not be known from either source separately. The work of Dean Maki and Michael Palumbo ["Disentangling the Wealth Effect: A Cohort Analysis of Saving in the 1990s," FEDS Working Paper 2001-21, Board of Governors of the Federal Reserve System, 2001] using the US Survey of Consumer Finances along with the Flow of Funds Accounts to simulate a time series of sub-aggregate savings behavior is a good example of the power that can be brought to bear when micro and macro data can be sufficiently reconciled. Each type of information has its own set of advantages. Macro data are generally assembled regularly and at a higher frequency than most survey-based sources of information. Micro data provide distributional detail on data covered at the macro level, in addition to providing information on the covariation between data items. In addition, micro data can provide insights into variables that net out in the aggregate, such as loans between individuals.

But reconciliation of micro and macro data is usually not easy. Sometimes there are deep conceptual differences. For example, it would be quite difficult to extract from survey respondents a measure of consumption comparable to a national accounting concept including imputed consumption and other such adjustments, though if respondents are able and willing to cooperate it may be possible to get sufficient information to make a micro estimate. Often the measurement systems underlying these types of data have different objectives and constraints that deeply affect what is actually measured. For example, aggregate systems based on money flows reported on tax returns will be affected both by the regulations that define the flows as well as by any economic incentives to over- or under-report the amounts; regulatory considerations may affect how financial institutions book their assets and liabilities in varying ways over time.

Measurement error is a problem in both systems. Aggregate data often combine data from many sources, each of which may have its own complex measurement problems. Survey data, the main source of micro data aside from administrative data, may suffer from comprehension and reporting errors on the part of respondents, various administration errors on the part of interviewers, as well as sampling error. Surveys have developed at least some range of tools for characterizing the effects of errors, but typically such tools are not available in macro data or administrative data.

I believe progress in combining micro and macro data will come only by principled and unremitting research to make the underlying statistical properties both more evident and more measurable. Where survey processes yield unreliable results, efforts should focus primarily on identifying and progressively eliminating the problem at its source—at the conceptual, embodiment, administration, reporting, recording, or processing level—where that is possible. Where this is not possible, it may still be possible to exploit conditional relationships in the data to make sufficient adjustments; when such procedures are uncertain, some means—perhaps multiple imputation—should be used to convey to users the uncertainty of the process. Great care should be taken to avoid *ad hoc* and unmeasurable adjustments that may introduce fundamental distortions. When reconception and adjustment are insufficient, it is time to consider either ceasing to measure the problem variable altogether or to choose another concept sufficiently similar but with fewer associated measurement problems. For macro data, the most pressing gap seems to

\* *Opinions expressed in this discussion are those of the author alone and do not necessarily reflect the view of the Board of Governors of the Federal Reserve System.*

me to be in the failure to incorporate the statistical properties of the source data; surely no one believes that national account estimates have degenerate confidence intervals. A greater understanding of the error properties of source data will lead inevitably to improvement in the construction of reliable aggregates and to an improved ability to align micro and macro data. Conceptual differences between micro and macro sources will require detailed analysis and a flexible understanding of the ultimate goals of measurement. The Luxembourg Wealth Study (see <http://www.lisproject.org/lws.htm>), to which the Bank of Italy has contributed in important ways, is intended to make progress on the range of issues confronting the joint use of micro and macro data.

The Carson paper reports on a framework for assessing and reporting on data quality that was developed under the leadership of Dr. Carson at the International Monetary Fund. The system covers the context of measurement—the supporting institutions, the people, the tools, etc—the conceptual framework, the credibility of the processes, the methodological soundness of methods, the degree to which measurement goals are realized, and various areas affecting the actual usefulness and accessibility of statistics. Although there is overlap with parallel frameworks in the EU and the US, the IMF model is designed more broadly to include concepts that apply to all countries, developed and developing. In my view, there are areas in the IMF model taken for granted in the parallel systems that could usefully be included. In reading a selection of the more than 40 country-provided reports available at this time of this discussion, I was struck by how seriously respondents took the reporting task, including the necessity of exposing problems.

I see quality frameworks as having two goals, only one of which—improving quality—is usually explicit. Certainly, placing into a public forum a detailed description of the entire balance sheet of inputs into a statistical process is virtually guaranteed to draw attention to problems and the need for their resolution, particularly when an incentive could be better relations with the IMF. The usually implicit goal is to use clear principles to attract and inspire people with a scientific disposition to maintain standards over the longer term. Most important systems are far too complicated to be controlled directly and must be managed by influencing the desire of the people involved to maintain standards in the many places where they cannot normally be observed without extraordinary effort. Principles must be embodied in people.

All systems tend to degrade over time as small compromises cumulate, understanding becomes rigid, or the nature of things covered in systems changes in fundamental ways. Something is needed to make systems live and evolve. The public nature of the reports and the inspirational effect of the principles on individuals are a strong start toward life for the IMF system. Helpful evolution depends on future interventions that can only be programmed in a constitutional sense. Attention will be needed to encourage the formation of external monitoring groups—preferably more than one—that should have rights to redress within the system. Data users should have a prominent role in such groups.

*Arthur B. Kennickell (Federal Reserve Board)*

# Robust analysis of the term structure of interest rates

*Elvezio Ronchetti (University of Geneva)*

In this talk we discuss how robust techniques can be used in the statistical analysis of financial models. The results are based on the papers by Ronchetti and Trojani (2001) and Dell'Aquila, Ronchetti, Trojani (2003) where the theoretical foundations and the complete analysis can be found.

The theory of robust statistics deals with deviations from the assumptions on the model and is concerned with the construction of statistical procedures which are still reliable and reasonably efficient in a neighborhood of the model; see Huber (1981), Hampel, Ronchetti, Rousseeuw, Stahel (1986), and Dell'Aquila, Ronchetti (2005) for an overview. Therefore it can be viewed as a statistical theory dealing with approximate parametric models.

Many classical econometric procedures are well-known for not being robust, because their results may depend crucially on the properties of a few observations in the sample. These procedures are optimal when the assumed model is exactly satisfied, but they are biased and/or inefficient when small deviations from the model are present. The results obtained by classical procedures can therefore be misleading on real data applications.

Financial models are often estimated and tested with methodologies that do not explicitly control for the effects of small distributional deviations from the assumptions; see Knez and Ready (1997). However, because of the intrinsic complexity of financial markets and the richness of financial phenomena, we may realistically believe that some deviations from the assumptions will almost always be present when using a financial model in empirical finance.

It seems therefore natural to treat financial models as approximate descriptions of the financial reality and to work with statistical procedures that can deal with some amount of "abnormal" observations and identify them systematically. In some cases, it is precisely a detailed analysis of the identified abnormal observations that will offer new insights and suggestions on the kind of features that a more accurate model should be able to fit.

Implicitly, we argue that while estimating a financial model it is important to verify first, if the *majority* of the data is consistent with the assumed model. If this is not the case, a more complex model can be introduced. This seems particularly meaningful in the context of empirical financial modelling, where parameter estimates and the model selected are often the input for the pricing and hedging of financial instruments. In practice, one would like to ensure that the choice of a model used to price and hedge a financial instrument is driven by the features of the majority of the observed data rather than by single datapoints or some particular historical period.

As an illustration we re-examine the empirical evidence concerning a wellknown class of one factor models for the short rate process; cf. Chan, Karolyi, Longstaff, Sanders(1992) (CKLS) and some recent extensions with a new statistical methodology based on robust statistics, the Robust Generalized Method of Moments (RGMM). In particular, we demonstrate how the RGMM may be used to produce important statistical information on a given data set and to identify statistical problems when investigating a given financial phenomenon.

CKLS nests several linear-drift one factor models for the short rate process. The main result of the paper is that the more appropriate models for the US short interest rates over the period 1964 to 1989 are those that allow the conditional volatility of short interest rate changes to be highly dependent on the level of the short rate. We choose this model because it is a typical application of GMM in finance, where estimation and testing procedures are derived from highly nonlinear orthogonality functions. Extensions to more complex models and to Euro-mark data produce similar results.

A simple sensitivity analysis performed by moving one single observation (out of 307) in a very small range compatible with the observed volatility, shows that the results obtained by classical econometric techniques on the original sample can be completely reversed. This is an extreme example of nonrobustness which affects in a drastic way the implications from the financial point of view. On the other hand, when testing the CKLS models with the RGMM

methodology, we find that they are all clearly misspecified and we identify a clustering of influential observations in the 1979–1982 subperiod, a time span that is well-known to coincide with a temporary change in the monetary policy of the Federal Reserve. This clustering of influential observations does not disappear when we introduce a non-linearity in the drift and allow for a parameter shift during the 1979–1982 period. Moreover, a Cox-Ingersoll-Ross model (selected by the RGMM) might offer a satisfactory data description for the period after 1982, since during this period only a few isolated outliers are found.

Looking at the influential observations found by means of the RGMM, we identify those observations that are primarily responsible for the different results between the robust and the classical analysis. In fact, we note that the majority of them are clustered in the 1979–1982 period. Further influential points show patterns similar to those of the probabilities estimated in switching regime models (cf. for instance Gray (1996)) and in particular corresponding to the first OPEC crisis and the October 1987 Stock market crash. This anomalous clustering of influential points may suggest a change of structure over this period, rather than the existence of a set of isolated outliers. This confirms the results in the literature (e.g. switching models), where this period is found to be the main cause of misspecification in the CKLS setting. It is important to stress, however, that with the RGMM we obtain this conclusion by a single analysis on the original data set and without changing the basic ideal model.

Recent applications to more complex models such as GARCH models (see Mancini, Ronchetti, Trojani, 2004) confirm the usefulness of a robust analysis in revealing hidden structures.

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## Résumé

*Dans cet exposé on discute le rôle des techniques robustes dans le domaine de la modélisation en finance. En particulier on illustre les points essentiels par une analyse des données américaines sur les taux d'intérêt.*

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# Comments to Ronchetti

*L.F. Signorini*<sup>1</sup>

Professor Ronchetti proposes a methodology for dealing with the effects of extreme data in the context of parametric financial modelling. His proposal is applied to the term structure of interest rates.

Estimates based on traditional models and techniques often appear to depend strongly on a few influential observations. This intuition is tested in the case of US short-term interest rate data over the period 1964–1989. The predictions of commonly used models are shown to change sharply if just one observation (outlier) is perturbed. For example, with the one-factor model proposed by Chan, Karolyi, Longstaff and Sanders (1992), the Generalised Method of Moments yields parameter estimates that turn out to be quite sensitive to arbitrary modifications in the highest-valued observation in the data.

This is not desirable in general, but the problem is especially serious in finance, since model-based estimates are heavily used for operational purposes such as the pricing and hedging of derivatives. It seems therefore crucial that the statistical tools used should convey reliable information based on the bulk of the data, and be largely unaffected by a few extreme values.

In order to limit the effect of outliers on the estimates, Ronchetti and co-authors suggest the use of robust estimation techniques. In a number of papers on which this presentation is based, a “Robust Generalised Method of Moments”, or RGMM is proposed. RGMM results do not suffer from over-sensitivity to individual observations. As an interesting by-product, with the RGMM it is possible to find which observations are responsible for most of the divergence between the robust approach and the standard approach.

The proposal has obvious merits, as eliminating the unwanted effect of outliers is particularly important in a field where unreliable estimates have a high potential for damage. Some points, however, appear to deserve further discussion.

1. In the experiment that was presented, extreme values were picked and changed, for the purpose of showing the instability of the standard models with respect to outliers, in a judgmental way. It might be useful to see what happens with a simulation approach, where the values to be changed are chosen (and perturbed) in some random way. This would be a way to check, as it were, the robustness of results in favour of the robust approach.
2. In the 2003 paper by Ronchetti and Trojani, the performance of the RGMM seems to depend on a constant  $c$  (the *tuning constant*), fixed at a value (5.85) that is said to be consistent with the desired level of bias. The authors claim that other choices yield qualitatively similar results. Users of robust methods would be interested to know whether some formal criteria (or at least some kind of rule-of-thumb) could be devised for choosing the value of the tuning constant in a systematic way.
3. As financial models are often used for forecasting purposes, it would be useful to enrich the comparison of standard and robust methods by looking at out-of-sample validation exercises.
4. One finally wonders whether it would be possible to have a rough idea of the cost of using such methods in terms of complexity (setting-up time, training, computational requirements, etc.).

*L.F. Signorini*

<sup>1</sup> C. Biancotti, L. D’Aurizio and R. Tartaglia Polcini supplied the ideas on which this discussion is based.

# The use of survey in financial statistics: challenges and opportunities

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# Surveys for insurance services in the balance of payments

*Ghislain Poulet (National Bank of Belgium)*

The activity of insurance may be considered as a financial intermediation in which the insurer collects funds from insured and invests them with the view to pay the future claims. The funds are not only redistributed among insured but also they retribute the insurance enterprise for its services. Because the insurance enterprises do not make an explicit charge for the service they provide, the transactions between insurer and policyholders have to be dismantled for identifying the insurance service. In the national accounts, following the SNA or ESA rules, the measurement of insurance service distinguishes three cases

- non-life insurance: actual premiums + income from investment – claims
- life insurance: actual premiums + income from investment – claims – increase of reserves
- reinsurance: actual premiums – claims

Exports of insurance services cover the provision of insurance to non-resident insured by - resident insurers while imports cover the provision of insurance to resident insured by non-resident insurers. Following the Balance of payment manual of the IMF, the insurance services are a standard component of the current account (classified I.A.b.5) and is subdivided into five basic headings: Life insurance and pensions/Freight insurance/Other insurance/Reinsurance/Auxiliary services. The second and third categories are non-life insurance and the last one is not *senso stricto* an insurance service but covers the activities closely related to the insurance carried on by insurance brokers, pensions consultants, experts. . . . Except for this last category (whose service is directly measurable), the particularity that insurance services are not directly measured complicates of course the compiling for the balance of payments. For example, the correct recording for the exports of non-life insurance will be the following

	<u>Credit</u>	<u>Debit</u>	
Insurance services	P + I – C		with P, I, C for premium, income, claims
Current transfers	C	C	
Income		I	

The saldo (Credit – Debit) will be (P – C) equal to the observed flow of payments. Because generally – and surely for the imports – only the flows of payments are available for the cross border operations, the IMF manual allows to simplify the formula of measurement of the services dropping the variables over income (I) and reserves (R). As I is positive this leads for the non-life insurances services to an underestimation of the exports and to a correlative over estimation of the domestic sector if this is calculated as the difference of the total production and the exports. For life insurance, the impact of simplification is not so clear because the sign of R is not determined, the actuarial reserves may increase or decrease. About this point the SEC is more strict; it proposes the uses of ratios issued from the domestic insurance sector for extrapolating the missing informations over the cross border operations and restricts the possibility of simplification to the imports of non-life insurance services. For european countries, this is a potential source of discrepancies between balance of payments statistics and national accounts.

The collect of data for the balance of payments in many countries is essentially made through the banking sector that record the payments between residents and non-residents. The coding of those operations is of course crucial. Unfortunately, the paying bank is an intermediary who doesn't know exactly the type of transaction made by its customers and who have no interest in it so the quality of coding is poor. This is particularly the case in the insurance sector where there are many transactions (premiums, claims, income, investment, fees . . . ) and a lot of confusions. In Belgium, the option has been taken of collecting data directly at the source without passing through the bank sector.

- The sectors concerned by insurance are listed hereafter with their potential transactions
- insurers: exports of insurance, exports and imports of reinsurance and auxiliary services
  - pensions funds: exports of life insurance and imports of reinsurance and auxiliary services

- reinsurance enterprises: exports and imports of reinsurance and auxiliary services
  - insurance brokers: exports and imports of auxiliary services
  - enterprises and households: imports of insurance services
- (public sector is not mentioned because it don't use insurance services)

The collect of data is organized by surveys launched towards each sector except the households. For the insurance and reinsurances enterprises and pensions funds, the population is inquired exhaustively, monthly for the biggest ones and quarterly for the rest. For the brokers, that are very numerous, there is a sampling of the population. In order to avoid redundances, the enterprises are asked to report, in matter of insurance, only the transactions resulting from contracts they have concluded directly with non-resident insurer without passing through a resident broker or insurer. The biggest enterprises are all surveyed monthly and there is a quarterly sample for the others. The households are not surveyed but there imports of insurance services is recorded via the activity of the brokers. The only missing part will be the service linked to contracts directly concluded by households with non-resident insurers but those are supposed to be negligible. The variables about premium, claims and fees are asked with a geographical breakdown.

An annoying problem linked to the measurements formula is that the exports or imports of insurance services could be negative. Over its whole activity, the insurance sector will be solvent and deliver a positive service meaning that revenues exceed outlays ( $P + I > C$  for the non-life insurance for example). This inequation may not be achieved for a (small) part of its activity like the cross border operations; the insurance enterprises may be in deficit abroad and make profits on the domestic market. The simplification mentioned formerly reduces the revenue and thus reinforces the occurrence of negative services. Offsetting the negative exports (imports) by increasing the imports (exports) is not an acceptable solution. A better alternative is to use ratio between the variables derived from the whole insurance sector. For example in the non-life imports, knowing the premiums received from abroad by residents insurers ( $P$ ), the claims  $C$  and the income  $I$  are estimated by  $PC'/P'$  and  $PI'/P'$  (with  $P'$ ,  $I'$ ,  $C'$  as observed values for the whole sector). This assures that the non-life imports will be positive. Doing so, you suppose that the geographical breakdown is the same for the claims as for the premiums. If you want to keep a more acute geographical information, it is possible use this method for determining the total of the claims and to distribute geographically this total using the geographical breakdown of collected claims  $C$ . This will assure that at least the of insurance services are positive for the total despite the fact that they may be negative for some countries.

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# Corporate balance sheet statistics as an input for compiling institutional sector accounts

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## 1. Introduction

Corporate balance sheet statistics (CBSS) are *an important statistical* source to analyse the economic behaviour of non-financial corporations in an economy. Within central banks, they are of specific interest for *monetary and financial market analysis, conjunctural and structural analysis, and financial stability analysis*. They usually consist of annual data on balance sheets and income statements often voluntarily collected on a sample basis by central banks and statistical offices. Corporate balance sheet data are also made available by commercial data providers.

The paper describes how CBSS are currently used and how they could ideally be used in the future as an input for compiling institutional sector accounts. It outlines in section 2 which tools are required to compile such accounts. Section 3 refers to the data sources as they are currently used to compile the quarterly non-financial corporate sector accounts. Shortcomings of this practice are discussed in section 4 and proposals are made in section 5 how to better integrate such data into quarterly institutional sector accounts.

## 2. Compilation of quarterly institutional sector accounts

### 2.1. System of quarterly institutional sector accounts

Compiling quarterly institutional sector accounts requires a set of well defined building blocks such as the definition of institutional units and their groupings into sectors and sub-sectors, the description of economic activities and their results as flows and stocks, and the architecture for the system of accounts. The construction of such building blocks is based on the methodology as outlined in the System of National Accounts (SNA93) or in the European System of Accounts (ESA95).

#### 2.1.1. Institutional units and sectors

*Institutional units* are economic entities capable of owning goods and assets, incurring liabilities, and engaging in economic activities and transactions with other units in their own right. In order to describe production, income, expenditure and financial flows, and balance sheets, institutional units are grouped into five mutually exclusive *institutional sectors* based on their principal functions, behaviour and objectives: (i) the non-financial corporations; (ii) the financial corporations; (iii) the general government; (iv) the households; and (v) the non-profit institutions serving households. The five sectors together make up the total economy. Each sector is also divided into sub-sectors. The system allows for a complete set of flow accounts and balance sheets to be compiled for each sector and sub-sector if desired, for the total economy and for the rest of the world.<sup>2</sup>

- <sup>1</sup> The authors would like to thank Werner Bier, Ieva Rubene and Caroline Willeke for their assistance and comments. The views expressed in this paper are not necessarily those of the European Central Bank.
- <sup>2</sup> The economic activities between the resident sectors and the non-resident institutional units are covered by the rest of the world (sector), which plays a role in the accounting structure similar to that of an institutional sector.

The non-financial corporate sector covers all institutional units, which are market producers and whose principal activity is the production of goods and non-financial services. By almost any indicator, the sector is large. There are more than ten million non-financial corporations in the euro area and about five million non-financial corporations in the U.S. Their equity was measured at EUR 6.6 trillions by the end 2002 for the euro area (nine countries excluding Greece, Ireland and Luxembourg) and USD 10.2 trillions in late 2004 for the U.S. In terms of production, the corresponding sectors cover about half of the euro area and the U.S. gross domestic products. They owed nearly one third of gross debt outstanding of the non-financial sectors in both economies.

### 2.1.2. Recording of stocks and flows

The system of quarterly institutional sector accounts records two basic kinds of information: *flows and stocks*. Flows refer to actions and effects of events that take place within a given period of time, while stocks refer to positions at a point in time. Transactions as economic flows are described as interactions between institutional units by mutual agreement or actions within an institutional unit. Other flows are either revaluations or other changes in volume of assets. The relationship between flows and stocks is presented in Table 1.

### 2.1.3. System of accounts

The system of accounts is built around a sequence of inter-connected accounts drawn up for the non-financial corporate sector, other resident sectors and for the rest of the world.<sup>3</sup> The full sequence of accounts for institutional units and sectors is composed of the current account, the accumulation account and the balance sheet. The Table 2 shows how the transactions, other flows and stocks are presented in the system of accounts.

The current account records the production of goods and services and the generation, distribution, redistribution, and use of income. It belongs, like the capital account and the financial transaction account, to the accounts in which transactions are recorded. The sequence of the transaction accounts for non-financial corporations is presented in more detail in Table 3.

While all changes in assets, liabilities and net worth are included in the accumulation account, the corresponding stocks are shown in the balance sheet. The balance sheet is composed of three elements: The stock of the non-financial assets and the stock of financial assets on the asset side and the stock of liabilities on the liability side. The net worth is given as the balancing item between assets and liabilities.

Drawing up a balance sheet makes it possible to focus on a sector's or an economy's net worth and how it changes rather than on net lending/net borrowing. Accordingly, the change in net worth is composed of saving, net capital transfers receivable, holding gains less holding losses, and other (net) changes in the volume of assets.

Table 4 shows, which categories of assets and liabilities are usually required for the non-financial corporate balance sheet in the national accounting framework. Non-financial

Table 1 – Relationship between flows and stocks

<p>Stocks of assets and liabilities at the beginning of accounting period t                  + flows (changes in assets and liabilities during the period t due to transactions;                  revaluations; and                  other changes in volume of assets)                  = Stocks of assets and liabilities at the end of accounting period t</p>
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*A resource or a change in liabilities for the rest of the world is a use or a change in assets for the total economy and vice versa. If a balancing item is positive, it means a surplus of the rest of the world and a deficit of the total economy, and vice versa if the balancing item is negative.*

3 An account is a means of recording, for a given aspect of economic life, the uses and resources or the changes in assets and the changes in liabilities during the accounting period, or the stock of assets and liabilities existing at the beginning or at the end of this period.

Table 2 – Transactions, other flows and stocks as presented in the system of accounts

Transactions	Other flows		Stocks
<b>Current account</b>			
Production of goods and services Generation, distribution, redistribution, and use of income			
<b>Accumulation accounts</b>			<b>Balance sheet</b>
<b>Capital account</b>	<b>Revaluation account</b>	<b>Other changes in the volume of asset account</b>	
Net acquisition of non-financial assets, saving and capital transfers	Holding gains and losses in non-financial assets, financial assets, and liabilities	Other changes in the volume of non-financial assets, financial assets, and liabilities	Non-financial assets, financial assets, liabilities and net worth
<b>Financial transaction account</b>			
Net acquisition of financial assets and net incurrence of liabilities			

assets are broken down by produced and non-produced assets and further sub-categories. Financial assets are shown, together with the liabilities, as the components of the financial balance sheet. They are classified according to their liquidity and their legal characteristics. Provision is made for further subdividing, in particular according to original maturity, type of instrument and counterpart sector. Shares and other equity, for instance, are broken down into quoted and unquoted shares, other equity, and mutual fund shares. In the context of breakdowns by counterpart sector, the economic activities between corporations and government are of specific interest.

## 2.2. From-whom-to-whom accounts

### 2.2.1. Quadruple entry principle

To derive from-whom-to-whom accounts data have to be compiled based on the quadruple entry principle. It means that each transaction is recorded twice by the two transactors involved. For example, a subsidy paid in cash by a government unit to a non-financial corporation is recorded in the government accounts as a use under distributive transactions and a negative acquisition of assets under currency and deposits. In the non-financial corporate sector accounts, it is recorded as a resource under distributive transactions and an acquisition of assets under currency and deposits. On the other hand, transactions within a single unit (such as the consumption of output by the same unit that produced it) require only two entries, whose values have to be estimated.

As a result, from-whom-to-whom accounts allow tracing the debtor/creditor relationships between institutional sectors. They are usually presented in tables or charts, preferably for transactions and stocks, showing either the transactions or the balance sheet positions (i) in assets cross-classified by debtor sector and creditor sector, (ii) in assets cross-classified by type of asset and by debtor sector, or (iii) in liabilities cross-classified by type of liability and by creditor sector. Chart 1 illustrates the from-whom-to-whom transactions as inflows and outflows, for one financial instrument, between the five resident sectors and the rest of the world.

Such presentations allow an analysis of who is financing whom, with what amounts, and with which instruments. They make it possible to answer questions like: What are the counterpart sectors of the financial investment and financing decisions of the non-financial corporate sector? Which are the corporations (financial or non-financial, resident or non-resident) in which the non-financial corporate sector participates? Alternatively: who is holding the corporate debt or equity within an economy or abroad?

Table 3 – Sequence of institutional sector transaction accounts for non-financial corporations

Uses		Resources
854	Output, basic prices	1,753
<b>854</b>	Intermediate consumption <b>Gross value added</b>	
	Taxes less subsidies on products <b>GDP</b>	
	<b>Value added/GDP</b>	<b>854</b>
545	Compensation of employees	
51	Taxes less subsidies on products	
<b>258</b>	Other taxes less subsidies on production <b>Gross operating surplus/mixed income</b>	
	<b>Operating surplus/mixed income</b>	<b>258</b>
	Compensation of employees	
135	Taxes less subsidies on products	86
<b>209</b>	Property income with a breakdown by interest, dividend, rent, withdrawal <b>Balance of primary income/national income</b>	
	<b>Balance of primary income/national income</b>	<b>209</b>
24	Current taxes on income and wealth	
	Social contributions	14
13	Social benefits	
11	Other current transfers	10
<b>185</b>	<b>Disposable income, net</b>	
	<b>Disposable income, net</b>	<b>185</b>
<b>185</b>	<b>Saving, gross</b>	
<b>48</b>	<b>Saving, net</b>	
<b>Changes in assets</b>		<b>Changes in liabilities and net worth</b>
	<b>Saving, net</b>	<b>48</b>
	<b>Current external balance</b>	
	Capital transfers, receivable	33
	Capital transfers, payable	-16
<b>65</b>	<b>Changes in net worth due to saving and capital transfers</b>	<b>65</b>
250	Gross fixed capital formation	
-137	Consumption of fixed capital (-)	
26	Changes in inventories	
2	Acquisitions less disposals of valuables	
-7	Acquisitions less disposals of non-produced/ non-financial assets	
<b>-69</b>	<b>Net lending (+)/net borrowing (-)</b>	
	<b>Net lending (+)/net borrowing (-)</b>	<b>-69</b>
71	Net acquisition of financial assets	
	Net incurrence of liabilities	140

Source: Box 4.2 of the IMF Quarterly National Accounts Manual.

### 2.2.2 Direct data sources to compile from-whom-to-whom accounts

For the compilation of from-whom-to-whom accounts, the data are ideally taken from direct sources in a non-consolidated form. The most appropriate way would be to receive such data from institutional units belonging to a sector by collecting flow and stock data sufficiently broken down by instrument category and counterpart unit. This would allow compiling for each sector and instrument category a split of the flow and stock data vis-à-vis (i) units within the same sector; (ii) units of other resident sectors; and (iii) non-resident units.





Data vis-à-vis other sectors are incomplete for the non-financial corporate sector. Some bits and pieces can be taken from indirect sources like money and banking, balance of payments and international investment position and government finance statistics. These are, for instance, deposits and loans vis-à-vis monetary financial institutions, trade credits vis-à-vis the rest of the world, or loans and equity vis-à-vis the government sector.

Data are usually not available for non-financial corporate sector inter-company loans, trade credits or other advances. Nevertheless, they might represent a considerable part of corporate finance and financial investment. The same applies for equity data not covered by security-by-security databases. Furthermore, other corporate financial assets and liabilities vis-à-vis households and non-profit institutions serving households are also not provided, like pension liabilities.

### 3.2. Corporate balance sheets statistics as a direct source

Intra- and inter-sectoral data could only be integrated into the compilation procedure if appropriate CBSS data would be available as a direct source for the non-financial corporate sector of national economies. In that case, the data taken from the balance sheets and the transaction accounts would allow showing the economic activities with other non-financial corporations and with institutional units of other sectors. However, significant quality improvements of the non-financial corporate sector accounts would only be feasible if a rather detailed and timely set of accounting data could be provided. This would allow carrying out comprehensive data checks based on the assumption that such data could be supplemented by time series taken from security-by-security databases with from-whom-to-whom data for traded financial instruments like debt securities or shares.<sup>4</sup>

The Table 5 describes the use of the CBSS data in combination with the data derived from a security-by-security database (SBS). It shows that both data sources would improve substantially the quality of the non-financial corporate sector accounts.

Different cases can be distinguished depending on the availability of such direct data. Rather high-quality from-whom-to-whom data could be provided if CBSS and SBS data are made available with sufficient coverage, detail, timeliness and frequency. This would also allow carrying out consistency checks between the direct and indirect data sources. In cases, where less timely and detailed CBSS data are made available these statistics can only be used as benchmarks. If no sufficient data are made available shortcomings might emerge in terms of the

Table 5 – Compilation of corporate sector accounts depending on CBSS and SBS data

SBS \ CBSS	Data available with sufficient coverage, detail, timeliness and frequency	Data available with sufficient coverage and detail	Some data available (loans, trade credits, other advances)	No sufficient data available
<b>Data available with sufficient coverage, detail, timeliness and frequency</b>	Coverage of intra-sectoral flows and positions Consistency checks between CBSS and SBS feasible	CBSS data as benchmark Consistency checks between CBSS and SBS feasible	CBSS data on loans, trade credits and other advances (annual) SBS data on securities No consistency checks between CBSS and SBS feasible	Incomplete coverage of loans, trade credits and other advances SBS data on securities No consistency checks between CBSS and SBS feasible
<b>No sufficient data available</b>	Coverage of intra-sectoral flows and positions No consistency checks	CBSS data as benchmark No consistency checks	SBS data on loans, trade credits and other advances (annual) Securities data based on securities issues statistics and indirect data (difference method) No consistency checks	Incomplete coverage of loans, trade credits and other advances Securities data based on securities issues statistics and indirect data (difference method) No consistency checks

<sup>4</sup> Beside the CBSS data, only security-by-security databases provide such from-whom-to-whom data on securities for the non-financial corporate sector (as for all other economic sectors).

coverage and comparability of the institutional sector accounts data because various aggregates have to be estimated as residuals.

The U.S. approach might be seen as an example how to combine the various direct and indirect data sets for the non-financial corporate sector. The data sources available at the Federal Reserve Board (FRB) are taken for the compilation of the corresponding corporate sector flow of funds accounts and balance sheets.<sup>5</sup> These are the corporate income tax returns, which contain balance sheets and income statements in a consolidated form of more than five million non-financial firms. To improve the detail and timeliness of the estimates for the corporate sector assets, a second important data source is used, the Quarterly Financial Report for Manufacturing, Mining, and Trade Corporations (QFR) maintained by the U.S. Bureau of the Census. The data sets retrieved from the QFR are based on a stratified sample survey conducted quarterly and available about ten weeks after the end of the quarter. A major limitation of the QFR is its lack of data for the services sub-sector. Efforts are underway at the Census Bureau to increase the coverage of such data.

Commercial databases are also applied to support the compilation of the non-financial corporate sector accounts. A particular useful dataset is CompuStat<sup>®</sup>, which contains balance sheet and income data from the quarterly and annual reports required by the Security and Exchange Commission for corporations with traded shares. The data in the reports are based on Generally Accepted Accounting Principles (GAAP) in the U.S., which differ from the valuation principles applied for the data collected through corporate income tax returns or the QFR. The CompuStat<sup>®</sup> database offers the micro data by corporation and allows analysis by industry, credit rating of firms, or by debt-to-income level.

### **3.3. Central balance sheet offices in the euro area**

Within the euro area, CBSS data are mainly collected and compiled within the central balance sheet offices (CBSOs), which are in most cases either part of national central banks (NCBs) or of national statistical institutes (NSIs). The data sets usually consist of annual data on the balance sheets and the income statements of non-financial corporations often voluntarily collected on a sample basis. The CBSOs of the Banco de España and of the Banco de Portugal also gather quarterly balance sheet and profit and loss data.

CBSS data are maintained by the CBSOs in all euro area countries, except in Greece, Ireland and Luxembourg. Such databases are also available in Denmark, Sweden and in the United Kingdom.<sup>6</sup> Only in Belgium's CBSO, individual balance sheets and profit and loss accounts are available for all non-financial corporations. The data maintained in the CBSOs of Portugal and Finland are based on samples, which are considered as representative for the whole population of the respective non-financial corporate sector. The samples of data maintained in the CBSOs of the remaining euro area countries seem to be representative at least for major non-financial corporate sub-sectors like the manufacturing sector. Furthermore, there is usually a rather broad coverage of large corporations.

The representativeness of the samples depends to some degree on whether the corporations have to report to the authorities or not. Belgium and Finland are the only countries, in which the reporting of CBSS data is mandatory.<sup>7</sup> The data for the CBSS in Spain, Germany, France, Italy and Austria are collected on a voluntary basis. Accordingly, there is a rather low coverage of data, specifically for small and medium-sized enterprises (SMEs) and for the services sub-sector.

The corporate data are collected in different ways. Secondary sources like published accounting data and tax returns are used in many countries (Belgium, Germany, France, Austria and Finland). In two of them, in France and Finland, the statistics are supplemented by data collected through special questionnaires. Two countries, Spain and Portugal, collect the data exclusively from special questionnaires.

Euro area NCBs use some of these data to enhance the non-financial corporate sector accounts. Like many other compilers of financial accounts, the Banco de España applies a three-step approach by compiling, first, the categories currency and deposits, loans, insurance technical reserves, and other accounts receivable and payable, except trade credits, based on indirect data. Second, for the securities as liabilities and for trade credits, information from capital market statistics and from CBSS is used. Third, for the securities as assets the aggregated information for the total holdings of non-financial corporations and households is estimated on a

<sup>5</sup> See A.M. Teplin (2004).

<sup>6</sup> The availability of CBSS data in the new Member States has not been assessed yet.

<sup>7</sup> The reporting is obligatory also in Germany, but binding only for a sub-sample of large corporations

residual basis and the amounts are distributed between the two sectors by applying the structures deducted from securities holdings statistics.<sup>8</sup> In addition, CBSS data are also used as a benchmark to check the consistency and plausibility of the indirect data.

For other NCBs the CBSS data have too many shortcomings to be of value for the compilation of non-financial corporate sector accounts. Especially, the limited coverage, timeliness, periodicity and international comparability are mentioned as the major obstacles to use extensively the existing CBSS data as a direct source for compiling the non-financial corporate sector accounts.<sup>9</sup>

### 3.4. BACH database

One of the major outputs of the European Committee of Central Balance Sheet Data Offices was the creation of the database on harmonised information on annual accounts statistics on non-financial corporations, the Bank for the Accounts of Companies Harmonised (BACH database).<sup>10</sup> This database is managed by the European Commission (DG ECFIN) and covers annual data for all euro area countries (except for Ireland, Luxembourg and Greece), for Denmark and Sweden, and for the United States and Japan. In the case of Belgium, Germany, Spain, France, Austria and Portugal the data are provided by the NCBs, while the NSIs transmit the data for Denmark, the Netherlands, Finland, and Sweden. The data source for Italy is a commercial company, the “Centrale dei Bilanci”, which has been set up by Banca d’Italia and leading Italian banks in 1983. The data for the United States are provided by the Bureau of the Census, while the data for Japan are supplied by the Ministry of Finance.

All countries contributing to the BACH database deliver aggregated data broken down by NACE industrial sub-sector and size. No individual corporation data are provided although available at a national level. As shown in Table 6, the size and the representativeness of the samples supplied by the different CBSOs vary considerably. Only the CBSO data transmitted by Belgium, Denmark and Finland cover nearly the complete population of the non-financial corporate sector in the respective countries (more than 90% of the GDP or of the turnover). The coverage is much lower in the samples for Germany, Spain, France, Italy, Netherlands, Austria and Portugal ranging between 35 and 55% of the sector’s GDP or turnover. Slightly higher degrees of the sample representativeness are observed in some specific sub-sectors like the industry, the energy and water, and the transport and communication sub-sector. Otherwise there seems to be a rather low degree of coverage for the services, the trade, and the building and engineering sub-sector.

Looking at the individual accounting items provided for the BACH database, only partial from-whom-to-whom data can be derived, particularly for financial instruments like loans, equity, trade credits and other advances. The sample compositions vary over time, which complicates the provision of consistent time series. One method to circumvent this issue is the compilation of sliding samples, which allows a year-by-year comparison. No EU or euro area aggregates are provided for the time being.

Updated figures are published by the European Commission depending upon the delivery of the data by the participating countries. The corresponding time lags are 12 months (for Belgium, Spain and France), 13 months (for Germany, Portugal and Finland), 14 months (for Austria), and 15 months (for the Netherlands). Accordingly, complete information for the participating euro area countries is only available after 15 months after the end of the reference year. Even if sometimes the national data in some countries are available earlier, the delay is far beyond the timeliness needed to be of any actual value for monetary policy analysis or conjunctural analysis.

<sup>8</sup> See P. Abad (2004).

<sup>9</sup> See E. Stöss (2004).

<sup>10</sup> The European Committee of Central Balance Sheet Data Office (ECCBSO) was set up in 1985 to improve the analysis of corporate accounts data through the exchange of information, the comparison of analytical methods, and the carrying-out of joint studies. The Committee is made up of representatives of the NCBs or the NSIs of 12 of the 25 EU member states (except Denmark, Luxembourg, Sweden and the new Member States) and the European Commission. Three Committee Working Groups have been established dealing with risk assessments, the BACH database and the IAS impact on standard questionnaires. There are also various study groups in place analysing the financing conditions in Europe, developing sectoral data and comparing corporate data by country (between France and Spain and between Germany and France).

Table 6 – Characteristics of the files sent by the countries for the BACH database

Country (reference date)	Features of data collection	Number of corporations							As a percentage of GDP/turnover of non-financial corporations						
		Sample size for BACH	Industry	Energy and water	Building and engineering	Transport and comm- unication	Trade	Non- financial services	Total	Industry	Energy and water	Building and engineering	Transport and communi- cation	Trade	Non- financial services
BE (1997) DK (1999)	p, GDP ms	175,150 8,700	20,657	114	20,389	8,619	63,752	61,619	... nearly 100	99.1	98.6	79.1	96.8	95.0	86.2
DE (1996)	vs, turnover	21,243	9,635	...	1,693	...	9,915	...	38.1	52.4	...	15.7	...	25.0	
ES	vs, GDP	7,500							36.0	31.7	71.7	11.3	67.3	10.3	7.0
FR (1997)	vs, value added	33,370	16,372		3,658	1,533	11,414	393	59.6	59.6	71.7	33.8	30.9	31.9	9.6
IT (1996)	vs, value added	39,414	19,910	299	2,256	1,727	12,006	3,216	35.1	59.7	71.2	13.3	45.8	15.4	17.3
NL	vs, value added	2,500							55.0						
AT	vs, turnover	6,890	2,554	45	856	410	2,358	667	33.0	54.0	81.0	25.0	26.0	27.0	6.0
PT (1998)	vs, turnover	25,247	6,564	8,584	2,525	3,787	4,292	4,040	42.0	42.0	98.0	38.0	63.0	44.0	44.0
FI (1999)	ms, turnover	108,240	17,794	1,004	17,335	13,682	28,490	29,935	91.0	99.0	99.0	88.0	95.0	89.0	83.0
SE (1997)	ms	287,630													
US (1998)	vs	9,300													
JP (1999)	vs	20,000													

*p* = population, *vs* = voluntary sample, *ms* = mandatory sample.  
For DE: Building and engineering refers to construction.  
Source: European Commission (DG ECFIN).

### 3.5. Commercial data providers

Various commercial data providers supply data on corporate balance sheets, profit and loss accounts and cash flow statements for non-financial corporations. The commercial databases differ substantially in terms of coverage by country and corporate sub-sector. The data availability of quoted non-financial corporations is in general much higher than of unquoted corporations because of the legal requirement that the accounts of quoted corporations have to be published.

The customers of commercial data providers are often market participants, which are interested in retrieving accounting information for a specific corporation or for a small number of corporations. Consequently, the amount of information downloaded from the databases is often limited and may be done in a standard online interface version.

To increase the comparability of the data across countries, the data providers usually standardise and harmonise the received data. While the availability of already harmonised data is welcome, there is a loss of information due to this adjustment process. If carried out by a CSBO, the usefulness of such a harmonisation process could be better assessed and appropriately tailored according to the analytical and statistical needs.

While the number of corporations included in the respective commercial databases is quite large, the actual number of units for which balance sheet information is available is much smaller. There is a large number of corporations included in the databases without any balance sheet data, but with some information like the name or the address of the corporation. Furthermore, the databases provide the individual data by industrial sub-sector according to the NACE classification. A rather detailed breakdown by instrument categories is also available but differs across the data providers. The accounting information becomes available within twelve months following the end of reporting year. Back data are usually only available for two to five years – with the exception of the Amadeus database with the length of time series up to 15 years. Table 7 provides an overview of the data coverage in terms of the number of corporations included in some commercial databases.

### 4. Shortcomings of corporate balance sheet statistics for compiling quarterly non-financial corporate accounts

The shortcomings of CBSS for compiling quarterly non-financial accounts could be assessed based on various quality aspects of statistics. Following the IMF's Data Quality Assessment

Table 7 – Number of non-financial corporations collected in commercial databases (end 2004)

	Amadeus (Bureau van Dijk)		Global Business Browser (OneSource)		Dun & Bradstreet	
	Total	o/w unlisted	Total	o/w unlisted	Total	o/w bal. sheet information
EU 25	6,090,047	6,081,290	405,469	399,447	35,000,000	*
Euro area	3,631,174	3,625,423	314,995	311,811	*	*
BE	361,639	361,497	15,358	15,219	*	*
DE	813,905	813,147	76,875	75,975	4,000,000	24,000
GR	26,684	26,385	643	304	*	*
ES	611,883	609,008	30,768	30,612	*	*
FR	909,454	908,589	78,174	77,403	7,000,000	770,000
IE	117,113	117,072	5,288	5,218	*	*
IT	272,844	272,618	55,397	55,125	*	*
LU	1,187	1,169	522	478	*	*
NL	313,895	313,714	30,394	30,207	*	*
AT	107,877	107,780	3,434	3,337	*	*
PT	69,375	69,301	4,442	4,385	*	*
FI	70,298	70,170	13,667	13,535	*	*

\* Information is not available.

Framework, four quality dimensions are chosen which are of utmost importance. They refer to the methodological soundness of the statistics in relation to the SNA93 or the ESA95, and to the accuracy and reliability, the serviceability, and the accessibility of the data.

#### **4.1. Methodological soundness**

The methodological basis for statistics should follow internationally accepted standards, guidelines, or good practices as outlined in the SNA93 or the ESA95. This refers to the concepts and definitions used for the compilation of CBSS, the scope, the classification and sectorisation criteria, and the basis for the accrual accounting and the market valuation rules. In this context, the available CBSS have to be evaluated how far they comply with such principles. As the CBSS statistics are not always collected and compiled for statistical purposes, but mainly for supervisory or tax purposes, various shortcomings of the currently available CBSS have to be taken into consideration when using the data.

Comparing the different CBSS data, the shortcomings related to the different business accounting rules have to be taken into consideration. For the accounts of listed corporations, the situation will improve in the future as harmonised accounting rules will have to be applied in the EU in accordance with the International Accounting Standards (IAS) starting with the financial year 2005.<sup>11</sup> In the case, where tax statements are collected the comparability of data across countries might still be hampered due to the different fiscal reporting requirements

##### **4.1.1. Institutional units and sectors**

Referring to the definition of institutional units and sectors it is of central importance whether the balance sheets and income statements are provided only in a consolidated form or also as non-consolidated data showing the flows and positions between the parent corporation and its affiliates. If the corporate data are collected on a ‘consolidated reporting’ basis, they cover not only the economic activities of the reporting corporation, but also the business of its branches and subsidiaries, which may be resident or non-resident in the national economy, with the consequence that all transactions between these entities and their positions are eliminated by consolidation.<sup>12</sup> In essence, consolidation is based on the concept of control by a parent corporation over the other operating units.

The consolidated approach is essential in monitoring the integrity of capital in the corporate sector as it eliminates double counting.<sup>13</sup> By contrast, the collection systems used for financial statistics, such as MFI balance sheets statistics, are based on a non-consolidated approach, in which reporting institutions provide data only on their business, without consolidating the activities of their branches and subsidiaries, whether resident or non-resident. In any case, such branches and subsidiaries are treated as ‘autonomous’ institutional units that are part of the reporting population of the country in which they are located.

##### **4.1.2. Recording of stocks and flows**

There is a rather detailed breakdown of the BACH data shown by accounting item for the balance sheet, for the profit and loss account, and for supplementary information. The asset categories of the balance sheet are subscribed capital unpaid, fixed assets, current assets and prepayments and accrued income. Fixed and current assets are further split into subcategories. Fixed assets cover intangible and tangible fixed assets and financial fixed assets. Current assets are divided into stocks, debtors, current investments, and cash at bank and in hand.

On the liability side, the main categories are creditors with amounts becoming due and payable within one year and more than one year. Further items are provisions for liabilities and charges, accruals and deferred income, and capital and reserves. The creditor categories are further broken down by counterpart and financial instrument, while provisions are shown separately for pensions and similar obligations. Capital and reserves are split into subscribed capital,

11 *Regulation (EC) No 1725/2003 adopting certain international accounting standards in accordance with Regulation (EC) No. 1606/2002 of the European Parliament and of the Council (OJ L 261, 13.10.2002).*

12 *See the IMF's "Compilation Guide on Financial Soundness Indicators" (July 2004) for a comprehensive review of the issues of consolidation reporting.*

13 *See the Basel Committee on Banking Supervision on the "Core principles for effective banking supervision" (1997).*

Table 8 – Main items of the balance sheets and the income statements in the BACH database

Assets	Liabilities and equity
Short-term (current) assets <ul style="list-style-type: none"> <li>• Cash and cash equivalents</li> <li>• Stocks and other money market instruments</li> <li>• Receivables</li> <li>• Inventories</li> </ul> Long-term (non-current) assets <ul style="list-style-type: none"> <li>• Intangibles</li> <li>• Tangibles</li> <li>• Financial</li> </ul>	Liabilities <ul style="list-style-type: none"> <li>• Short-term (current) liabilities                             <ul style="list-style-type: none"> <li>Loans</li> <li>Trade credits</li> </ul> </li> <li>• Long-term (non-current) liabilities                             <ul style="list-style-type: none"> <li>Long-term debt (mortgages)</li> <li>Other non-current liabilities</li> </ul> </li> </ul> Equity <ul style="list-style-type: none"> <li>• Capital                             <ul style="list-style-type: none"> <li>Capital and reserves</li> <li>Profit</li> </ul> </li> </ul>
<b>Profit and loss account</b>	
Operating income Operating charges Financial income	

share premium account, reserves and profit. Table 8 provides an overview of the main items as presented in the BACH database.

These breakdowns might meet the needs of many users for structural analyses of the corporate sector. However, it is rather cumbersome to translate the data in SNA categories taking also into account the divergent classification and valuation criteria, which do not always comply with the statistical standards. Furthermore, the instrument, maturity and counterpart sector details are more limited than most analysts and statisticians would require. Accordingly, additional breakdowns might be provided to be of use for the compilation of institutional sector accounts.

#### 4.1.3. System of accounts

It is difficult to assess how substantial the CBSS can feed into the compilation of the various accounts. The profit and loss data might be a significant source to complete the current account, which records the non-financial corporate production of goods and services and the generation, distribution, redistribution, and use of income. Components like the operating income, the value added, and the gross and the net operating profit can be drawn from the data as shown in Table 9. Supplementary investment and depreciation data are also made available.

The balance sheet data are also rather detailed. While these items are classified mainly according to the original maturity and the type of instrument, not much data are presented with a breakdown by counterpart sector. Shares and other equity as financial assets, for instance, are not broken down into quoted and unquoted shares, other equity, and mutual fund shares. On the liability side, the other obligations are not always recognised as liabilities in the SNA93.

As no detailed cash flow statements are made available the compilation of transaction data from stocks might be done with some caveats. As a result, the derivation of the balancing items like the non-financial corporate net lending/net borrowing or net worth and its changes might be rather difficult without using additional data sources.

#### 4.2. Accuracy and reliability

The accuracy and reliability of the CBSS is determined by various factors. One refers to the collection of the data on a sample basis, which requires that the CBSS have to be assessed and monitored for coverage, sample error, response error and non-sampling error. Another one is linked to the validation of intermediate results against other statistical information and the investigation of statistical discrepancies. As outlined above the sample data are often voluntarily collected. One of the major limitations of these samples is their lack of coverage of the services sub-sector, which is usually a large part of each developed economy.



Table 9 – Breakdown of profit and loss data by accounting item in the BACH database

Code	Description
1.	Net turnover
2.	Change in stocks of finished goods and work in progress
3.	Capitalised production
4.	Other operating income
<b>S.*</b>	<b>Total operating income</b>
5.	Costs of materials and consumables
5.a	Raw materials and consumables
5.b	Other external charges
8.	Other operating charges and taxes
<b>T.*</b>	<b>Value added BACH ( S – 5 – 8 )</b>
6.	Staff costs
6.a	Wages and salaries
6.b	Social security costs
<b>U.*</b>	<b>Gross operating profit ( T – 6 )</b>
7.	Value adjustments on non financial assets
7.a	Depreciation on intangible and tangible fixed assets
7.c*	Other value adjustments and provisions
<b>V.*</b>	<b>Net operating profit ( U – 7 )</b>
9/11	Financial income
12.	Value adjustments on financial assets
13.	Interest and similar charges
13.a*	Interest paid on financial debts
13.b*	Other financial charges
<b>W.*</b>	<b>Financial income net of charges (9/11 – 12 – 13)</b>
<b>X.*</b>	<b>Profit or loss on ordinary activities before taxes V + W)</b>
16.	Extraordinary income
17.	Extraordinary charges
Y.	Taxes on profit
<b>21.</b>	<b>Profit or loss for the financial year ( X + 16 – 17 – Y )</b>

The lack of representativeness of the samples together with the methodological shortcomings described above are often seen as the main reasons that these source data are not used as a substantial input for the compilation of the non-financial corporate sector accounts. This lack of reconciliation can clearly be shown by comparing the annual financial balance sheet data for the non-financial corporate sector with the corresponding BACH data as compiled by nine euro area countries.

Table 10 exhibits the corporate debt data as a percentage of liabilities for nine euro area countries as compiled for the annual financial accounts and by using the BACH data from 1995 to 2002. According to these data the corporate debt ratio for the nine countries as compiled for the annual financial accounts fell to 26.3% in 1999, down from 38.5% in 1995, but rebounded afterwards to 37.8% in 2002. Compared to this pattern the debt ratio according to the BACH data remained rather stable over the period from 1995 to 2000 (no EU9 data have been compiled for 2001 and 2002 due to the missing BACH data for Germany). Accordingly, the discrepancy between the two sets of debt ratios increased to 10 percentage points in 2000. The discrepancies observed for the data sets of the various countries vary between a few percentage points and more than twenty percentage points.

The comparison of the annual financial accounts data with the BACH data has to be assessed carefully. Major discrepancies are observed between the two datasets for those countries for which the BACH data cover only parts of the non-financial corporate sector. However, there are also some discrepancies for country data which reflect the whole or nearly the whole population of the non-financial corporations like in Belgium, Portugal or Finland. It is not clear whether such discrepancies are due to quality issues of the direct sources used for the BACH data or of the indirect sources mainly used for the financial accounts data. It would mean that the use of various direct and indirect data sources would not preclude the appearance of large miscellaneous categories in the non-financial corporate sector accounts as occasionally observed for the U.S. data.

Table 10 – Corporate debt in annual financial accounts and in the BACH database  
Debt as a percentage of corporate liabilities

	1995	1996	1997	1998	1999	2000	2001	2002
<i>Annual financial accounts</i>								
EU9	38.5	35.7	33.0	29.9	26.3	29.2	32.4	37.8
Belgium	43.2	41.0	38.3	35.8	32.5	36.4	38.5	45.3
Germany	43.2	41.0	38.3	35.8	32.5	36.4	38.5	45.3
Spain	27.6	25.4	23.8	21.3	21.8	23.5	25.2	28.6
France	33.6	29.9	27.1	22.9	18.8	21.5	25.7	33.1
Italy	41.5	39.9	37.0	34.1	30.3	30.5	32.9	34.6
Netherlands	41.0	37.9	34.8	34.9	32.3	35.8	39.1	44.5
Austria	66.1	65.5	63.6	62.1	61.6	63.9	63.9	62.3
Portugal	29.9	29.6	29.5	32.2	34.2	37.2	39.5	41.9
Finland	44.5	36.7	35.2	26.4	19.4	23.7	28.6	34.5
<i>Bach database</i>								
EU9	39.2	37.8	38.1	37.8	38.3	39.1	na	na
Belgium	40.9	40.1	40.5	39.9	39.4	38.6	37.2	39.1
Germany	27.0	26.9	27.3	28.3	29.4	31.3	na	na
Spain	38.9	34.2	33.9	34.3	38.3	41.2	43.0	45.3
France	41.2	41.3	39.1	37.8	38.3	38.0	38.3	35.6
Italy	40.1	37.5	40.4	37.7	36.7	35.4	36.2	33.0
Netherlands	49.9	48.9	48.0	51.1	50.0	52.3	53.3	55.1
Austria	39.1	39.4	39.1	44.9	43.8	49.0	46.6	45.7
Portugal	41.8	40.8	39.8	39.7	38.5	39.0	40.2	44.0
Finland	38.7	33.6	34.1	31.0	37.3	40.2	37.5	37.5
<i>Discrepancy</i>								
EU9	-0.7	-2.1	-5.1	-7.9	-12.0	-9.9	na	na
Belgium	2.3	1.0	-2.2	-4.1	-6.9	-2.2	1.3	6.2
Germany	16.1	14.1	11.0	7.5	3.1	5.1	na	na
Spain	-11.3	-8.8	-10.1	-13.0	-16.4	-17.7	-17.8	-16.7
France	-7.6	-11.4	-12.0	-14.9	-19.5	-16.5	-12.7	-2.5
Italy	1.4	2.3	-3.4	-3.6	-6.4	-4.8	-3.3	1.6
Netherlands	-8.9	-10.9	-13.2	-16.2	-17.7	-16.5	-14.2	-10.6
Austria	27.0	26.0	24.5	17.2	17.8	14.9	17.3	16.6
Portugal	-11.9	-11.2	-10.3	-7.4	-4.3	-1.8	-0.7	-2.0
Finland	5.7	3.1	1.1	-4.6	-17.9	-16.5	-8.9	-3.0

Sources: European Commission (DG ECFIN), Eurostat and ECB.

### 4.3. Serviceability

The serviceability of the CBSS refers to the adequate periodicity and timeliness of the data. Moreover, it has to be assessed whether the CBSS are consistent and follow a predictable revision policy. As already outlined, the lack of timeliness and the annual periodicity of the CBSS data are seen as one of the major obstacles that these data are not broadly used as a source to compile high-frequency financial statistics or quarterly institutional sector accounts. Otherwise, the annual frequency of the CBSS data is often observed as sufficient for structural analyses assuming that rather long time series are always available.

### 4.4. Accessibility

The accessibility as a data quality issue refers to the fact that data and metadata are easily available to the compilers and users and the assistance to users is adequate. As mentioned above the accessibility of individual data sets as included in national CBSS might be an issue because of confidentiality reasons. This quality criterion refers predominantly to the access of individual data sets as currently available for non-financial corporations.

While the CBSOs in NCBS have direct access to individual corporate data, external users are only able to retrieve these data from databases maintained by commercial data providers. To explore the usefulness of the CBSS data available at the NCBS the access to these databases, eventually in an “anonymised” form, might have to be looked at. This would also facilitate the combination of quarterly and annual data and the compilation of euro area or EU aggregates.

## 5. Proposals for a better integration of corporate balance sheet statistics into the compilation of non-financial corporate sector accounts

To better integrate CBSS data into the compilation of non-financial corporate sector accounts the features of these statistics have to be improved. These refer to the various quality dimensions as discussed above but also to the tasks to combine such data with other data sources.

### 5.1. Methodological improvements

It has to be evaluated in how far the available CBSS data could be improved to comply better with the internationally accepted statistical standards. One major step in this direction has been done with the Regulation (EC) No 1725/2003 adopting certain IAS starting with the financial year 2005. Further progress depends on how quickly the various IAS will also be applied broadly by a majority of corporations. As outlined in the various IAS improvements will be achieved in the context of valuation of balance sheet items and of instrument breakdowns.

The compilation of the accounts should rely on individual non-consolidated balance sheet and profit and loss account data. In this context, consolidated tax return data are of less value. If only consolidated data are made available, institutional units like sole proprietors, partnerships, or financial subsidiaries have to be excluded from the non-financial corporate sector, as they have to be classified within the household sector or within the financial corporate sector. The sector also excludes all non-resident subsidiaries of resident non-financial corporations.

Commercial databases are available which allow tracing the relationships between a non-financial corporation and its branches and subsidiaries. The Hoppenstedt-Konzernstrukturdatenbank, for instance, identifies the complete portfolios of participations undertaken by corporations, which are in most cases multinationals. For the time being, 140.000 corporations are covered in this databank.<sup>14</sup>

### 5.2. Accuracy and reliability of data

As the CBSS data are mainly collected on a sample basis, sufficiently large and representative sample surveys have to be chosen and advanced sampling and grossing up techniques to be applied to comply with the user requirements carrying out meaningful analyses on a macro- or a micro-level. It means that samples have to be designed with a sufficient coverage of corporate data in terms of total assets, liabilities or turnover. This also applies to specific sub-categories like the required breakdowns by industrial sub-sector, legal form including the breakdown into listed, unlisted and other corporations or by size.<sup>15</sup> Specific requirements related to the country coverage are needed when dealing with the aggregates for the euro area or the EU. In this context it has to be explored to which extent the methodology applied for other European sampling could be adopted.<sup>16</sup>

14 See also the work of the Steering Group on Multinationals (SGM). The ECB and the European Commission (Eurostat) mandated the SGM to assess the feasibility of a harmonised reporting form for multinationals across the EU. The final report of the SGM is in preparation. A paper on this subject will also be presented to the 2005 ISI Conference in Sydney.

15 Industrial sub-sectors of non-financial corporations according to the NACE classification are: 1) Agriculture and fishing (01–05); 2) Mining (10–14); 3) Manufacturing (15–36); 4) Utilities (37–41); 5) Construction (45); 6) Trade (50–52); 7) Hotels and restaurants (55); 8) Transport (60–63); 9) Post and telecom (64); 10) Real estate (70); 11) Renting, computer related activities, R&D (71–73); and 12) Business activities (74). According to the NACE classification the following categories are excluded: J: Financial intermediation; L: Public administration, defence, compulsory social security; M: Education; N: Health and social work; O: Other community, social and personal service activities; P: Private households with employed persons; Q: Extra-territorial organisations and bodies.

16 European sampling refers to the application of country-stratified euro area samples to improve the trade-off between timeliness and resources for a given statistical quality of sample-based statistics. See W. Bier (2001).

### 5.3. Serviceability

Improvements in terms of a higher periodicity and timeliness of the CBSS data would also be welcomed but might be difficult to achieve without increasing the need of major revisions. Nevertheless, the coverage and access of timely quarterly corporate data has to be broadened as already done by Spain and Portugal. Both CBSOs have supplemented their annual CBSS data by quarterly surveys. Some commercial databases also provide quarterly balance sheet and profit and loss data for quoted corporations. If available on a broader basis they will be of use to improve the data quality of quarterly institutional sector accounts allowing the compilation of specific indicators like quarterly corporate profit, employment, debt or equity.<sup>17</sup> Finally, the timeliness of providing the data will be improved by implementing a common standard format, the XBRL-IASB based taxonomy in compliance with the International Financial Reporting Standards (IFRS).

### 5.4. Use of a broad set of data to compile non-financial corporate accounts

In addition to such improvements, the principle to use a broad set of direct and indirect data sources should be applied for the non-financial corporate sector when compiling quarterly institutional sector accounts. However, the use of a large number of data sources means that care is needed to ensure consistency in the corporate accounts. The different times at which the data sources will become available also requires that hypothetically, at any moment in the compilation cycle, estimates could be recalculated based on the new data.

A broad set of data sources is used for the compilation of the U.S. flow of funds accounts and balance sheets for the non-financial corporate sector as described above. This also applies for other compilers of comprehensive sets of quarterly financial accounts like the Banco de España. Assessing the accuracy of the various sources, the compiler is required to understand and correct for the differences between tax accounting standards, IAS, and statistical standards when needed. The many sources also need specific efforts to be undertaken to ensure compatibility between the various transaction and other flow accounts and the balance sheet for the non-financial corporate sector vis-à-vis the other sectors.

The combined use of direct and indirect data sources to compile non-financial corporate accounts is not yet advanced in Europe. Only some selected items like data on trade credits taken from the CBSS are integrated into the national financial accounts because of the many shortcomings mentioned above. Integrating the CBSS data into the euro area accounts would have to take into consideration the still insufficient coverage of the data and the existing heterogeneous accounting standards across Europe, which are still prevalent in the data.

## 6. Conclusions

Using the CBSS data as an input for compiling institutional sector accounts it has to be considered that the institutional arrangements to collect the data as well as the accounting standards in the various euro area or EU countries are far from being homogeneous. Consequently, the coverage of the data is often insufficient and the options to compile euro area or EU aggregates rather restricted. Therefore, the CBSS data are still not much used in the EU countries for national accounts.

Major improvements of the CBSS are necessary to streamline the collection systems and to increase the coverage of the data. This could be achieved by designing more representative annual sample surveys supplemented by quarterly sub-samples. Improvements will also be expected by further harmonising the accounting rules based on the implementation of the IAS and the use of the standardised format XBRL-IASB.

The availability of more detailed and timely corporate databases, including various data sets of commercial data providers, might allow integrating such data more or fully into the compilation process for institutional sector accounts than this is currently the case. In this context, the issuance and holdings data derived from security-by-security databases would be an important step forward to support this development.

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<sup>17</sup> See, for example, the quarterly report on the results of non-financial corporations as published in January, April, July and October in the Economic Bulletin of the Banco de España.

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# Strengthening contacts with key data suppliers

*Brian O'Reilly and Greg Haymes (Bank of Canada)*

## 1. Introduction

Evidence-based decisions by central banks whether they concern monetary policy, stability of the financial system or other issues often involve uncertainty. Nevertheless, having the right data at the right time to minimize ambiguity can greatly assist in this effort. Several government bodies, both within and outside Canada, have recently implemented programs to facilitate the provision of robust and relevant data by key suppliers. The broad objective of such programs is to enhance working partnerships through regular face-to-face meetings. Such relationship building allows participants to take a longer-term view of data reporting and data quality, as they jointly learn about each other's needs. Although this approach is not directly related to traditional survey methodologies, it has been given high priority status by several data-gathering organizations. This paper reviews "best practices" related to data relationship programs in Canada. It also suggests how this approach might be extended to commercial suppliers.

## 2. Financial data supplier programs

Formal data relationship building programs usually involve large, complex business enterprises that consist of a number of distinct companies in different industries and different jurisdictions. Such programs establish a focal point who is responsible for articulating and rationalizing data requirements, explaining new reporting guidelines (as well as helping in their implementation), and communicating regularly with the data supplier to minimize surprises for both the collector and the supplier of data. The goal of the focal point is to create an environment where the interaction with each organization is on its terms, for example, using its language, and drawing on its information processes so as to minimize confusion and reporting burden. Other benefits include: keeping up with staff turnover (particularly important in this era of heavy merger/acquisition activity and labour mobility among finance professionals), effectively addressing confidentiality concerns through face-to-face exchanges where stronger cases can be made for data enhancements and/or explaining how the data reported by the organization are used (e.g., within the survey process or in the formulation of policy advice).

In Canada, data relationship programs have been implemented at Statistics Canada and the Bank of Canada.<sup>1</sup> Statistics Canada's Key Provider Manager (KPM) Program covers 150 non-financial enterprises and dates back to 1998. There are ten full-time staff involved with the program (eight in Ottawa and two in Montreal), and earlier this year it added Subject Matter KPMs to widen the scope of coherence analysis of enterprises' financial and economic data. The number of enterprises covered under the KPM Program is expected to more than double over the next year and a half.<sup>2</sup> The Bank of Canada's Reporting Managers (RM) Program was implemented in 2002 and covers the six largest domestic banks. The RM Program was designed to facilitate statutory bank reporting (including the statistics used for the BIS International Banking Statistics) for the following three reasons. First, Canada's banking industry is highly concentrated with the six largest banks accounting for over 90 per cent of its assets.<sup>3</sup> Second, the six major banks have a significant presence outside Canada, in areas such as the United States,

1 *Canada's Office of Superintendent of Financial Institutions (OSFI) has a program involving focal points that is wider in-scope, but covers important data issues. We are aware of a handful of formal relationship building programs implemented by national statistical agencies. The Australian Bureau of Statistics was the first in the mid-nineties, followed by Statistics Canada. Other countries (statistical agencies) that have implemented such a program include: the Netherlands, New Zealand, Switzerland, and the United Kingdom.*

2 *The top 300 enterprises in Canada account for about one-third of all economic activity.*

3 *The banking industry manages over \$1.6 trillion in assets and accounts for more than 70 per cent of the total assets of the Canadian financial services sector.*

Latin America, the Caribbean and Asia, that makes detailed data inquiries sometimes complex to solve.<sup>4</sup> Finally, the composition of bank financial statements have changed significantly in recent years (e.g., securitization, derivatives, new financial products, and non-interest income), which makes it difficult at times to interpret the monetary and credit aggregates. The objectives of the RM Program, in terms of enhancing working relationships with Canada's largest banks and learning more about each others business, have been met with resounding success.<sup>5</sup>

The Bank of Canada is undertaking an initiative to gather more data on the financial system.<sup>6</sup> To assist in this effort, a communications strategy is being developed to strengthen relations with commercial data suppliers (i.e., the Financial Data Suppliers (FDS) Program). The objective is to facilitate a two-way flow of information so that suppliers know where the Bank sees gaps in financial data from a public policy perspective and the Bank knows how suppliers intend to evolve their database. The strategy would likely be supported by increased or continuing business for those organizations responsive to feedback from the Bank, other things equal. Different issues arise in approaching the FDS Program, for instance:

- ability to make the data public (potentially restricting its use in research/publications)
- desire of supplier for a realized return (versus a regulatory obligation to supply data)
- need for high quality, consistent data (including definitions, methodologies, etc.)
- coverage of databases (e.g., Canadian markets) and data collection methods

### 3. Conclusion

The business world is becoming more complex and multi-dimensional – similarly, the demand for data enhancements has risen in tandem.<sup>7</sup> To meet data demands, there appears to be a growing trend, both nationally and internationally, to develop programs (or formal processes) by which to strengthen relationships with key data suppliers. The ultimate goal of any data relationship program is to foster mutual understanding and trust that is likely to lead to better data practices. This creates opportunities to improve a central bank's, and more broadly, a government's ability to meet its mandate. The benefits and challenges of extending traditional data supplier programs to commercial vendors remain to be seen.

### Résumé

*Plusieurs organismes gouvernementaux canadiens et étrangers ont mis en œuvre récemment des programmes visant à faciliter la transmission de données robustes et pertinentes par les principaux fournisseurs. L'objectif global de ces programmes consiste à renforcer les partenariats de travail au moyen de réunions périodiques. Cette façon d'établir des relations permet aux participants d'adopter un point de vue à plus long terme de la communication de données et de la qualité de celles-ci, car ils apprennent conjointement à connaître leurs besoins respectifs. Bien que cette méthode ne soit pas liée directement aux techniques d'enquête traditionnelles, plusieurs organisations de collecte de données lui attribuent une cote prioritaire.*

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<sup>4</sup> *International operations of these institutions account for approximately half of gross revenues.*

<sup>5</sup> *Earlier this year, for example, Bank staff gave information seminars to the Chief Accountant's Departments of the big six banks to explain the key functions of the Bank and why their data are important in formulating policy. Seminars provided details on the Bank's structure, core responsibilities, the data collection group, our partners, key outputs, data quality initiatives, economic concepts, data evolution, and new requirements.*

<sup>6</sup> *Increasingly staff are working on aspects of the financial system and this has led to the discovery of data limitations.*

<sup>7</sup> *Large businesses are accessing financing and conducting operations through various means in a global environment.*

# Use of surveys in statistics in the Czech National Bank

*Petr Vojtisek (Czech National Bank)*

## 1. Introduction

The Czech National Bank (CNB) not only carries out standard central bank statistics but also collects data in other areas. It uses two methods of data collection: the census and the survey. The census is used particularly in money and banking statistics for both balance sheet and interest rate statistics. While in the past the compilation of the balance of payments was based almost exclusively on the banking reporting system, currently the survey is becoming the main collection method. Foreign direct investment (FDI) statistics are the most developed area in direct reporting and portfolio investment statistics have also used this method increasingly in recent years. There are at least two other areas where the CNB carries out surveys: business surveys and measuring inflation expectations.

I would like to compare the direct reporting for FDI and portfolio investment on the one hand and the two above-mentioned projects on the other. There are two conflicting aims in dealing with the reporting population under the survey approach: to reach sufficient coverage and to optimise costs particularly in terms of reporting burden imposed on respondents. The reporting population represents various shares in the total volume in different cases.

## 2. Foreign direct investment

The international transaction reporting system was the first collection method for FDI. In the mid nineties the so called “reporting obligation” was set by decree based on the Foreign Exchange Act and brought into practice within the context of the liberalisation process in our country. Once the respective item had been liberalised, permission for carrying out this transaction was not necessary and this administrative source has continued for statistical purposes only. The reporting obligation means that all subjects are obliged to report the relevant information on transactions specified in the legislation at the moment when the transaction is being executed. Nevertheless it also had some shortcomings. It is difficult to check how the obligation is met since it is fulfilled on the initiative of the respondent. In addition, only flows are reported under this obligation. Stocks were calculated on the basis of cumulative flows. Having taken into account these drawbacks, there was a strong need to look for a more reliable source, at least on an annual basis.

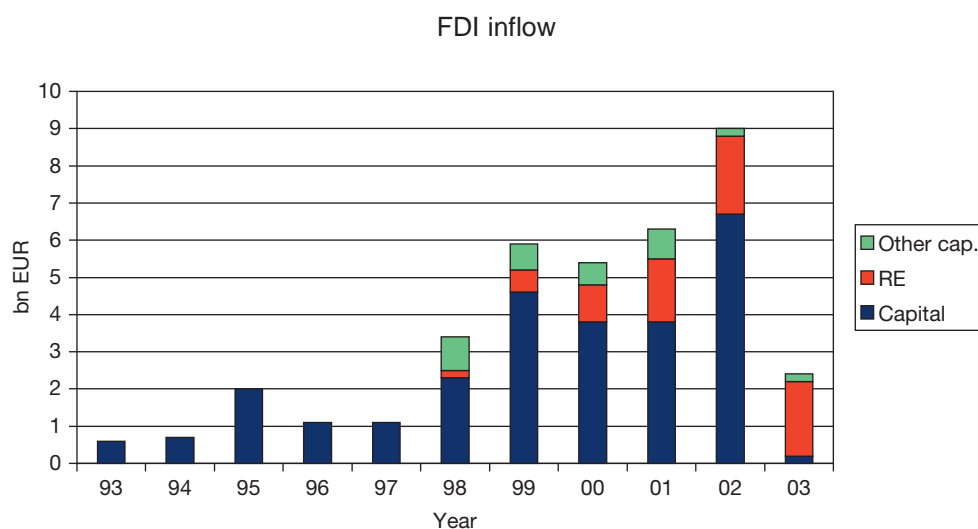
In 1998, a new reporting system of compiling FDI data – direct reporting – was introduced. The reason for the implementation of this system was twofold: to bring FDI statistics close to full compliance with internationally agreed principles as regards content and to have a more reliable set of respondents as regards the coverage.

The objective of having a comprehensive and updated list of respondents is the crucial point in this system. The main source for selecting the reporting population is the Business Register maintained by the Czech Statistical Office (CSO). Another source is the list of owners of 10 per cent and over of company shares, published by the Centre for Securities. In addition, public sources such as newspapers and other media are used for seeking and including the relevant subjects into the reporting population. The goal was to cover as many relevant respondents as possible. Very small businesses run mainly by physical persons are not included. Currently, the database contains approximately 6000 subjects of inward and about 600 subjects of outward foreign investment. These numbers show that in the field of the Czech FDI, the inward stock and flows are of a much greater importance than their outward counterparts.

As regards compliance with international standards, all components of FDI have been captured. This is particularly true for reinvested earnings. It had not been able to compile them under the banking reporting system or reporting obligation. The introduction of new surveys has brought about further effects. Various breakdowns have become available (e.g. territorial,



according to branches and by region) and the stock data enables checks of the flow data. In addition, information on economic activities included in the statement provides a good basis for compiling the Foreign Affiliates Trade Statistics.



The quality of FDI statistics has improved significantly since the introduction of the new survey collection system. An increase in coverage and the capture of all components of FDI are the main improvements. The annual stock data has become the main pillar of the FDI statistics. The flow data for the quarterly balance of payments compilation is still based on the reporting obligation.

The technical solution of the data collection depends on the number of reporting population. The method chosen must be simple since there are thousands of respondents and the reporting population changes over time. The reports are submitted on templates in Excel format and are accepted via e-mail. The blank report forms are available on the CNB web site.

### 3. Portfolio investment

The collection of information for the compilation of portfolio investment has evolved in a way that is similar to that of FDI. Transaction codes and reporting obligation were the original data sources. Surveys – direct reporting for security holdings were introduced in the second half of the nineties when the liberalisation of capital outflow was introduced. The main aims of this survey were similar to those set in the FDI area: a full coverage of subjects and meeting the international methodology standards.

The reporting population is known ex ante and does not change too frequently. Several categories of institutions dealing with portfolio investment have been identified: banks, security dealers, investment funds, pension funds and insurance companies. The total reporting population represents 150 respondents. The Securities Commission and the Ministry of Finance (a supervisory body for insurance companies and pension funds) are the main sources for identifying the relevant subjects. Currently, the CNB carries out annual checks as to whether other institutions have started this kind of business.

As regards the content of the survey, initial stock, flows and final stock are included for both on its own account and on behalf of client requirements. Transactions and valuation effects are distinguished. More detailed data, particularly territorial breakdown and breakdown by type of instruments are available. The surveys had been carried out quarterly till the end of last year and the periodicity has been changed to a monthly frequency since the beginning of this year. Nevertheless, all the information collected so far is on an aggregated basis, a security-by-security collection system is going to be established from 2006.

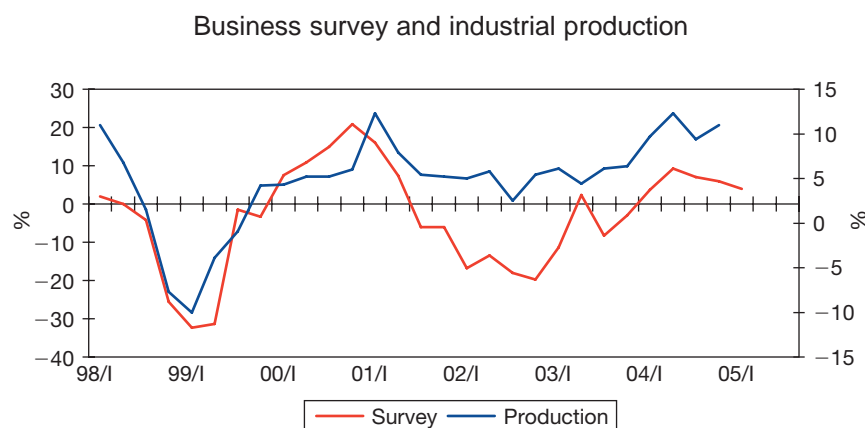
The technical solution of collecting the information is more sophisticated compared to that used for FDI. It is based on internet technology: the statements and the methodology are available on the CNB web site. The respondent can choose how to fill in the statements, either manually or in an automated way by connecting with their own information system. Once the statement is filled in it is sent directly to the CNB. Information is entered into the CNB database

after automated checks. Each respondent is provided with their own security key in order to ensure the relevance of the information put into the database.

#### 4. Business survey

The business survey carried out by the CNB is run on a voluntary basis. Four hundred firms in industry, the construction industry, transport of goods and retail sales are being addressed after prior agreement. The aim of the survey is to obtain information about the current position and expectations about further developments of the respondents and the branch in question. The first part contains information about absolute values such as contracts, collections and payments and the second part deals with expectations about further developments in the form of qualitative assessment.

Purposive sampling is used as a method for the selection of respondents. The weight is the main criterion in order to create a representative sample. The share of the selected reporting population in terms of turnover depends on the level of concentration in the respective branch. The coverage is 24% in industry (ranging from 9% in the food industry to 70% in the mining industry) and 10% in the construction industry and slightly less than 10% in transport and retail sales. Selection is carried out by using the Business Register maintained by the CSO. The register serves also as a list of institutions to be added to the reporting population if necessary. Substitution of firms leaving the survey is done according to certain rules.



Questionnaires are submitted in paper form and the information is entered through an input programme in the branches of the CNB. Logical checks are included in the programme and in case of doubts the respondent is contacted. Outputs are then calculated mainly in the form of indices based on positive, negative and neutral responses.

The strengthening of the representativeness of the sample, addressing the service sector and including more enterprises with foreign capital are the main challenges in this project.

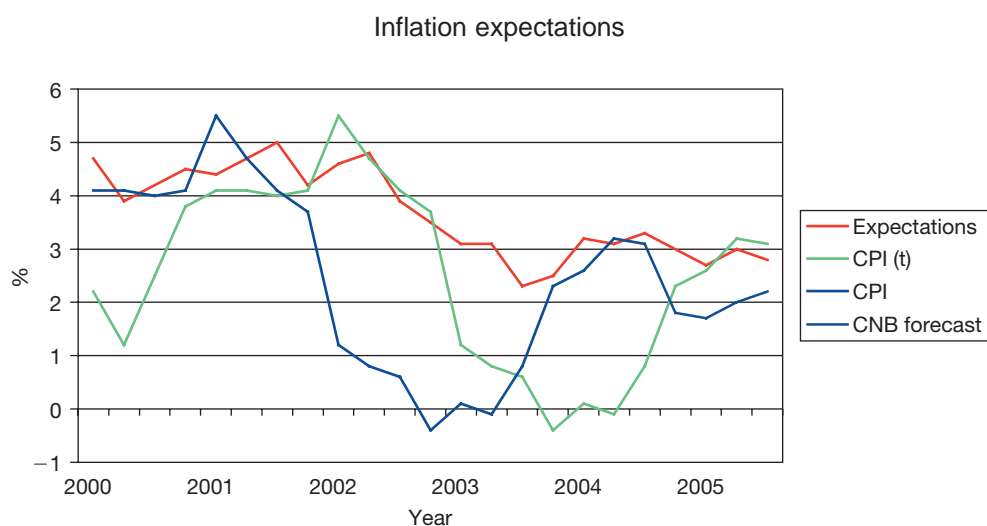
#### 5. Measuring inflation expectations

The CNB has already operated in an inflation targeting regime for more than seven years. Since inflation targeting is a forward-looking regime, inflation expectations play an important role in this scheme.

This survey is also run on a voluntary basis. It consists of three groups of respondents: financial market participants, enterprise managements and households. The questionnaire includes questions on inflation expectations with one- and three-year horizons.

As regards the first group, 20 market participants are addressed. Activity in the market has been used as the main criterion for selection. Since the CNB is in daily contact with the market participants, it is quite easy to exchange the required information and no special arrangements are necessary. These respondents also report their view on the future development of interest rates and the exchange rate of the Czech currency.

Around one hundred respondents from industry, the construction industry, transport and retail sales participate in the second part. This is the only group which deals not only



with expectations on consumer prices but also producer prices in the respective branches. While the selection and the addressing of respondents is the same as in the business survey, the reporting is carried out exclusively by electronic means in the form of MS word via e-mail.

In the households sector 600 respondents are addressed by the quota selection method. Gender, age, education, the number of members living in the same household and the size of the residential area are taken into account. The results in this group are the most volatile. Therefore extreme values at both the lowest and the highest ends are excluded from the sample.

The results of the measuring are used for the calculation of relative variables like real interest rates measured by the ex ante method and also for monetary analyses generally. Maintaining good contacts with the respondents is the first challenge due to voluntary participation in this project. A further challenge, which is recommended by the ECB, is to monitor inflation expectations very carefully particularly in the last months before adopting the single currency. It is the experience of several countries that inflation expectations are quite volatile in this period.

## 6. The way forward

There are challenges in the surveys currently being carried out. Maintenance of the registers and the representative samples are perhaps the main tasks. In addition, as regards the portfolio investment survey, it is necessary to follow carefully developments in the sector dealing with securities in order to maintain full coverage. Communication with the respondents when the survey is carried out on a voluntary basis is also very important.

The CNB has gained sufficient experience in dealing with the coverage and collection, transmitting and storage of data. This experience should be used for new statistics. There are at least two challenging statistics: financial accounts statistics and portfolio investments run on a security-by-security basis.

Financial accounts statistics are currently being established in the CNB. Experience gained in creating the reporting population, maintaining the register and sampling method will be used in these statistics. The sampling method will be relevant in sectors where the number of potential respondents is quite high, e.g. other financial intermediaries. The existing infrastructure, particularly the collection system based on internet technology would bring some advantages. Money market funds already send statements via this infrastructure, institutions engaged in leasing have recently started cooperation and other investment funds, pension funds and insurance companies will be addressed in the near future.

Another challenging area is data collection on a security-by-security basis. The main change will be carried out in the methodology: from aggregated figures to an individual basis. The technical solution for data collection is already in place.

## Résumé

*La Banque nationale tchèque exerce des enquêtes dans le domaine d'investissements étrangers directs et dans deux projets orientés vers la situation conjoncturelle et l'attente inflationniste. Tandis que pour ce qui*

*est de la première enquête, le but en est l'inclusion d'un plus grand nombre d'interrogés, quant aux deux autres enquêtes, des méthodes sélectives du choix sont mises en places. Dans les deux cas, un fichier de sujets économiques joue un rôle très important. Des expériences résultant des enquêtes dans la méthodologie et dans l'aspect technique de la collecte, du transfert et de la mise en place de l'information peuvent être utilisées même dans d'autres méthodes statistiques. Un défi consiste notamment en leur utilisation dans le domaine d'investissement de portefeuille et, quant aux quelques secteurs, dans le cadre de l'établissement de comptes financiers.*

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# UK surveys of non-financial corporations: integrated quarterly sector accounts

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## Introduction

One of the main factors which allow the UK to produce fully integrated quarterly institutional sector accounts in 90 days is due to the nature of the data sources we receive. The results of UK quarterly data surveys (below) are available within 60–70 days from UK non-financial corporations. Many of the surveys include questions on the top to bottom accounts – so they cover income and expenditure as well as financial assets and liabilities. This allows for a more integrated presentation and analysis of sectors within the accounts. The primary use of the data surveys is in the production of the National Accounts (including Financial Accounts) and in the financial account of the Balance of Payments, in particular figures collected on shares and securities issued by overseas residents.

## Data sources

The following are the main data sources:

*Financial Assets and Liabilities Survey.* This is a statutory quarterly survey of private non-financial companies' main financial assets and liabilities: F2, F3, F4, F5 and F7. The primary uses of the results of the survey are the production of national accounts and financial accounts and the Balance of Payments. This is a sample of 660 company groups (considered to be the population for this panel) whose employment (in the majority of industries) exceeds 2000. It is assumed that most businesses below this employment threshold contribute little to the total measure of financial assets/liabilities. Three 'special industries' have different employment cut-offs and are treated differently. Industries classified to Standard Industrial Classification (SIC) codes 11 and 27 (extraction of crude petroleum and gas, and manufacture of basic metals respectively) which contain some relatively small companies holding large total assets/liabilities and, conversely, SIC 70 (real estate) which has large companies with small assets/liabilities. A rough estimate is made for the total assets/liabilities of the businesses below these employment cut-offs.

*Non-financial Sector accounts.* The large majority of data used in the non-financial sector accounts are taken from data supplied for National Accounts (GDP compilation) purposes; for example: companies' profits, compensation of employees, final consumption expenditure, trade in goods and services, gross capital formation and levels of stocks. Data on operating profit is collected from a survey from a sample of between 1,600 to 1,700 company groups – or 2.5 percent of the companies across the economy – per quarter. This sample is stratified by a Business Register by broad industry groups, equivalent to SIC groups. Data collected are used to calculate growth rates of gross operating profits of non-financial companies and applied to annual profits data submitted for tax assessment purposes.

These estimates form a key component of GDP, contributing 18 per cent to the income measure of GDP. Data on the levels of stocks are collected from 21,500 non-financial companies (production – 8,000; wholesalers and retailers – 4,500; retailers – 3,200; motor traders – 2,300 and construction – 3,500) per quarter. The data collected are the level of stocks at the beginning and at the end of the quarter (or month) and a variety of asset breakdowns.

For *stocks*, the asset breakdowns of finished products are: materials, fuel, work in progress and goods in hand for sale. Data collected are used to estimate the changes in stock and work in progress for the expenditure and income measures of gross domestic product (GDP). The value of the physical increase or decrease in stocks – stockbuilding – is part of final expenditure. It forms part of capital formation and adds the nation's stock of wealth. Stock appreciation is used for the income measure of GDP. In addition, the surveys of stocks are used in the compilation of the Index of Production which in turn forms part of the output measure of GDP.

For *balance of payments*, the quarterly inquiries into direct investment abroad and direct investment in the UK form a major part of the non-financial corporations' contribution to Balance of Payments. As part of the ONS's work to meet the requirements of the European Commission's Balance of Payments Regulation, the existing direct investment surveys will be enhanced, to collect more detailed geographical breakdowns of income flows and stocks and flows. This may well require increased sample sizes.

Other quarterly sources of non-financial companies data include stock exchange data for bonds paid (Balance of Payments liabilities), Bank for International Settlements (one quarter in arrears but includes a geographical breakdown). Annual Financial Assets and Liabilities Survey and UK Share Ownership data are projected forward, by quarterly flows information and interest/dividends derived by applying appropriate yields to the resulting stocks. Quarterly geographical breakdowns are projected forward from annual benchmarks.

*Surveys of Insurance companies and Pension funds.* There are quarterly statutory inquiries on Income and Expenditure and Transactions in Financial Assets and annual balance sheet inquiries.

*Insurance companies.* The sample consists of all companies over £100 m premiums and some smaller companies, representing 90% of population premiums.

- Quarterly statutory inquiries into insurance companies' Income & Expenditure and into their Transactions in Financial Assets.
- Annual statutory inquiry into insurance companies' Income & Expenditure and Balance Sheets.

*Pension funds.* Data are collected separately for long-term funds and for general funds. The sample represents 50% of population market value.

*Self-administered pension funds:*

- Quarterly statutory inquiries into pension funds' Income & Expenditure and into their Transactions in Financial Assets.
- Annual statutory inquiry into pension funds' Balance Sheets.

*Security Dealers surveys.* Data are collected in a quarterly statutory inquiry into securities dealers' assets and liabilities and transactions in securities. The 50 largest contributors to the Financial Supervisory Authority are sampled, representing 80% of population turnover.

*Mutual funds* data are collected via voluntary inquiries.

- Quarterly voluntary inquiries into Transactions in Assets.
- Annual voluntary inquiries into Balance Sheets.

*Trusts* data are collected separately for Unit trusts & Open Ended Investment Companies, for Investment Trusts, and for Property Unit Trusts. The samples for each of the three categories represent approximately half of their population market value.

*Bank holding companies.* Bank Holding companies' data are collected via an annual inquiry into income and expenditure and balance sheets. For the 2002 survey, returns were received from 94% of the population.

*Monetary Financial Institutions.* The Central Bank has regular returns from the population of Monetary Financial Institutions (MFIs) in the United Kingdom. ESA 95 data requirements cover levels and flows for deposits and currency (F2 in ESA 95), data on MFI issues and holdings of securities other than shares (F3), loans issued by UK MFIs (F4), and holdings of quoted and unquoted shares (F5). The Bank also has data on UK official reserves: data for Monetary Gold and Special Drawing Rights (SDRs) (F1).

*Quarterly Dividends Inquiry.* Some unquoted dividends data is collected via a quarterly inquiry to those companies that have been identified as paying unquoted dividends. However it is recognised that many such companies are probably missed – so a grossing factor is required. Data on quoted dividends payments are collected from the Stock exchange database.

*General data sources.* Administrative data are received from the Treasury (and other government departments including Inland Revenue, Customs and Excise and Department for Work and Pensions). These data includes Central and Local government holdings and issues in most transaction lines in the financial account (F3, F4, F5, F7) and also provide data for most General Government entries in the non-financial accounts (i.e. D2, D3, D5, D6, D7, P3 and P5).

## Data flow

In the UK data flow process, survey respondents are filling in forms sent out by the ONS, using mainly company accounts data, in order to reduce the reporting burden. These forms must be returned to the Data Validation Branch (DVB) by a set time and filled in according to guidance supplied. DVB receive completed forms by respondents and input data onto the system. DVB

has to liaise with the respondents in cases where forms have been incorrectly filled in or chase them up if they are late returning their form.

Once data is on the system this can be used by the Report, Analysis and Production (RAP) team who take the input data that are now on the system and aggregate up from individual companies into institutional units. They will conduct analysis of these aggregates and send any queries back to the DVB team. For example, Insurance and Pension fund data for individual companies will be aggregated up to give financial holdings by transaction, for Pension funds, Life insurance and General Insurance. These aggregate level data are then sent to the compiler teams in National Accounts, along with appropriate briefing of the reasons for main changes in the dataset. Another function performed by the RAP team is the publication of the aggregated survey data as transmitted to compilers, this publication will not include any subsequent quality adjustments made within National Accounts.

The compiler teams will take the aggregates supplied from the RAP team and will analyse this data and perform any initial national accounts quality adjustments. They will then send this data to the central systems (The Data Management Unit – DMU) at the same time as providing a briefing on the delivered dataset to the Coordination/Analysis teams. The compilers will then act as the gateway between the centre and the data suppliers/survey teams, as well as providing methodological expertise on sectors and transactions within the accounts. DMU are responsible for the running and maintenance of the central systems, as well as managing the flows of data within UK National Accounts.

## Conclusions

The UK use quarterly data surveys from a sample of UK non-financial corporations to ensure the timely quarterly production of data for national accounts and the financial account of the balance of payments. These quarterly surveys are consistent with the annual sources of data. The methodology underlying the reporting instructions is consistent with national accounts and business accounts methodology. This ensures a high quality of the final dataset. These surveys form key components of UK GDP and of the International Investment Position and of the financial health of the UK corporate sector where there are currently no alternative sources for this information. Further, the use of single integrated returns from companies in the UK ensures that there is consistency between the creditor sector, financial instrument and debtor sector. In particular, there is consistency between the UK balance of payments and the UK S.11 Rest of the World. All regular surveys are reviewed, to obtain the information needed and to impose the minimum burden on respondents.

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# Financial risk management instruments usage in large and medium-sized enterprises – business survey in a transition country

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## 1. Introduction

Financial risk is uncertainty connected with the price of financial contracts that perform the affirmation of real goods and services (shares, bonds, and currency itself), and this risk could be dispersed, but can not be eliminated. After recognizing the type of risk, financial managers may use hedging, insurance or a kind of diversification strategy, prescribed instruments or financial limits. Protection against financial risks is extremely important for conducting a business in a global economy. Enterprises in transition countries are particularly exposed to this problem, because they do not have enough experiences with fighting against financial risks (about financial risk protection instruments see, e.g., Brealey, Myers, 2003; Jorion, 2001, or Peterlin, 2004).

In this paper, as an example of a transition country, a business survey conducted in Croatia in 2004 is described. It was a pilot survey, the first of that kind ever conducted in Croatia. The aim of the paper is to investigate the usage and non-usage of selected types of financial risk protection instruments by large and medium-sized enterprises, and to find out if the usage of these financial protection means would get a positive impact to enterprises' business success. In the analysis, adequate statistical descriptive techniques and inferential procedures, such as estimation and adequate tests of hypothesis, using statistical package SPSS 9.0, were applied.

## 2. The sample survey research methodology

Survey research based on telephone interviews with financial (or accounting) managers from a random sample of 100 Croatian companies in autumn 2004 was carried out. Equal allocation with 50 large (with more than 250 employees) and 50 medium-sized (with 51–250 employees) enterprises from each of respective strata was applied. Considering activity, sample structure was as follows: 46% from manufacturing; 15% construction; 11% retail trade; 7% hotels and restaurants; 7% transport, storage and communications; 7% real estate, renting and business activities; 4% wholesale trade; 1% agriculture, hunting and forestry; 1% of companies from electricity, gas and water supply; and 1% from other activities. Used sampling frame was a Croatian Financial Agency (FINA) list of Croatian companies from 2002.

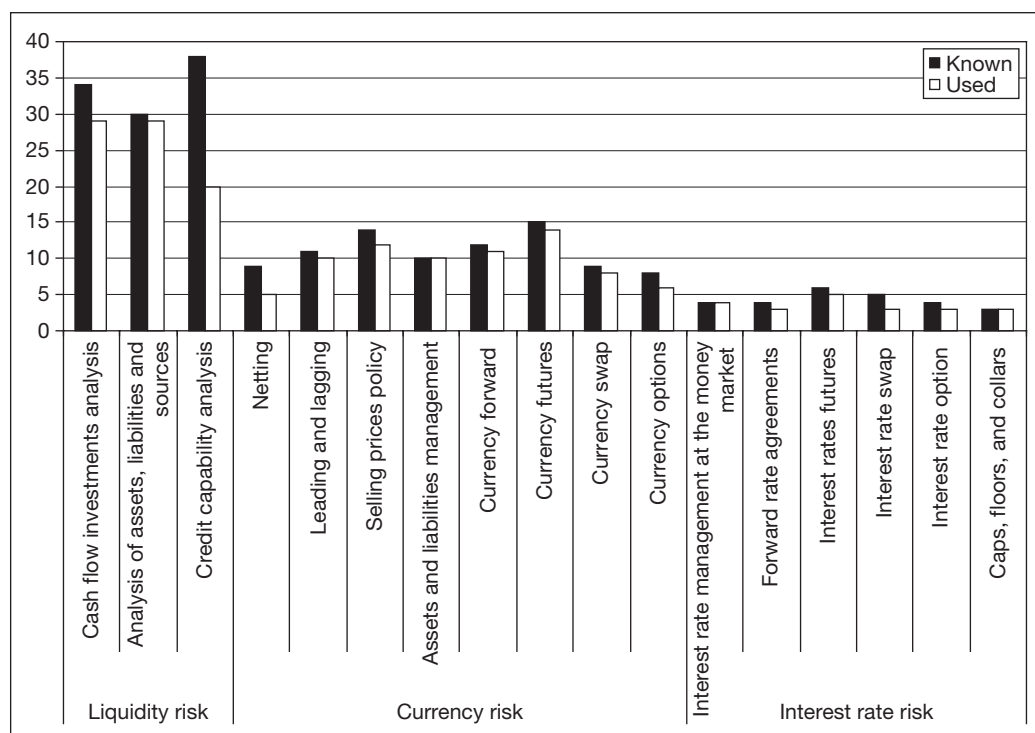
For the purpose of this survey the sampling methodology was carefully applied considering all non perfect practical situations, compare to Dumičić (1991), having in mind survey period and survey costs, following valuable literature resources like Groves (1989), and Cox et al. (1995). Estimation formulas took into account the procedure of random sampling of units, so, margin of errors could be given, as well. Considering normal approximation for the sampling distribution for the proportion estimator, in each strata with  $n = 50$ , with 95% confidence level and confidence coefficient  $z = 1.96$ , the research result is within margin of error of maximum  $\mp 14.2\%$ .

## 3. Usage of financial risk management instruments

The majority of 59% of enterprises in the sample do not use financial risk management instruments. From the further analysis the dependence of “financial risks protection instrument usage”



Figure 1 – Comparison of no. of managers/firms that know and that use protection instruments by types of financial risks



and “company size” was not appeared to be statistically significant, because in testing the hypothesis of independence of categories “use” and “don’t use” with categories “medium-sized companies” and “large companies”, the test value of  $\chi^2$  did not give enough evidence for rejection of the null-hypothesis.

Figure 1 shows which risk protection instruments are “known” to financial managers from 41% of companies that are “users”, and which of them are actually “used”. Comparison of instrument usage by types of financial risks is shown. It is evident from the highest bars for liquidity risk that most of users are concentrated on protection against this kind of risk. Currency risks, as well as interest rate risks, are not considered as to be so dangerous for Croatian managers.

It could be noticed that the frequencies for instruments “used” are in many cases smaller than for “known” category. This difference is the most evident for liquidity risk protection approach called “credit capability analysis”.

More detailed frequencies for using different types of financial risks protection instruments by company size are given in Table 1. Large companies seem to be more conscious about all kinds of financial risks and protection instruments. From 41 protection instruments users in the sample the majority of 56% of them are from large companies and 44% from medium-sized ones. Bigger firms covered by the sample are better informed and they use risk protection approach more often than those medium-sized.

The difference between proportions of users out of those who know for a particular risk protection instrument shows a great variability from instrument to instrument. Considering liquidity risk protection approach “credit capability analysis” as an extreme example, only 48% of those large firms who know, actually use this method (11 out of 23). From medium-sized firms who are acquainted with this protection approach, 60% use it in the same time (9 out of 15).

According to research results an estimated average yearly revenue for enterprises that are using financial risks protection instruments is higher (more than 35,000,000 €) than for non-users of these instruments (approximately 17,000,000 €). Applied *t*-test for the means difference has shown that this difference is statistically significant at  $\alpha = 0.05$ .

In the firms that apply risk protection the revenue is growing more dynamically than in the rest of firms. The  $\chi^2$ -test of independence of two categories shows that the growing of revenue

Table 1 – Usage of protection instruments by types of financial risks and by enterprises size (More than one answer was possible)

Instrument	No. of enterprises			
	Known		Used	
	Medium-sized enterprises	Large enterprises	Medium-sized enterprises	Large enterprises
<i>Against liquidity risk</i>				
Cash flow investments analysis	14	20	12	17
Analysis of assets, liabilities and sources	13	17	12	17
Credit capability analysis	15	23	9	11
<i>Against currency risk</i>				
Netting	3	6	2	3
Leading and lagging	3	8	2	8
Selling prices policy	3	11	2	10
Assets and liabilities management	1	9	1	9
Currency forward	6	6	5	6
Currency futures	7	8	6	8
Currency swap	4	5	3	5
Currency options	3	5	2	4
<i>Against interest rate risk</i>				
Interest rate management at the money market	–	4	–	4
Forward rate agreements	1	3	–	3
Interest rates futures	2	4	1	4
Interest rate swap	2	3	1	2
Interest rate option	2	2	1	2
Caps, floors, and collars	1	2	1	2

is dependant on usage or non-usage of financial risk protection and this dependence is shown to be highly significant at  $\alpha = 0.01$ .

#### 4. Conclusion

From this survey research came out the conclusion that companies in Croatian transition economy are not enough aware of possibilities to protect themselves from financial risks. It is shown that less than a half of medium-sized and large Croatian enterprises (41%) included in the sample do use instruments to protect themselves from financial risks. Even users of these means are not sufficiently acquainted with particular instruments and those who are, do not actually use them. It was shown that enterprises that use financial risk protection methods have got, firstly, larger total yearly revenue, and, secondly, this revenue has got a tendency to grow. These two mentioned business success variables are statistically significantly dependant on usage (non-usage) of financial risks protection instruments.

After the research, it should be recommended to banks, insurance companies and financial consultants to develop the corporate advisory service in the direction of better informing their corporate clients, actual and potential, about financial risks protection means and give them advice what is appropriate to use, why, when and how. This activity should be a kind of banks' and consultants' marketing activity, and help not only corporate clients in their financial management, but also help them to create better position on financial market.

In the future it would be interesting to investigate small enterprises' attitudes towards financial risk management concerning risk protection, and not only for medium-sized and large companies, as well, and this is the next task for the authors of the paper. A larger sample size should be recommended, as well.

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## Résumé

*Les risques financiers sont importants pour l'existence et pour la croissance des entreprises. Dans les économies de transition les entreprises ne sont pas suffisamment conscientes des dangers que les risques financiers portent. Une recherche à la base d'une enquête a montré que moins de la moitié d'entreprises moyennes et grandes utilise les moyens de protection contre les risques financiers. Les entreprises ne connaissent pas suffisamment ces instruments. Il s'est manifesté que les entreprises qui utilisent les moyens de protection contre les risques financiers ont le chiffre d'affaires plus grand et il montre aussi une tendance de croissance.*

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# Security-by-security collection system

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## 1. International requirements

International requirements placed on securities statistics have increased, among other things for monetary policy reasons and to guarantee financial stability, and harmonization of the requirements on different statistics has been pushed. Beside the need to provide data for the balance of payments and financial accounts, other statistics, like statistics on security issues, government finance, other financial intermediaries or on the international role of the euro define special demands. Future requirements, like the need for data on portfolio investment assets broken down by nondomestic issuer sector, arise from the need to consolidate national balance of payments statistics to a European balance of payments.

The following information is required from different economic statistics on securities

- information related to the security, like instrument classification, nominal currency, original maturity, residual maturity and the kind of interest
- information related to the issuer, like issuer domestic sector, issuer country, economic activity
- information related to the investor, like investor sector (for domestic investors) and investor country (for nondomestic investors)

For each combination of these types of information, stocks measured by market values; transactions; price, exchange rate and other adjustments; cash income (coupon and dividend payments); and income on an accrual basis should be available. Because of the growing importance of security markets, analysts require additional special statistics and ad hoc information.

## 2. Alternative collection schemes

Internationally, two different collection schemes are applied to collect information on securities for different statistics:

1. a security by security (sec-by-sec) scheme using identifiers for securities
2. an aggregated basis scheme under which precompiled data is requested from respondents.

A sec-by-sec reporting system collects data about stocks (and flows) for each single security. The compiler calculates the required output by using primary data about each single security (currency, interest rate, market price, outstanding amount, etc.) and its issuer (securities database). Thus, the work of classification, calculation, valuation and aggregation is transferred from the respondent to the compiler.

A reporting system on an aggregated basis defines one or more reporting forms to be filled in by the respondents, asking for several breakdowns in line with the required output.

The sec-by-sec data collection and compiling system reduces the burden of reporters substantially. The respondents do not have to implement any complex classification and calculation algorithms. The reporting system can be kept stable for a long time period, as a comprehensive securities database allows the compiler to react very flexibly to new requirements.

However, the challenges for a sec-by-sec compiler are manifold: All the details of securities administration and calculation have to be dealt with. Know-how has to be built up to handle all the different aspects and ongoing changes in the databases of commercial data providers. Algorithms have to be developed to calculate the required output and to ensure its quality. The amount of data is tremendous, and its handling is a challenging task for every IT department.

Covering all the statistics mentioned initially requires information about the holdings of all domestic sectors. This information can be collected directly from the investors and/or indirectly from domestic custodians and/or brokers. Having in mind the number of investors, for example, in the household sector, indirect data collection from the custodians, at least for the household sector, is obviously more efficient for both the compiler and the respondent than direct data collection.

However, not all data about investments of the nonfinancial sector can be collected via domestic custodians. Additional reports on investments not held on deposit with domestic banks have to be introduced. Whereas the reports of the custodians are a census, it is sufficient to use a cutoff survey for these additional reports.

Still, some remaining weaknesses in the system must be taken into account. One weakness is the country breakdown of portfolio investment liabilities, another is the investment of (very) small amounts by a (very) large number of private households in securities, especially mutual funds, abroad. In the latter case, third-party reporting schemes and access to tax data are being discussed internationally.

### **3. Austrian sec-by-sec compilation system**

In Austria both concepts were discussed intensively with the respondents, and in 1991a sec-by-sec-reporting and compiling system was introduced for balance of payments purposes. Whereas at the beginning, flow and stock data were collected and compiled separately, in 1996 a reconciliation of flow and stock data was implemented and a new data structure was introduced, also serving the needs of the financial accounts.

The Austrian securities data collection and compiling system is based on a register of securities (securities database), which is linked to a business register, and a database of holdings of securities by investors. Primary data on securities are bought from commercial data providers. Issuer information is taken from the official business register, and information on holdings is reported indirectly by custodians or – in special cases – directly by the investors on a sec-by-sec basis.

The monthly reports of the custodians about their own holdings and the holdings of their customers are derived directly from the securities management systems of the custodians. The customers are classified by the respondents, following the sector classification of the NSA. The reports for each group of investors use the ISIN code and include information about stocks (and flows).

After some formal and consistency checks, statistical data are compiled on a sec-by-sec basis. Holdings of the nondomestic sector are calculated by subtracting holdings of the domestic sector from the issued amount (residual approach). Using price and exchange rate information, market values and price effects are calculated. In the same step, income is calculated on a cash and accrual basis. Afterward, securities data are aggregated along the required output using the single security information and the business register.

In Austria the sec-by-sec system has become the basis for almost all required securities statistics (not only for balance of payments purposes).

### **4. Further developments**

The ECB is developing a Centralised Securities Data Base (CSDB) that provides key information about all securities relevant for Europe. The CSDB is to become the basis for compiling economic statistics on securities all-over Europe. By using the CSDB, securities output in Europe is expected to become more comparable and consistent. Hence, for balance of payments compilation purposes, the introduction of a sec-by-sec collection system will be obligatory for euro area countries beginning in 2008.

In the future it could be beneficial for Europe to use a sec-by-sec collection system combined with the CSDB for a harmonized compilation of economic statistics on securities not only for balance of payment purposes.

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## Methods in financial statistics: challenges and opportunities

*Rudi Acx (National Bank of Belgium and KU Brussels)*

I would like to thank the authors for their very inspiring contributions, on the broad range of data collection for financial statistics and results of their research in prospective surveys and surveys on the use of financial risk management instrument.

The different papers can all be linked (see figure 1). Firstly, there is the approach of the data collection, which might go through surveys, through administrative data, or both. These approaches have been presented for different statistical products:

- surveys prevail for Balance of payments statistics, the prospective analysis on the business cycle and inflation expectations in the Czech Republic, and for a study dealing with financial risk management at micro level in the non financial sector of Croatia;
- administrative data and/or surveys are combined in the field of the quarterly financial accounts, Bop-statistics and International investment position with, in the case of security-by-security data collection potential extensions to other macroeconomic statistics such as national accounts by institutional sectors and satellite accounts.

Secondly, there is the very interesting approach presented by the Bank of Canada in which the process of data collection is concentrated towards the key suppliers which are strongly involved in the set up of the data sets to be reported, creating mutual benefit for the data reporter and the statistics compiler.

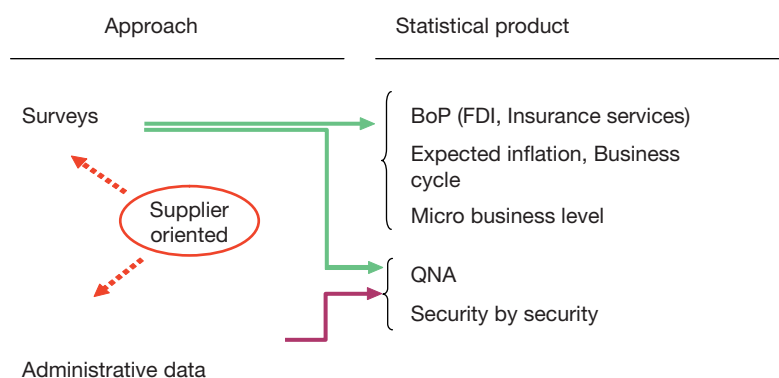
The papers dealing with the data collection and the compilation of the balance of payments and the quarterly accounts show a main central tendency which covers the input, production and output stages of the statistical procedure. That central tendency can be summarized as the aim

- to reduce the burden for reporting agents, and;
- at the same time, the reduction of the costs for the compiler, in order to;
- provide the user of statistics with consistent and integrated data sets.

That aim implies, among other elements:

- the re-use of available data for different statistics, which means a simplification to the reporting agent. This implies for the compiler however a possible trade off between ‘consistent’ errors versus reciprocal checking, whereby a fair balance should be reached;

Figure 1 – Scope of the papers presented



- the completion of administrative data with cost effective survey data;
- the development of input data in close consultation with reporting agents for a better understanding of the information for the supplier and the compiler, who might learn from each other.

In that respect the use of XBRL-taxonomies may contribute to a solution for the compiler and reporting agent and provide a much better structure and detailed description of the data content. The possibility for data suppliers to integrate requests from different authorities into a single application is cost-effective and contributes to the coherence across data. The idea to consult largely the so called key suppliers will increase the willingness to report data. In order to prevent interested compilers from reinventing the wheel, the dissemination of a kind of blueprint could be very efficient. It should be left to the user to adapt the blue-print to its specific environment such as the nature of industry, the degree of concentration, the administrative and legal procedures, and the available skills. The impact on the organisational structure of the side of the data compiler may be non negligible.

Different papers presented at this session make proposals that fit into the above aims. A first approach deals with the security-by-security portfolio data collection, which is most often cited in the field of balance of payments statistics. It should be seen as a challenge but surely as an opportunity in creating input data which can serve many different statistics, macroeconomic as well as microeconomic. In case the compiler has access to the detailed security by security portfolio for individual reporters, this means that the compiler has all the building blocks to make the statistics according to the statistical standards. Therefore not only balance of payments or international investment position statistics will benefit from it, but also the financial accounts and the economic accounts. Concerning the financial accounts, the who-to-whom accounting approach for securities becomes possible, even on a quarterly base. The re-valuations and the other changes in volume of financial instruments can be calculated in a more consistent way. Keeping the correct balances between the debts of the issuer and the assets of the investor is a challenge in that respect. All of this requires a consistent approach in the treatment of a huge number of data representing stocks and flows. Regarding national accounts, the investment and portfolio income flows can be correctly estimated in the dividend and interest matrix.

The approach of collecting security-by-security data contains however risks and may involve a shift of the costs from the reporting agents to the compiler, as the ultimate responsibility for the coherence of the required different classifications at individual level lies very probably with the compiler.

The use of administrative data, as second proposal, is also presented in the field of financial accounts, as it is already broadly used in economic accounts. There is an increasing demand for detailed financial accounts on a non-consolidated intra sector level and for industry breakdowns. This should lead to a better understanding of the finance and investment structure within an economy and the use of Corporate Balance Sheet Statistics (CBSS) could provide a way out. This raises however the question on the suitability and availability of data in CBSS. I mention, in addition to those reported in the paper and apart from the different philosophy in business accounting and national accounts:

- CBSS do not fit into the SNA-definition of institutional unit, as the annual accounts are mostly only available on the social basis, this is to say at the level of a company including domestic and foreign branches;
- Gross data are not in all cases available and do not contain industry breakdowns;
- Geographical breakdown remains unsure and/or incomplete;
- IFRS/IAS might be the vehicle to more homogeneity but utility for financial accounts remains, at least in the short run, low as IFRS/IAS is not imposed in all countries.

A third way which enters into the central tendency mentioned above, is the use of -quarterly-survey data for the quarterly national accounts. It might be clear that these will not yet reach the same degree of detail as the annual national account, due to lack of data and time for compiling the accounts. The results of the surveys, on a partial population or large transactions, will serve as, more detailed, indicators for estimates of quarterly national accounts.

Two papers presented at this session do present results of analysis and projects undertaken. The paper on the use of financial risk instruments by non-financial corporations in Croatia comes to very interesting conclusions. It would be worthwhile to further analyse one of the conclusions: to what extent is the type of industry relevant for the fact that companies applying more financial risk instruments show a larger revenue growth. As the sample consists of large and medium sized companies, it would also be interesting to analyse if there is a difference between them in the use of certain types of financial risk management instruments. For international comparisons one should bear in mind that national accounting rules might have an impact on the selection of financial risk instruments preferred by companies.



The paper on the use of surveys in the Czech Republic links data obtained from two different sources. The combination of the new Foreign Direct Investment-surveys and the data resulting from the 'reporting obligation'-decree for the quarterly balance of payments, seems not to create a break in the series, even if the reporting populations do not coincide. The paper presents also the results of expectations surveys and are very promising. A suggestion for further analysis comprises to assess the results of the business cycle surveys and the inflation expectations surveys in terms of magnitude of changes, covariance, the correctness and timing of turning points.

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# Statistics on real estate prices: the need for a strategic approach

*David Fenwick (Office for National Statistics)*

## 1. Introduction

Statistics on real estate prices are an important but relatively neglected area of statistics where information across countries on a coherent and consistent basis is generally lacking. This paper argues for the development of a conceptual framework for statistics on real estate prices and for active work programmes by statistical agencies to collect and publish the information that users need, including the information required by commentators on financial stability issues.

## 2. The importance of statistics on real estate prices and of associated contextual information

Statistics on real estate prices are important for a number of reasons:

- as a macro-economic indicator.
- as an input into:
  - the calculation of lender exposure.
  - wealth measurement.
  - national accounts deflators.
  - other price indices, for example, those used for wage indexation.

This applies in the case of both commercial and residential property. For instance, taking the residential sector, rising house prices may not only be symptomatic of strong economic growth and an indication of rising national wealth but can also contribute to growth:

- through the employment and income generated by an active property market.
- by boosting consumer spending through increased house renovation.
- by generating funds through mortgage re-financing to finance other expenditure, particularly when supported by relatively low interest rates.

Similarly, the converse also applies. It is therefore important that users have at their disposal timely information on price levels and trends.

Also such information needs to be usefully supplemented by relevant detailed analyses and by other information such as the type of property being sold the how the purchase is being financed. For example, a more detailed analysis of the types of houses being sold by region to show whether activity in the housing market is concentrated in particular segments of the market such as the upper end in capital cities. Similarly, the proportion of houses being purchased with cash rather than being financed through a loan and the average ratio of loan to property price provide an indication of the exposure of the borrower and the lender, as does the price to earnings ratio and, to a certain extent, the volume of transactions<sup>1</sup>.

## 3. Real estate performance measures

The connection between real estate cycles and debt finance and the role of real estate prices in financial crises has long been recognised as has the need for improved information and an increased capability to monitor and forecast future behaviour. This is particularly so in mature economies where real estate can account for as much as 15% of gross domestic product. Nabarro et al present a model for real estate and lending cycles, supported by case studies. It traces the cyclical evolution from initial indicators provided by the rental market, to property prices and

<sup>1</sup> *Past observation suggests that when P/E ratios get to an unsustainable high level, the adjustment is initially seen in a reduction in the volume of housing turnover than in transaction prices.*

through to balance sheets of borrowers and lenders and draws attention to a number of relevant indicators of the real estate market. The focus of the paper is investment property and the institutional rather than private investor. It does, nonetheless, bring out starkly the difficulties with compiling an “all property” index for a national market particularly for non-residential property where there is a high degree of heterogeneity. However, there are significant conceptual and measurement issues even with domestic property prices. These are discussed below in a UK context as an illustrative example.

#### **4. The measurement of house prices in the United Kingdom**

Robert Wood has pointed out that many of the problems associated with the measurement of house prices derive from the fact that houses tend to be heterogeneous and their prices can only be observed infrequently when they are sold. He also points to the fact that in the UK there are seven house price indices which are published on a regular basis and that given the different approaches to construction and the different data sources used it is not surprising that they can give conflicting pictures. For instance, the UK’s official House Price Index, produced by the Office of the Deputy Prime minister, is based on the transaction prices for a sample of UK completions dealt with by members of the Council of Mortgage Lenders, it uses hedonic regression techniques to standardise prices to make the index representative of a constant mix of different types of houses in different regions, and is expenditure weighted. The index represents the value of a standard average set of transactions purchased excluding cash purchases. In contrast the UK Land Registry publishes an expenditure-weighted index based on the average prices of all registered sales in England and Wales, not adjusted for differences in the mix of houses being sold, but including cash sales, which account for about a third of all transactions. Both compete with indices compiled by private companies, most of which are restricted to data relating to their own customers and either relate to the valuation at the time that a loan is approved or to sellers’ asking prices or estate agents’ estimated prices. Different indices measure the price of dwellings at different points in the house selling/purchasing process and this can vary during the course of the process. For instance, during a downturn in the market the selling price can often be lower than the initial offer price which can be lower than the original asking price.

This situation is not unique to the UK, for instance there are also several sources of data on real estate prices in the USA, which raise similar methodological issues- some published by government agencies and others by the private sector.

Clearly, there can be a number of valid concepts for a house price index but it is important that the concept used is fit for purpose and that there is a proper articulation of the relationship between the different concepts within a cohesive and coherent framework. It is also important that there is a numerical evaluation of the impact of the differences in index construction to assist reconciliation. The latter approach needs to be further supported by adequate meta-data.

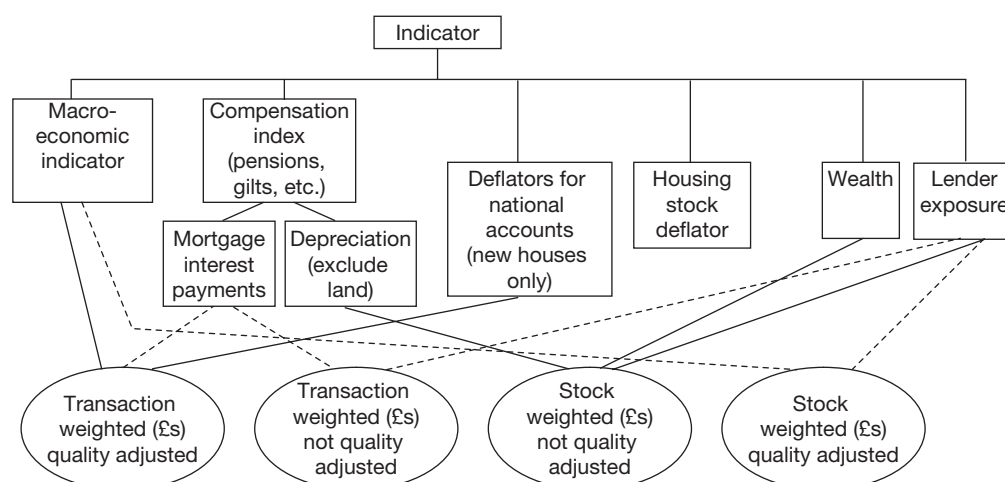
Such a framework can also provide the basis for greater international comparability and can be used to identify and prioritise key areas for statistical development by national statistical offices. It can be extended beyond the purchase of owner-occupier housing to purchases of domestic and commercial property by institutional and private investors.

#### **5. Conceptual frameworks**

An illustrative example of a framework for house price indices is given in Diagram A. It is based on an initial but systematic analysis of user requirements, in a UK context, expressed in statistical terms. The framework also enables the identification of linkages and can assist with the reconciliation of different measures. The nature of housing markets can vary enormously across countries, for instance the preponderance of self-build properties in some countries but not in the UK. Note also that the framework is much simplified, for example it doesn’t fully address the issues of land prices. Notwithstanding this, the overall implications of such a framework are fourfold:

- a family of house price indices is needed to meet user needs;
- the development of a coherent family of house price indices that are fit for purpose is reliant on an appropriate framework as its starting point.
- to facilitate cross-country comparisons such a framework needs to have international recognition.
- the availability of data sets may constrain the capability of a statistical agency to populate the framework in its entirety or to produce outputs to fit precisely within the framework but the latter provides the basis for an evaluation of existing indices.

Diagram A – Derivation of the primary house price indices (illustrative only)



Notes

1. For depreciation and National Accounts deflators (to deflate the GFCF housing stock value) land should be excluded from the acquisition value.
2. Land should also be excluded from a macro-economic indicator restricted to household consumption.
3. A calculation of mortgage interest payments would require the use of a number of historical indices to estimate mortgage outlay at time of purchase and should include separate information on re-financing.
4. Only basic house price indices are covered in this table, not derivatives used in subsequent calculations. For example, the UK Retail Prices Index's treatment of owner-occupier housing costs, which is based on its historical roots in a compensation index, is essentially based on a mixture of the payments and user cost approaches although the RPI itself can be considered an acquisitions index. Under the acquisition approach the total value of all goods and services delivered during a given period, whether or not they were wholly paid for during the period, is taken into account. With payments, the total payments made for goods and services during a given period, whether or not they were delivered, is taken into account. Finally, user cost (or consumption) considers the total value of all goods and services consumed during a given period. The distinction between the three approaches is particularly important for purchases financed by some form of credit, notably houses, which are acquired at a certain point of time, used over a considerable number of years, and paid for, at least partly, some time after they were acquired, possibly in a series of instalments. The RPI mortgage interest payments calculation uses a mix/quality adjusted transaction-weighted index to provide an historical profile of past houses purchases.
5. Depreciation can be thought of as the costs of major repairs and renovations, with minor maintenance and decorating costs covered elsewhere in the index. In the UK it is priced using a smoothed house price index.
6. The treatment of mortgage payments in a compensation index depends on what the owner-occupier is being compensated for. For example, whether the historical calculation to estimate current levels of mortgage debt should include the change in profile of houses acquired over the years.
7. Clearly, in reality in some instances the primary calculation is unlikely to involve a single house price index. For instance, the calculation of wealth where separate price indices may be used to up-rate the prices of separate sectors of the housing stock (e.g. apartments in Central London, detached houses in rural areas of Scotland) for subsequent summation to produce a total value for the UK.

Finally, although this paper has focussed on the production of a conceptual framework as a tool for the development of internationally comparable and coherent families of indices of real estate prices, it should be noted that issues relating to data sources and methodology can be substantial. The main problems are twofold:

- the collection of data on real estate prices can be fraught with difficulties and can be costly unless readily available data sources associated with the processes of buying and selling property are exploited. But the latter are not purpose-designed and can involve statistical compromises as already described above in a UK context.
- putting conceptual and data source issues to one side, there remains a lack of consensus on detailed methodological issues, for instance the computation of average or median prices for different property types and geographical locations and the use of hedonic models or re-weighting to account for changes in the mix of houses being sold. Such methodological issues would benefit from further research and discussion within the international community.

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## Résumé

*Ce papier présente une structure conceptuelle pour le développement de statistique des prix d'immobilier afin d'améliorer la cohésion et la consistance dans cet important et relativement négligé domaine de statistique.*

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## WORKSHOP H

### Financial accounts – linkage with balance of payments

Chair: Neil Patterson (International Monetary Fund)

Paper: **International organization in the balance of payments\***  
Henk Lub (De Nederlandsche Bank)

\* *Other papers from this workshop have already been published in IFC bulletin 21.*

# International organization in the balance of payments

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## 1. Introduction

International organizations have a special position in balance of payments statistics due to the unique way their residency status has been defined. According to the *Balance of Payments Manual* (Manual), they are not a resident of any country.<sup>2</sup> Even from the viewpoint of the country where they are physically located, they should be considered a non-resident. As a consequence, all transactions in which international organizations are involved should be recorded by some country in its balance of payments statement (except inter-organizational transactions). However, unlike other balance of payments transactions, which involve residents of two different countries and, therefore, are recorded by both countries, transactions with international organizations by one country find no offset in the balance of payments statement of another country. From this arises the need for constructing a balance of payments statement for the group of international organizations as an essential element in the study of global discrepancies. This issue is dealt with in section 2. In addition, there is a need to clearly define transactions that are typical for international organizations in the Manual. This is the subject of section 3.

Another consequence of the unique residency status of international organizations is that all transactions recorded in their annual reports are relevant for the balance of payments. Therefore, it should be possible to derive a balance of payments statement for an individual international organization directly from its annual report. This may contribute to achieving a better quality of statistics. Of course, differences in accounting rules applied by individual institutions and balance of payments methodology should be taken into account. This issue is dealt with in section 4. At the same time, the annual reports function as a kind of laboratory for the impact of the introduction of new accounting standards balance of payments transactions, from which compilers may learn a lot. They may use these lessons in their collection of source data through surveys from enterprises. See on this issue section 5.

## 2. Global discrepancies

Balance of payments compilers are in the unique position that they can perform a quality check on their products by adding up the balance of payments statements of all countries in the world. Ideally, the separate accounts of the balance of payments should show net balances of zero, since a credit entry for one country is a debit entry for another country. As a matter of fact, the net balances are far from zero. These 'global discrepancies' were studied by two IMF Working Parties in the final decades of the last century. Initially, most attention was devoted to the current account. The Working Party on the Statistical Discrepancy in World Current Account Balances made a number of proposals to repair the global discrepancies. Among them, it pointed to the need to take transactions by the international organizations into account, as they were a missing element in the checking exercise.<sup>3</sup> In particular, the Working Party found that net investment income of the international organizations made a sizable contribution to the global discrepancy in the income account, ranging between 10% and 30% (table 1). This was due to the policy of the international development banks (like IBRD, ADB) of not paying any income on

1 *Statistics and Information Department* (e-mail: h.lub@dnb.nl).

2 *IMF (1993), Balance of Payments Manual, fifth edition, paragraph 88.*

3 *IMF (1987), Report on the World Current Account Discrepancy, see pages 71–72.*

Table 1 – Global discrepancies and international organizations: findings of the current account and financial flows working parties (billions of US dollars)

	1979	1980	1981	1982	1983	1984
<b>Portfolio investment income</b>						
World before adjustments	-7.3	-11.2	-223	-35.9	-32.0	-41.6
Adjustments	7.5	15.0	23.1	36.4	32.8	41.1
<i>of which: International organizations</i>	2.3	2.5	2.5	2.8	3.1	3.7
World after adjustments	0.2	3.8	0.8	0.5	0.8	-0.5
	1986	1987	1988	1989	1986–89 average	
<b>Financial account</b>						
Before adjustments by Working Party						
World	18.0	32.6	45.1	65.8	40.4	
International organizations	-2.8	-8.0	-6.2	-4.8	-5.4	
After adjustments by Working Party						
World	3.0	8.4	31.8	25.5	17.2	
International organizations	-2.4	-7.4	-6.9	-8.4	-6.3	

*Explanation: a minus sign means that, in the sub-account mentioned, more debit items are included in the combined balance of payments statements than credit items.*

*Sources: IMF (1987), table 54, and IMF (1992), table 6.*

the capital subscriptions of the member countries, but using their investment income, instead, as a source of funding for their own operations. On a global level, this meant that a substantial amount of receipts of investment income was until then not recorded. The Working Party recommended the IMF to compile a balance of payments statement for the international organizations on a regular basis.<sup>4</sup>

Continuing the work of its predecessor, the Working Party on the Measurement of International Capital Flows made calculations that showed that a correct recording of financial transactions by international organizations contributed to reducing the global discrepancies in the financial account.<sup>5</sup> The Working Party noticed that the statistical reporting by the international organizations, which in the meanwhile had been set up by the IMF, was of poor quality. Therefore it had to make many adjustments to the data. It urged IMF staff to carefully check the report forms completed by the international organizations, for example by comparing the data with information from the balance sheets and cash flow statements contained in the annual reports.

In recent times, the global discrepancies in the portfolio and other investment income account have increased considerably compared to the period (1979–1984) for which the Current Account Working Party performed its study. Actually, the Working Party had been able to reduce the discrepancies to almost nil by making a number of adjustments, one of them being the inclusion of net interest receipts by international organizations. More recently, however, the global discrepancy in the portfolio and other investment income account has risen to widely over USD 100 billion (table 2). This should be very alarming to balance of payments compilers and a reason to again study the global discrepancies. Recording investment income by the international organizations still contributes to reducing the discrepancy. However, I am very suspicious about the quadrupling of investment income by international organizations that the data show. In view of the large number of methodological differences between the income concepts in the book-keeping of the international organizations and in the balance of payments (see following section), there is good reason to scrutinize the data on income they have reported.

In the period 1996–2002, the outcomes of the global discrepancy in the financial account were alarming too, reaching extreme levels in 2000 and 2001 (table 2). With respect to the role of the international organizations, a mixed picture emerged. Whereas the Capital Flows Working Party had consistently found that positive global discrepancies were partly offset by a negative outcome of the financial account for the international organizations, in 1996 and 1998 the

<sup>4</sup> IMF (1987), see page 122, recommendation no.14.

<sup>5</sup> IMF (1992), Report on the Measurement of International Capital flows, see pages 85–88.



Table 2 – Global discrepancies and the international organizations: latest results (billions of US dollars)

	1996	1997	1998	1999	2000	2001	2002
<b>Portfolio and other investment income</b>							
World	-125.7	-113.6	-122.1	-116.5	-96.6	-125.1	-140.2
International organizations	8.8	8.7	8.3	10.4	11.0	11.4	13.0
<b>Financial account</b>							
World	47.9	91.1	-9.1	42.3	214.5	171.5	112.8
International organizations	2.7	-1.4	-9.3	-8.0	-12.1	-8.9	-1.3

*Explanation: a minus sign means that, in the sub-account mentioned, more debit items are included in the combined balance of payments statements than credit items.*

*Source: IMF (2003), Balance of Payments Statistics Yearbook 2003, Part 2: World and regional tables.*

global discrepancy on the financial account and the financial account for the international organizations showed the same sign. On an average, recording the financial transactions of the international organizations contributed to reducing the global discrepancy on the financial account. It is evident that the importance of compiling a balance of payments statement for the international organizations does not depend on particular outcomes.

### 3. The classification of transactions

The international development banks are involved in a number of transactions of which the correct classification may give rise to diverging views among compilers. Therefore, it is desirable that the Manual provides clear guidance on these issues. I refer to 1) equity investments by the international development banks, 2) capital contributions to the international development banks by member states and 3) transactions in connection with the maintenance of value obligation. (The latter relates to both the international development banks and the IMF.) If there is agreement on the correct classification of these transactions, this improves the comparability of balance of payments statements for different countries, which makes it easier for users to analyse them. In addition, it helps solving the global discrepancies mentioned earlier. Another advantage is that it supports compilers in their efforts to construct balance of payments statements for larger areas on the basis of data provided by participating countries, for example for a monetary union like the euro area or an economic union like the EU.

Equity investments by international development banks have characteristics that may justify classification as either direct investment or as portfolio investment. However the arguments for classification as portfolio transactions are much stronger than those for classification as direct investment. The relationship between international development banks and the enterprises they invest in is very different from the relationship between enterprises and their affiliated enterprises and international development banks also behave differently. Their capital participations are driven by the development goals outlined in their charters. These are for example related to the creation of employment or the advancement of small and medium-sized enterprises. When their capital participations become profitable they will sell their equity shares in order to free funds for other projects. Although international development banks may be represented in the board of enterprises, they will refrain from influencing managerial decisions. Finally, international development banks do not consolidate capital participations in their annual reports.

From the point of view of compilers in the recipient economy, a number of formal arguments are in favour of classifying equity investments by international development banks as direct investment. First, capital participations mostly surpass the threshold of 10 % percent that is mentioned in the Manual as criterion for classification as direct investment.<sup>6</sup> And, indeed, international development banks are represented in the board of enterprises. However, I believe that these formal arguments must yield to the economic arguments presented above. I recommend that the Manual explicitly mentions that capital participations (equity investments) by international organizations are classified as portfolio investment. This recommendation is also a partial answer to the issue of direct investment by international organizations, insurance companies,

<sup>6</sup> Manual, paragraph 362.

pension funds, et cetera raised in the Annotated Outline.<sup>7</sup> It seems to me that the authors of the Annotated Outline are thinking in a different direction.

The Manual is quite clear about the classification of capital subscriptions by governments to international organizations: they are part of other investment, other (long-term) assets.<sup>8</sup> However, in this case confusion may still arise because it is one of the few instances of less than full harmonization between national accounts and the balance of payments. The SNA 1993 does not contain any specific prescriptions, but ESA 95 classifies capital subscriptions in international organizations as part of 'other equity'.<sup>9</sup> Apparently, capital subscriptions have characteristics that warrant either classification. Like equity instruments, capital subscriptions to international organizations do not provide a right on a predetermined income and the holders are entitled to the residual value of the institution. But other aspects of capital subscriptions point to a classification outside equity capital. First, the SNA is referring to equity and other equity in relationship with corporations, i.e. 'a legal entity, created for the purpose of producing goods or services for the market'. Clearly, international organizations fall outside the scope of corporations thus defined. Second, there is no market for capital subscriptions. The government of one country cannot sell its share in an international organization to the government of another country. It can only sell back its share to the international organizations under a lot of restrictions (for example, the price is determined by the board of the international organization, the government may not have any other liability to the international organization). Third, a maintenance of value obligation (more about this below) is attached to capital subscriptions in the development banks. Fourth, governments never receive any income from their capital subscriptions. It appears that capital subscriptions have so many characteristics that distinguish them from equity that it is advisable to classify them outside equity in the national accounts. I recommend a harmonization in accordance with the present classification in the balance of payments.

The classification of payments related to the maintenance of value obligation deserves to be addressed in the Manual as well. This obligation means that a member country is obliged to make payments to an international organization when the value of its currency depreciates against the currency held as value standard (for example, SDR or US dollar) by that institution in order to maintain the value of all the currency of that country held by the institution. The obligation works both ways: if the currency of the member country appreciates against the value standard the international organization will make a payment to the member country. The maintenance of value obligation has all the characteristics of a financial derivative, in this case a forward contract with periodic settlements. The size and the direction of the payment are determined by the exchange rate of the currency of the member country. Therefore, I recommend that the maintenance of value payments be classified as financial derivative and that these transactions are explicitly mentioned in the Manual. Presently, the large international development banks do not actually settle obligations arising from the maintenance of value obligation. They continue, however, to include the related assets and liabilities in their balance sheets.

#### 4. A balance of payments statement for the international organizations

In principle, all transactions by international organizations are relevant for the balance of payments. This means that compilers have the option of using the annual reports as a data source for deriving a balance of payments statement for an individual organization, rather than sending out survey forms to be completed by the international organizations. Compilers should go one step further than the Financial Flows Working Party, who recommended using the balance sheets and the cash flow statement from the Annual reports for a consistency check of the data reported by the international organizations on survey forms. Instead, they should consistently use all the available information from the income account, the cash flow statement and the notes to the financial statements to derive an almost complete balance of payments statement. They should only contact the international organizations directly with specific questions about missing information. This procedure opens up the prospect of a strong improvement in the quality of the data. Alternatively, the annual reports may be used by compilers to perform a quality check on the survey forms submitted by the international organizations.

By consolidation (leaving out transactions between the international organizations themselves) a balance of payments statement for the group of international organizations may be constructed. Statements for individual institutions are relevant too. This is the case for construction

<sup>7</sup> IMF (2004), *Revision of the Balance of Payments Manual, fifth edition (Annotated Outline)*, see paragraph 5.15 (b).

<sup>8</sup> *Manual*, paragraph 422.

<sup>9</sup> Eurostat (1995), *European System of Accounts*, paragraph 5.95.

of balance of payments statements for larger areas. For example the balance of payments of the euro area includes the transactions by the ECB, and the balance of payments of the European Union includes, in addition, the transactions of the EIB and the other European institutions.

When using the annual reports of the large international development banks, compilers should make a number of adjustments so that data in accordance with generally accepted accounting principles (mainly US GAAP) are converted into data that comply with balance of payments methodology. These adjustments relate to differences in coverage, classification, timing and valuation of transactions.

Many of these adjustments concern the different income concepts in both accounting systems. They have in common the recording of income on an accrual basis. However, differences occur with respect to the treatment of realized and unrealized gains and losses on investments – these are treated as income in the financial statements of international organizations – and the treatment of interest in arrears. In the balance of payments, realized gains and losses on sales of securities are not part of income but part of the value at which the sales of securities are recorded (valuation adjustment). Unrealized gains and losses are not part of the balance of payments at all (adjustment for coverage). In the balance of payments, interest in arrears is recorded as income with an offsetting entry in the financial account representing the creation of a short-term asset. In the financial statements of the international development banks, on the contrary, the accrual of interest is stopped if it is more than six months overdue and only actual payments are recorded until all arrears have been solved (timing adjustment). The claim from the arrears is not recorded in the balance sheet, but off-balance in the *notes*. All information needed to make proper adjustments in these cases can be found in the *notes*.

The adjustments for coverage relate to transactions that are recorded in the financial statements, but are not relevant for the balance of payments and, therefore, should be left out. In the first place, these adjustments comprise entries that are internal to the bookkeeping of enterprises: provisions for loan losses, depreciation of fixed assets and amortization of, for example, borrowing costs. The financial statements provide detailed information on provisions, but do not always clearly distinguish depreciation and amortization expense. Moreover, inter-organizational transactions have to be separated, because they should offset each other in a balance of payments statement for the group of international organizations. Information on these inter-organizational transactions – mainly, provision of services, loans and related interest income – is to be found in the *notes*. It may occur that international development banks invest surplus funds in bonds issued by sister organizations. This information is not available, nor should the compiler worry too much: the balance of portfolio transactions (assets and liabilities) by international organizations is not affected. Finally, adjustment for coverage is needed when the financial statements perform a netting of ‘other’ income and expenses, whereas the Manual prescribes gross recording of transactions.

The adjustments for classification relate to differences in the classification of transactions between both accounting systems. In the first place, compilers need to dispose of a further breakdown of the item administrative expenses in the income account. Administrative expenses comprise such widely differing components as compensation of employees, purchases of goods (other than fixed assets) and services, and depreciation. Another item for which a further breakdown is needed is ‘borrowing and other expenses’. The financial statements do not always clearly distinguish between interest and financial fees and commissions. The latter should be recorded as financial services. In both cases, the information needed should be asked from the international organizations directly. Another classification issue is the recording of transactions in financial derivatives. The financial statements do not always record these separately but as part of interest or transactions in (underlying) financial instruments. Again, the information needed should be asked from the international organizations directly. The adjustment for unrealized gains and losses on investments has already been mentioned.

The adjustments for timing are related to the different moments at which transactions are recorded in the financial statements and the balance of payments. In this respect, there is one important element: arrears on payments of interest and repayments of principal. Interest arrears have been dealt with above. The financial statements provide insufficient information for recording arrears of principal in the balance of payments. Normally, they would provide information on the net increase of arrears (new arrears minus repayments), whereas compilers need gross data to derive the proper balance of payments entries. It should be easy for the international development banks to provide the information needed. The adjustments for valuation, finally, relate to differences in the price at which transactions, for example securities transactions are recorded. Mostly they are related to the recording at book value (in the financial statements) against market value (in the balance of payments). These differences lead to realized gains and losses on securities and equity investments. They have already been mentioned above.

## 5. International accounting standards

Accountants and statisticians live in two different worlds and until recently largely ignored each other. However, the issuance of internationally applicable accounting standards has raised the interest of the latter. The IASB, an international board of accounting standards setters, issues International Financial Reporting Standards (IFRS, previously indicated as IAS) that are aimed to be employed world-wide. The European Commission has made these standards compulsory for large enterprises within the European Union, as from January 1, 2005. Moreover, the IASB and the FASB, the US board of accounting standard setters, have agreed on a convergence of their respective standards. As a matter of fact some IFRS reflect previously issued standards (SFAS) by the FASB (for example with respect to fair value accounting and the recording of financial derivatives).

Economic statisticians have designed their own accounting standards (for example, System of National Accounts, Balance of Payments Statistics Manual, Government Finance Statistics Manual) from methodologies based on economic theory. Faced with widely differing accounting standards for enterprises between countries, they had no stimulus to devote particular attention to accounting standards for enterprises. However, the issuance of internationally accepted accounting standards opens up the prospect of achieving a better quality of statistics while at the same time reducing the reporting burden on enterprises. Statisticians can reach these goals by either realizing harmonization of their own methodologies with international accounting standards or making their own needs more explicit by describing them in terms of these standards. With respect to the latter, it is essential that information produced from the internal bookkeeping of the enterprises is not lost in the process of combining and aggregating data for the financial statements.

From the analysis of adjustments to data derived from the financial statements in section 4, some general conclusions may be drawn. First, the concepts of income are different. There are few prospects for harmonization. The IASB is basing its income concept on the need of financial markets and is viewing it from the point of view of the individual enterprise, whereas statisticians have an income concept that is based on an integrated system of income, production and expenditure. Statisticians should make clear what additional information they need to compile their statistics.

Second, the classification in financial statements diverges from statistical needs. The profit and loss account of enterprises most often uses a classification by *function* of transactions (for example, distinguishing fixed and variable costs), whereas for economic statistics a classification by *nature* of transactions is needed. The latter distinguishes, for example, between wage costs, expenditure on goods and services and depreciation.

Third, financial derivatives are treated very differently. Financial statements may combine transactions in financial derivatives with transactions in the underlying assets. In economic statistics, financial derivatives are considered a separate category of financial instruments.

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