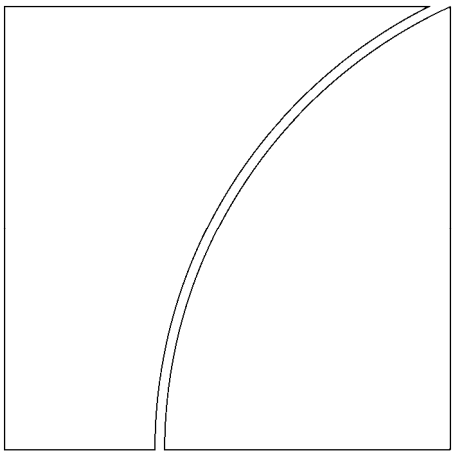
Irving Fisher Committee on Central Bank Statistics

IFC Bulletin

No 29



Challenges to improve global comparison of securities statistics

Proceedings of the IFC Workshop, Washington DC, 4–5 March 2008

January 2009

BANK FOR INTERNATIONAL SETTLEMENTS

The IFC Bulletins contain proceedings of meetings of the Irving Fisher Committee on Central Bank Statistics. Papers in this volume were prepared for an IFC-sponsored workshop entitled "Challenges to improve global comparison of securities statistics", held at the International Monetary Fund in Washington DC on 4–5 March 2008. Not all papers presented at the workshop are included in this volume. The views expressed are those of the respective contributors and do not necessarily reflect the views of the IFC, the BIS, the central banks or other institutions represented at the meeting. Individual papers (or excerpts thereof) may be reproduced or translated with the authorisation of the authors concerned.

Copies of publications are available from:

Bank for International Settlements
Press & Communications
CH 4002 Basel, Switzerland

E-mail: publications@bis.org

Fax: +41 61 280 9100 and +41 61 280 8100

This publication is available on the BIS website (www.bis.org).

ISSN 1991-7279 (print)
ISBN 92-9131-787-X (print)

ISSN 1991-7511 (online)
ISBN 92-9197-787-X (online)

Contents

Challenges to improve global comparison of securities statistics

Opening remarks

Jan Smets[1]

Good morning, ladies and gentlemen,

As Chairman of the Irving Fisher Committee on Central Bank Statistics, I would like to welcome all of you to the workshop on "Challenges to improve global comparison of securities statistics". I am very grateful that the IMF has agreed to host this event. I would like to also thank the Board of Governors of the Federal Reserve System for its support. I sense a keen anticipation among all central banks, statistical offices, economic ministries and multilateral institutions represented here in this room. This is indeed a highly topical field of statistics and one that, despite its infancy, does show a promising future. I would like to put you in the picture as to the background of this workshop and its objectives.

The Irving Fisher Committee on Central Bank Statistics, or IFC, is a forum for discussing statistical issues of interest to central banks, including those relating to economic, monetary and financial stability. The key objective of the IFC is to bring together compilers of statistics and the community of users and analysts of statistical information, both in and outside central banks.

Since its inception in 1997, the IFC has been governed by the international central banking community and has been associated with the International Statistical Institute. At the beginning of 2006 the Bank for International Settlements, or BIS, agreed to provide the Secretariat to the IFC, as it does for other well known groups. Since then all BIS shareholding central banks, and a few more, have become full institutional members of the IFC. The IFC is thus anchored in the international community of both statistical experts and central bankers.

The IFC has regularly been sponsoring meetings in the context of the biennial conferences of the International Statistical Institute. It has also organised independent conferences at the BIS in Basel. Moreover, the Committee has also occasionally organised workshops on specialised topics such as the measurement of consumer price indices in 2006, and in 2007 on the use of surveys by central banks.

The IFC first discussed the idea of organising a reflection on securities statistics at its meeting in August 2006, on the basis of a proposal prepared by its Secretariat. The Secretariat worked out the idea in more detail and at its 2007 meeting in Lisbon, the Committee expressed strong support for organising a workshop on the topic. The IFC took note that two international reports had been issued that confirmed the importance of the topics to policymakers. One was by the BIS Committee on the Global Financial System, which issued a report on "Financial Stability and Local Currency Bond Markets" in which it identified a lack of consistency in the statistical information on securities markets in emerging markets. The other was by the G8, which also looked at the same issues and recommended

[1] Chairman, Irving Fisher Committee for Central Banking Statistics.

improvements in the databases on securities market developments, including statistical information. We will hear about these reports, and their follow up, during our workshop.

After Lisbon, the IFC Executive and Secretariat worked out the workshop structure and content in more detail and were fortunate to receive the logistical and analytical support of the IMF, as a result of which we are now all sitting around this table here in Washington. Moreover, the IFC Secretariat, and Paul Van den Bergh in particular, have done us a great favour in providing us with a background document that provides us with a script for our meeting.

The background paper shows us that we have a very interesting, challenging and ambitious programme. We will first hear the experiences of international practitioners on the uses and sources of securities statistics. Though by no means exclusively so, one recurring theme is the added insight these statistics can provide in the analysis of financial stability. You will no doubt agree with me that this is highly relevant in today's tumultuous credit markets. Subsequently we will hear an overview of existing statistical frameworks and country experiences of debt issuance statistics. Then we will address the nuts and bolts of statistical methodologies that statistical compilers have to address. The focus will afterwards shift to the other side of the coin, or rather the balance sheets, ie to various approaches to compiling data on holdings of securities and the difficulties that have been experienced in this area. We will also cover security-by-security databases, an approach that shows a great deal of promise despite a number of associated issues, not least of which are the resources required to develop and operate them. Finally, the closing session of the workshop will be a kind of stocktaking of where international cooperation is currently situated, and what challenges lie ahead in defining an articulated set of principles and practices for this emerging statistical domain.

For each of the workshops we will have interveners to introduce the respective topic. I hope the presenters will understand that we want to have a general discussion on the key issues that have been identified in the background note rather than on their individual presentations. I am confident that the chairpersons of the different sessions will keep us focused on these key issues. Let me already thank the chairpersons and interveners in advance for their active contribution to the workshop.

Underlying the presentations and discussions there are three underlying objectives for our workshop:

1. First, to share experiences that we all have on particular issues relating to debt securities statistics, be they from the perspective of compilers, analysts or policymakers.

2. Second, to identify key areas in which follow-up would be useful, in particular with respect to the development of specific methodologies for statistics on issuance and holdings of debt securities.

3. Third, to establish an active network between the experts present at the workshop and, indirectly, with their colleagues at their respective organisations. This network will hopefully prove useful for any follow-up work that existing international groups or organisations might want to sponsor in the area of securities statistics. With respect to the latter, I should point out that the IFC does not want to duplicate the work of other organisations, for instance by launching the drafting of a compilation manual for securities statistics or by sponsoring a data collection exercise. For us, this workshop is thus a one-off exercise. I do hope, however, that our workshop will produce enough material for the publication of a special issue of the IFC Bulletin, to which others can refer in the future.

Ladies and gentlemen, I wish the workshop much success. Let me sincerely thank the IMF once more for its hospitality and the Board of Governors for the dinner invitation, which many of us here have accepted. Thank you.

Background issue paper

Paul Van den Bergh[1]

This IFC Workshop brings together users and compilers of securities statistics from a broad range of countries, with securities markets that are at different stages of development. The objectives of the workshop are:

- to share information on ongoing and planned initiatives to improve global comparisons of securities statistics,
- to share expertise in the compilation of securities statistics, and
- to identify and discuss key methodological issues that arise in the compilation of securities statistics, for both issuance and holdings.

In line with recent discussions in other international groups and with analyses and proposals made in various policy reports, the focus of the workshop is on debt securities. This note provides background information on the individual topics on the workshop agenda and also lists a number of key issues for discussion. The individual sessions are based on short individual presentations, which are followed by general open discussion, focused around the key issues identified below.

1. Uses of securities statistics

Broad range of requirements. Users of statistics on debt securities may have a broad range of requirements. From an operational perspective users will want information in order to be able to process securities transactions. Those users are not interested in statistics, but rather in the individual "technical" characteristics of the securities. Specialised financial institutions will also want information to establish league tables for particular financial services such as securities underwriting, or to gauge their market share in particular segments of the securities markets.

From the perspective of economic, monetary and financial stability analysis there are also a range of requirements. Moreover, these requirements have multiplied in recent decades, in line with the growing importance of securities markets in many countries around the world. To list just a few examples (not in order of importance):

- analysts of the transmission mechanism of monetary policy may want to know the relative importance of fixed vs floating rate instruments;
- analysts of securities market activity will want to understand the relative importance of different sectors issuing in domestic securities markets, including non-residents;
- similarly, market analysts may want to monitor particular market segments or financial instruments (eg index-linked debt, commercial paper, notes and bonds);

[1] Head, Information, Statistics and Administration, Bank for International Settlements, paul.van-den-bergh@bis.org, +41 61 280 8432.

- in order to understand the impact of debt restructuring, a differentiation will need to be made between gross and net issues, both in terms of amounts outstanding and new issues;
- those interested in debt positions and debt servicing capabilities might prefer data on a residual maturity rather than original maturity basis;
- analysts interested in tracing the importance of credit risk transfers are particularly interested in monitoring securitisation;
- in order to analyse the growing role of non-bank financial institutions, measures of the securities issues held through institutional investors are important;
- concerns about currency mismatches may lead analysts to pay particular attention to the use of the domestic currency vs foreign currency in domestic and international securities markets;
- measures of the value of household wealth, or of collateral used in financial transactions, require information not only on the contractual/face value of securities but also on their market value;
- information on holdings of securities may be useful in order to understand who is exposed to particular issuer categories (such exposures can often be altered through transactions in derivatives markets so that good data on these markets may also be necessary);
- in order to understand the openness of the national capital markets, analysts may want to have accurate data on the issuance activity of non-residents in domestic markets as well as on the holdings of domestic securities by non-residents;
- to analyse competitive pressures in capital markets and the impact of structural changes (deregulation, consolidation, innovation) in markets, a distinction may need to be made between national/domestic securities markets and international markets;
- those interested in market infrastructures may want to know the amount of securities used as collateral and the volume of trading, clearing and settlements of securities and the impact of securities settlement on payment systems.

For central bankers, the financial stability issues related to securities markets have clearly become more important over time. Previous episodes of financial instability have shown the dangers of excessive build-up of debt as well as the risks of mismatches between the maturity or currency of debt and that of related assets or cash flows. For example, businesses that issue commercial paper to finance long-term projects are vulnerable to surprise increases in interest rates or the drying up of liquidity and funding in the related markets. Governments that have tax revenues in local currency and debt in foreign currency are vulnerable to exchange rate depreciation, even if the initial level of debt is not especially high. Existing sources of data on issuers and holders of debt securities often provide few details on currency, maturity or other key characteristics of the debt. More recently, analysts have tried to track the growth in markets for securitised debt. Here too, limited information has been readily available from existing sources.[2]

[2] Some Governors of BIS shareholding central banks expressed a particular interest in better measures of securitisation during a meeting at the BIS in January 2007. It would be important to know, for instance, how much double counting may occur, for instance when asset-backed commercial paper is issued by a SIV or conduit against a pool of assets containing collateralised debt obligations that are themselves issued against asset-backed securities (for mortgages, credit cards or corporate credits).

National statistical agencies and central banks have been trying to compile aggregate securities statistics that can meet various needs of users and that are compatible or consistent with international statistical methodologies. In any data compilation exercise it is important to establish clearly in advance the purpose of the effort and the use that will ultimately be made of the data. It is also important to ensure, as far as possible, that statistics are internationally comparable and can be linked to other datasets used for economic, monetary and financial analysis.

Data used in financial stability analysis and reports. The analysis of securities markets plays an important role in financial stability reports published by many central banks around the world, as well as by international financial institutions. Since the recent financial turmoil has focused on developments in the credit markets in major financial centres, debt securities statistics have been exploited in much detail nationally and internationally. Analysis has been carried out, for instance, of the size of subprime mortgage instruments outstanding, both in terms of absolute amounts and as a relative share of global securities issues. There has also been interest in knowing the size of securitisation through special purpose entities such as SIVs and conduits, in particular asset-backed commercial papers. Moreover, analysts have struggled to identify the owners of subprime instruments and their exposures (direct through legal ownership and indirect through credit risk transfers such as credit default swaps or insurance).

More generally, central bank financial stability reports in many emerging and developing countries have carefully described recent developments in their securities markets. One aspect has been to illustrate the (often shrinking) size of international securities that are part of countries' external debt. Another has been to document the emergence and growth of local currency domestic securities markets, which are seen by many as a positive sign of financial deepening. In order to promote the development of securities markets, there have been various regional and international initiatives to bring together reference material on such markets, including statistics on issuance and holdings (these reference databases, such as the ADB's Asian Bond Monitor or the World Bank's Gemloc Program are broader than just statistical datasets and also include descriptions of the local market structure, regulation and operations).

Recent international recommendations to improve securities statistics. In May 2007 the G8 Finance Ministers issued an action plan for developing local bond market in emerging market economies and developing countries. This included the broadening of the database on EME bond markets, particularly with respect to currency composition, maturity and coverage of corporate bond issues. In January 2008 a follow-up conference was held to assess implementation of the recommendations to date. Progress was noted with respect to improving and compiling internationally comparable securities statistics and the development of an international compilation guide for securities statistics. Suggestions were also formulated for refining the Coordinated Portfolio Investment Survey (CPIS) and for studying the potential advantages and costs of a global security-by-security database. Some of these issues were discussed under agenda item 8 at the workshop (see below).

In June 2007 the Committee on the Global Financial System (CGFS) issued a paper on financial stability and local currency bond markets, which contained relatively comprehensive data on these markets in various countries around the world. In order to improve data on local currency markets it proposed that central banks work with the BIS to strengthen national securities statistics and their regular dissemination through the BIS securities statistics. Specific proposals included better breakdowns by instrument, currency of issue, sector of issue and maturity, as well as measures of debt securities outstanding at residual maturity. Some proposals also related to estimates of aggregate holdings of securities by broad sector, at least for non-residents. As discussed under agenda item 8, the BIS has started to follow up on these various proposals with many central banks represented at the workshop.

Issues for discussion:

1. *Most recent attention in securities statistics has come from the perspective of financial stability. What are the specific user requirements with respect to monetary stability? Are these likely to pose new or specific challenges in coming years?*

2. *In terms of financial stability, many requirements have been identified in the context of promoting the development of efficient securities markets in emerging and developing countries. What data challenges have arisen as a result of recent financial turmoil in more mature financial centres? Are these similar to or different from the issues identified in official reports from the CGFS and G8?*

3. *The recommendations for improving bond markets, particularly in emerging markets, have included suggestions for improving transparency through better disclosure of key information of interest to potential investors and borrowers. How important are official statistics on bond market activity in this respect?*

2. Sources of debt securities statistics

The issuance, custody, trading and transfer of ownership (settlement) of securities are highly automated processes. Moreover, nowadays most debt securities exist only in dematerialised form and are increasingly held by end investors through institutional vehicles such as pension funds, insurance companies and investment funds. The latter rely on specialised custodians to manage the administration of their portfolios. So, in principle, there are many potential types of data sources on securities issues and holdings that can be used by statistical data compilers.

Institutional sources. In most countries and markets, securities issues need to be announced (a market or regulatory authority usually keeps an issue calendar in order to avoid issues being concentrated on the same dates). Securities are deposited in the account of central securities depositories (CSDs) and custodians, who keep track of the ownership of securities (in some countries there are also registrars who keep a register of the holders of a company's debt and equity). Securities are traded on exchanges or over the counter, which results in some form of documentation and matching of trades. Finally, transactions need to be settled, ie the transfer of ownership needs to be recorded in the books of CSDs or custodians and the respective amounts paid.[3] CSDs work together to develop securities numbering systems, such as the International Securities Identification Number (ISIN) under the auspices of the Association of National Numbering Agencies (ANNA). In most cases these institutional sources can provide detailed data on individual securities issues.

Commercial sources. Since market participants need to have timely information on key securities reference and price data, various specialised commercial data vendors offer services domestically and internationally for reference and corporate actions data as well as for timely price data of individual securities. Rating agencies also sell information on the securities they rate. Because of their purpose, these commercial sources provide information at the level of individual securities. Commercial data vendors consist of large multinational companies that sell very large databases of information on international and domestic securities, as well as smaller specialised vendors that cover particular jurisdictions or instruments.

[3] After trading has taken place, a central counterparty sometimes clears the trades by interposing itself between buyers and sellers, thereby reducing the number of transactions to be settled.

Official/regulatory/supervisory data. Most countries will have a central office for government debt management, which can provide data on issues, and sometimes holdings, of government debt.[4] Data on issues and holdings by banks and other financial institutions, among others, can probably be obtained from money and banking statistics, special financial market statistics, various supervisory reports and/or regular surveys. Official surveys of securities transactions and holdings of households and non-financial corporations may also be conducted at regular intervals. Many countries have reporting requirements or administrative procedures for non-resident issuers that can be used. Additionally, countries with International Transaction Reporting Systems (ITRS) will be able to obtain detailed information on individual cross-border portfolio investments. Other countries may have similar reporting systems.

Custody data. Most securities have only one issuer, price and rating, as well as a series of specific individual characteristics. However, they typically have a wide range of holders, many of which hold titles to the securities through various institutional investors (pension funds, insurance companies, and mutual funds). The latter in turn hold their securities with specialised custodians, which in turn hold accounts with a Central Securities Depository. The result is a structure of layered securities accounts, which normally identify the holdings of securities only at their respective level.[5] Most of this information is, of course confidential and proprietary.[6] In order to track the changes in ownership of securities, the only approach might be to conduct regular surveys of custodians at different levels in the chain of holdings.

Combining different sources. Although it is mostly available in electronic form, information on securities is typically spread across different organisations and applications. For countries with highly developed securities markets in particular, with many specialised market segments and competing trading platforms, the information may be greatly decentralised. It is therefore a challenge to develop accurate and comprehensive securities statistics. Even where information is readily available from one or more sources, a major difficulty from a statistical compiler's point of view will be that the various sources use different classifications schemes and data exchange formats. This may make it difficult to group data and construct meaningful aggregates with relevant breakdowns. It may also make it difficult to track particular new developments or innovations, unless they have been identified separately.

Particular challenges are posed by very short-term securities, whose lifespan is limited to a few quarters, months or even less. Other challenges relate to the tracking of gross issuance, redemptions, corporate actions such as mergers and acquisitions, restructurings, and net issuance. Consistent data on amounts outstanding (stock) and net issuance (flow) are therefore not easy to come by. The biggest challenge, of course, remains the tracking of the ownership of securities since it is difficult to establish at every point in time the precise ownership (and therefore the SNA sector allocation) of all securities issued, particularly when they are actively traded in secondary markets and regularly used within collateral operations; session 6 addressed these issues in more detail.

One constraint facing compilers is that information in most of the available sources is not constituted to feed statistics but to support business decisions. Owners of information do not have an interest in providing their data in a way that is immediately of use to statistical

---

[4] However, data from state and local authorities (and their enterprises) may be less easy to collect, particularly in countries with strongly decentralised political structures.

[5] In countries/jurisdictions where the ownership of a company's debt securities and equity is tracked by a registrar, the latter often knows only the name of the nominee holder, and not necessarily that of the ultimate holder.

[6] Some large custodians sell aggregate information on flows through their custody accounts as an indication of market trends, for instance in terms of institutional investment flows to individual countries or instruments.

compilers. A particular concern or frustration for statistical compilers is the quality of data sold by data vendors. Commercial data providers are not typically familiar with the categories of statistics (for example SNA '93 or ESA '95 classification) and do not have an incentive to upgrade their databases to meet the requirements of statisticians. After all, central banks or other statistical agencies are not the major clients of these vendors. Cost-benefit trade-offs may therefore be difficult to make with respect to purchasing commercial data sources.

Methods of collecting and combining source data. There are two basic methods for compiling securities statistics: a direct or security-by-security approach based around information on individual securities, and an indirect or aggregated approach relying on aggregate reporting by, and/or surveys of, appropriate institutions. The first method taps directly into a range of micro databases at different organisations, while the second collects data in a standardised form and relies on compliance by reporters such as issuers and lead managers. Both approaches have their relative merits and drawbacks.

Reporting systems on an aggregated basis impose a greater burden on the reporters, because they have to calculate the prices of securities and complete the necessary aggregations as well as use of proper classifications. This system requires the reporters to maintain a securities database and a register of statistical classifications. In contrast, in security-by-security compilation, data are collected for each single security from various sources. Compilers themselves then complete the necessary filtering, categorisation and aggregation. This requires compilers to maintain a securities reference database. The advantages of a security-by-security approach were discussed in more detail in session 6 of the workshop (see below).

Timeliness of available data. Whatever method is used, there are various steps involved in the compilation and dissemination of securities statistics. Whereas available securities statistics might be relatively useful to understand structural developments in securities markets as well as the microstructure of the markets, they may be more difficult to use when there are major and rapid market developments. Indeed, when market tensions start to affect market conditions significantly, it may take some time before all the source data can be combined and adjusted to take account of new developments and to support the analysis of specific issues.[7]

The fact that statistical data are normally available only some time "after the fact" can pose a major challenge for central bank policymakers. In the summer of 2007, for instance, events in financial markets were moving at a rapid pace and important decisions needed to be made within short time frames and with limited information. The Reserve Bank of New Zealand was able to obtain some information for monitoring developments on a near real-time basis and for supporting the decisions that were made to ensure the stability of the financial system.

Issues for discussion

1. *Is it possible to convince owners/vendors of commercial and institutional securities databases to improve the quality of their data to meet statistical requirements? Alternatively, can statistical requirements be redefined such that vendor data could be readily used, thereby reducing the cost to and burden on both reporters and data compilers?*

2. *Much information on individual securities issues is publicly available, for instance from institutional sources. Is there a mechanism to ensure that it can be obtained*

[7] A security-by-security database combined with tick-by-tick price/transactions data and a monthly security-by-security reporting system for holdings might be reasonably flexible. Still, in times of turmoil additional information might be required in order to track developments specific to the event.

and exploited by statistical compilers of official securities statistics? How difficult is it to reconcile aggregate and individual securities data obtained from different sources?

3. *It might be possible to track data on issues/issuance of securities statistics on a more or less ongoing basis. Since measurements of holdings of securities will continue to require the conducting of surveys of direct or indirect (institutional investors) portfolio owners, what is the most realistic frequency with which this information can be obtained without putting undue burden on reporters and compilers?*

3. Methodological approaches and country experiences in compiling statistics on debt issuance

Reflecting the relative state of development of their national securities markets, securities statistics differ considerably from one country to another. Many of the statistics have also evolved over time. For instance, in most cases the early development of securities markets sees the issuance of short and, if there is enough monetary stability, long-term debt instruments, primarily by the government. This is normally followed by debt issuance by banks and, subsequently, by other financial institutions. Issues by the non-financial corporate sector, at least the private one, tend to come at a relatively late stage (securities issuance by this sector tends to start with equity). As markets develop and grow, the complexity of the number of instruments and issuers grows and local currency instruments become more important. For securitisation to emerge, proper operational, legal and governance arrangements need to be in place.

Much of the development of securities markets is determined by regulations, for domestic as well as cross-border transactions. At the domestic level, banks, institutional investors and other resident sectors might initially have regulatory requirements to hold their securities portfolios, in particular domestic instruments (eg government debt). External capital controls may limit issuance in the domestic markets by non-residents, as well as issuance abroad by residents. Regulations may also constrain the holdings by residents of issues by non-residents. Only the (central) government is allowed/able to borrow in the international markets, typically in foreign currency.

In such controlled environments, the collection and compilation of securities statistics may be relatively straightforward. However, as markets develop and controls are relaxed, the complexity of securities transactions may grow very rapidly and quickly pose major challenges for statistical compilers. Sometimes statistical data are available from different national sources, which are not always compatible or comparable. Central banks play an important role in the area of securities statistics as a result, probably, of their responsibility for compiling balance of payments, financial account, and other financial statistics.[8]

Differing national practices. A preliminary analysis of the national data published by a number of countries indicates that national practices in compiling and disseminating securities statistics differ significantly from one country to another. Some countries, such as the United States and the euro area, have developed securities statistics based on the principles of the financial accounts framework. They measure the issuance of all the resident sectors, irrespective of whether these are in the domestic or international markets. Others,

[8] Of course, national statistical institutes may also have a vital role to play in collecting and compiling securities data.

such as Australia, follow the same approach but also calculate separate data for their domestic market, including issuance by non-residents in their jurisdiction. Many emerging and developing countries also focus on their domestic markets, but, as mentioned above, this might be the result of the fact that cross-border issuance and holdings are restricted by capital controls. In most cases, however, the methodological notes attached to the national statistics make it very difficult to know exactly what they cover.

Breakdowns by institutional sector, instrument, currency and maturity differ significantly from one country to another. Most countries provide debt securities data at nominal/face value and at original maturity. There is typically no consistent set of data that reconciles amounts outstanding and gross and net flows. Sometimes a specific set of securities receives special attention in official statistics. This is typically the case for government debt as well as for commercial paper (the latter is covered in much detail for the United States, for instance).

Compiling information on issuance and holdings. Most national securities statistics focus on the issuers of securities, ie on the liabilities side of the different sectors in the economy. Little information is provided on holdings of securities, and is scattered in separate data on balance sheets of the individual sectors. Not surprisingly, data on ownership are most detailed for banks and other financial intermediaries such as pension funds, insurance companies and investment funds. In terms of global cross-border holdings, the major source is the Coordinated Portfolio Investment Survey, now organised annually by the IMF. Although the data are also available from the "mirror image" of the CPIS, some countries separately survey the holdings by non-residents of domestic securities (this was discussed in more detail in session 6 – see below).

Sources and compilation methods. Official compilers of statistics tend not to produce much detailed information on the underlying sources for securities statistics, or on the underlying method(s) for calculating them. Apart from the euro area countries, it is very unclear, for instance, which countries have developed a security-by-security database or are in the process of developing one. Other types of reference metadata that would allow us to understand the context of the securities statistics are also lacking (see below).

International comparability of securities statistics and their quality. For some time, the BIS has been collecting data on domestic debt securities issues from selected central banks, or indirectly from other published or unpublished national sources. Information on international and domestic debt issues is published in the Statistical Annex of the *BIS Quarterly Review* and is also made available on the BIS website, www.bis.org. The collection of information from national sources has been a challenge, particularly in terms of identifying and categorising the different statistics and comparing them internationally.

Since there is no specific international methodology for compiling securities statistics,[9] one way to assess the quality of national securities statistics, and their international comparability, is to use the IMF's Data Quality Assessment Framework (DQAF). This Framework is in six sections. In addition to a set of prerequisites for data quality, it covers five dimensions of quality: integrity, methodological soundness, accuracy and reliability, serviceability, and accessibility. It is probably fair to say that many official securities statistics fall short of best practice in one or more of these dimensions.

Taking the "prerequisites of quality" first, in many countries there is no legal or institutional framework for collecting, compiling and disseminating securities statistics, although central banks seem to be playing a major role in this area. Resources for this type of statistical exercise are often insufficient and quality awareness limited. In terms of "integrity", most

[9] As argued below, the SNA financial accounts and the BPM6 portfolio investment methodology provide only a high-level framework.

national compilation exercises might benefit from better processes to ensure that the principle of objectivity in the collection, processing and dissemination of statistics is observed. This might require greater professionalism of the staff involved and more transparency in the public dissemination of the data. It is probably in the area of "methodological soundness" that most progress can be made, by individual statistical compilers, and collectively. Indeed, more efforts should be put into determining the scope of securities statistics, developing appropriate concepts and definitions, maintaining proper classifications (in particular for sectors and instruments), and agreeing on accounting rules (eg valuations).[10]

Improvements in these areas will probably contribute to improve the "accuracy and reliability" of securities statistics as well, since compilers will be able to upgrade their data management procedures and statistical techniques. As a result, the "serviceability" of securities statistics, which is currently probably insufficient, might be enhanced in the foreseeable future. Securities statistics would therefore become more relevant, ie be in line with (evolving) user requirements, as well as more timely and more consistent. Finally, improvements could be anticipated in the "accessibility" of securities statistics, at the national, regional and international level.

Issues for discussion

1. *What approaches have individual statistical organisations used to compile national official securities statistics? Has it been determined by the state of development of their respective national securities markets?*
2. *Have compilers applied relevant international standards for categorising key elements in securities statistics such as sectors, instruments, stocks and flows, interest income, accounting rules, maturity, currency?*
3. *Have compilers looked at data from other countries to identify how their national data could be compared to those from other countries? How useful is the IMF DQAF for evaluating the quality of securities statistics? What are the major weaknesses in securities statistics from this perspective?*

4–5. Specific methodological questions regarding debt securities issuance

In order to improve global comparison of securities statistics, it would probably be useful to develop a common methodological framework that compilers can refer to and implement. As mentioned in session 8 (see below), thought is being given at the international level to drafting such guidelines. The workshop is a good opportunity to identify specific methodological questions, particularly with respect to debt issuance statistics.

Anchoring methodologies in the financial account framework. It is possible to develop a model for securities issuance statistics on the basis of established international statistical standards such as those for national and financial accounts, money and banking statistics, as well as the BOP and IIP. Table 1 shows the securities statistics from the perspective of the financial accounts. These are meant to show the asset and liability positions of the major sectors of the economy: the general government, non-financial corporations, financial

[10] The development of an international compilation guide for securities statistics could probably make a major contribution. This was discussed in session 8.

corporations, households and non-residents. The full financial accounts would show a sector-by-sector matrix, ie flow of funds from/to any one sector to/from all the other sectors.

It is not straightforward for users/analysts to derive securities statistics directly from these accounts since the securities markets are not identified as a separate sector of the economy, unlike banks or other financial intermediaries. Intermediation through the securities markets therefore needs to be tracked by looking at the instrument breakdown of the assets and liabilities of the various sectors of the economy. The securities instruments would be one component within each of the cells in this matrix. The financial accounts framework by itself does not generally provide a detailed breakdown by type of debt instrument, currency and maturity, although it could be extended to provide such additional detail.[11]

"Residency of issuer" vs "location of issue". With respect to securities issuance, the approach most consistent with the financial account framework would be to classify securities issues on the lines of "residency of issuer" as shown in Table 2. The focus would be on the global issuance activity of the domestic sectors of the economy, ie in the domestic and international markets (the latter consists of jurisdictions of other countries or multiple jurisdictions). One would thus look at the entries in the table vertically. Issuance by non-residents in the domestic markets would, in principle, be included in national statistics of other countries.

Alternatively, a "location of issue" approach would classify debt securities statistics based on the geographic delineation of securities markets. Indeed, each country would normally have a national regulation to govern the operation of its national securities/capital market. Such regulation would spell out who is allowed to issue securities; what instruments can be used; and whether there are disclosure, listing, registration and numbering requirements. The statistical framework would thus capture securities that have been issued in the domestic market/jurisdiction by all sectors, residents and non-residents. In other words, one would be looking at the entries in the table horizontally. National data from other countries could be used to obtain data on issues by residents abroad, as well as on issues by non-residents abroad in local currency.[12]

One complication that arises with the "location of issue" approach will be the treatment of exemptions that some countries make in the regulation of issuance of certain international or offshore securities. These may include the reduction in disclosure, listing or registration requirements. Regulation in this securities market segment could also be delegated to self-regulatory organisations such as the International Capital Markets Association. Such exemptions may be granted to attract business to the offshore part of the securities markets where non-residents can issue, purchase and trade securities. They also facilitate the issuance/placement of issues by residents.

The first key methodological question for compilers of securities issuance statistics to address might thus be whether a distinction should be made between domestic and international issues/markets. The latter are captured, on the basis of commercial and institutional sources, by the BIS international debt securities statistics, as shown in Table 3. They cover most, if not all, of the issues by residents of each country abroad, in domestic and foreign currency, as well as their issues in the domestic market in foreign currency. The BIS domestic securities issuance statistics are meant to cover only domestic issues by

[11] The balance-sheet approach promoted by the IMF in fact extends the financial accounts framework to provide a number of such breakdowns.

[12] A clear delineation of domestic and international issues would be necessary in order to allow international comparisons as well as the aggregation of securities issuance statistics at the global level. There is a clear risk of double-counting, also because some securities issues are placed simultaneously in more than one market.

residents in local currency.[13] It has been pointed out, however, that the segregation of domestic and international securities data may be less relevant when financial markets become more open to foreign users and providers of funds.

Breakdowns by sector, instrument, maturity, currency. A number of recent studies or policy papers have suggested that, whatever "market distinction" is made, a minimum number of additional breakdowns would be useful for the analysis of securities markets from the perspective of financial stability analysis.

As shown in Table 4, a more refined sectoral breakdown could be provided. For instance, the general government could be broken down into central government, state and local government, and social security funds. For financial corporations a distinction could be made between the central bank (eg its issuance of sterilisation bonds), banks (monetary financial institutions), investment funds, insurance companies, pension funds, and other financial corporations and financial auxiliaries. Also, in order to capture the securities issues resulting from securitisation a separate category could be created for special purpose vehicles, which are used to pool the underlying loans and to issue the securities in the market. Finally, an even finer distinction could be introduced to differentiate between public and private financial corporations and non-financial corporations, or between domestic and foreign-controlled financial and non-financial corporations.

Although the concept of residency might be relatively straightforward and in line with other international statistical standards, a particular issue arises in the context of securities issuance. Indeed, in some cases issues are placed by non-residents using a special company set up for the sole purpose of placing "local" securities. In a strict sense, these are resident entities, though they exist only for the purpose of issuing securities by non-residents. The question therefore arises of whether for statistical/analytical purposes they should be categorised as resident or non-resident.[14]

Data on the issuance of debt securities by each of these sectors could be broken down in different ways. A currency breakdown could usefully be made, with at least a distinction between local and foreign currency issues (possibly with the separate identification of issues in the major foreign currencies). Another would be to distinguish between the maturity of securities issues: short term (one year or less), and long term (more than one year). Original maturity would be used, though it might be useful to also have data on a residual maturity basis. A more detailed breakdown could be made for the type of instrument, for instance coupon type (fixed, variable, zero), rating, or collateralisation/securitisation (asset-backed, mortgage-backed, collateralised debt obligation). Whereas maturity and currency are standard concepts in financial statistics, there is no agreed detailed international classification of financial instruments.[15] International guidance might therefore be useful on the classification of debt instruments.[16]

---

[13] In some cases the BIS can obtain local currency domestic securities statistics directly from national sources. Where countries adopt a residency of issuer approach in their national statistics, the BIS subtracts from the national data the corresponding international securities data it has for the respective issuers resident in that jurisdiction.

[14] Under the methodologies for aggregate euro area securities statistics, these entities are treated as non-residents.

[15] For the euro area such a classification has been developed by the ECB.

[16] There is also the issue of whether debt securities instruments/statistics should include private placements. Moreover, new innovative financial instruments can have "hybrid" characteristics and could thus be classified as debt securities, equities or financial derivatives depending on which characteristic is considered decisive by the compiler.

Table 4 shows how a data template could be developed along those lines. Although the number of entries might look large, for many countries only a few of them would be relevant or significant. One could therefore capture the most important statistics on issuance with less than 50 time series. Also, in terms of implementation of a more coherent framework, countries could start with the key breakdowns and then provide more detail over time as their debt securities markets develop and mature. In some cases more breakdowns may be available, such as other subsectors of the financial corporation sector.

Stocks, flows and valuations. As for the financial accounts more generally, securities issuance statistics could, in principle, be made available not only in terms of amounts outstanding (stocks) but also of issuance (flows). The latter would distinguish between gross issues, repayments and restructurings. If, in line with SNA and BPM methodology, debt securities issues were to be measured at market value, there would be a need to record valuation changes separately.[17] However, even for face/contractual value the question is how to deal with (partial or full) reimbursements and how to determine what is included in the issue price (and nominal value) and what is not (eg accrued interest).

Reference metadata. In order to understand individual series on securities statistics, or related groups of series, it will be useful for analysts to have a minimum amount of so-called reference metadata. This would cover non-statistical information on the securities market in individual countries (as shown in Annex Table 5). The information would indicate, among other things, the various publications (printed or on websites) where national/domestic securities statistics might be available. Metadata would definitely be required for users to be able to identify whether compilers are following a "location of issue" or "residency of issuer" approach. Clarity on the approach used is absolutely essential for data analysts before they look at further breakdowns in the numbers by subsector, currency, instrument and maturity.

Issues for discussion

1. *Existing international statistical standards, such as the SNA, might provide a good general framework for securities statistics from a perspective of monetary analysis. In contrast, a similar framework for financial stability purposes is largely lacking (eg operational definition of a financial company group, bond insurance, links between securities and derivatives). What are the key/priority methodological issues that should be addressed in the development of a compilation guide for securities statistics that would allow both monetary and financial stability considerations to be taken properly into account?*

2. *How useful is the distinction between domestic and international markets for users and compilers of statistics in mature financial centres and emerging/developing countries?*

3. *Which methodological approach could be used to develop statistically useful measures of securitisation? Would a specific sectoral category for issuance by special purpose vehicles (under financial corporations) be a useful step forward?*

6. Statistics on holdings of debt securities

There is little doubt that there is a paucity of data on the holdings of securities. With the growth in primary and secondary market activity, the increasing role of institutional investors,

[17] It should be noted that other Manuals, such as the one for Monetary and Financial Statistics, recommends market valuation.

and the rapid expansion in cross-border portfolio investments it is almost impossible to track the ultimate ownership of individual securities on an ongoing, real-time basis. The only remaining solution is to carry out regular or ad hoc surveys of registrars, custodians, securities depositories, banks and other financial institutions such as institutional investors, as well as households and corporations in order to measure developments in their holdings of securities portfolios. This can be combined with direct or indirect information on holdings, which may be available from tax authorities (through, for instance, interest income of households and non-financial corporations) and supervisory reports (eg from banks and other financial institutions).

Table 6 shows the analytical detail that some users are requesting in terms of holdings of debt securities. For the issues of each major sector, it would be useful to have aggregate data for the holdings by the other major sectors. Note that the sectoral breakdowns in the rows and columns in the matrix might be different. Aggregate holdings by the government sector might be sufficient, whereas for financial corporations a breakdown may be provided for the central bank, monetary financial institutions (banks), institutional investors (with a possible further breakdown, for instance, for pension funds, insurance companies, investment funds, hedge funds and sovereign wealth funds), non-financial corporations, households (these are not in the columns), and non-residents. Moreover, as recommended by the CGFS, the holdings matrix could be collected separately for short-term and long-term instruments. Of course, further instrument breakdowns might, in principle, be required (eg currency).

Cross-border holdings of securities: the CPIS. Interestingly, most of the information on securities holdings that is readily available concerns cross-border holding. This is probably related to the fact that cross-border portfolio investment flows have grown significantly in recent decades and have been the dominant type of international capital flows during certain periods. This has resulted in greater interest on the part of policymakers and analysts in adequate information on these developments.

An important initiative in this area has been the Coordinated Portfolio Investment Survey (CPIS) conducted by the International Monetary Fund for the first time in 1997 and then on an annual basis since 2001. The objective of the CPIS, which now involves 74 reporting countries, is to collect comprehensive information on the cross-border holdings of securities by the domestic sectors, ie monetary authorities, banks, other financial institutions (insurance companies, mutual funds and other), general government and non-financial sector (non-financial companies, households and other). Holdings include those held directly by the end investors and/or through custodians. The information is collected on a residency of issuer basis with geographic breakdowns (eg holdings of US residents of securities issued by residents of every vis-à-vis country). Securities include equities and debt securities (short-term and long-term) issued by non-residents in their national market, in international markets and in the domestic markets of the holders (separate data are available for equities and debt securities).[18]

Before the CPIS, most national statistical agencies were already collecting the related information on a regular basis in order to calculate the portfolio investment assets in their own country's IIP. The CPIS is now providing more detailed standards for the collection of such information, ensuring that the conduct of national surveys is done for a common reference period and according to a common framework. Moreover, and most importantly, the IMF can calculate and publish the mirror view of these holdings, ie the derived portfolio investment liabilities of individual countries. These can then be used by national statistical agencies to compile their country's international investment/liabilities position with the

[18] Sectoral and currency breakdowns are also available at the individual country level.

sectoral and instrument breakdowns. In addition, the agencies can improve the calculation of the investment income in their national balance of payments and exchange bilateral data with other reporting countries.

Looking through layered holdings of securities. As described above (p. 5) many holders of securities keep their portfolio through accounts with custodians and central securities depositories. Also, many categories of owners, in particular households and non-financial corporations, hold securities indirectly through investment funds, insurance and pension funds. These various chains increasingly involve non-resident organisations, which further complicates the task of statisticians, who are trying to look through these layered holdings of securities.

Of particular interest are the challenges posed by repurchase agreements and securities lending and borrowing.[19] Most of these transactions imply a change in legal ownership of the securities. In many cases, counterparties in these transactions use an intermediary such as asset managers, custodian banks and specialised third-party agents, some of whom may be located abroad. All this makes it very difficult for custodians to distinguish their clients' outright sales/purchases from repurchase and securities lending operations when completing survey questionnaires on securities holdings. Various international expert groups have looked at the issue and have noted that information on repurchase and securities lending transactions is hard to come by and to take into account in securities holding statistics (including CPIS). The challenge is likely to be as important when an aggregate measure of securities holdings is used by compilers as when a security-by-security approach is taken.

Holdings and exposures. The growing use of credit risk transfers, including financial derivatives, means that credit, market and liquidity risk exposures of the different categories of holders can be very different from what the data on outright holdings suggest. Indeed, resident and non-resident investors can employ a broad variety of derivative instruments and strategies to gain (additional) exposures, including the use of credit default swaps, total return swaps, credit-linked notes, exchange-traded and OTC interest rate swaps and futures, and deliverable and non-deliverable currency forwards.[20] Insurance instruments and guarantees can also be used to shift credit risk to, or away from, direct holders of debt securities. Moreover, the use of these instruments allows exposures to be changed very rapidly, and much faster than can be traced by observing changes in direct holdings of securities.

Issues for discussion

1. *What are the adjustments/issues to take into account when reconciling holdings and issuance statistics for debt securities?*

2. *What improvements could be made to the CPIS in order to improve its relevance for tracking cross-border holdings of debt securities (eg frequency, classification of instruments)? Some countries publish separate data on cross-border securities holdings: why do these sometimes differ from CPIS data?*

3. *Legal holders of debt instruments may not be the ones bearing the ultimate market risk exposures (eg due to the use of derivatives) or credit risk exposures (eg due to insurance). Is it possible at all to envisage statistical measures of the actual*

---

[19] The paragraph draws on the paper presented by R. Chaudron at the 56th ISI Session in Lisbon (August 2007) on "Collecting data on securities used in reverse transactions for the compilation of portfolio investment: How to compromise between theory and practice".

[20] The 2007 CGFS report provides examples of how non-residents use derivative instruments to gain and manage exposures to local currency domestic debt instruments in the case of Brazil, Korea and Mexico.

exposures and their distribution across different categories of resident and non-resident sectors?

7. Security-by-security databases as a tool to improve securities statistics

A security-by-security database (SDB) is a repository of information on individual securities. For each security a number of characteristics are documented, sometimes grouped under different headings. For small databases, simple lists or spreadsheets can be maintained, whilst for more complex repositories, a relational database might be developed. The individual securities are first numbered, for instance using a national numbering system or ISIN codes. The database is then populated with information on the various characteristics of each security. This typically includes issuer data (name of issuer, sector, country, listing), instrument information (currency of denomination), event information (coupon dates) and price information (including ratings). The list of attributes can be as long as compilers/users require.

SDBs are typically built on the basis of unsorted data from different institutional and commercial sources. All this information is brought together and arranged in a comprehensive way. Duplications, errors and gaps are cleaned up. For large datasets containing millions of securities, powerful computers and sophisticated database software are used. Annex Table 7 provides a visual representation of a relational SDB database .

Benefits for compilers. Having a security-by-security database may have major benefits for compilers of securities statistics, in particular by reducing the reporting burden of reporting agents and improving the quality of the compilation of securities statistics. The normal starting point for compiling aggregate securities statistics would be to develop a reporting template that would satisfy user requirements, and to ask the appropriate reporting agents to mine their internal data to report this information on a regular basis. Reporters would classify their internally available information in terms of the statistical reporting forms, which is resource intensive (in many cases they rely on similar information from third parties such as securities numbering agencies). Since producing statistical reports is cumbersome (reporters are typically more interested in market concepts than statistical ones), the quality and timeliness of reports is not always sufficient. Moreover, as markets and user requirements evolve, the reporting templates and procedures would have to be adjusted along the whole chain.

A reference database for individual securities statistics could significantly reduce the resources involved. In fact, reporting agents would no longer need to map their internal data into statistical reports but could provide relevant information per individual security in their database. For instance, in terms of holdings, custodians would need only to provide data on the instrument codes and the number of debt securities held for each (category of) holder(s). Part of the reporting and database management costs is shifted from reporters to compilers, who will classify information according to statistical methodologies (eg sectoral and instrument breakdowns; stocks, gross and net flow calculations; original vs residual maturity estimations). Since classification is performed centrally by the compiler, the quality of the classifications can, in fact, improve significantly.

It should be pointed out that an SDB in itself does not constitute statistical information. A framework is required for translating the detailed information into appropriate statistical concepts and data, for instance to produce input for the calculation of the financial accounts, BOP, IIP and CPIS. Programs need to be developed for mining/reading the database to produce relevant statistics or conduct specific research.

Benefits for users. For analytical and research purposes, most users in central banks and outside would probably be satisfied with quality aggregate data on securities issues and holdings with adequate breakdowns. As securities markets become more complex and internationalised there may be an interest in more detailed disaggregated data or in combining different breakdowns (such as original and residual maturity). Sometimes a panel of individual securities data might be put together to analyse common developments, for instance for specific securitised debt instruments. The availability of a reference database of individual securities that supports the calculation of aggregate statistics allows this drill-down.

An SDB could, for instance, shed light on the financing of particular sectors (eg internet start-ups, real estate companies). It could also provide information about the size of particular market segments or the importance of particular instruments (fixed vs floating rate, securitised debt issues, subprime/junk debt). Other uses might be to track the number of rating upgrades or downgrades, (the impact of price changes on the value of particular types of collateral), or to estimate future payment flows resulting from coupon payments or corporate events.

A full-fledged SDB that includes detailed data on holdings would allow users not only to carry out traditional "institutional" analyses, but also to take a market approach to tracking the behaviour of issuers and holders. It would facilitate not only the from-who-to-whom analysis in financial accounting but also an in-depth review of market liquidity (eg through bid-ask spreads) and the degree of integration between markets. It could thus satisfy a very broad range of user needs.

Although the principal users of a SDB will be economists and statisticians in central banks, it should be possible, in principle, to use the information for other purposes as well. For instance, the database could be used to support central bank operations, as a source for collateral that could be eligible for open-market or lending operations.

Costs of SDBs. Although there my be a strong case for developing and maintaining a securities database, the benefits have to be weighed against the costs. Indeed, the initial development costs for setting up a security-by-security database may be significant. Commercial databases are not cheap and may be incomplete. Contacts with other data providers need to be set up for regular reporting or for conducting surveys. IT costs for database storage and processing may have come down significantly in recent years but could still be significant if a relational/dynamic system is developed instead of a simple "static" application, and/or if the volume of data starts to rise rapidly. A minimum amount of manual intervention will be necessary to develop and maintain the quality and timeliness of the individual pieces of data.

Experience with the CSDB in Europe and elsewhere. Recognising the benefits of an SDB approach, ECB and the euro area member central banks launched a major project to develop a Centralised Securities Database (CSDB). The initiative to develop the CSDB was launched in 1998 and officially approved by the ESCB Governing Council in June 2002. The main objective of the project is to compile a reference database of securities, issued by euro area residents and likely to be held or transacted by euro area residents. Compilation takes place by assembling data about individual securities issues from commercial sources and data reported by national central banks, cleaning it up, and in the future possibly incorporating all available information about holders. During the first phase, completed in April 2005, the ECB implemented a relatively "slim" version of the CSDB using an initial set of data. During the second phase, which is currently ongoing, the national central banks will be granted online access and the database will be enhanced in order to use it for regular statistical purposes. A later phase is expected to cover the collection of data on the holders of the securities stored in the CSDB.

The CSDB project has been complex and costly, from both a methodological and an operational perspective. One of the major challenges has been to deal with the legal obstacles preventing the exchange of data between the ECB, national central banks, the BIS

and a few statistical offices. Other issues were related to the availability of human, financial and IT resources. Finally, data quality had to be addressed regarding the classification of issuers, prices, coverage, and links between issuers and securities. The BIS has been, and continues to be, actively involved in the development of the CSDB. Its experts have participated in the meetings of the ECB statistical groups. The BIS also shares its international securities database with the ECB and assists in the CSDB's quality checking (in return it has access to the CSDB data).

Other central banks outside the euro area have also built, or are considering building, such databases.[21] They include the Bank of Canada, the Bank of Thailand, the Central Bank of Malaysia, the South African Reserve Bank, and the Reserve Bank of New Zealand.

Challenges in developing and maintaining an SDB. Developing and maintaining an SDB can pose significant challenges. One major problem is the relation with institutional and commercial data vendors who provide much of the raw data for the database. They should ensure a minimum level of quality of the underlying data, in particular its coverage of the respective markets/instruments. Statistical agencies may not be the major clients of these organisations, so contract negotiations, including on service level arrangements, might be difficult. One open question is whether data providers might have an interest in having access to part or the whole of the SDB, and would thereby benefit from the quality management conducted by the central bank or national statistical institute.

Another challenge is to ensure that the SDB can be adapted to changing user demand. For instance, in June 2005, the Irving Fisher Committee on Central Bank Statistics organised a workshop, cosponsored with the Bank of Canada, on "Data Requirements for Analysing the Stability and Vulnerability of Mature Financial Systems". It identified a number of areas in which existing data could be better exploited, including the development of SDBs. It also noted that it would be desirable for data on individual securities to be linked with balance sheet information of the entities that issue them, particularly financial and non-financial corporations. The Bank of Canada's proposed SDB includes a linkage to issuing companies' balance sheet information.

Linkages between SDBs? In the late 1990s, discussions were initiated by the IMF with various international organisations, including the BIS, and national statistical agencies to review the possible advantages and disadvantages of promoting national security-by-security databases. One idea was also to develop a global clearing house for the national data, in other words, gradually to establish a global security-by-security database. While the concept seemed appealing in principle, there was a major uncertainty about the cost-benefit of such a global initiative. It was agreed to await the outcome of the CSDB project of the ECB before making any further analysis of the advantages and disadvantages of security-by-security databases and of a possible project to integrate them internationally.[22]

Issues for discussion

1. *How convincing is the case for developing a security-by-security* (sec-by-sec) *reference database as a tool for compiling official statistics on debt securities issuance and holdings? What are the crucial elements determining the cost-benefit trade-off for developing a national sec-by-sec database?*

---

[21] A number of central banks in emerging markets have a de facto security-by-security database for their domestic market, as they operate all the principal components of the securities market infrastructure, including the national CSD and a delivery-vs-payment securities settlement system.

[22] The IMF has recently taken the initiative to reconvene the Working Group on Securities Databases (see below).

2. *Do sec-by-sec databases need to combine information on issuers as well as on holders? Is it possible to start with the former and then extend it to the latter? Could information on holdings be left in satellite accounts and linked to the reference database?*

3. *How could reference data from sec-by-sec databases be linked to other data sources such as balance sheet information of issuers?*

4. *What is the scope for sec-by-sec databases to provide information for ad hoc research or analysis as well as for supporting central bank market and lending operations?*

8. Cooperative efforts to improve securities statistics

Any efforts to improve the availability and international comparability of securities statistics must start with initiatives at the national level to improve national data. Various international and regional initiatives have probably contributed to convincing policy makers to support efforts in this area and to make additional resources available. Specific compilation guidelines might assist countries in collecting and compiling relevant data, and to making them publicly available in a user-friendly format.

Improving exchange of data among compilers. Efforts to improve security statistics may require a greater exchange of data among statistical compilers. As compilation methods come to rely more on security-level data there may be occasions when data exchange will conflict with legal requirements for data confidentiality. Even in the absence of legal constraints, the prospect of unwanted disclosure could lead to lower-quality data as respondents seek ways to avoid reporting. Mechanisms may need to be found to overcome these constraints.

Regional initiatives. Regional initiatives may help to focus attention on the need to improve securities statistics. For instance, the development by the ECB and the European System of Central Banks of a Centralised Securities Database has had major implications for the organisation and governance of central bank cooperation on securities statistics in the European Union. A common legislative framework may need to be developed for this, and financing and resource sharing arrangements worked out. In other regions, the regional development banks have taken initiatives, or are envisaging initiatives, to support improved statistical data on domestic securities markets.[23] These are often part of a broader set of actions to improve the efficiency and transparency of domestic bond markets through better disclosure of key information that interests investors and borrowers.

International initiatives. At the international level, the IMF Financial Soundness Indicators included a number of recommended indicators on securities markets, including indications of the stage of development in domestic markets and specific measures of market depth and tightness. More recently, in response to the recommendations made by the CGFS and G8, the IMF has reconvened the Working Group on Securities Databases. The Group, which includes the BIS and ECB as well as national central banks, has agreed to draft a Compilation Guide for Securities Statistics. The intention is to have a concise reference document, anchored in existing international statistical standards, that will address the key methodological issues identified at the IFC workshop, and will include some templates and a list of reference metadata. The Guide will focus initially on statistics related to issuance of

[23] This includes the Asian Development Bank, African Development Bank, Inter-American Development Bank, and European Investment Bank.

debt securities but will eventually be expanded to cover other securities as well as securities holdings. The Guide will contain an annex that will describe the advantages and disadvantages of security-by-security databases as a tool to support the compilation of securities statistics, and possibly a number of best practice recommendations in this area.[24]

Improving the BIS securities statistics. With respect to improving actual data on securities statistics on the lines of the analysis and proposals made by the Committee on the Global Financial System, the BIS has launched a project to improve its domestic and international securities statistics. In October 2007 it contacted most of the central banks in the countries included in its domestic securities statistics, in order to achieve a regular reporting of some key national/domestic securities data and related documentation.[25] The BIS asked for central banks' assistance in bringing together the existing national/domestic data from different sources and reporting them using a coherent framework. The exercise does not require central banks to introduce a new reporting system within their countries. The focus is on data that are already available, either stored in statistical databases or published in statistical bulletins and websites of central banks or other agencies.

The BIS exercise does not favour or recommend a residency of issuer or location of issue approach. However, central banks have been asked to explain better what approach is being taken in their national/domestic securities statistics, and which details they have for debt issuance securities in terms of sector, instrument, maturity and currency. A simple set of reference metadata questions have also been circulated (see Table 5). So far no actual data have been reported but the qualitative information submitted is being reviewed by BIS statisticians and discussed with contact persons at central banks. It will form the basis for the mapping of national data into time series codes to be used for regular reporting to the BIS. The intention is to receive the securities market data from individual central banks on a regular quarterly basis in future. In parallel, the BIS is also improving its international debt securities statistics, in order to align them better with the national data it will be collecting. The intention is to disseminate an improved set of data in the *BIS Quarterly Review* and on the BIS website by the end of 2008.

Issues for discussion

1. *Are the various initiatives being considered to improve the availability and international comparability of securities statistics transparent to the national compilers? Should additional initiatives be envisaged?*

2. *How can national experts be (better) involved in various international initiatives to improve securities statistics? Would central banks be the natural contact point for any international initiative, even if other national statistical agencies or data owners/sources are involved in the development and maintenance of securities statistics?*

3. *Would national compilers benefit from a broader discussion on the advantages and disadvantages of security-by-security databases, including the sharing of country experience and of particular technical expertise (eg information model, database design)?*

---

[24] Once the ECB and ESCB project on the Centralised Securities Database is implemented the Working Group might discuss the possibility of creating a global securities database.

[25] This has not included the central banks of the euro area since they already publish a broadly comparable set of aggregated securities statistics that is generally consistent with the framework developed by the BIS. At some point the BIS will discuss with individual euro area central banks and the ECB how the data can be mapped into the reporting and dissemination template.

Table 1

Securities statistics in the financial account framework

Debtor sectors (issuers) / Creditor sectors (holders)	General government	Non-financial corporations	Financial corporations	Households	Non-residents	Total Assets
General government						
Non-financial corporations						
Financial corporations						
Households						
Non-residents						
Total liabilities						

Table 2

Two main approaches to compile debt securities issuance statistics

	Breakdown / Sectors		General government	Financial corporations	Non-financial corporations	Residents	Non-residents	Total
Location of issue	Domestic market	Local currency						
		Foreign currencies						
		All currencies						
	International markets	Local currency						
		Foreign currencies						
		All currencies						
	All markets	Local currency						
		Foreign currencies						
		All currencies						
			Residency of issuer					

Table 3

BIS international and domestic securities statistics

	Breakdown / Sectors		General government	Financial corporations	Non-financial corporations	Residents	Non-residents	Total
Location of issue	Domestic market	Local currency	DDS	DDS	DDS	DDS	IDS	
		Foreign currencies	IDS	IDS	IDS	IDS	IDS	
		All currencies					IDS	
	International markets	Local currency	IDS	IDS	IDS	IDS	IDS	
		Foreign currencies	IDS	IDS	IDS	IDS		
		All currencies	IDS	IDS	IDS	IDS		
	All markets	Local currency						
		Foreign currencies						
		All currencies						
			Residency of issuer					

IDS: international securities.

DDS: domestic securities.

Table 4

Key breakdowns in debt securities issuance statistics

Sectors / Instruments[1]	General government[2]		Financial corporations[3]			Non-financial corporations[6]	All residents	Non-residents[7]
	Total	Of which central government	Total	Of which central bank	Of which special purpose entities[5]			
Local currency								
Short term[8]/total								
Long term[9]/total								
Floating rate								
Straight fixed rate[10]								
Inflation indexed								
Exchange rate linked								
Hybrids[11]								
Other[12]								
Total debt securities								
Memo item: long term at remaining maturity up to one year								
Foreign currencies								
Short term[8]/total								
Long term[9]/total								
Floating rate								
Straight fixed rate[10]								
Inflation indexed								
Hybrids[11]								
Other[12]								
Total debt securities								
Memo item: long term at remaining maturity up to one year								

For footnotes, see the end of the table.

Table 4 (cont)

Key breakdowns in debt securities issuance statistics

Sectors / Instruments[1]	General government[2]		Financial corporations[3]			Non-financial corporations[6]	All residents	Non-residents[7]
	Total	Of which central government	Total	Of which central bank	Of which special purpose entities[5]			
All currencies								
Short term[8]/total								
Long term[9]/total								
Floating rate								
Straight fixed rate[10]								
Inflation indexed								
Exchange rate linked								
Hybrids[11]								
Other[12]								
Total debt securities								
Memo item: long term at remaining maturity up to one year								

[1] Debt securities exclude repurchase agreements, ordinary shares, options, swaps, rights, warrants, and other financial derivatives. [2] General government – central government, local government, state government, and social security funds. [3] Financial corporations – central bank, deposit-taking corporations (such as banks, credit cooperatives, building societies), money market funds, non-money market funds, other financial intermediaries (such as investment corporations, finance companies, lease companies), financial auxiliaries, captive financial institutions and money lenders (such as special purpose entities), insurance corporations, and pension funds. [4] Special purpose entities include special purpose vehicles, conduits and structured investment vehicles. [5] Non-financial corporations – national public non-financial corporations, national private non-financial corporations, and foreign-controlled non-financial corporations. [6] Residents – general government, financial corporations, and non-financial corporations (households and non-profit institutions serving households are excluded since they do not issue debt securities). [7] In case a location of issue approach is taken. [8] Also referred to as money market instruments. They include: treasury bills; bills of exchange; bill acceptances; bill endorsements; certificates of deposit issued with original term to maturity of one year or less; unsecured commercial paper issued with original term to maturity of one year or less; asset-backed commercial paper (ABCP) issued with original term to maturity of one year or less; promissory notes issued with original term to maturity of one year or less; and other one-name paper with original term to maturity of one year or less. [9] Also referred to as bonds and notes. They include: certificates of deposit issued with original term to maturity of more than one year; unsecured medium-term notes, bonds and debentures; asset-backed debt securities with original term to maturity of more than one year; inflation-indexed and exchange rate linked bonds; straight fixed rate instruments as well as floating rate notes and other floating rate debt securities; hybrid debt securities, such as subordinated bonds and notes, perpetual debt securities, preference shares (including those that are redeemable); convertible notes and bonds prior to conversion; stapled notes and bonds; euro medium-term notes, euro notes, and eurobonds; and other long-term debt securities issued with original term to maturity of more than one year. [10] Straight fixed rate instruments include zero coupon bonds. [11] Hybrids combine features of two or more different financial instruments, eg convertibles. [12] Other could include Islamic instruments.

Table 5

Reference metadata for debt securities statistics

What are the basic regulations governing the operation of the national/domestic securities/capital market?
What is the name of the regulatory organisation(s) for the securities market?
Are there particular disclosure requirements for issuers of debt securities?
Is there a national issue calendar? Who keeps it?
What are the listing requirements for issuers of debt securities? What are the major exchanges where debt securities are traded? Are securities traded over the counter?
Are there particular registration requirements for holders of securities?
Is there a national securities numbering system? How does it relate to the International Securities Numbering system?
Which sectors are allowed to issue into the national/domestic markets: government, banks, non-bank financial institutions, non-financial corporations, non-residents?
Is there a list of permissible instruments that can be issued in the national/domestic market, including asset-backed securities and collateralised debt obligations?
What currency can be used for issuance in national/domestic markets: local currency, foreign currencies?
Are there exemptions or special provisions in national regulations for “international” securities issues? Is there recognition of the International Capital Markets Association as a self-regulatory organisation for the international segment of national market?
Can/do residents issue securities abroad? In domestic and foreign currency? What data sources are available to measure this?
Can/do non-residents hold domestic securities? What data are available to measure this?
Is the domestic currency used in issues by non-residents in other national/domestic markets? What data are available to measure this?
What are the basic data sources for securities statistics?
What is/are the major central securities depository/ies for securities? What is/are the major clearing and settlement system(s) for debt securities?
Is there a security-by-security database for issues in the national/domestic market? Which one? Who operates it? Is it developed or used for statistical purposes?
Who is the official compiler/publisher of aggregate national securities statistics? What are the major relevant publications or websites?
What is the frequency with which securities statistics for your country are published?

Table 6

Key breakdowns in holdings of debt securities

Issuers / Holders	General government		Financial corporations			Non-financial corporations	All residents	Non-residents
	Total	Of which central government	Total	Of which central bank	Of which special purpose entities			
Short-term instruments								
Government								
Financial corporations/total								
Central banks								
Banks								
Institutional investors								
Special purpose entities								
Non-financial corporations								
Households								
All residents								
Non-residents								
Long-term instruments								
Government								
Financial corporations/total								
Central banks								
Banks								
Institutional investors								
Special purpose entities								
Non-financial corporations								
Households								
All residents								
Non-residents								

Table 6 (cont)

Key breakdowns in holdings of debt securities

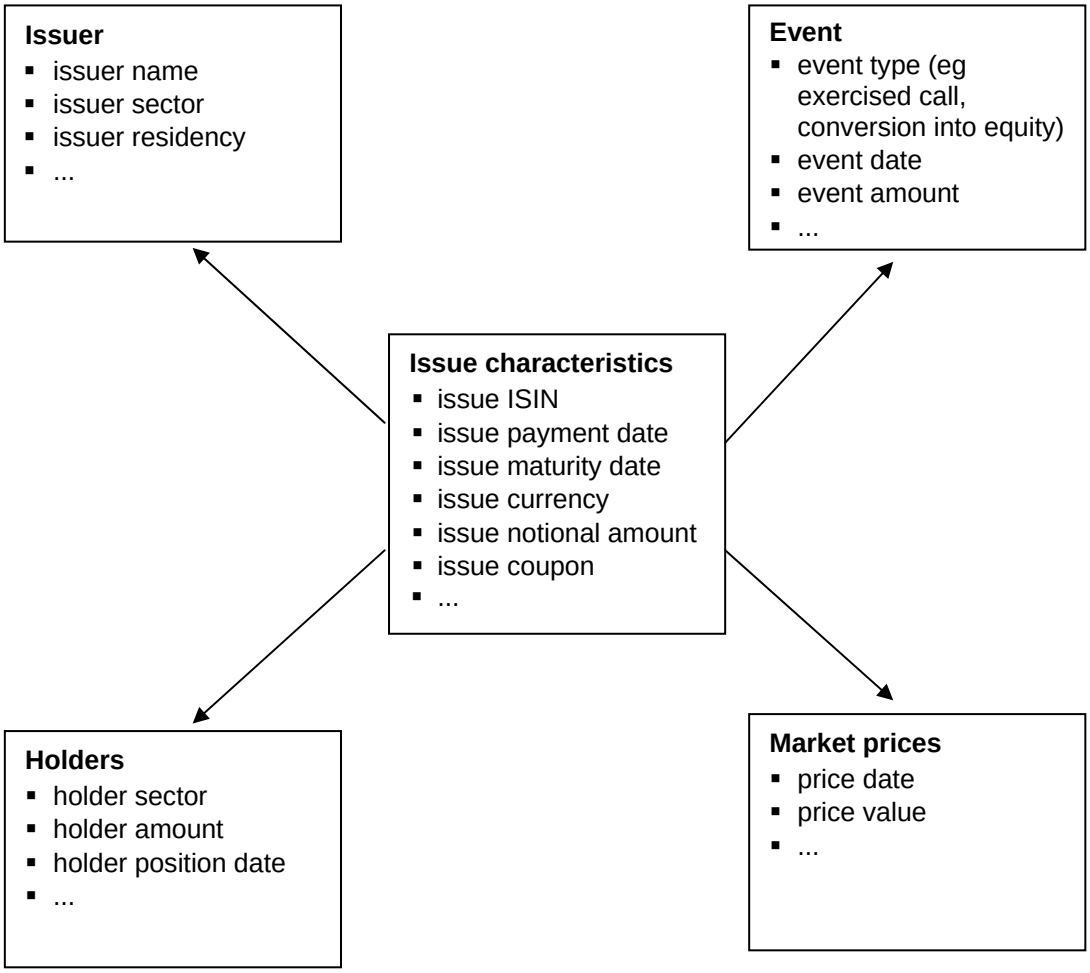
Issuers / Holders	General government		Financial corporations			Non-financial corporations	All residents	Non-residents
	Total	Of which central government	Total	Of which central bank	Of which special purpose entities			
All instruments								
Government								CPIS
Financial corporations/total								CPIS
Central banks								CPIS
Banks								CPIS
Institutional investors								CPIS
Special purpose entities								CPIS
Non-financial corporations								CPIS
Households								CPIS
All residents								CPIS
Non-residents	CPIS*	CPIS*	CPIS*	CPIS*	CPIS*	CPIS*	CPIS*	CPIS

CPIS: Coordinated portfolio investment survey.

CPIS*: Mirror view of the coordinated portfolio investment survey.

Table 7

Representation of a security-by-security database



Session 1

Uses of securities statistics

Chair: Joe Gagnon, Board of Governors of the Federal Reserve System

Paper: Data requirements for monitoring financial stability in emerging market economies
Hermann Remsperger and Bernd Braasch, Deutsche Bundesbank

Data requirements for monitoring financial stability in emerging market economies

Hermann Remsperger and Bernd Braasch[1]

I. G8 initiative on local currency bond markets

I.1 Background

Market corrections in some emerging market economies in 2006 have raised concerns about the extent to which this country group has overcome its underlying vulnerabilities – in particular, currency and maturity mismatches. Moreover, this interest has been intensified by further challenges that lie ahead for financial markets in emerging market economies and some developing countries. Emerging market economies have been contributing to the financing of large global imbalances, but in the process, they are becoming more exposed to sudden shifts in the direction of global capital flows. The second challenge, and one of the most important, is the ongoing process of institutionalisation of saving and its implications. Institutional investors such as pension funds, life insurance companies and mutual funds use international diversification of portfolio investments. These factors, like global liquidity and the risk appetite of global investors, are major determinants of the development of domestic bonds in emerging market economies and developing countries.[2]

With this in mind, G7 Finance Ministers and Central Bank Governors agreed (at their meeting in Essen in February 2007) that developing local currency bond markets deserves higher political priority. At their meeting in Potsdam, G8 Finance Ministers endorsed an Action Plan on developing local currency bond markets in emerging market economies and developing countries.

The G8 Action Plan includes seven key recommendations. One is a broadening of the necessary database to underpin in-depth analysis of financial stability issues. G8 Finance Ministers have therefore asked relevant international finance institutions to identify any data gaps. According to the philosophy of the G8 Action Plan, data needs for analysing vulnerabilities are of special relevance.

I.2 Implementation report and broadening the database

Based on recommendations of the IMF, the World Bank and G7 Deputies, the G7/G8 Finance Ministers endorsed an implementation report on the G8 Action Plan in October 2007. This implementation report also has a number of implications for international initiatives on broadening the database.

With regard to the recommended broadening of the database, the following recent and planned actions are of special interest for the future work programme:

---

[1] Hermann Remsperger, Member of the Executive Board of the Deutsche Bundesbank; Bernd Braasch, International Relations Department, Deutsche Bundesbank

[2] See Deutsche Bundesbank, "Bond markets in emerging market economies", *Financial Stability Review 2007*, November, pp 113–31.

(i) On the recommendation of the IMF, the Working Group on Securities Databases (WGSD) has been reconvened. The members of the WGSD are the ECB, BIS, IMF, World Bank and some central banks. The Working Group is one of the key elements for implementing the recommendations on broadening the database. At its three meetings since September 2007, the WGSD discussed a future work programme and mandatory aspects.

(ii) As a follow-up to the Committee on the Global Financial System (CGFS) report on financial stability and local currency bond markets,[3] a CGFS subgroup has made some recommendations, in particular, for broadening the securities database. These recommendations will be integrated into the broader work programme of the WGSD.

(iii) The Federal Ministry of Finance and the Deutsche Bundesbank co-hosted a G8 follow-up conference on "Bond markets in emerging market economies and developing countries – Financial globalisation, vulnerabilities and data needs" in Frankfurt in late January 2008.[4] The Irving Fisher Committee on Central Bank Statistics organised a workshop on "Challenges to improve global comparison of securities statistics" in March 2008. The results of both conferences have contributed to a further fine-tuning of the work programme of the WGSD. In the short term and working with high priority, the WGSD will produce a handbook and compilation guide on debt securities to enhance – inter alia – the international comparability of securities statistics, and on broadening this database.

(iv) The discussion up to now has also identified some mandatory problems that have to be overcome during the next few months. Members of the WGSD agreed that other identified and important data needs, particularly with regard to financial stability issues, go beyond its mandate. Both conferences reinforced the view that an intensified and regular dialogue between experts in financial stability and in statistics would appear to be necessary in order to identify future data needs. This dialogue should be focused on challenges of dynamically ongoing changes in market structures, in new instruments and transmission channels. What remains to be clarified is the extent to which established working groups can meet these important future challenges, or whether a new working group should be created. Central banks should be involved.

The IMF and the World Bank have been asked to present an annual report on progress made in all areas of the G8 Action Plan, including broadening the database. In this context, the IMF and the World Bank will organise a conference. The results of this conference will deliver further background material for fine-tuning the progress report, the assignment of tasks and the future schedule. The results of the IFC Workshop as well as the discussion in the other relevant Working Groups will therefore contribute to this planned G8 follow-up conference.

---

[3] Committee on the Global Financial System, "Financial stability and local currency bond markets", *CGFS Papers*, no 28. June 2007.

[4] The presentations can be found on the Bundesbank`s website: www.bundesbank.de/presse/presse_aktuell.en.php. The High Level Workshop 2007, co-hosted by the Federal Ministry of Finance and Deutsche Bundesbank, which contributed to the G8 Action Plan, you can find on the Bundesbank`s website: www.bundesbank.de/vfz/vfz_konferenzen_2007.en.php. Both conferences will be shifted to the Bundesbank website: www.bundesbank.de/international relations, which will be built up in the near future.

II. Criteria for evaluating and prioritising data needs

Priorities for broadening the database can be derived from various criteria and with different perspectives. According to the Action Plan, one of the key questions is whether, and to what extent, emerging market economies have overcome underlying vulnerabilities and what challenges lie ahead.

Identifying data needs and closing the gaps is a three-stage process: (i) Now and in the near future, the most important financial stability questions which it has not been possible to answer owing to a lack of data, will need to be evaluated, and priorities set; (ii) In a second stage, we have to evaluate how far existing data resources meet the necessities ahead and are internationally comparable; (iii) In order to contain the input for newly collected data, we have to evaluate the net effort involved.

III. Identifying data needs – several dimensions

Identifying data needs can be guided by several methodical aspects, which may result in quite different levels of data needs.[5] These various aspects beyond developing local currency bond markets are of paramount importance. We have to keep in mind that the development of local currency bond markets should be seen in the context of the whole national financial system. Moreover, these markets are also embedded in the dynamic process of financial globalisation, which changes market structures and their response pattern in the event of exogenous shocks. Against this background and in a stylised and simplified differentiation, it is possible to identify the following aspects:

- A more *static view* is concerned, for example, with the data coverage of industrial countries' local currency bond markets in comparison with that in emerging market economies and developing countries. These data are of particular relevance for gaining a broader background to the development of local currency bond markets.
- In a more *dynamic view*, the initiatives are focused – inter alia – on the process of financial innovation, the changes in market structures and responses to exogenous shocks, and the further integration of local currency bond markets into the process of financial globalisation. This refers, in particular, to data for a deeper analysis of risk exposures, vulnerabilities, the portfolio channel, new investors and the implications of new strategies. Financial markets and their structures are changing dramatically, as are financial stability issues and priorities in resulting data needs.
- Financial globalisation also implies increasing challenges for the *international comparability* of financial statistics.
- *Micro data* are of increasing importance for evaluating financial stability issues. Developing local currency bond markets has – inter alia – been seen by most emerging market economies as an instrument for enabling and facilitating a shift of external debt in foreign currency to domestic debt in local currency. In particular, most emerging market economies have developed domestic bond markets to reduce currency and maturity mismatches, which had been one of the main

[5] See Hermann Remsperger and Bernd Braasch, "Priorities in broadening the database in emerging market economies and developing countries and organisation of the future work programme", speech at the conference "Bond markets in emerging market economies and developing countries – Financial globalisation, vulnerabilities and data needs", Frankfurt am Main, 1 February 2008, Deutsche Bundesbank, *Auszüge aus Presseartikeln*, no 8, 20 February 2008, pp 9–12.

determinants of the financial crises in emerging market economies. There is good data coverage for analysing these financial distortions on a macroeconomic level. But recent financial crises have shown that sectoral developments are increasingly important. We need a better data coverage beyond macroeconomic levels; this is especially true considering the shift of risks from the financial sector to the household and corporate levels.

All initiatives in this field are important. But with regard to changing risk exposures, vulnerabilities, changes in financial market structures and transmission channels, it seems necessary to give higher priority to initiatives that could be classified as having a more dynamic view and better coverage with micro data. This is also one of the clearest results of current financial market tensions.

IV. Challenges ahead

Developing financial market statistics and broadening the database should be guided by the challenges ahead and a containment of efforts for collecting new data. According to the philosophy of the Action Plan, the main challenges ahead are to take a closer and deeper look into the dynamically changing financial market structures and their implications for the changing risk exposures and vulnerabilities. Within this framework, only a few aspects can be highlighted, which were reiterated at the conference in Frankfurt in late January 2008:

(i) Financial globalisation and its implications for changing market structures and response patterns in the event of exogenous shocks are one of the key challenges for broadening the database. Transmission channels for financial disturbances, contagions and spillovers are changing tremendously. The ongoing integration of financial markets heightens the impact of shocks.[6] Empirical studies and continued research in this field are of increasing importance. Inter alia, the Bank of England's "New approach to assessing risks to financial stability" can provide fruitful guidance.[7]

(ii) Increasingly, key financial indicators of emerging market conditions are being influenced by global factors, such as global liquidity and the risk appetite of international institutional investors. For example, during the past few years, about 50% of the variance of the spread level – which is becoming increasingly important for the transmission of financial market effects to the real economy of selected emerging market economies – can be explained by these factors.[8] Moreover, these

---

[6] See Jürgen Stark, "Main challenges for monetary policy in a globalised world", speech at the conference "Monetary policy in Sub Saharan Africa: Practice and Promise", Cape Town, 28 March 2008, *BIS Review*, 35/2008, pp 18–27.

[7] See Andrew Haldane, Simon Hall and Silvia Pezzini, "A new approach to assessing risks to financial stability", Bank of England, *Financial Stability Paper*, no 2, April 2007. Inter alia, this publication can provide fruitful guidance: "A first step towards assessing the significance of vulnerabilities is to develop a better understanding of the ways in which they affect the functioning of the financial system. What are the potential shocks that could trigger the vulnerability? Which parts of the financial and non-financial sectors would be affected initially? What second-round feedback and interaction effects between the real economy and financial system, or between financial sector participants, might be set in place? And how, ultimately, would the combined effects of the various transmission channels affect UK financial system stability? Answers to these questions are fundamental to a clear and consistent understanding of the nature of each vulnerability and the risk it poses to the system." (p 4)

[8] MG Rozada and EL Yeyati, "Global factors and emerging market spreads", Inter-American Development Bank, Research Department, Working Paper no 552, May 2006.

transmission channels are proving to have an increasingly influential role in the real economic sphere.[9] In general, we should enhance our knowledge of what this dynamically ongoing process means for the stability of local currency bond markets and the financial systems of emerging market economies and developing countries as a whole.

(iii) One of the main future challenges is the dynamic process of the institutionalisation of saving. Without any doubt, globally active institutional investors are enhancing the efficiency of the international allocation of capital and risks and are one of the main driving factors behind stronger world economic growth in recent years. This dynamic ongoing process enhances the financial market channel for the transmission of shocks across different financial markets and into the real economy.[10] Among top priorities for a better and deeper understanding of the changing response patterns, including local currency bond markets, are:

- Better data on national and international investors' behaviours
- Better quality of CPIS data
- Better data on non-bank financial corporations portfolio flows and shifts in their portfolios across countries and markets, which are critical for the understanding of changing risk exposures and transmission channels.

(iv) Financial globalisation is accompanied by a faster development and dissemination of financial innovations or instruments. There seems to be a need to enhance empirical work on the extent to which these financial innovations are changing the risk exposure and vulnerabilities of financial markets in emerging market economies and developing countries. This is all the more so as, besides a number of benefits, "these developments also had two negative side effects, namely a significant increase in leverage and unprecedented growth in the marketisation of financial instruments."[11]

(v) Moreover, significant financial market risks have been transferred to the household sector, which has no sophisticated risk management system to evaluate these risk exposures. This development magnifies the necessities of broadening the database for balance sheet approaches. Here, data reliability is highest for the financial sector. Therefore, these data provide a good coverage for evaluating, for example, currency and maturity mismatches in the financial sector. However, in the meantime,

---

[9] "Overall, then the recent decline of spreads is more related to risk appetite and uncertainty regarding U.S. monetary policy than is due to country fundamentals as these variables account for over the half of the decline of spreads." Kristian Hartelius et al, "Emerging market spread compression: Is it real or is it liquidity?" *IMF Working Paper*, WP/08/10, p 2.

[10] With regard to the recent tensions: "There were a number of factors and mechanisms that played a role in the propagation and amplification of the market turmoil which neither we, nor other institutions, foresaw, at least not fully, notably: (i) the way various intertwined vulnerabilities would eventually combine; (ii) the speed and intensity with which tensions in one specific segment of the credit market in one country could spread so extensively to other markets and countries; (iii) the size of banks' off-balance sheet exposures to the US sub-prime related structured finance products; (iv) the activities, features and implications of new financial entities – conduits and other structured investment vehicles – that have been sponsored by banks and linked to them by liquidity commitments. Finally, it was impossible to predict the extent to which risks were transferred to market participants who were ultimately unable to bear them." Lucas Papademos, Address upon receiving the 2007 "Risk Manager of the year" Award of the Global Association of Risk Professionals, New York, 26 February 2008, *BIS Review*, 21/2008, p 25.

[11] See Stark (2008,) p 22.

risks have shifted to the non-financial corporate and household sector, where balance sheet data in emerging market economies are largely non-existent.[12]

In sum, analytical research on financial market development seems still to be focused on the development of yields, asset prices and relative prices. But with regard to financial stability issues, research efforts could be enhanced to obtain a better and more timely insight into the dynamically changing transmission channels of disturbances with relevance to national and global financial stability. Taking an isolated view, we have some high-quality data on sectoral developments, but one of the main lessons of the current financial market tensions has been that "alarm bells have rung" at junctions in the network of international financial markets that had not previously been identified as critical.

V. Shortening the time lag between financial crises, identifying data needs and closing the gaps?

Against the backdrop of the current tensions, the question was raised at both conferences as to whether the time lag between financial crises, identifying data needs and closing the gaps can be shortened. This time lag is characterised by two subperiods: one potential measure to shorten the time lag between financial crises and identifying the data needs is an intensified and institutionalised dialogue about financial innovations, financial globalisation and its implications for changing risk exposures, transmission channels and resulting data needs between experts in financial stability and statistics. Another matter for further discussion is the extent to which instruments such as a Globalised Securities Database can provide a broader-based tool of available data that can be used flexibly, and at short notice, to analyse different kinds of financial instruments. In this context, one interesting question is how similar data needs and priorities are for both monetary and financial stability purposes.

Keeping these time lags short despite the rapidly changing environment of financial markets is one of the main criteria for prioritising further steps to close data gaps.

[12] "Data reliability can vary significantly by sector. In general, central bank data are most reliable, followed by data from commercial banks and other financial corporations, international investment position data, and government debt data. (...) Data on households and non-financial corporations are typically very scarce in emerging markets and in many cases are non-existent." Johan Mathisen and Anthony J Pellechio, "Using the balance sheet approach in surveillance: Framework and data sources and availability", *IMF Working Paper*, WP/06/100, 2007, p 28.

Session 2

Sources of debt securities statistics

Chair: Edit Gódorné, Director of Statistics, Magyar Nemzeti Bank

Papers:

Overview of sources for compiling securities issuance statistics
Erich Hille and Günther Sedlacek, Austrian National Bank

Data sources for the compilation of the Norwegian securities statistics
Ole Petter Rygvold, Statistics Norway

Commercial data sources
Philip Papaelias, Federal Reserve Bank of New York

Monitoring of securities held by financial institutions: merging statistical and supervisory demands
Vlastimil Vojacek, Czech National Bank

Overview of sources for compiling securities issuance statistics

Erich Hille[1] and Günther Sedlacek[2]

Introduction

From the perspective of economic, monetary, and financial stability analysis, securities issuance statistics plays an important role. The focus of these statistics is on financing of the different sectors of a specific economy by means of securities (debt securities as well as equities). The depth of the capital market considered, the role of different currencies and the demand of different sectors on capital markets can be analysed.

A wide range of collection methods and of sources exists for compiling securities issuance statistics. The choice of sources depends heavily on the chosen collection method. This paper first describes the common output requirements on securities issuance statistics and briefly discusses existing standards and some open questions. Second, different collection methods and their impact on the choice of data sources are described. The main part of this paper deals with the strengths and shortcomings of different data sources; and the final section provides some recommendations for an optimal mix of sources.

Output requirements of securities issuance statistics

The collection of stocks, ie outstanding amounts at the end of a considered period, and flows, referring to new issues and redemptions in the considered period, are common requirements regarding securities issuance statistics. Stocks and flows can be collected at nominal and/or market value. This can depend on the instrument (straight bonds vs zero bonds or deep discounted papers; shares), and on the aim of the statistics.

According to the needs of analysts and researchers, stocks and flows can be further broken down by the following dimensions:

- Issuer-related attributes (eg issuer country,[3] sector, economic activity, rating information)
- Instrument-related attributes (instrument type, original and residual maturity, type of interest, nominal currency).

Existing standards can be used for most dimensions; the economic sector can be based on the National Systems of Accounts (NSA) or on the European System of Accounts (ESA); the economic activity can be based on the ISIC[4] or – in Europe – on the NACE[5] code. The instrument type as well as the original maturity could also be based on the classification of

[1] Deputy Head, External Statistics and Financial Accounts Division, Austrian National Bank, erich.hille@oenb.at.

[2] External Statistics and Financial Accounts Division, Austrian National Bank, guenther.sedlacek@oenb.at.

[3] In some cases, also the market, on which an issue is placed in, is of interest.

[4] International Standard Industrial Classification of all economic activities.

[5] Nomenclature statistique des activités économiques dans la Communauté européenne.

financial transactions in the NSA/ESA. However, this breakdown is insufficient for many analytical purposes; thus, a more detailed standardised breakdown of the type of instrument and of (original/residual) maturity is desirable. In future, the CFI code[6] will probably be able to address a number of problems that have concerned the financial community in recent years.

Collection systems and corresponding data sources

For other securities statistics, two different collection schemes can be applied to collect information on securities issues:

1. A security-by-security (sec-by-sec) scheme using identifiers (mostly the ISIN[7]) for securities
2. An aggregated basis scheme under which precompiled data is requested from respondents.

A security-by-security reporting system collects the required amounts (outstanding amounts, issues and redemptions) for each individual security. The compiler aggregates these data according to the required output dimensions (eg issuer sector and economic activity; maturity, interest rate information etc) by using a comprehensive securities database, which is linked to an issuer database. For the collection of outstanding amounts and the accordant flows as well as for the collection of issuer and instrument related attributes, in principle, all financial data management systems using a security identifier are possible data sources.

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

A mixture of both collection systems, security-by-security and aggregated, can also be applied. A sec-by-sec scheme might be used for available ISIN codes and/or for reporting agencies in the financial sector; aggregated schemes can be used for securities without an ISIN code and/or for reporting agencies in the non-financial sectors.

A further aspect to classify collection systems refers to the data sources (for instruments and issuer data) used.

- In a direct reporting system the information needed is collected from the issuer or lead manager, who has primary responsibility for organising bond issuance. Direct sources can be used for aggregated and sec-by-sec collection systems. In aggregated systems, available reporting forms originally developed for other statistics (such as statistics about monetary financial institutions) or balance sheet information can also be used (in an adapted form). In sec-by-sec systems, direct reports of issuers and/or lead managers could supplement or even completely replace indirect sources.
- In an indirect data collection system, the required data are all collected from institutions not directly involved in issuing the security. Different indirect data sources can be distinguished according to their role in the financial market:

---

6 ISO 10962 Classification of Financial Instruments.

7 International Security Identification Number (ISO 6166).

– Numbering Agencies (ANNA,[8] National Numbering Agencies)

– Financial data providers (eg Bloomberg, Reuters, Financial Times Interactive Data)

– Market-supporting institutions (eg stock exchanges, clearing and settlement houses, centralised securities depositories)

– International organisations and statistical institutes (eg ECB, BIS, Eurostat, National Statistical Institutes).

Indirect sources are mainly applicable for security-by-security collection systems. In practice, a mixed sec-by-sec data collection system using direct and (a combination of) indirect sources is often applied.

Pros and cons of different data sources

The indirect data sources are manifold and have different strengths and shortcomings concerning the compilation of securities issuance statistics.

Numbering Agencies, maintaining registers of local issues, keep track of all issues in their area, independent of the residence of the issuer. They usually cover a high percentage of securities issued by residents. However, not fully covered by National Numbering Agencies are securities of residents issued abroad,[9] and issues where the issuer has not requested an identification number.[10] Usually the issuer contacts the Numbering Agency before issuing a security; a specific set of key data has to be delivered to receive an identification number for the security (mostly the ISIN and/or national codes like the CUSIP,[11] Valoren[12]). If the issuer does not inform the Numbering Agency about changes, the database will not be updated, with consequent adverse impacts for securities issuance statistics that rely on just this data source. The list of local issues can be completed by ANNA data by adding issues that were issued abroad and might therefore not be covered by the National Numbering Agency. The ANNA database contains a comprehensive list of issues that have an official identification number (probably ISIN), but with only a few key attributes. Whether this is complete and up to date depends on the National Numbering Agencies' policies. In any case, ANNA data alone are not sufficient for building up a comprehensive securities issuance statistics.

The next group of potential indirect sources are financial data providers such as Bloomberg, Reuters or Financial Times Data. Some of the Numbering Agencies also act as commercial data providers. The customers of commercial data providers are primarily players in international markets; financial data providers are therefore primarily interested in meeting the needs of these market participants. Statisticians and economists are not – at least at the moment – very important customers. Thus, from a compiler's point of view, the coverage of neither instruments nor attributes relevant for securities statistics (sector classification, stocks

---

8 ANNA: Association of National Numbering Agencies.

9 In their role as Numbering Agency, these organisations are responsible for assigning an official identifier to securities issued in the home market. However, National Numbering Agencies often act as commercial data providers who have information about other securities as well.

10 In this case official identifiers are not available, and the necessary information has to be requested from issuers (or lead managers).

11 CUSIP: Committee on Uniform Security Identification Procedures; the CUSIP Services Bureau acts as the National Numbering Association (NNA) for North America.

12 National securities identifying number used in Switzerland.

and flows data etc) is satisfactory. This holds even more for smaller markets, but the datasets of commercial data providers can be very useful in supplementing National Numbering Agencies' data, eg with rating information.

Market-supporting institutions' data (such as those of the stock exchange) might also be useful for complementing a securities database and securities issues statistics.

In the European Union, the Centralised Securities Database (CSDB) of the ECB is becoming increasingly important for the compilation of securities issuance statistics (and other securities statistics). The CSDB is a securities database that aims to cover relevant information[13] about all issues of euro area residents, all issues denominated in euros as well as non-euro area issues in which euro area residents have invested.[14] The ECB collects this information from

- Commercial data providers,[15]
- National Central Banks (NCBs), and
- Internal data sources.[16]

The aim is to take into account, automatically, the best information available for each security. The result of this process is called the "golden copy". This model's great advantage is that the strengths of different commercial data providers as well as the knowledge and the available data of the NCBs are used to produce the golden copy. The data sent by the NCBs as well as those stored in the ECB-MFI list and OFI list are partially based on direct reports from issuers; thus, the CSDB tries to combine indirect and direct sources (via NCBs' data sources and internal sources). On the other hand, the challenge of this approach is the handling of contradictory information referring to the same attribute reported by different sources.

Information collected directly from the issuers is usually very precise and reliable. In practice, however, issuer information alone is often insufficient. Reports might not cover all issuers and/or all issues; issuers are often unable to report all the attributes required by a securities database, in particular, financial ratios or key capital market data. Furthermore, the reporting and updating of specific key data is burdensome. Table 1 gives an overview of sources for instrument information as well as related strengths and shortcomings.

---

[13] Relevant means with respect to the required securities statistics like portfolio investments as part of external stocks and flows statistics, investment funds statistics and securities issuance statistics.

[14] More information about the CSDB is given in the paper by Stefan Brunken.

[15] At the moment these are Reuters, Telekurs, Wertpapier Mitteilungen and Financial Times Data.

[16] Eligible Assets database, list of Monetary Financial Institutions (MFI list), list of Other Financial Intermediaries (OFI list, to be published for investment funds as of December 2008).

Table 1

Overview of sources for instrument information

Source	Issuers' reports	Commercial data providers	Numbering Agencies
Strengths	• reliable and precise information about stocks and flows as well as about key characteristics of their issues	• reliable and precise information about a subset of attributes, especially for international issues	• almost complete register of issues of the home market (with official security identifier) • reliable and precise information about a subset of (mostly static) attributes
Shortcomings	• reporting burden • not all issuers • not all required attributes available	• not all issuers (and issues) necessary for statistical purposes • poor quality (or even non-availability) of certain attributes	• partially outdated information (mostly for dynamic attributes, amounts) • not all required securities/attributes available

Conclusions

The following conclusions can be drawn:

- The reports of issuers and lead managers are precise and reliable; they seem to be the best data source for flows and stocks data in particular. However, they do not usually cover all issuers or all attributes of an issue. For compilers it is a challenge to identify all issuers, especially in the group of non-financial corporations, without using any additional sources. Furthermore, these reports cause reporting burdens for the issuers or their lead managers. In the case of aggregated direct reporting the breakdown of available balance sheet information or other aggregated data is usually not detailed enough to support all the users' needs.
- National registers of the Numbering Agencies and the Statistical Institutes offer almost complete registers about issuers and local issues with a good quality of static attributes. However, National Numbering Agencies might not include international issues, and attributes that change over time might be outdated. In particular, flows and transactions data are often of insufficient quality.
- Financial data providers' data lack in the coverage of local markets. The data quality for statistical purposes is – at least partially – insufficient. The data can help to complete a database with information about international issues, and help to reduce the reporting burden for issuers.

From our point of view, there is no single optimal data source. In practice, a mixed security-by-security system of direct and indirect sources seems finally to be the best option. In such a system,

- Flows and stocks data should primarily be collected directly from issuers and supplemented by information from National Numbering Agencies or Financial Data Providers in order to improve the completeness of the data;
- Key characteristics of instruments can be collected
  - from National Numbering Agencies and/or – at least for international issues – from commercial data providers in the case of official securities identifiers, and
  - from issuers, lead managers or custodians in the case of non-official securities identifiers;
- Key characteristics of issuers should be maintained in an issuer register (preferably linked to the register of the institution responsible for allocating the economic sector and activity).

Such a system takes also advantage of all the strengths of security-by-security systems, such as flexibility, reduced reporting burden etc. To reduce the compilers' costs it is recommended to compile other securities statistics like portfolio investments as part of external stocks and flows statistics, investment funds statistics, government finance statistics, financial accounts etc, as well on the basis of such a securities (and issuer) database.

References

Brunken, Stefan (2008): "Cooperation to Improve European and National Securities Statistics", Paper at the IFC workshop on "Challenges to improve global comparison of securities statistics", IMF, Washington DC, 4/5 March 2008.

ECB. *Securities issues statistics Methodological notes*. Background paper on the Web: http://www.ecb.int/stats/money/securities/html/index.en.html#info

Hille, Erich (2005): "Building a securities information system on a security-by-security basis", *IFC Bulletin*, no 23, October.

Hille, Erich and Sedlacek, Günther (2005): "Security-by-security collection system", *IFC Bulletin*, no 22, September.

Van den Bergh, Paul (2006): "Improving the Methodological Framework for Securities Statistics", Background paper for Nineteenth Meeting of the IMF Committee on Balance of Payments Statistics, Frankfurt, Germany.

Data sources for the compilation of the Norwegian securities statistics

Ole Petter Rygvold[1]

Preface

Statistics Norway is the official compiler and publisher of aggregate national securities statistics as from 1 January 2007, when the Statistics Division of the Central Bank of Norway was transferred to Statistics Norway. All the tasks were transferred; they comprise financial market statistics including securities statistics and financial accounts.

Legal framework

The legal basis for collecting securities statistics is the Statistics Act of 1989. This stipulates that Statistics Norway is the central body for preparation and dissemination of official statistics and that it is an independent institution in its field, including a comprehensive research activity.

Coverage, periodicity and timeliness

The securities statistics include on the whole statistics on securities registered with the Norwegian Central Securities Depository (VPS), mutual funds statistics, statistics on bonds and commercial papers, and statistics on Norwegian holdings of foreign securities. In the future the aim is to produce more general aggregate securities statistics, focusing on the financial instruments and not on the data sources, as is currently the case. In addition to the publication of aggregate national securities statistics, the statistics are an important input source for financial accounts, national accounts and balance of payments statistics.

Thus, on the whole, domestic securities are covered except for derivatives and a large part of shares in limited companies (which are not registered in the VPS). Norwegians' investments in foreign securities are also covered if the investments are held through domestic custodians.

The statistical information published comprises data on stocks by holding and issuing sectors, net flows by buying and selling sectors, and yield by issuing and receiving sectors for shares, primary capital certificates, bonds, commercial papers and mutual fund shares. Data are valued at market values and/or nominal values. In addition, information is published on issues of bonds and commercial papers by issuing sectors and location of the issues (domestic/foreign).

[1] Senior Adviser, Department of National Accounts and Financial Statistics, Statistics Norway, ole-petter.rygvold@ssb.no.

Statistics	Periodicity		Timeliness
	data collection	publication	
Bonds and commercial papers (issues)	monthly	monthly	one month
Securities registered with the Norwegian Central Securities Depository	monthly	quarterly	nine weeks
Mutual funds	quarterly	quarterly	ten weeks
Annual accounts for mutual funds	yearly	yearly	eight months
Statistics on Norwegian holdings of foreign securities	monthly	–	three weeks

Public access

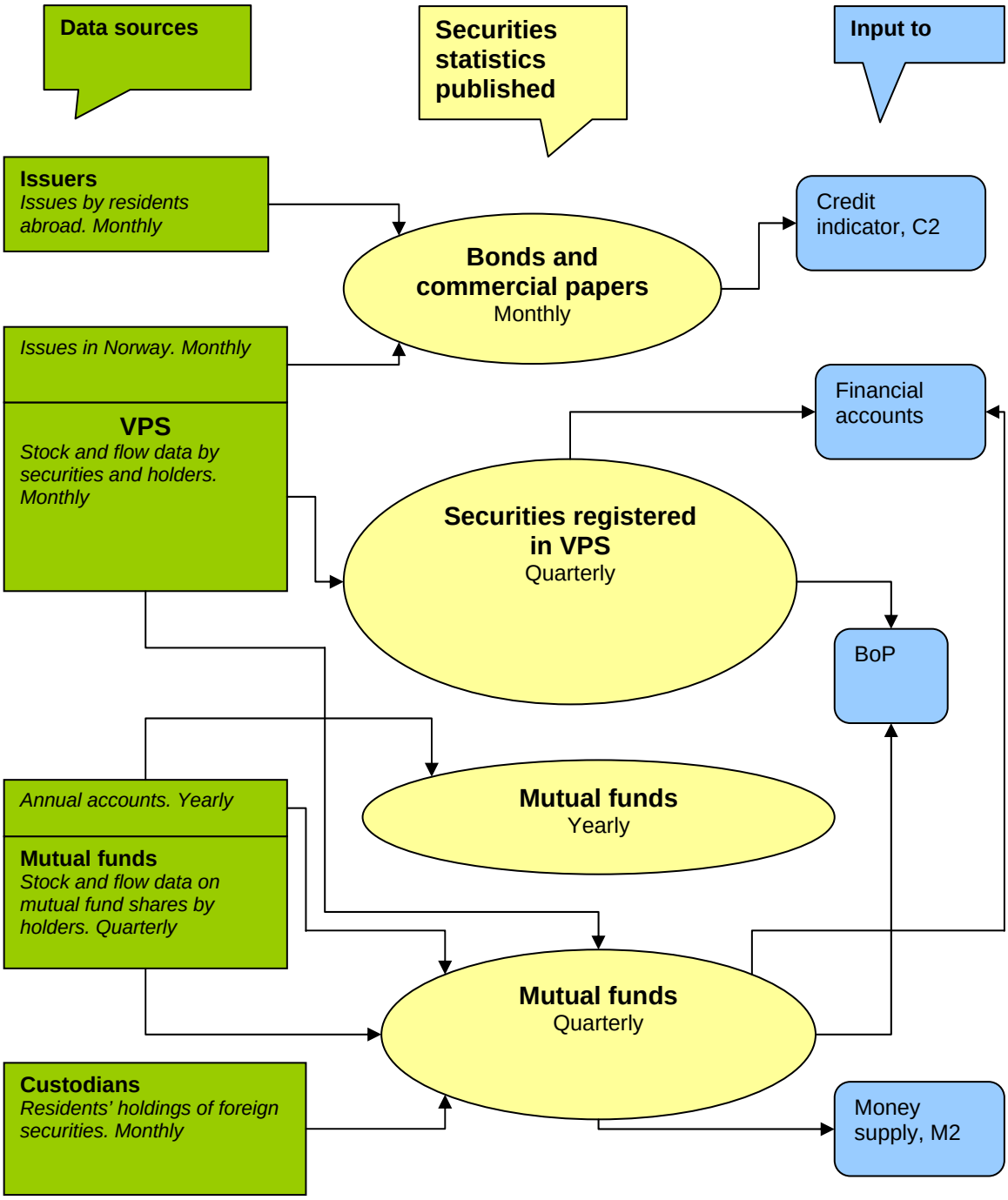
An advance release calendar for coming statistics from Statistics Norway for the next four months is updated and released every day at 10:00 on the website.Each release of securities statistics contains text, tables and one or more diagrams, and is accessible via the main website. In addition, further data is or will be available in the StatBank Norway during 2008. StatBank Norway (also found under the main website) is a service where readers can select the scope and content of each table, and then export the result in various formats to their own PC. The only release on paper is a limited set of tables in the *Statistical Yearbook*.

Data sources

General

The most important data sources for securities statistics are the Norwegian Central Securities Depository, domestic issuers of bonds and commercial papers abroad, Norwegian-registered mutual funds and custodians.

The compilation of the securities statistics has undergone several changes and improvements over the last three to four years. First, the compilation is now based on security-by-security and holder-by-holder reporting and thus information on the securities' ISIN and the IDs of both holders and issuers. Previously, aggregate information by financial instrument and holding and issuing sectors were reported or to some extent estimated.Second, compilation from domestic custodians has been established to cover residents' investments in foreign securities, ie mainly to cover such investments by small Norwegian private non-financial corporations and households. However, the coverage is not complete, as these investments also may be carried out directly abroad or through foreign intermediaries or custodians.There are also plans to establish reporting from other sources to make use of information we currently lack, including that covering domestic investments in foreign registered mutual funds.



Issues

As shown in the diagram above, the main two data sources for securities issues in the bonds and commercial papers statistics are VPS and direct reports from domestic issuers. VPS covers information on issues of shares and primary capital certificates, in addition to bonds and commercial papers issued in Norway by residents and non-residents in both local and foreign currency. The direct reports cover residents' issues of bonds and commercial papers abroad in local and foreign currency. In other words, a combination of the "residency of issuers" and "location of issues" approaches is used. Data are compiled and published (ie issues of bonds and commercial papers) on a monthly basis.

The compilation is based on detailed data at the level of individual securities/ISINs. In addition to the amount of funds raised, amount outstanding at the beginning and end of the

month, and the dates of issues and maturity, information on the name, issuer's ID, country of residence and market of issue, and issue price are reported, among other things.

Holder information

The main data sources for holder information on securities are VPS, the quarterly collection from the mutual funds and the monthly collection from custodians. VPS covers mainly domestic securities, while the custodians on the whole cover residents' investments in foreign securities. The compilation from all three sources is based on detailed data at the level of individual securities/ISINs and holder-by-holder reporting.

More about VPS as a data source

VPS was established by law as Norway's sole CSD in 1986 and is now a public company, established and authorised (licensed) through new legislation. The new legislation, in force as of 1 January 2003, allows other authorised depositories to perform the same services as VPS, but VPS is still the only authorised CSD.

VPS provides a full range of depository services to issuers and investors in the Norwegian securities market. It is a for-profit public company that in dematerialised form offers registration of ownership, clearing and settlement services, and corporate actions services for domestic and foreign financial instruments.

All shares and subscription rights issued by Norwegian public limited companies and Norwegian bearer bonds are required to be registered in an authorised CDS, ie VPS. In addition limited companies, mutual funds and other financial instruments may be registered.

Except where otherwise provided in or according to law, financial instruments may be registered either in individual accounts belonging to the individual investor, or in nominee accounts for two or more investors. In practice, however, all resident investors are registered on individual accounts, while the majority of foreign investors are registered on nominee accounts. The reason is twofold. According to law all resident holders of shares in both public limited and limited domestic companies are required to keep their shares in individual accounts. This was also the case for bonds until the new legislation for securities depositories was brought into force in 2003. Since then resident holders of Norwegian bonds have been permitted to register their holdings in nominee accounts. However, in practice nothing has changed yet. When it comes to foreign investors in domestic shares, bonds and other financial instruments, they have always had the choice of whether to register their holdings in an individual or nominee account.

Data from VPS were collected on an aggregate level by type of security and issuers' and holders' sectors on a quarterly basis until September 2006. Since then, data reported from VPS have been more or less a copy of detailed information from the register and, therefore, comprise several million records every month. The information reported is based on the date of settlement and includes the number of shares (nominal value for debt securities) that the investor holds at the end of the period, corresponding transaction data (every single one) and return data for the period in question. In addition, information about holder's ID, type of account (eg individual or nominee), holder's country of residence, nationality of holder, type of transaction, date of settlement, transaction price and/or transaction value, amount of return, type of return, ISIN, issuer's name and ID, CFI code (Classification of Financial Instruments), currency of issue, total number of outstanding shares (nominal value of bonds/debt securities) in the ISIN, and par value are reported, among other things.

More about custodians as a data source

The collection of data from custodians was established in December 2004 and is currently based on a sample of 17 custodians, ie 7 custodian banks, 8 capital asset management enterprises and 2 brokers. The information reported is based on the date of settlement and include number of shares (nominal value for debt securities) that the investor holds at the end of the period and return data for the period in question. In addition, information about holder's ID, type of account (individual or nominee), holder's country of residence, nationality of holder, type of transaction, date of settlement, transaction price and/or transaction value, amount of return, type of return, ISIN, market place, currency of trade, name and type of security, issuer's ID, currency and country of issue are reported, among other things.

Definitions and methodology

Bonds and commercial papers

A distinction is made between debt securities with an original maturity of one year or less and those with more than a year. Debt securities with an original maturity of one year or less are defined as commercial papers, while debt securities with an original maturity of more than a year are defined as bonds.

Market value

Stocks of securities are valued on basis of available market prices. For quoted domestic securities, these prices are quoted from the Oslo Stock Exchange (OSE). For unquoted domestic securities, either available purchase prices from VPS are used or, if such purchase prices do not exist, estimated market rates derived from annual assessment rates for tax purposes. If neither is available, the valuation is based on the par value.

Transaction value

Transactions in securities are valued at transaction values. For securities registered in VPS, ie largely domestic securities, this mean the observed value of the transaction, eg new shares are recorded at issue value and shares in circulation are recorded at the value at which they were traded. If observed transaction prices/values are not available from VPS, the quote price from OSE is used for the individual trading dates in order to estimate a trade value for transactions in the secondary market for quoted securities. On the other hand, estimated market rates derived from annual assessment rates for tax purposes are used for transactions in unquoted securities. If these assessment rates are not available, the valuation is based on the par value, as for the valuation of the stocks for unquoted securities.

Breakdown of institutional sectors and business enterprise sectors

The ID for a legal entity is a unique nine-digit organisation number allocated by the authorities to identify a legal entity, and making it easier for the authorities to collaborate in information exchange. The organisation number, among other data, is used to identify the entities in The Central Coordinating Register for Legal Entities (ER). This register contains basic data about entities that are under reporting obligations to various authorities, and was established to ensure that all the information is collected in one place, thus keeping the burden of reporting as low as possible. Among the basic data included in ER are the institutional and the business enterprise sectors. As Statistics Norway is the main contributor to determining the classification of the entities according to both of these variables, correct

and uniform classification is ensured. Therefore, by collecting the issuers' ID and linking it to ER, the sector breakdown obtained is more accurate and uniform, compared to collecting the sector information directly from the data sources. Similarly to the issuer side, data are compiled on the holders' ID, ie the organisation number for domestic legal entities and a fixed fictive number (for reasons of anonymity) for all holders with a personal identification number. Thus, ER is used to set the institutional sector of domestic issuers as well as of domestic legal holders of securities.

Distinct methodological approaches regarding compilation of data from custodians

In contrast to VPS, observed transactions are not reported from custodians. Hence, transactions are derived directly from stock data at the beginning and end of the period and information on market prices for every single security and exchange rate in question. The approach used for the derivation of transactions is based on the so-called "Austrian model" for derivation of transactions from stocks in the area of portfolio investment, cf supplementary documents to the ECB's "Task Force on Portfolio Investment Collection System. Final report" of June 2002. In addition to deriving transactions directly from stocks, price adjustments (based on the stocks and derived transactions) are calculated in this model. This is necessary in order to achieve a complete reconciliation of flows and stocks with all their analytical values.

Except for information on exchange rates, the compilation of data from the custodians is largely based on information collected from them. No third-party data sources, like Reuters or Bloomberg, have so far been used to collect information beyond what we gather from the custodians. However, this is something we will consider. Most of these securities are foreign securities held by Norwegians, and in many cases we receive information on the same security from several custodians, ie information that might differ in some way or other. The market price at the end of the period is one example. Another is the classification of the security. One custodian may say the security/ISIN is a share, and another that it is a mutual fund share. Or one custodian might be able to specify that the ISIN is an unquoted share, while another just specifies that it is a share. Therefore, a third-party data source for information on all the securities/ISINs reported through the custodians would be useful. But as long as such a third-party data source is not used, the compilation of these statistics has to take account of cases with differing information.

More specifically, when it comes to the market prices, we have chosen to trust one custodian more than the others. Therefore, we rely on the market prices for all the ISINs from this custodian when calculating market values of all the holdings in the same ISINs reported by other custodians. However, there are quality controls in the system that make it possible to check whether this assumption is plausible or not and, possibly, to make corrections for the ISIN in question.

A database consisting of an "original" and variants of each security/ ISIN has been established for basic information on an ISIN, including the classification of the security and except for the market price. Whenever a new ISIN is reported, an "original" will be defined. However, if at some point in the future a custodian reports this ISIN and some of the basic information differs from the "original", the system will identify it automatically. As the ISIN is unique and thus no differing occurrences of the ISIN should exist in the database, the compiler has to decide how to treat this particular occurrence. The easiest way is to link this occurrence to the "original" as a variant, meaning that the "original" overrules the metadata on the variant. Each time occurrences corresponding to the variant are reported in the future they will automatically be accepted and linked to the "original". However, if the information in the variant turns out to be more accurate than the information in the "original", it is easy to switch their roles in the database, ie let the variant become a new "original" and let the previous "original" become a variant.

Commercial data sources

Philip Papaelias[1]

The purpose of this paper is to describe how the Statistics Function of the Reserve Bank of New York (FRBNY) uses commercial securities data in its analysis of security-by-security data. Commercial securities data sources are primarily used in the quality assurance process for the data received from the reporters and to supplement reported data with information not provided directly by the reporters for publication purposes. This paper describes the benefits and drawbacks of using commercial securities data.

Use of commercial data sources

The FRBNY uses commercial data sources primarily in the quality assurance for the data received from the reporters on the security-by-security reports and to obtain data that are used in conjunction with reported data for publication and advanced analysis. No information acquired from any commercial data sources is published directly. However, data such as coupon rate and dividend rates are used in calculations, the results of which are published.

Due to cost and resource restrictions, the number of commercial resources used by the FRBNY is limited. As a result of these limitations, the sources used are selected based on their ability to provide comprehensive coverage of various types of instruments (eg debt, equity and asset-backed securities). In addition, to reduce cost, the FRBNY only receives commercial data for securities that are reported by the security-by-security data reporters.

Commercial data sources do not primarily exist to meet FRBNY data collection needs, which are a very small percentage of the vendors' overall business. Therefore, these data are often not aligned with the data definitions used for FRBNY analysis or publications needs. Since it is not cost-effective for vendors to alter the data to meet specific data collection needs, the FRBNY selects from data fields that already exist in the vendors' databases that are designed for their primary customers.

Drawbacks of vendor data

Commercial data sources are a valuable resource that enables the FRBNY to validate and analyse the data received from reporters of the security-by-security data. However, there are limitations to most commercial data sources that make it impractical to use these data in place of the reported data. The main drawback is that commercial data sources cannot provide information on securities that are reported with internally generated security identifiers (ie IDs that are assigned by the reporting entities). Almost every major US reporter reports some holdings using internally generated security identifiers. On average, approximately 3% of foreign securities and 2% of US securities reported on the United

[1] Supervising Reports Analyst, Securities Reports Division, Federal Reserve Bank of New York, philip.papaelias@ny.frb.org.
The views expressed should be interpreted as those of the author and do not necessarily reflect views of the Federal Reserve Bank of New York.

States' security-by-security data are reported with internally generated security identifiers. In 2004, the value of foreign securities reported with these identifiers was less than 2% of the total reported data and comprised predominately of private placements.

The values of foreign securities reported with these identifiers are increasing as a result of investments in offshore limited partnership investments. Since 2003, the market value of these reported securities increased approximately 300%. The detailed attributes, such as security type, issue and maturity date (if debt), currency of denomination and market value, associated with these securities would be lost from our dataset if we did not ask our reporters to provide it. This would be a significant loss to users of these data since they would not get an understanding of how large the markets for these securities are.

A solution to this issue is for reporters to provide all the detailed attributes for securities reported with internally generated security identifiers while reporting only specific fields such as type of holder and quantity for securities with security identifiers issued by a recognised numbering agency (eg ISIN, CUSIP). This assumes that vendor data would be able to provide the fields not reported. However, US reporters have indicated that this solution would significantly increase reporting costs because they would have to identify which securities require complete information rather than providing the information they have for all securities.

Another drawback of vendor data is that short-term debt information is typically not available once the issue has matured. Data are provided by US reporters approximately 60 days after the as-of date. This prevents the FRBNY from obtaining detailed attributes about short-term instruments that have matured. This is also an example of where the reporter would provide limited data because the short-term instrument has a valid CUSIP or ISIN, but FRBNY would not have access to the attributes data.

Comparison of information across reporters vs vendor data

As a result of these drawbacks, the FRBNY has found the best method of analysing reported data is to compare individual security attributes across different reporters. As reporters have gained familiarity and experience with compiling security-by-security reports, the quality of the data they provide has increased. This increased quality enables the FRBNY to analyse the attributes of individual securities reported by different reporters to determine the correct value. If a majority of the reporters report the same attributes for a security, then a high level of confidence is gained that the data have been reported correctly. However, if there is a discrepancy between different reporters for an individual security or if there is only one reporter of a particular security, then commercial data sources assist in identifying the proper attributes of the security.

In order for this comparison to be effective, the reporters must be trained extensively in the methods of proper reporting. The FRBNY holds seminars for reporters in which reporting issues are discussed, as well as one-on-one sessions with representatives from individual reporting institutions to discuss specific reporting issues. In addition to the seminars and one-on-one meetings, we have asked reporting institutions with significant reporting issues to provide action plans that describe the steps they will implement to address these systemic issues. Once the action plans are submitted, follow-up discussions are held in order to ensure that the action plans are being implemented. These measures have led to significantly increased data quality and have enabled us to rely less on vendor data.

Conclusion

Commercial securities data are a very useful tool for analysing security-by-security data. However, a drawback such as high cost and the lack of information on non-registered securities and short-term debt that has already matured prevents us from using these sources as a primary source of information.

Monitoring of securities held by financial institutions: merging statistical and supervisory demands

Vlastimil Vojacek[1]

1. Introduction

The development of information systems and harmonisation of statistics[2] has allowed the gradual introduction of a new data collection method: collection of data on an instrument-by-instrument basis. The main prerequisite for using this method is the existence of a high-quality public register, for example a securities register. A common data source independent of the reporting agent can thus be used to compile uniformly defined aggregates and thereby enhance the quality of statistics.

The statistics units of the Czech National Bank (CNB) were faced in 2007 with the challenge of implementing single monitoring of securities held by banks and investment funds in such a way as to satisfy the statistical and regulatory demands and to ensure efficient data collection, paying due heed to data quality and the reporting burden. Given acceptable starting conditions, collection of data on a security-by-security (sec-by-sec) basis was selected in both cases.

2. The data collection setup at the CNB

Financial institution reporting at the Czech National Bank is split into the statistical area and the regulatory area. Data are collected through a single statistical information system, as the banking data collection and transfer systems were developed and operated by the CNB's statistics units.

As far as bank reporting is concerned, organising the preparation of the two areas of reporting and drafting relevant single legislation are traditionally tasks for the central bank, as banking supervision has always been a part of the CNB's organisational structure.

A major event impacting on the non-bank data collection setup was the reform of financial market supervision in 2006 and 2007. The non-bank financial market supervisory authorities were relocated to the central bank, where all financial market supervision was unified and then reorganised.

This reorganisation led to new demands for a single reporting setup and a single technical solution for collecting data from all groups of regulated entities for all groups of users. The central bank's statistics units set about converting the various forms of regulatory reporting into a single model combined with statistical reporting. This process was completed in 2007.

---

[1] Head of Monetary and Financial Statistics Division, Czech National Bank, Prague. The views and opinions expressed herein are those of the author and do not necessarily represent those of the CNB.

[2] For the sake of simplicity the term "statistics" will be used to refer to any sort of defined data collection and subsequent processing, be it for the needs of the central bank's statistics units or for supervisory and regulatory purposes. Use of the term "statistics" to mean an area of activity or an organisational unit within the central bank will be specified where relevant.

3. The role of statistics units in the CNB's single reporting model

The new data collection setup at the Czech National Bank involved setting rules, work procedures and competences to enable standardised processing of the requests of all CNB statistical or regulatory users for data from financial intermediaries.

The central bank's statistics units have a twin role in the data collection process. On the one hand they are data users themselves (monetary statistics, balance of payments statistics, financial account statistics), but on the other they have responsibility, or shared responsibility, for data collection, and are also responsible for running the single information system. They use this system to define user reporting requirements and data transfer process requirements, and for data quality control. The monetary and financial statistics unit, for example, plays an important integrating role in bank reporting, because, despite being one of the users itself, it is responsible for organising bank data collection and for drafting the single legislation and general procedures for bank data collection. As for reporting by other categories of financial intermediaries, for example investment funds, credit unions, insurance corporations and pension funds, the relevant reporting is more decentralised but retains the basic rules of the single reporting model, ie the use of a universal information system and fixed working procedures for reporting.

In this paper, we offer our experience regarding a practical solution for collecting data on securities held by banks and investment funds. The questions are how it should be organised, what methods should be chosen, and what compromises should be made in the monitoring of securities holdings to cover the diverse needs of various business areas, ie monetary, financial and external statistics vs regulatory demands.

4. The solution for the collection of data on a security-by-security basis at the CNB

The incorporation of the single financial market regulator into the CNB's organisational structure and the ensuing need to expand the data collection function provided a common impetus for the challenge of finding a suitable way of collecting data on securities held by banks and investment funds. The data collection design had to be tailored to the needs of all users. In the central bank's new organisational setup, these users consisted of both statistical and regulatory units, ie units concerned with (i) monetary and financial statistics; (ii) balance of payments statistics; (iii) financial account statistics; (iv) credit institution supervision; and (v) capital market supervision.

The collection of data on securities holdings also had to take account of the requirements formulated by the European Central Bank for balance of payments statistics and monetary and financial statistics based on a centralised securities database (CSDB). These requirements consisted of:

- The need for a single approach to the collection of data in the field of portfolio investment as laid down in the "Guideline of the ECB on the statistical reporting requirements of the ECB in the field of balance of payments and international investment position statistics, and the international reserves template" (ECB/2004/15)
- The collection of data on securities held by investment funds as laid down in the "Regulation of the ECB concerning statistics on the assets and liabilities of investment funds" (ECB/2007/8), which entered into force on 27 July 2007.

The security-by-security method was chosen as the optimum solution for both banks and investment funds. The results of cost analyses, which included discussions with all users and

designers as well as representatives of banks and investment funds, ultimately led to two different compromises.

4.1 Collection of data on a security-by-security basis

The creation of high-quality securities registers enables single pieces of information on a particular security to be used jointly not only by reporting agents, but also newly by data recipients or compilers of the relevant statistics. In the harmonised statistics a common data source independent of the reporting agent can thus be used to compile uniformly defined aggregates, thereby preventing a non-uniform description of the same security, eg information on the issuer's sector or the price. This has led to the phasing-in of a new data collection method, namely collection of data on a security-by-security basis.

The existence of a high-quality register is a necessary condition for adopting this data collection method. One then has to start assessing the ensuing costs and benefits. These include:

(i) ***Reporting burden***: If data from the register are used at the statistics compilation stage, the respondent should only have to report information that only he or she knows and is therefore not contained in the register. Moreover, the register is a wider data source, and the compiler specifies which, if any, of this information – for example additional breakdowns – is to be incorporated into the relevant reporting, thereby increasing the flexibility to make changes to reporting. *Use of the security-by-security method should reduce the reporting burden*.

(ii) ***Data quality***: Processing of single items of data by the compiler and the subsequent acquisition of missing information from the single register should generally *increase the quality of the compiled data*. In the case of securities, however, practical difficulties can arise with the use of single pieces of information, due, among other things, to the fact that they are marketable instruments. Reporting agents relinquish the practice of independently compiling and submitting relevant information, such as a complete, balanced sectoral balance sheet, and delegate this responsibility to the data compilers. The compiler thus receives an incomplete balance sheet from the reporting agent and only later centrally performs the calculation and acquires the missing information from the register for all respondents and then compiles the balance sheet. The quality of the resulting data is thus an outcome of two opposing tendencies. On the one hand, the use of the single items of information from the register increases data quality, but on the other, data quality may be reduced by a potential security information deficit on the part of the compiler and/or by a substandard register.

(iii) ***Compiler burden***: As the compiler is responsible for compilation quality, *he or she faces an increased burden*. The compiler must newly perform a series of tasks as described in item (ii). This transfer of compilation burden from reporting agent to compiler plays a key role in the choice of suitable collection method. The increase in the compiler burden must therefore be kept to an acceptable level. The fact that the statistics unit must have a securities specialist is another cost item.

(iv) ***Technical costs***: Lastly, one needs to consider the potential technical costs, as the central bank's information system may have to be modified to cope with receiving large amounts of data.

If the cost-benefit criteria are not met, the standard scenario cannot be used and a compromise must be found. If even the compromise proves to be unacceptable, the security-by-security approach must be abandoned and aggregated data collection retained.

4.2 Securities held by banks

It has proved difficult in the given conditions to formulate a single security-by-security solution for the collection of data on securities held by banks. Even before the single financial market regulator was established it had been clear that this data collection process needed to be unified, because information on banks' securities holdings was being collected separately for the needs of monetary statistics, portfolio investment statistics and banking supervision. Duplicate information was being gathered, so the requirement was clear: find a single solution meeting the needs of all stakeholders. The merger of financial market supervision accentuated the need to optimise the system, and also added a new user – the capital market supervisory unit.

The starting point for the single security-by-security solution was the requirement formulated in the ECB Guideline (ECB/2004/15), in the shape of a "Monthly stocks [sec-by-sec] + derived monthly flows [sec-by-sec]" model using a centralised securities database (CSDB).

In the search for a single security-by-security collection solution the main obstacle turned out to be an increased compiler burden, especially in the case of the monetary statistics. The proposed standard sec-by-sec scenario using a CSDB would have involved a major intervention into the existing compilation process for monetary financial institution (MFI) balance-sheet statistics in respect of stocks and, in particular, transactions. In addition, the ECB Regulation (ECB/2007/13) does not recommend collection of data on securities holdings by the sec-by-sec method for monetary statistics, unlike portfolio investment statistics. The monetary statistics unit rejected the proposed sec-by-sec method, preferring to retain aggregated data collection. Moreover, the banking supervisory and regulatory unit questioned the proposed standard sec-by-sec model envisaging the use of a CSDB to complement the basic information on securities provided by banks. According to the regulator, banking supervision is based in essence on authentic information from the regulated entity, so the bank itself must report complete information on the security – including the information contained in the CSDB. Despite its controversial nature, this opinion had to be taken on board even though it reduces data collection quality and increases the banks' reporting burden. Hence, it seemed at this stage that a single solution could not be found and that collection of data on securities holdings would remain as fragmented as ever.

The breakthrough came at a consultation with banks. The banks' representatives made it clear that they would prefer a single security-by-security solution to the existing fragmented reporting setup. In addition, they said that reporting of complete information on securities within a sec-by-sec collection framework would be convenient for them and would not represent an increased burden. However, accepting this offer meant accepting a compromise, in the sense that the register data would not be used during the compilation stage, but each respondent would use it when compiling complete information on its securities (data record – key family). This meant that the expected increase in sec-by-sec data quality through the use of single items of register information by the compiler, which was the primary benefit of the standard sec-by-sec scenario, would not materialise. At the same time, the banks were willing to provide sec-by-sec test data for testing the compilation procedures.

The subsequent discussions involved bank representatives and representatives of all relevant units of the CNB. The costs and benefits of the proposed compromise were weighed. It was ultimately decided that if the results of the testing were satisfactory, the compromise would be acceptable. An analysis of the proposal revealed that (i) it would significantly reduce the reporting burden; (ii) the compiler burden, especially in the monetary statistics area, would not increase as dramatically as shown for the original standard scenario using a register; (iii) data quality would remain approximately unchanged; (iv) all user demands would be met and there would be no duplicate reporting; (v) the specific demand of the banking supervisory unit for reporting of the full data record would be met; and (vi) the technical costs would increase slightly.

Tests of the quality (completeness) of the security-by-security data, tests of integrity with other statements, and finally tests of compilation of outputs by individual users were performed on the test data during the latter half of 2007. The tests proceeded satisfactorily and the proposed bank reporting solution was ultimately accepted by all stakeholders for implementation in 2009.

4.3 Securities held by investment funds

The search for a single security-by-security solution for the collection of data on securities held by investment funds was prompted by the requirement contained in the new Regulation (ECB/2007/8) to collect fully harmonised (steady-state approach) balance-sheet assets and liabilities of investment funds for the needs of the monetary statistics under the combined approach. This approach allows national central banks to use the security-by-security method with the aid of a CSDB in order to collect data on the securities held by investment funds. Naturally, the proposed solution could not be limited to the needs of the monetary statistics unit, but also had to be incorporated into the wider context of the needs of the other statistics units and the capital market supervisory unit.

The main aims were the same as in the search for the bank data collection solution, but, owing to a different starting position, the approach taken was different. In this case, security-by-security data collection already existed, tailored to the specific needs of the collective investment supervisory unit. Two solutions were possible: either to modify the existing regulatory sec-by-sec statement and collect single data items, or to leave the regulatory data collection in place and design a standard sec-by-sec scenario using a CSDB for the needs of the monetary statistics, the balance of payments statistics and the financial account statistics.

Initially, a single sec-by-sec statement was proposed for the statistics units and the collective investment supervisory unit. This proposal, however, involved a fairly complicated merger of the diverse statistical and regulatory requirements (period, submission date, reporting population, specific regulatory and statistical instruments). In this case, a single solution did not prove to be optimal. The variant in the shape of a single statement for both statistical and regulatory users, which had proved successful in the case of banks, turned out to be a no go for investment funds. The investment funds did not agree with the initial sec-by-sec data collection proposal, pointing out that the regulatory requirements were diametrically opposed as regards, for example, data on relations to legislation, investment limits on fund assets, investment limits per issuer or investment fund, total purchase prices and shares in securities issued by a single issuer. It was apparent that, unlike in the case of banks, a single solution could not be found.

The optimum solution, upon which all the relevant user units and investment funds eventually agreed, was to leave the original regulatory sec-by-sec statement in place and design a new statement based on standard sec-by-sec data collection using a CSDB, in accordance with the requirements formulated in Regulation ECB/2007/8 and Guideline ECB/2004/15. An analysis of the agreed solution showed that it was acceptable. The costs and benefits in this case could be summed up as follows: (i) the increase in the reporting burden would be minimised; (ii) the compiler burden would increase moderately; (iii) data quality would increase; (iv) all user demands would be met and there would be no duplicate reporting; and (v) the technical costs would increase moderately. So the standard sec-by-sec scenario, ie single sec-by-sec data collection using a CSDB, will not be implemented in the case of investment funds either. Sec-by-sec data collection had to be split into a statistical component and a regulatory component.

5. Conclusion

The merger of statements on securities held by banks and investment funds on a security-by-security basis undoubtedly represents a great increase in data collection efficiency for both reporting agents and central banks. The course of the two projects shows that it was not easy to find generally acceptable solutions and that the solutions ultimately chosen are a compromise between the needs, objectives and capacities of reporting agents, compilers and users. In particular, in the case of sec-by-sec collection of data from banks it appears at first glance that the concession towards a single solution involving the transfer of registry data to the reporting entity is too large and undermines the main benefit of the standard sec-by-sec approach. However, we feel that the introduction of modified sec-by-sec data collection is a step in the right direction and that it will be possible in the future to implement the standard sec-by-sec approach gradually and make full use of the register for output compilation.

Session 3

Methodological approaches and country experiences in compiling statistics on debt issuance

Chair: Werner Bier, European Central Bank

Papers:

Debt securities statistics: the Bank of Thailand's experience
Pusadee Ganjarerndee, Bank of Thailand

The experience of the Bank of Mexico: compiling data on domestic debt securities
Samuel Alfaro, Bank of Mexico

Challenges in compiling Polish debt securities statistics
Piotr Boguszewski, Jacek Kocerka and Marcin Sienicki, National Bank of Poland

Debt securities statistics: the Bank of Thailand's experience[1]

Pusadee Ganjarerndee[2]

Significant role of debt securities on the Thai economy

Prior to the 1997 financial crisis, most capital mobilization through debt security issuance in Thailand was undertaken by the public sector. The private corporate sector, at that time, had greatly relied on market borrowings from financial institutions (both domestic and foreign) to fulfill their financing needs. The aftermath of the crisis called for development of the debt security market to become a fund-raising alternative for the private sector. Many major policy measures were undertaken to resolve obstacles and also to create the necessary infrastructure for the development of the Thai bond market. Meanwhile, the Office of the Securities and Exchange Commission, the Stock Exchange of Thailand, the Thai Bond Market association, the Bank of Thailand (BOT), and the Ministry of Finance (MOF) deemed it necessary to issue bonds in a more consistent and active manner so as to create benchmark rates for private issuers. These concerted efforts have since significantly strengthened the role of capital raised through debt securities issuance. This paper outlines the data issues involved in debt securities statistics in Thailand and relates the BOT's experience with building a security-by-security database.

Debt securities statistics in Thailand: major characteristics and data sources

Since the collection system of statistical data in Thailand is decentralized, there is no single entity that monitors or compiles a comprehensive national database on debt securities that the BOT could utilize. Each compiling agency collects and compiles securities data to serve only their own needs and interests. Those agencies are:

1. Public Debt Management Office (PDMO): The PDMO is established under the umbrella of the MOF. The scope of its responsibility includes public debt and liability management (including guaranteeing the debt of state enterprises). In terms of debt securities, the PDMO functions as the official information center for public debt securities issued by the government and state enterprises, covering bonds, promissory notes and treasury bills. Information collected include data on new issuance (both domestic and offshore), redemptions, interest payment, outstanding amount, maturity date, etc.

2. Bank of Thailand (BOT): The BOT serves as an official registrar for public debt securities: treasury bills, government bonds, Bank of Thailand bonds, Financial Institutions Development Fund's (FIDF) bonds, and some other state enterprise bonds. Data collected include new issuance, auction results, amount sold, redemption, interest payments and accrued interest, outstanding amount classified by holders, and registration information on a

---

[1] Any views or opinions presented in this article are those of the author and are not necessarily endorsed by the Bank of Thailand (BOT).

[2] Director, Statistics Office, Data Management Department, Bank of Thailand, pusadeeg@bot.or.th.

security-by-security basis. In addition, the BOT conducts quarterly surveys of the private sector's external debt and an annual survey of international investment position (IIP). From these surveys, the BOT has been able to obtain detail information on the private sector's debt securities outstanding amount vis-à-vis non-resident counterparties. Data can be classified by country of issuer (asset side), country of holder (liability side), institutional sector (sector of resident entity issuing or holding the securities), and term range (short-term vs long-term). In addition to debt securities, money market instruments are also obtained from the surveys: these are FRN (Floating Rate Note), FRCD (Floating Rate Certificate of Deposit), NCD (Negotiable Certificate of Deposit), P/N (Promissory Note), and B/E (Bill of Exchange), etc, denominated in both foreign currencies and in baht.

3. Office of the Securities and Exchange Commission (SEC): The SEC is the government authority that approves new issuance of debt securities of corporate residents, in the domestic or offshore markets. Data compiled include information on permission granted to issue new private debt securities, offered in both domestic and offshore markets, and classified by type of securities.

4. Thai Bond Market Association (Thai BMA): The Thai BMA is a private entity established under the Securities and Exchange Commission Act (B.E. 2535), and mandated as the sole information center for yields and prices of bonds in Thailand. Its other objectives are (1) to serve as a center for debt instrument registration following SEC approval; (2) to oversee and monitor the conduct of securities trading to ensure fairness and efficiency of the trading process; and (3) to prepare data on reference prices and yields curve for mark to market purpose. Data compiled by the Thai BMA include new issuance and outstanding amount (security-by-security), trade transactions with details of transactors, broken down into resident and non-resident groups, and further into subgroups according to the classification scheme set forth by the Thai BMA, market prices, interest rates, and details of bond profiles such as issuers, instruments and denominated currency.

5. Thailand Security Depository (TSD): The TSD is a subsidiary of the Stock Exchange of Thailand, and has become the sole national security depository center. It functions as (1) a depository for securities under a "scriptless" regime; (2) a "back office" for clearing and settlement operations (3) the registrar for most equity securities and some debt securities. Data compiled include outstanding amount of debt securities hold at intermediary level (custodians and brokers), and is classified by group of holders (under the financial institutions sector).

6. Custodian: Most custodians serve as intermediary in the debt market. They perform several functions; for instance, (1) serving as a registrar and underwriter of the first issue of debt securities pertaining to private sector and some public issues (where the BOT plays no role); (2) providing custodian service for investors; and (3) serving as licensed dealers for the secondary and OTC market. Data obtained from custodians include outstanding debt of public and private sectors (security-by-security) classified by holders, issuers and instruments. Information on Thai securities held by non-residents is collected, as well as on foreign securities held by Thai investors. It should be noted that tracking the ultimate ownership of Thai securities held by non-residents through information obtained from the custodians is difficult since cross-border purchase/sale of securities is mostly recorded under the name of the intermediary rather than end investors.

With regard to the operations of all six aforementioned agencies involved with debt securities in Thailand, it could be asserted that quite substantial debt securities statistics data are available. Nonetheless, the data from each agency are collected in different formats to serve only each internal use, and do not therefore adhere to a common standard. Indeed, this calls for a central agency to oversee and establish a compilation standard to ensure that these debt securities statistics correspond to the needs of central banks and the financial community. The BOT has so far attempted to integrate and unify data, from various sources with different levels of detail, and to compile standards with the aim of creating a

comprehensive database that would enable multidimensional classification; eg by issuer (location of issue or residency of issuer), holder, residency, institutional sector, instrument, country (location of issue or residency of issuer), and currency to accommodate the BOT user requirements.

The Bank of Thailand: Role and demand for debt securities statistics

The BOT needs to use debt securities statistics to accommodate their operations in four major areas.

1. The compilation of macro economic statistics in accordance with international standards and guidelines. These data include balance of payments (BOP), international investment position (IIP), external debt and monetary statistics. The BOT serves as the official compiler of these statistics along with providing data support to other compiling agencies for the purpose of constructing other macro statistics, such as items in the GFS, GDP and Flow of Funds Accounts to ensure that they conform to international standards. Debt securities statistics used for macro economic statistics compilation will feature detailed breakdown by type, currency, maturity, location of issue, residency of issuer/holder, sector of issuer/holder, etc.

2. Information for monetary policy formulation and implementation. In order to implement monetary policy efficiently through the money market, the BOT needs information for monitoring the condition of the debt securities market very closely. The BOT utilizes the data for liquidity intervention, to drain liquidity from or inject it into the financial system through the outright purchase/sale of securities or through the repo facility so as to indicate the monetary policy stance via money market rates. While aiming for financial stability, this information also contributes to enhancing and developing the debt securities market.

3. Monitoring short-term capital inflows such as investments in baht debt securities by non-resident investors.

4. Assessing financial institutions' risk exposure and financial soundness. Financial institutions are required to submit their administrative reports – in particular, information on issuers and holders of debt securities – to the BOT. Data would be used to accommodate the BOT's prudential supervision over financial institutions on a timely basis.

Despite the fact that Thailand has no comprehensive database for debt securities statistics, the BOT needs to use such data for its operations in the four areas mentioned. BOT obtains such data from other external sources; for instance, direct reports from custodian entities, survey of investors, foreign exchange records (ITRS or dataset), financial institutions' financial statements for supervision purposes, etc.

Comprehensive debt securities database: the BOT's initiative

The BOT acknowledges the need to establish a comprehensive debt securities database, to serve as a central data warehouse that could fully accommodate various demands from the BOT's internal users. Once completed, the database would feature debt securities data collection in formats set forth under international standards. It would be highly flexible, with multidimensional data available to users, will eliminate any redundancy in data collection, and will be able to capture detailed information on security-by security basis.

In order to make this initiative successful, the development of such a comprehensive debt securities database would require close cooperation from relevant compiling agencies, both public and private, in order to ensure that the BOT obtain sufficient debt securities data with

a well-structured format. Nevertheless, at present there are different approaches to data collection and differing characteristics of the data obtained from external agencies, which need streamlining to make them conform with the BOT's user requirements. Over the years, the BOT has gained cooperation from compiling agencies: some are willing to prepare/provide data in the BOT's specified formats, while some will take more time and consideration to make data available to the BOT.

As for data submission channels, the BOT is developing a standard process for a data transmission channel in *DMS DA Extranet/Internet*, for easy and safe data transfer. Nevertheless, as most data providers tend to provide similar data to other external agencies as well, they would prefer to provide data via a Web Service channel. The BOT will continue to develop new alternatives to accommodate data submissions in the future.

At present, the BOT allocates a budget especially for developing the comprehensive debt securities database. The project commenced in 2005, starting with development of the basic foundation of a Central Data Warehouse (data are collected via a security-by-security approach), and is expected to be complete by 2008. The system will be designed and developed with appropriate tools to accommodate all the different needs of BOT internal users. The project is being implemented in 3 phases as follows:

Phase 1 (2005–2006) Compilation of debt securities data of which the BOT serves as official registrar.

Phase 2 (2007–2008) Compilation of data on Thai debt securities, equity securities and Thai financial derivatives held by resident and non-resident investors, as well as those foreign securities held by Thai investors.

Phase 3 This future phase will encompass debt instruments in the money market, new type of debt securities, as well as data on Thai institutional investors' holdings of foreign securities.

Problems, concerns, and experiences related to the development of the BOT's comprehensive debt securities database

Since 2005, the development of a comprehensive debt securities database for BOT internal use has progressed quite significantly; nevertheless, there are still some problems, concerns, and experiences that could be worth mentioning, as follows:

1. With data needs that differ among BOT internal users, a sufficient amount of time must be planned for gathering and thoroughly analyzing data requirements. This is to ensure that the process yields the proper framework and design for creating a database with sufficient data availability. Meanwhile, data redundancy would be eliminated to reduce the burden borne by data providers.

2. As sources of Thai debt securities information tend to belong to several agencies, as mentioned above, the identification of data needs with matching data sources must be well considered to ensure that the BOT obtain useful and complete information. The new work system should be able to accommodate all data and contents from various sources submitted via various channels, depending on the development of each provider's internal system.

3. A good relationship with and an understanding of compiling agencies on data compilation are crucial. Data consistency checking is a major challenge for the central compiler, since the data come from different sources. The checking is required in terms of both data definition and content, in order to ensure the accuracy and quality of data. The work system should be designed and developed to be able to perform data accuracy and

consistency checks of each data source. It is also crucial to meet the deadline of the project; we need to ensure the willingness of various data providers to synchronize with our time line.

4. The system must be developed with great flexibility that could fully accommodate new and complex financial instruments in the future.

Conclusion

From the BOT's experience and its attempt to construct a comprehensive debt securities database, some interesting conclusions can be drawn: that Thai debt securities statistics are sufficiently available, and could be further classified into standard formats set forth by international guidelines. Nevertheless, there has been limited use of Thai debt securities data due to the lack of a national debt securities database. The BOT's recent initiative on the development of a comprehensive national debt securities database will therefore be a vital contribution not only to BOT internal use but also to the whole financial system. In addition, the BOT's experiences will serve as an example for other developing nations that are interested in developing their own national debt securities database system in future.

References

Ganjarerndee, Siri (2001): "Government bond market development in Asia: Thailand", in Yun-Hwan Kim (ed), *Country report on Government bond market development in Asia*, Asian Development Bank.

Thai Bond Market Association (2007): *Thai Bond Market*, Bangkok.

——— (2007): *Bond Issuance Manual*, Bangkok.

The experience of the Bank of Mexico: compiling data on domestic debt securities

Samuel Alfaro[1, 2]

1. Introduction

The Bank of Mexico (Banxico) has been publishing on its website (www.banxico.org.mx) a wide set of time series on domestic debt securities statistics, which are obtained from different sources and using different methodologies. This paper describes the central bank's experience in compiling, organising and publishing debt securities data. In particular, it provides an assessment of the advantages and disadvantages of each source of information and the changes that are planned to be implemented to improve the consistency and accessibility of the available information. Banxico's experience suggests that the information obtained for the payments settlement system from the central securities depository institution (Indeval) is the best source for constructing a security-by-security database. This is because the database available at Indeval incorporates, comprehensively, accurately and promptly, the most relevant characteristics (maturity, payment flows, breakdown of holders by sector etc) of each security that has been issued and/or traded in the domestic debt market.

This paper is divided into four sections. Section 2 focuses on describing the information available at Indeval and how it has been exploited by Banxico to obtain its government securities database. Section 3 presents the information received from financial institutions, which has been used to complement its debt statistics. Finally, section 4 presents a summary of this note and makes some final remarks on the strategy to improve Banxico's domestic debt securities statistics.

2. Debt statistics assembled from Indeval's database

Banxico's methodology for gathering information on domestic debt instruments has been facilitated because in Mexico the majority of the trades involving securities are settled through the same settlement system, operated by Indeval, which also provides the only central securities depository. Indeval has been operating as a private enterprise since 1986 and its relevance for the money market has increased since 1996, when Banxico transferred to this system the settlement of government securities transactions. It is important to mention that Indeval's system, as well as the corresponding legal and regulatory framework, has been subject to continuous upgrades to comply with the CPSS-IOSCO "Recommendations for Securities Settlement Systems".

---

[1] Director, Market Analysis and Risk Evaluation, Bank of Mexico, salfaro@banxico.org.mx.

[2] The opinions expressed in this document are those of the author and thus do not necessarily reflect those of the Bank of Mexico. The author acknowledges the comments and the technical assistance of Rodrigo Cano and Daniela Gallardo. Any inaccuracy in the paper is the sole responsibility of the author.

This section describes the methodology used to compile statistics on government securities,[3] which have been obtained from Indeval's database. It should be noted that this section focuses on government securities, as the methodology for compiling information is fully operational and has been exploited to assemble the most complete section of Banxico's securities database. Government securities represent more than two thirds of the outstanding stock of domestic debt instruments. With the forthcoming update of Indeval's system, to be implemented in the second half of this year, it is intended to apply the same methodology to collect a comprehensive database for the entire set of domestic debt instruments.

The first part of this section describes the available database at the level of a particular issue in order to understand its components and its potential application to elaborate consistent and timely debt security statistics. The second part considers aggregate statistics that have been assembled and published by Banxico regarding the outstanding stock of government securities.

2.1 Description of the security-by-security database

Each debt security deposited at Indeval's system is distinguished through several identification fields that are designed to describe all its characteristics, such as issuer, maturity date, face value, number of titles placed, coupon, coupon payment date and periodicity (Table 1). The next upgraded version of the system will also include an ISIN code to identify each domestic debt security. It is important to note that all the data presented in this part of the paper refer to a specific security, identified as M-Bond 15/12/2016, and for a particular date queried: 20 February 2008.

Table 1

Debt security description

Issuer	Federal Government
Type of instrument	M-fixed coupon bond
Maturity date	15/12/2016
Nominal value	100
Currency	MXP
Coupon	7.25%
Frequency (days)	182
Request date	20/02/2008
Titles placed	733,356,217
Accrual days	55
Coupons to be paid	18

Source: Indeval.

[3] Broadly defined, government securities include the debt instruments issued by the Federal Government, Banxico and those of the Deposit Insurance Agency (IPAB) with the explicit support of the Federal Government. Government securities are placed by Banxico either as part of their own sterilisation instruments or acting as the Federal Government or IPAB's financial agent.

Indeval's database provides a breakdown of the number of titles placed of each debt security, based on the amount deposited in the system by every financial institution that has a custodian account. Furthermore, Indeval's regulation requires that any financial institutions with a custodian account segregate its own holdings from those held as clients' positions.

Table 2 gives an example of the distribution of the M-Bond[4] 15/12/2016 between financial institutions that have a custodian account at Indeval. It is important to note that Banxico is included among these institutions in order to integrate the position of this particular debt security held by the central bank as collateral from its open market operations conducted through reverse repurchase agreements (repos) with financial intermediaries.

Table 2

Breakdown of holdings by custodian

Nominal value in MXN million

	Total	**Own**	**Clients**
Institution 1	34,999	0	34,999
Institution 2	13,356	0	13,356
Institution 3	9,798	0	9,798
Institution 4	2,783	0	2,783
Institution 5	2,775	2,705	70
Other Inst.	2,425	1,042	1,383
Sum	**66,136**	**3,747**	**62,389**
Banxico	7,200	7,200	0
In circulation	**73,336**	**10,947**	**62,389**

Source: Indeval.

To obtain a more comprehensive breakdown of the M-Bond 15/12/2016 held by custodians in the name and account of their clients, several regulations have been issued. These include, in particular, Banxico's requirement for the custodian institutions to deposit the securities holdings of foreign residents in a separate account. To preserve banking secrecy, the custodian institutions do not reveal the names of their clients. Even though the central bank is aware of the problem that the residency breakdown may not necessarily correspond to the nationality of the final holder, but is associated with the nationality of the institutional client who deposits the securities in custody, this has been the only available information source.[5]

The segregation of debt securities held by custodians in the name and account of their clients has also been facilitated by specific regulation imposed by other official entities. In particular, to gather timely information of the securities held by a specific group of institutions,

[4] M-Bonds are fixed-coupon notes and bonds placed by the Federal Government, since 2000, with maturities of 3–30 years.

[5] The residency problem arises, for example, when a Mexican resident requests a foreign financial institution to manage his/her position in domestic debt securities. In this case the foreign financial institution will request a Mexican custodian to deposit these securities at Indeval. However, on the basis of the available information, the custodian will wrongly classify such position as holdings of the foreign financial institution.

the National Commission for the System of Pension Fund Managers (CONSAR) has requested each manager to deposit the securities integrating its portfolio in a specific account at Indeval. Taking advantage of this regulation, Banxico has been able to identify the government securities maintained by pension funds, at either the level of a particular participant or the aggregate of the system. Similar types of regulations with the same objectives have been issued for their constituency by the National Banking and Securities Commission (CNBV) in the case of mutual funds, and by the National Commission of Insurers (CNSF) in the case of insurance companies. Table 3 presents information on the breakdown of the M-Bond 15/12/2016 held by specific clients that Banxico is able to assemble daily from Indeval's database.

Table 3

Breakdown of holdings by type of client

Nominal value in MXN million

	Pension funds	**Investment funds**	**Insurance cos.**	**Foreign residents**	**Non-specified**
Participant 1	11,186	150	630		
Participant 2	9,232	125	275		
Others	21,534	826	136		
Sum	**41,952**	**1,101**	**1,040**	**14,754**	**3,541**

Source: Indeval.

By applying this methodology Banxico has been able to keep track of a comprehensive debt security database, which is assembled on a security-by-security framework that provides information at different layers. For one thing, it gives data on the total amount outstanding of each security, including maturity and coupon payment dates, which are useful for computing statistics on terms to maturity. For another, it provides information on the breakdown of each security by type of holder, which in some cases can be identified by a specific participant. By relying on Indeval's system, under which most of the securities transactions are conducted, this information is updated daily and then assembled and processed by the central bank. There is therefore no need to implement surveys to obtain information or to monitor closely specific placements of securities by public and/or private entities. In the particular case of Mexico, surveys of this type have been distorted by buybacks and exotic transactions, such as warrants, that might affect the total amount outstanding of a security.[6]

The operation of the Market Maker programme implemented since 2000 by the Ministry of Finance (SHCP) is prominent among the transactions in the money market that has given rise to relevant changes in the outstanding stock of fixed or zero coupon government securities. As part of this programme, the institutions selected as market-makers have the right to access a securities lending facility through which they can borrow up to 4% of the outstanding amount of each government security. In particular, this facility operates by allowing the financial intermediaries[7] to borrow government securities that have been issued

[6] The Federal Government of Mexico has used warrants to exchange domestic debt (M-Bonds) for external debt (UMS Bonds).

[7] For the purpose of this paper a financial intermediary is defined as a bank or a brokerage house.

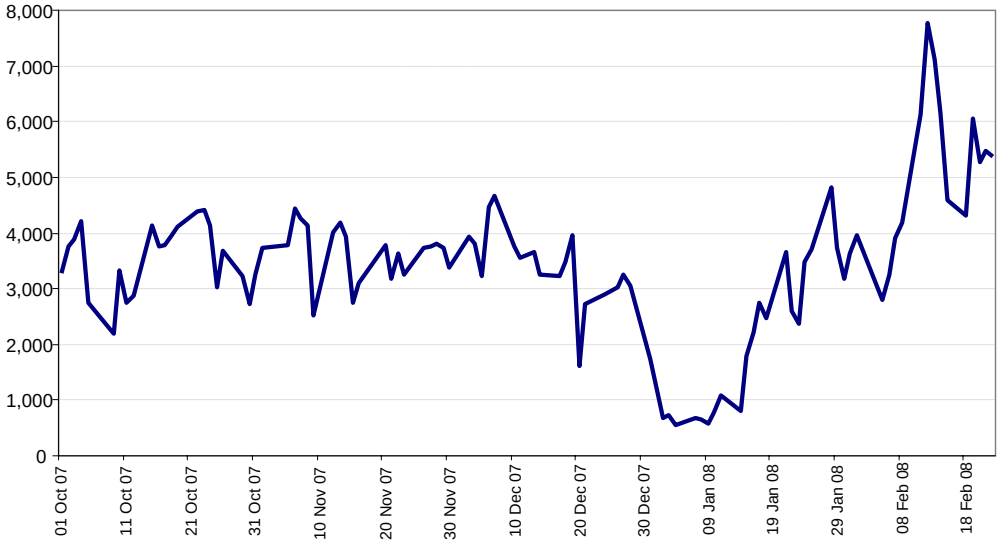
but not yet placed in primary auction, so that the outstanding amount in circulation of such debt instrument is temporarily enlarged.

Figure 1 shows the position of the M-Bond 15/12/2016, which was put into circulation in the money market through the market-makers' securities lending facility. From this graph it is evident that the outstanding stock of this government security has fluctuated significantly in the last 3 months, reflecting the activity of the market-makers' securities lending facility and their particular views with respect to the evolution of the yield curve. In particular, due to the market-makers' securities lending window, the amount of this particular instrument in circulation increased between 1% and 10% with respect to the stock placed through primary operations.[8]

Figure 1

Position from the securities lending facility, M-Bond 15/12/2016

Nominal value in MXN million



Source: Banco de México.

Table 4 gives a complete breakdown by holders of the M-Bond 15/12/2016, including the amount placed through the securities lending facility. From this layout it is possible to identify, at least partially, the holdings of financial intermediaries, which correspond to their own positions plus the securities maintained by Banxico from repurchase agreements.

[8] The amount of debt securities placed through primary operations corresponds to the nominal amount of titles placed through primary auctions, direct private placements, bond swaps, warrants, or other type of operations with the exception of the market makers' securities lending window, less those withdrawn from circulation via anticipated redemption transactions (bond swaps, outright purchases etc).

Table 4

Total breakdown by holders

Nominal value in MXN million

1. Placed in primary operations	68,049
2. Placed through the securities lending window	5,287
3. In circulation (1 + 2) = (4 + 5)	73,336
4. Held by domestic residents:	58,582
a. Financial intermediaries[1]	10,947
b. Pension funds	41,952
c. Investment funds	1,101
d. Insurance companies	1,040
e. Others	3,541
5. Held by foreign residents	14,754

[1] Includes the securities held by Banxico from repos conducted with financial intermediaries.

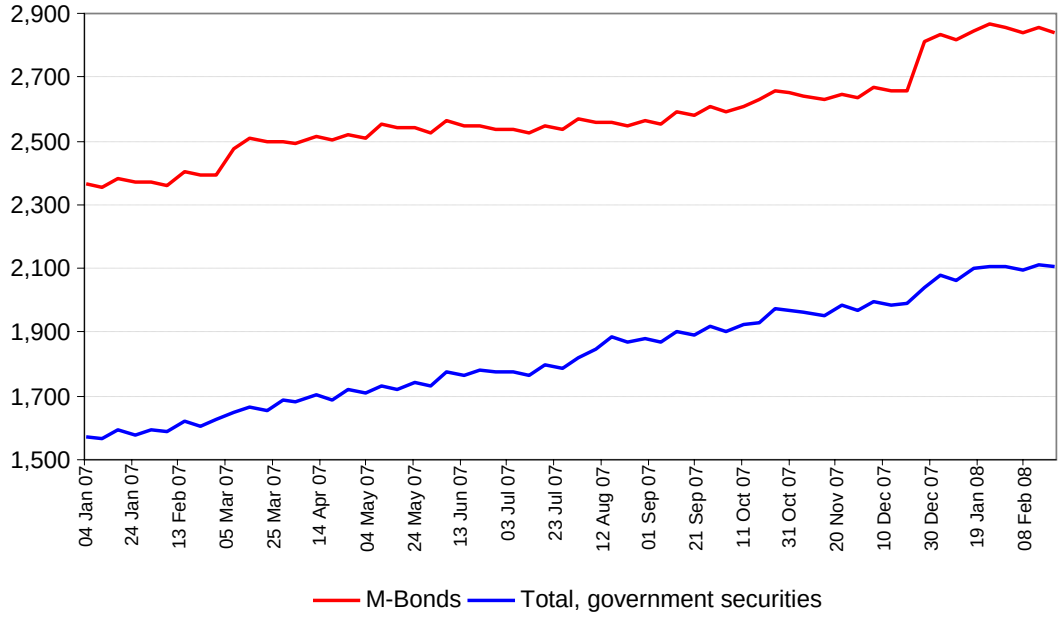
Source: Indeval.

2.2 Description of the aggregate statistics on government securities

The information presented at the level of a specific security (the M-Bond, 15/12/2016) is aggregated in this section for the whole group of government securities to obtain the statistics that Banxico publishes on its website. In particular, from the data describing the characteristics of each security, the central bank obtains statistics on the term to maturity and the duration of government securities (Figures 2 and 3).

Figure 2

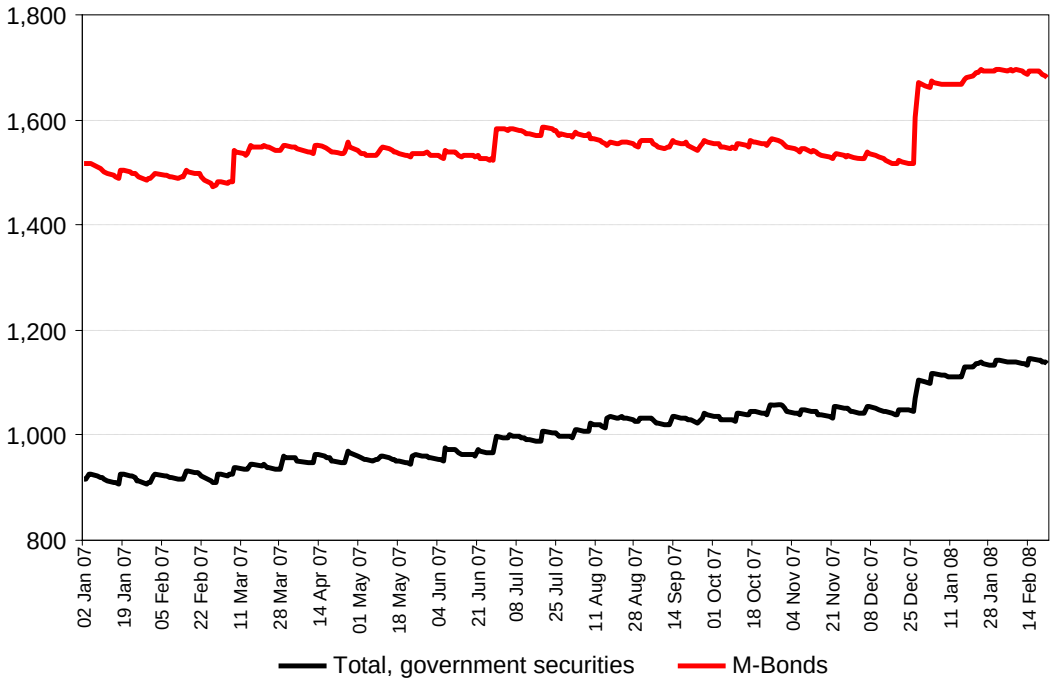
Average term of maturity, days



Source: Banco de México.

Figure 3

Duration of the government securities portfolio, days



Source: Banco de México.

Figures 2 and 3 show that M-Bonds have contributed significantly to extending the average term to maturity and duration of the overall portfolio of government securities. The corresponding statistics for the rest of the government securities portfolio are smaller, reflecting the relative importance of other types of instruments such as Cetes,[9] Udibonos[10] and Bondes,[11] which have a shorter term-to-maturity and/or a smaller outstanding amount in circulation. The relative importance of each type of government security is shown in Table 5, which presents the aggregate set of government securities statistics published daily by Banxico using Indeval's data as a source. In particular, the information given in this section corresponds to a specific date: 31 January 2007.

[9] Cetes are zero coupon bills placed by the Federal Government at discount with maturities from 28 days to 1 year.

[10] Udibonos are fixed-coupon notes and bonds denominated in UDIs (a unit of account, the value of which is updated daily with respect to the latest inflation rate) placed by the Federal Government with terms-to-maturity of 3–30 years.

[11] Bondes are floating rate notes. Currently the Federal Government has placed Bondes D, the coupons of which are determined with reference to the overnight interbank funding rate, placed by the Federal Government and Banxico with maturities of 3 and 5 years.

Table 5

Government securities in circulation

Nominal value in MXN million

Security	Placed through		In circulation (A + B)
	Primary operations (A)	Securities lending window (B)	
Cetes	353,925	5,518	359,443
Bondes-D	492,396	0	492,396
M-Bonds	895,053	46,482	941,535
Udibonos	235,327	0	235,327
Total	**1,976,701**	**52,000**	**2,028,701**

Source: Banco de México.

Table 5 illustrates the relevance of M-Bonds since they represent close to half of the outstanding government securities in circulation. Additionally, this type of security makes up almost all the operations conducted through the securities lending window for the market-makers.

SHCP also publishes information on the outstanding stock of government securities placed through primary auctions. However, such statistics are not consistent with those presented in Table 5, as the SHCP does not publish information on the total stock of government securities in circulation. This is because, for public debt purposes, the relevant information is related to those securities placed at the primary market to finance the Federal Government.

Additionally, when comparing the statistics published by Banxico and by SHCP it is important to take into account the following methodological and practical distinctions:

- Cetes are recorded by SHCP at placement value.
- Bondes-D is placed both by Banxico and SHCP. In particular, the central bank uses this type of instrument to sterilise the excess of liquidity.[12] Given that the SHCP publishes statistics to measure the outstanding amount of public debt, the stock of Bondes-D placed by Banxico are not recorded in their statistics.

This last discrepancy can be resolved by distinguishing in Banxico's statistics whether the primary placement of Bondes-D was conducted to finance the Federal Government or for liquidity sterilisation purposes, as shown in Table 6.

[12] By law, Banxico is allowed to acquire in the primary market government securities if those securities are matched with a Deposit of Monetary Regulation. This is a liability of Banxico to the Federal Government with the same financial characteristics (payment flows) as the government security with which it is associated. If Banxico sells a government security (now Bondes-D) its position will be short, implying that the central bank will be obliged to reimburse to the Federal Government the entire flow stream associated with the instrument placed (at the corresponding payment date). This allows for the government securities placed by Banxico to be indistinguishable from those placed by the Government.

Table 6

Comparison of government securities statistics

Outstanding stocks in MXN million

Security	Banxico: debt security placed through primary operations			SHCP: public debt statistics[1]
	Total (i + ii)	For monetary regulation (i)	For Federal Government financing (ii)	
Cetes	353,925	0	353,925	340,454
Bondes-D	492,396	167,396	324,999	324,999
M-Bonds	895,053	0	895,053	895,053
Udibonos	235,327	0	235,327	235,327
Total	**1,976,701**	**167,396**	**1,809,305**	**1,795,833**

[1] Source: "Federal Government Quarterly Report on the Economic Outlook, the Public Finances and the Public Debt".

Source: Banco de México and Ministry of Finance, Mexico (SHCP).

The statistics published by Banxico regarding distribution between sectors of the government securities held by the public is presented in Table 7. In this table residents and pension funds are identified as the main holders of M-Bonds.

Table 7

Distribution by sector of the government securities in circulation

Nominal value in MXN million

Sector[1]	Cetes	Bondes-D	M-Bonds	Udibonos	Total
In circulation, held by (A + B):	359,443	492,396	941,535	235,327	2,028,701
A. Domestic residents (a + b + c + d)	350,085	492,293	737,367	230,125	1,809,870
a. Financial intermediaries[2]	39,232	154,863	110,496	2,105	167,285
b. Pension funds	96,788	45,727	213,754	118,640	474,910
c. Investment funds	59,176	82,600	120,276	18,002	280,054
d. Others	154,889	209,103	292,840	91,377	748,209
B. Foreign residents[3]	9,358	103	204,167	5,203	218,831

[1] The stock of securities held by a sector includes the net position generated by repurchase agreements. [2] Includes the securities held by Banxico from repos conducted with financial intermediaries. [3] The holder's residency is obtained from the nationality of the agent who deposits the securities in custody.

Source: Banco de México.

It is important to notice that foreign residents are identified using the same methodology described in the first part of this section, so that it represents an approximation of their actual position. Another problem in interpreting these statistics relates to the impact of repurchase agreements. As these statistics are obtained from the accounts of the custodian institutions

at Indeval, they measure the position maintained by a specific sector. In particular, the statistics do not distinguish whether the position comes from an outright purchase or from a temporary repurchase agreement.

3. Complementary statistics for analysing the government securities market

The previous section mentioned that the total position of government securities held by financial intermediaries can be approximately estimated by adding up the debt securities deposited in their own accounts, plus those securities received by Banxico from repurchase agreements to control the liquidity in the money market. However, it was also remarked that Indeval's statistics may not be the best alternative for measuring the positions at risk because it is not possible to distinguish between outright purchases and temporary holdings coming from repurchase agreements. Due to this problem, the statistics obtained from Indeval reflect only the very short-term final holder of a security[13] and, consequently, do not reveal the real position at risk of the final holder. This is particularly relevant for the financial intermediaries involved in most of the repo transactions.

To gather the information that is needed to conduct a thorough analysis of the positions at risk in the government securities market, Banxico relies on complementary information provided directly by the financial intermediaries. The central bank has been able to collect this complementary information since, under the law governing the Bank of Mexico, financial institutions are obliged to report any information requested. The broad set of operative data that have been assembled is described below. The first part of this section deals with the use of the information obtained by Banxico on a daily basis regarding the operations conducted by financial intermediaries in the money market. The second part focuses on the use of information from the financial statements of the intermediaries.

3.1 Detailed data on the financial intermediaries' daily operations with government securities

To obtain information about the microstructure functioning of the money and foreign exchange markets, Banxico has requested each financial intermediary to report, on a daily basis, all the operations conducted in these markets. The objective of these directives is to obtain the elements that will allow the central bank to monitor, almost in real time, the positions at risk of the financial intermediaries. The scope of the information received is as wide as possible. For instance, in the case of government securities, it includes the outstanding position from outright and repo operations, plus unsettled transactions including those with financial derivatives. The compilation of these statistics has not incurred additional cost for the financial intermediaries since Banxico's system has been designed to operate as an interface with their back office system. This detailed database was initially used to estimate the market and liquidity risk exposure of specific financial intermediaries, but it has evolved to become an important information source complementing Indeval's statistics.

As mentioned above, one of the problems with Indeval's data is that the market participants' position at risk in securities cannot be identified. The position at risk is defined as the amount of securities that could affect the net income of a market participant. For instance, in the case of repurchase agreements, the institution that sold a security will have a positive (negative) net income flow by the appreciation (depreciation) of that security, depending on the money

[13] In Mexico, more than 90% of the repurchase agreements are settled overnight.

market conditions at the end of this short-term agreement. The same applies for securities lending and for unsettled transactions. The complementary information obtained from financial intermediaries allows the central bank to obtain information about these operations.

The detailed database constructed by Banxico from the operations of the financial intermediaries distinguishes the transaction at the individual level of:

- Name of the domestic financial institutions involved
- Sector
- Type of security
- Type of operation (outright buy/sell, repo, securities lending)
- Agreed price
- Use of broker's system.

With this extensive information set, Banxico is also able to compile a security-by-security database and update it daily. Since the detailed database provided by financial intermediaries includes identification fields for the same type of sectors as those published by Banxico, a breakdown of the position at risk can be provided by sector. Table 8 presents this breakdown for the case of M-Bonds, to simplify the table. It is important to note that this information complements the statistics provided in Tables 5 and 7 for the corresponding column of M-Bonds.

Table 8

Distribution by sector of the position at risk in M-Bonds

Nominal value in MXN million

Sector	In circulation (A)	Net repo position[1] (B)	Net unsettled transactions[2] (C)	Net securities lent[3] (D)	Position at risk (A + B + C + D)[4]
Total (A + B)	941,535	0	0	–46,482	895,053
A. Domestic residents (a + b + c + d)	737,367	1,919	0	–46,482	692,805
a. Financial intermediaries	110,496	347,404	–7,709	–51,572	398,620
b. Pension funds	213,754	–9,733	–1,110	4,900	207,812
c. Investment funds	120,276	–94,822	–292	190	25,352
d. Others	292,840	–240,930	9,111	0	61,021
B. Foreign residents	204,167	–1,919	0	0	202,248

[1] A positive sign indicates that a sector has sold M-Bonds through a repurchase agreement to another sector, the contrary if it is negative. [2] Incorporates the net unsettled outright purchases of securities between sectors. A positive sign implies that a sector has already purchased a security but the transaction has not been settled yet, the contrary if it is negative. [3] Incorporates the net position from securities lending between sector. A positive sign implies that the sector has temporarily lent a security, the contrary if it is negative. The activity of financial intermediaries in the Market Makers securities lending facility is included as a negative position of this sector. The total amount is equal to that of the Market Maker securities lending facility. [4] By construction the amount of the position at risk equals that of the securities placed through primary operations.

Source: Banco de México.

Table 8 shows that the total amount of the M-Bonds position at risk is equal to that of the total primary placements for that specific security (see Table 5 for M-Bonds). This is because

the amount of securities in circulation on a particular day is affected by the activity of the market-makers, who might temporarily be borrowing securities from the standing facility. In this regard, the securities obtained by market-makers from the securities lending window increase the amount of securities in circulation (M-Bonds in this particular case). However, since the borrowers have the obligation to reimburse these securities to the Federal Government, such operations have to be deducted from their direct holdings to compute their position at risk. From this argument it follows that the total amount for column D "Net securities lent" is the negative of the corresponding amount for M-Bonds of "Securities lending window" in Table 5.

With respect to the impact of the other entries identified in Table 8 for the computation of the position at risk, it is important to notice that the total amount recorded at the items of "Net repo position" and "Net unsettled transactions" must come to zero, given that the transactions recorded indicate a distribution of securities between sectors but without altering the total amount in circulation.

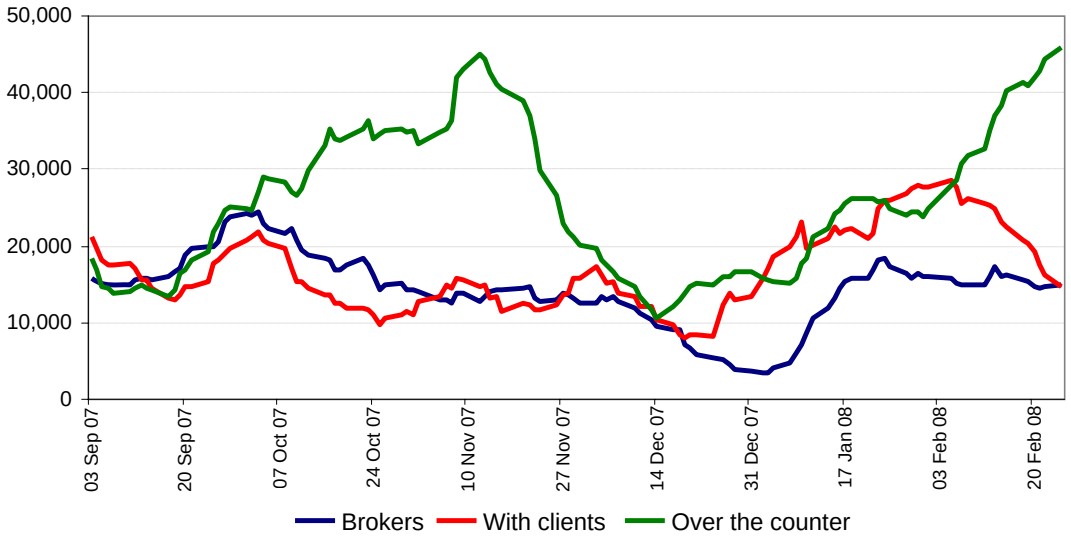
In Table 8 it can also be seen that the financial intermediaries' position at risk is almost four times that of the amount reported as their own holdings (column A). This is because most of the M-Bonds included in the position at risk of the financial intermediaries are registered at Indeval as securities maintained by other sectors (mainly other domestic residents and investment funds), which receive them as part of repo transactions.

As previously mentioned, the complementary database from the financial institutions allows the central bank to identify the segment of the secondary market in which a particular transaction has been conducted. Additionally, the Bank of Mexico has been able to segregate the interbank operations, in which the counterparties are financial intermediaries, from those with clients (the rest). It is important to mention that, in the case of interbank operations, the information is double-crossed to verify that the data provided by each counterparty match. Furthermore, interbank transactions can be disaggregated between those carried out through the broker's system and those over-the-counter. Figures 4 and 5 depict the recent data on the daily (average of 10 days) volume and number of operations with M-Bonds at the secondary market.

Figure 4

Trading of M-Bonds in the secondary market

Volume at nominal value in MXN million

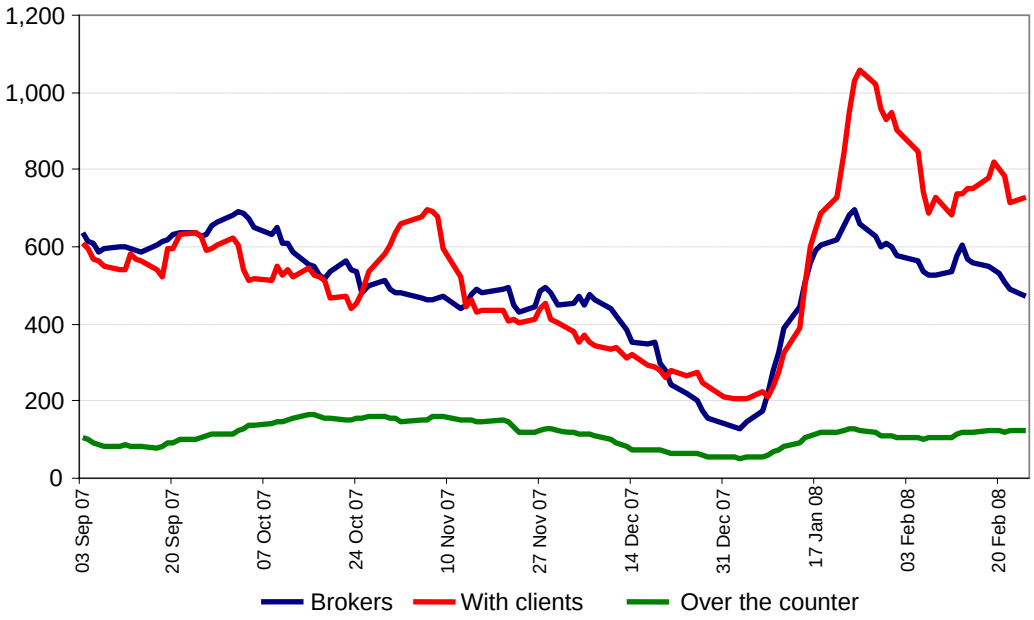


Source: Banco de México.

Figure 5

Trading of M-Bonds in the secondary market

Number of operations



Source: Banco de México.

3.2 Information from the financial intermediaries' analytical and consolidated financial statements

The financial intermediaries also submit their analytical and consolidated financial statements monthly to Banxico. This information is compiled by the central bank to elaborate the banking statistics available on its website. Such statistics include, as part of its assets, the financial intermediaries' investments in government securities. In terms of comparison these positions are not, and should not, be equal to those registered at Indeval in the aggregate account of own holdings. Notable among the differences between these concepts is the fact that financial statements are registered at market value while Indeval's statistics are reported at nominal value. However, as Figure 6 shows, even though the general trend in these two concepts is similar, the difference between them is not constant but is inconsistent in some cases, as in December 2007.

Although the information is not presented in this paper, in order to make the statistics presented by banks comparable in their financial statements, the debt securities data obtained from Indeval, registered as the outstanding number of titles, can be transformed into mark-to-market values, just by applying a price vector provided by price vendors.

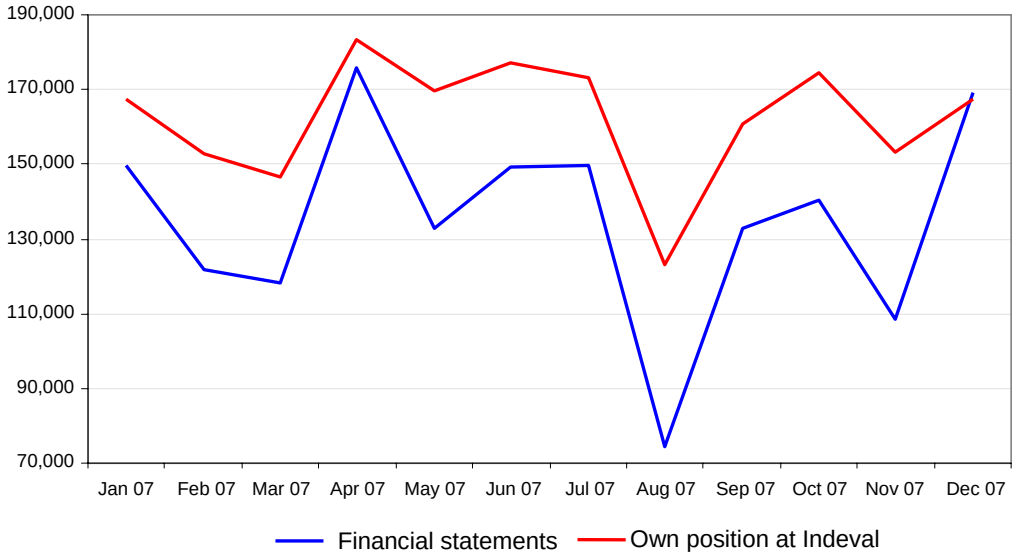
Price vendors are institutions, authorised and supervised by the banking and securities regulator (CNVB), that compute prices for most of the financial instruments traded in the Mexican financial markets. The prevailing regulation states that, in order to mark-to-market their financial statements, most of the financial intermediaries have to apply the price vectors provided by private price vendors to their marketable securities positions. Even though the vendors compute prices applying different methodologies, they have some similarities that can briefly be described as follows:

- They take the prices observed in primary and secondary markets to price securities.
- The source for the secondary market information is that provided by the five institutions that act as brokers in Mexico.
- From the secondary market, they use the prices observed in settled transactions and the prices observed in bid-ask offers.
- If there is no information available in the primary and the secondary market, they interpolate the price of the security, using the information available for other securities.
- Taking the previous information, they create a weighted average to obtain the market price of a security. The weight for settled transactions is higher than the weight used for bid-ask offers.

Figure 6

Financial intermediaries' position in government securities

In MXN million



Source: Banco de México

4. Concluding remarks on Banxico's experience in compiling domestic debt securities statistics

Banxico's experience in compiling, organising and publishing debt securities data indicates that using the information available at the central securities depository institution (Indeval) is the best source for constructing a security-by-security database. This is because the available database incorporates comprehensively, accurately and promptly the most relevant characteristics of each security that has been issued and/or traded in the domestic debt market. The use of Indeval's database has been facilitated because in Mexico the majority of the trades involving securities are settled through the same settlement system and held with the same central securities depository. The use of the data available at the central depository institution could also be the best alternative for other emerging countries, since it is likely that only one of these institutions is operating in the payment system.

The sections above have given evidence of the advantages of compiling statistics obtained from a central depository of securities, such as Indeval:

- The database is accurate and timely as it is the source for settling transactions with securities at the payment systems on a daily basis.
- The database is comprehensive at a security-by-security level, as transactions in the payment systems are settled at the level of each security by each financial intermediary.
- The breakdown by sector can be obtained within the same database by requesting the specific sectors or entities to deposit their holdings in separate accounts at the central depository of securities.
- For statistical purposes the information can be aggregated at the level of each security, debt instrument type, financial intermediary, or sector.

The methodology for elaborating debt security statistics is incomplete and thus requires improvement in the following:

- The identification of each security has been designed for the case of Mexico, but this can be improved in the next version of Indeval's system, which will include the ISIN code. Banxico is willing to include the identification fields of a standard security-by-security database. For this it is necessary for the central banks and international financial organisations to agree on those basic fields.
- The methodology has been applied to government securities alone. In this case, the upcoming Indeval system will facilitate the implementation of the methodology for the rest of the domestic debt securities.
- The available statistics are designed for specialists of the Mexican money market, so they are not friendly or consistent with basic financial concepts. To rectify this problem, we are planning to publish statistics using the proposed BIS template.
- The published statistics on the securities distribution by sector indicate who is holding the securities, without distinguishing whether these are temporary positions such as those coming from repos or securities lending. Banxico has obtained operational data from the financial intermediaries to relieve this deficiency, but the data received from financial intermediaries are not yet public.
- The information available to Banxico on microstructure operative activity in the government securities market is still scarce and fragmented. However, the process of collecting such data is advancing fast. For this process of data collection to be efficient and consistent it would be good for central banks and international financial organisations to agree on a standard methodology for assembling statistics, not only on the outstanding amount of domestic debt securities but also on the microstructure operation of the securities market.
- Discrepancies can distinguished, even within government securities holdings. These discrepancies are most evident between the data published by Banxico and those of SHCP, or in the information reported by financial intermediaries in their financial statements. The first discrepancy is minor and is easily resolved, as shown in section 2.2. The second is a more complex problem. A possible alternative is to use the information provided by the price vendors, so that Banxico could also obtain and publish its statistics at market value, and these could be compared with the financial statements by the financial institutions. After that, the discrepancies should be confronted at the level of each institution and each security.

Challenges in compiling Polish debt securities statistics[1]

Piotr Boguszewski[2], Jacek Kocerka[3] and Marcin Sienicki[4]

1. Introduction

We should start our considerations by asking the fundamental question in this context: why are debt securities statistics important for central banks, and especially for the National Bank of Poland? The answer is complex and forces us to limit ourselves to a few main aspects of this problem. One reason is obvious – if the statistical system imposes a responsibility on the central bank it must meet all the requirements of statistical excellence. This is a very important argument, but only a formal one for our interest in this subject. There is a second stream of motives for addressing this problem in central banks. Experience gained over the last decade shows clearly that debt securities, especially those issued by enterprises, are becoming increasingly important for monetary transmission mechanisms and for financial stability.[5] Among other things, there is empirical evidence that corporate bond spreads lead real economic activity.[6] The situation in the debt securities market is also meaningful for the general condition of the credit market, as bonds are close substitutes for banking credit. Development of the debt securities market also contributes to the so-called financial market deepening effect, with multiple consequences for transmission mechanisms.[7] It should be noted that, owing to the wide variety of channels through which debt securities can interfere with monetary policy operations, the central banks are interested in collecting detailed information on these instruments. In practice it results in a complexity of standards for debt security statistics that central banks are expected to meet.

Figure 1 relates to the case of Poland. Since the second half of 2005 we have observed very high dynamics in the growth of corporate debt securities, significantly exceeding the dynamics of loans in some subperiods. In consequence, the bonds/loans ratio rose after accession to EU. It is known that there is a positive correlation between the commercial bond market and economic perspectives. For Poland, forecasts are good in this respect. We can foresee further development of this market in Poland and its growing importance for monetary policy in the future. Although the debt securities market in Poland is not large at present[8] compared to other developed economies, there is evidence for its rapid growth – in ways typical of many "catching-up" economies.

---

[1] The views presented in this paper are those of authors and do not necessarily represent the official position of institutions with which they are affiliated.

[2] National Bank of Poland, University of Warsaw, piotr.boguszewski@mail.nbp.pl.

[3] National Bank of Poland, jacek.kocerka@mail.nbp.pl.

[4] National Bank of Poland, macin.sienicki@mail.nbp.pl.

[5] EP Davis, "Multiple avenues of intermediation, corporate finance and financial stability", *IMF Working Paper*, no 115, 2001.

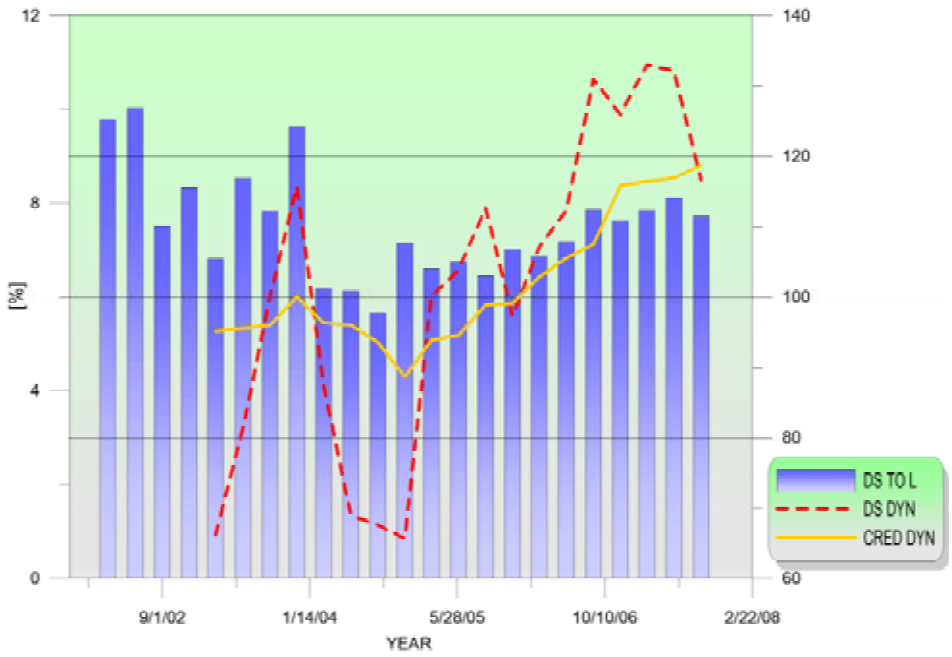
[6] See, for example, G De Bond, "Euro area corporate debt securities market: First empirical evidence", *ECB Working Paper*, no 164, 2002.

[7] I Visco, "Financial deepening and the monetary policy transmission mechanism", speech delivered at the IV Joint High-Level Eurosystem – Bank of Russia Seminar, Moscow, 10–12 October 2007.

[8] Total value of debt securities reached approx. PLN 500 billion.

Figure 1

Debt securities and credit



Yearly dynamics of credit and loans to enterprises (CRED DYN – right axis), bond issues (DS DYN – right) and ratio of bonds to credit and loans (DS TO L – left, in per cent) in Poland.

Source: authors' calculations for companies with more than 49 employees and reporting to the Central Statistical Office of Poland.

For compiling debt securities statistics, the National Bank of Poland primarily uses information from the National Depository of Securities. Domestic banks also provide the NBP with information about debt securities on behalf of their customers. For securities issued abroad, data are collected from end investors.

Overall analysis of the quality of debt securities statistics leads us to conclude that although the data quality is good, some problems are visible. These are difficulties in finding good data sources for the household sector, and information on securities traded outside the regulated market. We are also aware that our reporting agents have problems in the appropriate classification of financial assets. Comparison of information from two data sources (stocks from the National Depository for Securities and flows from balance of payments statistics) also confirm that there is room for improvement. We notice some inconsistency between stocks and flows data, showing that those two datasets give a similar but not identical picture of the economy.

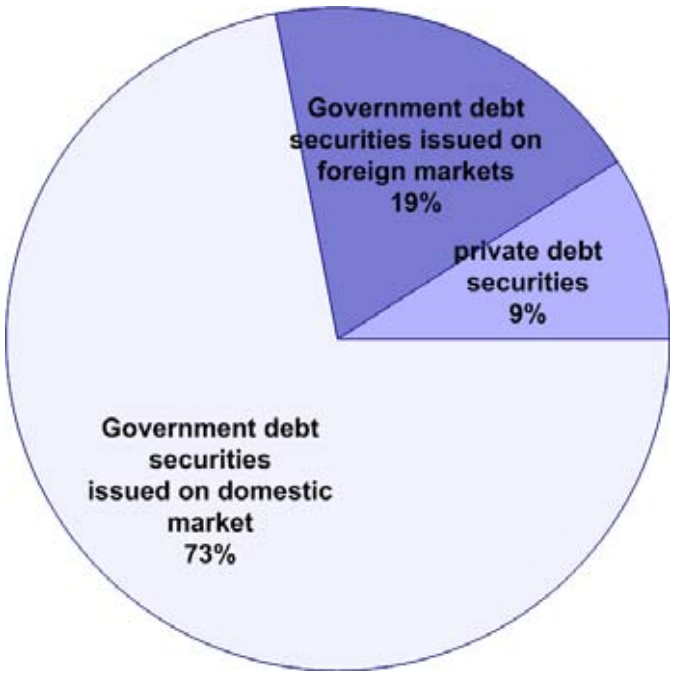
This paper is organised as follows: Section 2 gives a description of the statistical system used for compiling debt securities statistics in the NBP. In section 3 we use a Data Quality Assessment Framework to evaluate our statistics and to identify areas in which quality can be improved. Finally, we draw some conclusions.

2. Description of the statistical system

For the purpose of this paper we treat as Polish debt securities all those securities that interest the National Bank of Poland. These cover all debt securities issued in the domestic

market as well as debt securities issued by Polish residents in foreign markets. The total value of debt securities reached approx. PLN 500 billion (EUR 140 billion, USD 200 billion) in 2007.

Figure 2



Polish debt securities market.

Source: authors' calculations.

As shown in Figure 2, the greatest proportion of the debt securities market in Poland is made up by government securities issued in the domestic market. Information for this part of the market is collected directly from the National Depository for Securities.

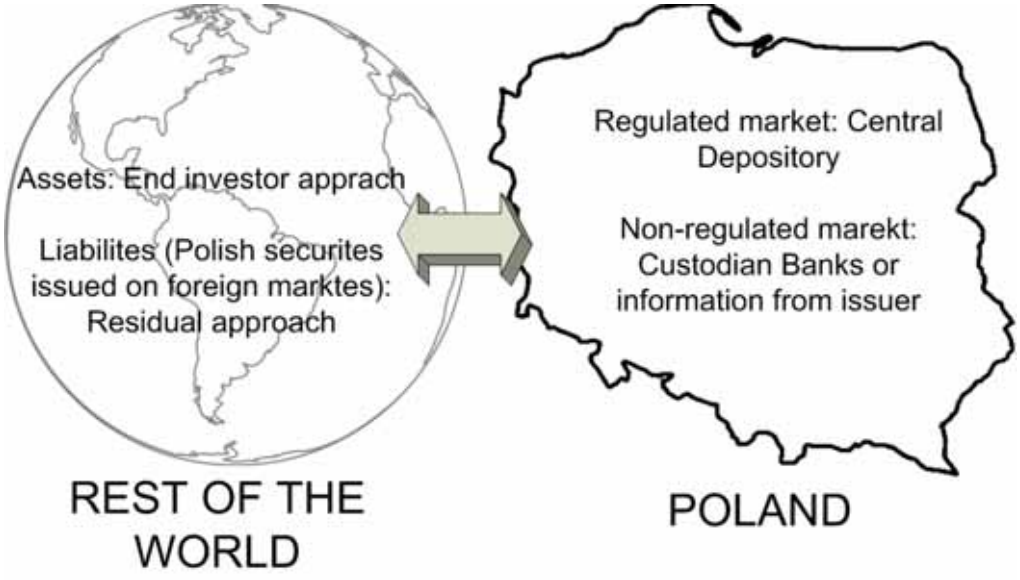
We should remember that the infrastructure for the securities market has been established quite recently, compared with other developed economies, and that all securities traded in the regulated market must be dematerialised and registered with this centralised depository. In Poland there is a single centralised depository institution, which is good for data quality. For government debt securities traded in the domestic regulated market, the National Bank of Poland is able to collect information directly from the National Depository for Securities. The Depository provides the NBP with information on stock and flows of debt securities it stores, broken down by institutional sector of holders for each single security (on a security-by-security basis). The NBP also collects information about non-resident transactions in debt securities for balance of payments statistics purposes. These data come from the settlements system. Polish banks are obliged to report information to the NBP on their own behalf as well as for their customers.

Debt securities issued by government in external markets are also important from the National Bank of Poland's point of view. In this case we apply the residual approach – the NBP collects information from the government on the amount of securities issued abroad, as well as information from Polish residents about their holdings of those securities.

The last area of the market under discussion is securities issued by monetary financial institutions (MFIs) and companies. These securities are usually not traded in the regulated market. They are issued in either domestic or foreign markets. For securities issued in Poland (mainly short-term commercial papers), information from financial intermediaries

(mainly custodian banks) is used to compile the statistics. In the case of foreign markets, information is collected from issuers and resident holders (residual approach).

Figure 3



Data sources for debt securities statistics.

3. Evaluation of the system

The aim of the Statistics Department of the central bank is to provide good-quality statistical data. Data quality can be defined in various ways. We have adopted a Data Quality Assessment Framework (DQAF) to evaluate our data collection system. Against this background we try to describe the merits and drawbacks of the statistical system currently used by the National Bank of Poland to compile data on debt securities statistics. The IMF DQAF identifies quality-related features of the governance of statistical systems, statistical processes, and statistical products.

3.1 Data quality

Data quality is a multidimensional concept. The IMF defines five quality dimensions from the input (process/institutional framework) and the output (product) side, which can be used for assessing the quality of the collection and compilation system. The dimensions of the quality are:

3.1.1 Assurances of integrity

This dimension relates to the adherence to the principle of objectivity in the collection, compilation and dissemination of statistics. It encompasses institutional arrangements that ensure professionalism in statistical policies and practices, transparency and ethical standards. The three elements for this dimension of quality are professionalism (statistical policy and practice are guided by professional principles); transparency (statistical policy and practice are transparent); and ethical standards (statistical policy and practice are guided by ethical standards).

This dimension is common to all statistical activities in the central bank and has no specific reference to debt securities statistics; we will not therefore analyse this dimension in the present paper. It was assessed by the International Monetary Fund in its *Report of Observance Standards and Codes* as

> Staff at all three data compiling agencies demonstrate a high degree of professionalism, and compile data on an impartial basis, selecting techniques purely on statistical considerations. Transparency of statistical practices is promoted by the publication and wide dissemination of the laws and regulations under which the work is undertaken. Ethical standards are maintained by codes of conduct that have recently been updated and that the staff are committed to observe.[9]

3.1.2 Methodological soundness

This dimension covers the idea that the methodological basis for the statistics should be sound and that this can be attained by following internationally accepted standards, guidelines or good practices. This dimension is dataset-specific, reflecting different methodologies for different datasets. Debt securities statistics are part of different datasets compiled or used in the central bank and there is no unified methodology for compiling these data. Debt securities are included in balance of payments, money and banking, financial accounts, securities issues statistics and others. Four elements draw our attention here:

- Concepts and definitions – these are used in accord with internationally accepted standards. For debt securities statistics, these standards are the IMF *Balance of Payments Manual*, *System of National Accounts*, and the *European System of Accounts*. It is also important to emphasise that consistency between different manuals is expected. The current updating process of the different manuals (SNA, BOP, ESA) will improve consistency between manuals.
- Scope – this is in accord with internationally accepted standards, guidelines and/or good practices.
- Classification/sectorisation – data are good quality if classification is in accord with internationally accepted standards. Below, we use some examples to illustrate particular classification issues.
- Basis for recording – this means, in the context of debt securities, that the market value should be used as a basis for recording.

3.1.3 Accuracy and reliability

This dimension covers the idea that statistical outputs sufficiently portray the reality of the economy. It is also data-specific, reflecting the sources used and their processing. The five elements of this dimension cover the following:

- Source data – the data sources used in the compilation process provide an adequate basis for producing statistics. Taking into account the structure of the Polish debt securities market, data sources are reliable and exhaustive; however, in the next section we show that problems with the reporting population have not been fully solved.

---

[9] IMF, Poland, *Report on the observance of standards and code – Data module; response by the authorities; and detailed assessments using the data quality assessment framework*, available at http://www.imf.org/external/pubs/ft/scr/2003/cr03311.pdf.

- Assessment of source data – whether the data sources are regularly assessed.
- Statistical techniques – techniques applied are sound and confirm statistical procedures. It is important to stress that procedures used to compile debt securities statistics are not straightforward, especially if a security-by-security collection system is used. In this case the compilation process is rather complicated, as the compiler has to merge information from the respondent with information from commercial sources or other databases (CSDB, for example). Moreover, if a residual approach is used as part of the compilation process, the system becomes more and more complicated.
- Assessment and validation of intermediate data and statistical outputs; and
- Revision studies.

3.1.4 Serviceability

This dimension relates to the need that statistics are disseminated with an appropriate periodicity in a timely fashion, are consistent internally and with other major datasets, and undergo a regular revision policy. The three elements for this dimension are as follows:

- Periodicity and timeliness
- Consistency – for debt securities statistics, there should be consistency between stock and flows. For Poland, flow data on non-resident buying/selling debt securities come from banks' settlements, while stocks come from the Central Depository. We are able to compare those two datasets, and present this comparison the last part of this paper.
- Revision policy and practice.

3.1.5 Accessibility

This dimension relates to the need for data and metadata to be presented in a clear and understandable manner on an easily available and impartial basis, that for metadata are to be up-to-date and pertinent, and that for a prompt and knowledgeable support service is to be available. This dimension has three elements: data accessibility, metadata accessibility, and assistance to users.

3.2 Classification issues

Good classification is one of the elements of data quality. For a number of dimensions (currency, country etc), our reporting agents usually have no problems with classification.

3.2.1 Debt securities vs credits

An important role in Polish portfolio liabilities is played by bonds issued intra capital groups. These securities are usually held by one or a very limited number of entities – non-resident parent companies or subsidiaries. However, from the legal point of view these instruments are securities and theoretically they are negotiable; in most cases known to the NBP these securities do not change holders from the issue to maturity date. Thus, from the economic point of view, these instruments behave more like credits than debt securities.

3.2.2 Debt securities vs financial derivatives

Debt securities with embedded financial derivatives are another borderline case. Problems emerge at the moment of valuation of such instruments if they are not listed anywhere. A good example here is convertible bonds of large Polish public companies, with low nominal

value, which were in fact intended to be manager options. These instruments, issued as private placements, are bonds only from the legal point of view. Their price is generally similar to the value of conversion option. The lack of a market, and consequently the lack of any market prices, makes valuation very difficult.

Last year new structured products for general public issued by non-resident banks were announced in the Polish market. These products are bonds with embedded options, eg for commodities or stock exchange indices. Although the proportion of debt instrument price in the total value of the instrument is higher than in the convertible bonds described earlier, no market prices are available. One way to value such products can be calculation based on market benchmarks and the prices of underlying instruments.

3.2.3 Remaining vs original maturity

The final problem is classification of debt instruments as long or short term. For securities without an ISIN code, only a holder or custodian of these securities can classify them. The maturity date is very clear for all debt market participants; the issue date, by contrast, is a statistical rather than a market parameter. A market participant understands eg the announcement date or initial date of accrual calculation, but not the “issue date”. This is the first factor that poses a problem for a reporting entity when classifying a security as long- or short-term. The other problem is that, from a market point of view, the remaining maturity is more important for a holder than the original maturity of a security, while the original maturity is essential for statistical purposes.

3.3 Source data

Evaluation of source data is one of the elements included in a description of data quality. The NBP uses various data sources (Central Depository, financial intermediaries, reporting agents etc) to collect information. They are reliable and exhaustive, but in some specific areas, which are fortunately not presently of great importance, some problems remain to be solved.

3.3.1 Households

One of the problems with having good data sources for compiling debt securities statistics lies in a good coverage of households.

In the case of Poland, one specific feature is a relatively high proportion of households as end investors in total portfolio investment assets. Although, local Polish investment funds investing in non-resident securities are becoming increasingly popular among households, on the one hand, while on the other, “wealthy” individual investors stay with their non-resident banks, which provide them with a full range of private banking services. Private banking is still at a rather early phase of development in the Polish market, as is brokerage of securities issued by non-residents. These factors account for the investment habits of Polish households. Average households prefer holdings of units and certificates issued by domestic investment funds investing in non-resident securities, while “wealthy” households hold their portfolio assets with non-resident custodians. As mentioned above, local financial intermediaries (custodians and brokers) cannot be a reliable source of data on Polish household holdings for the international investment position. The end-investor approach has therefore been chosen for collecting data on portfolio investment assets. Each Polish resident whose holdings of non-resident securities exceed a threshold of EUR 10,000 has a legal obligation to report these holdings to the NBP.

Analysis of the actual reporting population shows a high concentration of the total holdings in the hands of a relatively small number of respondents. It is thus very important to cover all “wealthy” respondents, because if a single one is missing, their reports may change the total

figures dramatically. The other information we have (as those respondents are stakeholders of Polish public companies) suggests that the coverage of these "wealthy" households may not be sufficient. The problem to be solved is a choice between a direct approach, ie better detection of potential "wealthy" respondents, and direct collection of real data or estimation of their holdings based on existing population reports.

3.3.2 Private placements

Another problem is related to ensuring good data sources for securities traded outside the regulated market.

An important part of Polish portfolio liabilities, especially in the corporate, but also in the banking sector, are debt securities without an ISIN code. They are usually issued intra capital groups, eg between a Polish subsidiary and a non-resident parent company, or between a Polish parent company and a related Special Purpose Entity (SPE) abroad. As these securities do not have an ISIN code, they cannot appear in the ECB's CSDB or any security code-oriented commercial database. Notwithstanding the classification issues (direct or portfolio investment, security or credit) described earlier, the main problem is how to trace such securities. Every resident issuer that issues securities in the foreign or domestic markets, but without intermediation of any Polish institution, is obliged to report the characteristics of such securities to the NBP. Again – as in the case of "wealthy" households – the actual reporting population may be too limited for the possible population. In the case of bonds issued by a Polish parent company to an SPE, tracing is more possible – they are usually a means of transferring capital raised by the issue of SPEs' debt securities in the international market. Securities issued by non-resident SPE (in the case of Poland, usually established in the Netherlands) in most cases have an ISIN code and can thus appear in securities databases. In other cases, close cooperation with the largest domestic companies may be the solution.

Domestic SPEs, established for the securitisation of certain assets of banks and other financial intermediaries (eg credit portfolios), are quite a new phenomenon in Poland. Debt securities issued by these SPEs do not have ISIN codes, which may result in the same problems described above. The first known cases show that, because of the amounts issued, securities of this kind may be an important part of Polish portfolio liabilities.

3.3.3 Liberalisation of capital flows and globalisation

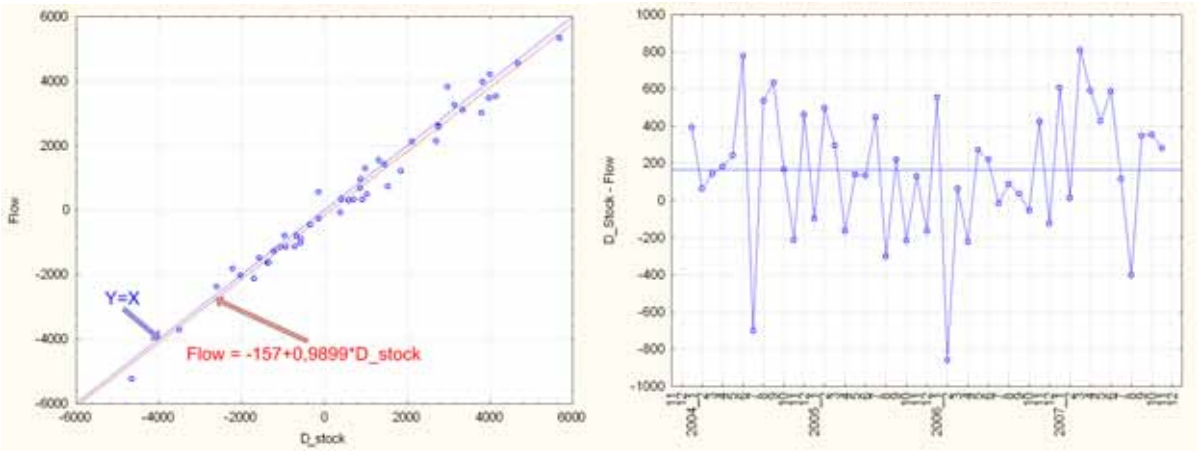
At present, although it is legally possible, debt securities issued by Polish residents are not double-listed, ie traded simultaneously in domestic and international markets. Each issue, if registered, is registered with a single central depositary, domestic or foreign. This provides for easy separation of data collection system into subsystems for securities issued in domestic and international markets, with different approaches, optimal for each market segment. But it is possible, in the immediate future, that Polish debt securities as well will circulate between domestic and one or more foreign markets. This leads the NBP to consider applying a residual approach, currently being used only for securities issued in foreign markets. This approach has the disadvantage, compared with the custodian approach, of complete lack of geographical and sector identification of non-resident holders, even if in the custodian approach it is not always the real end-investor identification.

The same refers to portfolio assets – debt securities issued by non-residents in the Polish market. At present, none of them is double-listed, but, as experience with double-listed shares issued by non-residents shows, there will be a need for necessary adjustments in the data collection system in the immediate future.

3.4 Stock/flow consistency

We have analysed consistency between stock and flows of non-resident holdings of Polish government debt securities. Information on stock of non-resident holdings of debt securities come from the National Depository for Securities, while information on flows is collected by the National Bank of Poland from banks via the settlements system.

Figure 4



Flows and change in stocks (left panel), and their difference over time (right panel).

Source: authors' calculations.

Figure 4 presents a scatterplot of flows and change in stocks. The vertical axis gives the non-resident inflow/outflow of capital into/out of Poland collected by balance of payments statistics. The horizontal axis gives the change in stocks. As this figure shows, these two datasets are generally consistent. If one of them shows a large outflow, the other also shows outflow with a similar value. Theoretically, if these two datasets are consistent, as would be ideal, this scatterplot should be a single line.

However, analysing the right panel of Figure 4, which shows the difference between change in stocks and flows, we observe that the average difference is not equal to zero as it should be. This inconsistency is stable over time and is not dependent on the size of flows or stocks. The average difference between change in stocks and flows is equal to PLN 165 million, which means that flows are systematically lower than the change in stocks by approx. 20%. This difference might have been be caused by the different valuation approach used in these datasets. Stock data are recorded in nominal values, while for flows the market value is used. The other reason for this inconsistency is that banks make mistakes in compiling flows data for balance of payments statistics. Different data sources can also have different classifications of customers as residents or non-residents.

4. Conclusions

Our paper shows the strengths and drawbacks of the statistical system used to compile debt securities statistics in Poland. To reduce weaknesses, various changes in the compilation process are expected in the near future. The NBP will continue its project to change the compilation system.

The settlements system will not be used. The only source for non-resident stocks and flows of government securities will be the National Depository of Securities, and in the new system

those securities will be valued at market value. This is how we intend to reduce inconsistencies in one dataset.

Moreover, new compilation systems allow the NBP to concentrate on the population, which is the most important factor for these statistics. The new system will also enable us to use more sophisticated statistical methods to estimate non-respondents' data.

Session 4

Specific methodological questions regarding debt securities issues

Chair: Paul Van den Bergh, BIS

Papers:

Framework for aggregate securities issues statistics in the euro area
Alexander Cho and Cristina Abascal, European Central Bank

Methodological questions regarding debt securities: residency of issuer, location of issue, residency of obligor
Carol Bertaut, Board of Governors of the Federal Reserve System

Aggregate debt securities statistics: classification by sector, currency, maturity and financial instrument
Kerry Wood, Bank for International Settlements

Treatment of hybrid securities
Kenneth Aberbach, Federal Reserve Bank of New York

Valuation of debt instruments
Csaba Ilyés and László Lakatos, Magyar Nemzeti Bank

Framework for aggregate securities issues statistics in the euro area

Alexander Cho[1] and Cristina Abascal[2]

The euro area securities issues statistics are used for the monetary and financial analysis of the euro area. The statistics cover debt securities and quoted shares issued by euro area residents, as well as euro-denominated debt securities issued worldwide. The document outlines the scope of the current statistics, the underlying methodology, data quality assessment and production processes and dissemination channels to the public.

Methodology

Securities issues statistics are used to monitor the role of capital market activity in the context of the transmission of monetary policy. Holders of financial assets view securities issued by "non-banks" as partial substitutes for bank deposits and negotiable instruments issued by banks. For issuers of securities, debt and equity issuance constitutes an alternative to traditional bank loans. Over time, shifts between direct financing (through securities markets) and indirect financing (through the banking system) may affect the transmission mechanism of monetary policy, and such shifts may change the financial structure in the euro area. The outstanding amounts and flows (gross issues, redemptions and net issues) of securities are also monitored in order to analyse the depth and liquidity of the financial markets for capital market instruments. Information on securities issued in euro (by euro area residents and by non-residents) is also used to assess the role of the euro in international financial markets.

The national central banks (NCBs) of the euro area countries collectively cover all issues of securities by euro area residents. This is in accordance with the commonly agreed framework for producing statistics. As per December 2006, the outstanding debt securities issued by euro area residents accounted for 22% of the outstanding debt securities issued worldwide.[3]

The euro area statistics are estimated to cover approximately 95% of total issues by euro area residents.

Breakdowns

Securities issues currently cover two broad groupings: debt securities, ie securities other than shares, excluding financial derivatives, and quoted shares, excluding investment fund shares/units. Debt securities issues are broken down further by the sector of the issuer, the

---

[1] Economist-Statistician, Financial Statistics, European Central Bank, alexander.cho@ecb.europa.eu.

[2] Research Analyst, Financial Statistics, European Central Bank, cristina.abascal@ecb.europa.eu.

[3] Debt securities issued by euro area residents accounted for €11 trillion of total issues of approximately €50 trillion worldwide, as estimated from the euro area securities issues data, the BIS database and securities data collected by the NCBs of non-euro area Member States.

currency of issue ("euro" and "other currencies"), the original maturity (short and long-term), and the type of coupon (fixed or variable). Quoted shares are broken down by the sector of the issuer (excluding the government sector that does not, in practice, issue quoted shares).

The euro area securities issues statistics cover all securities issued by euro area residents, as collected by the euro area NCBs. The statistics are broken down by euro area country on the basis of the residency principle but are not broken down into international/domestic market types. In addition, monthly data on euro-denominated debt securities issued by non-residents of the euro area are collected and transmitted to the ECB by the Bank for International Settlements (BIS).

Breakdowns by sector

A breakdown of the issuance by sector of the issuer is used to analyse the relative importance of the demand by the government and non-government sectors on capital markets and helps to account for movements in market interest rates, in particular in the case of medium to long-term issues.

The sectors below constitute the most granular level of the sectoral breakdowns transmitted by the euro area NCBs and the BIS. The sector classification follows the international standards laid out in the European System of Accounts 1995 (ESA 95), which is also compliant with the System of National Accounts 1993 (SNA 93). These sectors are thereafter aggregated at various levels by the ECB in its publications and internal briefing notes. Data on the "general government" sector are published in the ECB's press release on the securities issues statistics and constitute an aggregation of the subsectors "central government" (S.1311), "state government" (S.1312), "local government" (S.1313) and "social security funds" (S.1314). The non-government sectors comprise "central banks" (S.121), "other monetary financial institutions" (S.122), "non-financial corporations" (S.11), "other financial intermediaries" (S.123), which also include "financial auxiliaries" (S.124), and "insurance corporations and pension funds" (S.125).

Breakdown by currency

Euro area securities issues statistics cover securities denominated in euro[4] and in other currencies, with it having to be noted that derivatives such as swaps and the resulting changes to net currency exposures are excluded.

Quoted shares are typically denominated in euro, as they are issued in the currency of the country of residence of the corporation; issues of shares in other currencies are negligible or non-existent. Hence, the data on quoted shares refer to all issues by euro area residents that are listed in the euro area.

[4] These issues also cover issues originally denominated in the national currencies of those EU Member States that have subsequently adopted the euro or the ECU.

Breakdown by original maturity

Short-term debt securities comprise securities that normally have an original maturity of one year or less, even if they are issued under longer-term facilities.[5] Long-term debt securities comprise securities that have an original maturity of more than one year. Issues with optional maturity dates, the latest of which is more than one year away, and issues with an indefinite maturity, are classified as long-term.

Long-term debt securities are broken down further into fixed and variable rate issues. Fixed rate issues constitute bonds with a nominal coupon payment that does not change during the life of the issue, while variable rate issues constitute bonds that have a coupon rate or an underlying principal that is linked to an interest rate or some other index resulting in a variable nominal coupon payment over the life of the issue. Data on long-term zero-coupon issues are also collected, but are not currently published as a separate breakdown. Such issues, however, constitute a very small proportion of all long-term bonds.

Type of data: outstanding amounts, gross issuance, redemptions, net issuance

Outstanding amounts cover all securities outstanding, including issues that have been assumed or taken over by the reporting entity, as well as securities resulting from the conversion of loans. Such conversions, however, are not recorded as gross or net issues as they are not effected against cash. Other changes in the outstanding amounts that are due to instrument or issuer reclassifications or to valuation changes on account of exchange rate movements are not collected separately, given the focus of the dataset on measuring the changes in the outstanding amounts from gross issues and redemptions.

The outstanding amounts of quoted shares represent the full market value of all quoted shares of resident entities. If a company is privatised and the government keeps part of the shares, but the other part is quoted on a regulated market, the entire value of the company's capital is recorded under outstanding amounts of quoted shares, since all shares could potentially be traded at market value at any time. The same applies if part of the shares is sold to major investors and only the remaining part (free float) is traded on the stock exchange.

Gross issues include all primary market issues of debt securities and quoted shares where the issuer sells newly created securities against cash. Private placements covering non-public issues of securities or quoted shares for cash are included. Gross issues of quoted shares cover the newly created shares that are issued against cash by corporations quoted on a stock exchange. Gross issuance is considered to have been effected when the issuer receives payment (payment date), and not when the issuer counterparty or syndicate takes up the commitment (trade date).

Redemptions cover all repurchases of debt securities and quoted shares by the issuer where the investor receives cash for the securities. Redemptions concern the regular deletion of instruments and exclude repurchase agreements. They cover all debt securities that reach their maturity date, as well as early redemptions. Company share buybacks are covered if the company repurchases all shares against cash prior to a change in its legal form, or part

[5] In some exceptional cases, instruments with maturities in excess of one calendar year are included in the short-term maturity bracket (ESA 95, paragraph 5.22). A breakdown by residual maturity would provide additional information on outstanding amounts, but requires the ready availability of security-by-security data.

of its shares against cash if these shares are then cancelled, thereby leading to a reduction of the company's capital. Company share buybacks are not covered if they are investments in own shares. Redemptions are not reported in the event of a sole delisting from a stock exchange.

Net issues are the balance of all gross issues minus all redemptions that have occurred during the reference period.

Valuation

Quoted shares are reported at market value. ESA 95 stipulates that debt securities should be valued using market values. However, the euro area debt securities are reported at nominal value. A market valuation of debt securities is relevant for a fair representation of the holdings of an investor, while – in some cases for the same instruments (such as for subprime bonds) – the fair value of the issuers' debt service commitments on the liability side of the balance sheet may be more adequately represented using nominal values. The measurement of debt securities using nominal valuation is consistent with the international debt securities statistics of the BIS, and thus makes a consistent calculation possible of total euro-denominated debt securities issued by the rest of the world. In principle, the nominal valuation of the debt securities also allows monthly reconciliations between the outstanding amounts at the end of each reference period and the transactions within the period.

The growth rates in the outstanding amounts are calculated from transactions in securities issues, excluding reclassifications, revaluations, exchange rate variations and any other changes except transactions. An index series is first calculated that is based on the net issues in relation to the outstanding amounts. As a base, the index is set equal to 100 in December 2001. If N_t^M represents the net issues in month t and L_t the outstanding amounts at the end of the month t, the index I_t in month t is defined as:

$$I_t = I_{t-1} \times \left(1 + \frac{N_t}{L_{t-1}}\right)$$

The growth rate a_t for month t, corresponding to the change in the index in the 12 months ending in month t, may be calculated using either of the following two formulae:

optional formula (a)

$$a_t = \left[\prod_{i=0}^{11}\left(1 + N^{M}_{t-i} \Big/ L_{t-1-i}\right) - 1\right] \times 100$$

optional formula (b)

$$a_t = \left(I_t \Big/ I_{t-12} - 1\right) \times 100$$

The method used to calculate the growth rates for securities other than shares is the same as that used for the monetary aggregates, although it should be noted that net issues for securities issues statistics are calculated from collected data on gross issues and redemptions, while the monetary aggregates are based directly on (net) transactions.

Seasonal adjustment

The general principles followed by the ECB in the seasonal adjustment of time series are laid down in the ECB's publication "Seasonal adjustment of monetary aggregates and HICP for the euro area". The approach to seasonally adjusted securities issues statistics is a multiplicative decomposition using the Census X-12-ARIMA method, Version 0.2.10. Outliers are taken into consideration in order to minimise distortions to the estimated seasonal components.

Seasonally adjusted data for outstanding amounts, net issues and growth rates of securities issues are based on seasonal adjustments to indices that reflect the changes in outstanding amounts caused by transactions (ie net issues). This approach is consistent with the current procedures for seasonally adjusting monetary aggregates. To ensure the additivity of the seasonally adjusted components to the seasonally adjusted aggregates, the seasonally adjusted series for the total securities issues are derived indirectly from the breakdowns by sector and maturity. A direct adjustment of the total is regularly carried out for monitoring purposes. The difference between direct and indirect estimates is generally negligible. The seasonal factors are re-estimated annually. No seasonal adjustments are undertaken for data on quoted shares as no significant seasonal variation exists for these series. The growth rates and seasonally adjusted statistics for debt securities are available for the individual breakdowns where relevant (please see the Seasonal adjustment section on the Securities Issues Statistics webpage.)

Production process

The NCBs report national securities issues data on a monthly basis in accordance with Part 12 of the Guideline of the European Central Bank of 1 August 2007 on monetary, financial institutions and markets statistics (recast) (ECB/2007/9).[6] The NCB send the most granular national time series to the ECB, which subsequently aggregates these for all feasible breakdowns. This building-block approach allows a high level of consistency and depth in the aggregated dataset. When compiling their national contributions, the NCBs use multiple data sources to maximise their coverage by sector and instrument, including data from the national debt agency or ministry of finance, national financial supervisory authorities, commercial data providers, national stock exchanges, settlement systems and direct reporting by issuers. Finally, the NCBs ensure correct statistical classifications of all issues as per Guideline ECB/2007/9 prior to transmitting the data to the ECB.

The monthly national contributions are transmitted using a common reporting scheme and harmonised code list, which minimises the need for transmissions of metadata within the regular data transmissions. The metadata pertain to specific attributes of the time series, whereas national methodological notes are collected and maintained separately outside the technical framework of regular data transmissions. The monthly transmissions to the ECB take place in the 5th week after the reference month via a secure transmission channel network encompassing the whole European System of Central Banks (the ESCB-net) according to an agreed transmission calendar that is reviewed annually. The BIS provides quarterly updates consisting of monthly data for euro-denominated debt securities issued by non-residents of the euro area.

Any missing data are automatically flagged to ensure that the transmission is complete and covers all the series that are supposed to be transmitted by the NCB concerned. Revisions to

---

6 *Official Journal of the European Union*, L 341, 21.12.2007, pp 1 ff.

national data are automatically flagged for checking when the revisions exceed €100 million or result in a change of 5% or more of a previously reported value within a national series. The national data are checked for internal consistency, and the changes in the national stocks are checked against the national flow data over multiple time periods. The pattern of each national series is furthermore checked for any outliers or for breaks in the series. The national series for outstanding amounts of quoted shares are also compared to national stock market indices. The national data are thereafter aggregated to euro area series using a bottom-up building-block approach. The euro area growth rates for transactions are thereafter calculated and seasonally adjusted data for the aggregate euro area series are produced (see previous sections).

Dissemination channels

The securities issues statistics produced are published at monthly intervals via the euro area securities issues statistics press release, the ECB's Monthly Bulletin, the Statistics Pocket Book, and in the ECB's Statistical Data Warehouse (SDW). The euro area securities issues statistics presented in the ECB publications relate to all current euro area countries for all reference months, including historical periods prior to January 1999 (the fixed composition). The euro area series relating to the changing composition of the euro area over time are also disseminated in the SDW. The time series starts in December 1989 (January 1990 for flows). Moreover, euro area aggregates and their national contributions are part of the euro area joint dissemination framework, which presents a cross-sectional view and time series of selected euro area and national aggregates on the websites of the ECB and the NCBs, using a single data source while applying the typical national "look and feel".

Future output

The securities issues statistics dataset will continue to be enhanced. Furthermore, the feasibility of further subsectoral breakdowns based on the activity of the issuer is currently under examination.

A breakdown envisaged in the medium term is for instrument types such as covered bonds, inflation-linked securities and mortgage-backed or asset-backed securities. The quoted shares statistics may also be further enhanced with separate breakdowns for initial public offering volumes, secondary public offering volumes and privatisation volumes.

References

ECB Guideline 2007/9:
http://www.ecb.europa.eu/ecb/legal/pdf/l_34120071227en00010232.pdf

ECB Monthly Bulletin:
http://www.ecb.europa.eu/pub/mb/html/index.en.html (Statistical Tables 4.1–4.4)

http://www.ecb.europa.eu/stats/services/downloads/html/index.en.html (Chapter 4 Financial Markets)

http://www.ecb.europa.eu/pub/mb/html/index.en.html (Technical Notes)

ECB Securities Issues Statistics monthly release calendar:
http://www.ecb.europa.eu/events/calendar/statscal/mfm/html/stprsi.en.html

ECB Securities Issues Statistics Press release:
http://www.ecb.europa.eu/press/pr/stats/sis/html/index.en.html

ECB Securities Issues Statistics webpage:
http://www.ecb.europa.eu/stats/money/securities/html/index.en.html

ECB Statistical Data Warehouse:
http://sdw.ecb.europa.eu/browse.do?node=2018780

ECB Statistical Pocketbook:
http://www.ecb.europa.eu/pub/spb/html/index.en.html (Tables 9.1–9.4)

European System of Accounts 1995:
http://circa.europa.eu/irc/dsis/nfaccount/info/data/esa95/esa95-new.htm

Selected euro area statistics and national breakdowns (euro area joint dissemination framework):
http://www.ecb.europa.eu/stats/services/escb/html/index.en.html

http://www.ecb.europa.eu/stats/money/securities/debt/html/debt_securities_latest.en.html

http://www.ecb.europa.eu/stats/money/securities/quoted/html/quoted_shares_latest.en.html

Methodological questions regarding debt securities: residency of issuer, location of issue, residency of obligor[1]

Carol Bertaut[2]

An important methodological question in categorizing debt securities (and indeed in categorizing all types of securities) is how to determine to which country the security should most appropriately be attributed. Common possibilities include classifying according to the *residence of the issuer*, according to the *location of the issue* (the actual market into which the security is issued), or according to the *residence of the ultimate obligor*. Additional considerations can include the intended target investor audience of the security, which may also be related to the currency of the issue. In many cases, the classification is straightforward, but as noted below, the complex nature of international financial markets and of corporate legal structures can make the task more difficult. This paper discusses some of the issues raised by the different possibilities for country attribution.

The International Monetary Fund Balance of Payments convention for country of attribution of securities is straightforward: securities should be assigned by the *residence of issuer* of the security, where residence is determined by the economic territory under whose laws an enterprise is incorporated or registered.[3] Attributing securities by residence of issuer can in many cases give different outcomes than if securities are classified by *location of issue*, especially for securities that are internationally traded. This distinction may matter more for countries where financial markets are developed and where cross-border investment is sizable. However, this convention may be in conflict with the basic concept of residence determined by *center of economic interest*, that is, the location where a significant amount of economic activity takes place.[4] It may also be in conflict with a wish to associate a security with the *country of the obligor or guarantor*. To illustrate these points, consider a few specific examples:

A straightforward example: Ford Motor Company (United States) issues US dollar-denominated securities in the United States

In this case, there are no conflicts in classification or interpretation. Such debt securities are clearly US obligations, and in the balance of payments accounts, any non-US resident holdings of Ford Motor Company securities are recorded as US liabilities to foreigners in the US International Investment Position (IIP). The *residence of issuer* is the United States, because Ford Motor Company is incorporated in the United States. In this case, the *location of issue* is also the United States, and the *residence of obligor* (Ford Motor Company) is also

---

1 The views expressed should be interpreted as those of the author and not as reflecting the views of the Board of Governors of the Federal Reserve System or any other person associated with the Federal Reserve System.

2 Senior Economist, International Finance Department, Board of Governors of the Federal Reserve System, carol.bertaut@frb.gov.

3 See IMF Balance of Payments Manual Sixth Edition (Draft), section 4.143, available at http://www.imf.org/external/pubs/ft/bop/2007/pdf/BPM6.pdf.

4 See, for example, IMF Balance of Payments Manual Sixth Edition (Draft), section 4.123.

the United States. And Ford Motor Company's *center of economic interest* is also clearly the United States.

Note also that such securities correspond to the Bank for International Settlements (BIS) definition of US "domestic" debt securities: securities that have been issued by residents in domestic currency (with a few exceptions) and targeted at resident investors.[5]

Now consider the example where Ford Motor Company issues securities abroad, with the (presumed) intention of attracting foreign investors

In this example, the *residence of issuer* (Ford Motor Company) is still the United States, and the *residence of obligor* (Ford Motor Company) is also still the United States. However, the *location of issue* is no longer the United States, and instead is most likely the European market, either Luxembourg or the United Kingdom. And if the securities are issued in the European market, they may well be issued in euros, rather than US dollars. Such securities correspond to the traditional BIS definition of US "international" debt securities, because they have been issued by US residents in a foreign market (and targeted to non-US investors), and also (if issued in euros) because they are issued in a foreign currency.

The main point to consider is that although the securities are issued abroad, they are still the obligations of a US-incorporated enterprise and for balance of payments purposes, we would want such securities to be included as US liabilities in measures of the US IIP. So in this case, the *residence of issuer* still corresponds to the *center of economic interest*, whereas the *location of issue* does not. A side point is that there can be useful information about the currency of issue: it may provide useful information on the extent of foreigners' dollar versus non-dollar claims on the United States, but this aspect is not central for determining the country of attribution.

Similarly, consider the example of American Honda Motor Corporation (the US subsidiary of Honda Motor Co.) issuing securities in the US market

These securities are also considered US securities because of *location of incorporation* of American Honda Motor Corporation. In this case there is again no conflict between the *residence of issuer*, the *location of issue*, or the *residence of first guarantor* of the securities (American Honda). Such securities will again be considered obligations of US enterprises, and foreign holdings of such securities will be included as US liabilities in the US IIP. There is a slight wrinkle in the possibility that Honda Motor Co. (Japan) might (ultimately) guarantee the securities, but such a guarantee is not certain. Investors generally understand this distinction, and thus the prices of securities issued by subsidiaries such as American Honda Motor Corporation will not necessarily move with prices of parent companies. It also makes "economic sense" to consider the securities of American Honda Motor Corporation as US securities, because the center of economic activity is the United States, and the securities themselves are backed by real US assets in the form of US manufacturing facilities.

However, there are certainly reasons when the *location of issue* is a major consideration

If, for example, a country such as Argentina issues a debt security in the United States, the security has to be issued in accordance with US laws. Such information (and the

[5] See BIS Papers No 14, "Guide to the international financial statistics", available at http://www.bis.org/publ/bppdf/bispap14.pdf?noframes=1.

consequences for investor rights and protections) is clearly information that is important to investors: investors want to know the *location of issue*, and thus keeping statistics on location of issue is important and informative. However, the security is still ultimately the obligation of Argentina, and should be included in measures of Argentina's external debt, and thus for balance of payments purposes, we care about the *residence of issuer*. This is a case where the *residence of issuer* (Argentina) is in conflict with the *location of issue* (United States), but not with the *residence of obligor* (again, Argentina). And as with the case of Ford Motor Company issuing euro-denominated securities directly in the European market, the currency of issue may provide additional information on the willingness of foreigner investors to acquire local versus dollar-denominated Argentinean debt, but this is again a side issue relative to the appropriate country of attribution.

Where we have potentially more serious problems of measurement and interpretation

More serious problems of attribution may arise from reincorporations, establishment of shell corporations, and creation of Special Purpose Vehicles (SPVs) in offshore financial centers (for example, Bermuda or Cayman Islands), or with incorporation as a Delaware affiliate in the United States.

Under the balance of payments convention, securities issued by Delaware affiliates are considered US securities. Likewise, securities issued by Bermuda or Cayman affiliates are considered non-US securities, even if the issuer (for example the SPV) is established by a US entity. The complication caused by these situations is that the *residence of issuer* may be at odds with the *center of economic interest or activity*, and may also be at odds with the *residence of obligor*. Although attribution according to the balance of payments convention may be straightforward according to residence of issuer, the attribution may make less "economic sense."

Consider, for example, securities issued by KfW International Finance, Inc: a Delaware affiliate of KfW (Germany)

Under the balance of payments *residence of issuer* convention, debt securities issued by the Delaware affiliate are considered US securities in the US IIP. This is the case even though the sole function of KfW International was to issue debt securities on behalf of and guaranteed by its parent, KfW. In addition, the *location of issue* was frequently Europe. And although the securities were issued by KfW International Finance (Delaware), it was understood by investors that the *obligor/guarantor* was KfW (Germany). So in this case, there are not only conflicts between *residence of issuer* and *location of issue*, but a more serious question of whether *residency of issuer* gives a meaningful economic interpretation – is there any "economic sense" in which these Delaware-issued securities have a meaningful connection with the US economy?

Similar problems of economic interpretation arise from debt securities issued by Cayman affiliates

According to the *residence of issuer* convention, debt securities issued by Cayman affiliates are not considered US obligations, even if the issuing entity is established by a US enterprise. In the US cross-border portfolio data, we have seen the consequences of a proliferation of SPVs in the Caribbean established by US financial firms specifically to issue asset-backed securities, where the assets frequently have been pools of US loans. US investors' holdings of such securities are considered holdings of foreign securities. This is a growing concern: Of foreign debt securities held by US residents in December 2006, nearly 15% ($242 billion) were securities issued by entities incorporated in Caribbean financial

centers. By December 2007, such holdings had grown to $294 billion, or 18% of all foreign debt securities held by US residents.

From the Cayman perspective, we expect that they would not wish to include such securities in the Cayman IIP, because these securities are not truly obligations of the Cayman Islands: activities of the shell corporations usually have no physical presence in the Cayman Islands, and have no real economic relation to the Cayman economy. And so an "*economically sensible*" IIP for the Cayman Islands would exclude both assets and liabilities of the SPVs. However, inclusion of these securities as cross-border assets of the United States but exclusion of them from the IIP of the Cayman Islands greatly complicates the ability to compare IIPs across countries.

A further issue that can arise from the establishment of SPVs and shell corporations is that in some cases it may not be a straightforward task to identify and classify securities according to *residence of issuer*. Such complications may arise when SPVs are established in both Delaware and the Cayman Islands, and securities are issued by either entity or at times are "co-issued" by the two entities jointly. Similar issues may arise with SPVs established in other financial centers. In practical terms, it can be difficult for data compilers to distinguish between Delaware and Cayman securities issued by SPVs that fall under the same "umbrella" entity. And according to the specific legal structure of such entities, "co-issues" may be more correctly considered wholly the issue of one or the other of the SPVs, for example either entirely "Cayman" or entirely "Delaware".

Concluding remarks

In determining the country of attribution of securities for cross-border data collection, the balance of payments convention is to assign securities by *location of residence*. In some cases, this attribution may conflict with that of attribution by *location of issue*, but as the above examples involving securities issued by Ford Motor Company and American Honda Motor Corporation illustrate, in most cases, the *residence of issuer* classification will give a result that also makes "economic sense" in terms of the center of economic activity of the issuer and also corresponds to the *residence of the obligor* of the issue.

Residence of issuer can be straightforward to apply, especially if data are collected at the individual security level. It is possible (at least in theory) to determine the location of incorporation of the issuing entity. In practice, however, this may not always be a straightforward task. Complexities of the legal structures of various offshore or shell corporations can make it difficult to determine the issuer's legal residence, even if data are collected at the security level. And the above examples involving activities of Delaware affiliates and of SPVs established in offshore centers illustrate the further complication that data collected and presented according to the *residence of issuer* convention may be less satisfactory than data presented by *residence of obligor*.

Aggregate debt securities statistics: classification by sector, currency, maturity and financial instrument

Kerry Wood[1]

Background

Debt securities statistics have been traditionally presented on a market-segmented basis, decomposed between those issued and traded in domestic, international and all markets.[2] This presentation was developed in response to international debt securities markets increasing their role in global financial intermediation in the 1980s. The data have also served to complement international banking statistics to provide a more comprehensive monitoring of international financing market activity.

More recently, a number of studies and policy papers – see, for example, the Committee on the Global Financial System (2007) – have suggested that apart from market segmentation, a minimum number of additional ways to classify aggregate debt securities statistics would be useful for the analysis of financial markets, particularly from the perspective of financial stability. This background note outlines a range of classifications for the presentation of debt securities statistics across sectors, currencies, maturities and financial instruments.

National institutional and regulatory arrangements of debt securities markets have determined how statistics are presented. At the same time, there have been no recommendations made to national compilers to change the approach that they use to report debt securities statistics. This has resulted in statistics with gaps, and that are inconsistent, opaque and lacking in international comparability. Despite this, it is important to examine how existing national data can be "sliced and diced". This will increase the international comparability and transparency of debt securities data and facilitate improved analysis. Fortunately, compilers of debt securities statistics have well established international statistical standards, guides and manuals to help them with this exercise, though there is no single international standard for the presentation of debt securities statistics.

Sector

From a financial stability perspective, it is important to analyse and understand the relative size of different issuing and holding sectors in domestic debt securities markets, including non-residents. In order to analyse the growing role of financial corporations outside deposit-takers, measures of debt securities issued and held through institutional investors (eg pension funds) are important. Knowledge of the openness of national capital markets can also be gained by having accurate data on the issuance activity of non-residents in domestic markets as well as on the holdings of domestic debt securities by non-residents.

---

[1] Statistical Analyst, Bank for International Settlements (kerry.wood@bis.org, Tel. +41 61 280 8327).

[2] The BIS international and domestic debt securities statistics have been published since the mid-1980s and early 1990s respectively. Available via the Internet: http://www.bis.org/statistics/secstats.htm.

The *System of National Accounts 2008* (*2008 SNA*) groups resident institutional units into five mutually exclusive sectors: non-financial corporations; financial corporations; general government; non-profit institutions serving households (NPISH), and households. The coverage of each sector is outlined below.

Non-financial corporations

The non-financial corporations sector comprises resident corporations (and non-profit institutions) whose principal activity is the production of goods and non-financial services. Some non-financial corporations may have secondary financial activities, such as producers or retailers of goods that provide consumer credit directly to their customers. Such corporations are classified as non-financial corporations, provided their main activity is non-financial. The *2008 SNA* divides the non-financial corporations sector, on the basis of the types of corporations that exercise control over them, into: national private non-financial corporations; foreign controlled non-financial corporations; and public non-financial corporations.

Financial corporations

The financial corporations sector consists of all resident corporations principally engaged in providing financial services to other institutional units. The production of financial services is the result of financial intermediation, financial risk management, liquidity transformation or auxiliary financial activities. Financial corporations incur credit and financial risks, have separate set of accounts for their financial intermediation activities, and provide financial services within the total production of goods and services.

The *2008 SNA* identifies nine sub-sectors within the financial corporations sector – central bank, deposit-taking corporations except the central bank, money market funds (MMF), non-MMF investment funds, other financial intermediaries except insurance corporations and pension funds, financial auxiliaries, captive financial institutions and money lenders, insurance corporations and pension funds.

General government

Government agencies are unique kinds of legal entities established by political processes that exercise legislative, judicial or executive authority over other entities within a given area. Within a single territory there may be different levels of government. The *2008 SNA* provides two methods for delineating the sub-sectors of the general government sector. The first method divides general government into: central government, state government, local government and social security funds. The second method subsumes the social security funds within the general government sub-sectors – central, state, local – in which they operate. The choice between the methods depends on the magnitude and organisation of the social security funds, as well as on the extent to which their management is independent of the government agencies with which they are associated.

Households

A household is a small group of persons who share the same living accommodation, pool some or all of their income and wealth, and consume certain types of goods and services collectively, mainly housing and food. Unincorporated enterprises are classified as households.

Non-profit institutions serving households (NPISH)

NPISH provide goods and services to households free of charge or at prices that are not economically significant.[3] NPISH consist mainly of associations, such as trade unions, professional or learned societies, consumers' associations, political parties (except in single-party states where the political party is included in the general government sector), churches and religious societies (including those financed by the general government sector); social, cultural and recreational sports clubs and organisations providing goods and services for philanthropic purposes rather than those that control them.

Currency

Concerns about currency mismatches may lead to interest in the use of the domestic and foreign currencies in domestic and international debt securities markets. In terms of financial stability, countries that have tax revenue denominated in local currency and debt denominated in foreign currencies can be vulnerable to a large increase in debt repayments during a sharp exchange rate depreciation, even if the initial level of debt is not high. According to the *Balance of Payments Manual*, 6th ed (*BPM6*), financial assets and liabilities can be classified as domestic or foreign currencies. Additional breakdowns into major currencies may be desirable.

Maturity

BPM6 indicates that debt securities can be classified as either short term or long term. Short term is defined as payable on demand,[4] or with a maturity of one year or less. Long term is defined as having a maturity of more than one year, or with no stated maturity. Debt securities statistics with this split are useful to provide information on when most debt obligations are due.

Maturity may also relate to original and remaining (or residual) maturity. Original maturity is the period from the issue date until the redemption of a debt security. Remaining maturity is the period from the reference date until the final contractually scheduled payment.

Data on both original and remaining maturity are accommodated by the following split:

(a) Short term on an original maturity basis;

(b) Long term on an original maturity basis that will mature within one year or less; and

(c) Long term on an original maturity basis that will mature in more than one year.

Item (a) can be combined with item (b) to derive liabilities due within one year, that is, short-term debt on a remaining maturity basis. Alternatively, item (b) can be combined with item (c) to derive long-term debt on an original maturity basis.

A question is whether data should be reported on an original or remaining maturity basis. The original term to maturity concept is useful for classifying financial instruments in broad terms, and it is likely that most compilers will report data based on this concept. However, it

[3] Non-profit institutions financed and controlled by government are part of the general government sector.

[4] Payable on demand refers to a decision by the creditor, an instrument where the debtor can repay at any time may be short term or long term.

may also be useful to report data where maturity is based on the time remaining until payment of the outstanding debt obligation, or remaining maturity basis. Those interested in debt positions and debt servicing capabilities might prefer data on a remaining maturity rather than an original maturity basis. This concept is more closely related to duration, and given the tendency for debt securities with the same duration to have a similar yield, remaining differences may then be due to the credit risk of the borrower, or market liquidity etc. It would be useful to provide an estimate of total long-term debt securities on a remaining basis with a term to maturity of one year or less.

Another question is whether maturity can be matched with instrument breakdown. When debt securities markets were in their infancy, it is conceivable that short-term debt securities would have comprised treasury bills, bank bills, certificates of deposit (CDs), commercial paper (CP) etc, and long-term debt securities would have comprised bonds and notes. Financial innovation over the past few decades now means that financial markets are more sophisticated than they once were. CP and CDs can be issued with a term to maturity of less than one year as well as more than one year. If, for example, all CP and CDs are treated as short-term debt securities, there is a risk of upward bias to the positions for short-term debt securities and a downward bias to the positions of long-term debt securities.

Financial instrument

There may also be interest in issuance and holdings of different types of financial instruments. From a financial stability perspective, there is growing interest in tracing the importance of credit risk transfers, particularly when monitoring securitisation.

BPM6 provides some examples of debt securities – bills, bonds, bankers' acceptances, CDs, CP, debentures, asset-backed securities (ABS), non-participating preferred stocks or shares, convertible bonds, indexed-linked securities and stripped securities – and a limited list for short-term debt securities – treasury bills, negotiable CDs, bankers' acceptances, promissory notes and CP.

The *Monetary and Financial Statistics Compilation Guide* (*MFSC Guide*) nominates some standard types of debt securities, and some specific types that are issued and traded in international markets.

- Short-term debt securities sold on a zero coupon (discount) basis include: treasury bills and other securities issued by central government or its agencies; tax anticipation notes and other debt securities issued by state and local governments; commercial and financial paper issued by non-financial and financial corporations; negotiable certificates of deposit issued by deposit-taking corporations, and bankers' acceptances.
- Long-term debt securities sold on a fixed-rate coupon basis include: central government bonds; general obligation and revenue bonds issued by state government and municipalities; corporate bonds; negotiable certificates of deposit issued by deposit-taking corporations; and preferred stock.
- Pass-through debt securities and other asset-backed securities (including principal-only and coupon-only strips).
- Debt securities with embedded derivatives including: denominated in foreign currency; variable interest rate (including with interest caps, floors, or collars); interest or principal indexed to equity values, commodity prices, or other reference variables; callable at the option of the issuer; puttable at the option of the holder; convertible to equity shares; extendable maturity; and credit derivative features.

- Debt securities issued and traded in international markets that are short term include: London certificates of deposit – negotiable certificates of deposit issued by a London bank or a London branch of a foreign bank; euro commercial paper and euronotes; and euro bankers' acceptances.
- Debt securities issued and traded in international markets that are long term include: global bonds that are issued simultaneously on the domestic and euro market; eurobonds that are issued by an issuer in a foreign country and denominated in the eurocurrency (US dollar, euro, yen etc) and underwritten and sold by an international syndicate of financial corporations; Brady bonds that are issued to refinance a developing country's debt to foreign commercial banks, and floating rate notes (FRN) that are medium- to long-term securities with variable rates usually linked to Libor.

The ECB *Statistical Classification of Financial Markets Instruments* lists a range of debt securities split between short term and long term.

- Short-term debt securities include: treasury bills and other short-term paper issued by general government; negotiable short-term paper issued by financial and non-financial instruments, such as CP, commercial bills, promissory notes, bills of trade, bills of exchange and CDs; short-term securities issued under long-term underwritten note issuance facilities (NIF), and bankers' acceptances.
- Long-term debt securities include: bearer bonds; subordinated bonds (or debt); bonds with optional maturity dates, the latest of which is more than one year away; undated or perpetual bonds; FRN; index-linked securities, where the value of the principal is linked to a price index, the price of a commodity or to an exchange rate index; deep-discounted bonds and zero coupon bonds; eurobonds; global bonds; privately issued bonds; securities resulting from the conversion of loans; loans that have become negotiable de facto; debentures and loan stock convertible into shares; shares or stocks that pay a fixed income but do not provide for participation in the distribution of the residual value of the corporation on dissolution, including non-participation preference shares; financial assets issued as part of the securitisation of loans, mortgages, credit card debt, accounts receivable and other assets.

Other possible classifications

With regard to monetary policy, the share of debt comprising fixed and variable interest rate debt securities is relevant, particularly in the analysis of the monetary policy transmission mechanisms. In the case where a large share of debt is issued with a variable interest rate, the interest rate channel of the monetary policy transmission mechanism is likely to be more significant. Hence, a possible additional breakdown is fixed and variable interest rate debt securities. From a financial stability perspective, there is interest in information on debt securities split by credit rating, that is, prime, sub-prime and unrated securities.

Conclusion

In this background note, a range of classifications for aggregate debt securities statistics have been outlined across sectors, currencies, maturities and financial instruments. Existing international standards, guides and manuals already provide a sound approach with most of these classifications. Debt securities statistics presented consistently and transparently will

help facilitate international comparability, and assist with monetary policy and financial stability analysis.

References

Commission of the European Communities, International Monetary Fund, Organisation for Economic Cooperation and Development, United Nations, and World Bank (2008): *System of National Accounts 2008*, Brussels, Luxembourg, New York, Paris and Washington. Available via the Internet: http://unstats.un.org/unsd/sna1993/draftingphase/WC-SNAvolume1.pdf.

Committee on the Global Financial System (2007): *Financial stability and local currency bond markets*, Basel. Available via the Internet: http://www.bis.org/publ/cgfs28.pdf?noframes=1.

European Central Bank (2000): *Guideline of the European Central Bank for Money and Banking Statistics*, Frankfurt am Main. Available via the Internet: http://www.ecb.eu/stats/pdf/ecb200013.pdf.

International Monetary Fund (2000): *Monetary and Financial Statistics Manual*, Washington. Available via the Internet: http://www.imf.org/external/pubs/ft/mfs/manual/index.htm.

——— (2001): *Government Finance Statistics Manual 2001*, Washington. Available via the Internet: http://www.imf.org/external/pubs/ft/gfs/manual/pdf/all.pdf.

——— (2008): *Balance of Payments and International Investment Position Manual*, Washington, 6th ed. Available via the Internet: http://www.imf.org/external/pubs/ft/bop/2007/bopman6.htm.

——— (2008): *Monetary and Financial Statistics Compilation Guide*, Washington. Available via the Internet: http://www.imf.org/external/pubs/ft/cgmfs/eng/pdf/cgmfs.pdf.

Treatment of hybrid securities[1]

Kenneth Aberbach[2]

The purpose of this paper is to describe different types of hybrid securities and to discuss the issues that affect how data on hybrid securities are collected. Hybrid securities are securities that have a combination of debt and equity characteristics. The original hybrid security was preferred stock, representing ownership in a company (like equity) but having fixed payments (like bonds). Since then, companies have structured securities in many different ways. Many are structured in ways similar to debt, allowing the owner to receive a cash flow (floating or fixed) with a periodic rate of return, but also have options for conversion to equity.

Hybrid securities are beneficial to investors because they provide investors with protection during bankruptcy as compared to common stock. That is, hybrid investors are eligible to be paid before common stockholders in bankruptcy. Additionally, hybrid securities generally provide a higher rate of return then the typical debt instruments. Hybrids can also be tailored to meet their individual investor's needs. The complexity of some of these new structures can cause reporting institutions to be inconsistent in reporting data on hybrid securities, which is a significant issue for data compilers.

Types of hybrid securities

Preferred stock was the first type of a hybrid security offered in the market place.

Investors who wanted to own stock of a company without assuming some of the risks of owning common stock would purchase preferred stock. Preferred stock gives the investor a higher dividend then the company's common stock (closer to the rate of the company's bonds) and places the investor before the common shareholder in bankruptcy. However, owning preferred stock typically does not give the holder voting rights in the company. In addition, preferred stock can be callable, giving the company the option to repurchase the shares back from the preferred shareholder.

A type of hybrid security that has significantly grown is convertible securities. These are issued as bonds with the option to be converted into shares. Typically, these securities have a set interest payment until the conversion. (Some companies have even allowed loans to be converted into shares.) The convertible security holder determines if and when to convert the bond to equity based on that company's common stock price. In other cases, the company retains the right to determine when the conversion occurs. Convertible bonds are popular especially when there is a volatile equity market.

Recently, companies have issued different types of hybrid securities that are similar to preference shares and convertible debt securities, but are structured slightly differently to meet the needs of investors. The characteristics that change from security to security are the type of interest/dividend payments, a fixed or variable maturity date, and its price. However,

---

[1] The views expressed should be interpreted as those of the author and do not necessarily reflect views of the Federal Reserve Bank of New York.

[2] Staff Director, Securities Reports Division, Federal Reserve Bank of New York, kenneth.aberbach@ny.frb.org.

all are similar in that they have a combination of debt and equity characteristics, which are set up to meet the specific needs of investors.

Data collection of hybrid securities

The United States' security-by-security annual reports, ask reporting institutions to code each security with a security type (for list of reportable security types see Appendix A). There are several codes under the broad headings of equity and debt. As part of those codes, there are individual security types for the most common types of hybrid securities. All preferred stock are coded with a unique security type code under the broad classification of equity. The quantity held of the preferred security is the number shares, similar to the way ownership of common stock is reported. All convertible debt is coded with a unique code under the broad classification of debt. The quantity held of the convertible security is the face value held, similar to "straight" debt. Once the security is converted to equity, the reporting institution reports the new security type and reports the quantity as the number of shares instead of the face value.

In order to collect data on newer versions of hybrid securities, there are several steps taken to ensure that the securities are coded with the proper security type. First, data compilers determine if reporting guidance was provided for similar instruments and if those reporting criteria can be applied to this instrument. Then, each security in analyzed on an individually to understand its characteristics. Some of the key characteristics that indicate that the security is equity are a) if the owner has a claim on the residual value of the company; b) the owner has voting rights; and c) there is no finite maturity date. Indications that the security is a debt security include a) the owner has unconditional rights to the payments and principal, and b) a finite maturity date. Based on the characteristics, a decision is made on the appropriate security type and how the reporters should report the amount held.

Additionally, data compilers investigate how institutions code these securities in their internal systems. At times, because of complex accounting rules, securities may be coded in their internal system as a particular security type even though the characteristic of the security indicates a different one. Compilers work with the reporting institution to ensure that the data reported are consistent with our needs.

Issues in collecting data on hybrid securities

One key issue is how the reporters report the quantity held of a hybrid security. The United States collects the market value and quantity held for each security, and based on those fields calculates the security's implicit price. The actual price is not reported. Occasionally, the quantity for a particular security is represented in both shares and face value. This may lead to reporting inconsistencies between reporting institutions. Ultimately this may cause market value errors, especially if the reporting institution reports the face value of the security but calculates the market value based on the share price.

Other reporting issues occur while collecting data on hybrid securities, including when non-US preferred stock is sold in the United States as American depository receipts (ADRs). The United States require the security type of an ADR's underlying security to be reported, which in this case would be preferred stock. Frequently, it is incorrectly reported as common stock. Another significant issue is when mutual funds have hybrid securities within their portfolio. The custodian of the fund needs to look carefully at all the different types of securities the fund has in its portfolio and properly code them as equity or debt. A fund may be called an "equity fund" but contain some hybrid securities that need to be classified as debt.

Conclusion

There is a considerable challenge for data compilers to keep track of different types of hybrid securities issued in the market and to determine how they should be captured on various reports. In addition, data compilers need to understand that at times our classification of hybrid securities may not be compatible with some of the accounting rules of either US GAAP or IFRS.

Appendix A

Security types from the TIC SHC(A) report of US ownership of foreign securities

Equity	Debt
1 = Common stock	5 = Commercial paper
2 = Preferred stock	6 = Negotiable CD
3 = Fund shares	7 = Convertible debt security
4 = All other equity	8 = Zero coupon and stripped security
	9 = Unstripped note or bond & all other nonasset-backed debt
	10 = Asset-backed security

Security types from the TIC SHL(A) report of foreign ownership of US securities

Equity	Debt
1 = Common stock	5 = Commercial paper
2 = Preferred stock	6 = Negotiable CD
3 = Fund shares	7 = Convertible debt security
4 = All other equity	8 = Zero coupon bond or note
	9 = Bond or note, unstripped
	10 = Bond or note, stripped
	11 = All other nonasset-backed debt
	12 = Asset-backed security

Valuation of debt instruments

Csaba Ilyés[1] and László Lakatos[2]

Last decade in Hungary the securities market developed very rapidly. During this period the amount of securities increased by more than 50%. Our paper addresses the recording of amounts, giving statistics that show the reasons for the change (transaction, revaluation, other change in volume). We introduce the different types of debt securities with their features. In the third section we summarise the methodology of the measurement, the applied techniques themselves, the problems that arise in the measurement process, and the solutions developed for these problems. We detail the alternative solutions, their benefits and drawbacks. The fourth section presents special cases and their treatment. Finally, we briefly analyse the Hungarian case.

A security is a fungible, negotiable instrument representing financial value. Securities have made good progress up to now. Securities may represent the largest proportion of the financial instruments. For debtors, securities are financing alternatives. Several types of securities have been created through financial innovation.

We can classify securities into various categories, according to the right that the security represents: debt, equity or goods. Securities are broadly categorised into three main groups:

- ***Debt securities*** are government securities (government bonds, government bills, central bank bonds), corporate bonds (issued by industrial entities, local governments or commercial banks), mortgage bonds and certificates of deposit. The holder of debt securities is typically entitled to payment of principal and interest, together with other contractual rights under the terms of the issue, such as the right to receive certain information. Debt securities are generally issued for a fixed term and are redeemable by the issuer at the end of that term. Debt securities may be protected by collateral or may be unsecured.
- ***Equity securities*** are mutual fund shares and shares. Equity securities are shares in the capital stock of a company. The holder of equity is a shareholder, owning a share, or fractional part of the issuer. Unlike debt securities, which typically require regular payments (interest) to the holder, equity securities are not entitled to any payment.
- ***Title securities*** are securities that represent a right to goods. One such security is a warehouse receipt/certificate. A receipt used in futures markets to guarantee the quantity and quality of a particular commodity being stored within an approved facility.

Our paper deals only with debt securities and their statistical problems (types, amounts, valuation).

[1] Magyar Nemzeti Bank. Head, Financial Accounts Statistics, Magyar Nemzeti Bank, ilyescs@mnb.hu.

[2] Magyar Nemzeti Bank. Senior Advisor, Securities Statistics Section, Magyar Nemzeti Bank, lakatosl@mnb.hu.

The types of debt securities in Hungary

In this section we talk about the types of debt securities step by step. Considering Hungarian securities, we can say that they have a similar structure to that described above.

Government securities

Government securities are issued by the government of a given sovereign country, and come with a guarantee for the payment of capital and interest. Government securities represent the government debt of the country. The Hungarian government has frequently issued government securities to finance the budget and refinance its expired securities. These securities may be bought by players in the economy, eg households. Government securities can be classified by their maturity.

International methodology distinguishes three main types of government securities: 1) Treasury Bill or T-Bill with maturity shorter than one year; 2) Treasury Note or T-Note with maturity of between one and five years; 3) Treasury Bond or T-Bond with maturity of more than five years. Hungarian legislation allows only two types of the government securities: A) government bills with maturity of less than one year, and B) government bonds with maturity of more than one year.

At the time of issuance, the government guarantees to the buyer (the lender) that it will pay interest and settlement, both of which are determined at the time of issuance.

The government securities are the following:

- *Government bonds*: The Hungarian Government Bond is an interest-bearing security with more than one year of original maturity. Currently four maturities exist (3, 5, 10 and 15 years). The Hungarian Government bonds receive annual and biannual payments of interest. Since 2002 interest has been paid once in the case of government bonds. From 1996 these securities have been sold over auction.
- *Interest bearing treasury bonds*: The treasury bond is a bearer government security with fixed, stepped interest and 3 years and 2 months original maturity. It could be redeemable before maturity. It was first issued in 1998, but did not fulfil the issuer requirement, so in 2001 the issue was terminated.
- *Treasury bills*: These securities are issued for large investors, and can be sold over auctions. T-bills have less than 1 year of original maturity, the holders do not receive interest, they could buy it at discounted price (below par value), and on the due date the holders receive the nominal value. The holder's profit is the difference between the purchase price and the nominal value of security. Currently there are T-bills with 3, 6 and 12 months' original maturity.
- *Interest bearing treasury bills*: The first was issued in 1988. It can be bought in local branches of banks, and is intended for small investors. It is an interest bearing security, where the interest is paid to the holders along with repayment at the end of its duration. Their original maturity is 1 year.
- *Treasury saving note*: These securities are sold to households in post offices. It is an interest bearing security. It has stepped interests, so the holder receives interest depending on holding time. These securities are sold continuously and the maturity is 1 or 2 years.

Central bank bonds (MNB-bonds)

The central bank bonds are issued by the central bank of Hungary. These bonds are denominated in either Hungarian forint (HUF) or other foreign currencies. The holders can

use them as collateral security on their credit operations. There had previously been bonds with maturities of 3 months or 5 years. From 2007 the leading instrument has been a 2-week bill. The leading instrument is to negotiate the optimal interest level for the financial market.

Other bonds (non-government bonds)

We classify the other bonds on the base of issuers' sector. These are the following:

- Bonds issued by local government;
- Bonds issued by credit institutions;
- Bonds issued by other financial intermediaries;
- Bonds issued by non-financial corporations.

These instruments have the same features as normal bonds.

Mortgage bonds

The mortgage bond is similar to the long-term bond, which can be issued only by a specialised financial institution. In Hungary the first such security was issued in 1998. Its market is developing continuously. It is largely similar to long-term government bonds, because both types of securities fall into the same risk category. However, it differs from the government bonds in that it has special collateral.

The mortgage bank issues short- and long-term bonds. The short-term bonds have a 1-year duration, and the long-term bonds have 3–10 years' duration. The commonest bonds for public have 1 year's duration.

Certificates of deposit

This security is issued by a credit institution and works like a bond. The issuer guarantees that the prefixed interest and the face value will be paid to the holder of the security at the given date. The duration of the certificate would be a maximum of 3 years.

Convertible bonds

In Hungary the corporate enterprises may issue registered bonds, which may cover a maximum of half of their capital stock. This security may be converted to shares. This instrument means in practice that the issuer of the convertible bond takes up a credit. At the end of the maturity the holders of the convertible bonds may ask for the board of directors to convert their bonds to shares, if these are more profitable.

Securities statistics in Hungary

In Hungary the Magyar Nemzeti Bank (central bank of Hungary) is responsible for preparing securities statistics, ie statistics on debt securities.

The MNB publishes these statistics at market prices, based on a security-by-security methodology. There are two main products. This section briefly presents these two publications.

When we refer to securities statistics we have in mind the financial and capital markets, and we describe and analyse the activities in these markets etc. Our securities statistics have two main publications:

- Deposit statistics, (eg distribution of securities holdings by institutional sector)
- Securities issues statistics.

Securities holdings (deposit) statistics

In December 1997 the MNB started to publish the "Distribution of securities holdings by institutional sector": quarterly securities holdings statistics with a time lag of 52 days. These statistics present the stocks of government securities, shares quoted on the Budapest Stock Exchange, and mutual fund shares held by each sector and calculated at market value. In addition to stock data, flows and other changes in stocks are also published. The flow data comprise the calculation of transactions, revaluations and other changes. Data are collected at face value or based on the number of securities, depending on whether debt or equity security is reported.

The data sources of the statistics are monetary financial institutions, investment enterprises, the Central Clearing House and Depository Ltd., the Hungarian State Treasury, the Budapest Stock Exchange and the Hungarian Financial Supervisory Authority.

The methodologies of SNA 1993 and ESA 1995 were used in the data collections and the compilation process, and the amounts of debt securities are therefore given at market value in the securities holdings statistics.

Securities issues statistics

In June 2003 the MNB started to publish securities issues statistics according to recommendations and requirements laid down by the ECB, monthly and with 40 days' time lag. The time series currently date back to December 1994. The aggregated data are available by issuers' sectors. The stock data are presented at nominal value or discounted price.

The outstanding amount of securities at the end of the month is the most important indicator in these statistics. There are also monthly flow data, eg net and gross issue and their components, redemptions. The main equation is the following: Net issue = Gross issue – Redemption (including early redemptions).

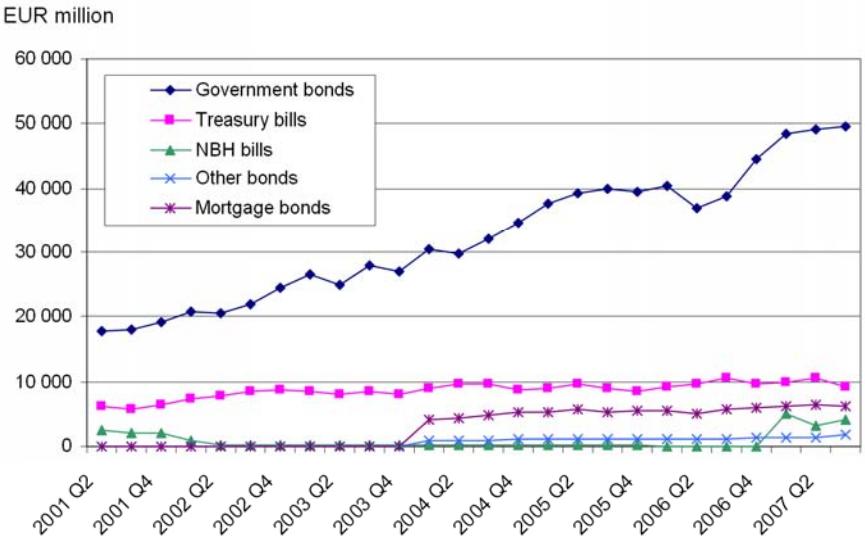
MNB compiles the above-mentioned statistics using a proprietary computer system (called EPSJ). As a satellite of the first system a register of securities is also used containing all basic information about each security issued by Hungarian residents. This register is capable of handling changes in the various characteristics of securities (for example, changes of ISIN-code, face value, form of securities).

Stocks of debt securities

In Hungary the outstanding amount of debt securities consists mainly of long-term government bonds, which grew continuously in the reference period. The outstanding amount of government bonds is currently close to EUR 48 billion. The stock of T-bills is about EUR 9 billion (see Chart 1).

Chart 1

Stocks of debt securities



Source: Magyar Nemzeti Bank (Securities and Financial Accounts Statistics).

Valuation of debt securities

In deposit statistics all debt securities are calculated at market prices. The key users (financial accounts, balance of payment) of these data require information according to this methodology.

The following relation is true for prices of all debt securities:

Dirty price = Clean price + Accrued interest

Dirty price is quoted in most markets, but there are exceptions, and consequently either clean price is the starting point or accrued interest is deducted from gross price.

The next chapter deals with the calculation of market prices by individual instruments.

Publicly issued government bonds

Clean price of publicly issued government bond is calculated in order of the following priority:

- The primary source of market price is derived from OTC (over the counter markets). In OTC markets dirty price is quoted from which we can deduct the actual accrued interest in order to obtain clean price.
- When there is no OTC transaction on the reference day, we use the average net price (weighted by values of transactions) which is settled on the Budapest Stock Exchange (BSE) (secondary source).
- Where there is no transaction neither at OTC nor on BSE, we take the mathematical average of bid and ask prices of all government bonds calculated by the Hungarian State Treasury.

We are generally in the position of having information about the prices of government bonds from the sources mentioned above, but if not, we go back the nearest historical date and use the same procedure.

Privately placed government bonds

In the case of privately placed government bonds we use different methods to calculate the prices of fixed or floating (variable) interest bearing bonds.

Fixed bonds

In the case of fixed bonds we determine first the gross price on the base of yield curve, by counting the present value (PV) of the security by discounting future cash flows, which is by definition the gross (market) price.

Discount rate as zero coupon yield can be calculated on the basis of yield curve, using the following formula:

$PV = \sum_{t=1}^{n} \frac{C_t}{(1+r)^t}$, where

C_t = future cash flow,

r = zero coupon yield

Clean price is computed by deducting the accrued interest:

Clean price = Dirty price – Accrued interest

Floating bonds

Future cash flows of floating bonds are unknown, because coupon payments are determined only for the next period of duration, so we cannot use the formula above. In this case we simply regard these prices as 100% of nominal value.

Treasury saving notes

In Hungary, treasury saving notes are zero coupon bonds, because the whole of the interest is paid to the holders at redemption, together with nominal value of securities. We determine the gross price on the basis of yield curve using methods similar to the case of fixed bonds.

Clean price = Dirty price – Accrued interest.

This differs from 100% of par value in only case, when the beginning of interest bearing differs from the issuance date.

Interest bearing treasury bills

We obtain clean price of an interest bearing treasury bill using the Hungarian State Treasury data. This institution also has accrued interest information, so dirty price can be calculated easily. (Dirty price = Clean price + Accrued interest)

Treasury bills

In the case of treasury bills dirty price will be determined in the same way, which is formalized in the case of publicly issued government bonds (OTC information, Stock Exchange average, average of bid and ask price of Hungarian State Treasury). If we have no information about the given security, we use the following estimation:

Using discount factors of the security and the formula PV=(1-dt)*C, we calculate the dirty price of the security. Then we obtain the clean price by deducting accrued interest from the dirty price.

Non-government bonds

For these securities, which are traded on the Stock Exchange, we use the actual information on a transaction. If we have no price data about the bonds, we determine the necessary data from database information on the securities using the following formula:

Dirty price = Clean price + Accrued interest

For this calculation we assume that the clean price is 100%.

Mortgage bonds

In the case of securities traded on the Stock Exchange, we use actual information. If we have no price data about the bonds, we determine the necessary information from descriptive data of the securities using the following formula:

Dirty price = Clean price + Accrued interest

For this calculation we assume that the clean price is 100%.

In determining dirty price the main question is measuring accrued interest of securities. Debt securities allow the payment of interest to their holders. Below, we show the calculation of accrued interest by individual instruments.

Calculation of debt securities' accrued interests

If we have precise information about the securities, we naturally use these data for the calculation. If we do not, we have to calculate the accrued interest using the predefined methodology.

To calculate accrued interest it is essential to obtain information about issue and maturity date, stock of securities at the reference date, and the next interest payment date.

We follow this methodology for every group of instrument, because every type has own particularities.

Considering accrued interest we have to separate the government bonds into fixed and floating bonds.

Fixed bonds

The accrued interests of fixed government bonds are calculated on the basis of ***Actual/Actual method***, as also used by the Hungarian Government Debt Management Agency.

$AI_i = c_{i+1} * (d_s - d_{t0}) / (d_{t1} - d_{t0})$, where

AI_i = accrued interest in per cent at the reference month

d_s = settlement date

d_{t0} = previous interest payment date

d_{t1} = next interest payment date

c_{i+1} = coupon in per cent at the next interest payment date

When have calculated the accrued interest in per cent, we can specify the amount of interest in the given currency (in Hungary in HUF) using the stock value. We assume that interest is always paid on the interest payment date, so the accrued interest is equal to zero at the end of the settlement day.

Floating bonds

In case of floating rate bonds we use different formulae to calculate the accrued interest depending on the reference product on which the interest calculation is based.

1. If the reference product is an interest bearing treasury bill, then the formula is the following:

Accrued interest = $\frac{g_v * (d_s - d_{i-1} - leap - day)}{365}$, where:

g_v = actual coupon of the government bond

d_i = date of the i-th cash-flow element (interest payment and redemption)

d_s = settlement day

2. If the reference product is a treasury bill, or any index-linked treasury bill (eg DWIX index), or any derivative or money market product (base rate, repo rate, BUBOR etc), then the formula is the following:

Accrued interest = $g_v \times \frac{d_s - d_{i-1}}{360}$

3. If the reference product is a fixed government bond, any derivative or consumer price index, then the formula is the following:

Accrued interest = $\frac{g_v}{f} \times \frac{d_s - d_{i-1}}{d_i - d_{i-1}}$, where:

f = the number of interest payment or coupon announcements in a year.

MNB (central bank) bonds

We calculate the accrued interest of central bank bonds presently outstanding using the same method as in the case of floating government bonds.

Accrued interest = $\frac{g_v \times (d_s - d_{i-1} - \text{leap-day})}{365}$, where:

g_v = actual coupon of MNB-bond with floating rate.

Interest bearing treasury bills

Interest bearing treasury bills are zero coupon securities as well, so interest is paid out only upon redemption. For this calculation we determine the period from the issue date to the settlement day out of the total interest paid on the whole period.

$AI = \frac{k}{(d_n - d_0)} * (d_s - d_0)$, where

k : nominal interest rate

d_s : settlement day

d_0 : issue day

d_n : maturity day

Discount treasury bills

In the case of discount treasury bills we deem the difference of nominal value and redemption price as being accrued interest in line with ESA95 methodology.

Other bonds and mortgage bonds

We calculate the stocks of accrued interest of non-government bonds and mortgage bonds using the following formula and the descriptive data of securities:

$AI_i = k_{i+1} * (d_s - d_{t0}) / (d_{t1} - d_{t0})$, where

AI_i = accrued interest in per cent at the reference month

d_s = settlement day

d_{t0} = previous interest payment day

d_{t1} = next interest payment day

k_{i+1} = coupon in per cent at the next interest payment date

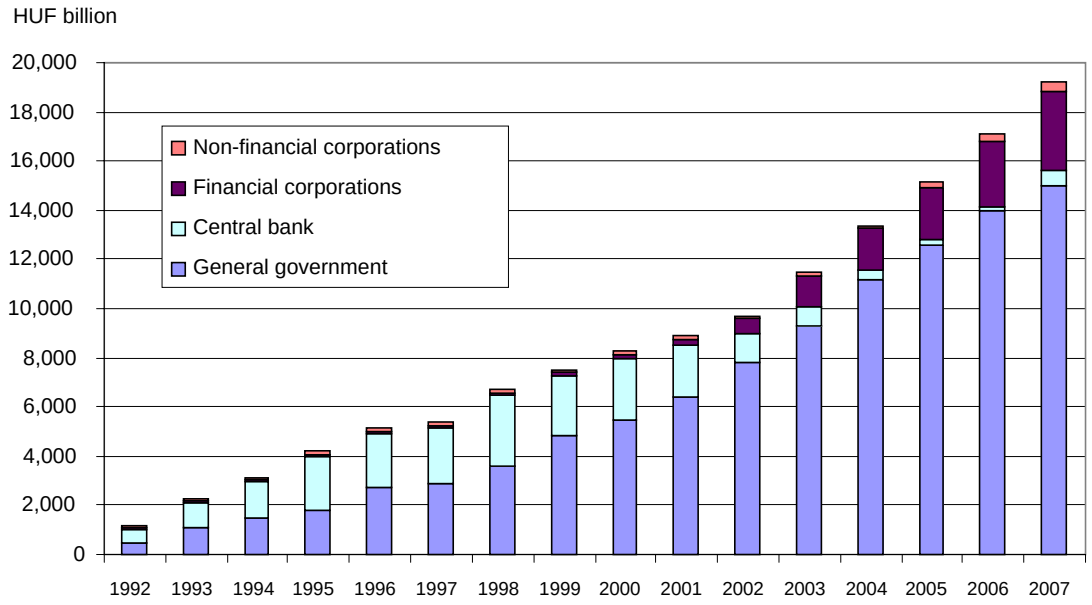
Finally, we summarise the most important issuer and holder sectors in the Hungarian securities market.

Securities debtors in Hungary

In the course of the 1990s and 2000s, the stock of securities issued by residents was on a steady rise, while the selection of security types did not change considerably. The role of different economic sectors, however, changed in relation to the issue of securities (see Chart 2).

Chart 2

Stock of securities issued by resident institutional sectors



Source: Magyar Nemzeti Bank (Securities and Financial Accounts Statistics).

Up to 1995, the MNB was the leading securities debtor in Hungary. Its sustained leading position is attributable to the fact that in this period there were major changes affected the composition of the central bank's liabilities. At the end of 1990, bonds represented only 30% of its liabilities vis-à-vis the rest of the world (thus, the larger share was composed of loans), but this ratio was reversed in five years. From 1991, the MNB did not finance general

government through lending, therefore the central bank's issue of bonds in the first half of the 1990s served the substitution of earlier loan debts and the increase of foreign exchange reserves. From 1996, the repayment of foreign exchange bonds dominated over new issues, but the volume of stocks did not fall significantly until 2001, as a result of the change in the foreign exchange rate and the issue of domestic HUF bonds commencing at the end of 1997.

Central government was the second-largest securities debtor in the first half of the 1990s, going head to head with the central bank, to take over the lead from 1996. If we disregard the central bank loans of the government, most of its debt was always represented by securities (government securities).

The behaviour of non-financial corporations – ranked third for some time in the area of securities supply – is very interesting. At the beginning of the 1990s, this sector assumed a considerable short-term and long-term debt (ie composed of bills of exchange and bonds) which, disregarding temporary increases in such stocks in the mid-1990s, has basically remained unchanged until 2004, amounting to approximately HUF 100 billion. This is possibly explained by the fact that companies primarily raised domestic funds through the issue of securities. The above trend is well illustrated by the fact that in ten years, the rate of issued securities within the total liabilities of companies fell from 1% to 0.2%. From 2005, the outstanding amount of securities increased significantly because of corporate bonds issued abroad.

With the exception of the MNB, among financial corporations, the securities debt of credit institutions grew at the highest rate in past years, and in 2000, this sector was therefore ranked third ahead of non-financial corporations. In 2003, it even changed places with the central bank, which reduced its foreign debts rapidly. Thus, after central government, the sector is currently the second-largest securities debtor in Hungary. The rising rate in the issue of securities by credit institutions is related to the increased volume of mortgage loans.

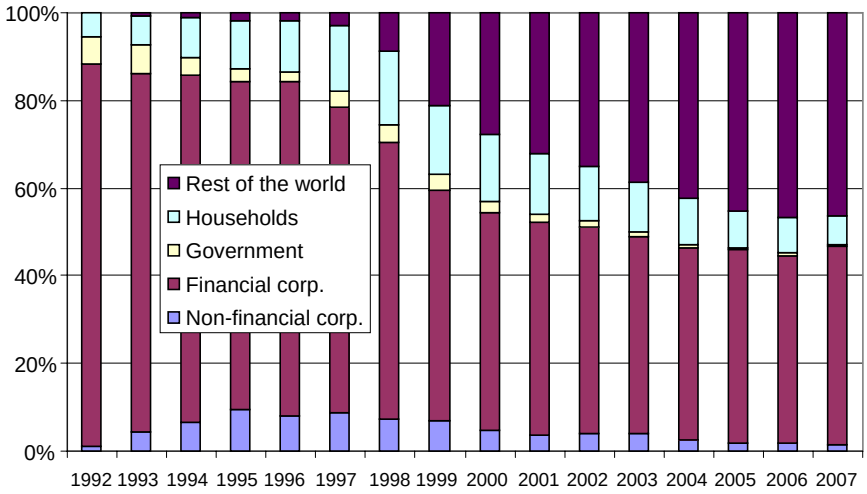
From the end of 2003, the role of this sector has been enhanced on the capital market by way of the securities issue of the Student Loan Center Co.

Holders of domestic securities

Approximately 55–60% of the total value of securities issued by resident institutional units has always been held by residents. In the first half of the 1990s, of the total quantity of outstanding securities, government securities and MNB-bonds, each representing roughly half of such quantity, were typically held by residents and non-residents, respectively. In parallel with the growing proportion of government securities, the increasing acquisition of these securities by non-residents commenced from 1998. Presently, the rate of foreign holding approximates 46% of government securities. Financial corporations are considered to be the largest resident holders of government securities; their share of outstanding securities has remained stable in past years, at nearly 50%. However, the role of individual subsectors in holding securities has changed. With the permanent domination of credit institutions, a considerable quantity of stocks was held by the central bank until 1997. In parallel with the reduction of these quantities, from the end of the 1990s, the investments of insurance companies and pension funds grew rapidly. Thus, this subsector has now basically caught up with credit institutions, considered to be the main investors in this area. The share of the second-largest holder sector, households, has gradually fallen from the peak value of 16%, measured in 1998, to the present 6–7% (see Chart 3).

Chart 3

Distribution of government securities by main holder sectors

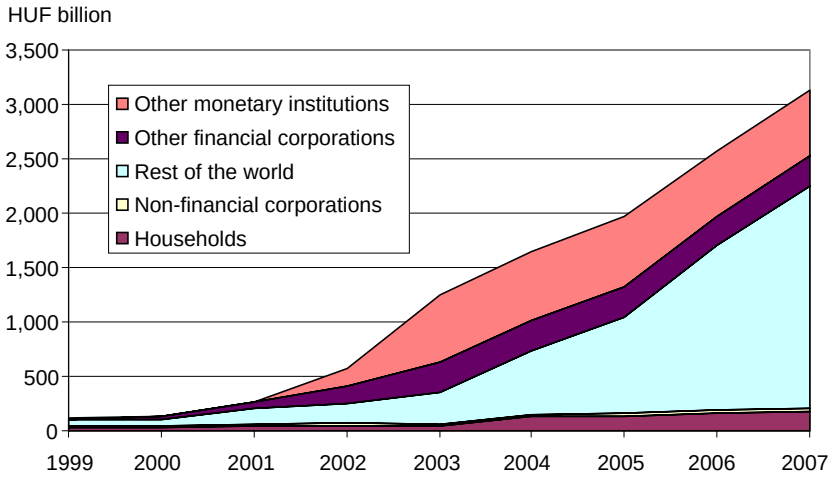


Source: Magyar Nemzeti Bank (Securities and Financial Accounts Statistics).

The securities of financial corporations (primarily credit institutions), other than the central bank, have traditionally been held by households and non-residents. As a result of the rise in the rate of home loans and mortgage bonds, from the end of 2000 the range of securities-holding sectors expanded: non-financial corporations and financial corporations, primarily insurance companies and pension funds, assumed a determining role in this area. In 2002, certain credit institutions started to finance the mortgage banks they owned through the purchase of securities, accompanied by the stalled purchase of securities by companies and households, which in turn drew loans. Since 2004, the increase in the outstanding amount has been driven by the issues of bonds abroad. Presently, financial corporations hold 28% of securities issued by credit institutions; most of the outstanding amount is held by non-residents (see Chart 4).

Chart 4

Stock of securities issued by other monetary financial institutions by main holder sectors



Source: Magyar Nemzeti Bank (Securities and Financial Accounts Statistics).

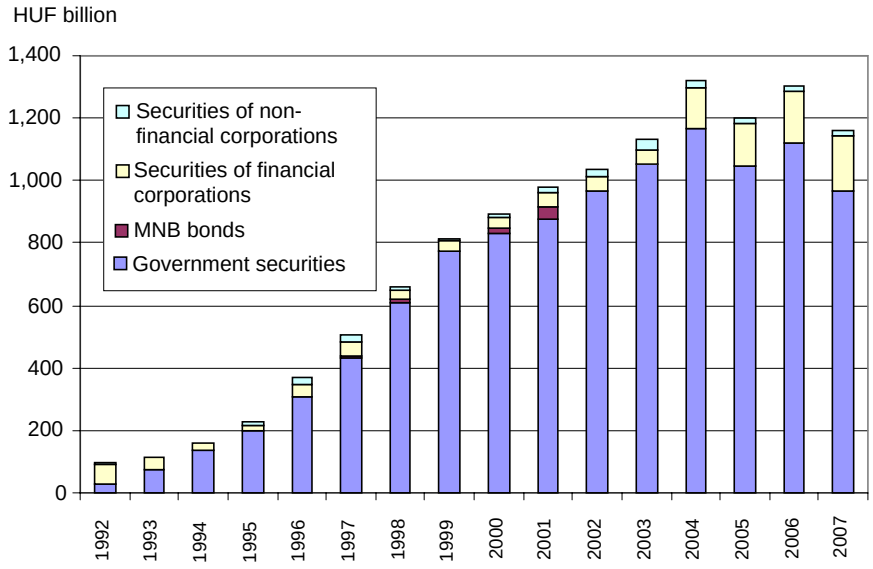
Portfolio of securities holders

Central government, the leading issuer of securities, holds the fewest debt securities representing credit relationships. Among the claims of institutions comprising part of general government, in addition to government securities, corporate and credit institution securities are also introduced, albeit in symbolic quantities.

The stock of securities held by households and non-profit institutions serving households increased at an accelerated rate in the course of the 1990s, but the growth rate slackened and evened out from the beginning of the following decade (see Chart 5). The share of government securities dominates among debt securities, followed by the bonds of financial corporations (credit institutions, other financial intermediaries).

Chart 5

Domestic securities investment of households and non-profit institutions serving households



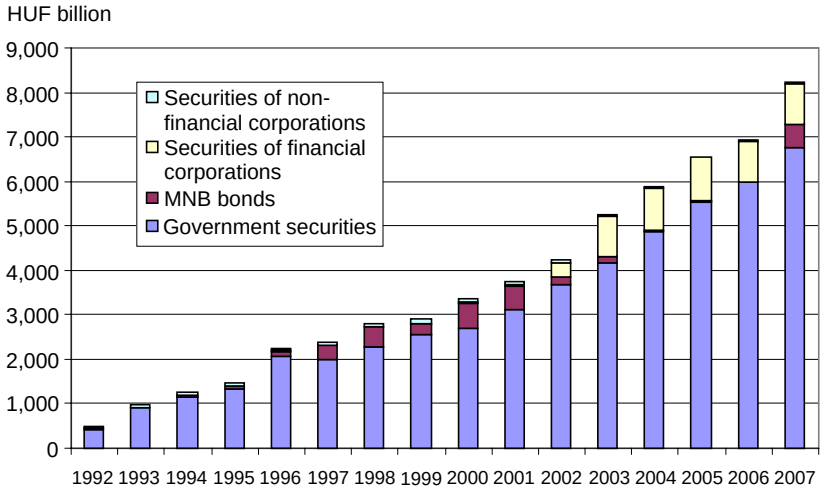
Source: Magyar Nemzeti Bank (Securities and Financial Accounts Statistics).

The domestic securities investments of non-financial corporations rose gradually until 1999, and have basically remained at a constant level until 2003 (nearly HUF 400 billion). From 2004 onwards, the securities holdings of non-financial corporations decreased gradually. The fall in the rate of intercompany securities is linked to the slump in the use of short-term commercial securities (bills of exchange) and the decrease in the stock of long-term corporate bonds held by non-financial corporations.

The stock of domestic securities held by financial corporations (the MNB, credit institutions, insurance companies, pension funds, mutual funds, other financial intermediaries) has shown a steady rise from year to year (see Chart 6). Similar constant growth characterises the stock of government securities, dominating securities portfolios. Between 1997 and 2002 and from 2007, domestic bonds issued by the MNB, from 2002 the securities (mortgage bonds) issued by credit institutions are noteworthy among the assets of the sector.

Chart 6

Domestic securities investment of financial corporations

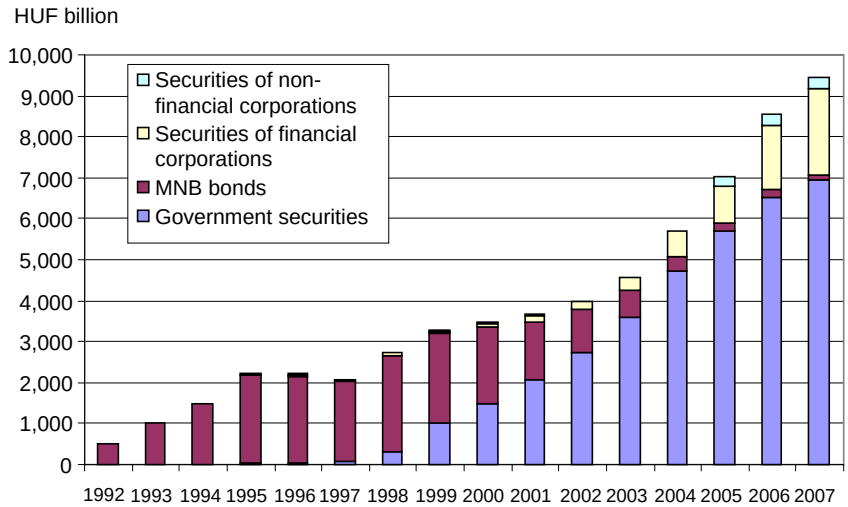


Source: Magyar Nemzeti Bank (Securities and Financial Accounts Statistics).

The most distinctive picture is provided by the composition of securities held by non-residents according to the time series and the type of securities (see Chart 7). Prior to 1998, practically only the MNB had a presence on the foreign bond market. From 1995, the central bank terminated its direct net lending to general government. The above trend is reflected by the fact that the stock of MNB-bonds held by non-residents decreased at a moderate rate up to the end of the 1990s, followed by a plunge in stocks. From 1998, the investment of non-residents in securities gained momentum and has since remained constant. Thus, by the end of 2001, general government became the largest securities debtor abroad. Furthermore, we may also observe the enhanced role of the securities of financial corporations (credit institutions) among foreign investments. These securities have always been in the majority of the instruments of non-residents, compared to securities issued by non-financial corporations. Of the latter papers, short-term commercial papers (bills of exchange) were purchased by the rest of the world in the first half of the 1990s and long-term bonds from 2005.

Chart 7

Stock of domestic securities held by the rest of the world



Source: Magyar Nemzeti Bank (Securities and Financial Accounts Statistics).

Session 5

Specific methodological questions regarding debt securities issues, continued

Chair: Paul Van den Bergh, BIS

Papers: How to capture securitisation and structured debt instruments
Raymond F D D Chaudron, De Nederlandsche Bank

Taking account of short positions in international portfolio investment statistics
Leon Taub, Federal Reserve Bank of New York

How to capture securitisation and structured debt instruments

Raymond F D D Chaudron[1]

Introduction

"The lack of markets may lead to the mispricing of risk and, with opaque balance sheets, make it harder to monitor risks. … In the event of financial distress, bond markets can disperse risks; the declining market value of debt spreads the losses over a wide ownership base."

CGFS, "Financial stability and local currency bond markets", *CGFS Papers*, no 28, pp 1–2.

Securitisation is a relatively recent phenomenon in the Netherlands. In the United States, the first mortgage-backed pass-through security was issued in 1977 by Bank of America. In the Netherlands, for various regulatory and economic reasons, the first "residential mortgage-backed security" (RMBS) was not issued until 1996 by Fortis. During the following years, however, securitisation has become a widespread phenomenon. Gross issues averaged over EUR 50 billion in both 2005 and 2006. Despite the turbulence in this segment of the capital markets since August 2007, the amounts issued reached a record of EUR 118 billion for the whole of last year. As a result, the total amount outstanding of mortgage- and asset-backed securities issued by Dutch special purpose vehicles (SPVs) reached nearly EUR 300 billion by the end of 2007.

With the proliferation of securitisation in the Netherlands, the need for information on the securities issued by SPVs and its holdership has grown in parallel. The Netherlands Bank currently collects data on securities issued by Special Purpose Vehicles (SPVs) for three main sets of statistics:

- A separate set of statistics on the aggregate balance sheet of SPVs;
- As part of its securities issues statistics; and
- Holdership information for financial accounts and balance of payments.

This paper documents three important issues that are at the heart of the compilation of these statistics: maintaining a complete picture of the population of SPVs, the recording of outstanding amounts, and the valuation of the securities. The paper ends with a short summary of the main methodological issues that have yet to be resolved.

Population

Data on SPVs and their securities are not collected from reporters in the Netherlands, but from public and commercial sources. Nevertheless, the remaining part of this paper is more easily understood after a brief explanation of the different parties involved in a securitisation (see figure 1).

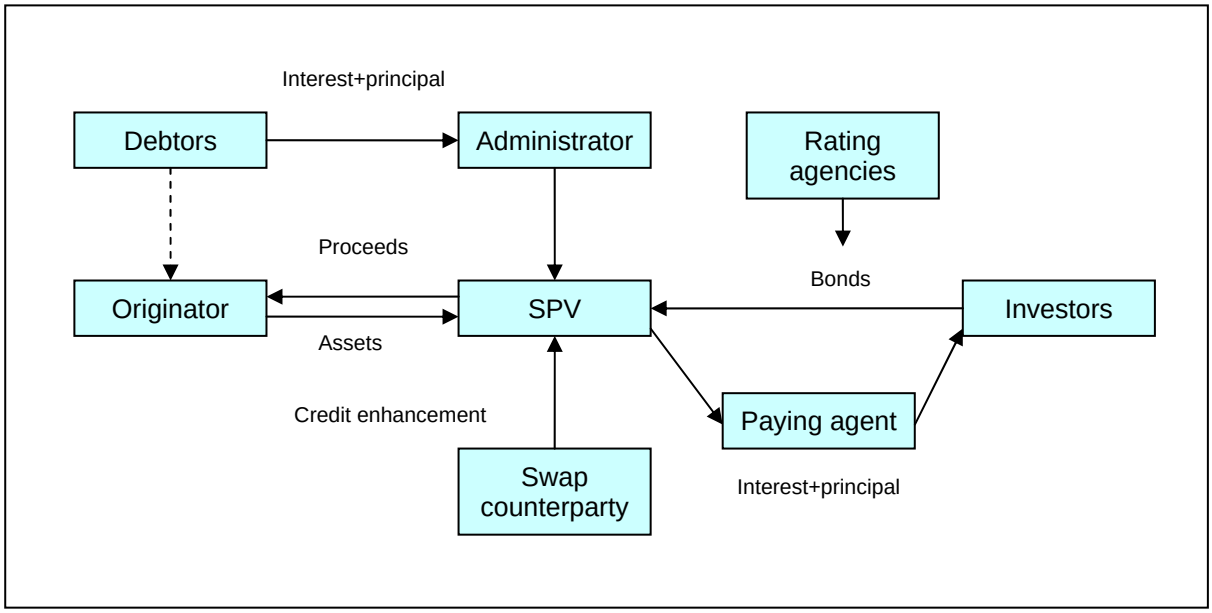
[1] Senior Economist, Statistics Division, De Nederlandsche Bank, r.f.d.d.chaudron@dnb.nl.

In a true-sale securitisation, the originator sells the assets (eg a pool of residential mortgages) to a specially founded SPV.[2] The SPV finances the purchase with the proceeds from the issue of bonds. Each securitisation usually involves the issue of a couple of bonds, known as tranches, of decreasing size and credit quality (from senior to mezzanine to junior). SPVs in the Netherlands are set up so that the originator is not able to lay any claim on the assets it has sold to the SPV in case of its bankruptcy. By placing the equity of the SPV in the possession of a specially created foundation (Dutch: *stichting*), no economic links remain other than that the originator usually acts as an administrator for the assets (for which it earns a fee). The SPV cannot therefore, at least not formally, be regarded as a subsidiary of the originator. Whether this is sufficient for the originator to be able to derecognise the assets is an issue discussed further at the end of this paper. In addition to the originator and the SPV, other parties involved in the securitisation include the debtors (who might not even be informed of the securitisation), the rating agency, the paying agency, and of course the investors in the bonds.

The investors in the bonds are represented collectively by a "security trustee", which holds various forms of collateral in addition to the assets. The collateral can be used to repay principal and interest in the event that debtors are unable to fulfil their obligations. The paying agent for an SPV functions in the same way as for any other issuer of negotiable debt: it collects funds from the issuer and distributes these funds to the holders of the securities. The rating agencies provide the securities with a credit rating based on the quality of the assets. Since the assets are usually regarded to be of better than average quality, the SPV can issue the securities at a lower cost of capital than the originator is able to demand. (At least, that was the case until last year.) There is usually also a host of legal and financial advisors who support setting up the SPV, but their role is limited once the bonds have been issued.

Figure 1

Parties involved in a securitisation



Source: De Nederlandsche Bank.

[2] A less frequently used type is synthetic securitisation. In this case, the originator only "sells" the credit risk to the SPV. The SPV puts the proceeds of the bond issue on (time) deposit with the originator.

Statistics on the balance sheet of SPVs in the Netherlands are restricted to those either set up by a resident originator or involving the securitisation of domestic assets. SPVs involved in the securitisation of foreign assets by a non-resident originator are excluded. These SPVs are considered to be part of a special class of institutions, referred to as "Special Financial Institutions" (SFIs for short). SFIs have traditionally been excluded from Dutch national statistics because of the great influence they have on financial flows and stocks without having any significant economic activity in the Netherlands. Since a number of years, both the Netherlands Bank and Statistics Netherlands have started publishing statistics including and excluding SFIs.

The most important source of information on the birth of SPVs and the issue of new securities is the commercial data provider used by the Netherlands Bank. An online terminal provides direct access to the data provider's database of securities. This database can be queried for new issues by mortgage and funding institutions, as most SPVs are classified. A great deal of current and historical information (among others in the form of investor reports and offering circulars) is also available from a fiduciary group based in the Netherlands that acts as security trustee for a large proportion of SPVs. Additionally, rating agencies such as Moody's and Standard and Poor's regularly publish investor reports containing a wealth of information. Data on new SPVs are also checked with information from the department that compiles money and banking statistics.

Outstanding amounts

Compiling information on outstanding amounts of structured debt requires accurate and up-to-date information for each separate security, because a large proportion of the bonds issued by SPVs are so-called "pass-through securities". This means that the interest and redemption paid by the debtors is channelled almost directly to the investors in the bonds. The bonds amortise during their life, as they mimicking the cash flows of the underlying assets (see figure 2). The most efficient approach to compiling data on outstanding amounts is on the basis of electronic data. The number of bonds has become very large (over 2000 Dutch issues by end-2007) and manual processing is very laborious and prone to errors. For these reasons, the Netherlands Bank also uses the information on outstanding amounts from its commercial data provider.

In the relatively recent past, the Netherlands Bank based its information on outstanding amounts on publicly available information such as the investor reports mentioned above. This had the drawback that investor reports were not available for all bonds. For these bonds, outstanding amounts were estimated using the "weighed average life" (WAL) as reported in the prospectus or by using the WAL of a comparable bond. The WAL is an indication of the expected actual maturity of the bond, taking into account not only contractual redemptions but also prepayments.

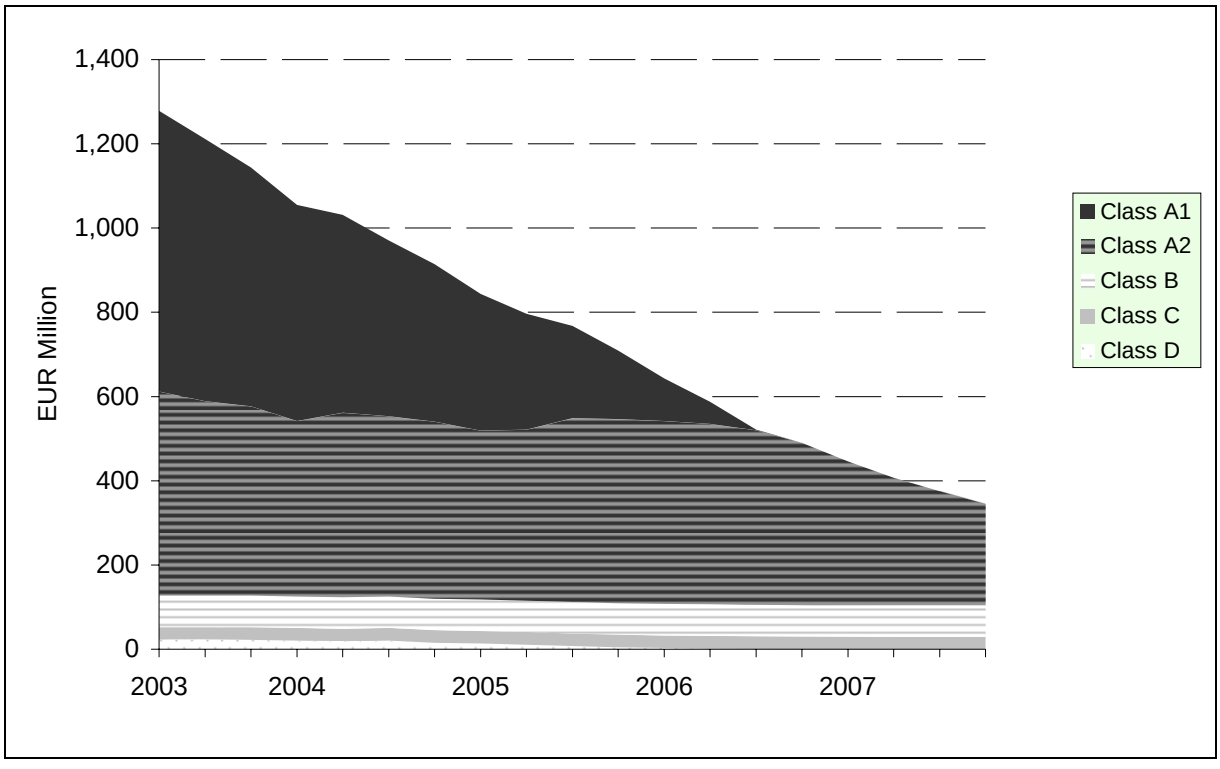
Although the payment of contractual redemptions is very predictable, the incidence of prepayments makes the (remaining) WAL an imprecise measure. While the bonds have a maturity at issue that corresponds to the legal maturity of the longest loan in the pool of assets, which for certain interest-only or redemption-free mortgages can amount to 80 or 90 years, mortgages almost never ever reach their legal maturity. Early redemption, known as prepayment, depends on many factors. Prepayment can be motivated by a decision to refinance, depending on the difference between current mortgage rates and those specified in the existing mortgage. Prepayment can also be made as the result of a domestic

circumstance such as a change of job, divorce or death.[3] Some SPVs also incorporate a "grace period" in the issue conditions of their bonds, during which the bond cannot be redeemed. During this grace period, new mortgages from the originator are substituted for those prepaid. This guarantees a certain minimum term to maturity for the investors. Prepayment affects the securities of an SPV differently. The earliest prepayments are passed on to the investors in the bonds with the highest credit quality. The lower credit tranches are only redeemed once the higher classes have been redeemed completely. These tranches also bear any effect of default or arrears that cannot be borne by the additional collateral kept by the security trustee. It should be kept in mind that SPVs sometimes differ substantially in structure and the conditions they attach to their bonds. This means the analysis should be of individual bonds, or at least grouping them by certain characteristics. In conclusion, the estimation of outstanding amounts for securities carries with it the risk of some imprecision.

Although a precise cost-benefit analysis is not feasible, a crude assessment can be made of whether the acquisition of commercial data is worthwhile. This involves weighing the loss in precision together with the effort needed for the collection of information, analysis and estimation, against the costs of a commercial data provider balanced by an increase in efficiency from compiling the data on the basis of electronic data. For the Netherlands Bank, the use of commercial data proved to be the most economical. This was, however also influenced by the fact that the commercial data were also used for other statistics such that the costs could be spread over several statistical areas.

Figure 2

Outstanding amounts per tranche for a typical RMBS (Hermes VI)



Source: De Nederlandsche Bank.

[3] A good introduction to more sophisticated models used to estimate prepayment is that by Kang and Zenios (1992).

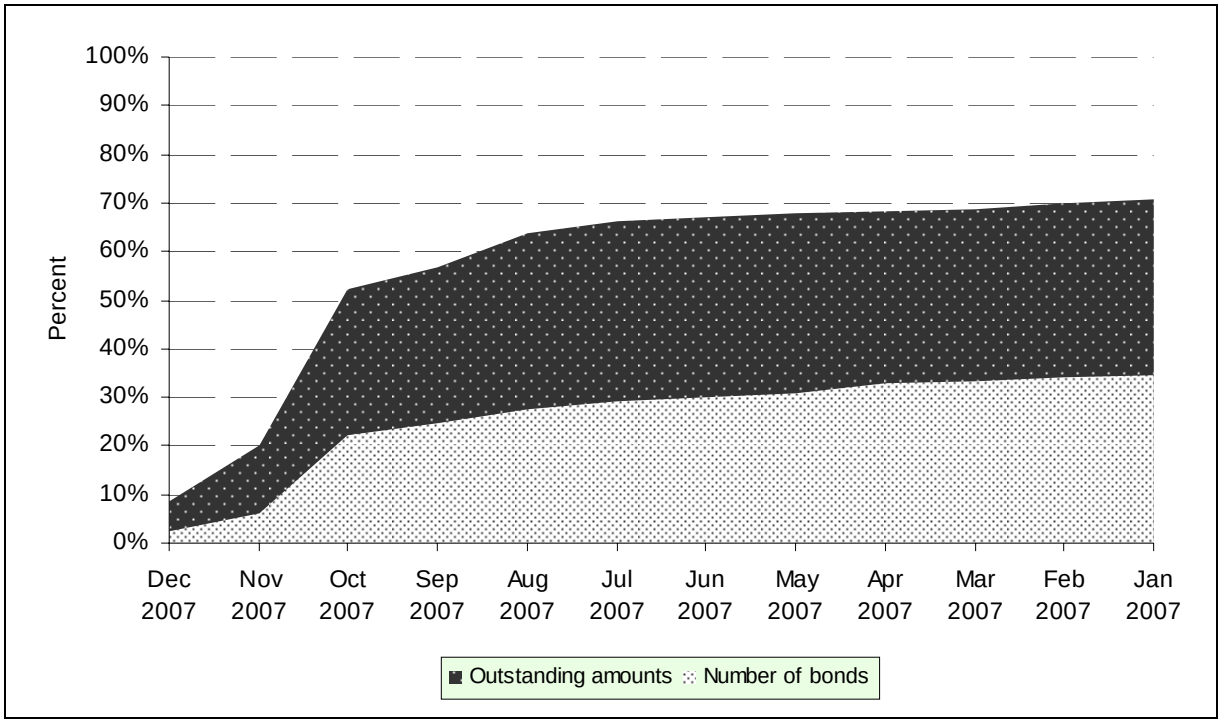
Valuation

The outstanding amounts of securities included in the SPV balance sheet and securities issues statistics are valued at nominal value. In financial accounts and balance of payments statistics however, international guidelines prescribe market values. The extent to which this is possible depends on the availability of market prices for structured debt.

An investigation for this paper into the availability of trade prices showed that the commercial data provider delivered a trade price for December 2007 for only 52 out of 2004 bonds. If the range of useful prices is extended to prices less than a year old, the coverage increases very significantly but still to only 696 or 35% of bonds, ie just 35% of bonds was traded at least once during 2007. Although this proportion is alarmingly low, the price coverage calculated in terms of amounts outstanding is much more reassuring. Due to the fact that large tranches are traded more often than the smaller tranches, the coverage of prices rises to 71% for 2007 when measured this way. In fact, the coverage already reaches 66% when the range is extended to cover prices up to a maximum of just 6 months old (see figure 3).

Figure 3

Availability of prices to value year-end stocks for Dutch structured debt during 2007



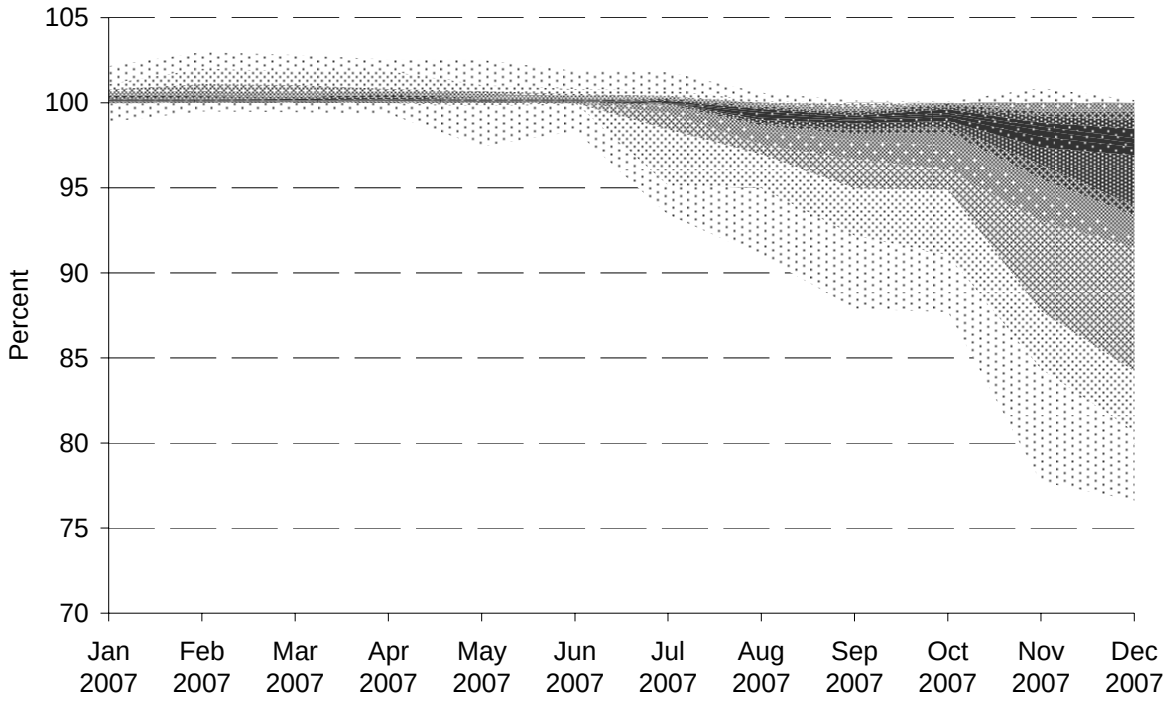
Source: De Nederlandsche Bank.

Those securities without a relatively recent price are valued at 100% or, if available, the issue price in the compilation of national accounts and balance of payments statistics in the Netherlands. As a high proportion of structured bonds have a floating coupon rate, it was thought that their price would not deviate much from 100% anyway. This assumption has been severely tested in recent months. At the start of 2007, 90% of bonds for which a trade price was reported had a price of between 99.5% and 102.1%. By December 2007, the range had broadened to 76.6–100.2% (see figure 4). It seems safe to assume that the aggregate outstanding amounts at market value are overestimated to the extent that securities without a recent price should be valued below 100%. For the moment, however,

when even market participants are uncertain about the correct price of these securities, estimation of prices is not a very attractive alternative, even if it were feasible.

Figure 4

Distribution of prices by quintiles for Dutch structured debt during 2007



Source: De Nederlandsche Bank.

The lack of price information due to the fact that most securities are never or hardly ever traded can also be approached from another angle. There is evidence that the originators themselves figure prominently among the investors in the securities. Banks thus turn their assets into negotiable securities, making them pledgeable for repurchase agreements since many central banks in Europe accept these securities as collateral in open market operations. In case banks carry these securities as “held-to-maturity” (which is suggested by the lack of trading), they will not be measured at fair value on their balance sheet but at amortised cost. The valuation of the securities will thus be very close to the value of the original assets if they had not been derecognised. This brings us to the question of whether securities that are not intended to be traded and are valued by investors at close to nominal value should be regarded as securities at all. Both the UN’s Advisory Expert Group on National Accounts and the Balance of Payments Committee at the IMF, however, have decided not to reclassify securities as loans when they are not traded in practice (Shrestha 2005).

Unresolved methodological issues

There remain two important methodological questions that have an important bearing on the measurement of structured debt and SPV balance sheets, but have not yet been resolved. These questions are the recognition of SPVs as institutional units and the treatment of credit derivatives.

In their comment on the draft SNA chapter on institutional units and sectors, Lyon and Wright of the Bank of England argue that SPVs should not always be regarded as separate institutional units. They also argue that in some cases the original assets are kept on the balance sheet of the originator, which could lead to double-counting. To avoid this, they propose to follow IFRS rules for the derecognition of assets, which are laid down in IAS 39, paragraphs 18–20 for the compilation of statistics.

The consequence of not treating SPVs as separate institutional units but instead consolidating them with the originator is that the securities issued by SPVs would then not be classified as issued by an other financial intermediary (S.123) but in most cases by a monetary financial institution (S.122). In light of the fact that (at least in the Netherlands) SPVs cannot be considered subsidiaries of the originator, whether consolidation is even possible seems questionable. It would also mean that the outstanding amounts of securities issued by monetary financial institutions would double and that it would no longer be possible to identify the securities separately. The treatment of SPVs that Lyon and Wright propose would therefore lead to a loss of information on what has become an important class of securities.

The potential for double-counting when the originator does not derecognise the original assets is a serious problem. IAS 39, however, paragraphs 18–20 focus on the right to receive the cash flows from the original assets, which for a “true-sale” securitisation lie clearly with the SPV. In the case of a synthetic securitisation, the originator retains ownership of the original assets and the potential for double-counting is nil.

The final issue raised here is the treatment of credit derivatives. SPVs involved in synthetic securitisation basically act as the counterparty to the originator in a credit derivative. In such a contract, the SPV receives a premium from the originator. In return, the SPV compensates the originator for any losses (due to bankruptcy or failure to pay of the debtors) on a pool of assets. The guidelines published by the IMF in its supplement to the fifth edition of the *Balance of Payments Manual* mention only that certain credit derivatives are more properly classified as insurance (paragraph FD 31). They do not mention which criteria should be used to make this distinction. Unfortunately, although the economic significance of these contracts is growing, this has not been discussed in preparation of the revisions of either the *Balance of Payments Manual*, nor the System of National Accounts. For the moment, the preferred treatment of credit derivatives therefore remains unclear.

Summary and conclusions

The Netherlands Bank compiles various statistics involving the issue of or investment in structured debt instruments. For these statistics, the Netherlands Bank increasingly depends on the information provided by a commercial data provider. Although costly, the electronic form in which it is delivered, its coverage and quality make it an excellent source for accurate and up-to-date information. Due to the large volumes involved, both in terms of amounts outstanding as well as the number of securities, collection of information from public sources is no longer efficient. The commercial data are used for several other statistical areas, which reduces the average costs to the compiler. The quality of commercial sources notwithstanding, data on prices are very incomplete. This problem can however be mitigated by allowing for the use of prices up to half a year old. As far as methodology is concerned, a number of questions remain unresolved, specifically regarding the recognition of SPVs as institutional units and the treatment of credit derivatives.

Annex

Table 1

Balance sheet of Special Purpose Vehicles in the Netherlands

EUR million

	2002	2003	2004	2005	2006	2007
Assets						
1. Mortgages	36,361	56,239	65,241	81,956	112,581	176,368
2. Loans	7,064	6,964	8,652	9,667	14,744	25,948
3. Shares	0	0	0	0	0	0
4. Deposits	21,696	22,644	14,049	36,620	38,127	61,777
5. Cash	1,485	2,503	2,123	3,262	2,633	2,009
6. Other assets	7,539	7,358	7,552	3,620	3,022	3,320
Total assets	74,145	95,708	97,617	135,125	171,108	269,422
Liabilities						
1. Equity	1	1	2	2	3	3
2. Long-term debt securities	71,998	92,502	94,415	131,556	167,467	266,153
3. Loans	175	306	433	444	503	392
4. Other liabilities	1,972	2,898	2,727	3,122	3,136	2,875
Total liabilities	74,145	95,708	97,577	135,125	171,108	269,422

Note: excluding SPVs with foreign assets set up by non-resident originators.

Source: De Nederlandsche Bank.

References

IMF (2000): *Financial derivatives, A supplement to the fifth edition of the balance of payments manual*, Washington DC.

Joosen, EPM and MG van 't Westeinde (2002): *Securitisatie*, NIBE-SVV, Amsterdam.

Kang, P and SA Zenios (1992): "Complete prepayment models for mortgage-backed securities", *Management Science*, 38(11), November, pp 1665–85.

Kendall, LT and MJ Fischman (1996): *A primer on securitization*, MIT Press, Cambridge.

Lyon, M and C Wright (2007): *The statistical treatment of securitisation vehicles*, Bank of England.

Shrestha, M (2005): "Borderline between securities and other financial instruments", paper presented at the fifth meeting of the Advisory Expert Group on National Accounts (AEG), 27 June to 1 July, 2005.

Taking account of short positions in international portfolio investment statistics

Leon Taub[1]

Compilers of portfolio investment data often assume that securities held domestically plus securities held by foreigners must equal total securities issued. However, investors can, and often do, borrow securities and sell them "short." In that case, the security's lender, as well as the eventual purchaser of the security sold "short" have economic claims based upon the security.

The purchaser of the security from the short seller (and, if it is resold, any subsequent purchaser) clearly has full ownership rights and possession of the security. The lender of the security has a claim roughly equivalent to the owner of the security. However, it is not against the issuer. Because the lender does not have possession of the security, the lender's claim must be against the borrower. However, perhaps surprisingly, the lender may not even know about the loan. The custodian of the lender might or might not know about the loan, but is typically instructed to report the security "as if continuously held."

The obligation of the borrower/short seller is quite complex, as it involves not only an obligation to return an item, but an obligation to incur all of the benefits and costs that the issuer of the security faces. In effect, the borrower/lender becomes a "pseudo-issuer" of the security. The consequences of this situation for compilers can be fairly complex, particularly when the borrower/short seller is a resident of a country other than that of the security's issuer.

Section 1: Short sales and negative positions – Liabilities

1.1 Securities borrowing is a common activity. The Bond Market Association (BMA) estimates that US residents had almost $8 trillion in securities loans outstanding as of June 2004. Of this amount, over $2 trillion were lent through repurchase agreements with non-US counterparties. An additional $700 billion were lent through securities lending agreements with non-US counterparties. Securities borrowing activities in Europe are in excess of US$ 2 trillion and growing very rapidly.

1.2 In many cases, a borrowed security is subsequently sold. Indeed, the primary motivation for the borrowing of a security may be to sell it (engage in a "short sale"), with the objective of having a negative economic position in the security. As of 15 February 2008, short interest in 2,698 NASDAQ securities totaled 8.9 billion shares (3.5 days average trading volumes),[2] and often exceeds 25% of shares outstanding,[3] and short in exchange traded fund indices can range as high as 40% of shares outstanding.[4] Short interest in the shares of Lehman 20+Year Treasury

---

1 Senior Vice President, Statistics Function, Federal Reserve Bank of New York, leon.taub@ny.frb.org.

2 NASDAQ press release, 27 February 2008.

3 Seekingalpha.com, 14 February 2008.

4 Marketwatch.com, 13 October 2004.

Bond Fund can be than 200% of shares outstanding.[5] Last Friday, short interest in Microsoft had a value in excess of $3 billion.[6]

1.3 It should be noted that the common use of the term "short sale" begins on the trade date. However, international economic account reporting standards call for positions to be reported on a settlement basis.[7] Therefore, for the purposes of this paper, all negative positions must be obtained through the delivery of a borrowed security. Economically, of course, one is "short" during the period between trade and settlement. However, unless international standards change to trade date reporting, it would be inconsistent to include these short positions in economic accounts.

1.4 In addition, there are cases in which negative positions are incurred without the seller obtaining a borrowed security, or even the commitment to obtaining a borrowed security, in order to make a delivery. Short roles of this type are called "naked short sales" and are illegal in the United States. These are not considered further in this paper.

1.5 A typical short sale of a US Security is shown in ***Figure 1***. The custodian for Investor A lends a security to the custodian for Investor B. (The loan can be arranged by the two investors, the two custodians, one of each, or even through a third party arrangement.) In ***Figure 1*** Investor B is a short seller, who sells the security to Investor C (who typically would have no knowledge that the purchased security had been borrowed by Investor B).

1.6 For simplicity, all custodians are assumed to be US residents and all of the investors are assumed to be foreign residents. The holding of Investor A will be reported by the US custodian because custodians are instructed to report securities borrowing arrangements (including repurchase agreements that are treated as collateralized borrowing) as if the borrowing had not occurred. For example, the instructions for the 2006 US liabilities survey state:

Securities "sold" by foreign residents under repurchase agreements or buy/sell back agreements, lent under securities lending arrangements, or delivered out as collateral as part of a reverse repurchase agreement or security borrowing agreement *should* be reported as if the securities were continuously held by the foreign resident. That is, the security lender's US custodian should report the US security as if no repurchase agreement or buy/sell back agreement occurred.

1.7 The negative holding of foreign Investor B will not be reported. (The United States currently does not require the reporting of the negative economic positions that occur when a borrowed security is sold. The recording of short sales is not currently an international reporting standard, but is very likely to be included as a standard in BPM6.)[8] The holding of Investor C is reported, correctly, by Custodian C.

---

5 Ibid.

6 Barrons, 1 March 2008.

7 "When all entries relating to a transaction pertain only to the financial amount, they should be recorded when the ownership of the asset is transferred." SNA 1993, Paragraph 11.48. The reasoning for this is presented in SNA 1993, Paragraph 3.109: "One may wonder why nominal holding gains and losses are not calculated over a period beginning at the moment on which two units agree to a mutual exchange of assets instead of the period which starts with the moment on which the assets are acquired ... The System, however, regards commitments resulting from a contract as contingent until one of the parties has performed its obligation ..."

8 In 2001, the IMF Committee on Balance of Payments Statistics accepted the recommendation of a working group to record securities onsold that were acquired through repurchase agreements as short positions (Recommendation A.(iv)) and through securities lending agreements (Recommendation B.(v)) (BOPCOM-01/16).

1.8 Note that in this example, Investors A and C are each reported to own a security, but both positions result from a single security. There is a temptation to posit that Investor C does not own a "real" security. However, Investor C will receive all interest or dividends or other attributes of ownership from the issuer (through the issuer's agents and Investor C's custodian, of course). Investor C may sell the security without restriction to any US or foreign resident, who will also have full ownership rights.

1.9 It is Investor A who does not have full ownership rights to the security. The only thing that Investor A owns is a promise to be repaid a security from Investor B. Investor A will not receive interest or dividends from the issuer of the security (although Investor A's agreement with Investor B undoubtedly includes some sort of compensatory payment for the lost relationship with the security's issuer). Thus, for the accounts to balance, if Investor A is shown as owning the security, Investor B must be shown as having a negative position in that security.

1.10 The residency of Investors A and C do not matter. If Investor A were a domestic resident, current data collection would show only the position of the foreign Investor C. The negative position of any foreign Investor B would still be ignored. As a result, a net liability to foreigners would be shown, even though foreigners on balance have a net neutral position in the security. The residency of Investor C also does not affect reporting quality – which is fortunate, because Investor C can onsell the security to any other (domestic or foreign) investor. (If Investor C is a US resident no foreign position is shown. However, the negative position of any foreign Investor B would still be required in order to avoid overstating the aggregate net liabilities of US residents to foreign residents for the security.)

1.11 Note that the type of loan does not matter. In particular, the situation does not change if Investor B acquires the security through a term resale agreement, not currently due. Because repurchase/resale agreements are treated as a loan, if an acquirer uses a delivered security to settle a subsequent sale, consistency requires that we treat the investor as having a negative position in the security, even though, legally, the short seller has no obligation to deliver a security until the term of the resale agreement ends.[9]

1.12 Other presentations are possible. Instead of reporting a negative US liability to Investor B, the United States could show a claim on Investor B for the US security. However, the showing of a negative liability may be preferable. First, no US resident has a claim on Investor B. Second, since Investor B has an obligation to acquire and deliver a security issued by a US resident. This obligation is quite different in nature from US claims on foreign issuers. Also, the mechanics of data collection and presentation might be more difficult if the position were considered a US claim, as the claims and liabilities survey would have to be integrated and claims would include negative foreign holdings of US securities.

1.13 Some might suggest that Investor A be shown as having a short claim on Investor B in Country B. Just as Investor B has a claim on Investor A (for cash), Investor A has

---

In 2003, an IMF working group recommended that this treatment be expanded to all short positions (BOPCOM-03/15). The *Draft annotated outline for revision of the balance of payments manual*, fifth edition (BPM5), states (section 6.11(c)): "short positions occur when a unit sells assets (usually securities) that it does not own ... the short position will be shown as a negative holding." Since many nations already collect data on at least some negative positions, this statement of intent is very likely to be incorporated into BPM6.

[9] Because market participants may use different terminology (not always considering a sale completed using a security obtained through a resale agreement, particularly a term resale agreement, as a "short sale"), data collection for these types of positions may have to be specified carefully.

a (short-term) claim on Investor B for the security. By convention, this liability is not shown in the accounts, as it is assumed that the security is merely collateral for the cash loan. However, the cash could, just as easily, be collateral for the loan of the security. (If one security is lent as collateral for the borrowed security, the short-term debts are, by convention, not shown.)

1.14 Presentation as a short-term debt to Investor A has some logic, but it is, in any case, not the full story. Investor B has created an obligation akin to that of the security's issuer. Investor B must pay the obligations of the issuer of the security and acquire the security before delivery needs to be made. This liability to act in the place of the issuer is not shown in the accounts unless a negative liability to the issuing country (not necessarily the country of the lender of the security) is shown.

Section 2: Short sales and negative positions – Claims

2.1 The situation with respect to claims surveys is analogous to that of liabilities surveys. The collection of data on the negative positions of own-country residents would eliminate the current overstatement of domestic residents' net claims on that security (at least for the United States). However, analyzing the impact of short sales on claims surveys can be instructive.

2.2 In ***Figure 2***, the relationships that exist when a security is borrowed and sold short are explored further. A US resident (Investor C) owns a foreign-issued security that happens to have been sold short by an investor in Country B. (Investor B obtained the security by borrowing it from Investor A in Country A.) With full knowledge of the transactions: (1) the United States will show a claim on Country X (as Investor C owns a security issued by a resident of Country X); (2) Country X will show a liability to the United States (because Investor C will have a US custodian, with a subcustodian in Country X); and (3) Country A will show a claim on Country X (as Investor A in Country A "economically owns," but lent the security). On a worldwide basis, the accounts will balance only if Country B shows Investor B's negative position against Country X. The "negative liability" of Country B to Country X is required even though the debt is to an investor in Country A. (A short-term loan from Investor A to Investor B is, of course, required to be shown in the short-term debt accounts of both Country A and Country B but does not affect this analysis.)

Section 3: The relationship of borrowed securities and negative positions

3.1 Lending securities, even if there is no short sale, can result in significant data compilation difficulties. These are explored in the paper "Borrowed securities: Implications for measuring cross-border portfolio investment," which was presented at the 22–29 August 2007 meeting of the Irving Fisher Committee in Lisbon.

3.2 Every negative position is simply a borrowed position that is neither held nor relent. As a result, when calculating an investor's ownership, either of the following equations could be used:

Securities owned = securities held + securities lent – securities borrowed

or

Securities owned = securities purchased and held + securities purchased and lent – securities borrowed and sold (sold short)

However, it would be double-counting to subtract both borrowed securities and securities "sold short" from positions held.

Section 4: Short sales by domestic residents

4.1 If the investor borrowing a domestic security to sell it short is a domestic resident (including a US broker/dealer), the situation is different, as a domestic resident would have the liability. ***Figure 3*** shows a securities flow in which a foreign investor (Investor A) owns 150 units of a security, a US investor (Investor B) sells 100 units (borrowed from Investor A) short, and a foreign investor (Investor C) eventually acquires the security. Under current reporting, the United States would show foreign residents (Investors A and C) owning 250 units of the security. Collecting data on foreign residents' negative positions would not have any impact in this situation, because no foreign residents have negative positions in the security. Fortunately, 250 units is, in fact, both the correct number of units held by foreign residents and the correct number of units for which US residents have liabilities.

4.2 ***Figure 3*** is instructive, because it shows why it is incorrect to calculate foreigners' ownership of a security as a percentage of the amount issued and assume that domestic residents own the "remaining percentage." Investors (domestic and foreign) can, and often do, hold aggregate claims for more than 100 percent of the quantity of a security issued. Not all of these positions are effective claims against the issuer, because some of the positions are, in reality, claims against short sellers. The only way to obtain a full picture of the situation would be to collect data on the negative positions of domestic investors as well as those of foreign investors, a very large data gathering effort for a country as large as the United States.

Section 5: Borrowing from a foreign resident

5.1 A possibly significant situation is shown in ***Figure 4***, in which a foreign Investor B borrows a domestic (US-issued) security from a *foreign* custodian (or investor) and sells it short.[10] In this case, the domestic data collection agency will not be able to collect information on either the borrowing by Investor B or the subsequent sale to Investor C. However, this may not be a serious problem for the calculation of domestic residents' liabilities. Although Investor A owns 150 units, the domestic custodian (Custodian A) sees only the 50 units held by foreign custodian of Investor A. The other 100 units have been delivered by the foreign custodian to Investor C (or its custodian). Thus, liabilities will be shown correctly, even though the negative position of Investor B cannot be collected and the holding of Investor A is understated.[11]

---

[10] For convenience, the security and cash are shown as going directly to Investor C, but the result would be the same if the flows went to a foreign custodian of Investor C.

[11] In this example, a problem may arise if Custodian A is affiliated with Investor A's foreign custodian. In this case, Custodian A may have knowledge of Investor A's actual holdings. Utilization of this knowledge would, paradoxically, lead to an incorrect total for domestic residents' liabilities, unless it were also possible to capture the onsale of Investor B (which might be possible, if the Custodian is an affiliate of Custodian A and reports by "looking through" its foreign affiliate). Before designing reporting instructions, this issue would need to be investigated.

5.2 The existence of securities lending activities through foreign custodians, however, does provide another source of error in determining the residence of the holder of a domestic security. If Investor B (in ***Figure 4***) were to relend (rather than onsell) the security, the domestic Custodian C might not know that the security was borrowed. In this case, Custodian C would overstate the (non-existent) ownership of Investor C. However, this overstatement would offset the understatement of Investor A's position. (The lack of reporting of any position of Investor B is, in this case, correct.) If Investor A and C reside in different countries, however, the country of ownership would be misstated.

5.3 If a domestic resident borrows a domestic security from a foreign investor or custodian and the US custodian for the foreign investor/custodian is unaware that the security is on loan, the understatement of the foreign position will not be offset and domestic liabilities will be understated. However, this error may be offset by domestic residents' loans to foreign residents that are held at foreign custodians.

5.4 A claims survey may be less affected by a reporter's lack of information of this type than a liabilities survey. When a resident end investor uses a foreign custodian directly, the end investor typically will have reporting responsibilities and a lack of information will generally not be a problem. Even if a security held by a resident end investor is lent by a foreign custodian without the end-investor's knowledge, the end investor will report (correctly) the ownership of the security. Similarly, a security borrowed without the end investor's knowledge will be reported correctly (ie not at all). If the resident end investor uses a domestic custodian, lending/borrowing by the foreign subcustodian will certainly not be a problem, as the domestic custodian will continue to show the investor's ownership of the security. However, end investor arranged loans will continue to be a problem.

Appendix A:
Selected types of borrowing agreements

A security can be borrowed in many different ways. Several of these are described below. The agreements differ mainly in the nature of the participants and the way protection, in the case of default, is provided to the security's lender. However, these differences can result in very large differences in legal form and in the knowledge of the transaction by some of the participants. Therefore, the reporting implications of the type of lending agreement used can be significant.

A. Collateralized lending agreements

Brokers and other financial intermediaries may allow customers to borrow securities by posting cash or other specific collateral. Brokers and other financial intermediaries also may allow customers to borrow a security based on the customer's margin account balances. These agreements often allow the customer to relend or sell the borrowed security to a third party. In each case, the financial intermediary shows a (collateralized) claim on the customer and the customer shows a liability to the financial intermediary.

B. Use of a security held in a "street name"

Securities, particularly equity securities in retail customers' accounts, are often held by the broker, acting as a custodian (or by the broker's custodian), in a "street name." When this occurs, the books and records of the issuer, usually as compiled by a central clearing organization (primarily the Depository Trust Clearing Corporation (DTCC) in the United States), show the broker/custodian as the legal owner. The only record of the customer's ownership is on the books and records of the broker/custodian (which are provided to the customer). Often, the customer and the broker agree that the broker or its custodian may borrow the security *without the customer's knowledge or specific consent*.[12] A summary of this type of agreement is shown in Appendix B.[13] (Security for the customer is provided by the broker's assets, a government guarantee (SPIC in the United States), or perhaps broker-acquired private insurance.) Once the broker/custodian borrows the security, the broker/custodian can relend or onsell it.

The same situation may occur in a non-retail setting. "Re-hypothecation" is the use of posted collateral (by the intermediary holding that collateral), either to lend the security or to post it as collateral for the intermediary's own obligations. The UK Financial Securities Authority

[12] In fact, the broker/custodian may hold these securities in an undifferentiated account (a "pool"), with brokers' books showing a liability either to the customer or to the pool (and the customer on a pro rata basis). The customer has no knowledge that security was borrowed (and lent or onsold). The broker/custodian is responsible for providing compensation to the customer for corporate actions (eg interest or dividend payments), but as shown in Appendix A, this compensation may not include compensation for less favorable tax treatment (as the broker may have to declare some of the payments to be interest rather than dividends).

[13] See also http://www.nyse.com/pdfs/MarginCustomersKnowYoursShareholderRights.pdf.

reports, “Re-hypothecation is a key generator of prime brokerage revenue and is often linked to the terms on which other prime brokerage services are offered to the hedge funds.”[14]

C. Reverse transactions

Reverse transactions (RTs) are transactions, such as repurchase agreements, in which a security is legally sold, but the seller and buyer both have legal obligations to engage in a subsequent transaction to return that security (or an equivalent security) to the original owner. The second transaction is specified to be made at a defined price, usually based upon the time elapsed between the two transactions. Although the agreement is written as two separate transactions, the economic substance of the agreement is akin to a loan. RTs are treated as a loan for current US reporting[15] and for most financial analysis and reporting purposes.[16]

RTs can be conducted in several different ways.

a. ***Delivery vs payment repurchase agreements***: A bilateral “delivery vs payment” or (“DVP”) repurchase agreement is shown in ***Figure 5***. Note that as long as repurchase agreements are treated as borrowings, the situation is, in theory, exactly analogous to any other borrowing used to facilitate short sale (as shown, for example, in ***Figure 1***). However, this type of borrowing can be a particular problem for data compilers because: (1) the custodian for the original owner may or may not know that the security was delivered out as part of a repurchase agreement; and (2) the custodian for the short seller may or may not know that the security was acquired through a repurchase agreement. Hence the custodians for Investors A and B may or may not have a record of the loan or the short seller’s obligation to return the security upon expiration of the repurchase agreement, respectively. The BMA estimates that US residents’ DVP repurchase agreements with non-US counterparties exceeded $1 trillion in 2004 (about half the total).

   Sometimes, end investors authorize custodians to initiate and carry out DVP repurchase agreements on their behalf (or on the custodian’s behalf in return for reduced custodial fees). In some of these cases, it may be that the end investor may not “know” of the repurchase agreements, depending upon the nature of the agreement between the end investor and the custodian, and the characteristics of the custodian’s and the end investor’s record keeping systems. This issue needs to be explored further.

b. ***Securities lending agreements***: A securities lending agreement is similar in concept to a DVP repurchase agreement, albeit different in legal form. In addition, either cash or a security can be given to a counterparty to provide collateral for the

---

[14] Financial Services Authority, “Hedge funds: A division of risk and regulatory engagement,” Discussion Paper 05/4, June 2005, Paragraph 3.48.

[15] Current US treatment (cf Carol Bertaut, William Griever, Ralph Tryon, “Understanding US cross-border securities data,” *Federal Reserve Bulletin*, May 2006, p A59) and international standards (SNA 1993, Paragraph 11.32) call for RTs that involve cash collateral to be treated as collateralized loans, created through a financial instrument that is distinct from the underlying securities. Securities transferred as a result of RTs without cash collateral are treated, to the extent the source data permit, as if the securities had not been transferred, which is analogous to their treatment as a loan.

[16] “Repurchase agreement: A form of secured, short term borrowing in which a security is sold with a simultaneous agreement to buy it back from the purchaser at a future date. The purchase and sales agreements are simultaneous, but the transactions are not.” (American Banker Online, Glossary).

borrowed security.[17] In the latter case, the title and voting rights for the "collateral" security are usually not transferred, although they could be. Custodians have told us that, in contrast to the situation with DVP repurchase agreements, they are almost always aware of the nature of positions arising from securities lending agreements. We do not know if the end investors are always aware of the specific securities lent or used as collateral.

c. ***Triparty repurchase agreements***: Repurchase agreements are often carried out on a "triparty" basis. In this case, a single custodian is responsible for managing the custodial arrangements for both parties to the repurchase agreement. In a triparty repurchase agreement, the (single) custodian for both parties will know that the positions result from a repurchase agreement and that the parties have an obligation to engage in the reverse side of the transaction upon expiration of the repurchase agreement. The custodian will also know if the security acquirer has the security in its account, which is the usual case.[18] We do not know if end investors' reporting systems can identify exactly which securities have been lent under triparty repurchase agreements. The BMA estimates that US residents engaged in triparty repurchase agreements with US and foreign residents totaled about $1.4 trillion in June 2004.

d. ***Central counterparty (multilateral clearing) repurchase agreements***: Repurchase agreements can also be carried out using a central counterparty. (The use of a central counterparty is often called "multilateral clearing.") By far the largest central counterparty in the United States is the Fixed Income Clearing Corporation, Government Securities Division (FICC). Trades between counterparties are brought to the FICC by the counterparties (or an interdealer broker). The FICC substitutes *two new contracts* from itself, one to each party, for the contract between the two parties (or at least the next day of the contract between the parties). FICC, as the central counterparty, can then engage in a massive netting operation (estimated to be in excess of 80%), reducing costs and counterparty risk. With custodial reporting, the reporting implications for repurchase agreements carried out using a central counterparty are virtually identical to triparty repurchase agreements, as the central counterparty has full knowledge of the transactions and the securities typically remain overnight with the central counterparty.[19]

---

[17] See http://www.isla.co.uk/sl_fundamentals.asp.

[18] The original owner may have an additional "primary custodian," which delivers the security to the tri-party custodian. Less commonly, the acquirer may have an additional custodian which takes delivery of the security. These extra flows may affect the information available to custodial (or end investor) reporters.

[19] In addition, for the United States, the central counterparty typically deals almost exclusively with domestic residents.

Appendix B

Figure 1

A foreign resident borrows and sells "short" a US security

All custodians are US residents and all
end investors are foreign residents

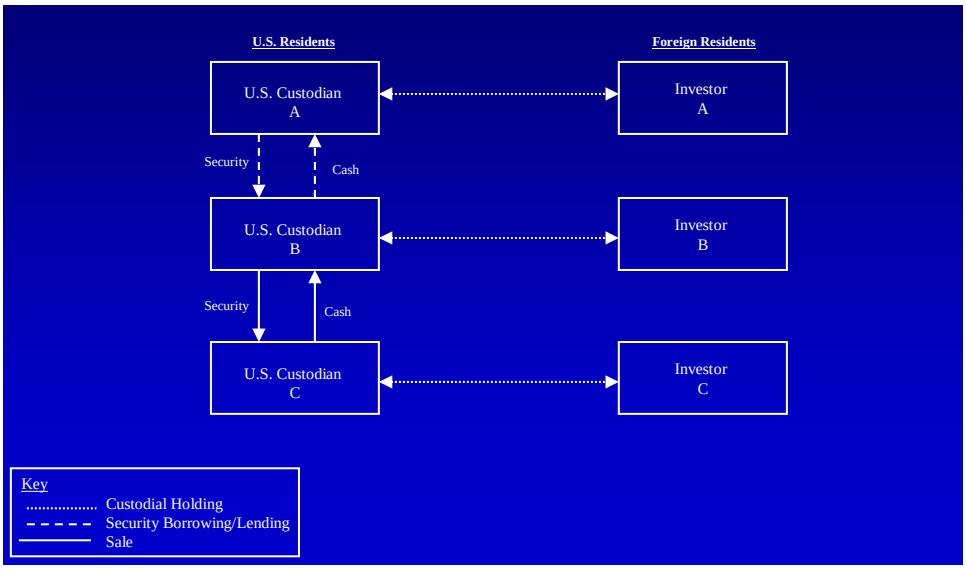


Figure 2

A multinational borrowing and short sale chain

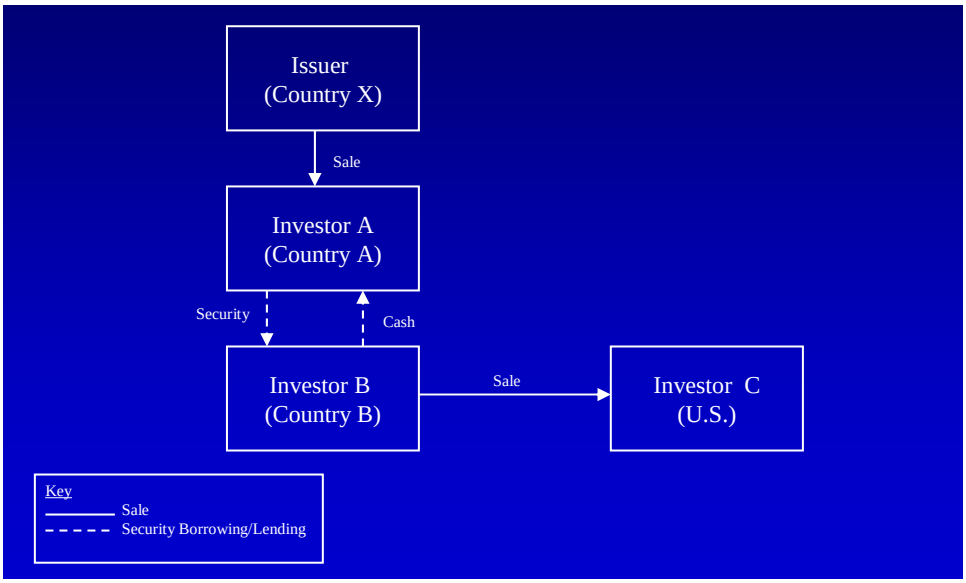


Figure 3

A short sale of a US security by a US resident

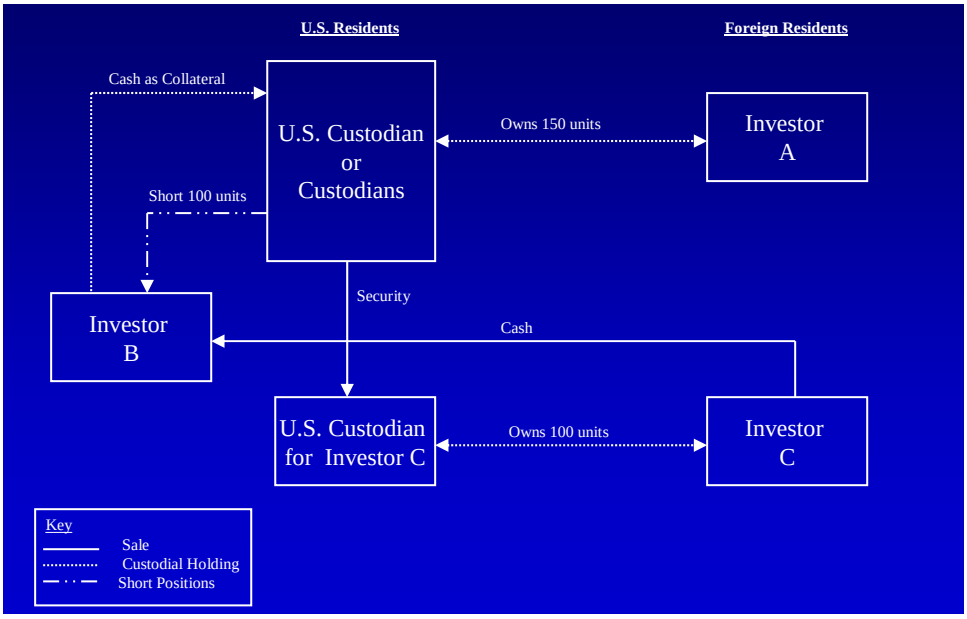


Figure 4

A short sale conducted through a foreign custodian

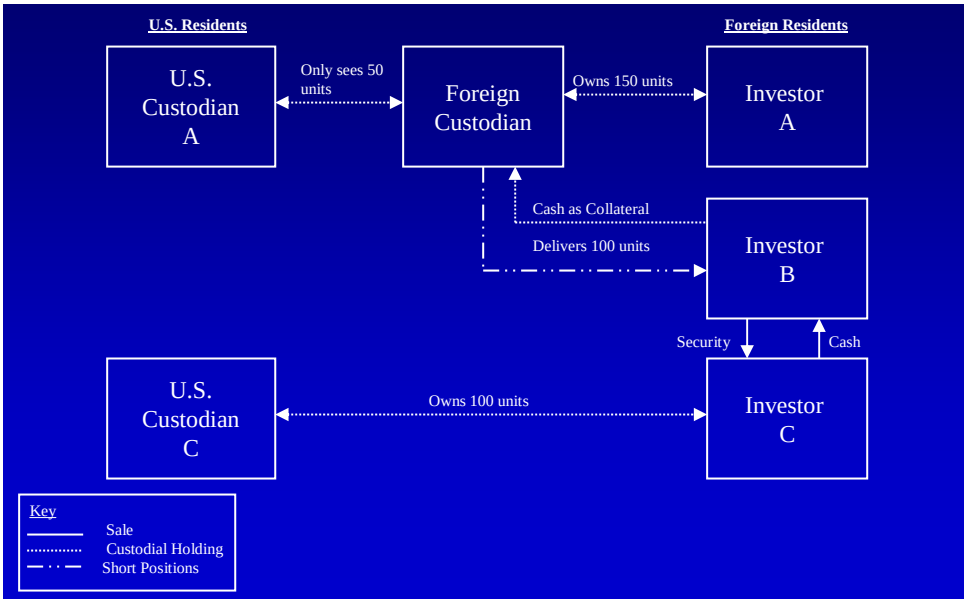
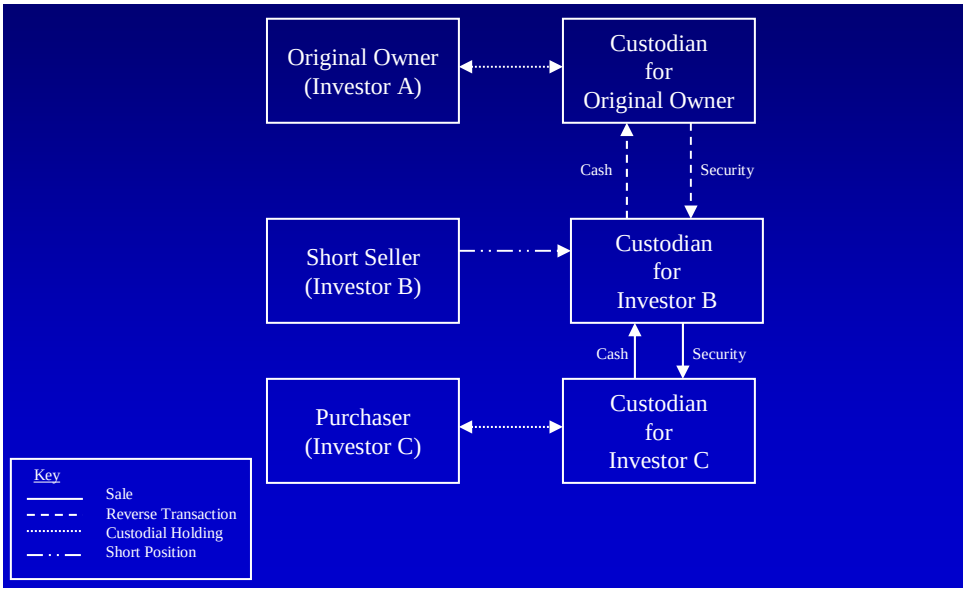


Figure 5

A typical short sale using a "delivery vs payment" reverse transaction



Session 6

Statistics on holdings of debt securities

Chair: Debra Gruber, Federal Reserve Bank of New York

Papers: Holdings of securities by institutional sector
Celestino Girón, European Central Bank

Data on bilateral external positions, an insight into globalisation
Lucie Laliberté and John Motala, IMF

Holdings of securities by institutional sector

Celestino Girón[1]

Financial accounts – comprising financial balance sheets, transactions and other flows – show data on debt securities within a comprehensive and consistent statistical framework. In addition to details of the net issuance of debt securities by the institutional sectors and foreign debtors and the amounts outstanding for such securities, the financial accounts present data on the net acquisition of debt securities by euro area residents and foreign creditors and their holdings. The uniform valuation of debt securities as liabilities and assets, including accrued interest, is a prerequisite for the presentation of creditor-debtor relationships. Moreover, the financial accounts, as part of the institutional sector accounts, allow analysis of the significance of debt securities for the financial markets and the business cycle. This document provides an overview of the data on debt securities in the euro area accounts. It looks at the relevant methodological principles, data sources and compilation challenges, and focuses on the integration of securities statistics within a consistent accounting framework.

1. Introduction

Since June 2007 the ECB, in cooperation with Eurostat (the Statistical Office of the European Communities), has been publishing quarterly euro area accounts. These statistics cover all of the euro area institutional sector's economic transactions, financial balance sheets and other financial flows.

Euro area accounts are almost entirely integrated (ie almost entirely free of discrepancies). These statistics are based on – but are not simply the sum of – the national accounts of the euro area countries and a variety of statistics for the euro area as a whole. Moreover, the euro area accounts conform to international statistical standards (mainly the System of National Accounts 1993 (SNA 93) and the European System of Accounts 1995 (ESA 95)) and integration techniques. Securities issued (debt securities and shares and other equity; stocks, transactions and other flows) are included in the accounts as liabilities of the various institutional sectors. In addition, the corresponding holdings of securities are presented for all sectors.

This paper looks at a number of issues concerning data on securities in the euro area accounts, with a focus on debt securities. Section 2 sets out the conceptual framework for securities in national accounts. Sections 3 and 4 deal with the specific implementation of the statistical framework in the euro area accounts, focusing on data sources and the analytical use of the statistics. Finally, Section 5 looks at the availability of data on holdings of debt securities and details future improvements to such data in the euro area accounts.

2. Debt securities in the sectoral account framework

The methodological framework established by the SNA and the ESA provides a description of the different stages of the process of generating and distributing value, from production to the accumulation of wealth.

[1] Principal Economist-Statistician, Directorate General Statistics, European Central Bank, celestino.giron@ecb.int.

Economic flows are divided into transactions and other economic flows on the basis of the nature of the relationship between the economic agents that gives rise to the change in the agents' balance sheets. These flows are grouped together in analytical devices called accounts. The accounts covering value accumulation in the form of transactions are the "capital account", which covers non-financial assets, and the "financial account", which covers financial assets and liabilities. The balancing item in the accumulation accounts is called "savings" and captures, together with net capital transfers, the total change in the net worth of a sector (ie its assets minus its liabilities) as a result of transactions.[2] Holding gains and losses are shown in the "revaluation account", while the "other changes in the volume of assets account" covers other economic flows.

Debt securities are defined as tradable financial assets that give the holder a contractually determined (fixed or variable) income. Debt securities appear in the financial account, the revaluation account, the other changes in the volume of assets account and the financial balance sheets.

The sectoral account framework is consistent – ie each economic flow is recorded in an identical manner for each of the parties involved. In particular, consistency is achieved for debt securities through the establishment of a single valuation rule, with valuation on the basis of the market price for both assets and liabilities. The market price used is that prevailing when the economic flow is recorded (generally the time at which the economic flow takes place) or the time to which the financial balance sheet refers.

3. Debt securities in the euro area accounts

The euro area accounts are based on two sets of data sources. The first comprises euro area statistics ("euro area building blocks") such as macroeconomic aggregates, the consolidated balance sheet of euro area deposit institutions (monetary financial institutions (MFIs)), the euro area balance of payments (BOP), international investment position (IIP). and various other euro area financial statistics compiled by the ECB. Second, sectoral accounts for the countries of the euro area are used to supplement the euro area building blocks.[3]

Annex 1 shows debt securities held by the household sector as part of an analytical presentation published regularly in the ECB's *Monthly Bulletin*. It shows all financial and non-financial transactions, other financial flows, and financial balance sheets for this sector.

This comprehensive presentation sheds light on developments in debt securities in the context of overall developments in portfolios, savings and financing. For instance, it makes it possible to analyse the way in which the issuance of debt securities relates to changes in alternative sources of financing, whether internal, such as savings, or external, such as equity or loans.

The euro area accounts also provide a comprehensive picture of portfolio allocation across the various sectors, complementing the traditional monetary analysis. The intention is to present (sectoral) data on money in conjunction with statistics on other (financial) assets and thereby provide additional insights into developments in money, as well as portfolio allocation decisions. The euro area accounts also contain aggregates in addition to those envisaged by the SNA in order to highlight developments in liquid assets vis-à-vis long-term financial investment. The

---

[2] The other accounts covering transactions, called "current accounts", provide a complementary description of savings through a series of accounts describing the economic cycle from the production and generation of income, through its distribution and use, to its accumulation.

[3] National data are made available to European institutions in accordance with European statistical legislation obliging national compilers – ie national central banks and national statistical institutes – to provide information in a timely manner and an appropriate format.

data in Annex 1 distinguish between short-term assets (in accordance with the definition of M3) and long-term assets, including a corresponding breakdown for debt securities.

4. Data sources for debt securities and horizontal consistency

The debt securities data in the euro area accounts may differ from those presented in other euro area statistics on the basis of valuation criteria other than market prices (eg securities issues statistics, which are based on nominal or face values). This also means that a large amount of additional work is needed in order to compile integrated sectoral accounts.

Data on debt securities issued by resident sectors are estimated on the basis of securities issues statistics,[4] adapted in line with the standards applied for sectoral accounts. This adaptation relates mainly to stocks and non-transaction flows, which use different valuation criteria, but may also concern transactions. In particular, in the euro area accounts, interest accrued is included in the value of the debt securities, rather than in some other entry in the accounts. Accrued interest is registered as a financial transaction capturing the reinvestment of the interest income in the debt security that generates it. Other discrepancies concern the distinction made between transactions and other economic flows. In particular, in the securities issues statistics, securities issuance is regarded as a transaction only where securities are issued in exchange for cash, whereas in the sectoral accounts transactions cover, in principle, all issuance.[5]

In order to estimate the securities holdings of resident sectors, national data are taken from balance sheet statistics, supervisory information or security custodians. As in the case of securities issues statistics, the data have to be adapted in line with the standards applied to national accounts. Data on liabilities and financial assets vis-à-vis non-residents are taken from the euro area BOP and IIP.

The requirement that valuation be on the basis of market prices supports the consistency of the euro area accounts, meaning that debt security flows and stocks always have the same value in the accounts of both the creditor and the debtor. This allows a comprehensive analysis of flows of funds between sectors, which would not otherwise be possible. In particular, the accounts provide information on the way that financing and investment flows are channelled from one sector to another, and allow the potential impact of monetary policy decisions or market shocks on that process to be monitored.

The framework for the euro area accounts fulfils the requirement of “horizontal balance” – that is to say, the sum of all transactions, other flows and stocks for debt securities issued across all resident sectors and the rest of the world is equal to the sum of all transactions, other flows and stocks for debt securities held across all resident sectors and the rest of the world.

The euro area accounts present compilation difficulties over and above those in evidence at the national level. A national compiler has to cope with mismatches involving data from two or more different sources, usually linked to the various sectors engaging in the transaction (or other flow). For the euro area, mismatches also occur between sectors resident in different countries.

---

[4] See Alexander Cho and Cristina Abascal, “Framework for aggregated securities issues statistics in the euro area”, background paper for the IFC Workshop on “Challenges to Improve Global Comparison of Securities Statistics”, IMF, Washington DC, 4–5 March 2008.

[5] This adaptation in line with the standards applied for sectoral accounts is carried out at the national level (typically by the national central banks, although in some cases this is carried out by the national statistical offices) using market prices or indices to estimate current prices, using data on interest flows to estimate accruals, and using market information to compile correct flows of funds where securities are not issued in exchange for cash.

As the euro area consists of 15 countries, the process of achieving consistent euro area accounts is anything but simple.[6]

The increasing sophistication of the markets causes additional compilation difficulties. In particular, where transactions involve, in business accounting, off-balance sheet disposals or acquisitions (eg in the case of repos, securities lending, certain forms of securitisation and short selling[7]) there is a risk of double-counting.

5. Holdings of debt securities and counterpart sector information

Annex 2 shows the set of debt securities data currently presented in the quarterly euro area accounts. It covers the holdings of the institutional sector, transactions and other flows, and the corresponding entries for liabilities. Although not shown in the table, debt securities are also broken down by original maturity.

Chart 1

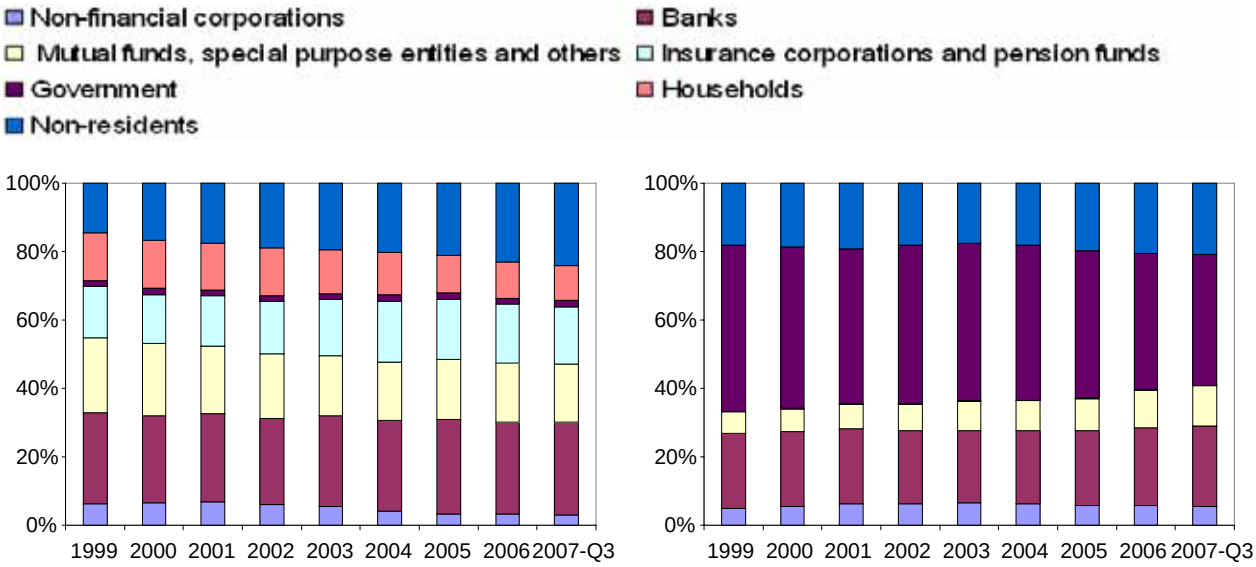
Issuance and holdings of euro area debt securities

Holdings of debt securities by sector

(balance sheet data; percentages of total)

Issuance of debt securities by sector

(balance sheet data; percentages of total)



[6] This problem, which is specific to supranational statistics, already features prominently in the national BOP and IIP data, where discrepancies, known as "asymmetries", arise in respect of intra-euro area transactions in the form of differences between inflows and outflows within the euro area. In order to resolve the horizontal discrepancies in the euro area accounts, compilers have to remove both the national sector discrepancies and the BOP/IIP asymmetries.

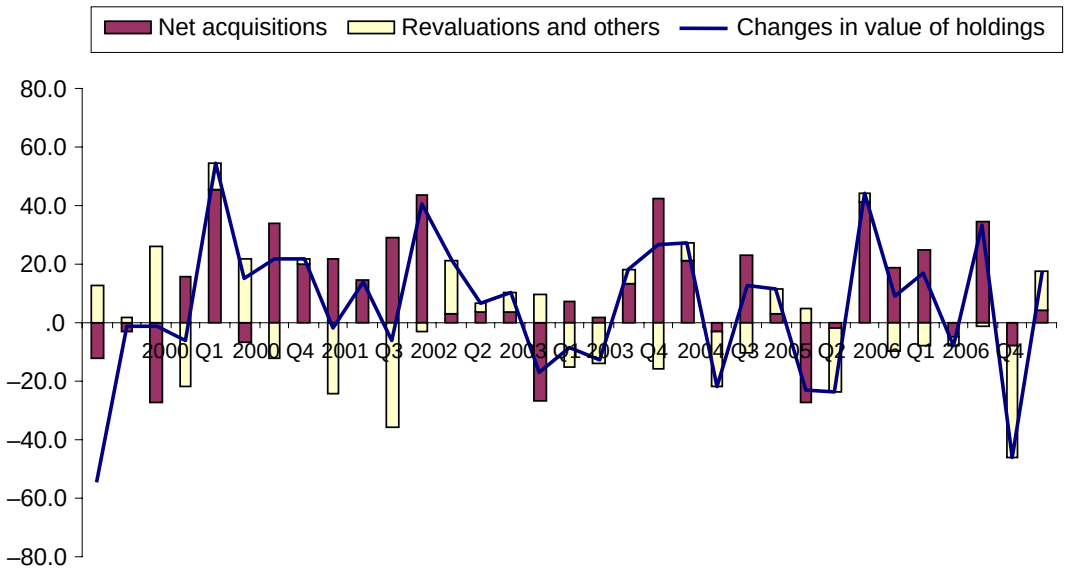
[7] See Leon Taub, "Taking account of short positions in international portfolio investment statistics", background paper for the IFC Workshop on "Challenges to Improve Global Comparison of Securities Statistics", IMF, Washington DC, 4–5 March 2008.

Chart 1 shows developments in holdings of euro area debt securities broken down by sector. The increase observed in the share of holdings by non-euro area residents reflects the significant growth seen in cross-border portfolio investment in euro-denominated assets in recent years. This relative increase has taken place at the expense of the holdings of non-financial sectors and, to a lesser extent, financial corporations. A smaller increase has been seen in euro area residents' holdings of foreign debt securities.

The accounts also cover other economic flows, including revaluations.[8] This information complements the analysis of net acquisitions by covering additional changes in wealth resulting from interest rate changes. Chart 2 shows how changes in holdings of debt securities are broken down into net acquisitions and other flows for the portfolios of euro area households.

Chart 2

Changes in the euro area household sector's holdings of debt securities



Comprehensive presentation of all financial balance sheet data in the euro area accounts would allow the use of the IMF's "balance sheet approach", which allows balance sheet mismatches, vulnerabilities and inter-sectoral linkages to be studied. That approach would require the availability of information on the counterpart sector. At the same time, in order to undertake a full analysis of flows of funds for transactions, the data on holdings would also need to be broken down by debtor counterpart and the data on liabilities would need to be broken down by creditor counterpart, so that a sector-to-sector analysis could be undertaken.[9] This is not yet possible for euro area account data on securities.[10]

---

8 For other economic flows, the data sources available do not allow a distinction to be made between revaluations and changes in volume. In the case of debt securities, most flows other than transactions relate to revaluations.

9 Statistics on the holdings of counterpart sectors also allow us to "see through" layered financing setups. For instance, financing flowing from households to the government sector is usually channelled through investment funds. Counterpart sector information would allow the netting out of the positions between households and investment funds and so reveal the financing link being used.

10 At present, limited counterpart sector information is available in the euro area accounts. Available information relates mainly to deposits and loans vis-à-vis banks. By mid-2009 counterpart information will be made available for all deposits and loans.

The presentation of counterpart sector information for debt securities is challenging owing to the tradability of such securities. The information currently available, which is based mainly on aggregate reporting, is insufficient for the compilation of debtor-creditor relationships. However, in the medium term, increased use of security-by-security reporting in the euro area, in combination with the development of an ESCB centralised securities database, will help to meet this objective.[11]

Counterpart sector information can be produced in various ways. The most relevant shows flows and stocks for every sector for every category of asset, broken down by the sectors for which these constitute a liability, and vice versa. For transactions and as supplementary information, counterpart sector information can also be compiled by indicating the sectors between which such transactions take place.[12] This method – the "transactor approach" – might better serve the analysis of flows of funds, as it provides a better picture of transactions among sectors on the secondary market.

[11] See Werner Bier and Frank Mayerlen, "The CSDB project of the ECB", background paper for the IFC Workshop on "Challenges to Improve Global Comparison of Securities Statistics", IMF, Washington DC, 4–5 March 2008.

[12] For example, a household's acquisition of government debt securities from a non-financial corporation would, in the household account, be classified as a transaction vis-à-vis the government sector if the debtor-creditor method were followed and a transaction vis-à-vis non-financial corporations if the transactor approach were followed.

Annex 1:
Publication of data from the euro area accounts in the ECB's *Monthly Bulletin*: Households

Households

EUR billions; four-quarter cumulated flows;
outstanding amounts at end-of-period

	2003	2004	2005	2005 Q4–2006 Q3	2006 Q1–2006 Q4	2006 Q2–2007 Q1	2006 Q3–2007 Q2	2006 Q4–2007 Q3
Income, saving and changes in net worth								
Compensation of employees (+)	3,673.6	3,779.1	3,884.2	4,000.3	4,037.1	4,081.3	4,123.7	4,163.4
Gross operating surplus and mixed income (+)	1,228.6	1,280.5	1,329.3	1,383.6	1,403.9	1,424.9	1,445.8	1,466.6
Interest receivable (+)	237.5	230.6	228.7	249.6	259.8	267.7	275.2	282.8
Interest payable (–)	124.1	125.2	128.9	148.7	156.9	165.0	173.2	180.5
Other property income receivable (+)	615.4	650.3	696.7	725.4	736.6	742.9	753.0	756.9
Other property income payable (–)	8.9	9.4	9.4	9.5	9.5	9.5	9.5	9.5
Current taxes on income and wealth (–)	702.0	705.5	738.4	770.8	788.8	797.1	810.5	829.5
Net social contributions (–)	1,384.4	1,423.7	1,465.5	1,513.7	1,528.6	1,540.8	1,553.2	1,564.3
Net social benefits (+)	1,396.7	1,440.7	1,484.2	1,518.6	1,529.3	1,536.3	1,544.0	1,553.7
Net current transfers receivable (+)	65.3	64.6	67.4	62.8	62.9	64.5	65.3	66.4
= Gross disposable income	***4,997.7***	***5,182.1***	***5,348.4***	***5,497.5***	***5,545.8***	***5,605.1***	***5,660.8***	***5,705.9***
Final consumption expenditure (–)	4,319.7	4,485.4	4,653.3	4,798.2	4,843.5	4,882.1	4,920.9	4,961.2
Changes in net worth in pension funds (+)	54.5	57.1	59.4	62.0	63.1	63.0	63.4	64.4
= Gross saving	***732.5***	***753.8***	***754.4***	***761.4***	***765.4***	***786.1***	***803.4***	***809.1***
Consumption of fixed capital (–)	288.1	303.3	318.4	331.0	335.2	338.8	342.1	344.8
Net capital transfers receivable (+)	12.6	18.9	25.0	28.9	32.3	30.3	27.6	20.5
Other changes in net worth[1] (+)	256.1	300.1	617.9	366.5	479.4	386.1	604.1	200.0
= Changes in net worth[1]	***713.2***	***769.5***	***1,078.9***	***825.8***	***941.9***	***863.7***	***1,092.9***	***684.8***

Households (cont)

EUR billions; four-quarter cumulated flows;
outstanding amounts at end-of-period

	2003	2004	2005	2005 Q4–2006 Q3	2006 Q1–2006 Q4	2006 Q2–2007 Q1	2006 Q3–2007 Q2	2006 Q4–2007 Q3
Investment, financing and changes in net worth								
Net acquisition of non-financial assets (+)	495.8	526.7	559.7	600.4	612.0	627.1	638.1	644.8
Consumption of fixed capital (–)	288.1	303.3	318.4	331.0	335.2	338.8	342.1	344.8
Main items of financial investment (+)								
Short-term assets	211.3	214.6	207.7	262.2	301.6	345.8	378.5	398.9
Currency and deposits	226.5	213.0	247.9	265.6	283.8	293.2	316.9	328.2
Money market fund shares	25.1	–6.4	–20.2	–17.5	0.3	25.7	44.7	42.9
Debt securities[2]	–40.3	8.0	–20.1	14.0	17.6	26.9	16.8	27.7
Long-term assets	311.0	342.3	443.3	359.7	303.1	257.9	222.5	157.7
Deposits	–5.7	33.7	–10.1	–0.3	–6.7	–19.7	–29.3	–34.1
Debt securities	25.8	65.8	17.0	69.1	62.4	46.4	29.7	–2.0
Shares and other equity	59.9	–8.5	136.1	–7.3	–29.7	–26.3	–32.8	–32.5
Quoted, unquoted shares and other equity	7.6	–13.5	61.4	–8.7	–1.4	30.2	32.2	38.0
Mutual fund shares	52.2	5.0	74.7	1.5	–28.3	–56.5	–65.0	–70.6
Life insurance and pension fund reserves	231.0	251.3	300.4	298.2	277.1	257.4	254.8	226.3
Main items of financing (–)								
Loans	262.8	311.7	390.3	411.4	390.7	382.4	364.6	361.6
of which from euro area MFIs	*211.6*	*280.8*	*358.3*	*372.1*	*346.5*	*337.2*	*316.8*	*302.3*
Other changes in financial assets (+)								
Shares and other equity	272.5	256.5	521.4	353.8	460.0	371.4	587.4	196.1
Life insurance and pension fund reserves	29.0	56.9	129.4	55.0	48.5	33.4	66.1	29.8
Remaining net flows (+)	–55.5	–12.5	–73.8	–62.9	–57.4	–50.7	–92.9	–36.0
= Changes in net worth[1]	***713.2***	***769.5***	***1,078.9***	***825.8***	***941.9***	***863.7***	***1,092.9***	***684.8***

Households (cont)

EUR billions; four-quarter cumulated flows;
outstanding amounts at end-of-period

	2003	2004	2005	2005 Q4–2006 Q3	2006 Q1–2006 Q4	2006 Q2–2007 Q1	2006 Q3–2007 Q2	2006 Q4–2007 Q3
Financial balance sheet								
Financial assets (+)								
Short-term assets	4,058.0	4,275.7	4,494.8	4,644.7	4,751.6	4,830.1	4,969.5	5,020.9
Currency and deposits	3,710.1	3,926.0	4,176.7	4,318.2	4,456.5	4,497.3	4,613.3	4,653.9
Money market fund shares	321.0	313.9	300.5	285.4	261.3	281.0	305.0	302.8
Debt securities[2]	27.0	35.7	17.6	41.2	33.8	51.8	51.2	64.3
Long-term assets	9,214.9	9,847.5	10,931.5	11,483.6	11,761.0	11,981.2	12,081.2	11,863.0
Deposits	841.9	876.6	883.9	870.9	871.0	847.8	836.3	830.9
Debt securities	1,202.1	1,243.3	1,239.6	1,286.8	1,286.5	1,301.8	1,256.5	1,261.1
Shares and other equity	3,629.8	3,878.4	4,529.1	4,808.2	4,999.0	5,160.4	5,241.1	4,997.3
Quoted, unquoted shares and other equity	2,480.8	2,712.8	3,207.9	3,462.0	3,613.6	3,775.6	3,842.6	3,634.2
Mutual fund shares	1,149.1	1,165.6	1,321.2	1,346.2	1,385.4	1,384.8	1,398.5	1,363.1
Life insurance and pension fund reserves	3,541.0	3,849.2	4,278.9	4,517.6	4,604.6	4,671.1	4,747.3	4,773.7
Remaining net assets (+)	190.2	228.0	184.0	203.9	202.6	215.0	207.8	219.8
Liabilities (–)								
Loans	3,922.2	4,245.6	4,630.0	4,915.9	5,015.6	5,099.1	5,195.5	5,275.2
of which from euro area MFIs	*3,521.2*	*3,812.5*	*4,195.9*	*4,464.5*	*4,543.0*	*4,611.3*	*4,692.7*	*4,752.9*
= Net financial wealth	**9,540.8**	**10,105.6**	**10,980.3**	**11,416.3**	**11,699.7**	**11,927.2**	**12,063.0**	**11,828.5**

[1] Excluding changes in net worth due to other changes in non-financial assets such as revaluations of residential property. [2] Securities issued by MFIs with a maturity of less than two years and by other sectors with a maturity of less than one year.

Sources: ECB and Eurostat.

Annex 2:
Data on debt securities in the euro area accounts (EUR billion)

A95TP_TRANS	95TP_DC_AL	ESA95TP_SECTOR	2001Q1	2001Q2	2001Q3	2001Q4	2002Q1	2002Q2	2002Q3	2002Q4	2003Q1	2003Q2	2003Q3	2003Q4	2004Q1	2004Q2	2004Q3	2004Q4	2005Q1	2005Q2	2005Q3	2005Q4	2006Q1	2006Q2	2006Q3	2006Q4	2007Q1	2007Q2	2007Q3
Transactions	Assets	S. Total	178.1	160.8	115.8	170.6	175.4	161.1	114.5	103.5	269.1	241.9	133.9	67.4	256.8	264.7	154.2	100.7	323.2	351.4	121.5	142.5	373.5	293.3	220.2	286.7	444.1	455.7	109.0
		S1. Domestic economy	137.9	135.5	66.7	128.6	185.0	39.4	61.7	34.5	194.5	102.3	146.3	40.0	146.0	169.4	104.3	82.5	244.7	190.9	103.6	152.9	267.2	169.9	132.3	108.0	281.8	303.1	40.9
		S11. Non-financial corporations	31.8	9.1	19.4	-3.8	27.2	-22.7	9.1	-13.9	18.9	-5.8	-8.6	-32.4	-4.5	-13.6	-29.7	-7.8	-5.9	.3	-3.4	-14.1	5.3	14.5	-17.7	6.5	-6.2	16.8	-11.2
		S12. Financial institutions	63.1	107.2	21.5	120.3	124.3	17.8	50.3	44.1	170.3	133.8	144.7	72.3	142.2	132.7	105.9	86.4	224.8	176.2	125.8	171.8	213.6	130.0	122.5	96.9	247.7	281.9	33.8
		S125. Insurance crporations and pension funds	32.1	14.1	16.8	33.6	35.2	8.8	29.1	28.3	45.9	29.3	29.9	46.5	35.2	25.9	22.9	71.2	45.9	37.5	38.2	28.1	38.9	27.8	41.3	38.8	57.2	53.9	21.9
		S121+ S122. Banks	39.3	66.7	15.9	33.7	58.8	3.9	29.4	15.9	86.8	72.8	54.9	29.7	92.8	82.6	32.9	18.2	116.5	93.5	20.0	72.7	109.9	46.8	35.8	49.1	145.3	158.8	-11.8
		S123 + S124. Other financial intermediaries	-8.3	26.4	-11.2	53.0	30.3	5.1	-8.1	.0	37.6	31.6	60.0	-3.9	14.2	24.3	50.0	-3.0	62.4	45.2	67.6	71.0	64.9	55.4	45.3	8.9	45.1	69.3	23.7
		S13. General government	9.1	-.8	3.7	-2.3	4.3	.8	-.5	.4	1.7	1.2	3.1	-1.7	-5.0	8.0	7.0	6.9	2.6	11.3	8.5	-2.9	7.2	6.5	2.5	9.8	5.9	12.1	14.1
		S14 + S.15 Households and non-profit institutions serving households	33.9	19.9	22.1	14.4	29.2	43.5	2.8	3.8	3.6	-26.8	7.0	1.7	13.3	42.3	21.2	-3.0	23.2	3.1	-27.3	-2.0	41.0	19.0	25.0	-5.1	34.4	-7.7	4.2
		S2. Rest of the world	40.2	25.3	49.2	42.0	-9.6	121.7	52.8	69.0	74.7	139.6	-12.4	27.4	110.8	95.2	49.9	18.2	78.5	160.4	17.9	-10.3	106.4	123.4	87.9	178.7	162.3	152.6	68.1
	Liabilities	S. Total	178.1	160.8	115.8	170.6	175.4	161.1	114.5	103.5	269.1	241.9	133.9	67.4	256.8	264.7	154.2	100.7	323.2	351.4	121.5	142.5	373.5	293.3	220.2	286.7	444.1	455.7	109.0
		S1. Domestic economy	146.2	123.5	115.0	105.5	145.7	130.3	79.5	73.8	217.2	181.5	91.7	39.3	188.6	219.1	93.3	39.4	247.2	261.8	43.5	93.6	267.6	223.0	115.0	169.5	312.8	309.5	80.8
		S11. Non-financial corporations	37.8	22.1	31.9	10.4	5.0	-6.6	17.0	2.1	30.9	24.6	-1.4	8.9	-9.3	22.8	6.2	-12.4	13.6	8.5	-8.9	-9.9	8.5	23.9	5.8	3.0	11.5	39.4	-13.3
		S12. Financial institutions	71.1	44.3	49.0	98.3	47.6	67.2	18.0	78.0	56.5	69.8	45.9	74.0	60.9	93.3	49.8	95.0	105.4	142.9	55.0	124.7	180.7	143.2	100.6	207.3	213.2	164.0	96.5
		S125. Insurance crporations and pension funds	1.0	.6	.3	.3	.1	-.5	.0	.0	.8	.8	1.2	2.2	.2	-.1	-1.9	.1	.6	.1	.6	-1.2	.0	.3	.6	3.1	.0	-.1	.4
		S121+ S122. Banks	54.1	20.1	25.6	46.8	34.5	36.4	18.0	27.0	32.4	32.8	22.3	45.9	68.3	60.4	43.1	46.4	84.7	75.0	44.2	34.0	99.2	69.2	66.5	106.3	130.4	101.1	76.4
		S123 + S124. Other financial intermediaries	16.0	23.5	23.2	51.2	13.0	31.3	.0	50.9	23.3	36.1	22.4	26.0	-7.6	33.0	8.6	48.5	20.2	67.7	10.1	91.9	81.6	73.7	33.5	97.9	82.8	62.9	19.7
		S13. General government	37.4	57.1	34.1	-3.2	93.1	69.8	44.6	-6.3	129.9	87.1	47.1	-43.6	137.0	103.0	37.2	-43.1	128.2	110.4	-2.5	-21.3	78.3	55.9	8.6	-40.8	88.1	106.1	-2.4
		S2. Rest of the world	31.8	37.2	.8	65.1	29.7	30.7	34.9	29.7	51.9	60.4	42.2	28.1	68.2	45.6	60.9	61.3	76.1	89.6	78.0	49.0	105.9	70.3	105.2	117.2	131.3	146.3	28.3
	Net assets	S. Total	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Other flows	Assets	S. Total	62.4	-5.1	-34.5	-12.3	-141.3	-75.3	133.3	-91.4	-66.0	7.3	-88.8	-159.9	124.5	-105.2	45.9	17.2	46.3	179.5	-12.4	-25.8	-149.7	-169.1	88.1	-108.7	-64.9	-169.3	-11.9
		S1. Domestic economy	35.4	8.2	-44.0	-17.9	-24.6	-87.8	104.3	-122.0	-18.7	5.6	-74.6	-101.8	91.5	-66.0	32.1	31.8	-11.0	129.8	8.1	-24.7	-85.1	-105.5	61.7	-99.4	-62.1	-125.5	-11.8
		S11. Non-financial corporations	-8.9	8.6	-21.9	15.4	-2.0	-8.9	10.0	-47.0	.2	5.2	-2.7	-5.8	-.6	1.2	-3.2	-27.9	-1.4	1.7	-1.9	-13.2	-.3	.0	-2.4	-3.2	-7.6	-1.5	-.8
		S12. Financial institutions	55.8	-1.5	1.5	-32.1	12.1	-77.5	73.0	-76.3	-27.4	-10.8	-56.1	-81.2	85.3	-49.5	27.9	77.9	.9	116.9	5.1	11.5	-85.6	-93.2	70.1	-92.2	-52.2	-82.4	-27.4
		S125. Insurance crporations and pension funds	4.6	-4.1	2.0	12.2	10.3	-8.9	21.6	7.7	4.6	8.0	-6.8	-17.6	31.2	-19.9	19.2	121.3	-9.7	31.1	10.3	-25.7	-20.4	-10.3	26.0	-46.7	-17.3	-27.0	-15.0
		S121+ S122. Banks	38.3	16.9	-22.2	11.1	12.0	-50.4	24.0	-45.9	45.3	-8.4	-13.5	-35.2	41.4	-4.8	-6.1	-32.2	1.1	47.2	-2.0	81.1	-36.6	-38.4	19.3	-32.2	-18.3	-4.1	-33.1
		S123 + S124. Other financial intermediaries	12.9	-14.3	21.8	-55.4	-10.3	-18.2	27.4	-38.1	-77.3	-10.4	-35.8	-28.5	12.7	-24.8	14.9	-11.2	9.4	38.7	-3.2	-43.9	-28.6	-44.4	24.8	-13.2	-16.7	-51.3	20.7
		S13. General government	.8	-.7	.3	-.9	.8	1.5	3.2	-1.7	1.8	1.4	-.4	-.6	2.1	-1.8	1.5	.5	-.1	2.7	.4	-1.6	-2.7	-2.4	1.9	-1.6	-1.1	-3.4	2.9
		S14 + S.15 Households and non-profit institutions serving households	-12.4	1.8	-24.0	-.2	-35.5	-2.9	18.2	3.0	6.7	9.8	-15.3	-14.2	4.7	-15.9	6.0	-18.6	-10.3	8.4	4.6	-21.5	3.5	-10.0	-7.9	-2.5	-1.2	-38.2	13.5
		S2. Rest of the world	27.0	-13.3	9.6	5.5	-116.7	12.6	29.0	30.6	-47.3	1.7	-14.3	-58.1	33.0	-39.2	13.7	-14.5	57.3	49.7	-20.6	-1.1	-64.6	-63.6	26.4	-9.3	-2.7	-43.9	-.1
	Liabilities	S. Total	62.4	-5.1	-34.5	-12.3	-141.3	-75.3	133.3	-91.4	-66.0	7.3	-88.8	-159.9	124.5	-105.2	45.9	17.2	46.3	179.5	-12.4	-25.8	-149.7	-169.1	88.1	-108.7	-64.9	-169.3	-11.9
		S1. Domestic economy	19.9	-19.6	2.8	-20.0	-68.2	-25.4	90.2	-29.9	-35.3	24.8	-67.7	-67.0	82.0	-73.8	40.2	62.0	17.7	121.9	-3.9	-46.7	-112.0	-96.8	56.0	-49.9	-35.9	-131.1	20.7
		S11. Non-financial corporations	-.2	-.4	-3.2	14.0	1.3	-6.7	1.7	-3.1	-11.7	4.3	-2.2	8.0	7.5	-3.7	-.9	29.4	.3	6.9	1.9	-8.9	-4.3	-5.6	-2.8	-1.2	.1	-6.9	3.4
		S12. Financial institutions	4.0	7.8	-25.2	-34.2	-6.5	-45.5	-2.1	-20.2	-44.4	-18.2	-9.2	-29.3	14.0	.9	-5.9	-13.7	25.6	27.1	-5.2	13.6	-11.7	-20.7	-3.1	-5.7	-1.0	-15.7	-26.2
		S125. Insurance crporations and pension funds	.0	.1	-.4	-.1	-.2	-.1	.1	.1	-.1	.2	.1	.2	.2	.0	-.1	.1	.0	.1	.1	-.2	-.4	-.6	1.8	-.5	-.2	-.5	-.2
		S121+ S122. Banks	13.2	17.4	-16.7	-27.9	-.7	-43.0	.6	-16.4	-38.6	-11.9	-1.3	-24.6	15.4	-1.5	-7.4	-26.7	22.3	23.4	3.2	10.7	.3	-16.4	-2.6	-12.8	-6.9	-5.0	-27.0
		S123 + S124. Other financial intermediaries	-9.2	-9.6	-8.1	-6.2	-5.6	-2.4	-2.7	-3.9	-5.7	-6.5	-8.0	-4.8	-1.7	2.5	1.6	12.9	3.2	3.6	-8.5	3.0	-11.7	-3.7	-2.3	7.6	6.2	-10.3	1.0
		S13. General government	16.1	-26.9	31.3	.2	-63.0	26.9	90.6	-6.5	20.9	38.7	-56.3	-45.7	60.4	-71.0	47.0	46.3	-8.1	87.9	-.7	-51.3	-96.0	-70.6	61.8	-43.0	-35.0	-108.5	43.5
		S2. Rest of the world	42.5	14.4	-37.3	7.7	-73.1	-49.9	43.1	-61.6	-30.7	-17.5	-21.1	-92.9	42.6	-31.5	5.7	-44.7	28.6	57.6	-8.6	20.9	-37.7	-72.3	32.1	-58.8	-29.0	-38.2	-32.6
	Net assets	S. Total	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Stocks	Assets	S. Total	8368.3	8523.9	8605.3	8763.6	8797.7	8883.5	9131.2	9143.3	9346.4	9595.7	9640.7	9548.2	9929.6	10089.0	10289.1	10407.1	10776.6	11307.5	11416.5	11533.3	11757.1	11881.3	12189.5	12367.5	12746.8	13033.2	13130.3
		S1. Domestic economy	6938.0	7081.6	7104.3	7215.0	7375.4	7327.0	7492.9	7405.4	7581.3	7689.2	7760.9	7699.1	7936.6	8040.0	8176.4	8290.7	8524.5	8845.2	8956.9	9085.1	9267.2	9331.6	9525.5	9534.1	9753.8	9931.5	9960.6
		S11. Non-financial corporations	564.7	582.5	579.9	591.6	616.8	585.1	604.2	543.3	562.4	561.8	550.5	512.4	507.2	494.8	461.8	426.1	418.7	420.7	415.3	388.1	393.2	407.6	387.4	390.8	376.9	392.2	380.3
		S12. Financial institutions	5062.6	5168.3	5191.3	5279.5	5415.8	5356.1	5479.4	5447.2	5590.2	5713.1	5801.8	5792.9	6020.3	6103.5	6237.3	6401.5	6627.2	6920.3	7051.2	7234.5	7362.5	7399.4	7591.9	7596.6	7792.0	7991.6	7998.0
		S125. Insurance crporations and pension funds	1211.8	1221.8	1240.6	1286.4	1331.9	1331.9	1382.6	1418.6	1469.1	1506.4	1529.6	1558.5	1624.9	1630.8	1672.9	1865.3	1901.5	1970.1	2018.6	2020.9	2039.4	2056.8	2124.2	2116.3	2156.2	2183.1	2190.0
		S121+ S122. Banks	2138.9	2222.5	2216.2	2260.9	2331.8	2285.2	2338.6	2308.5	2440.6	2505.0	2546.4	2541.0	2675.2	2753.0	2779.7	2765.8	2883.4	3024.1	3042.1	3196.0	3269.2	3277.6	3332.7	3349.6	3476.6	3631.3	3586.5
		S123 + S124. Other financial intermediaries	1711.9	1724.0	1734.5	1732.2	1752.2	1739.0	1758.3	1720.2	1680.5	1701.7	1725.8	1693.4	1720.3	1719.8	1784.7	1770.4	1842.2	1926.1	1990.5	2017.6	2054.0	2064.9	2135.0	2130.7	2159.2	2177.1	2221.5
		S13. General government	150.1	148.6	152.7	149.4	154.6	156.9	159.6	158.3	161.8	164.4	167.0	164.7	161.9	168.2	176.7	184.0	186.6	200.7	209.6	205.2	209.7	213.8	218.3	226.4	231.2	240.0	257.0
		S14 + S.15 Households and non-profit institutions serving households	1160.6	1182.3	1180.4	1194.5	1188.2	1228.8	1249.8	1256.6	1266.9	1249.9	1241.6	1229.1	1247.1	1273.5	1300.7	1279.0	1292.0	1303.5	1280.7	1257.3	1301.8	1310.8	1328.0	1320.4	1353.6	1307.7	1325.4
		S2. Rest of the world	1430.4	1442.3	1501.0	1548.6	1422.3	1556.5	1638.3	1737.9	1765.2	1906.5	1879.8	1849.2	1993.0	2049.0	2112.7	2116.4	2252.1	2462.3	2459.7	2448.2	2489.9	2549.7	2664.0	2833.4	2993.0	3101.7	3169.7
	Liabilities	S. Total	8368.3	8523.9	8605.3	8763.6	8797.7	8883.5	9131.2	9143.3	9346.4	9595.7	9640.7	9548.2	9929.6	10089.0	10289.1	10407.1	10776.6	11307.5	11416.5	11533.3	11757.1	11881.3	12189.5	12367.5	12746.8	13033.2	13130.3
		S1. Domestic economy	6782.0	6886.0	7003.8	7089.2	7166.7	7271.6	7441.4	7485.2	7667.2	7873.6	7897.5	7869.8	8140.3	8285.7	8419.2	8520.6	8785.4	9169.1	9208.7	9255.6	9411.2	9537.4	9708.4	9828.0	10105.0	10283.3	10384.8
		S11. Non-financial corporations	481.5	503.2	531.8	556.2	562.5	549.1	567.8	566.7	585.9	614.8	611.3	628.2	626.4	645.6	650.8	667.8	681.6	697.1	690.1	671.3	675.6	693.9	696.9	698.8	710.4	742.9	733.0
		S12. Financial institutions	2417.0	2469.1	2493.0	2557.0	2598.0	2619.7	2635.6	2693.4	2705.5	2757.1	2793.8	2838.5	2913.5	3007.6	3051.6	3132.9	3263.9	3433.9	3483.7	3622.0	3791.0	3913.5	4011.0	4212.7	4424.9	4573.1	4643.4
		S125. Insurance crporations and pension funds	17.9	18.6	18.5	18.6	18.6	17.9	18.0	18.1	18.8	19.8	21.1	23.4	23.8	23.6	21.7	21.9	22.5	22.6	23.4	22.0	21.6	21.3	23.7	26.2	26.0	25.4	25.6
		S121+ S122. Banks	1843.1	1880.6	1889.5	1908.4	1942.1	1935.5	1954.0	1964.7	1958.5	1979.4	2000.4	2021.7	2105.4	2164.3	2200.0	2219.7	2326.7	2425.2	2472.7	2517.4	2616.9	2669.7	2733.6	2827.1	2950.6	3046.7	3096.1
		S123 + S124. Other financial intermediaries	556.1	570.0	585.0	630.0	637.4	666.3	663.6	710.6	728.2	757.9	772.3	793.4	784.2	819.6	829.9	891.4	914.8	986.0	987.7	1082.6	1152.5	1222.5	1253.7	1359.3	1448.3	1501.0	1521.6
		S13. General government	3883.5	3913.6	3979.0	3976.0	4006.1	4102.8	4238.0	4225.1	4375.9	4501.6	4492.4	4403.1	4600.5	4632.5	4716.7	4719.8	4839.9	5038.1	5034.9	4962.3	4944.6	4930.0	5000.5	4916.6	4969.7	4967.3	5008.4
		S2. Rest of the world	1586.3	1638.0	1601.5	1674.3	1631.0	1611.9	1689.9	1658.1	1679.2	1722.1	1743.2	1678.4	1789.2	1803.3	1869.9	1886.5	1991.2	2138.4	2207.8	2277.7	2345.9	2343.9	2481.1	2539.5	2641.8	2749.8	2745.5
	Net assets	S. Total	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

Annex 3:
References

System of National Accounts 1993
http://unstats.un.org/unsd/sna1993/toctop.asp

European System of Accounts 1995
http://circa.europa.eu/irc/dsis/nfaccount/info/data/esa95/esa95-new.htm

ECB euro area accounts
http://www.ecb.int/stats/acc/html/index.en.html

ECB euro area accounts, press release
http://www.ecb.int/press/pr/stats/ffi/html/index.en.html

Euro area accounts in the ECB's Statistical Data Warehouse
http://sdw.ecb.europa.eu/browse.do?node=2019181

Data on bilateral external positions, an insight into globalisation[1]

Lucie Laliberté[2] and John Motala[3]

During the past decade, cross-border financial transactions tripled to more than $7 trillion, reaching some 15% of world GDP in 2005. This led to a rapid accumulation of cross-border savings, which were channelled into a range of investments – portfolio equity and debt securities, direct investment, and other types of investment, including deposits with banks abroad. The growing cross-border financial linkages are reflected in a sharp increase in economies' external assets and liabilities.

This paper describes how the analytical framework of the balance sheet approach (BSA) can help analyse these "inter-economy" financial linkages. The first section describes how the BSA framework, which generally focuses on domestic sectors of an economy, can be extended to encompass foreign economies; the second section reviews selected statistical initiatives relating to external sector statistics that can help populate this expanded balance sheet framework; the third section presents the results of the Coordinated Portfolio Investment Survey for 2006 to highlight the relevance of expanding the BSA to non-residents; and finally, some broad conclusions are presented.

I. Analytical framework to track the financial developments in a globalised world

The BSA framework[4] – drawn from the 1993 SNA – provides an analytical framework for assessing the risks inherent to integrated financial markets, namely by credit, currency, maturity and instrument. By grouping economic agents by broad sectors (eg government, financial and non-financial corporations, and the non-resident/rest of the world sector), the framework usually presents metrics on claims and liabilities of individual domestic sectors with one another and with non-residents as a single group. With deepening financial globalisation, this paper suggests adapting the BSA to identify the impact of non-residents by identifying the largest partner countries by broad types of investment (direct investment, portfolio investment, reserve assets and other investment) (Figure 1). This would help focus on country risks as encapsulated in the credit, currency and instrument risks. The resident sectors could be grouped between the government and all other residents (by instruments) for preliminary analysis, with the focus subsequently shifting to the domestic sectors most affected by external vulnerability. For instance, in less developed countries, a significant portion of government debt could be foreign-held, with the other sectors holding assets abroad. In more developed countries, the other domestic sectors are likely to be both

---

1 This is a revised version of the authors' paper presented at the International Statistical Institute Conference, Lisbon, Portugal, 22–29 August 2007. The views expressed in this paper are those of the authors and should not be attributed to the IMF, its Executive Board, or its management.

2 Deputy Director, Statistics Department, IMF, llaliberte@imf.org.

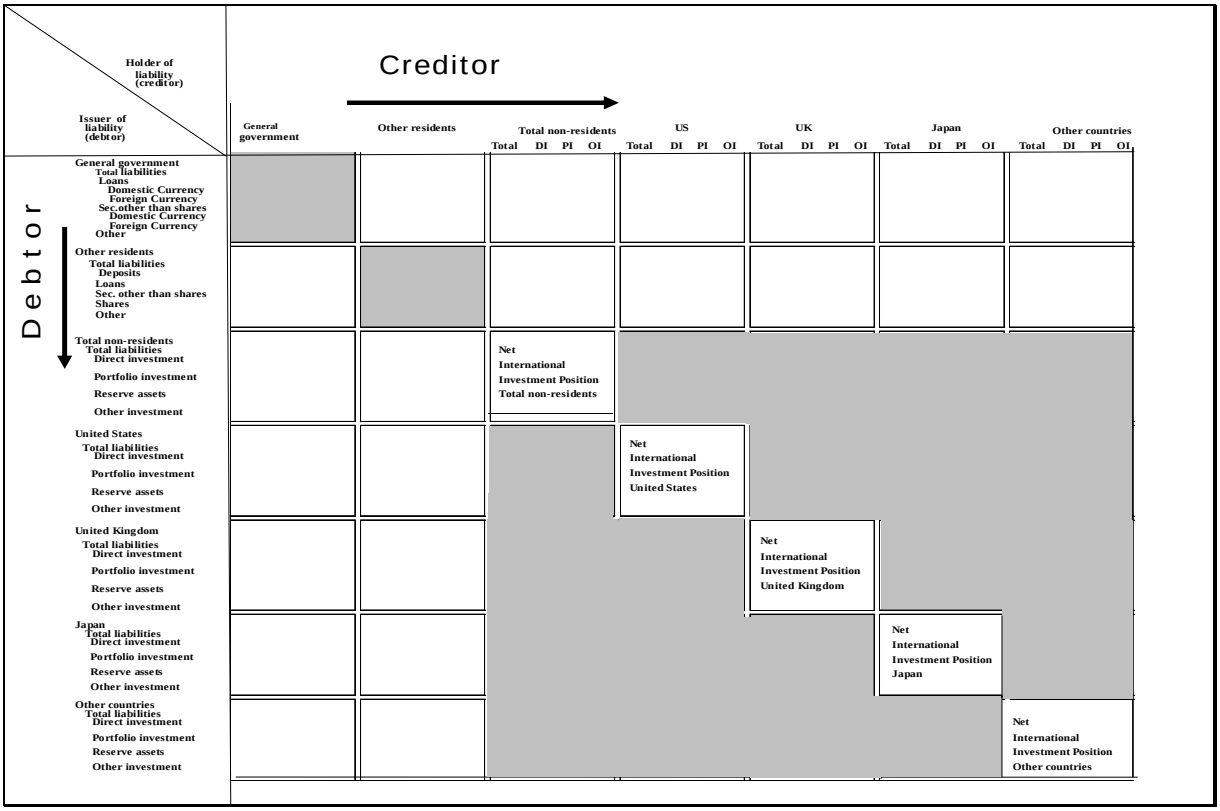
3 Senior Economist, Statistics Department, IMF,.jmotala@imf.org.

4 Johan Mathisen and Anthony Pellechio, "Using the Balance Sheet Approach in Surveillance: Framework, Data Sources, and Data Availability", *IMF Working Paper*, 06/100.

substantial holders of assets (creditors) as well as and debtors to foreign residents. This is evidenced by some analytical studies on home bias that have suggested a recent decline in investors' tendency to hold securities issued in their home markets in a larger proportion than theory would indicate.[5] Changes in the financial structure show a growing importance of pension funds, insurance and mutual funds, that displaces some of the more traditional banking loans and deposits, and increased investment abroad for portfolio enhancement purposes. These changes in the financial structure affect the transmission channel of monetary policy.[6] They also reflect forces at play that are often beyond domestic control, such as the spreading of shocks through the networks of interconnected balance sheets across economies, which the expanded BSA can help identify.

Figure 1

An economy's inter-sectoral asset and liability positions with other countries



Source: IMF.

II. Developing comparable data on the non-resident sector for the balance sheet framework

A number of international statistical initiatives are in train that can help operationalise the proposed expansion of the BSA. These initiatives can be divided into two broad categories –

[5] Philip R Lane and Gian Maria Milesi-Ferreti, "A global perspective on external positions", *IMF Working Paper*, 05/16.

[6] Jorge Roldos, "Disintermediation and monetary transmission in Canada", *IMF Working Paper*, 06/84.

improving data availability, including partner country detail; and harmonising methodologies to ensure consistency of these datasets.

A. Improving data availability on external positions

Over the past decade, several important projects were launched to provide more data on countries' external positions.

First, the IMF has been encouraging countries to ***report international investment position (IIP)*** data for publication in the *Balance of payments statistics yearbook*. The number of countries reporting IIP statistics has increased from 37 in 1998 to 113 at end-2007, albeit with varying degrees of component detail. Reporting on external positions was further promoted by the IMF Executive Board decision to include the IIP data as a prescribed category of the IMF's Special Data Dissemination Standard (SDDS) as of 31 December 2001.

Second, since 2000, countries subscribing to the SDDS have also been reporting additional information on ***reserve assets*** in the Data Template on International Reserves/Foreign Currency Liquidity. More than 60 economies currently report these data to the IMF.

Third, in collaboration with the World Bank, the IMF has also encouraged SDDS subscribers as well as participants in the General Data Dissemination System (GDDS) to report quarterly data on ***external debt*** positions for inclusion in the Quarterly External Debt Statistics (QEDS); more than 70 economies currently participate in the QEDS database.

Fourth, since 2001, the IMF has conducted the ***Coordinated Portfolio Investment Survey (CPIS)*** each year to improve statistics of holdings of foreign portfolio investment securities – equities and debt securities. A distinguishing feature of the CPIS is the provision of data by partner economies. The data disseminated by the IMF also incorporate the survey results of large reserve-holding economies that provided, on a confidential basis, the geographical breakdown of securities held as reserve assets (a similar survey is also undertaken for securities held by selected international organisations).

Fifth, a ***Coordinated Direct Investment Survey (CDIS)***, modelled on the CPIS, is being conducted for the reference year 2009. The CDIS will gather partner country data on both inward and outward foreign direct investment. The CDIS will be conducted in collaboration with several of the IMF's inter-agency partners – the European Central Bank (ECB), Eurostat, the Organisation for Economic Cooperation and Development (OECD), and the United Nations Conference on Trade and Development (UNCTAD). Over 100 countries have indicated their interest in participating in the CDIS.

Sixth, the Bank for International Settlements (BIS) has a long-established collection of ***international banking statistics*** that provide extensive counterpart or partner country information on borrowing from non-resident banks (foreign liabilities of partners) and deposits with non-resident banks (foreign assets of partners). The BIS locational banking statistics provide information on the aggregated positions of the 40 BIS-reporting countries vis-à-vis individual countries, for cross-border loans (partner country liabilities) and cross-border deposits (partner country assets); some of the individual reporting economies publish their bilateral data.

Seventh, the BIS also maintains a ***database on international securities*** issued in foreign markets on a security-by-security basis (the database also includes selected bonds issued domestically).

Eighth, the ECB is developing a ***Centralised Securities Database (CSDB)*** that captures security issues by euro-area residents and holdings by euro-area residents of securities issued outside the euro-area. International cooperation in the CSDB could include the cross-checking of securities information by the countries that issued the securities (but using appropriate mechanisms to deal with any legal constraints on the sharing of information).

These data measure external sector positions from various angles. The first three initiatives draw on aggregate information compiled by individual countries; the next three contain the added aggregate dimension of partner country detail; and the last two provide details of individual securities by issuer and country of issue. Through their identification of partner country data, three of the initiatives (banking, CPIS, CDIS and international banking) provide "mirror" data that can be used to validate national data. For example, Canada's national data on portfolio assets in the United States can be compared to United States national data on portfolio liabilities towards Canada (leaving aside any errors in measurement). Using a common methodology (see next section) in producing the data greatly facilitates such data validation.

The BIS, IMF, OECD, and the World Bank brought together some of these data by launching in 2006 the Joint External Debt Hub (JEDH). The JEDH contains comprehensive external debt statistics of all SDDS-subscribing countries and selected GDDS countries; and data on external claims and liabilities from selected creditor and market sources (mainly the CPIS and the BIS international banking and international securities statistics).

B. Developing common statistical methodologies

Bringing together various datasets from sources into a common framework, as in the BSA and the JEDH, underlines the importance of data consistency, that is, data compiled according to common concepts, definitions, and classifications so that the data can be compared across countries.

The IMF's *The System of Macroeconomic Accounts Statistics, An Overview,* highlights how the *System of National Accounts 1993 (1993 SNA)* has served as the overarching framework for the balance of payments, the international investment position (IIP), external debt, monetary and financial and government finance methodological standards, as well as a range of other economic statistics.

The IIP provides the sectoral (and maturity) breakdown of economies' claims on and liabilities to the non-resident sector. Unlike the update of the *1993 SNA* framework, that is currently underway, the draft sixth edition of the *Balance of Payments and International Investment Position Manual (BPM6)* will provide, as supplementary information, a currency composition for debt claims and liabilities, and, for debt liabilities, a remaining term to maturity breakdown. The latter dimensions enhance significantly the analytical potential of the BSA.

For both the CPIS and the CDIS, the IMF, in collaboration with other organisations and national expert groups, has prepared survey guides to assist countries to compile portfolio and direct investment statistics using harmonised concepts, definitions and classifications. Similarly, the BIS has developed a guide for its international banking statistics; a detailed currency breakdown forms part of the BIS reporting template for the locational banking statistics, but currency details are not disseminated in the context of the bilateral data. The BIS is planning to produce a guide on debt securities statistics to assist national compilers in producing data consistent with international statistical standards such as the *1993 SNA* (institutional sector and financial asset classifications; financial balance sheets, transactions, and other changes; market and nominal values).

The IMF's *Monetary and Financial Statistics Manual 2000*[7] provides, among other things, for a domestic/foreign currency breakdown of instruments. In fact, reflecting the key financial role of depository corporations in the domestic economy, the BSA is usually centered on the

[7] See IMF, *International financial statistics, supplement on monetary and financial statistics*.

financial corporate sector of the economy that provides extensive and valuable details called for by the manual.

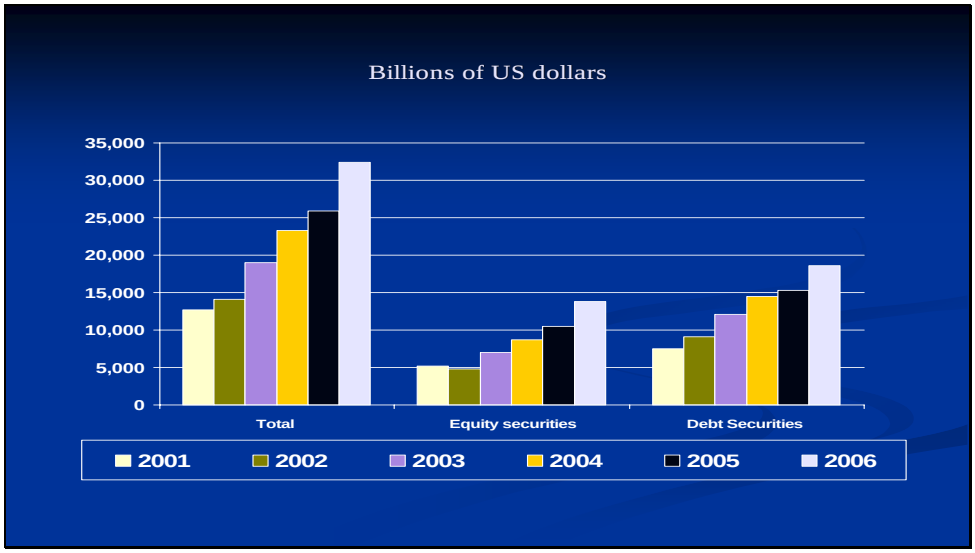
III. Results of the 2006 coordinated portfolio investment survey

Using results of the CPIS, this section highlights the magnitude of the amounts involved in cross-border portfolio investment as well as the relative importance of selected countries in international financial markets.

Seventy-four jurisdictions participated in the 2006 CPIS. The overall survey results show cross-border holdings of securities reaching $32.4 trillion at end-2006 (Chart 1),[8] an increase of 26% in dollar terms from the end-2005 level. Holdings of equity securities increased by over 30% to $13.8 billion, while holdings of debt instruments increased by 18% to $18.6 trillion. In addition to a higher coverage (four new participants in the 2006 survey), the increase reflected increased cross-border activity, as financial markets continued to become more integrated, and the impact of dollar depreciation. Over a longer term, the CPIS reveals that since 2001 total portfolio investment asset holdings increased at an average annual rate of 21%.

Chart 1

CPIS: portfolio investment assets



The results also show a concentration of portfolio investment assets in a few economies, with the top 10 economies accounting for about 70% of the total holdings (see Chart 2) with the ranking remaining largely unchanged over the period under review.

Table 1 shows the bilateral claims of the reporting economies vis-à-vis 10 partner countries.[9]

---

[8] Data compiled by Thomas Elkjaer, economist in the IMF Statistics Department.

[9] The CPIS also collects supplementary information on holdings by sector. However, at this time relatively few countries report such information.

Chart 2

Top 10 holders of CPIS assets

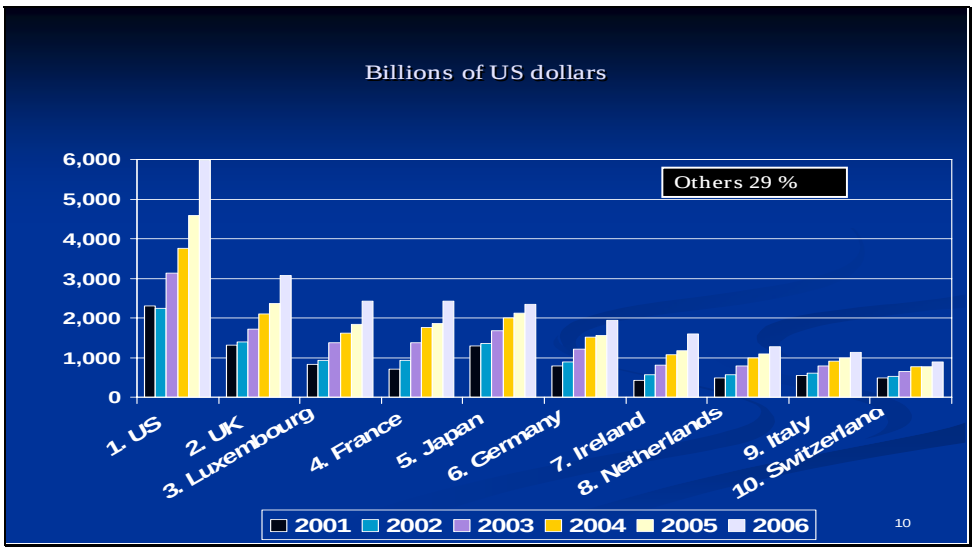


Table 1

Geographic breakdown of total portfolio investment: top 10 economies by holders and issuers

US Dollars Billions

	Investment from: / Invest-ment in:	1 US	2 UK	3 LU	4 FR	5 JP	6 DE	7 IE	8 NL	9 IT	10 CH	Total value of invest-ment
1	United States	..	817	417	254	798	179	397	306	104	119	**6,254**
2	United Kingdom	1,076	..	196	247	145	148	308	110	46	51	**3,178**
3	Germany	288	144	304	239	174	..	115	192	141	101	**2,541**
4	France	397	195	220	..	142	171	92	107	123	65	**2,096**
5	Luxembourg	60	87	..	124	89	300	39	61	325	131	**1,652**
6	Netherlands	234	162	117	223	77	154	57	..	78	55	**1,509**
7	Italy	106	121	163	305	67	166	124	97	..	10	**1,441**
8	Japan	586	231	104	86	..	28	57	37	14	19	**1,435**
9	Cayman Islands	376	126	69	79	324	32	57	17	26	..	**1,368**
10	Spain	111	101	98	223	33	216	76	63	33	8	**1,119**
Other		2,739	1,085	743	651	494	544	272	274	251	322	**9,801**
Investment		**5,972**	**3,068**	**2,431**	**2,429**	**2,343**	**1,938**	**1,594**	**1,263**	**1,141**	**881**	**32,394**

IV. Conclusions

As a way to address the sharp growth in cross-country financial flows, this paper first calls for the BSA to be expanded to main bilateral partner economies. It covers several initiatives that have been conducted at the international level from compiling data to the harmonisation of concepts, definitions and classifications.

The growing breadth and scope of cross-border investment creates an international financial market, bringing complex challenges to policymakers that need to be addressed at the international level. A multilateral perspective can usefully supplement the more traditional national perspective in gauging the risks for policy purposes.

Session 7

Security-by-security databases as a tool to improve securities statistics

Chair: Coen Voormeulen, Netherlands Bank

Papers:

Mining individual securities databases for analytical purposes: the example of the BIS international debt securities statistics
Denis Pêtre, Bank for International Settlements

The use of security-by-security databases for portfolio investment statistics
João Cadete de Matos, Paula Casimiro and Maria do Carmo Aguiar, Bank of Portugal

Opaqueness to transparency: the Bank of Canada's financial data strategy
Greg Haymes, Bank of Canada

Practical examples of policy relevant uses of security-by-security data
Günther Sedlacek, Austrian National Bank

Mining individual securities databases for analytical purposes: the example of the BIS international debt securities statistics[1]

Denis Pêtre[2]

1. Introduction

The BIS acted as a pioneer in setting up security-by-security databases.

Its international debt securities database was set up in the late 1980s. The data, collected from various market and institutional sources, contain detailed information on individual securities placed in international markets. In addition to the amount of funds raised and the dates of announcement, completion and maturity of deals, information is also available on the name of the issuer, the sector of the immediate borrower (issuer), the sector of the ultimate borrower (parent company of the borrower or guarantor), country of residence and nationality of the issuer, the type of instrument, the interest rate structure and market of issue and, for international bonds, the terms (coupon, issue price, interest base etc), conditions (call and put options, conversion clauses etc) and rating of individual issues. At end-December 2007, information on around 1,000,000 international bonds, notes and money market instruments was available in the BIS international debt securities database.

As regards securities placed in domestic markets, the BIS collects from various national sources time-series data covering 49 OECD and major emerging market countries. In contrast to its security-by-security database covering debt securities placed in international markets, its domestic database covers only aggregated information on amounts outstanding, broken down by sector of the issuer and type of instrument.

International debt securities are defined as all foreign currency issues by residents and non-residents, as well as domestic currency issues launched by non-residents. Additionally, domestic securities specifically targeted to international investors are also considered as international issues in the BIS database. In some cases, it might be difficult to identify the targeted investors. The composition of the group of intermediaries and underwriters arranging the deal is often taken as a first approximation in determining the domestic or international nature of the investment base. Domestic debt securities are defined as those issued by residents in domestic currency (with a few exceptions) and targeted at resident investors.

A new delineation line that is increasingly being used by analysts is to distinguish local issues (ie securities issued under local law, cleared and settled locally) from foreign issues.

This paper considers the practical issues that would allow the BIS to identify local and foreign issues separately in its international debt securities database. The methodology was applied to the fourth quarter 2007 data published in the March 2008 issue of the BIS *Quarterly Review*.

---

[1] The views expressed are those of the author and not necessarily those of the BIS, the IFC or its member institutions.

[2] Statistical Analyst, International Financial Statistics, Bank for International Settlements, denis.petre@bis.org.

2. Tentative definition of an algorithm

In order to identify local and foreign issues separately in the BIS international debt securities database, we established an algorithm that makes use of four elements available in the BIS database or in the data reported by commercial data providers: the ISIN code, the governing law, the listing place, and the separate identification available for foreign issues.

- The ISIN code

ISIN codes are allocated by national numbering agencies. The two first letters of an ISIN code identify the ISO country code of the agency that allocates it. Each national numbering agency is competent for the debt securities issued in its own jurisdiction and typically held by the local central securities depository (CSD). The ISIN codes for issues held or deposited with Euroclear and Clearstream are allocated directly by Euroclear and Clearstream and start with the letters “XS” (cf ISO 6166 standard).

The assumption made by the algorithm is that the two first letters of the ISIN code indicate the local market where the security is issued. Securities starting with the letters XS are of foreign nature.

The ISIN code is available in the BIS database. In the examples in table 1 below, the two first letters of the code are given in the column “Cty_ISIN”.

- The governing law

The governing law is defined as the national, state or provincial law under which the terms of a new issue are agreed. The governing law is provided in Dealogic Bondware.

The data were downloaded from Bondware and matched as far as possible with the content of the BIS database. Issues governed by multiple governing laws are marked “XS” indicating that they are of foreign nature. In the examples in table 1 below, the ISO country code of the governing law is given in the column “Cty_gov_law”.

- The listing place

The listing place is defined as the stock exchange on which the security is traded. The information is provided in Dealogic Bondware. The data on the listing place were downloaded from Bondware, matched as far as possible with the content of the BIS database. In the example in table 1 below, the ISO country code of the listing place is given in the column “Cty_listing”.

- The separate identification available for foreign issues

Foreign issues are defined as issues by non-resident borrowers placed on the local market of a given country, in the domestic currency of that country. Foreign issues are identified with specific names by market participants, for example “Yankee Bonds” for the United States, “Samurai Bonds” for Japan, “Bulldog Bonds” for the UK, “Kiwi Bonds” for New Zealand, and “Matador Bonds” for Spain.

Information on foreign issuance is available in the BIS database. These were the data used, and the local market on which the issue was placed are given in the column “Cty_foreign”.

For each of the 996,483 international debt securities issues available in the BIS database at the end of December 2007, we allocated, as far as we could, the four elements described above. We then calculated a “compound” issue place. All debt securities with elements that indicate only a local nature were considered in the algorithm as local issues. In the example below, the result of the algorithm is given in the column “Cty_compound”.

Examples

Table 1

Bond number	Cty_ISIN	Cty_gov_law	Cty_listing	Cty_foreign	Cty_compound
132614	...	GB	IE	...	XS
133139	...	IT	...	...	IT
133163	XS	...	...	...	XS
133369	AU	AU	AU	AU	AU
133441	CH	US	CH	CH	XS
133654	...	...	...	...	XS

Source: Author's calculations.

- For bond 132614, two of the four elements were found in the data. The bond was issued under English governing law and is listed in Ireland. The available elements indicate that the issue is of foreign nature.
- For bond 133139, only one element was found in the data. The bond was issued under Italian governing law. The available element indicates that the issue is of Italian local nature.
- For bond 133163, only one element was found in the data. The ISIN code was allocated by Euroclear or Clearstream. The available element indicates that the issue is of foreign nature.
- For bond 133369, all the four elements were found in the data and indicate that the issue is of Australian local nature.
- For bond 133441, all elements were found in the data. The ISIN code was allocated by Telekurs Financial Ltd, the numbering agency for Switzerland. The bond was issued under US governing law and is listed in Switzerland. The data indicate that it is an issue in CHF by non-residents and placed in the Swiss domestic market. The available elements indicate that the issue is of foreign nature.
- Finally, for bond 133654, no element was found in the data. By default, the issue is considered as being of foreign nature.

3. Global results should be interpreted with some caution

Global results presented in table 2 were computed by aggregating the security-by-security data available in the BIS international debt securities database, by place of issue (ie the compound issue place described before), currency (local currency / foreign currency) and issuer sector.

The results indicate that around 30% of all international debt securities outstanding at end December 2007 were issued in local markets and found their way into the international database because they were sold through international underwriting syndicates to international investors. It is worth mentioning that the results are similar to those obtained at the end of 2005.

Table 2

International debt securities – outstanding at end 2007

USD billion

Market	Currency	Corporate issuers	Financial institutions	Govern-ments	Interna-tional Institutions	Total
Local	Local	657.0	4,119.6	700.2	0.0	5,476.7
		29%	*23%*	*38%*	*0%*	*24%*
Local	Foreign	249.7	901.4	157.0	56.5	1,364.5
		11%	*5%*	*8%*	*9%*	*6%*
Foreign	Local	774.8	6,403.0	418.4	0.0	7,596.2
		34%	*36%*	*22%*	*0%*	*33%*
Foreign	Foreign	575.1	6,570.1	585.1	604.8	8,335.1
		25%	*37%*	*31%*	*91%*	*37%*
Total		2,256.6	17,994.0	1,860.7	661.3	22,772.6

Source: Author's calculations.

We need, however, to introduce a note of caution when interpreting the results of the algorithm, due to the scarcity of the information underlying the computation of the "compound" field, and the assumptions that were made.

While we allocated, as far as we were able, the ISIN country information, the governing law, the listing place and the foreign country information to each international debt securities issue available in the BIS database, the resulting matrix (see example table 1) is far from perfectly completed. Table 3, below, shows the actual contribution of the four elements to the amount outstanding, for issues outstanding at end December 2007.

Additional time could be invested in trying to improve the coverage of the four elements used in the algorithm in order to reduce the identified information scarcity. The CSDB available at the ECB, as well as data available from Thomson Financial, could be used for this purpose.

Table 3

International debt securities – outstanding at end 2007

USD billion

Number of identified elements	ISIN	Gov_law	Listing	Foreign	Bond		Notes_&_Money_Market_Instruments		Total		Total – cumulative percentage
4	X	X	X	X	299.2	*2%*	121.9	*1%*	421.2	*2%*	*2%*
3	X	X	X	...	5,692.1	*44%*	5,492.8	*46%*	11,184.9	*45%*	*46%*
3	X	X	...	X	393.9	*3%*	45.9	*0%*	439.8	*2%*	*48%*
3	X	...	X	X	0.2	*0%*	0.0	*0%*	0.2	*0%*	*48%*
3	...	X	X	X	9.8	*0%*	0.0	*0%*	9.8	*0%*	*48%*
2	X	X	...	...	3,382.4	*26%*	911.8	*8%*	4,294.2	*17%*	*65%*
2	X	...	X	...	15.9	*0%*	59.3	*0%*	75.2	*0%*	*66%*
2	X	...	...	X	81.4	*1%*	12.9	*0%*	94.3	*0%*	*66%*
2	...	X	X	...	145.0	*1%*	0.0	*0%*	145.0	*1%*	*67%*
2	...	X	...	X	28.6	*0%*	0.0	*0%*	28.6	*0%*	*67%*
2	...	...	X	X	0.6	*0%*	0.0	*0%*	0.6	*0%*	*67%*
1	X	...	...	...	1,225.8	*9%*	5,373.1	*45%*	6,598.9	*26%*	*93%*
1	...	X	...	...	118.7	*1%*	0.0	*0%*	118.7	*0%*	*94%*
1	...	...	X	...	9.5	*0%*	0.0	*0%*	9.5	*0%*	*94%*
1	...	...	...	X	96.0	*1%*	1.1	*0%*	97.1	*0%*	*94%*
0	...	...	...	...	1,480.4	*11%*	6.7	*0%*	1,487.1	*6%*	*100%*
Total					12,979.4	*100%*	12,025.6	*100%*	25,005.0	*100%*	

Source: Author's calculations.

The use of security-by-security databases for portfolio investment statistics

João Cadete de Matos[1], Paula Casimiro[2] and Maria do Carmo Aguiar[3]

1. Introduction

Statistical data on securities, periodically released by the Bank of Portugal, are compiled on the basis of the Securities Statistics Integrated System (SIET – *Sistema Integrado de Estatísticas de Títulos*). This system was developed by the Statistics Department of the Bank of Portugal, with the purpose of gathering in a single repository all the information deemed necessary to comply with reporting requirements on securities. SIET makes it possible to meet user needs, at both the national and international level. Quite ambitious in its aims, the system has been a challenge for data quality managers and a source of opportunities for data "explorers".

One of the statistical outputs that benefited from the development of this system was the portfolio investment data collection system for balance of payments (BOP) and international investment position (IIP). Until 1999, the Portuguese portfolio investment (PI) statistics relied on an asymmetric system for assets and liabilities. Although in the latter case, the data collection system implemented since 1991 was already based on a security-by-security data model, on the assets side the inexistence of a unique and standardised identifier prevented the application of this method, and so data was collected from respondents aggregated by type of security, country of the issuer and currency of denomination. Another distinctive feature of both systems was the periodicity of the data collected. While monthly flows were available for both PI assets and liabilities, in the case of end-of-period positions the data collection ranged from monthly data for the liabilities side, to annual data for the assets side.

As already mentioned, the existing data collection system was implemented in the early 1990s, and by the end of the decade it was necessary to make some changes and adjustments, mostly due to the need to improve the periodicity – of the end-of-period statistics – and coverage – in terms of the variables collected – of the PI assets.

With developments in financial markets worldwide, securities statistics have increasingly gained importance. Therefore, subjects related to coverage, quality and harmonisation of securities statistics produced in the various countries are a growing concern at the international level and, in particular, within the scope of the European System of Central Banks (ESCB). In this context, integrated statistical systems enable a more efficient and harmonised production of statistical data. SIET, being an integrated system that includes data on issues and portfolios and covers all the economy's institutional sectors, makes it possible to cope efficiently with most information requirements in the field of securities statistics.

This paper overviews SIET architecture: inputs, processing and enrichment modules, and outputs. It describes the Portuguese experience in compiling PI statistics, specifically the benefits of using a security-by-security database. A glance into the near future foresees the

[1] Director, Statistics Department, Bank of Portugal, joao.cadete.matos@bportugal.pt.

[2] Head, Balance of Payments Statistics, Bank of Portugal, paula.casimiro@bportugal.pt.

[3] Head, Securities Statistics, Bank of Portugal, maria.carmo.aguiar@bportugal.pt.

integration of information from the Centralised Securities Database (CSDB), an ongoing project of the European Central Bank (ECB).

2. SIET features and main components

SIET is an information system that stores data on securities issues and portfolios on a security-by-security and investor-by-investor basis, except for investors in the households institutional sector, whose data are aggregated by the investor's country. This means that data considered relevant for statistical analysis are collected, validated and stored for each security, each issuer and each investor. The existence of a reference database with individual information on securities and issuers allows the collection of statistical information from reporting entities on a security-by-security basis. This approach implies lower reporting costs, given that there is no need for reporters to aggregate background information according to multiple criteria. Furthermore, it enables better information monitoring and a greater flexibility when exploring data and building statistical analysis.

SIET comprises two information segments: one on securities issues and the other on securities holders. In the segment on securities issues, information is collected on securities issued by resident entities in Portugal, issues taking place in either the Portuguese market or external markets. Data on issues are collected from several sources, such as the Institute of Registries and Notaries, the Ministry of Justice, the Securities Market Commission, and the Portuguese Treasury and Government Debt Management Agency, among others. In accordance with the provisions of Article 13 of its Organic Law, Banco de Portugal shall ensure the production of securities statistics covering issues by Portuguese residents and it may require of any public or private body the direct supply of information deemed necessary for the compilation of these statistics.

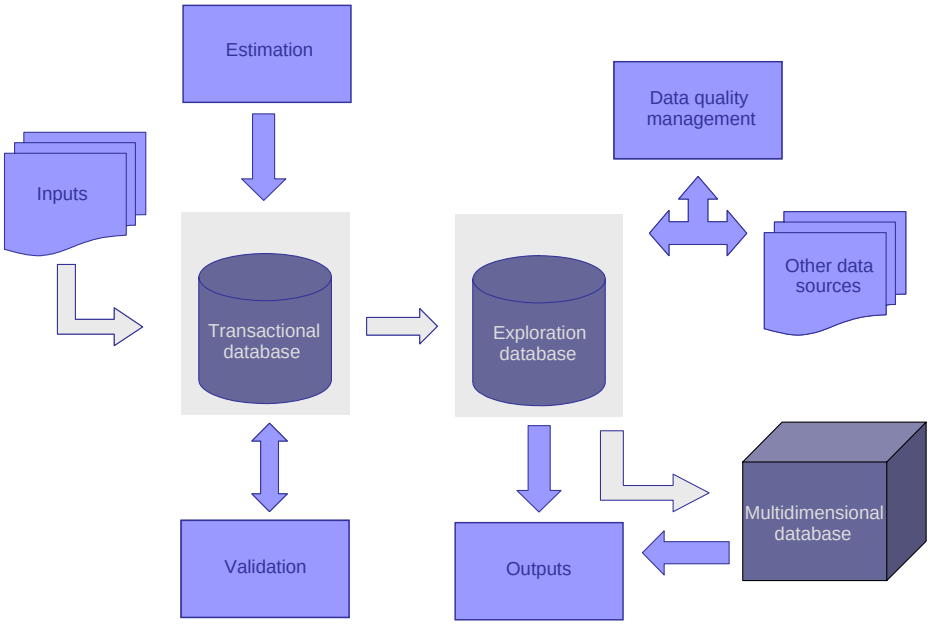
At the securities portfolios level, detailed information is collected on investments by residents in domestic and foreign securities, as well as on the portfolios of non-resident investors in domestic securities. Data are reported according to a Bank of Portugal Instruction on "Securities Statistics – Transactions and Positions". Additionally, information on the features of foreign securities held by resident investors is obtained from commercial databases.

SIET replaced a relatively large set of procedures for the collection of data on securities, while extending the coverage of reporting to all investing sectors and enabling a better quality control. As regards data on issues, the procedures for researching and collecting information underwent some evolution, and reporting on securities' holders was totally changed. In fact, the report on securities portfolios had previously covered only information on external transactions and on operations conducted by monetary financial institutions (MFIs). Today all sectors are covered.

Figure 1 illustrates SIET architecture. The system relies on two relational databases and one analytical database. Collected data are stored and validated (first level of quality control) in the "transactional database". Data estimation of missing information is also done in this database. Validated and "enriched" data are copied daily to the "exploration database". A second level of quality control is performed on aggregate data, by carrying out consistency tests and comparisons with other information sources. Statistical outputs are produced from the "exploration database" as well as from the "multidimensional database". This analytical database was developed recently and is a quite powerful tool since it enables user-friendly multidimensional analysis of the information.

Figure 1

SIET architecture



SIET stores information on the type of instrument, the institutional sector and the residency of the issuer/investor, prices (quotations), transactions and positions associated with securities issues (issues, redemptions and outstanding amounts) and transactions and positions associated with securities portfolios (purchases, sales, stocks). Classification of securities and entities follows the European System of National and Regional Accounts (ESA/95). Securities are preferably identified through the ISIN code (International Securities Identification Number), and resident issuers/investors through the NPC (Portuguese acronym for the fiscal number of collective entities). Standard unique identification codes are fundamental for sharing and integrating information from different sources. The ISIN code accomplishes this purpose for securities. Unfortunately, for entities (such as issuers or investors) there is no such code at an international level.

SIET was intended to be a system that would make it possible to address all the Bank of Portugal's needs at the level of statistical information on securities. The development and implementation of the system was quite challenging and ambitious, but the outcome was very positive.

While preparing the project, reporters were contacted and the new reporting scheme was discussed. One may think that asking the reporters to send individual information on transactions and positions would be burdensome. However, most reporters were also developing their own information systems, and sending individual information was easier and less expensive than aggregating it according to several different statistical criteria. Compilers at the Statistics Department needed to handle much more data. Gradually, methods were developed for rapidly identifying possible errors or discrepancies. As in all new systems, there was a learning curve.

SIET is an open system in the sense that new components may be developed and integrated. The component related to the estimation of missing information is currently being enhanced and, in the near future, information on foreign securities will be obtained from the CSDB (see section 6. The near future), benefiting from the increased quality of this information.

3. The Portuguese experience in compiling PI statistics

There are different possibilities available when designing a data collection system for portfolio investment statistics, in the context of BOP and IIP The possible systems may differ according to the targeted reporting agents, periodicity and level of aggregation, and the corresponding results vary in terms of implementation and running costs, data availability and quality, and response burden.

3.1. Selection of a data collection model for PI statistics

A data collection model for PI statistics can be defined as a combination of several features: the level of detail of the information collected (aggregated or on a security-by security basis); the type of information collected (both stocks and flows or collecting one and deriving the other); the collection method used (census or a sample survey); and the reporting channel (indirect reporting – settlement or custodian based – or end investor direct reporting).

Aggregate reporting has the advantage for the compiler of reduced costs of implementation and maintenance, resulting in a relatively small amount of data to keep. However, it also holds the risk of potential miscalculation or the use of non-generalised aggregation procedures by the different reporting entities, and it carries greater difficulties in cross-checking the data and in reconciling flows and stocks. Another non-negligible aspect is the greater risk of misclassification or double-counting between portfolio investment and direct investment, since this distinction will have to be implemented by each individual respondent and it may provide limited information about the weight of a given investor in a company's equity capital. For respondents, aggregate reporting usually also means a greater reporting burden in terms of details and breakdowns to be reported, the need to keep and maintain (in every respondent's system) a security-by-security database from which to derive such breakdowns, and the need to make adjustments in the reporting systems every time new or additional output requirements emerge.

On the other hand, security-by-security reporting ensures accuracy and consistency of the data, although it implies a shift of costs and work from the respondent to the compiler in terms of aggregation procedure and maintenance of an individual securities database. The implementation of new requirements becomes more flexible and, in some cases, may not even imply the need to introduce changes in the respondents' reporting systems. This type of system can be used to derive flows from high-frequency stock data, reducing the reporting burden for reporting agents and allowing for quality checks at a very detailed level. The reporting burden will also be reduced since the amount of detail (in terms of breakdowns) to be reported by respondents decreases. Finally, security-by-security reporting is useful for the calculation of interest on an accruals basis, and it may support synergies with other statistics, such as money and banking statistics and national financial accounts. The main disadvantages of security-by-security data collection models are the considerable costs of setting up and maintaining them, and their dependence on the availability of unique securities identifiers.

According to the targeted respondents, three major reporting channels can be distinguished. The first option is indirect settlement-based reporting by domestic banks for their own transactions and transactions on behalf of their clients. This alternative has the advantages of keeping the size of the reporting population relatively small while providing high-frequency, timely data. It is easily adaptable to security-by-security reporting and carries minor problems concerning double-counting between portfolio and direct investment. The main problems come from the widespread use of netting and clearing techniques, which prevent the collection of gross investment and disinvestment, and the need for complementary reporting (eg for settlements through accounts with foreign banks). In addition, pure stock statistics have to be collected separately, through one of the other possible channels.

A second option is direct reporting by resident issuers and end investors, which can ensure full reconciliation between flows and stocks and the collection of related income on an accrual basis. The distinction between direct and portfolio investment does not constitute a problem either. The major drawback of this alternative is the potentially large size of the reporting population, namely in the case of households. Also in the case of some specific sectors it may be difficult to receive timely and high-frequency data. The implementation of security-by-security reporting may be more difficult for sectors unfamiliar with this way of reporting and storing of information and, finally, statistical principles and methodology can differ from accounting principles used by a great number of respondents.

The third option is the indirect reporting by custodians or other financial intermediaries involved in securities transactions and holdings. This reporting channel has the same advantages of the first alternative (timely and high-frequency data, relatively small reporting population, easy to adapt to security-by-security reporting, allowing for micro-checks of the data) and at the same time it permits a full reconciliation between stocks and flows. However, it will require some complementary information collected directly from the end investors in the case of securities held in custody abroad. Additional challenges will be the exclusion of repo-type transactions/positions and direct investment holdings.

The selection of a direct or indirect reporting scheme depends, of course, on the national specificities, like the size of the targeted population or the reporting practice. Direct reporting is more suitable for banks' own holdings but indirect reporting may be the only practical approach for households. For other sectors, the most suitable reporting channel depends on several factors, such as the average size of companies. Indirect reporting has advantages in terms of timeliness, efficiency and adaptability to a security-by-security system. However, there may be difficulties in collecting specific data such as repo transactions, or in distinguishing between portfolio and direct investment, and it will have to be supplemented with direct reporting in some cases, taking special care to avoid gaps (lack of coverage) or overlaps (double-counting).

3.2. The Portuguese model

The need to change the portfolio investment data collection system for BOP and IIP purposes led to the deep consideration of several dimensions of the problem, including the selection of a more appropriate level of detail and reporting channel, as described above. The experience gathered from the simultaneous existence of a security-by-security (sec-by-sec) reporting system (for PI liabilities) and an aggregated one (for PI assets) facilitated the choice of a data model of the sec-by-sec type. Some benefits of a sec-by-sec system as compared to an aggregated approach were evident at that time. On the compilers' side, the quality of the final statistics and the data control checks are facilitated and enhanced if items of data are collected on an individual basis. On the respondents' side, the need to aggregate the data means that each one of them will have to keep a database of individual securities and run aggregation procedures, increasing by the number of respondents the workload needed to produce these statistics. The contacts held with respondents confirmed that they preferred a security-by-security solution, and by that time the widespread use of the ISIN code in the financial markets overcame the practical difficulties of implementing such a system in the case of resident's investment in foreign securities.

As to the selection of the respondents, the existing system was based on indirect reporting by resident custodians, complemented by direct reporting from end investors holding securities in custody abroad; it appeared that this would continue to be an appropriate solution, especially in terms of reliable and timely data.

Portugal participates in the Coordinated Portfolio Investment Survey (CPIS) of the International Monetary Fund (IMF) since its first edition in 1997, and also plans to participate in the forthcoming Coordinated Direct Investment Survey (CDIS). These initiatives are

important in promoting the availability and consistency of bilateral data and enhancing the quality of the information available to meet users' demand. However, their objectives depend to a great extent on the number of countries participation and, above all, on the common methodologies and definitions used. For both questionnaires, a sec-by-sec system is the only option that guarantees that securities are correctly classified and that the risk of double-counting between portfolio and direct investment is minimised.

4. Consistency across statistics

As mentioned previously, one of the major drawbacks of a sec-by-sec reporting system is the significant costs involved in its development and further maintenance. The solution envisaged for reducing these costs was to adopt the system also for other statistics compiled in Banco de Portugal Statistics Department. In this context, SIET was implemented, as described above. This option carried additional benefits: respondents do not have to extract from their systems only the information that is relevant for BOP and IIP (ie residents' investment in foreign securities or non-residents' investment in national securities), but provide data on all investors' transactions/holdings in all securities; some data needed for financial accounts (residents' investment in national securities) was not previously available; and an integrated collection system finally produces more consistent statistics.

The data collected through this system are, therefore, very rich in terms of the information they may provide to compilers and users of PI statistics. Not only are traditional variables such as (detailed) type of security, (detailed) institutional sector of the resident investor/issuer, and a full geographical breakdown (on the assets side) available, but other possible details may be provided for analysis, such as the currency of denomination or the institutional/economic sector of the non-resident issuer. Changes in the underlying methodology may also be introduced with minor efforts, since the data collection system was designed in a broader manner comparing to the required output.

SIET's information is used as input for the compilation of a wide set of statistics produced at the Bank of Portugal (in addition to the compilation of portfolio investment figures and related income), which are also disseminated at the national and international level:

- In the field of monetary and financial statistics, SIET enables the validation and detailing of the information reported in MFI and non-monetary financial institutions' balance sheets, as regards their securities issues and own portfolios. Additionally, investment funds statistics are also produced using SIET.
- SIET information is used for the compilation of public finance statistics, in order to obtain the issues of the different general government subsectors and to determine the share of these securities that is taken by general government entities (for data consolidation purposes).
- Values reported to the central balance sheet data office on the activity of non-financial corporations are also compared with SIET data, for the purpose of quality control, of the information collected by both systems, regarding securities issued and purchased by these entities.
- Finally, at the level of national financial accounts, SIET data are used to compile assets and liabilities items of the various institutional sectors of the economy, in debt securities and equities, broken down by type of security and maturity.

SIET promotes consistency across statistics produced by the Bank of Portugal. In fact, securities issues statistics are an output of SIET. In addition to the component of analysis and release at the national level, these statistics are reported to international organisations, namely the ECB and the Bank for International Settlements (BIS). Furthermore, SIET

provides information on securities to several surveys and studies promoted internationally, which are a very important tool for financial and economic analysis. They include the CPIS, which is conducted by the IMF on an annual basis, the ECB annual statistical survey on market structures, the BIS international banking statistics, and the Eurostat government debt questionnaire.

Research on capital market structures and financial stability uses both macro and micro data on securities issuers and holders. SIET has been a source of information to the annual Financial Stability Report of the Bank of Portugal (since 2004), as well as to the Financial Soundness Indicators – an initiative of IMF to identify the strengths and weaknesses of the financial sector, with 62 participating countries (end-2005 reference data), and to the Financial Sector Assessment Programme – conducted by the IMF in Portugal in 2006.

Against a background of turmoil in international financial markets, as the one recently observed, the availability of detailed information on the portfolio assets of financial institutions has proved to be essential in the reassessment of risk exposure.

5. Opportunities and challenges

From our experience, the development of an integrated system for securities statistics has provided major improvements and opportunities in this field:

- Information for statistical purposes is classified by statistical experts and follows a common methodological framework.
- Calculations are performed locally according to internally defined algorithms.
- Valuation adjustments follow uniform criteria.
- Consistency between transactions and positions are monitored in detail.
- Outstanding amounts issued and held are compared at the security level.
- Outputs are compiled according to multiple criteria without having to ask the reporters to do so.

There are still some challenges regarding the compilation of securities statistics. In particular, in the case of the PI liabilities, the direct reporting option is not usually available, and indirect reporting through resident custodians is limited to the extent that non-resident investors use the resident financial system. Additionally, the two options are unable to provide a geographical breakdown of liabilities by creditor country. The Portuguese case follows a mixed approach, ie PI liabilities are calculated based on the net balance of all cross-border custody holdings between issuers, central securities depositories (CSDs), resident custodians and resident end investors. The potential risk of misclassification or double-counting with direct investment is taken care of by relating the PI data with the direct investment surveys.

The geographical allocation of PI liabilities' end-of-period positions and related income by creditor country is the main limitation for the time being. It is an important issue for concern since it also limits the compilation and dissemination of meaningful bilateral IIP statistics. In this context, an exploratory analysis of CPIS data is being undertaken. This intends to derive measures for overcoming some of its limitations, such as the existence of non-published confidential data, the geographical allocation of securities held as foreign reserve assets (collected through another, confidential, survey – SEFER) and the holdings of countries not reporting to the CPIS.

In the case of PI assets, the indirect reporting system via custodians may not be able to capture all the relevant data, even when complemented by direct reporting of securities held

in custody abroad, especially in the case of households. Although this is not considered to be a significant problem for the time being, since it is expectable that Portuguese households use the resident banking system for their investment decisions, it may become increasingly important in the future, namely in a context of a more integrated financial system at the level of the European Union (EU) and, more specifically, of the euro area. In this context, a third-party reporting schema could be further analysed and developed at the EU/euro area level.

6. The near future

The compilation of statistical information on securities entails a number of difficulties, both in terms of classification and valuation and at the level of the holders' identification. The problems are not related to the lack of information sources, given that there are several commercial databases that provide information on individual securities and several ESCB central banks maintain their own databases. However, in some cases, there are gaps and, in other cases, information is not consistent between different sources. These were the main reasons for the development, at the ECB, of a reference securities database with information on a security-by-security basis – the CSDB.

The purpose of the CSDB is to set up a database with complete, consistent, validated and updated information on all securities relevant to the ESCB's statistical objectives. The existence of a single database should promote consistent results and efficient data collection and compilation. This database uses information from commercial databases and other sources, which include the National Central Banks (NCBs) that maintain security-by-security databases. Data quality management will benefit from the cooperation between the different CSDB participants.

The Bank of Portugal has actively collaborated in this project since its inception. Information on Portuguese securities, extracted from SIET, is being sent to the ECB on a monthly basis. Also, monthly extracts of the CSDB are being used for data quality checking.

From the statistical viewpoint, the CSDB serves two purposes: to supply information for the compilation of aggregates for the euro area, such as securities issues statistics, and to supply reference information on securities and issuers, so as to cope with the collection of statistical information on a security-by-security basis, and enabling the production of improved aggregate statistics.

The development of the CSDB is being carried out gradually: in phase 1, completed in May 2005, the system was implemented at the ECB; in phase 2, currently ongoing, mechanisms will be implemented for online access and application-to-application communication for NCBs.

Currently, several countries are already collecting information on portfolio investment on a security-by-security basis for the production of balance of payments and international investment position statistics. In the near future, all euro area members will follow this approach, using the CSDB for the classification of information on securities. In this sense, the CSDB will be a major contribution to a more efficient production of harmonised statistics.

We conclude by re-emphasising that recent changes in financial markets, due to globalisation and innovation, brought new challenges and demands to statistics. Simultaneously, technological evolution continues to provide opportunities to develop increasingly integrated systems, based on item-by-item data. These developments, together with an increasing collaboration between institutions at national and international levels, are definitely contributing to the production of more accurate, reliable, and comparable statistics.

Opaqueness to transparency: the Bank of Canada's financial data strategy

Greg Haymes[1]

1. Introduction

> *"Investments in financial data and the systems that support these data will enhance our research and analytic capabilities in the monetary policy, financial system, and funds-management functions."* Bank of Canada (2006)

The Bank of Canada is increasingly constrained in its ability to analyse and research issues related to its economic functions owing to limits on the availability and quality of financial data. Consultations with other central banks and a review of the literature indicate there is general agreement that existing data are not sufficient for the purpose of analysing financial stability and efficiency.[2] Indeed, most are at an early stage in setting up a financial data framework. For instance, more detailed information is required on balance sheet positions, on asset prices, and on indicators of liquidity of financial markets (Van den Bergh (2005)).

This paper documents a strategic medium-term plan for strengthening the collection and use of financial data by the Bank of Canada. It articulates the need to develop financial databases, and discusses various ongoing initiatives. The Bank has shown leadership in the field of financial statistics in recent years by actively promoting discussions, surveys and research, both within Canada and among other central banks, in determining how best to develop an appropriate data framework.[3] These preliminary steps were important before embarking on a new direction for the Bank.

The data strategy aims to provide a more complete picture of financial developments. This would allow us to describe and analyse financial change better and so contribute to the many forms of policymaking. Recent events in the global financial market emphasise the need for a comprehensive approach. Given the Bank of Canada's expertise in analysing the financial landscape, it has a comparative advantage in determining priorities for the development of related databases.

The primary objective is to redesign and enhance the Bank's securities database. Besides providing valuable information for policy and related advice, these data are used to estimate Canadian business credit published on the Bank website, sent to international organisations (the BIS, IMF and OECD), and are a primary source for Statistics Canada's Balance of Payment statistics. Other strategic elements include: building a Bank-wide data repository, signing a Memorandum of Understanding with Statistics Canada, and filling identified household data gaps.

---

[1] Coordinator, Monetary and Financial Analysis, Bank of Canada, ghaymes@bankofcanada.ca.

[2] See Davis (1999); O'Reilly (2004); Haymes and O'Reilly (2005a, b); White (2004); Stevens (2005); Smith (2005); St-Amant, Gauthier and Bandt (2008).

[3] In recent years, Bank staff has led several statistical developments at the international level through work related to the Bank for International Settlements (BIS), the Irving Fisher Committee (IFC), and the International Statistical Institute (ISI). Staff initiated two BIS surveys of central banks, published three papers in the *IFC Bulletin* and one *IFC Working Paper*, presented and discussed papers at IFC and ISI conferences, and hosted the first IFC joint event in June 2005.

This paper is organised as follows. Section 2 identifies benefits to financial policies and other strategic considerations. Section 3 envisions a target data environment modelled on the Bank's needs. Section 4 provides a broader context to the strategy. Section 5 details our learning from the experience of others in enhancing financial data. Section 6 discusses ongoing Bank initiatives to strengthen the collection and use of financial data. Section 7 concludes and emphasises the need to act in this area.

2. Motivation

Why did the Bank of Canada feel the need to develop a strategic plan for financial data? The Bank's vision for fulfilling its responsibilities is to be second to none among the world's central banks (Bank of Canada (2006)). Among other things, it means allocating resources to the highest-value-added activities, and, in the case of the plan for financial data, providing a clearer picture of financial developments in the economy. In view of the fact that policymakers, and those who advise them, face major challenges in their ongoing efforts to achieve the degree of understanding required for their work.[4]

In an ever-changing world, the Bank faces all kinds of unpredictable challenges, both large and small, as do most organisations. Being mindful *of* and proactive to these changes is a mark of a strong organisation (Coutu (2003)). The Bank has been active in responding to changes in the macro environment. For instance, in the context of accelerated globalisation and technological innovations, capital flows impacting the financial sector bring with them increased risks. In recognition of these risks, a key objective for the Bank is to promote the safety and efficiency of the financial system. Attention has also been focused in recent years on ensuring that the Canadian financial system has a proper framework to compete globally.

2.1 Strategic outcomes

Databases are a derived demand stemming from a central bank's responsibilities (Dodge (2003)). When mandates are changing there can be substantial uncertainty as to what the next set of important questions will be and, hence, what data will be needed to support it. Since the Asian crisis of the mid-1990s, many central banks have increased resources and the rigour of their analysis on potential threats to their financial systems as their responsibilities have shifted to focus more on the systemic risks involving the financial sector of the economy. In particular, the Bank undertakes extensive research on the financial system, and twice a year, updates Canadians on new developments, issues, and research in its *Financial System Review*.

High-quality data provide the foundation for sound analysis. However, a comprehensive database does not exist for the Canadian financial system. Data are neither as complete – through time and across instruments – nor as centralised or of consistent quality as is needed. Long periods of macro data, such as data in the System of National Accounts, are readily accessible from sources like Statistics Canada.[5] But neither these data nor the micro

[4] Particularly with respect to work to support the Bank's policy advice on legislation, regulations, and practices affecting financial institutions, financial markets, and financial infrastructure arrangements.

[5] It should be noted that the Financial and Wealth Accounts at Statistics Canada provide a consistent macro database on the Canadian financial system. The integrated system of accounts provides a framework within which financial transaction balances of sectors of the economy may be examined and related to aggregate income and expenditure accounts. This allows for some broad insights into the basic structure of financial markets, and the financing of economic activity.

data from regulatory agencies like the Office of the Superintendent of Financial Institutions were specifically designed for addressing the types of questions arising on the financial system. Improving access to better data on the financial system and its participants will aid the Bank in its efforts to ensure a strong Canadian economy.

The remainder of this section will discuss the importance of the financial system to an economy and the various outcomes and motivating factors for the financial data strategy.

A well functioning financial system is important for several reasons:

- Financial markets play an increasingly important role as a source of capital.
- The financial system helps to ensure an efficient allocation of savings and capital, and hence sustained and robust growth. By helping firms – one of the main building blocks of the economy – to grow, the performance of the financial system is directly linked to an economy's health.
- The financial system plays a key role in the transmission of monetary policy actions to the economy. To the extent that the system does not function well and is relatively inefficient, a central bank's ability to provide for monetary stability is diminished.
- The financial system consists of various participants and a disruption in one can cause instability in the others as well as the economy as a whole.
- More and more individuals have a significant portion of their wealth linked to financial markets, either directly through stock ownership or indirectly through mutual funds and pension funds.

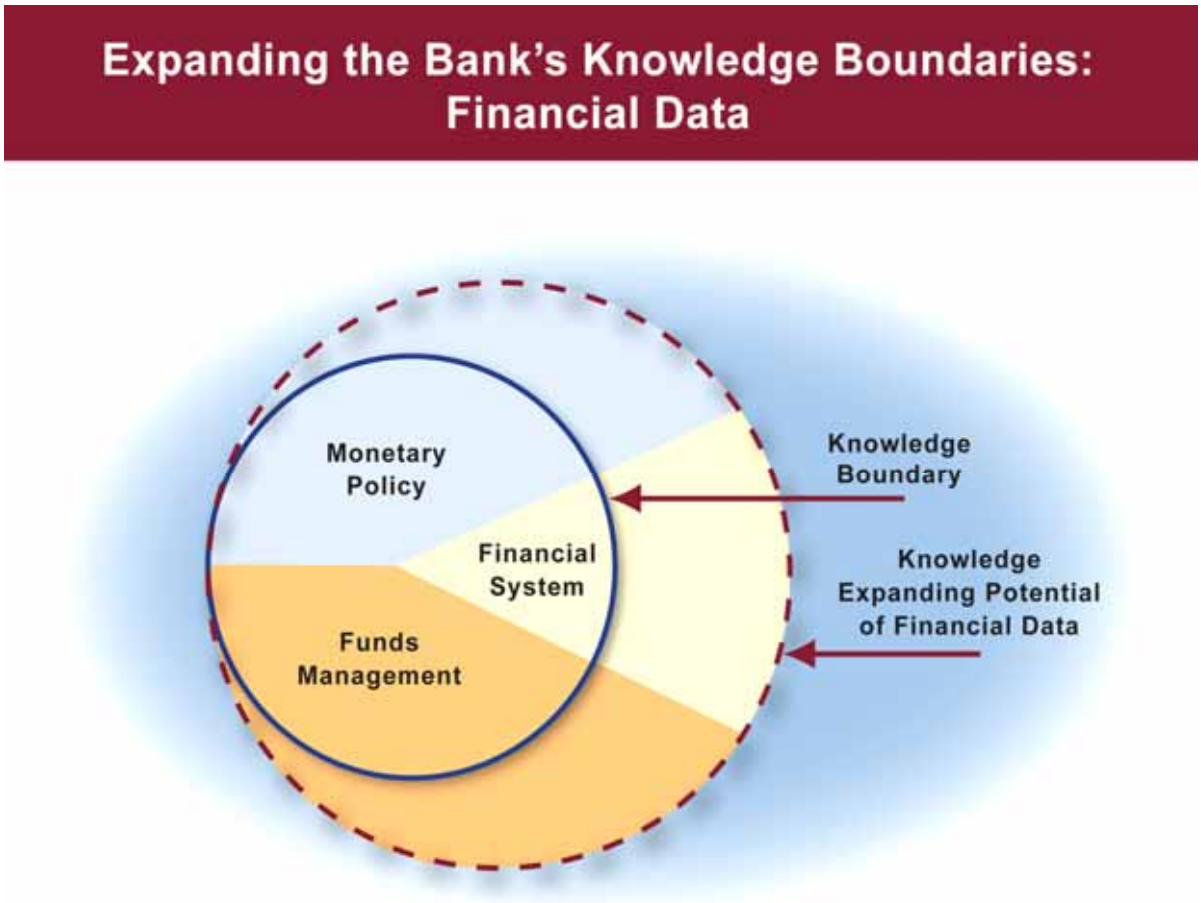
Four main outcomes are envisioned by the financial data strategy. In general, these outcomes represent better Bank policy to contribute more effectively to the economic wellbeing of Canadians. These outcomes are:

1. Better policy with respect to the stability of the financial system, leading to less of a downside risk on economic output.
2. Better policy with respect to the efficiency of the financial system, leading to a higher level of output through a better allocation of resources.
3. Better monetary policy leading to lower macroeconomic volatility and possibly a higher average level of economic output.
4. Better funds management policy leading to more cost-effective management of the government's debt and foreign exchange reserves.

As illustrated in Figure 1, improved financial data are expected to provide the Bank with additional information needed to extend its understanding of important issues related to three key functions. More specifically, these data are primarily envisioned to target issues in the financial system, where the breadth and depth of our knowledge is relatively weaker, but also have obvious uses for addressing monetary policy and funds management objectives.[6]

[6] Former Federal Reserve Board Chairman, Alan Greenspan, said, "I suspect greater payoffs will come from more data than from more technique". (Greenspan (2001))

Figure 1



There are still some questions regarding the Bank's role in the promotion of financial stability. Similarly, there is considerable uncertainty with respect to how – and how well – the financial system is currently functioning. The improvement of financial data is a necessary step in examining the system, as well as understanding better the vulnerabilities arising in the household and business sectors. Once better defined and supported by the right data, financial system policy designed to improve stability and efficiency can promote a more efficient allocation of resources, less volatility and greater certainty, yielding a higher level of aggregate output.

Improved financial data will also support the Banks' monetary policy and funds management functions. The Bank, along with other central banks, is converging on the "best" linear aggregate model of the economy for use in monetary policy. However, there is the potential to improve monetary policy by moving beyond the linear model to more complex non-linear models with heterogeneous agents (firms and households) based on disaggregated data. Funds management policy is likely to benefit the least from new financial data. However, improvements are possible. A better understanding of the drivers of the government yield curve, that is, the pricing of government bonds and bills, and the functioning of these markets can help to improve the management of public debt. More detailed pricing information on a broad class of assets is necessary for the construction of an optimal portfolio selection model for the Exchange Fund Account.

On the external front there are three prominent drivers:

- ***A rapidly evolving financial landscape*** – The challenge of remaining up-to-date on developments in the financial world has never been greater – or more critical – for central banks. New industry trends and products are changing the way

businesses operate and structure themselves. A broadening and deepening of international capital markets continues to transform the manner in which commerce is conducted and, as financial markets become more globalised, the risks faced by domestic agents and the economy are more complex and external than ever before (Schembri (2005)). In response, there is a need to develop better policies (eg financial sector regulation reform), and ensuing demands for better sources of information. For example, the IMF is developing Financial Soundness Indicators, and several central banks are working with data providers to improve available financial data (Haymes (2008)).

- ***Demand for comparability*** – As globalisation and convergence continue, viewing and comparing financial statistics across countries and institutions is likely to increase. The ECB's securities data are shared with several European central banks, and the BIS Data Bank continues to categorise and disseminate timely macro data. Several countries are taking an integrated approach to data collection activities, whereby agreements have been made (or legislation changed) to share information between statistical agencies and the central bank. More thought is being given to formal financial data exchanges between central banks as they begin to grapple with the challenges of what is required and how to assemble the information.
- ***The need for micro data on households and firms*** – Central bankers, academics, and other major users of financial data are placing a premium on the availability of various types of micro data. Whereas two decades ago central banks' data focus was on monetary policy purposes, a more institutional approach is coming to the fore, along with demands for micro data, market flow and pricing information. The growing importance of the financial system for several central banks has driven these developments. With the added pressure of a rapidly evolving financial data environment, there is an increasing tendency for central banks to centralise data management as well as accommodate future growth in this area.

2.2 Effect on research, analysis and data management

The development of detailed, timely and relevant financial databases will result in:

1. Better research, in all three Bank functions, to understand the role played by financial factors in the economy;
2. Better analysis feeding into broad policy, as well as the *Financial System Review*, *Monetary Policy Report*, the Fixed Action Date process and other regular briefings; and
3. Better data management, resulting in easier access, information sharing, contract management and quality assurance (financial data expertise).

Expanding on points 1 and 2, the Bank has long been hampered in addressing a range of questions necessary to build a complete, integrated, analytical financial policy framework. The following questions exemplify the kinds of questions that could be addressed with appropriate data:

- What are the key risks in the Canadian financial system?
  eg Are particular sectors more vulnerable to shocks?
- How stable is the Canadian financial system?
  eg What is the impact of interest rates on the distribution of household debt and the debt service ratio? Does policy affect firms differently across their different dimensions?

- What is the role of financial frictions in the financial system and how does it affect the monetary transmission mechanism?
  eg How have financial "headwinds" affected firms' behaviour and investment?
- Is the Canadian financial system efficient?
  eg What are the sources of asymmetric information affecting asset prices?

This is only a small sample of the types of questions that the Bank has faced recently that would have benefited from better data. Section 3 contains additional questions.

3. Target environment

This section describes the new data environment, one that responds to Bank of Canada needs. It begins with a summary of our approach, followed by the core data items and related drivers.

3.1 Approach

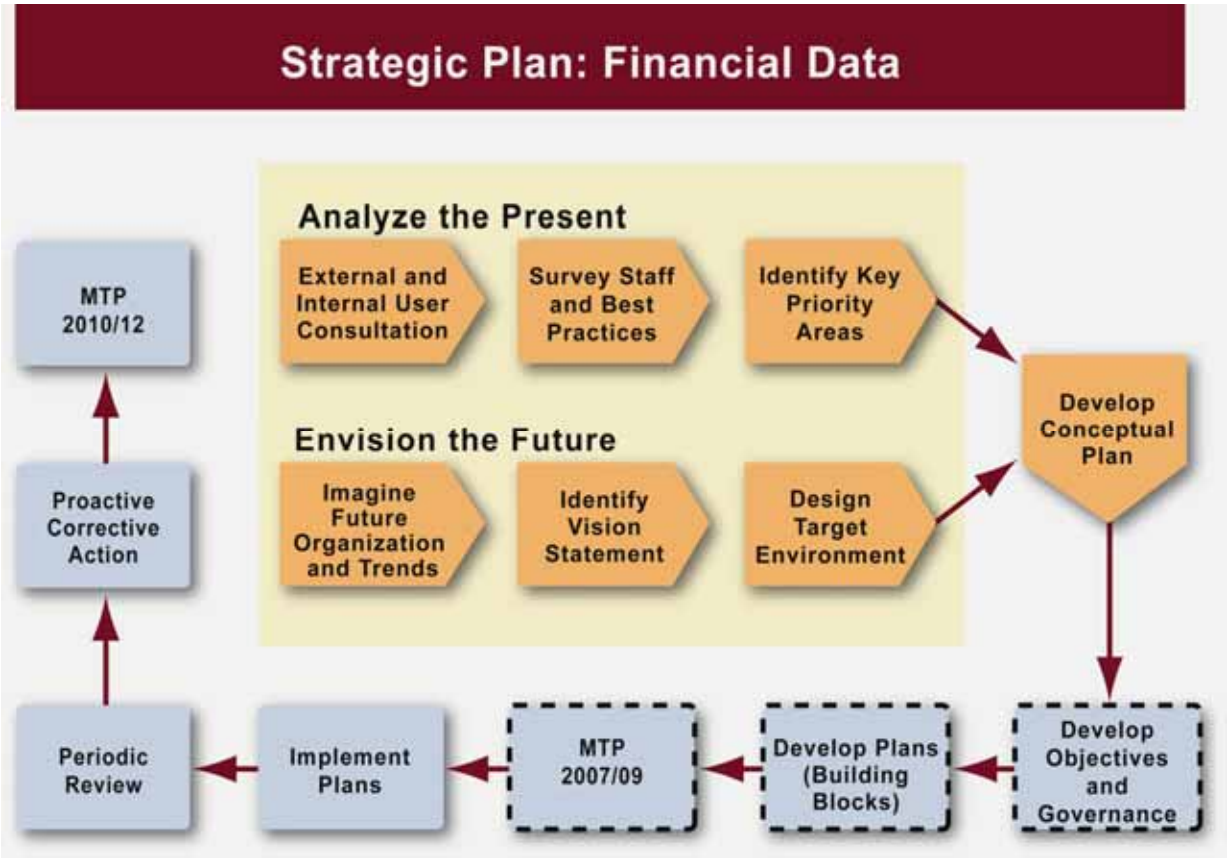
The Financial Data project evolved from a project initiated in late 2001, known as the Capital Markets Database project. The articulation of the need for such data arose in response to questions raised regarding the possibility of a "hollowing out" of Canadian capital markets. From this starting point, the idea of an enhanced capital markets database was broadened to one of information on the financial system. The main reason for this broadened concept was the increasing interest in the stability of the overall financial system, and recognition that existing databases had not been specifically designed to meet the needs of the evolving financial landscape from a financial system perspective.

As the flow chart (figure 2) illustrates, the strategy sets out a conceptual plan for the medium term. The middle boxes indicate work leading up to the plan, ie *analysing the present* and *envisioning the future*, and boxes to the left and bottom indicate future steps:

- ***To analyse the present***: An extensive consultation process was undertaken to identify Bank data needs (current/future) and priorities, including a survey of senior staff responsible for providing policy advice. Several meetings were arranged with external organisations to determine the extent to which needs overlap.
- ***To envision the future***: A target environment was designed according to a needs-based model, organisational objectives, data developments at other organisations, and emerging trends. Cost estimates were obtained from Statistics Canada and commercial vendors.

Steps leading up to the Bank's strategic plan provided considerable insight in terms of how best to approach and achieve the overall vision. Implementation of the various solutions is ongoing (ie obtaining/redesigning databases and creating a governance structure). Part of this work includes continued outreach efforts to interested parties.

Figure 2



3.2 Core data items

The core target items include, ranked by priority:

1. Financial instrument data (Capital Markets Statistical System enhanced);
2. Financial statements (linked to debt and equity issuance data); and
3. Household balance sheet data.

The number one-ranked data need is the ability to cross-reference financial instruments with financial statements in a transparent and systematic way. Linkage of this information would allow for a better understanding of financial behaviours and their implications (eg systemic vulnerabilities). In addition, improved data on the household sector are required to study the distribution of household financial characteristics, and to determine how the distribution might change in response to shocks (eg to measure wealth effects and their impact on household consumption/investment /saving behaviour better and to identify the magnitude of risks).

The focus of the target environment is on data that the Bank will begin to collect and analyse over the medium term. Given that datasets are a derived demand, flexibility in evolving the target is crucial, since four or five years from now the Bank could have a different view. In other words, the environment for financial data is expected to evolve over time.

The remainder of this section provides a high-level, outcome-oriented motivation, along with specific questions, for each of the three targeted areas: financial markets, firms and households.

3.3 Specific drivers

1. Financial markets

There is a continuing need to gather data on outstanding bonds and equities to construct measures of long-term business credit. This need is currently being met by the Bank's Capital Markets Statistical System (CMSS) – which permits the Bank to produce aggregate data on gross new issues, redemptions and net new issues. Relative to other sources that contain similar data on securities, a main advantage of the CMSS is that there are theoretical economic ideas underlying the data constructs. However, for the most part, these concepts were developed some 20 years ago. For example, it does not incorporate current standards for sector classification (ie the North American Industry Classification System). Furthermore, the CMSS is an old system using outdated and inflexible technology. It is time that the CMSS was updated to combine these data with the issuer's financial statements. Redesigning the CMSS (ie enhance and link its data) will result in:

- A replacement product that is different from the existing product in form, function and benefits;
- An innovative product based on user demands; and
- A long-term product that is accessible, visible and usable.

To date, the main use of CMSS data has been as part of the credit aggregates, reported in the *Bank of Canada Banking and Financial Statistics*, internal reports and elsewhere. Freedman and Engert (2003) is the most recent well known research that used these data to discredit the notion that Canadian credit markets were hollowing out. Current research is using aggregate CMSS data to determine whether it helps to measure important underlying economic developments, and whether it would improve forecasts. These data are also supplied to Statistics Canada, who benchmark them to their annual surveys. Statistics Canada considers CMSS to be the primary source of redemptions and net new issues, and supplies a broad range of capital markets data (issues, secondary transactions, positions and holdings) to the IMF and OECD.

It is important that policymakers have information similar to that available to the financial institutions and market participants being monitored and/or overseen. The existing database is straining under this challenge. Future research involving CMSS data is likely to focus much more on distribution. For instance, questions exist as to whether debt and equity are used differently across different sectors, and over the business cycle. At the broadest level, questions relating to the cost of capital, the functioning of financial markets and the behaviour of participants cannot be explored fully, because of inadequate data.

Based on staff consultations and the general research direction of the Bank, demand for improved CMSS data will increase substantially in the years to come. For example, market microstructure is a relatively new area in financial economics that seeks to explain price behaviour in financial markets by modelling the interaction and trading behaviour of individual market participants. Drivers of such research include: rapid growth of domestic and global financial markets, extensive deregulation, technological changes and management of risk. Hartman and Kwast (2005) discuss how to manage an active research agenda at a central bank, and they indicate that data are an important resource in producing state-of-the-art "micro" financial research.

Questions:

What sectors are facing higher default risk? How can policies improve the allocation of resources and the capacity to absorb shocks? How has the cost of capital changed across different dimensions over time? What are the incentives and barriers? What are the transaction costs associated with raising capital in Canada? Do firms change their borrowing behaviour over stressful episodes? How are innovative products and services impacting markets?

2. Firm

Researchers are considering a number of different approaches to studying firms' activity. Aggregate data alone are not always sufficient to monitor these risks – subaggregates provide a clearer picture (eg by sector). In addition, firms can become so large or dominant in their sector that they take on systemic importance (eg Nortel and BreX). Improved firm-level data would yield a number of benefits:

- Permit the creation of detailed time series that would link distinct characteristics of individual firms – for example, balance sheet data, credit ratings and industry classification – to the amount and type of securities they issue. This would help deepen our understanding of how markets function.
- Identify financial imbalances to assess the financial situation of businesses. This would facilitate the monitoring of financial system stability, potentially helping to detect problems before they occur.
- Improve our understanding of the sources of innovative financing, and help explain why some asset classes have experienced less development in Canada than elsewhere.
- Facilitate research on the underlying factors of doing business in Canada (eg reporting, tax and legal environment), which affect organisational structure, investment, and financing decisions.
- Allow for a fuller understanding of risk-taking behaviour, and help policymakers make better decisions in times of crisis.

Questions:

Do credit channels work differently in different sectors or for firms of different size? Does the age of a company foster or inhibit change? Does the exchange rate have different implications on debt and equity across sectors and firms? What is the distribution of firm assets? Based on firms' valuations and risk exposures, is there a bubble? What are the changing roles of financial and non-financial institutions in providing financing or sharing risks? Do reporting requirements and taxation issues across jurisdictions, within and outside Canada, create disadvantages? Do sector exposures shift during the business cycle, because of policy, or for other reasons? What kind of protection do firms have against a large shock?

3. Households

High-quality data on the financial condition of the household sector has always been considered a priority for the Bank, owing to that sector's important implications for consumer spending and overall macroeconomic performance within the context of our monetary policy responsibilities. If data on the household sector were available on a more disaggregated and frequent basis, one could study a number of important issues. In recent years, increased attention has been paid to the evolution of household balance sheets in connection with financial stability issues. For example, policies designed to improve the financial stability of systemically or otherwise important institutions need to consider the consequent flow of risks to households and their ability to absorb such risks.

There is also a need for more frequent data with which to identify potential vulnerabilities. Published non-proprietary data (ie those from Statistics Canada) do not allow for the development of a disaggregated picture of the household sector's financial condition – these data are usually several years out of date and do not exist in sufficient detail (eg to derive a Financial Obligation Ratio). Moreover, linkages between financial variables and consumer spending or bankruptcy information are extremely limited in existing sources. These

shortcomings have diminished the Bank's ability to fully evaluate changes in the sector's risk profile, and from identifying potential impacts of policy initiatives.

The lack of timely disaggregated household data also prevents a fuller understanding of the financial behaviour of different household groups and cohorts. This may become particularly important as baby boomers begin to retire in the foreseeable future, thereby leading to changes in future obligations (eg increases in health care costs) and saving patterns (eg to buffer market shocks).

The IMF has indicated that similar gaps are prevalent across other industrialised countries, notably France, Germany, Japan, the Netherlands, the United Kingdom and the United States (IMF (2005)). For example, the Survey of Consumer Finances provides detailed balance sheet data for the United States, but it is available only every three years. Some central banks have begun to take steps to address the gaps. Sweden's central bank has augmented the analysis in its *Financial Stability Report* by presenting data on debt and wealth for households in different income categories (Sveriges Riksbank (2005)).

Questions:

To what extent are households exposed to a downturn in the housing market (eg a housing bubble)? How volatile are the asset holdings of households and unincorporated businesses? How are savings allocated across the demographics? How will this change in response to a shock or over time? How much does the debt distribution move around? Does it react wildly or smoothly relative to income? Does its reaction to various shocks change dramatically over time? How can certain groups that could be particularly vulnerable best be defined (eg low-income households with significant debt burdens)?

4. Broader context

New information in the past has ultimately changed the way people think and behave. Prior to certain statistical developments, individuals, firms and governments did not have the ability to measure how the economy was performing or transforming. The development of the System of National Accounts (and ultimately GDP), for example, provided governments with a standard tool whereby it can develop macroeconomic policies that react to changes in the economy. Indeed, Canada has been well served over the years by its National Statistical Office. Considered among the best in the world, Statistics Canada continues to fulfil its mandate to "collect, compile, analyse, abstract and publish statistical information" on economic and social issues important to Canadians.

The need for central bankers to develop a financial data framework for financial stability, the financial aspects of monetary policy, and funds management has been well documented both within and outside Canada. In fact, several central banks have undertaken large, multi-year projects to address certain data gaps. Furthermore, often the Bank is expected to have informed views on a wide range of financial developments, which can be difficult without proper data. Placed in this context, it suggests that improved data must be one of the Bank's top priorities in going forward. Taking a longer-term perspective, these data will assist households and firms in two practical ways:

1. ***Education***: to gain a clear understanding of financial developments; and
2. ***Comparability***: to obtain a better sense of how they measure up to others.

Such a far-reaching data strategy will not be realised overnight; it will take several years to develop a data framework and related statistical concepts.

5. Learning from other organisations

5.1 Central banks

As mandates evolve, central banks are becoming more proactive in the development of, and access to, financial data:

- ***Securities data*** – Changes in the financial landscape have prompted an increased interest in security statistics by central bankers, market regulators, financial supervisors and private financial institutions. Central banks in England and Austria and the European Central Bank (ECB) have recently developed (and/or enhanced) security databases. The Bank of England recently introduced a new securities database to deliver more timely and accurate data. The ECB is probably the most advanced in this area, with an ongoing multi-year initiative involving several staff – the Centralised Securities Database is a security-by-security database that may become a universal standard. The IMF and BIS are currently leading a multi-country effort to create a *Handbook for Securities Statistics* that will provide a conceptual framework for the presentation of debt securities statistics.
- ***Financial data research capabilities*** – There is a growing emphasis by central banks to research and develop data. For example, the ECB created a division within its Statistical Department, the Statistics Development and Coordination Division, with a mission to "strive for an appropriate statistical description of the constantly evolving economic environment in order to contribute to providing the ECB and the general public with high quality statistics".
- ***Active input on statistical standards/practices*** – Central banks, as major users and producers of data, are active in discussions involving statistical approaches, practices and standards. For example, the Federal Reserve Bank of New York increased its derivatives data collections in a number of ways to meet international standards, and the ECB is providing direct input in System of National Accounts (SNA) revisions.[7]
- ***Household distributional data*** – There is recognition of the importance of knowing the characteristics of the distribution across households of liabilities, assets, income and debt service in order to understand the tail of the distribution better. The need for longitudinal data is also evident. For example, the Reserve Bank of New Zealand recently sponsored a new longitudinal household wealth survey.
- ***Cooperation with the National Statistical Office (NSO)*** – In England, a Service Level Agreement was introduced between the central bank and NSO. In Australia, an outpost officer from the NSO works at the central bank. Some central banks have also been active in changing legislation to gain access to micro data collected by the NSO.

5.2 Irving Fisher Committee

The Irving Fisher Committee (IFC) has been instrumental in encouraging cooperation amongst central banks, and has been a strong proponent for advancing financial data

[7] International statistical standards can be slow to adjust to change. For instance, the SNA 1993 measures the output of financial institutions using the Financial Intermediation Services Indirectly Measured (FISIM), which has been criticised for not calculating output properly, thereby underestimating the true economic contribution of the evolving modern bank. Some suggest central banks should be more proactive when it comes to statistical standards, despite the lack of consensus.

research on a number of fronts. For instance, it publishes data studies by central bankers, surveys its members, and sponsors conferences on various statistical challenges (eg measuring the financial position of the household sector and statistical requirements for analysing financial systems). William White, former Head of the Monetary and Financial Analysis Department of the BIS, and others have pointed out that changes affecting financial stability and financial statistics are often global in nature, and to keep up with these changes more work should be done on the international front to help address issues such as harmonisation, financial innovations and comparability.

In recent years, the IFC has begun sponsoring independent conferences outside of the biannual International Statistical Institute (ISI) conference. Its cosponsored workshop with the Bank of Canada on "Data Requirements for Analysing the Stability and Vulnerability of Mature Financial Systems" (June 2005) was the IFC's first joint event. Besides providing useful pointers of what financial data are needed, a common theme of the workshop was that "central banks had been innovators in developing better data on the basis of existing sources or statistical exercises, and they would clearly benefit from each other's experience", (O'Reilly and Van den Bergh (2005)).

6. Moving forward

The data strategy outlined in this paper reflects and enables the Bank of Canada's long-term objectives, responsibilities and interests. This section discusses ongoing Bank initiatives to improve the collection and use of financial data.

6.1 Business and Capital Market Statistics (BCMS)

The Capital Market Statistical System (CMSS) was created in the mid-1980s to provide a time series database on capital market activity. The system is being redesigned to understand financial behaviours and their implications for system-wide vulnerabilities better. The new system, the BCMS, will link financial market data (bonds and equities) to industry characteristics and to firms' economic activity (financial statement data, NAICs sectoring, credit ratings etc). It will be flexible enough to capture evolving market developments and changing needs. Indeed, the overall objective in designing the BCMS is to create a flexible statistical system that concentrates on critical issues, without limiting its potential use going forward (ie flexible to new reporting requirements or participation in a Global Securities Database).

Our focus is quite different from that of other central bank security databases. First, we want to provide economists across the institution access to the micro data. At a minimum, we want to ensure: complete Canadian coverage; proper sector classification; storage of real-time data; and appropriate breakdowns by instrument, currency and maturity. Second, we want to link securities data to a firm's fundamental information. Some new data types, such as financial statement data, will be accepted "as is" for the most part and automatically incorporated into the system. Third, we are actively partnering with other data providers to fulfil various needs (eg commercial data vendors, industry associations). In doing so, we aim to strike the right balance between meeting our data consumption needs and ensuring a fast, efficient tool.

Determining the content and structure of the future database is a critical step. The envisioned system will contain various areas where data can be stored and accessed. The system will allow for automatic feeds to substitute some of the manual entry of bond and equity data, and act as an additional check to improve data quality. For financial statement data, five potential vendors were investigated. Based on a review of their coverage, the number of variables and length of time series, we identified the Globe and Mail's *Report on Business*

dataset as the most complete for Canadian financial statement information.[8] We are also developing a relationship with the Investment Industry Association of Canada that may result in an exchange of securities data.

The lack of an internationally agreed upon standard for securities statistics makes certain decisions to develop the BCMS tricky, although Bank staff are working with international organisations and other central banks to address the issue. Most standards adopted by securities data compilers are currently aligned with the Balance of Payments (BOP). The BOP systematically summarises transactions between residents and non-residents for each institutional sector. The concept of residence is based on a sectoral transactor's centre of economic interest, which can, at times, be ambiguous given the nature of global trade and financial transactions. For instance, when a parent company guarantees and utilises funds raised by a foreign affiliate, select international guidance includes:

- The BOP manual suggests assets should represent an actual claim that is legally in existence and that the incurrence of a contingent obligation does not establish such a claim or alter the ownership of the asset. However, options and financial derivatives can under the right circumstances (eg instruments under contract with a market value and do not extend to actual delivery) be treated as an asset or liability on the financial account.
- The IMF's guidance on external debt securities suggests contingent liabilities, such as guarantees, should not be part of the data, but strongly recommends collecting the information.
- The BIS "Guide to the International Banking Statistics" expanded its data collection activities to include exposures on an ultimate risk basis.

All things considered, when one encounters a complex financial instrument, or transaction, it can be difficult to make a proper assessment.

6.2 Financial Data Repository (FDR)

> *"Most believed America to be on a "permanently high plateau" (in the phrase of the Yale economist Irving Fisher, uttered October 16, 1929, a few days before the market crash)".* Black (2003)

Central bank staff require ready access to relevant financial data to analyse ongoing economic developments properly and to conduct good empirical research. In particular, there is a trend toward the use of micro data for answering macroeconomic questions. The financial data strategy allocates a budget to areas within the Bank to allow for one-off data purchases. These discretionary funds have allowed the Bank to respond quickly to rapidly evolving financial markets (and risks) in recent years.

Such expenditures vary from year to year as purchases depend on specific work plan objectives that tend to evolve over the course of the year. The management of these funds is left with the departments. The advantage of this approach is that individual departments are responsible for prioritising their new purchase choices and deciding which items are worth buying each year. One of the concerns is our ability to access these data from other areas, although the Bank plans to address the issue (ie corporately manage access to these data).

---

[8] *Report on Business* data include 229 annual financial variables for 2,400 firms, while the quarterly data contain 64 variables for 1,200 firms. The annual series goes back to 1974 and the quarterly series to 1985. Coverage has increased considerably over the years, from only a few hundred firms in the 1980s. The assets in the system account for about 60% of the non-financial sector reported by Statistics Canada, which researchers view as very good compared to other sources.

Data management at the Bank is a substantial activity. To maintain high-quality output, a multi-year project is underway to implement a new data management architecture.[9] The Bank currently uses FAME to store time series data. A recent review of other central banks confirmed this remains the common platform for time series storage. However, the Bank uses an increasing amount of data that can be considered non-time series, or relational data. These data cannot effectively be stored within FAME. Moving forward, a data warehouse is envisioned that can accommodate various types of data and be fed from multiple sources. Once established, staff will have easy access to Bank data through various data marts arranged according to subject matter.

6.3 MOU with Statistics Canada

> *"A dynamic statistical system that reflects our ever-changing economy is essential to both government and private decision making. In particular, I support the recommendation for legislation to permit the statistical agencies to expand data sharing".* Kroszner (2008)

In 2006, a Memorandum of Understanding (MOU) was signed between Statistics Canada and the Bank of Canada on facilitating Bank access to confidential business and household micro data for statistical research and analysis purposes. Requests for access to detailed survey and/or tax data on individual businesses or households are made on a project-by-project basis and assessed by a senior official at the Bank; followed by a Statistics Canada assessment. Each project requires a brief description of the work to be done, including the data and analytic software required, and a timeline to complete the work. Statistics Canada reviews the proposal within 10 working days. If it is determined that the agency can carry out the work quickly and efficiently, the Bank representative will be informed of this and of whether there are any associated costs.

There are two ways the MOU facilitates access to confidential micro data. First, Statistics Canada provides a dedicated employee to service the Bank's requirements. To the extent possible, this person will be the liaison with the owners/producers of the files at the agency to clarify questions that arise from the use of the files. However, it is possible that in some projects there may be a need to draw upon other Statistics Canada resource centres in order to prepare datasets. Linkage of two or more datasets, "cleaning" of administrative or survey micro data files for research purposes, associated computer programming and methodological work, and other related statistical tasks might occasionally require capabilities beyond the expertise of the dedicated Statistics Canada employee. In such cases, additional costs are charged to the Bank on a case-by-case basis.

The second way to gain access is to become a "deemed employee of Statistics Canada" for purposes of completing the work. Hence, the Bank employee is subject to the same requirements of Statistics Canada employees under the Statistics Act, including signing the oath of secrecy. These Bank employees conduct their statistical work in a restricted area on the premises of Statistics Canada, designed and managed by the agency, with no external communication linkages from computer workstations. In addition, no confidential statistical information can be removed from the room on any medium. It should be noted that the Bank has no restrictions on what facts or conclusions, it reaches using Statistics Canada data.

---

[9] The Bank is proposing a complete change in the way data are collected, verified, stored and accessed. The current technology platform used at the Bank is not high performance and does not compare well to today's standards. In the case of data management, there is a large amount of manual intervention, which can lead to errors in handling. In addition, there are many local databases that are not easy to share, nor is there a corporate data store for non-time series data.

The MOU with Statistics Canada is facilitating access to a wider range of detailed confidential data, and a number of important projects have been started and/or completed that would not otherwise have been possible. Given that Bank researchers want to do much of the work themselves, most decide to use the "deemed employee" approach. This enhanced relationship continues to serve us well; resulting in several Working/Discussion Papers.

6.4 Household data

Increased attention has been paid to the evolution of household balance sheets in connection with financial stability issues in recent years. In addition, if financial channels are important for real activity, ignoring or underestimating the importance of these channels – especially during times when asset prices are growing or contracting strongly – may lead to inappropriate policy.

There are a number of data initiatives taking place to address the Bank's demand for more timely and complete information on the household side. We expect Statistics Canada's redesign of the Survey of Household Spending to include more frequent updates on household wealth. Implementation is expected in 2010 for reference year 2009. Previous wealth surveys (Survey of Financial Security) were conducted in 1978, 1984, 1999 and 2005.

Since 2004, the Bank has purchased a quarterly wealth survey from a commercial vendor given its timeliness and coverage. These data have been used more intensively over the last few years for both monetary policy and financial system analysis. To learn more about its data quality, it was recently compared with Statistics Canada's wealth survey. The main findings are:

- The commercial data on debt and assets compare quite well with information from Statistics Canada, with some exceptions.
- Methodological differences (ie household and income definitions) may be key factors driving the observed discrepancies in the results.

The vendor data, therefore, seem quite robust, suggesting its continued use in Bank analyses. Over the last two years, we have made incremental investments in the survey by paying for additional questions on mortgage refinancing and household spending.

Household credit accounts for about 70% of the total loan exposure of banks in Canada. Hence, work is underway to improve understanding of the financial position of households under different scenarios and to estimate household default risk (Djoudad and Traclet (2007)). One project uses the estimated default equation (from Statistics Canada's 2005 wealth survey) and household-level vendor data to run various stress-testing scenarios.

Another key gap identified by the Bank is the lack of data linking information on the assets/debts of households with expenditure patterns. Such data would, among other things, allow for a better understanding of adjustments to higher interest rates in terms of magnitude and timing. Statistics Canada will pilot a new longitudinal survey in the fall that aims to cover socio-economic issues, including household assets and debts, income and expenditures. The design of the survey is based on the German Socio-economic panel, the British Household Panel Survey, and the Household, Income and Labour Dynamics in Australia. If the survey proceeds, we expect a broad picture of household spending (on food, shelter, clothing, transportation and other expenses) linked to household wealth.

In 2007, the Bank purchased an extensive micro database on consumer credit in Canada. The quality of these data is very good because the information has been obtained directly from financial institutions. A special historical cube was created for the Bank with data back to 1992. Going forward, these data will be used to provide a more in-depth analysis of consumer credit for monetary policy (eg distribution along product lines and utilisation rates

for lines of credit), and from a financial stability perspective, we are investigating potential leading indicator properties.

7. Conclusion

Recent financial market difficulties and tightening credit conditions are still unfolding before our eyes. Financial activity now represents a much larger share of aggregate economic activity than it did 20 or 30 years ago. Moreover, financial crises over the past several years have put pressure on central banks to tackle tough issues as they focus more attention and formalise financial system functions. These developments underscore the need to ensure access to relevant and timely financial data that support work on key Bank functions.

Similar to 70 years ago, prior to unemployment and GDP statistics, financial data are far from optimal. There is clear evidence that other central banks recognise the need to develop an infrastructure in order to build a more rigorous framework for examining implications of developments in the financial system. An internationally agreed methodological framework for security statistics would be a positive step.

Improved financial data would benefit several areas of work at the Bank of Canada. The financial data strategy positions the institution to meet its mandate well into the future. This new direction is consistent with the growing importance of financial issues in Canada (and in many other countries), which will increase the need for analysis and research using such data. The ultimate aim is to shed a brighter light on our transforming economy leading to better policies and regulation.

References

Bank of Canada (2006): "Moving forward: Building the future together, medium-term plan 2007–2009", Bank of Canada.

Black, C (2003): "Franklin Delano Roosevelt: Champion of freedom", *PublicAffairs*, New York.

Coutu, DL (2003): "Sense and reliability", *Harvard Business Review*.

Davis, EP (1999): "Financial data needs for macroprudential surveillance: What are the key indicators of risks to domestic financial stability", *Handbooks in Central Banking Lecture Series*, no. *2*, Bank of England.

Djoudad, R and V Traclet (2007): "Stress-testing the Canadian household sector using micro data", *Financial System Review*, Bank of Canada.

Dodge, D (2003): "It all starts with the data", speech delivered at the Conference of European Statisticians, Geneva, Switzerland.

Freedman, C and W Engert (2003): "Financial developments in Canada: Past trends and future challenges", *Bank of Canada Review*.

Greenspan, A (2001): "The challenge of measuring and modeling a dynamic economy", speech delivered at the Washington Economic Policy Conference of the National Association for Business Economics (NABE), Washington, DC.

Hartman, O and M Kwast (2005): "Managing financial research in central banks", Central Banking Journal, Central Banking Publications.

Haymes, GJ (2008): "Discussant comments on the IMF's Financial Soundness Indicator initiative and on central bank experiences in developing relations with data providers", IFC Bulletin, no 28, August.

Haymes, GJ and BP O'Reilly (2005a): "Formulating a strategic plan for financial data", *IFC Bulletin*, no 21. Brussels: Irving Fisher Committee.

——— (2005b): "Strengthening contacts with key data suppliers", *IFC Bulletin*, no 22, Brussels: Irving Fisher Committee.

International Monetary Fund (2005): "Household balance sheets", *Global Financial Stability Report*.

——— (2008): "Market update", *Global Financial Stability Report*.

Kroszner, RS (2008) Comments on the report "Innovation measurement: Tracking the state of innovation in the American economy", Prepared for the Secretary of Commerce by The Advisory Committee on Measuring Innovation in the 21st Century Economy.

O'Reilly, BP (2004): "Financial data: Approaches in selected countries", *IFC Bulletin*, no.18, Brussels: Irving Fisher Committee.

O'Reilly, BP and P Van den Bergh (2005): "Overall summary of the workshop", Proceedings of the Bank of Canada/IFC Workshop, *IFC Bulletin*, no 23, Brussels: Irving Fisher Committee.

Sveriges Riksbank (2005): "Swedish households' debt-servicing ability 1997–2003", *Financial Stability Report*.

Schembri, L (2005): "Conference summary: Canada in the global economy", *Bank of Canada Review*, Spring.

Smith, P (2005): "Broadening the scope of Canada's national accounts", *HORIZONS*: Policy Research Initiative, vol 8, no 1.

St-Amant, P, C Gauthier and O de Bandt (2008) "Developing a framework to assess financial stability: Conference highlights and lessons", *Bank of Canada Review*, Spring.

Stevens, G (2005): "The changing statistical needs of central banks", speech delivered at the International Statistical Institute conference, Sydney, Australia.

Van den Bergh, P (2005): "Overview of past, current and future developments of the IFC", background material for an IFC administrative meeting.

White, WR (2004): "Economic and financial statistics: A glass half full or half empty?", speech delivered at the IFC conference, Basel, Switzerland.

Practical examples of policy relevant uses of security-by-security data

Günther Sedlacek[1]

Introduction

International requirements placed on securities statistics have increased, among other things for monetary policy reasons and for monitoring financial stability. At the same time, the harmonisation of the requirements on different statistics has been pushed. Apart from the need to provide data for balance of payments, international investment position and financial accounts, other statistics, such as statistics on security issues, government finance, other financial intermediaries or on the international role of the euro, define special demands.

Because of the growing importance of security markets, financial market analysts, economists and supervisors require supplementary statistics and ad hoc information.

The paper gives a brief overview of security statistics collection systems in general and the Austrian security-by-security (sec-by-sec) information system in particular. Sec-by-sec systems have many advantages (eg enhanced possibilities of data quality management, flexibility concerning changing output requirements, and reduction of reporting burden); however, the main focus of this paper is to show how sec-by-sec data can be used to support data quality managers, analysts and policymakers in their work. Finally, the paper discusses the necessary preconditions for meeting the expectations of these stakeholders regarding a sec-by-sec information system.

Security statistics collection systems

Internationally, two different basic collection schemes are applied for collecting information on securities for different statistics:

1. a security-by-security scheme using identifiers (mostly the ISIN[2]) for securities
2. an aggregated basis scheme under which precompiled data are requested from respondents.

A security-by-security reporting system basically collects data about stocks (and flows) for each single security[3] on an investor-by-investor basis or grouped by the economic sector of the investors. The compiler calculates the required output, using primary data about each single security (instrument classification, nominal currency, maturity, issue and redemption price, coupon rate, market price, outstanding amount etc) and its issuer (country, sector and industry). Thus, the work of classification, calculation, valuation and aggregation is transferred from the respondent to the compiler.

---

[1] External Statistics and Financial Accounts Division, Austrian National Bank, guenther.sedlacek@oenb.at.

[2] International Security Identification Number.

[3] Some sec-by-sec reporting systems additionally collect primary data from the reporting agencies.

By contrast, 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.

In practice often a mixture of both collection systems is applied. A sec-by-sec scheme is used for available ISIN codes and for reporting agencies belonging to the financial sector; aggregated schemes can be used for securities without an ISIN code and in general for reporting agencies belonging to the non-financial sectors.

The Austrian security-by-security system

In Austria, both concepts were discussed intensively with the respondents, and in 1991 a pure sec-by-sec reporting and compilation system[4] was introduced for balance of payments purposes. Although initially 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 introduced that also served the needs of the financial accounts statistics. At the beginning of 2006 the upgraded sec-by-sec system went into production, and by the end of 2008 the compilation of the ECB investment fund statistics based on fund-by-fund and sec-by-sec data will be fully integrated into this system.

The Austrian securities data collection and compilation system is based on a securities database, which is linked to a business register, and a database of security holdings by investors or investor groups. Primary data on securities are primarily bought from the Austrian and German numbering agency and are increasingly taken from the ESCB Centralised Securities Database (CSDB). Issuer information about Austrian issuers is primarily taken from the official business register and about foreign issuers from the German numbering agency and the ECB.[5] Information on holdings is reported indirectly by custodians or – in special cases – directly by the investors on a sec-by-sec basis. Figure 1 gives an overview of the Austrian sec-by-sec information system.

The monthly reports of the custodians on 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 (with the support of the Austrian National Bank); this grouping of the investors is based on the ESA 95 sector classification, but is more detailed for some of the sectors. The reports for each group of investors are broken down by ISIN code and include information about stocks (and flows), but no primary data on securities.

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

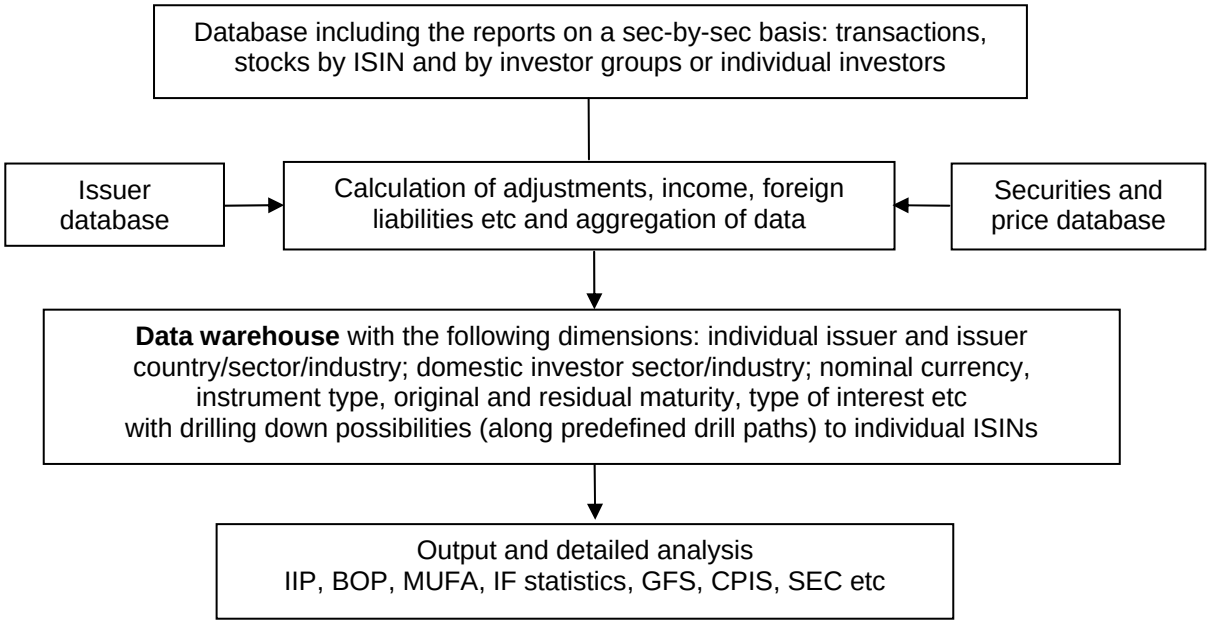
---

4 A pure sec-by-sec system in this context means that no aggregated reports are allowed. Securities without an official ISIN code have to be reported with an internal ISIN code.

5 CSDB and MFI list.

Figure 1

Overview of the Austrian security-by-security information system



Practical examples of policy relevant uses of security-by-security data

Sec-by-sec data allow a detailed and flexible analysis of specific instruments (bonds and notes as well as equities), specific issuers and domestic investors or investor groups. Data quality managers and data analysts can both benefit from this feature. For data quality managers the correct treatment of borderline cases and specific instrument categories, such as strips, bonds with a pool factor or index-linked bonds, can be monitored. Plausibility checks can be carried out by drilling down to the sec-by-sec level, supported by an adequate design of the data warehouse. Errors can thus be easily identified. For data analysts this flexibility of drilling down to more detailed levels or even to a sec-by-sec level allows very specific questions to be answered. This shows that both user groups can also benefit greatly from each other. Data quality managers learn much about the financial market, and data analysts/researchers can support the data quality assessment by using more detailed data.

The following examples show how some of the requests addressed to the External Statistics Division of the Austrian National Bank over recent years were easily answered.

In crisis situations, the main focus often lies on specific instruments, countries, industries or companies. This often raises the question of the extent to which Austrian investors, and which sectors are affected by such a crisis.

For example, when Parmalat, a large European food production company, encountered difficulties in 2003, the possible consequences for Austrian investors was (at least partially) estimated by drilling down to the securities issued by the Parmalat group. This also happened during the crisis in Argentina at the beginning of this century, resulting in significantly falling prices of government bonds; and in 2007 when the trading of some European ABS funds was stopped because of the illiquidity of the market. In such cases, the necessary breakdown for analysis cannot be defined in advance, but a security-by-security database makes it possible to extract the necessary information quickly.

Another recent example relates to the Austrian stock market, where in 2007 shares of listed real estate companies (and related share-bonds) showed a much more negative trend than

the rest of the market. It was shown that domestic private households in particular had invested greatly in these shares[6] during the previous years. From 2000 to 2006 the percentage of real estate shares in the stock portfolio of Austrian private households increased from about 5% to almost 30% in terms of market value. Due to this high concentration of household equity investments in a specific market, the price loss of private households caused by shares was significantly higher in 2007 than for other sectors. In January 2008 the development of the whole stock market was very negative, and the shares of listed real estate companies was not able to escape this trend.

A sec-by-sec information system also supports the analysis of significant changes of specific subcategories (eg investments in or issues of money market papers of a specific sector) and – to some extent – unexpected developments. For instance, in 2007 there was a special request from the Financial Market Analysis Division about Austrian direct and portfolio investments in the CEEC region. The analysis was motivated, among other things, by the significant increase of Austrian investments in debt securities of the new EU member states and some other eastern and southeastern European countries, which have already reached a higher level than the investments in the United States. The analysis delivered further insight into this development, in particular by investors (individual and groups) and issuers (individual or sector, country). Another example is a recent request by the users of the financial stability area related to exceptionally high net issues of bonds by Austrian banks in the first half of 2007. Further breakdowns by residual maturity (and other attributes) were required to analyse possible maturity mismatches.

In recent years corporate bonds have become increasingly important in Austria. An analysis focusing on issuer details, the currency of the issue, the interest rates offered and the liquidity of the market can easily be carried out with the help of a security-by-security system (for the past as well). Similarly, the importance of covered bonds and asset-backed securities can be analysed, eg to support the analysis of liquidity risks aspects.

From a risk perspective, a sec-by-sec information system allows several aspects to be analysed. The assets of specific investors or investor groups or, with some limitations, the liabilities can be analysed, for example, by

- Individual countries and country groups (regional risk and geographical diversification)
- Residual maturity (reinvestment/refinancing risk)
- Type of interest (interest rate risk)
- Nominal currency (exchange rate risk)
- Rating and/or sector of issuers (credit risk)
- Type of instrument (market risk)
- Stress testing (interest rate and exchange rate risk)

[6] In fact, there are five relevant shares of listed real estate companies in the Austrian stock market.

Conclusions

It is expected that a well designed security-by-security information system, which integrates issuer, holder, instrument and business information, will

- meet all official requirements of security statistics,
- reduce the responding burden,
- improve the output quality, and
- offer the needed flexibility
  - in the case of changing requirements caused by rapidly changing financial markets,
  - for analysis, and
  - ad hoc data requests.

However, the flexibility to support a more detailed policy relevant analysis depends on specific aspects of a sec-by-sec system; in particular the

- quality of the available issuer and instrument data, also at a very detailed level of classification, which would probably not be so important from a pure output perspective,[7]
- availability and granularity of information (eg rating, type of instrument/interest etc),
- quality and level of detail of holder information (individual holders, holder groups),
- the technical design of the data warehouse, which should allow user-friendly navigation through the huge volume of data.

Thus, the developer of such a system must find the right degree of complexity and information; which is finally a trade-off between costs and benefits.

References

Hille, Erich (2005): "Building a securities information system on a security-by-security basis", *IFC Bulletin*, no 23, October.

Hille, Erich and Günther Sedlacek (2005): "Security-by-security collection system", *IFC Bulletin*, no 22, September.

Sedlacek, Günther (2007): "Real estate shares in Austrian households' portfolios – Development from 1999 to 2007", *Statistiken Daten & Analysen Q2–2008*, Austrian National Bank.

[7] This depends very much on the quality of the data provided by commercial data vendors and on data source management.

Session 8

Cooperative efforts to improve securities statistics

Chair: Alfredo Leone, IMF

Papers: Cooperation to improve European and national securities statistics
Stefan Brunken, Deutsche Bundesbank

Improving the BIS debt securities statistics
Paul Van den Bergh, Bank for International Settlements

Cooperation to improve European and national securities statistics

Stefan Brunken[1]

Introduction

Worldwide developments, such as globalisation, financial innovation and dynamic changes in the structures and reaction patterns of the markets have led to a higher demand for more detailed, timely, and harmonised securities statistics that make it easier for users and policymakers to respond quickly to, or even anticipate, financial market developments or strains.

These requirements may increasingly be met by moving gradually to innovative statistical compilation systems, involving the collection of highly granular data at individual security or loan level. The underlying idea is that such data can be arranged and aggregated by the statistical compilers themselves in a highly flexible fashion, rather then relying on preclassified and preaggregated "blocks" of reported information that may only be changed once in a while, with high implementation costs and a rather long implementation lag. Modern IT systems and programmes are sufficiently capable of providing the strong technical support needed for handling and processing huge amounts of micro data.

Security-by-security collection systems

Securities statistics are particularly suited to this approach as (i) the majority of securities have a unique identifier[2] and (ii) as many of the analytically relevant classifications of securities and issuers may be obtained from commercial sources.[3] They can be consolidated, appropriately complemented with additional internal source data, in a reference securities database. As a result, only very basic data are required from the reporting agents, including the identifiers and amounts of each individual security, which are then matched by the compiler with the reference database to produce statistics.

Security-by-security collection systems in combination with a securities reference database offer several advantages, providing a strong business case:

- *Flexibility/more detail:* Input data granularity, in combination with a comprehensive reference database, allows in principle the flexible compilation of very detailed statistics for many different purposes and user groups at rather short notice ("time-to-market").
- *Higher data quality:* Security and issuer features are usually no longer provided by reporters who are less familiar with statistical concepts, such as SNA93, but are now under close control of statistical experts who are able to regularly monitor the quality of the reference database.

---

[1] Senior International Advisor, Statistics Department, Deutsche Bundesbank, Stefan.Brunken@bundesbank.de.

[2] ISIN, CUSIP, SEDOL codes etc.

[3] Holder information is more difficult to come by and has to be derived largely from institutional and official sources.

- *Consistency (across individual data and statistical domains):* In using the same reference database, the classifications of securities and issuers (and, in future, maybe even holders) are consistent across several individual reports and statistical domains.
- *Reduction of the response burden:* Under the concept of security-by-security reporting, it is no longer necessary, in principle,[4] for data to be classified and aggregated, thus reducing the statistical costs for the reporting agents significantly. The flexibility of security-by-security systems (see above) also leads to a stabilisation of statistical requirements over time. In addition, data may be used for multiple purposes. This reflects well the political commitment at EU level, and also in Germany, to reduce the administrative burden.

It is against this background that the European System of Central Banks (ESCB) has taken the strategic approach to move gradually from aggregated to security-by-security based securities statistics. In doing so, the aggregated securities statistics need to be transformed, in a phased and coordinated fashion in the coming years, into security-by-security compilation systems.[5] This move has already been started. It is strongly supported by the development of a single securities reference database within the ESCB, which is described in the following chapter.

The role of the ESCB Centralised Securities Database

The development of a single reference securities database in the ESCB – the Centralised Securities Database (CSDB) – is the cornerstone of the transition to security-by-security based securities statistics in Europe. Therefore, the project has the highest strategic priority for the ESCB.

The CSDB aims to cover all debt securities (including those with a hybrid structure), shares and mutual fund shares issued or held by euro area residents, as well as all instruments denominated in euro. It currently contains around 4 million individual securities, for which the aim is to store up to around 300 attributes related to the instruments and the issuers; holder information may be added at a later development stage. It is currently sourced by five commercial data providers, 14 EU central banks (NCBs) and internal sources of the European Central Bank (ECB), such as the Financial Markets Database.[6]

Yet the CSDB may not only be seen as the "catalyst" for the euro area wide transition to security-by-security based collection systems but it is also considered superior to local securities reference database solutions once the initial technical and organisational challenges involved with the setup of a system of such complexity have been successfully tackled:

- *Higher coverage and data quality:* The CSDB consolidates micro data from both ESCB-internal and commercial sources for the common use, thus leading to a higher coverage of instruments and attributes, in particular regarding non-resident issues. Furthermore, data quality management work is shared in a network on the basis of comparative advantages.[7]

---

4 To the extent that the relevant information is available in the reference securities database.

5 See also the last chapter "Current situation and outlook".

6 More information regarding the CSDB is shown in the contribution to this IFC Workshop "The CSDB project of the ESCB" by Frank Mayerlen, ECB.

7 Table 1 shows the division of labour.

- *Efficiency:* The common sourcing and quality monitoring provides also for efficiency gains. In addition, the CSDB may obviate the need to update similar databases at national level unless they are needed as a source or for data quality monitoring.
- *Consistency (cross-border):* The CSDB will ensure a consistent classification of the security and issuer features throughout the euro area,[8] thereby further increasing the degree of harmonisation of euro area statistics.

The CSDB is a pioneer project in many respects. It is unique in terms of its technical setup, in particular the flexible data model in the new ("Phase 2") system, the large volume of data stored and processed as well as its complex algorithms for the selection of the best[9] out of several "candidate sources". It is also new in the world of statistics. The CSDB project is the first cooperative project within and even beyond the ESCB statistical function, involving the need to establish, and further develop on an ongoing basis, sound operational business procedures.[10]

Governance structure and operational framework

A certain minimum governance structure is needed in running a supranational securities database of such ambition and complexity. Common agreements are needed on the scope and financial budget of the project; the technical framework, its maintenance and development; as well as on methodological issues. Furthermore, arrangements have to be put in place for the development and regular review of the operational framework and the business procedures (including the tasks, processes and quality benchmarks for the database and the statistics produced on this basis) as well as for the sharing of financial, human and IT resources. In addition, legal clarity is needed as to the possibility of exchanging confidential data and the terms of usage of commercial source data. The former aspect is addressed in Europe by supranational statutes and guidelines. The same goes for many of the arrangements set out above, in particular the mutual financing of the CSDB project by the ECB and the 15 central banks of the euro area.

Table 1 shows that while the application is technically maintained and developed by the ECB, the CSDB has been an ESCB project from its inception, reflecting the participation of NCBs in the definition of the timetable, budget, organisational framework, shared tasks, processes and quality benchmarks of the database, as well as in its financing, sourcing and quality monitoring. The latter two tasks are also supported by the Bank for International Settlements (BIS), which has been actively involved in the development of the CSDB from the beginning. This requires a close coordination at different levels: within the CSDB Network;[11] between the ECB and external counterparts, such as system developer and commercial data providers; between statistical and IT experts; between different statistical domains and between experts and managers.

---

8 The EU countries outside the euro area may also use the CSDB.

9 The so-called "golden copy".

10 These procedures need to be adapted as and when new statistics, which may require different data as well as specific methodological, technical and operational solutions, are produced with the support of the CSDB.

11 The CSDB Network consists of the European System of Central Banks and the BIS. In addition, two statistical offices are associated. For the responsibilities of the different network members, see Table 1.

Table 1

Stylised roles of CSDB Network members

CSDB-related task	Owner				
	ECB	Euro area NCBs	Remaining EU NCBs	BIS	Two statistical offices[1]
Definition & decision of/on scope, timetable, budget, organisational framework, shared tasks, processes and benchmarks	■	■	■		
Project ownership[2]	■	■	■		
Financing of the CSDB project	■	■			
Technical development and maintenance[3]	■				
Gradual transition to security-by-security systems and compilation of statistics with the CSDB[4]		■	■		
Business coordination[5]	■	■	■	■	■
IT coordination[6]	■	■	■		
Sourcing[7]	■	■	■	■	
Data quality management[8]	■	■	■	■	■

[1] Ireland's Central Statistics Office (CSO) and the UK's Office for National Statistics (ONS). [2] System owner of the CSDB is the ESCB Statistics Committee. [3] The development work has been largely outsourced to an external system provider. [4] While the EU NCBs outside the euro area are not yet required to move to security-by-security systems, many of them have already initiated this process. [5] This is the task of the CSDB Business Coordination Group (CSDB BCG). More specifically, it develops proposals for the definition and regular adaptation of the organisational framework and the related business procedures, including the shared tasks, processes and quality benchmarks to ensure the necessary data quality for statistical production. It is currently chaired by the Deutsche Bundesbank. [6] While the external system provider and the ECB are responsible for the IT-related development and maintenance work of the CSDB, some ESCB-wide coordination takes place at IT level (eg regarding the connection of NCBs to the CSDB, the data model of the CSDB system and the data transmission within the ESCB). [7] Commercial data are procured by the ECB who keeps the contact to the data vendors. Additional internal data are provided by the ECB, NCBs and the BIS. [8] NCBs: Issues by resident entities. ECB, BIS: Issues by entities located outside the EU.

Current situation and outlook

Gradual change to security-by-security based securities statistics:

The first statistics to be produced euro area widely on the basis of security-by-security systems and the CSDB will be external statistics and statistics on investment funds. The current work by the CSDB Network is strictly prioritised to achieve this goal in early 2009. More and more statistics are expected to follow later in order to reap the benefits of security-by-security systems in combination with the CSDB over time. However, no clear indicative timetable has been defined so far. The tentative order of priorities is: (i) external statistics, (ii) statistics on investment funds, (iii) statistics on financial vehicle corporations, (iv) securities issues statistics, (v) financial accounts, (vi) government finance statistics, and (vii) MFI balance sheet statistics and other statistics.

The situation at the Deutsche Bundesbank:

Given the strategic benefits involved with security-by-security based systems and the CSDB, the Bundesbank is strongly committed to supporting this process. It is, as some other euro area NCBs, somewhat ahead of these developments and already uses the CSDB. Three different types of statistics are collected on security-by-security based systems: external transactions in securities (since 2002), securities issues statistics (since its inception) and securities deposits statistics (since 2006). The ***securities deposits statistics*** are of particular strategic relevance as they involve a security-by-security compilation of holder information for debt securities and (mutual fund) shares. While the MFI holdings are directly reported, holder data related to the non-MFI sectors are based on information provided by German custodians. The latter data are reported in partial aggregates by non-MFI holder sector and country.[12] The processing of around 300,000 securities involves a first grouping by ISIN number before further aggregations are made on the basis of CSDB extracts, which are used for the instrument and issuer information. The securities deposits statistics are legally based on two ECB Guidelines relating to external statistics and financial sector accounts and national implementation law[13]. Monetary, economic and financial stability analyses and the compilation of a broad range of statistics is supported, including the international investment position, the financial accounts, the Coordination Portfolio Investment Survey of the IMF and government finance statistics. While the classification of ***security-by-security data on external transactions in securities*** is currently been made with a local reference database, it is planned to use the CSDB quite soon. The ***securities issues statistics*** are based, as far as debt securities are concerned, on direct data collection involving MFIs in their capacity as issuer or underwriter; these statistics are an important source for the CSDB. A harmonised euro area concept for ***investment funds statistics is being implemented***. It will involve the collection of security-by-security data on securities holdings and mutual fund shares issued, which are expected to facilitate very detailed analysis on the portfolios of different fund categories, including hedge funds. It will become available from early 2009 and will be produced on the basis of the CSDB.

Current situation of the CSDB and immediate next steps:

The CSDB has been in production since 2005 and is already used by some NCBs. It is expected to start supporting the statistical production processes euro area broadly from early 2009 (see above). The current CSDB system is being enhanced (new Phase 2 A system) with a view to connecting all ESCB NCBs to the system, introducing an enhanced online data quality management interface and implementing a new flexible data model that is capable of coping with financial innovation. It is expected that the tasks by the CSDB Network, above all data quality management work, will be further defined after the successful completion of this phase, which is scheduled to be concluded by around mid-2008. Also, a new procurement round will be launched to further optimise the mix of commercial sources and enhance the data quality (“Data Source Management”). Further development steps, including the integration of holder attributes, may be considered in the medium to longer term.

The future: International collaboration on security-by-security databases?

After the successful completion of Phase 2 and a subsequent evaluation and stabilisation period, in which the technical infrastructure and data quality of the CSDB have stabilised, as well as the business processes in the CSDB Network, it should be technically feasible to link

---

[12] Holdings with foreign custodians are not covered for the non-MFI sectors.

[13] National implementation law is the general term for section 18 of the Bundesbank Act (being the national legal basis for the compilation of statistics) in combination with specific rulings ("Anordnungen") for each single statistics.

or connect additional partners to the network. In technical terms, this may be done by either linking/connecting regional/local security-by-security databases and the CSDB or by simply exchanging database extracts between the different owners of regional and local SDBs. The members of such a global network may also work under a joint data quality management framework to maximise the quality of data in areas that are currently not so much in the business focus of the different SDBs.[14] The sharing of data, expertise and costs would result in positive network externalities on a retrospective basis (a "win-win situation"). The cost efficiency of a global SDB or a network of regional SDBs is understood to increase with the number of connected partners.

However, several technical, legal and financial issues would first need to be addressed. Sound operational procedures and the terms of cooperation would also need to be defined, eg possible sharing arrangements in IT, human and financial resources. After an initial period in which the CSDB system and the business procedures in the CSDB Network have stabilised and been adapted to accommodate additional data and network members (as a precondition for further cooperation), the technical and operational implications of the relevant cooperation option, which are expected to be rather complex, would have to be addressed in detail first. As far as legal issues are concerned, some of the data stored in the CSDB are not publicly available and therefore subject to protective confidentiality provisions. While such data may be exchanged by statistical experts within the ESCB,[15] the use of this information by other institutions may not be permitted by law. The proportion of confidential data in the CSDB is rather small, though. And the IT-related implications might not be significant as technical procedures are already in place that manage the access to confidential data according to the assigned CSDB user profiles. However, similar confidentiality restrictions may also apply to data owned by the new network members. In financial terms, the overall costs of the global cooperation would need to be established and weighted against the merits mentioned in the previous paragraph. Apart from the IT-related expenses and coordination costs, the extension of the CSDB users would require an adaptation of the contracts with the commercial data providers and additional licences for the use of the CSDB portal and its different software packages. Similar considerations may apply to other SDBs sourced by commercial data.

The Working Group on Securities Databases (WGSD),[16] which was reconvened by the IMF in response to CSDB developments and recommendations by G8 and the CGFS, may discuss further the options for a creation of a global (network on) securities database(s) once the preconditions summarised above have been met, above all the stabilisation of the CSDB and the related business procedures. As a first step, the Group will develop best practices and guidelines for securities databases and statistics. The envisaged Compilation Guide for Securities Statistics will address the key methodological issues identified at this IFC workshop. The Guide will be consistent with international statistical standards but more operational. Some parts will be devoted to security-by-security reporting. The participation of (some) Central Banks in the WGSD is seen as very useful in this respect to take practical compilation issues into account.

[14] Each network member is considered to have best knowledge on the respective domestic market.

[15] This is enshrined in supranational EU legislation, which is intended to be even more aligned to this purpose.

[16] Senior statisticians from the BIS, ECB, IMF, World Bank and some Central Banks participate in the Group.

Improving the BIS debt securities statistics

Paul Van den Bergh[1]

Given the increasing role of international debt securities markets in global financial intermediation, and based on the recommendation of the Committee on the Global Financial System (CGFS), the BIS started to collect and publish quarterly statistics on these markets in the mid-1980s, as a complement to its international banking statistics. The BIS uses information sourced from commercial and institutional databases to compile its international debt securities statistics. Over the past two decades, the BIS has made data on available in printed and electronic form through its *Quarterly Review* and on the BIS website www.bis.org. Breakdowns are provided by residency and nationality of issuers, sector of issuers, currency denomination and maturity, and instrument. Additional breakdowns are possible and are made available on request. Data include amounts outstanding, gross issuance and net issues.

In the 1990s, these data were complemented with domestic debt securities statistics for selective countries. Sources for this dataset consist mainly of publications and websites of national central banks and other national agencies as well as some specific data sent by them on a bilateral basis. Breakdowns are sought with respect to sector and maturity/instruments. A limited number of tables on domestic securities are also included in the *BIS Quarterly Review* and posted on the BIS website.

In 2006 the CGFS Working Group on Financial Stability and Local Bond Markets, with the assistance of the BIS, organised a specific collection exercise covering data on issuance and holdings of debt securities for end-2005 data from a broad range of countries in major financial centres as well as emerging markets (see http://www.bis.org/publ/cgfs28.htm). Some of these datasets were subsequently updated (for end-2006 and end-2007). The CGFS noted the lack of comparability of securities statistics and recommended that central banks work with the BIS to make improvements in the domestic and international debt securities statistics it publishes regularly. In terms of requirements, the CGFS urged better breakdown of aggregate national data on debt issuance by currency of issue, sector of issue, maturity (including residual maturity), and instrument. It also recommended statistical measures of aggregate holdings of securities by broad sector, at least with a breakdown between residents and non-residents. The CGFS suggested that the BIS work with other international agencies to develop a methodological framework for debt securities statistics as well as to investigate the advantages and costs of security-by-security databases.

The BIS experience in compiling debt securities statistics from different sources has shown that it is difficult to obtain appropriate and internationally comparable data on debt securities at the individual country level as well as to compile global aggregates from national data. Internal research was carried out in recent year in order to identify ways to improve national securities statistics. The BIS's own research as well as the work of the CGFS confirmed that one of the main reasons for the relatively poor quality of data on securities statistics is the lack of an internationally accepted methodological framework for debt securities statistics.

In 2007, the IMF reconvened its Working Group on Securities Databases (WGSD) in response to the recommendations made by the CGFS and the Group of Eight (G8) countries,

---

[1] Head, Information, Statistics and Administration, Bank for International Settlements, paul.van-den-bergh@bis.org, +41 61 280 8432.

The Working Group agreed to take an initiative to draft a *Handbook on securities statistics*. The intention is to have a simple reference document, anchored in existing international statistical standards. The first draft of the *Handbook* will focus on statistics for issuance of debt securities, with subsequent drafts possible covering a framework of statistics on holdings of debt securities. The *Handbook* is not intended to serve as a detailed and operational compilation guide or manual. Expectations are that countries will be able to use the *Handbook* to improve their national statistics on debt securities, and thereby to contribute to improving the BIS data on domestic and international debt securities.

Already before the WGSD decided to embark on a project to draft a *Handbook on securities statistics*, the BIS contacted most of the more than 50 central banks of the countries that are included in its domestic debt securities statistics in order to achieve regular reporting of some key national data, and related documentation.[2] Central banks were asked to indicate, using templates similar to those included in the background paper of the IFC Workshop, the approach taken in their country for compiling and disseminating national debt securities statistics (and what type of debt markets and instruments actually exist for their country). Subsequently their assistance was, or will be, requested to bring together the existing national data from different sources and to map them into a coherent code structure (the underlying framework and code structure will be adapted in line with the presentation tables included in the background paper). On this basis, regular reporting of the statistics will be organised with the BIS, which will be able to use the information to improve the quarterly data it publishes in its *Quarterly Review* and on its website. With respect to the latter, the intention is develop a kind of statistical hub for domestic and international debt issues (in parallel, the BIS is also improving its international debt securities statistics, to align them better with the national data it will be collecting). The objective is to be able to make better and internationally comparable data available by end-2009.

The improved BIS exercise does not require central banks to introduce a new reporting system within their countries. The focus is on data that are already available, either stored in statistical databases or published in statistical bulletins and websites of central banks or other agencies. The intention is to capture a wide range of debt securities characteristics, although only a small subset of these will be relevant for a particular country given its market structure and regulations. Initially the exercise will focus on outstanding amounts of debt securities but the collection will be extended to statistics on gross and net issuance that are consistent with the data on outstanding amounts, if these can be provided. Additionally, data on holdings of debt securities could be collected across sectors (the CGFS will probably continue to ask for the data it has collected on holdings of debt securities for the time being).

Of the 41 central banks contacted, most have nominated an expert to work with the BIS in developing a regular reporting of their existing national data. Most of these have reported the initial qualitative information requested. Actual regular data reporting is gradually being implemented.[3] It is expected that the involvement of central banks in the BIS data collection exercise will contribute significantly to improving the data on debt securities published by the BIS.

---

[2] National central banks in the euro area were excluded from the initial exercise since they already publish a broadly comparable set of aggregate debt securities statistics that is generally consistent with the BIS framework.

[3] At some point the euro area central banks and the ECB will be contacted to see how their currently published aggregate securities statistics can be mapped in the BIS code structure and how they can subsequently be reported to be included in the BIS statistics.

Summary of discussions

Christian Dembiermont and Paul Van den Bergh

The Workshop followed the proposed agenda, starting with a discussion on the variety of uses of securities statistics and the range of data sources available for their compilation. The methodological approaches for compiling securities statistics were reviewed for some countries. Two sessions were devoted to specific methodological questions connected to statistics on the issuance of debt securities. Discussions also took place on data related to the holding/ownership of securities as well as on the advantages and disadvantages of security-by-security databases. Finally, the concluding panel covered possible cooperative efforts to improve securities statistics and make them more comparable internationally.

With respect to the ***use of debt securities statistics*** it was noted that they were important for monitoring monetary as well as financial stability and were good indicators of an economy's financial depth. This meant that user requirements might be rather varied, which could have an impact on the way statistics are, or need to be, collected and disseminated. At the same time, a broad consensus emerged early in the discussions on the need for internationally agreed methodological standards for securities statistics, which would allow relevant developments in major financial centres and in emerging markets to be captured (for the latter, for instance, a currency breakdown of debt securities issues might be more relevant than for the former).

The conference confirmed that there are a wide range of ***sources on securities market activity*** that could be used by data compilers. One major problem was the poor quality of many data sources, in particular those from commercial data providers. It would be helpful if all sources, and private data vendors in particular, could use a common internationally recognised classification for issues and issuers. There was clearly a role for statistical agencies, depositories and numbering agencies in harmonising the relevant nomenclature. This would assist not only institutional and commercial data providers but also reporting agents approached to collect information on securities holdings (eg custodians or institutional investors).

Due to the lack of appropriate international standards, it was clear that the ***practice of national compilers*** of securities statistics differed significantly. One major difference seemed to be with respect to the geographical breakdown of securities issuance. Reflecting the state of development of their national securities markets, compilers in emerging markets often collected debt securities data on a "location of issue" basis by focusing on the issuers in the "local" securities market. This could be appropriate where strict regulations applied to securities market activity, including capital controls. Another approach would use the principle of "residency of issuer", whereby issuance by residents would be captured at a global consolidated level (ie irrespective of the jurisdiction where securities were issued). This seemed to be the preferred approach for countries with more developed and open securities markets.

Notwithstanding the various national practices, it was noted that there were a number of ***methodological statistical standards*** which could be used as a reference for securities statistics, including the SNA and BOP manuals and guidelines (they would provide, for instance, a description of the concept of residency, sector and instrument classifications, and various principles for valuation and stock/flow measurement). These standards could be used as a reference for a more specific methodological framework for debt securities statistics. It was recognised, however, that the standards were mostly developed to facilitate general macroeconomic analysis and might need to be amended to properly cover requirements for monetary and financial stability analysis. Also, there were differences

between the methodologies of the SNA, the BOP and the Monetary and Financial Statistics (although a full-fledged integrated system of financial accounts, including a who-to-whom presentation, should, in principle, iron out the current discrepancies between the different manuals).

Several ***specific methodological challenges*** for debt securities statistics were identified. One example was the location of securities issuance involving offshore financial centres, where the location of the issue, the residence of the issuer and the residence of the possible guarantor might all be different. Hybrid securities posed a major challenge in terms of instrument classification. There were also issues related to the valuation of securities, including asset-backed instruments, and to the treatment of short sales of debt securities.

Despite these hurdles, there was strong support for defining standards that would follow fundamental economic and financial concepts, as set out in the stylised framework in the background paper produced by the BIS. There was an expectation that a simple conceptual framework could be developed relatively quickly. The alternative approach of addressing the specific data requirements for monetary and financial stability purposes one by one and in full detail was seen as too cumbersome. It would be useful if the conceptual framework could also provide specific metadata for debt securities data.

Discussions covered questions related to the issuance of debt securities and to ***securities holdings***, ie the relevant statistics that would allow the tracking of the (ultimate) ownership of securities. Some of the existing compilation exercises for securities holdings were presented, including the IMF's Coordinated Portfolio Investment Survey (CPIS), in which many central banks participated. The CPIS focuses on cross-border securities holdings. Interestingly, many countries, even those that participated in the CPIS, did not yet collect data on holdings of securities at the national level. Much more work was therefore needed in this area, including at the conceptual level.

The role of ***security-by-security databases*** as a means for improving securities statistics received considerable attention. A general consensus emerged that they were, in principle at least, a very useful tool. At the same time, questions were raised regarding the reliability of the underlying data sources, particularly those purchased from data vendors. Another concern was that such initiatives could shift a significant part of the collection burden from reporting agents to official compilers. The traditional reporting of aggregate positions required that the classification of securities and issuers be performed by the respective reporting agent (eg banks or custodians). With a security-by-security database, the burden would shift to the compilers of securities statistics, typically central banks. There was a general recognition that the costs of developing a security-by-security database could be significant.

Towards the end of the conference a broad consensus emerged to encourage ***cooperative efforts to improve securities statistics***. Support was expressed for two international initiatives launched to improve the comparability of debt securities statistics. The IMF had reactivated its Working Group on Securities Databases, which had agreed to draft a Handbook on Securities Statistics. The latter was expected to address the key methodological issues identified at the conference. The Working Group intended at a later stage to also look at the costs and benefits of promoting national security-by-security databases that could be linked to constitute a global security-by-security database (along the lines of the ECB's Centralised Securities Data Base).

The BIS has started a project to improve its domestic and international securities statistics. The central banks in the countries currently covered by its domestic securities statistics will eventually be contacted in order to achieve regular reporting of existing national securities data using a simple harmonised framework, similar to the stylised framework in the background paper produced for the conference (as indicated above, it was expected that this would be reflected in the Handbook on Securities Statistics).

Annex:
Participants in the workshop

Algeria	**Bank of Algeria** Mustapha Abderrahim Branka Achari-Djokic (Ms)
Argentina	**Central Bank of Argentina** Oscar C Marchelletta
	Ministry of Economy and Production Susana Beatriz Casillas (Ms)
Armenia	**Central Bank of Armenia** Lusine Harutyunyan (Ms)
Austria	**Austrian National Bank** Erich Hille Günther Sedlacek
Belgium	**National Bank of Belgium** Jan Smets
Brazil	**Central Bank of Brazil** Tulio José Lenti Maciel
Bulgaria	**Bulgarian National Bank** Emil Dimitrov
Canada	**Bank of Canada** Greg Haymes Maureen Tootle (Ms)
Chile	**Central Bank of Chile** Alfredo Fuentes
Croatia	**Croatian National Bank** Branimir Gruic
Czech Republic	**Czech National Bank** Vlastimil Vojacek
Denmark	**National Bank of Denmark** Majbrit Christensen (Ms) Tue Mollerup Mathiasen
Estonia	**Bank of Estonia** Jaanus Kroon Tiina Nomme (Ms)

European Union	**European Central Bank (ECB)** Werner Bier Alexander Cho Celestino Giron Pastor Frank Mayerlen
Finland	**Bank of Finland** Harri Kuussaari
France	**Bank of France** Emmanuel Gervais
Germany	**Deutsche Bundesbank** Bernd Braasch Stefan Brunken Gabriele Meinert (Ms) Ursula Schipper (Ms)
Ghana	**Bank of Ghana** Ivy Acquaye (Ms)
Greece	**Bank of Greece** Nicos Kamberoglou
Hungary	**Central Bank of Hungary** Edit Kalo Gódorné (Ms) Csaba Ilyes
Indonesia	**Bank Indonesia** Herina Prasnawaty Dewayany (Ms) Prijono Triono Widodo
Ireland	**Central Bank & Financial Services Authority of Ireland** Mary Everett (Ms) **Central Statistics Office Ireland** Stephen McDonagh John Sheridan
Italy	**Bank of Italy** Maurizio Iannaccone
Japan	**Bank of Japan** Chikako Ohashi (Ms)
Lithuania	**Bank of Lithuania** Rimantas Vaicenavicius
Malaysia	**Central Bank of Malaysia** Mohd Fitri Md Yusof
Mexico	**Bank of Mexico** Samuel Alfaro Desentis

Netherlands	**Netherlands Bank** Raymond Chaudron Coen Voormeulen
Norway	**Statistics Norway** Ole Petter Rygvold
New Zealand	**Reserve Bank of New Zealand** Ian Nield
Philippines	**Bangko Sentral ng Pilipinas** Mary Rose Espina (Ms)
Poland	**National Bank of Poland** Piotr Boguszewski Jacek Kocerka
Portugal	**Bank of Portugal** Maria do Carmo Aguiar (Ms)
Romania	**National Bank of Romania** Marian Mustareata
Russia	**Central Bank of the Russian Federation** Marina Pavlova (Ms) Anton Tokush
Slovakia	**National Bank of Slovakia** Ivana Brziakova (Ms)
South Africa	**South African Reserve Bank** Zophania Zeph Nhleko
Spain	**Bank of Spain** Eduardo Rodríguez-Tenés
Sweden	**Sveriges Riksbank** Britt Kerkenberg (Ms)
Switzerland	**Swiss National Bank** Stefanie Schnyder (Ms)
Thailand	**Bank of Thailand** Pusadee Ganjarerndee (Ms)
Turkey	**Central Bank of the Republic of Turkey** Cigdem Kogar (Ms) Hakan Toprak
United Kingdom	**Bank of England** Deborah Gould (Ms)

United States

Board of Governors of the Federal Reserve System
Carol Bertaut (Ms)
Joseph Gagnon
William L Griever
Susan Hume McIntosh (Ms)
Charles Thomas

Federal Reserve Bank of New York
Kenneth Aberbach
Debra L Gruber (Ms)
Frank Innocenti
Philip Papaelias
Leon Taub

US Treasury
Dwight Wolkow

Asian Development Bank
Lotte Schou-Zibell (Ms)

Bank for International Settlements
Christian Dembiermont
Denis Pêtre
Bun Ung
Kerry Wood

Inter-American Development Bank
Esteban Piedrahita

International Finance Corporation (IFC)
Alison Harwood (Ms)

International Monetary Fund
Claudia Dziobek (Ms)
Lucie Laliberté (Ms)
Alfredo M Leone
Jose Carlos Moreno
Ceyla Pazarbasioglu (Ms)
Armida San Jose (Ms)