

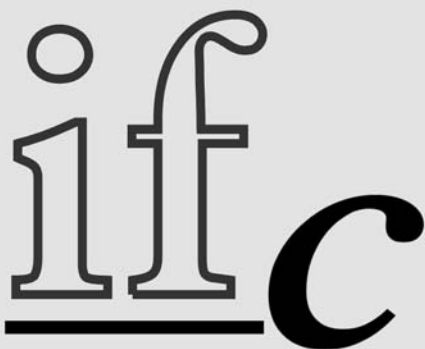
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IRVING FISHER COMMITTEE  
ON CENTRAL-BANK STATISTICS

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*ifc Bulletin*

No. 21 • July 2005



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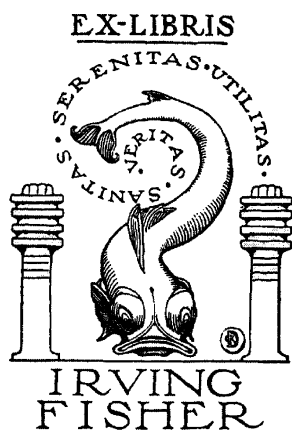
*Workshops F, G and H*

**PANEL DISCUSSION**

**Article**

*Building a data warehouse for a  
central bank - CDBMS*





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# ifc Bulletin

No 21 – July 2005

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## What is the IFC?

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

## Objectives

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

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

## Strategy

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

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

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

## What kind of topics are discussed?

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

## Membership and Structure

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

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

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

## A Short History

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

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

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

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

## IFC Bulletin

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

## SESSION 3

# Financial accounts – key issues

Chair: Leon Taub (Federal Reserve Bank of New York)

Papers: **Selected key issues of financial accounts statistics**

Reimund Mink (European Central Bank)

**The impact of expected changes in international accounting practices on compiling monetary and financial statistics**

Ekaterina Prokunina (Bank of Russia)

**Assessing household sector risk: an Australian perspective**

Carl Schwartz (Reserve Bank of Australia)

# Selected key issues of financial accounts statistics<sup>1</sup>

*Reimund Mink (European Central Bank)*

## I. Introduction

Financial accounts statistics are becoming increasingly important for monitoring the financial side of the economy and its links to the real side. Central banks are also relying on these data more and more as the rise of globalisation, cross-border ownership and financial innovation seem to have speeded up the transmission of policy and other effects. The usefulness of financial accounts statistics is also growing in the context of financial stability analysis allowing the derivation of macro-prudential indicators taken from the financial balance sheets and the transaction accounts of the various non-financial sectors of an economy. The use of financial accounts statistics, however, is often limited due to the lack of a full and integrated set of timely and high-frequency data. Therefore, the completion of a quarterly system of from-whom-to-whom financial accounts is seen as a major step to improve the understanding of the links between the sectors of an economy and the rest of the world. It also helps to disentangle the complexity of the financial system and its relationship to the real side of the economy.

This paper discusses key issues falling into three categories. They are linked to questions, which have to be addressed by moving to such a complex and detailed system of financial accounts. The issues are not representative, but they do reflect to some extent my own experience of constructing, compiling and using financial accounts. Chapter II deals with the first set of key issues, the design of financial accounts. Financial accounts are part of an integrated system of accounts as described in the System of National Accounts (SNA93) or in its European counterpart, the European System of Accounts (ESA95).<sup>2</sup> Data are usually provided in a non-consolidated form. This means that, for instance, corporate bonds issued by one corporation and held by another appear as both liabilities and financial assets in the balance sheet of the non-financial corporation sector. A more detailed presentation provides from-whom-to-whom financial accounts tracing the debtor/creditor relationships by sector and illustrating the links between stocks and flows for various financial instruments.

Chapter III elaborates on key issues falling into the compilation of financial accounts category: Compilation relies on numerous statistical sources, usually collected originally for other purposes. They are of high frequency and timeliness when taken from statistics on money and banking, balance of payments, government finance, or securities issues. Advanced financial accounts systems are based on a rather broad set of data, including statistics from security-by-security databases, corporate balance sheets or household surveys, if they are timely and detailed enough. Such a broad coverage of data with from-whom-to-whom statistical information substantially reduces the need to apply the so-called counterpart-method for drawing up the sector accounts. Otherwise, it requires some work in assessing which data sets should be chosen within the compilation process.

Finally, Chapter IV looks into key issues related to how financial accounts are disseminated and used for economic and policy analyses in current practice, such as monetary policy analysis, fiscal policy analysis, conjunctural analysis, and financial stability analysis.

<sup>1</sup> *The views expressed in this paper are those of the author and do not necessarily reflect the views of the European Central Bank.*

<sup>2</sup> *Commission of the European Communities – Eurostat, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank (1993), System of National Accounts 1993 (SNA 93), Brussels, Luxembourg, New York, Paris, Washington, D.C. and Commission of the European Communities, Council Regulation (EC) No 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community. Both concepts, the SNA93 and the ESA95 are in all respects consistent with each other.*

## II. Designing financial accounts

### A. Buildings blocks

Financial accounts are part of an integrated system of accounts as described in SNA93 or ESA95. The system of economic accounts by institutional sector traces the whole economic process from the production of income, through the redistribution of income, consumption and saving, through the accumulation of non-financial and financial assets, to the position of net worth for each institutional sector. The financial accounts are part of this system dealing with financial wealth and its accumulation in the form of financial assets and liabilities.

Financial accounts are compiled and presented in different degrees of complexity. They may be available as highly aggregated tables of financing and financial investment for specific sectors, as matrices with breakdowns by sector and financial instrument, or as three-dimensional tables within a from-whom-to-whom context tracing the debtor/creditor relationships and illustrating the links between stocks and flows for various financial instruments and institutional sectors. Constructing a system of financial accounts requires a variety of well-defined building blocks. In general, it requires three main components: (a) a definition of institutional units and their groupings into sectors and sub-sectors; (b) a description of economic activities and their results as flows and stocks; and (c) an architecture for the system of accounts.<sup>3</sup> Finally, some special features are needed to build a system of from-whom-to-whom financial accounts.

### B. From-whom-to-whom financial accounts

Financial accounts measure the flows (as transactions, revaluations and other changes in the volume of assets) and stocks of financial instruments for the economy's sectors and for the rest of the world, tracking the instruments as they move from the sectors that provide financing to those that invest them in financial assets. Consequently, financial accounts within the from-whom-to-whom framework provide, for the financial instruments, additional information on the debtor and creditor sectors.

Counterpart information within the financial accounts further enhances the analytical usefulness of the data. From-whom-to-whom information enriches, for example, considerably the approach of monitoring monetary transmission processes. Because price and interest changes that affect the sectors' various financial assets and liabilities play a major role in this process, the analysis also focuses on stock-flow adjustments within the sectors. In this respect, it is possible to analyse how financial assets, liabilities and balancing items as transactions, other flows and stocks have been changed as a consequence of policy decisions.

The following sections raise various issues related to the construction of from-whom-to-whom financial accounts. They describe how from-whom-to-whom accounts are reflected in the various methodological handbooks, deal with the quadruple-entry system as designed for this purpose, and present a complete system of from-whom-to-whom financial accounts. Furthermore, they explain the relationship between the from-whom-to-whom financial accounts and consolidation and distinguish between the various types of from-whom-to-whom financial transactions. Finally, components are characterised which determine the complexity of the system, like the different types of stock and flow accounts, number of instrument categories, debtor sectors, and creditor sectors.

#### 1. From-whom-to-whom financial accounts as described in methodological handbooks

In SNA93, from-whom-to-whom accounts (detailed flow of funds accounts) are based on two three-dimensional tables. The first table, Table 11.3a of chapter 11.F, records transactions in assets cross-classified by type of asset and by debtor sector. The second table, Table 11.3b, records transactions in liabilities cross-classified by type of liability and by creditor sector. Similar tables may also be designed for balance sheet items. Chapter 11.F also describes how to use such tables in various economic policy areas. ESA95 defines such a system as a financial account by debtor/creditor (of a sector or of the rest of the world), showing a breakdown of the net acquisition of financial assets by debtor sector and of the net incurrence of liabilities by

<sup>3</sup> For the System of National Accounts four main features are mentioned: (a) statistical units and their groupings; (b) flows and stocks; (c) the system of accounts and the aggregates; and the input-output framework (see ESA95, paragraph 1.26).



creditor sector. The same applies for the financial balance sheet by debtor/creditor (of a sector or of the rest of the world).<sup>4</sup>

The IMF Government Finance Statistics Manual 2001 (GFSM) outlines the importance of classifying transactions in (and stocks of) financial assets and liabilities by (counterpart) sector. It stresses that, for a full understanding of financial flows and the role they play in government finance, it is often important to know not just what types of liabilities a government unit uses to finance its activities, but also which sectors are providing the financing. In addition, it is often necessary to analyse financial flows between sub-sectors of the general government sector. Table 8.4 of the Manual is an extended version of the ‘government part’ of Tables 11.3a and 11.3b of SNA93. Financial assets and liabilities are both classified by the residence and the sector of the unit that issued the financial asset or holds the liability. Even for the non-resident units (referred to collectively as the rest of the world), it is important to know not only the amount of financing received from non-resident units, but also the types of non-resident units supplying the financing by sector.

The GFSM also focuses on another important reason for collecting and compiling such counterpart information. It states that some financial assets and liabilities, most typically deposits, securities other than shares, loans, and other accounts payable/receivable, require (information on) the debtor to pay interest. Interest accrues continuously and increases the total amount that the debtor will be required to pay. An appropriate attribution of the interest accrued to the parties requires the collection of counterpart information because the value of these assets and liabilities includes all interest that has been accrued and not yet paid.<sup>5</sup>

The IMF Quarterly National Accounts Manual and handbooks dealing solely with the rest of the world account like the IMF Balance of Payments Manual, 5<sup>th</sup> edition, refer to the importance of showing detailed counterpart information. By definition, assets and liabilities of the rest of the world account are presented in relation to their counterparts in resident sectors. For instance, debt qualifies as ‘external’ purely because of the residence status of the creditor.

To conclude the three-dimensional tables as described in SNA93 cover the breakdowns by instrument, debtor and creditor sector necessary for a detailed from-whom-to-whom presentation designed either for the whole economy or for specific sectors and sub-sectors. The tables allow an analysis who is financing whom, to which amount and by which instrument. Questions could be answered like: What are the counterpart sectors of the financial investment and financing decisions of a sector or a subsector?

## ***2. Double-entry and quadruple-entry systems***

For a unit, a sector or an economy, national accounting is based on the principle of double entry. Each transaction is recorded twice, once as a resource (or a change in liabilities) and once as a use (or a change in assets) or twice as a change in assets or as a change in liabilities (an increase combined with a corresponding decrease). The sum of transactions recorded as resources or changes in liabilities must equal the sum of transactions recorded as uses or changes in assets, thus permitting a vertical check on the accounts’ consistency.

In practice though, national accounts with all units and all sectors are based on the principle of quadruple entry, since most transactions involve two institutional units. Each transaction of this type is recorded twice by the two transactors involved. For example, a social benefit paid in cash by a government unit to a household is recorded in the accounts of government as a use under transfers and a negative acquisition of assets under currency and deposits. In the household sector accounts, it is recorded as a resource under transfers and an acquisition of assets under currency and deposits. On the other hand, transactions within a single unit (such as the consumption of output by the same unit that produced it) require only two entries, whose values have to be estimated.<sup>6</sup>

## ***3. A system of from-whom-to-whom financial accounts***

The generalisation of such a quadruple-entry accounting system leads to a system of from-whom-to-whom financial accounts. For such a system, four dimensions have to be specified: the type of accounts (balance sheet, transaction account, revaluation account and other changes

<sup>4</sup> See ESA95, paragraphs 5.13 and 7.69.

<sup>5</sup> See the IMF’s Government Finance Statistics Manual, paragraph 7.86.

<sup>6</sup> See ESA95, paragraph 1.50.



in the volume of assets account), the instrument categories, and the sectors (as debtors and creditors).

For this purpose, a four-dimensional system of linear equations is considered the appropriate way to present from-whom-to-whom financial accounts. For instance, a financial transaction  $F(i)$  in a specific period of time (from  $t$  to  $t+1$ ) between a debtor  $D(j)$  resident in a specific economy or area  $a(k)$  and belonging to a sector  $s(l)$  and a creditor  $C(m)$  resident in the same economy or area  $a(k)$  and belonging to a sector  $s(m)$  is described as:

$$F(i) = F(i)_{t,t+1} (D(j)_{a(k), s(l)}, C(m)_{a(k), s(m)})$$

The from-whom-to-whom financial transaction account of a sector or of the rest of the world is an extension of the non-consolidated financial transaction account, showing in addition a breakdown of the net acquisition of financial assets by debtor sector and a breakdown of the net incurrance of liabilities by creditor sector. Therefore, it provides detailed information on the debtor/creditor relationship, which is consistent with the financial balance sheet by debtor/creditor.

In the case of financial transactions on secondary markets, however, it does not provide information on the institutional units to which financial assets were sold or from which financial assets were bought; that is to say, the financial account by debtor/creditor does not provide a complete answer to the question of who is financing whom in an accounting period.<sup>7</sup>

The from-whom-to-whom financial balance sheet of a sector or the rest of the world is an extension of the non-consolidated financial balance sheet, showing in addition a breakdown of financial assets by debtor sector and a breakdown of liabilities by creditor sector. Therefore, it provides information on debtor/creditor relationships, which is consistent with the financial transaction account by debtor/creditor.<sup>8</sup>

Deriving the from-whom-to-whom financial transaction account and the financial balance sheet makes it possible to draw up from-whom-to-whom other flow accounts. This information is of value specifically for holding gains or losses, as it allows quantifying the various asset price effects measured for specific sectors vis-à-vis other sectors.

#### 4. Consolidation

Consolidation is the elimination of all intra-sector asset-liability positions, transactions and other flows. Consolidation can be applied to statistics of any group of units, including sub-sectors of the financial corporation or the general government sector, the entire public sector, or any other grouping considered holding analytical interest.

In general, consolidation is not used under SNA93. Moreover, from-whom-to-whom financial accounts are based on non-consolidated data, which are ideally broken down (for transactions) into intra-sector transactions, transactions with other resident sectors or sub-sectors, and cross-border transactions. Showing the creditor/debtor relationships they provide a detailed picture of the economy's financing and are considered very useful for understanding the channels through which financing moves from lenders to borrowers.<sup>9</sup>

Consolidated accounts may be built up for complementary presentations and analyses. Consolidation refers to the elimination, from both the asset and liability side, of positions, transactions, and other flows that occur between units when the latter are grouped. It also refers to the elimination of reciprocal financial assets and liabilities. It is important for the MFI balance sheet and full consolidation is used in government accounts. The purpose is to show the activities of the MFI or of the general government sector, or any other grouping of units, as if only a single unit existed.

#### 5. Financial transactions and their counterpart transactions

According to the quadruple-entry accounting system, transactions between two institutional units, sectors, or economies are recorded in the accounts of both. Financial transactions always have counterpart transactions in the system. Such a counterpart transaction may be a non-financial transaction or another financial transaction.

Non-financial transactions as counterparts may be transactions in products, distributive transactions, or transactions in non-financial non-produced assets. For example, the compensation of

<sup>7</sup> See ESA95, paragraph 5.13.

<sup>8</sup> See ESA95, paragraph 7.69.

<sup>9</sup> See ESA95, paragraph 1.58.

an employee is recorded in the accounts of the employer and in the accounts of the employee as a non-financial transaction, but also as a financial transaction. In cases where the counterpart transaction is a non-financial transaction, net lending/net borrowing of either the institutional units involved or the rest of the world will change.

The quadruple-entry identity also holds true for purely financial transactions: The issuance of debt securities by a government increases its debt and also its financial assets in cash. A household that purchases such debt securities increases its holdings of debt securities and decreases its holdings of currency. There is no effect on net lending/net borrowing.

There are two types of purely financial transactions: financial transactions that involve the two transactors directly and financial transactions on secondary markets, which usually involve three parties.

### 6. Financial transactions between two transactors

In these types of transactions, debtors and creditors usually coincide with the transactors. A credit institution (the creditor, S.122), for instance, grants a loan (F.4) to a non-financial corporation (the debtor, S.11). The receipt of cash (F.21) gives rise to a net acquisition of a financial asset by the credit institution and to a net incurrence of a liability by the non-financial corporation.<sup>10</sup>

Non-financial corporation (S.11)		Credit institution (S.122)	
+F.21	+F.4 (S.122)	+F.4 (S.11)	
		-F.21	

The same applies if, for instance, a central government unit (as the debtor, S.1311) issues a bond (F.32), which is acquired by a household (the creditor, S.14).

Central government (S.1311)		Household (S.14)	
+F.21	+F.32 (S.14)	+F.32 (S.1311)	
		-F.21	

The transactions are recorded within the financial transaction account (of a sector or the rest of the world). In cases where a transaction and its counterpart are both financial transactions, they may change the relevant units' totals of both financial assets and liabilities or the portfolio of financial assets and liabilities. Accordingly, financial transactions with financial transactions as counterpart lead to either a) a simultaneous rise or reduction in the financial assets and liabilities of both transactors, or b) an exchange of financial assets between two parties (see Table 1). The parties to the transactions can be resident institutional units or the rest of the world.

Another example is the buy-back of quoted shares by a non-financial corporation. It is assumed that the quoted shares are held by a household (see Table 2).

Transactions often involve the exchange of one financial asset for another without any exchange of currency or transferable deposits. Such operations include, for instance, the conversion of unquoted shares into quoted shares, of other deposits into transferable deposits, or of long-term debt securities into quoted shares. They raise the question of whether to treat the conversions as financial transactions or as other changes in the volume of assets. Within a system of from-whom-to-whom financial accounts such a conversion should be treated as two financial transactions, like the redemption of unquoted shares and the issuance of quoted shares.

### 7. Financial transactions on secondary markets

From-whom-to-whom financial accounts also make it possible to show economic activity on secondary markets and their impact. Financial transactions on secondary markets involve mainly securities, either debt securities, quoted shares or mutual fund shares, ownership of which can change without the direct involvement of the debtor. This type of transaction leads to accounting

<sup>10</sup> The sector, sub-sector and instrument classifications follow ESA95.

Table 1 – Financial transactions with counterpart financial transactions

<b>Simultaneous rise of financial assets and liabilities</b>		<b>Exchange of one financial asset for another</b>	
Households		Credit institutions	
Financial assets	Liabilities	Financial assets	Liabilities
Currency (+)	Loans (+)	Currency (-)	
		Loans (+)	
<b>Simultaneous reduction of financial assets and liabilities</b>		<b>Exchange of one financial asset for another</b>	
Households		Non-financial corporations	
Financial assets	Liabilities	Financial assets	Liabilities
Currency (-)	Trade credits (-)	Currency (+)	
		Trade credits (-)	
<b>Exchange of one financial asset for another</b>		<b>Exchange of one financial asset for another</b>	
Households		Credit institutions	
Financial assets	Liabilities	Financial assets	Liabilities
Currency (-)		Currency (+)	
Shares and other equity (+)		Shares and other equity (-)	
<b>Exchange of one financial asset for another</b>		<b>Simultaneous rise of financial assets and liabilities</b>	
Households		Credit institutions	
Financial assets	Liabilities	Financial assets	Liabilities
Currency (-)		Currency (+)	Debt securities (+)
Debt securities (+)			

Table 2 – From-whom-to-whom financial transactions involving quoted shares

<b>Buy-back of quoted shares by a non-financial corporation from a household</b>			
Household		Central government	
Financial assets	Liabilities	Financial assets	Liabilities
Currency (+)		Currency (-)	
Quoted shares (-) issued by a non-financial corporation			Quoted shares (-) acquired by a household

entries on the creditor side for both transactors and also on the debtor side. As an example, let us look at a household's purchase of a central government bond previously held by a non-financial corporation.

The issuance of a central government long-term debt security is reflected in the financial accounts as shown in Table 3a; the sale by a non-financial corporation to a household is shown in Table 3b. In the from-whom-to-whom financial accounts framework, the corresponding transactions on the secondary market involve only the creditors, while the change in ownership is reflected in the central government account as an 'other flow'.

#### 8. Components determining the complexity of from-whom-to-whom financial accounts

The complexity of the system is determined by the four dimensions of the system of accounts as mentioned above: (1) the type of account; (2) the financial instrument category or sub-category; and the sector or sub-sector as (3) a debtor sector or sub-sector and (4) a creditor

Table 3 – From-whom-to-whom financial transactions involving debt securities

a. Issuance of a long-term debt security			
Non-financial corporation		Central government	
Financial assets	Liabilities	Financial assets	Liabilities
Currency (–)		Currency (+)	Debt security (+) acquired by a non-financial corporation
Debt security (+) issued by central government			
b. Sale of a government long-term debt security by a non-financial corporation to a household			
Non-financial corporation		Central government	
Financial assets	Liabilities	Financial assets	Liabilities
Currency (+)			Debt security (–) acquired by a non-financial corporation
Debt security (–) issued by central government			Debt security (+) acquired by a household
Household			
Financial assets	Liabilities		
Currency (–)			
Debt security (+) issued by central government			

Table 4 – Number of cells to be compiled for a complete set of from-whom-to-whom financial accounts

Number of institutional debtor and creditor sectors	Number of financial instruments			
	2	3	8	16
2	32	48	128	256
3	72	108	288	576
6	288	432	1,152	2,304
8	512	768	2,048	4,096
13	1,352	2,028	5,408	10,816

sector or sub-sector. Combining the four types of accounts for stocks, transactions, revaluations and other changes in the volume of assets, the eight instrument categories and the five resident sectors and the rest of the world sector leads, theoretically, to  $4 \times 8 \times 6 \times 6 = 1,152$  cells to be compiled. An increase of the number of instrument categories to 16 and the number of sectors to 13 would mean that we would have (theoretically) to compile 10,816 cells (Table 4).

Table 5 presents all possible financial transactions for a financial instrument  $f(i)$  within a time period between the resident sectors (S11 to S15) and the rest of the world (S2). The transactions are shown in a matrix in such a way that the cells in each row represent the flows from the debtor sectors to the creditor sectors and the cells in each column the flows from the creditor sectors to the debtor sectors. The intra-sector financial transactions are shown in the main diagonal of the matrix. There is one restriction on the rest of the world, which is not further split into institutional sectors. Moreover, the rest of the world is treated as a sector, which is by definition consolidated.

Table 6 provides a condensed presentation of the transactions shown in Table 5. They can be split into intra (economy) transactions and cross-border transactions, while the rest of the world (extra) transactions are not shown.

The transactions between the individual resident sectors and the rest of the world can also be illustrated in a flow chart (see Chart 1). For each sector, the incoming and outgoing transactions

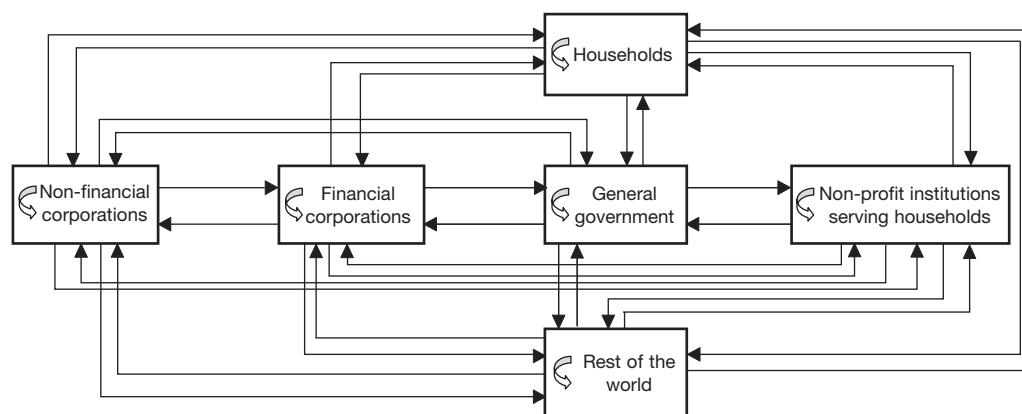
Table 5 – From-whom-to-whom transactions between five resident sectors and the rest of the world sector for a financial instrument f(i)

Fn		S1						S2	Total
		S11	S12	S13	S14	S15	Total		
S1	S11	S11_S11	S11_S12	S11_S13	S11_S14	S11_S15	S11_S1	S11_S2	S11_S
	S12	S12_S11	S12_S12	S12_S13	S12_S14	S12_S15	S12_S1	S12_S2	S12_S
	S13	S13_S11	S13_S12	S13_S13	S13_S14	S13_S15	S13_S1	S13_S2	S13_S
	S14	S14_S11	S14_S12	S14_S13	S14_S14	S14_S15	S14_S1	S14_S2	S14_S
	S15	S15_S11	S15_S12	S15_S13	S15_S14	S15_S15	S15_S1	S15_S2	S15_S
Total	S1_S11	S1_S12	S1_S13	S1_S14	S1_S15	S1_S1	S1_S2	S1_S	
S2		S2_S11	S2_S12	S2_S13	S2_S14	S2_S15	S2_S1	0	S2_S
Total		S_S11	S_S12	S_S13	S_S14	S_S15	S_S1	S_S2	S_S

Table 6 – Condensed presentation of from-whom-to-whom transactions between five resident sectors and the rest of the world sector for a financial instrument f(i)

Fn	S1i	S2	Total
S1i	Intra-economy transactions	Cross border transactions	Total intra/cross border transactions
S2	Cross border transactions	Extra (ROW) transactions = 0	Cross border transactions
Total	Total intra/cross border transactions	Cross border transactions	Total

Chart 1 – From-whom-to-whom transactions between five resident sectors and the rest of the world sector for a financial instrument f (i)



are represented by arrows. Intra-sector transactions are illustrated by an arrow within each of the sector boxes.

The sector account of S.12 (financial corporations) in Table 7 covers all transactions in financial assets and liabilities for the instruments 1 to 8 vis-à-vis all resident sectors and the rest of the world. Net lending/net borrowing can be derived by subtracting the transactions in liabilities from the transactions in financial assets and shown with a breakdown by financial instrument (F) and counterpart sector (S.11, S.13, S.14, S.15, and S.2). Intra-sector transactions in financial assets and liabilities net to 0.

### 9. Specific characteristics of financial instruments

A system of from-whom-to-whom financial accounts is very complex because of the multitude of dimensions even if the rest of the world sector and, possibly even some non-financial sectors are treated as consolidated sectors. It is possible to reduce the complexity of the system of financial

Table 7 – From-whom-to-whom financial transaction account for financial corporations (S.12)

Change in financial assets	Change in liabilities	Net lending/ net borrowing
F1(S11_S12)	F1(S12_S11)	F1(S11_S12) – F1(S12_S11)
F1(S12_S12)	F1(S12_S12)	0
F1 F1(S13_S12)	F1 F1(S12_S13)	F1 F1(S13_S12) – F1(S12_S13)
F1(S14_S12)	F1(S12_S14)	F1(S14_S12) – F1(S12_S14)
F1(S15_S12)	F1(S12_S15)	F1(S15_S12) – F1(S12_S15)
<i>F1(S2_S12)</i>	<i>F1(S12_S2)</i>	<i>F1(S2_S12) – F1(S12_S2)</i>
F2(S11_S12)	F2(S12_S11)	F2(S11_S12) – F2(S12_S11)
(S12_S12)	F2(S12_S12)	0
F2 F2(S13_S12)	F2 F2(S12_S13)	F2 F2(S13_S12) – F2(S12_S13)
F2(S14_S12)	F2(S12_S14)	F2(S14_S12) – F2(S12_S14)
F2(S15_S12)	F2(S12_S15)	F2(S15_S12) – F2(S12_S15)
<i>F2(S2_S12)</i>	<i>F2(S12_S2)</i>	<i>F2(S2_S12) – F2(S12_S2)</i>
...	...	...
...	...	...
F8(S11_S12)	F8(S12_S11)	F8(S11_S12) – F8(S12_S11)
F8(S12_S12)	F8(S12_S12)	0
F8 F8(S13_S12)	F8 F8(S12_S13)	F8 F8(S13_S12) – F8(S12_S13)
F8(S14_S12)	F8(S12_S14)	F8(S14_S12) – F8(S12_S14)
F8(S15_S12)	F8(S12_S15)	F8(S15_S12) – F8(S12_S15)

accounts still further considering specific characteristics of certain financial instruments. For example, transactions in monetary gold and SDRs take place between the holder of these financial assets, the national central bank or the central government as the respective monetary authority, and the rest of the world.

Transactions in currency are either issuances of currency by monetary authorities or transactions between the holders of currency. The national central bank usually issues currency in the form of notes, while the central government usually issues coins. Currency in circulation, either national or foreign, is used by all money-holding sectors as a means of transactions, financial or non-financial, but also as a store of value. Transactions in deposits usually involve both resident and non-resident credit institutions as debtors and typically involve all sectors, whether resident or non-resident, as deposit holders.

Transactions in debt securities and shares and other equity usually take place between corporations, both financial and non-financial, as the issuing institutional units and the holders. Households and non-profit institutions serving households do not issue debt securities or shares, while the general government sector issues debt securities. All sectors are usually holders of these instruments, of which debt securities and quoted shares are traded on secondary markets. Finally, transactions in net equity of insurance technical reserves are, by definition, between households as the policyholders and the insurer. The insurer can be either a corporation, or a government unit. These specific characteristics are shown as shaded cells in Table 8.

#### 10. Systems of from-whom-to-whom financial accounts with reduced complexity

Systems of from-whom-to-whom financial accounts with reduced complexity include:

- Monetary or financial surveys, which provide a partial from-whom-to-whom presentation of the financial instruments held and incurred by the monetary sector or the financial sector vis-à-vis the money holding sectors or the non-financial sectors;
- Tables on financing and investment showing a sub-set of financial instruments for a sector or a group of sectors comprised partly of from-whom-to-whom information;





- c) Tables showing financial assets acquired and liabilities incurred by institutional sectors with some from-whom-to-whom breakdowns (Tables 6 and 7 of the ESA95 transmission programme).

### **III. Compiling financial accounts**

Chapter III elaborates on the compilation of from-whom-to-whom financial accounts. Accounts compiling can be split into two stages. First, the compiler has to collect the economic time series and the accompanying metadata necessary for compiling and interpreting the accounts. To compile financial accounts, specifically from-whom-to-whom financial accounts, counterpart information has to be collected for the various financial instruments like deposits, loans, debt securities, and shares including other equity – held and incurred by the institutional sectors. In principle, such data can be provided from three different statistical sources: from the accounting frameworks of the debtor or of the creditor or from sources collecting market data. As a goal, from-whom-to-whom information has to be extracted from the most reliable statistical source possible, data derived from the various accounting systems of institutional units – amended by statistical information taken from securities databases. Usually, no detailed quarterly counterpart information is available for non-financial corporations and households including non-profit institutions serving households.

The second stage applies to the compilation process, or more specifically, to the balancing process. Some issues related to the compilation process are described like the flow of data, their horizontal balancing, and the structure of a compilation system.

#### **A. Statistical sources for compiling financial accounts**

It is necessary to use numerous statistical sources, most of which are initially collected for other purposes. Most are high-frequency data taken from money and banking, balance of payments, government finance, and securities issues statistics. Advanced systems also use data from securities holdings and from corporate balance sheets, if timely and detailed enough. Relying on a broad coverage of such direct data limits the need to use the so-called counterpart-method for drawing up the sector accounts and should enhance the reliability of the data.

For the purposes of compiling quarterly financial accounts in a from-whom-to-whom framework, the collection of statistical data must focus on financial data collected directly from the respective institutional units. Such direct reporting by institutional units allows a from-whom-to-whom presentation of financial transactions and stocks. Taking into account the incompleteness of data, existing data collection systems may have to be amended. This may be especially necessary for households, non-financial corporations, and financial corporations like insurance corporations and pension funds, and other financial intermediaries. Databases covering information on issues and holdings of debt securities and shares will have to be designed in such a way that from-whom-to-whom information can be used. One example is the development of an ESCB project on a Centralised Securities Database (CSDB), which will allow compiling such detailed information for various financial instruments.

#### **B. Data flow for compiling financial accounts**

To compile from-whom-to-whom financial accounts, the data flow is carried out through file transfers between the participating institutions. To facilitate the data transmission, these institutions have often adopted a common approach: In the European context, data flows make use of the E9 facility and GESMES/TS messages and are supported by a transmission code, described by the key family for Monetary Union financial accounts (MUFA). The data flow and the key family for MUFA are closely related to the design of the MUFA database and the associated MUFA compilation system.

The key family for MUFA has been designed for the transmission and compilation of from-whom-to-whom financial accounts. Therefore, the key structure entails various dimensions, which are compatible with the keys used in other statistical areas. Dimensions were designed to distinguish between stocks, non-financial transactions, financial transactions, and other flows. To keep track of the information needed for the from-whom-to-whom transactions, positions and other flows separate dimensions for debtor and creditor areas and sectors have been introduced. Further dimensions cover features like maturity, degree of consolidation, valuation method, and statistical source.

In addition to these dimensions, *statistical attributes* describing the transmitted time series may be added, like the observation status (normal value, estimation, forecast, etc.), the currency code, the unit (millions, billions, etc.), the unit multiplier, the number of decimals, the degree of consolidation and the organisation (transmitting the data).

### C. Horizontal balancing

From-whom-to-whom financial accounts can be described as a system of linear equations. Balancing in this context is seen as the process of solving the system, for which a necessary condition is that the number of equations is at least equal to the number of unknown variables. A simple example should explain this. One equation might be defined in such a way that the total issuance of long-term debt securities is identical to the issuances of the various resident sectors including the issuances of non-residents. In a case involving five resident sectors and the rest of the world sector such an equation for the issuances (net incurrence of liabilities, I) of long-term debt securities (F.311) of all sectors except 'households including non-profit institutions serving households' securities is equal to:

$$\begin{aligned} I(F.331(S.1/S.2)) &= I(F.311(S.11)) \\ &+ I(F.311(S.12)) \\ &+ I(F.311(S.13)) \\ &+ I(F.331(S.2)) \end{aligned}$$

To "compile" this equation at least four of the five variables have to be known. If exactly four variables are known, the fifth variable can be compiled by summation or by difference. If less than four variables are known further inquiries are needed to solve the equation. This might be done by attributing one amount to different sectors based on specific a-priori information.

Another issue has to be considered as well. In many cases various time series are available for a single variable. For instance, a series for the issuance of long-term debt securities by general government can be taken either from the direct source, government finance statistics, or from an indirect source, a summation of the various holdings of long-term debt securities by (counterpart) sectors or from a third source, the securities issues statistics, assuming that all of them have been compiled independently. In that case the compiler of financial accounts has to decide which series should be included into the equation. In many cases, the direct source might be the most reliable source. Nevertheless, plausibility and consistency checks have to be carried out before choosing the appropriate figure.

A corresponding example refers to the net acquisitions or holdings (H) of long-term debt securities (F.311) by all sectors, which are identical with the total issuance (I):

$$\begin{aligned} H(F.331(S.1/S.2)) &= H(F.311(S.11)) \\ &+ H(F.311(S.12)) \\ &+ H(F.311(S.13)) \\ &+ H(F.311(S.14/15)) \\ &+ H(F.331(S.2)) \\ &= I(F.331(S.1/S.2)) \end{aligned}$$

In contrast to the data on issuances of debt securities, the variety and quality of data on debt securities holdings is less promising. Holding data are often available from direct sources for financial corporations, less often for non-financial corporations and government, and not available for households. Some incomplete information might be taken from indirect sources via counterpart sectors. A potential third source is custodian statistics, which are sometimes available only annually and with some delay. In that case, some variables of the equation might have to be compiled residually by subtracting the known variables from the total holdings and using further qualitative information. This is the case of long-term debt securities held by households, which could theoretically be compiled as the difference between the total holdings (or issuances) and the holdings of all other sectors. It must be noted that all household financing and financial investment data usually have to be compiled in such a way, because only counterpart data or securities holding data are available for them.

As indicated above, the identity implies that total issuances and holdings of long-term debt securities are equal. Nevertheless, the corresponding totals are often not identical. In that case, one of the two figures has to prevail. Due to the higher quality the data on issuances would be used while the data on holdings by sector might have to be calculated residually.

Horizontal balancing is based on the availability of data taken directly from the various data sources. Deriving from-whom-to-whom financial accounts in this balancing process requires

Table 9 – From-whom-to-whom financial transaction account matrix for one instrument (F.331)

	S.11	S.12	S.13	S.14	S.15	S.1	S.2	S.1/S.2
S.11								I(S.11)
S.12								I(S.12)
S.13								I(S.13)
S.1								I(S.1)
S.2								I(S.2)
S.1/S.2	H(S.11)	H(S.12)	H(S.13)	H(S.14)	H(S.15)	H(S.1)	H(S.2)	I = H

more detailed data and even more knowledge about the quality of the available data. Table 9 provides an overview of the number of cells one would have to compile in the example described above. The column on the right-hand side of the matrix shows the various issuances of long-term debt securities by the four sectors (S.11, S.12, S.13 and S.2) and the bottom line shows the various holdings of long-term debt securities by the various sectors (S.11 to S.15 and S.2). In addition to these totals the data for the various cells of the matrix must be compiled taking into account the incomplete information especially for the non-financial sectors. For the purposes of filling in these cells, it appears a comprehensive security-by-security database essential for financial instruments like debt securities or shares, given the incomplete coverage of from-whom-to-whom information taken directly from accounting systems of institutional units. Nevertheless, from-whom-to-whom financial accounts are evidently heavy in their demand for data.

It must be mentioned that this type of balancing refers to horizontal balancing, i.e. maintaining the equivalence between financing (liabilities) and financial investment (financial assets) by type of instrument and of account (financial transactions, other flows and stocks). In a further step the balancing has to be extended to vertical balancing, which refers to maintaining identities between non-financial and financial transactions within the system of accounts. This balancing usually refers to reconciliation exercises related to the whole and to the sector net lending/net borrowing derived from the capital account and from the financial transaction account (B.9 versus B.9F). As the statistical sources used for the compilation of the non-financial and of the financial accounts are different, this reconciliation process between the two sets of accounts is often difficult to tackle. Furthermore, the institutions compiling national accounts, the national statistical office and the national central bank, are often both involved in this balancing process.

#### D. Compilation system

A compilation system serves several purposes. It combines the various data sources required to ascertain what adjustments are needed. Second, it provides tools to make the necessary adjustments during the balancing processes within the accounting framework, which reflects the relationships between instruments, areas, sectors, and accounts. Third, it facilitates the construction of a system of checks to determine the completeness, plausibility, and consistency of the various data sets. Finally, it makes it possible to combine the financial accounts data with metadata. Such metadata provide additional information on the quality of data like the frequency or magnitude of revisions or on major events and their impact on the aggregates.

### IV. Using financial accounts

Financial accounts are disseminated and used for economic and policy analyses, such as monetary analysis, fiscal analysis, conjunctural analysis, and financial stability analysis.

#### A. Dissemination of financial accounts

Financial accounts are disseminated to internal and external users for economic and policy analyses. For internal users, the data are immediately accessible via databases. Most recent data are described in briefing notes, which are provided to policy makers. Given the complex structure

of financial accounts, resources are also needed to improve the timeliness of the accounts. This can be achieved by providing estimations for a small number of key variables such as debt ratios or balancing items based on available monthly data. Furthermore, a broader system of financial accounts forecasts could be developed which could be integrated into the overall forecasting exercise.

Actual data are usually disseminated externally via press releases. These releases focus mainly on a specific selection of data, related to certain sectors or financial instruments. Detailed sets of data are published in bulletins or on websites.

### ***B. Financial accounts for monetary policy analysis***

The portfolio approach to analysing monetary policy can be used in such a way that it shows money and credit together with other assets within the system of financial accounts.

Assets are usually arranged according to what in usual circumstances would be decreasing liquidity: money encompassing currency, short-term deposits, short-term securities other than shares and money market fund shares (issued by MFI), and credit as loans and securities other than shares (granted by MFI). Other assets include long-term securities other than shares, shares and other equity, and insurance technical reserves.

The financial accounts framework allows analysing monetary aggregates jointly with other short-term financial assets which may represent close substitutes to money. Moreover, movements of money and credit are also presented in relation to the long-term financial investment and financing components of the money-holders and credit takers, especially households and non-financial corporations, but also general government and the rest of the world. As a result, it is possible to monitor the portfolio shifts within the financial wealth of these sectors and movements of their asset prices and indebtedness.

### ***C. Financial accounts for fiscal policy analysis***

Government deficit and debt are the main indicators used to analyse fiscal policy. Within the European context, both aggregates are the instruments applied to monitor fiscal rules in respect of the Stability and Growth Pact and public finances.

From the perspective of from-whom-to-whom financial accounts, a comprehensive fiscal policy analysis deals with questions like: What are the counterpart sectors of financial investment and financing decisions of general government or of one of its sub-sectors? Which are the corporations (financial or non-financial, resident or non-resident) in which the government holds a stake? Or, alternatively: Who is holding the government debt within the economy or abroad?

### ***D. Financial accounts for conjunctural analysis***

Combining the financial transaction account with the capital account broadens the scope of the analysis. On the one side, it leads to a relatively broad presentation of the portfolio approach by covering investment as a whole (financial and non-financial investment) as well as financing (net saving, net capital transfers and net incurrence of liabilities (Table 10)). On the other side, it opens the path to complement the investment and financing analysis by further integrating components taken from the production and the income accounts. The link with real variables allows using the 'extended' financial accounts to study the interrelation between financial and real variables, which also refers to the monetary policy transmission process, as reflected in income and wealth effects. This analysis might be expanded by also integrating other flow accounts and balance sheets to cover, for instance, the impact of asset price movements.

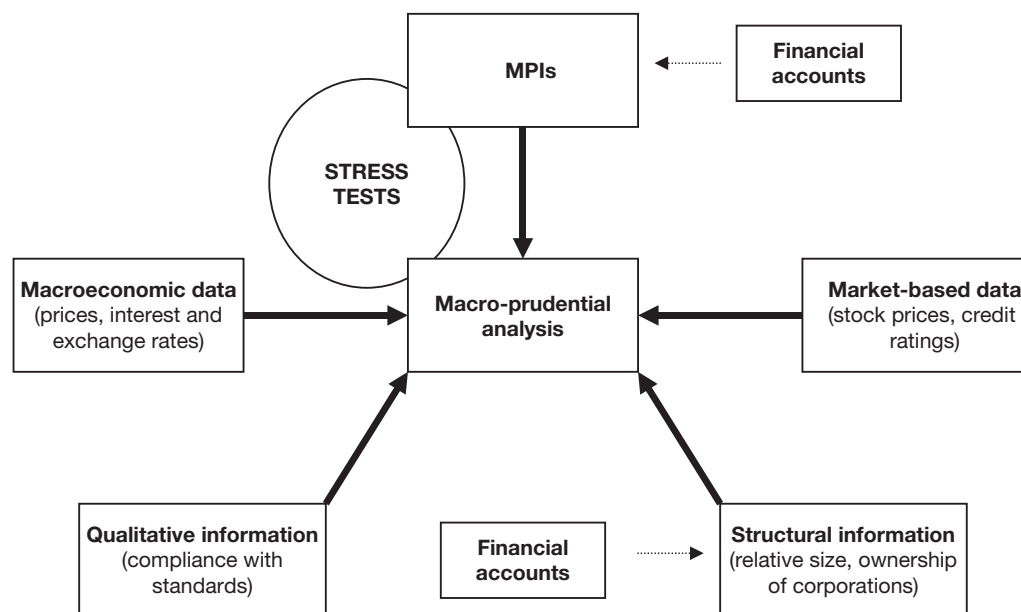
### ***E. Financial accounts for financial stability analysis***

The financial crisis in Asia in the late 1990s has highlighted the importance of identifying potential sources of financial risk and alternative approaches for assessing the vulnerabilities of national economies and specific institutional sectors within national economies. It also has stimulated detailed research on threats to macroeconomic financial stability in addition to micro-economic analyses in the context of financial supervision.

Table 10 – A table covering financing and investment (a numerical example)

Changes in Assets							Changes in Liabilities and Networth						
Rest of the World	Economy	Non-financial corporations	Financial corporations	General government	Households and NPISH	Transaction	Non-financial corporations	Financial corporations	General government	Households and NPISH	Economy	Rest of the World	
						Financing	205	236	132	260	833	50	
						<b>Changes in net worth due to saving and capital transfers</b>	<b>65</b>	<b>4</b>	<b>-38</b>	<b>199</b>	<b>230</b>	<b>-38</b>	
						Saving, net	48	11	-10	184	233	-42	
						Current external balance	33		6	23	62	4	
						Capital transfers, receivable							
						Capital transfers, payable	-16	-7	-34	-8	-65	-1	
						<b>Net incurrence of liabilities</b>	<b>140</b>	<b>232</b>	<b>170</b>	<b>61</b>	<b>603</b>	<b>88</b>	
						<b>Investment</b>							
	<b>192</b>	<b>134</b>	<b>-1</b>	<b>12</b>	<b>47</b>	Non-financial investment							
	376	250	9	37	80	Gross fixed capital formation							
	-222	-137	-10	-30	-45	Consumption of fixed capital (-)							
	28	26			2	Changes in inventories							
	10	2		3	5	Acquisitions less disposals of valuables							
		-7		2	5	Acquisitions less disposals of non-produced/non-financial assets							
	642	71	237	120	214	<b>Net acquisition of financial assets</b>							
49													

Chart 2 – Components of macro-prudential analysis



Source: Sundararajan, V. and others (2002) – adapted.

To successfully safeguard financial stability, the vulnerabilities of the financial sector and, as their counterpart, the non-financial sectors should be effectively identified and monitored, and the potential shocks to (financial and non-financial) markets. Typically, economists refer to this as macro-prudential analysis or surveillance. Such activities are part of the core competencies of central banks to promote financial stability and sound payment systems. These activities differ from financial supervision activities, as they are primarily focused on factors that may pose risks to the economy as a whole, with significant macroeconomic repercussions.

The measures of financial soundness and the methods to analyse them are called macro-prudential indicators (MPIs)<sup>11</sup> and analysis, respectively. MPIs “are indicators compiled to monitor the health and soundness of financial institutions and markets, and of their corporate and household counterparts”. Such indicators “include both aggregated information on financial institutions and indicators that are representative of markets in which financial institutions operate” as well as “other indicators that support the assessment and monitoring of the strengths and vulnerabilities of financial systems, notably macroeconomic indicators”<sup>12</sup>.

As indicated in Chart 2, financial accounts play a major role in the compilation of certain MPIs – such as debt-to-GDP ratios and the financial health of the non-financial sectors – as well as in structural analyses, including the importance of the main instruments, ownership structure and concentration.

## V. Conclusions

The architecture of from-whom-to-whom financial accounts gives guidance on how to embed policy-oriented variables within the accounting framework. Accordingly, it adds explanatory power to aggregates like money, credit, deficit and debt as they are used in the context of monetary policy, fiscal policy and financial stability analyses. Moreover, the inclusion of the ‘non-financial accounts’ will lead to a system of institutional sector accounts, which will enable a detailed assessment of monetary and fiscal policy impulses, of specific traces of the monetary policy transmission process, and of related production, income and wealth effects.

Looking at the different systems of financial accounts as currently compiled the use of the data concentrates on individual sectors like households or corporations. Issues are the asset portfolio restructuring by households or the analysis of the relationship between saving, financing and investment of non-financial sectors and of the rest of the world. Further issues refer to the description of the financial investment behaviour of insurance corporations, pension funds

11 In the context of the IMF, these indicators are described as Financial Soundness Indicators (FSIs).

12 See Sundararajan, V. and others (2002).



and other financial intermediaries. The stability of the banking system crucially depends on the sustainability of the level of corporate and household debt. Indebtedness and leverage of corporations derived from financial accounts are recognised as key leading indicators in identifying financial stresses.

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### **Abstract**

*Financial accounts statistics are becoming increasingly important for monitoring the financial side of the economy and its links to the real side. Central banks are also relying on these data more and more as the rise of globalisation, cross-border ownership and financial innovation seem to have speeded up the transmission of policy and other effects. The usefulness of financial accounts statistics is also growing in the context of financial stability analysis allowing the derivation of macro-prudential indicators taken from the financial balance sheets and the transaction accounts of the various non-financial sectors of an economy. The use of financial accounts statistics, however, is often limited due to the lack of a full and integrated set of timely and high-frequency data. Therefore, the completion of a quarterly system of from-whom-to-whom financial accounts is seen as a major step to improve the understanding of the links between the sectors of*

*an economy and the rest of the world. It also helps to disentangle the complexity of the financial system and its relationship to the real side of the economy.*

*This paper discusses key issues falling into three categories. They are linked to questions, which have to be addressed by moving to such a complex and detailed system of financial accounts. The issues are not representative, but they do reflect to some extent my own experience of constructing, compiling and using financial accounts. Chapter II deals with the first set of key issues, the design of financial accounts. Chapter III elaborates on key issues falling into the compilation of financial accounts category. Finally, Chapter IV looks into key issues related to how financial accounts are disseminated and used for economic and policy analyses in current practice, such as monetary policy analysis, fiscal policy analysis, conjunctural analysis, and financial stability analysis.*

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# The impact of expected changes in international accounting practices on compiling monetary and financial statistics

*Ekaterina Prokunina (Bank of Russia)*

Globalisation has compelled the international community to pay more attention to the elaboration and introduction of common standards, which are designed to ensure the effective functioning of economic and financial systems. Among the most widely discussed are the International Accounting Standards (IAS), a set of international principles and rules used in compiling and presenting corporate financial statements. Many countries have come to realise the importance of using IAS and the discussion has now focused on practical details, such as what steps need to be taken to introduce IAS and what changes this may require in the national accounting and reporting systems.

IAS are not an abstraction for Russia and its central bank. From January 1, 2004, Russian credit institutions are required by the Bank of Russia to compile and present IAS-compatible financial statements on the basis of Russian accounting statements, using the transformation method. During the next few years Russian credit institutions are to switch to IAS accounting principles and all Russian companies are expected to adopt IAS accounting practices simultaneously to ensure compatibility of the accounting principles being used both in accounting and performance records in the financial statements of credit institutions and real sector enterprises.

Such changes will doubtlessly affect the interests of compilers of macroeconomic statistics, since accounting (financial reporting) is a major source of information for the System of National Accounts (SNA), balance of payments and monetary and financial statistics. Unfortunately, Russia does not yet compile SNA accumulation accounts and therefore it is impossible to examine the effect of IAS on financial account data. At the same time, the Bank of Russia is currently introducing the principles of the IMF's new Monetary and Financial Statistics Manual (MFSM) in the compiling of the financial survey, which may be regarded as a basis for the compilation of the financial corporations sector's financial account. Taking into consideration that the balance sheets of credit institutions, Bank of Russia and other financial intermediaries provide a basis for compiling the financial survey, it is important to analyse in advance, at least in theory, financial reports compiled by credit institutions according to IAS as a potential source of information for the financial survey. This will make it possible to evaluate the extent of the forthcoming changes in initial data necessary for compiling monetary and financial statistics according to international standards.

We believe that the analysis of IAS compliance with MFSM should be establishing the purpose of compiling and presenting statements according to IAS requirements and the problems tackled by users of such statements.

Let us consider the **objectives** of evolving standards, because they predetermine the choice of the principles and concepts used in standards.

*The MFSM objective* is to give recommendations on the compilation and standard presentation of data on stocks and flows of financial assets and liabilities of all institutional units, especially the financial sector. *IAS are designed* to harmonise the rules, accounting standards and procedures relating to the compiling and presenting of information on the financial standing, performance and changes in the financial condition of companies.

As we can see, both standards aim to establish common principles of compiling and presenting data on stocks of financial assets and liabilities of companies, including financial corporations, which data users may find useful in taking economic decisions. If we analyse from these positions financial statement data compiled according to IAS, we shall see that IAS are a major step forward in harmonising accounting rules with economic accounting principles used in the SNA and MFSM. Many key parameters of IAS fully comply with MFSM requirements (see Table 1).

Table 1 – Data compilation principles common to MFSM and IAS

MFSM (other internationally recognised requirements to monetary and financial statistics data)	IAS
<p>Principal assumptions and characteristics:</p> <ul style="list-style-type: none"> <li>– accrual basis of accounting</li> </ul> <p>“42. This manual (like the 1993 SNA) recommends recording transactions on an accrual, rather than cash, basis.”</p> <ul style="list-style-type: none"> <li>– prevalence of substance over form</li> </ul> <p>Not said implicitly but assumed in describing the principles of compiling monetary aggregates and classifying financial instruments</p> <ul style="list-style-type: none"> <li>– compatibility</li> </ul> <p>DQAF. 4.3: “Statistics are consistent within the dataset. Statistics are consistent or reconcilable over a reasonable period of time.”</p> <ul style="list-style-type: none"> <li>– timeliness</li> </ul> <p>DQAF. 4.1.2: “Timeliness follows dissemination standards.”</p> <ul style="list-style-type: none"> <li>– stocks valuation</li> </ul> <p>MFSM. 196. “The general recommendation in this manual is that valuations should be based on market prices or market-price equivalents of financial assets and liabilities.”</p> <ul style="list-style-type: none"> <li>– gross-basis data presentation</li> </ul> <p>MFSM. 45. “It is the general principle in this manual and in the 1993 SNA that data should be recorded and compiled on a gross basis. In some circumstances, the presentation of data on a net basis is appropriate...”</p>	<p>22: “In order to meet their objectives, financial statements are prepared on the accrual basis.”</p> <p>35: “If information is to represent faithfully the transactions and other events, that it purports to represent, it is necessary that they are accounted for and presented in accordance with their substance and economic reality and not merely their legal form.”</p> <p>39: The measurement and display of the financial effect of like transactions and other events must be carried out in a consistent way throughout an enterprise and over time for that enterprise and in a consistent way for different enterprises.”</p> <p>43: “If there is undue delay in the reporting of information it may lose its relevance... In achieving a balance between relevance and reliability, the overriding consideration is how best to satisfy the economic decision-making needs of users.”</p> <p>Summary of IAS 39. 17: “Subsequent to initial recognition, all financial assets should be remeasured to fair value, except for the following, which should be carried at amortised cost...”</p> <p>IAS 1. 33: “Assets and liabilities should not be offset except when offsetting is required or permitted by another International Accounting Standard.”</p>

As for the Russian accounting rules, in some areas they do not meet the requirements established for data on the basis of which monetary and financial statistics should be compiled.

The Russian banking system uses the cash basis of accounting. In some cases stipulated by Bank of Russia regulations, the accrual basis of accounting is partly reflected the accounting of claims/liabilities on the receipt/payment of interest, using accounts receivable/payable. There is no provision for breaking down interest accounting by type of financial instruments, which is required by the compilation of the financial survey. The only exception is accrued interest on deposits, which is reported in a separate balance account. This makes it possible to account for the said sums as part of the money supply.

Balance sheets of credit institutions provide no information on the fair value of derivatives, which is necessary for making the accounting of these instruments in accordance with the financial survey compilation rules. In some cases, operations are recorded in balance sheets in accordance with their legal form rather than economic substance. Among such operations are the discounting of bills and repo operations, which are accounted for in credit institutions' balance sheets as operations with securities rather than credit operations, and this requires their reclassification in accordance with MFSM standards. Yet another divergence from MFSM principles is the limited use of market value. Under Russian rules, market prices are only used in respect to securities traded in financial markets. Securities in investment portfolios, shares and other equity are evaluated at purchase price.

There is reason to believe that the disparities described above will be eliminated after Russian credit institutions switch to IAS accounting practices, which will increase the informative value of credit institutions' balance sheets for the compilers of the MFSM-compatible financial survey.

Now let us pass to the analysis of users' **information needs**, which determine the content of information contained in reports and the form in which it is presented.

*The Standards (p.10)* stipulate that the principal users of financial statements are investors who provide capital to the company. Information they need includes information on investment-related risk and profit, information for taking decisions on investment in securities and information on a company's ability to pay dividends. The interests of users of the *financial survey* lie in the sphere of macroeconomic decisions and analysis. The aim of data contained in the survey is to demonstrate the role played by the financial sector in analysing operations in other sectors of the economy and evaluate the sources and targets of financing and the liquidity level of institutional units.

In other words, users of financial statements take investment decisions with regard to individual institutional units on the basis of their individual data, while users of the financial survey take decisions relating to macroeconomic and financial policies on the basis of aggregate data. As different users decide different problems, there are some substantial differences between the methodology of compiling and presenting the financial survey and IAS rules and procedures.

Of fundamental importance for the compiling of financial statistics is the principle of separately accounting for and reporting resident and non-resident stocks and flows and monetary aggregates by issuer and money holder sector with the use of a single classification of the sectors of the economy and financial assets and liabilities by institutional units in various sectors of the economy. IAS do not require disclosing information by sector and residency of counterparties and contains a somewhat different classification of bank balance sheet assets and liabilities (see Table 2)

The analysis of data in Table 2 shows that information disclosed by banks in their financial statements is not enough for regrouping it into the form convenient for the compilation of the financial survey. Such regrouping requires, in addition to information on the creditor/debtor category, separating from investments in securities investment in shares and other equity, disclosing the composition of financial instruments accounted for in all other balance sheet items, breaking down accrued incomes/expenses by type of claims/liabilities and disclosing the amount of insurance technical reserves. It should be noted that such information may be presented in notes to financial statements, but since companies are free to choose the form of its presentation, it is difficult to process such information and compile aggregate data.

Differences in information requirements lead to differences not only in presenting data, but also in the methods of evaluating financial instruments.

It is clear that to compile inherently uncontradictory aggregate data, it is necessary to use the same accounting rules by all reporting units. It is also clear that to obtain real performance indicators on a company, it is necessary in some cases to be guided by fundamental principles and use reasoned professional judgement.

The methods of accounting for shares and other equity (investments, to use the financial statements term) may serve as an example. IAS permit the use of one of the following methods of evaluating investments in subsidiary and associated companies, depending on the company managers' intentions with regard to these investments: 1) at actual cost; 2) according to the equity method; 3) as financial assets available for sale, that is, at fair (market) value. MFSM do not provide for the possibility of choosing the valuation method and recommend accounting for shares and other equity in the financial survey at their market value.

Another example is connected with the evaluation of credits and loans. They are accounted for in the financial survey on the basis of the amount of creditors' unsettled claims unadjusted for expected loan losses. This method ensures the reconciliation of initial data for the compilation

Table 2 – Classification of bank assets and liabilities

MFSM Assets/Liabilities	IAS 30	
	Assets	Liabilities
foreign currency and deposits, including deposits including accrued interest (broken down by type of claims/liabilities, debtor/ creditor category and national and foreign currency)	balances in accounts with central bank; deposits in other banks; other funds in money market	deposits of other banks; other money market deposits;
securities, except shares, including accrued income (broken down by debtor/ creditor category)	treasury and other bills accepted for rediscount in the central bank; x central bank; government and other securities kept in	certificates of deposit; promiss notes
credits and loans, including accrued interest (broken down by debtor/creditor category)	funds placed in other banks, loans and advances against them; other funds placed in the money market; loans and advance payments to customers	other borrowed funds
shares and other equity (in assets – broken down by debtor category and in liabilities – broken down by funds paid in by owners, retained profit, reserves and funds)	investments in subsidiary and associated companies	capital (broken down by paid- up capital, income from share issues and reserves and funds)
insurance technical reserves (broken down by debtor/creditor category)	IAS do not require disclosing data on insurance technical reserves	
derivatives (broken down by debtor/creditor category)	data on derivatives must be disclosed in the balance sheet or notes to the balance sheet	
other creditors/debtors (commercial loans and advances expenses are accounted for separately with a breakdown by debtor/ creditor category )	other financial assets, including accrued income on financial instruments	other financial liabilities, including accrued on financial instruments

Note. IAS also require banks to disclose in greater detail balance sheet aggregates in notes to financial statements (the composition of linear balance sheet items, potential liabilities and dummy events, concentration of assets and liabilities in respect to sources of risk, the movement of loan loss provisions, etc.).

of financial statistics by similarly reporting debt on loans in the balance sheets of the creditor and debtor sectors. According to IAS, credits and loans extended should be shown in the balance sheet in the sum of depreciated costs, using the effective interest rate method, which permits the evaluation of their current replacement value.

Although more comparisons can be made between IAS and MFSM, the considerations set out above allow one to draw some general **conclusions** about the effect of changes in international financial reporting standards on monetary and financial statistics:

1. The adoption of IAS will improve compatibility between individual data and macroeconomic indicators and broaden the range of sources of information for the compilation of the financial survey in compliance with MFSM.

2. Financial statements compiled on the basis of IAS will not be the only source of information for the compilation of the financial survey in compliance with the requirements of the new Manual. The need to use a single set of rules and receive data broken down by sector of the economy, flow of financial assets and liabilities and their components will require central banks to introduce additional reporting and restrict the choice of methods of evaluating some financial assets.

*Ekaterina Prokunina (Bank of Russia)*



# Assessing household sector risk: an Australian perspective<sup>1</sup>

*Carl Schwartz (Reserve Bank of Australia)*

A recurring theme from episodes of financial instability in Australia and overseas is that a rapid run-up in property prices, especially when coupled with heavy borrowing, can be an important warning sign of future financial fragility. The increase in housing prices and household indebtedness in Australia since the mid 1990s has been unusually large, both by our own historical standards and by comparison with experience abroad.

This paper begins with some aggregate indicators of these developments, which highlight the potential increased vulnerability of the household sector and associated risks for financial institutions and the macroeconomy generally. Against this backdrop, the paper then turns to some of the micro level data the Reserve Bank has been analysing to better understand developments in indebtedness and house prices and the associated risks.

## **Developments in aggregate data**

### ***House prices***

House prices have risen rapidly in Australia over recent years (Graph 1). Taking the beginning of 1996 as a broadly representative starting point, the median house price increased at an average annual rate of 12 per cent in the upswing. In the two years to 2003, the upward trend accelerated, with broad measures of house prices showing annual growth of close to 20 per cent. More recently, the housing market has slowed, with various measures showing that house prices have fallen to date over 2004.<sup>2</sup>

The upswing continued over a more prolonged period than has been typical in the past, and occurred at a time when the general inflation rate was low. As a result, the cumulative increase in house prices in inflation-adjusted terms has been larger than those occurring in previous cycles. The rise significantly exceeded growth of household incomes, so that the ratio of house prices to income is high by historical standards (Graph 2). While international comparisons are difficult, the available evidence suggests that the ratio of house prices to income in Australia is relatively high by international standards, whereas a decade ago it had been similar to that observed in a number of other countries.<sup>3</sup>

### ***Household debt***

The rapid increase in housing prices in Australia has been accompanied by strong growth in borrowing by the household sector. Since the beginning of 1996, household debt has increased at an average annual rate of around 15 per cent, accelerating to growth of 20 per cent over 2003. Most of this increase has been in loans for the purchase of housing. This component of household debt now accounts for 85 per cent of the total, up by around 15 percentage points since 1990 (Graph 3).

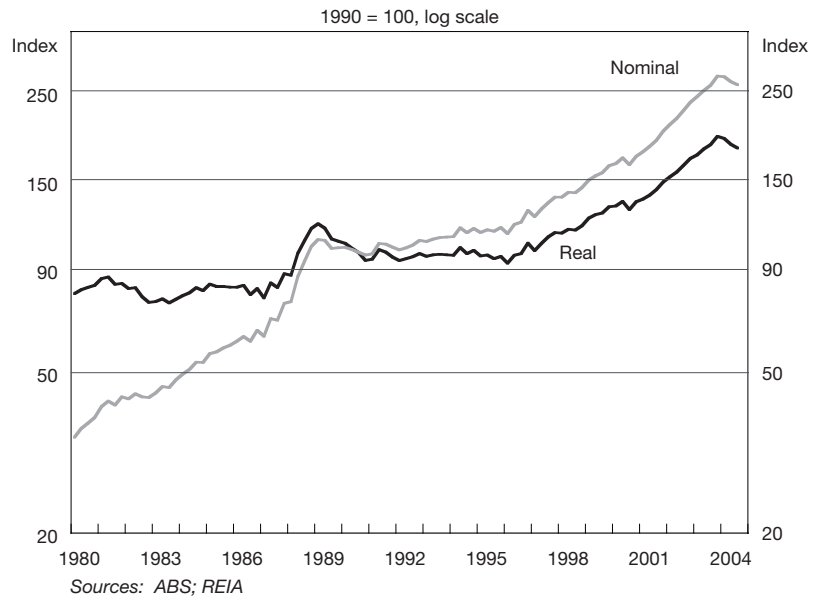
Housing-related debt can in turn be separated into borrowing for owner-occupation and borrowing for investor housing (i.e. buy to let). While borrowing for owner-occupation is still the larger of these components, the investor component has been growing much more quickly over

1 *This paper was prepared by Carl Schwartz of the System Stability Department, Reserve Bank of Australia, for the Irving Fisher Committee Conference on Central Bank Issues Regarding National and Financial Accounting, Basel, September 9–10, 2004. The paper draws on Reserve Bank material cited in the text and listed in the references, but views expressed do not necessarily reflect those of the Reserve Bank.*

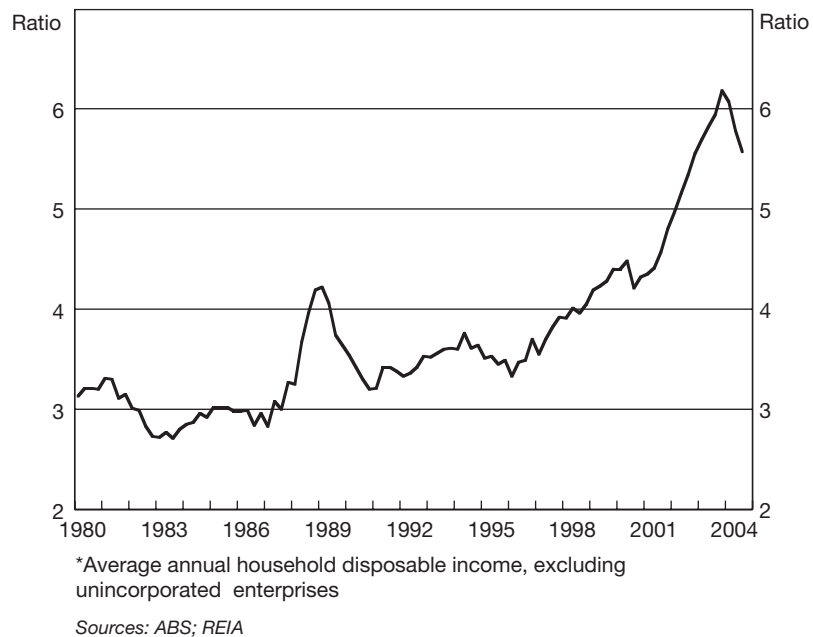
2 *Measurement issues are discussed in "Measuring House Prices", Reserve Bank Bulletin, July 2004.*

3 *Refer Table 2 in "Submission to the Productivity Commission Inquiry on First Home Ownership", Reserve Bank Occasional Paper No 16 November 2003.*

Graph 1 – Established house prices



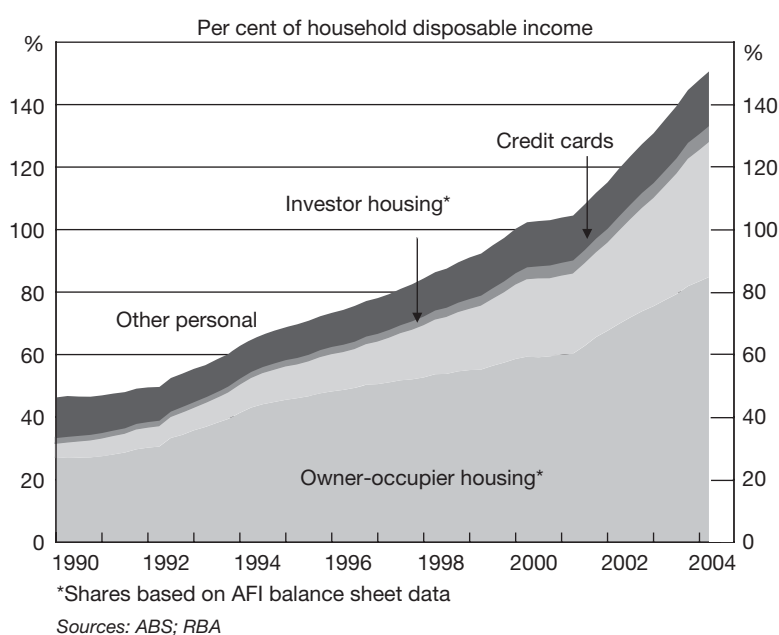
Graph 2 – House prices to household income\*



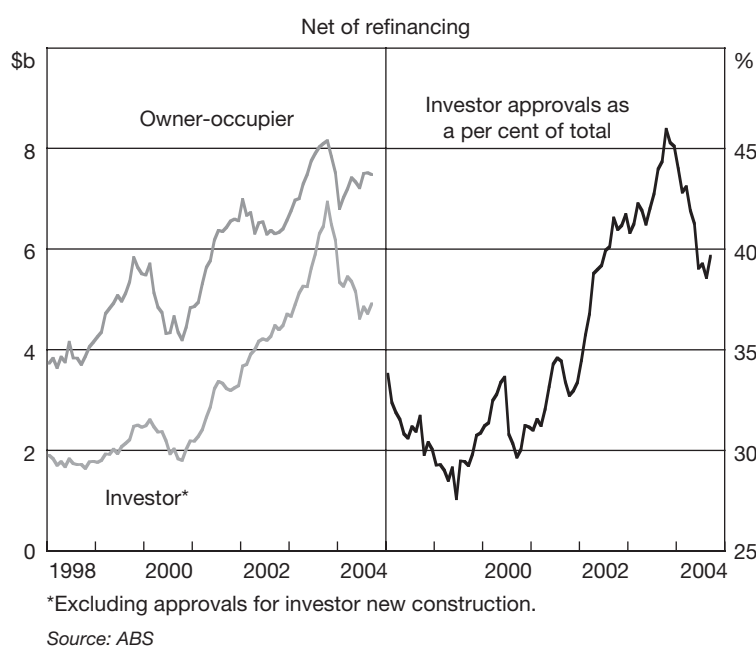
recent years. The extent of investor interest has been unprecedented, both in terms of previous experience in Australia and experience overseas. Since mid 2002, loans approved by financial institutions for investment properties have typically accounted for over 40 cents of every dollar of new housing loans, whereas in most countries, the percentage of housing loans accounted for by investors is estimated to be only in single figures. Since late 2003, loan approvals for investors have eased by more than those for owner occupiers (Graph 4).

The rapid growth of household debt in Australia has resulted in a strong upward trend in the ratio of debt to income and this ratio is now at the top end of the range seen in most other countries (Graph 5). Given strong growth in the value of housing assets, the rise in gearing – debt relative to assets – has been more muted (Graph 6). While the ratio increased strongly over the first half of 1990s it remains relatively low by international standards.

Graph 3 – Household debt

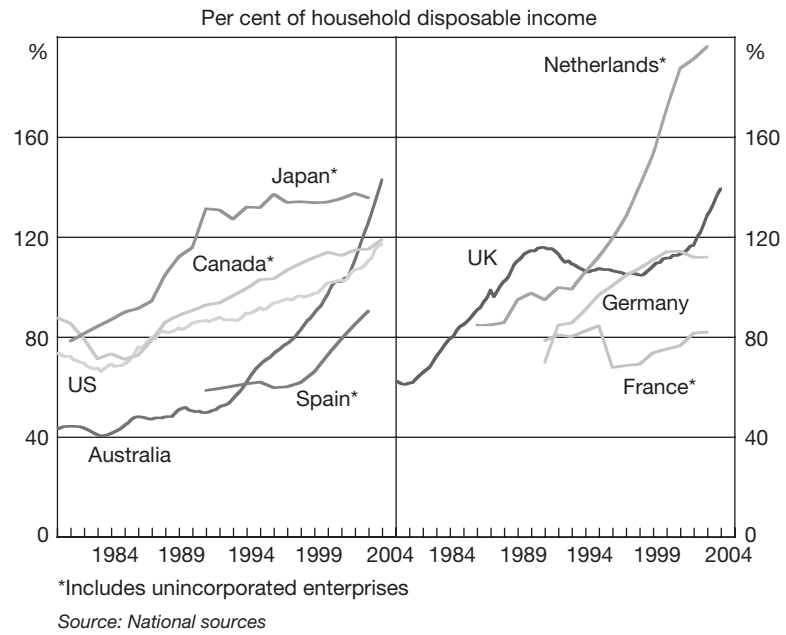


Graph 4 – Housing loan approvals

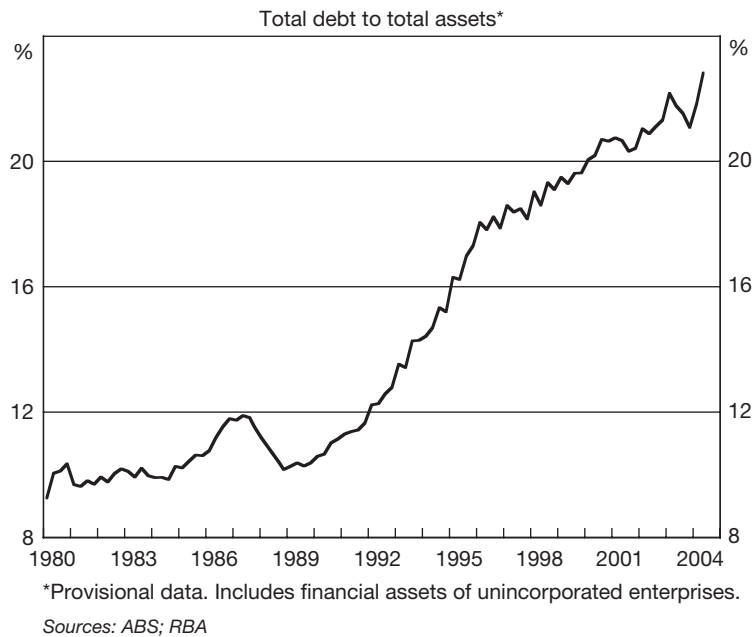


The upward trend in the debt-to-income ratio has meant that the debt-servicing ratio – the ratio of interest payments to disposable income – has also trended upward over recent years (Graph 7). Mortgage interest costs now represent around 73/4 per cent of aggregate household disposable income, a level that exceeds its peak of nearly 6 per cent in the 1990s and is still increasing as mortgage debt continues to rise more quickly than incomes. The total interest costs of the household sector (i.e. including interest on other forms of household borrowing) now equal around 91/4 per cent of household income, above the peak of the late 1980s. Nonetheless, in an environment of solid economic growth and historically low unemployment, the rapid increase in household debt has not been associated with an increase in the rate of mortgage arrears. The ratio of housing loans past due to total housing loans is around the lowest level over the period for which we have data (Graph 8).

Graph 5 – Household debt



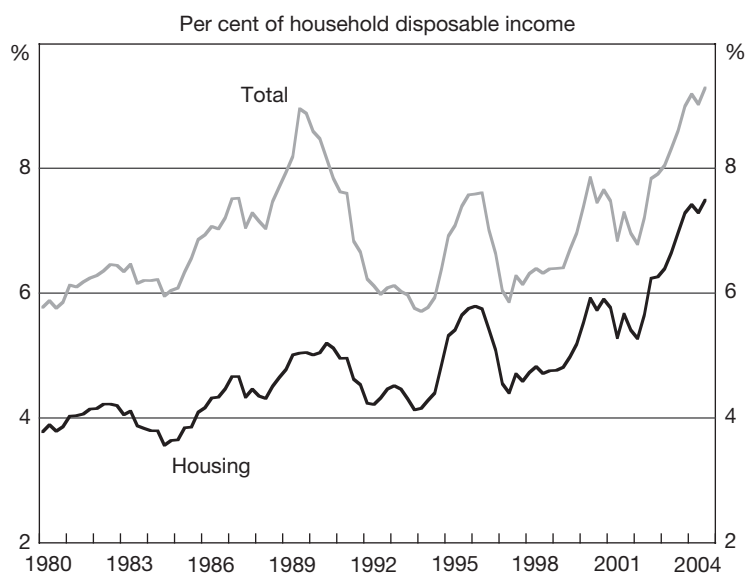
Graph 6 – Household gearing ratio



### Reasons and implications

The strong rise in housing prices and household debt in Australia largely reflects structural factors, many of which are familiar to other countries. On the demand side, a shift to a low interest/low inflation environment has significantly increased the capacity of households to borrow, particularly for housing. On the supply side, financial deregulation and the associated competition among lenders has also played an important role by making cheaper, more innovative mortgage products easier to obtain. This includes products specifically tailored for investor housing. The relatively strong participation in investor housing appears to importantly reflect

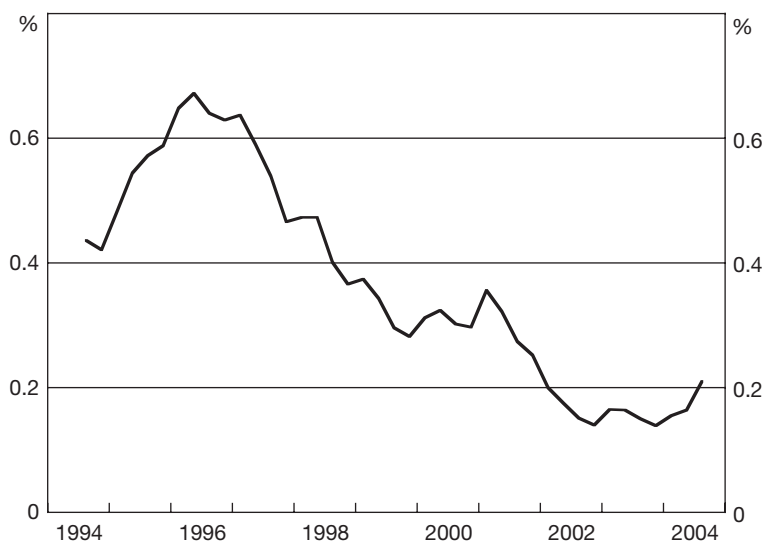
Graph 7 – Household interest payments\*



\*Includes the imputed financial intermediation service charge.

Sources: ABS; RBA

Graph 8 – Bank's housing loans past due

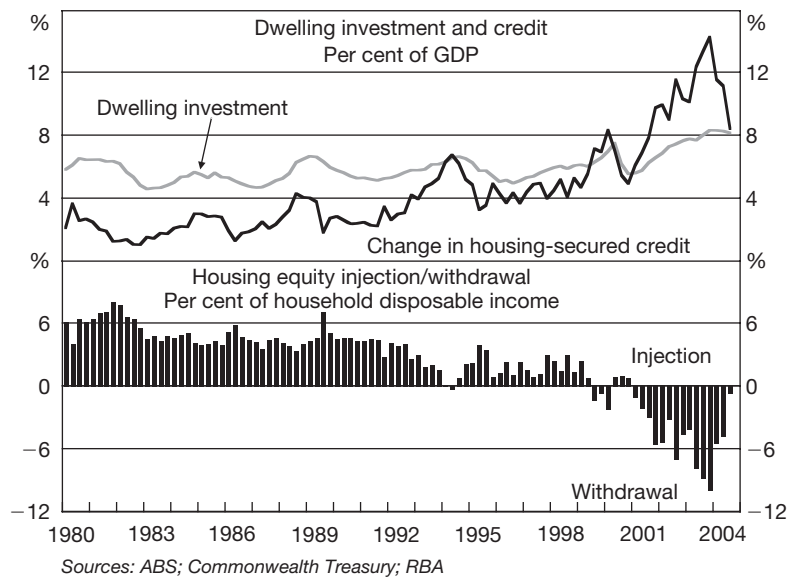


Source: APRA

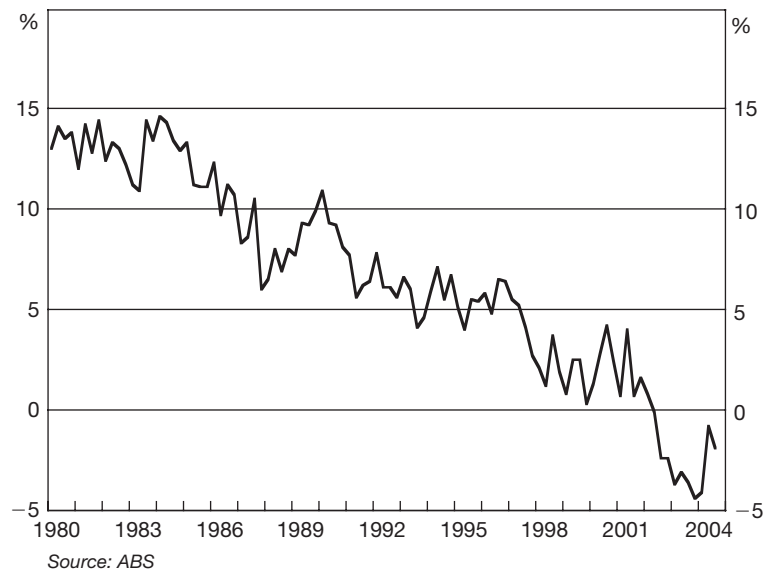
relatively more generous terms available for investor finance than in other countries, as well as relatively favourable taxation arrangements.

The rise in debt has important implications for both financial institutions and the macro-economy. Financial sector exposure to households has increased, reflecting that the bulk of debt is on the books of financial intermediaries. Also, over recent years, the strong growth in borrowing, underpinned by rising house prices, has been supportive of above-trend growth in domestic spending. Borrowing for housing has grown much more quickly than the value of dwelling investment – a phenomenon known as housing equity withdrawal (Graph 9) – and growth in consumption has outpaced that in household disposable income, with the saving rate falling considerably (Graph 10). If the household sector were to decide that the level of

Graph 9 – Housing equity withdrawal



Graph 10 – Household saving



borrowing had become too high, a period of weaker consumption growth might be expected, as households attempt to reduce their debt levels.

#### Disaggregating the rise in debt and assets<sup>4</sup>

The much larger stock of debt suggests that indebted households may now be more vulnerable to a rise in interest rates or deterioration in economic conditions. Consequences for the financial system and macroeconomy, however, will be influenced by the distribution of debt and the financial buffers of indebted households.

<sup>4</sup> This section draws heavily on analysis undertaken with Justin Fabo, Christine Lewis and Kylie Smith of the Reserve Bank.

**Distribution of debt and assets**

In Australia, disaggregated information on household debt and assets has historically required piecing together information from various sources. Census data shows that *owner-occupier housing debt*, which accounts for the bulk of household debt, is concentrated in less than a third of Australian households, and that this degree of concentration has not materially changed over the past decade (Table 1). This means that the rise in owner-occupier housing debt is primarily due to an increase in the average level of debt per debtor household rather than a higher proportion of households acquiring debt. For *investor housing debt*, the next largest component, Australian Taxation Office data suggests that the rise in debt reflects both an increase in the proportion of investors, and an increasing tendency for investors to use debt finance (Graph 11). For *household assets*, stock data was typically inferred by grossing up income flows from survey data.

Table 1

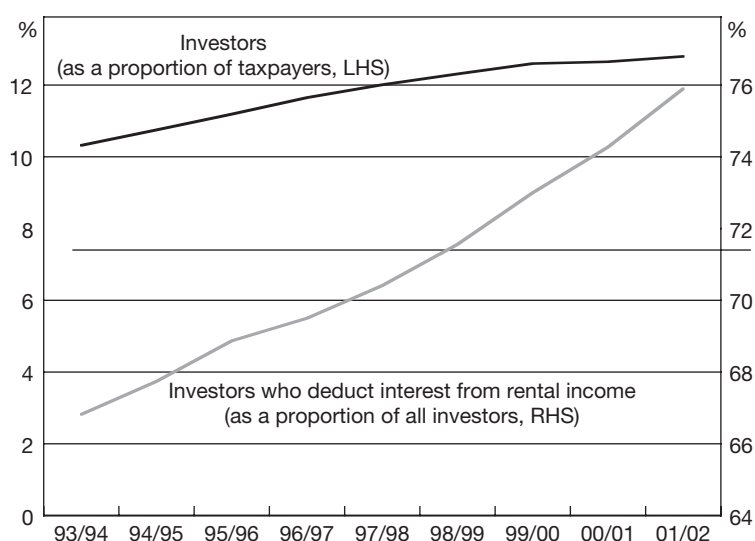
	Home owners			Renters
	Owned outright	Mortgage	Total	
1981	35.7	35.5	73.2 <sup>(b)</sup>	26.8
1991	43.1	28.5	71.5	28.5
1996	43.7	27.2	70.9	29.1
2001	43.0	28.6	71.6	28.4

a Excludes other forms of occupancy

b Includes home owners where ownership status not specified

Source: Census of Population and Housing, ABS Cat No 2015.0

Graph 11 – Property investors\*



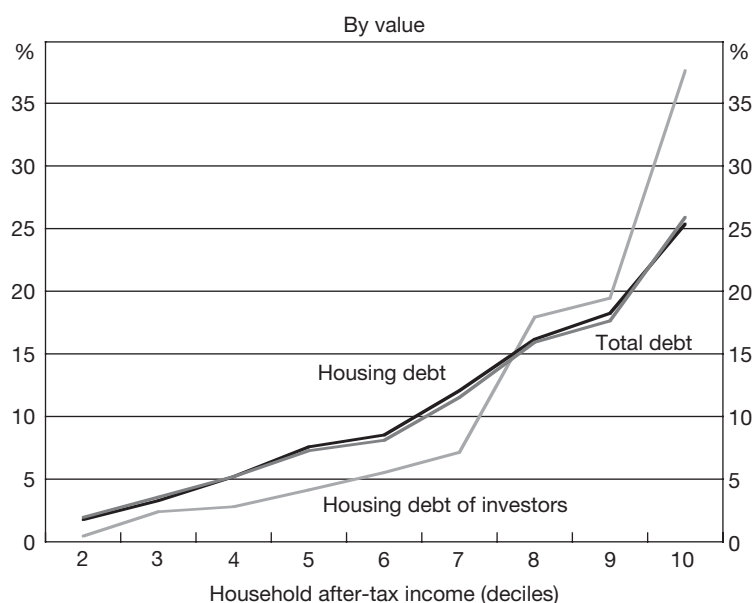
\*Investors defined as individuals who receive rental income.

Source: Australian Taxation Office

Data in this area have recently been improved. The 2002 wave of the Household, Income and Labour Dynamics in Australia (HILDA) Survey includes the first comprehensive survey of Australian households’ debt and assets from one source, allowing a disaggregated view of the entire household balance sheet.<sup>5</sup>

5 The HILDA Survey, which was partly sponsored by the Reserve Bank of Australia, drew responses from 7 245 households. For further information see M Kohler, E Connolly and K Smith “The Composition and Distribution of Household Assets and Liabilities: Evidence from the 2002 HILDA Survey”, RBA Bulletin April 2004.



Graph 12<sup>8</sup> – Distribution of household debt

Source: HILDA 2002

The Survey shows that household debt is fairly concentrated among the upper income groups, so from a financial stability perspective, the financial characteristics of this group are of particular interest. Indebted households in the highest three income deciles held 60 per cent of aggregate debt, and households in the next three highest income deciles owed a further 27 per cent of debt (Graph 12). Total household debt and property debt were similarly distributed across their respective samples of households, though the distribution of total property debt owed by residential property investors was skewed more heavily towards high-income groups.

The HILDA Survey allows a disaggregated look at standard indebtedness ratios of debt to income and debt to assets (gearing). For households with any form of debt, the median ratio of debt to income increased with income as relatively few low-income households had property debt. However, focusing on those with property debt – who account for the bulk of debt owed – median property debt-to-income ratios fell as income increased (Graph 13).<sup>6</sup>

Gearing ratios suggest that the majority of debt outstanding is well secured by underlying property assets. Median levels of gearing, whether measured with regards to total debt and assets, or just property debt and related assets, tended to fall with income, and were therefore lower for those households holding the bulk of aggregate debt. Three quarters of those with property debt reported property gearing ratios of 60 per cent or less.<sup>7</sup>

The ability of households to continue to make loan payments is another important consideration, and the Survey provides information on the distribution of owner-occupier housing debt-servicing costs – interest and principal – as a share of income. An important caveat, therefore, is that for households that had both owner-occupier mortgages and other forms of debt – particularly the 8 per cent of households that owe both owner-occupier and investor property debt – their total debt-servicing burden may be appreciably higher.

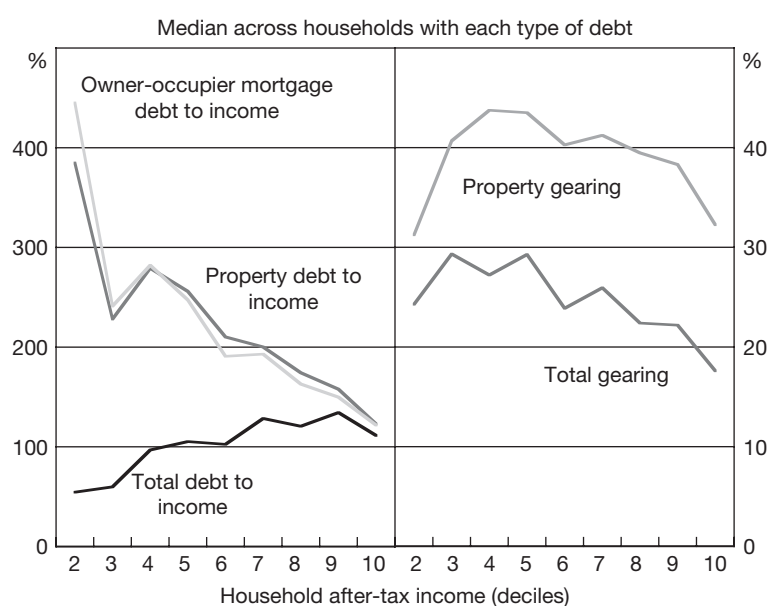
In terms of owner-occupier debt servicing, households in the highest income deciles tended to use relatively less of their income to meet interest and principal repayments (Graph 14). The relatively high debt-servicing burden for lower income households, which possibly reflects some households that have experienced a loss of income since taking out their loan, suggests that they are more financially exposed to a rise in interest rates or fall in income. Around 60 per cent of

6 Low income households that did have housing debt, though relatively few in number, had very high housing debt to income ratios, possibly reflecting that some of these households had experienced a shock to income such as unemployment and fallen down the income distribution.

7 The finding that mortgage debt is well secured accords with results of a stress test of financial institutions – by the Australian Prudential Regulation Authority – suggesting that a fall in house prices would be unlikely, by itself, to present a systemic risk. Refer “Stress Testing Housing Loan Portfolios”, APRA Insight, 3<sup>rd</sup> Quarter/4<sup>th</sup> Quarter 2003.

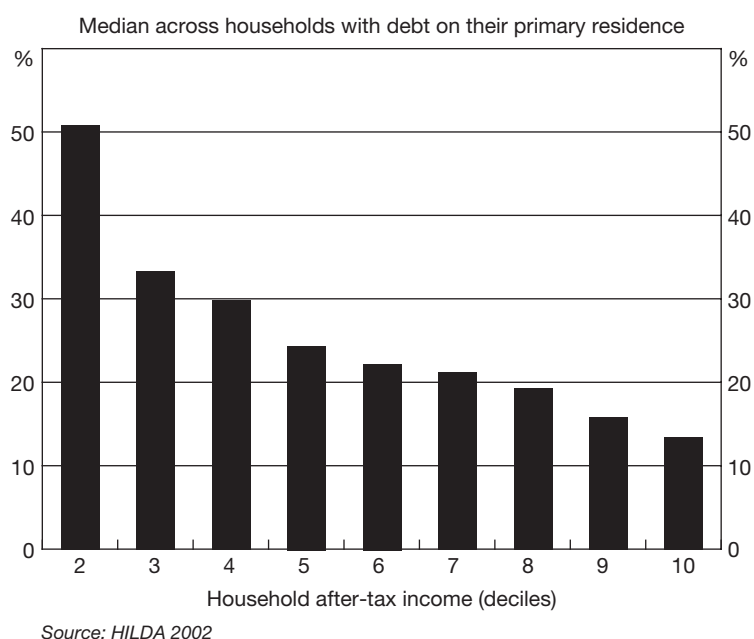
8 Outcomes for the lowest 10 per cent of the income distribution are excluded from this and subsequent graphs for reasons including suspected misreporting of incomes by some respondents in this group and small sample sizes.

Graph 13 – Household debt ratios



households with a primary mortgage had some leeway by being ahead of schedule on their mortgage repayments, though information on the size of these extra repayments is not available.

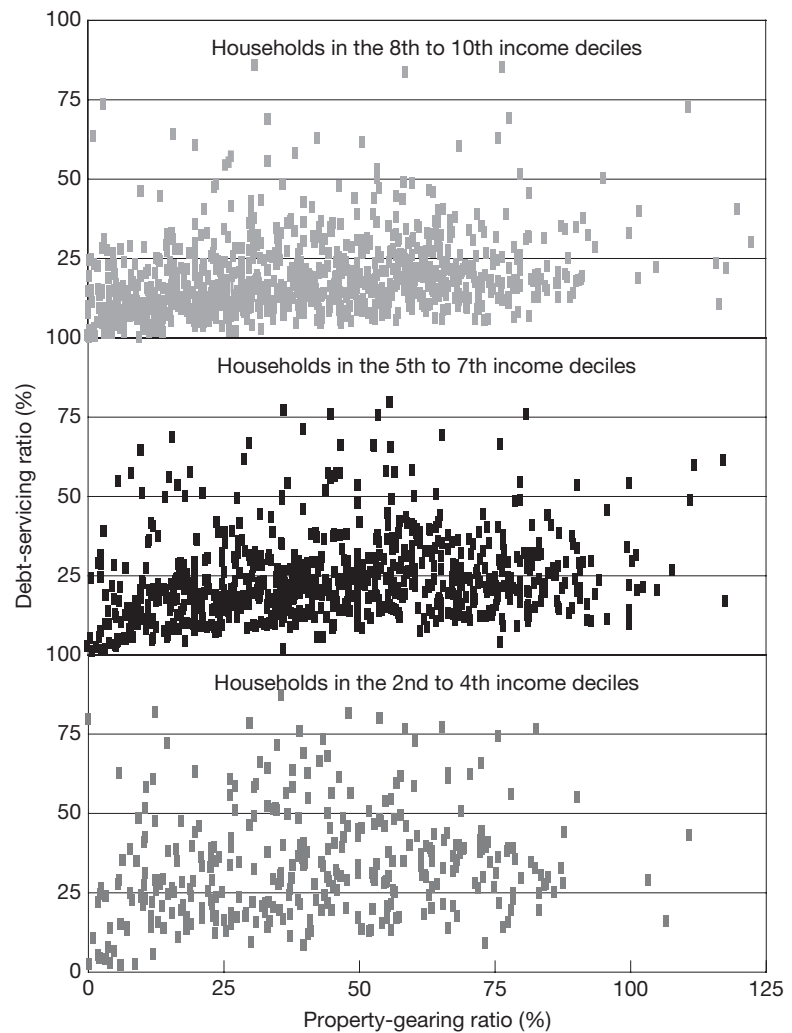
Graph 14 – Debt servicing ratio on owner-occupier housing debt



Analysis here has focused on median data, but information on financial characteristics at an individual household level is also of interest. Conclusions drawn from median ratios may disguise important distributional information, in this case *within* each income decile, and there is interest in combining information from various measures: households with both high property-gearing ratios and high debt-servicing ratios have greater financial risk.

At the upper end of ranges for property-gearing and debt-servicing ratios, 12 per cent of households with owner-occupier mortgages had property-gearing ratios greater than 75 per cent, while debt-servicing costs were at least 50 per cent of after-tax income for 7 per cent of these

Graph 15 – Distribution of debt-servicing ratios



\*Excludes 33 outliers and those households not reporting debt-servicing costs

Source: HILDA 2002

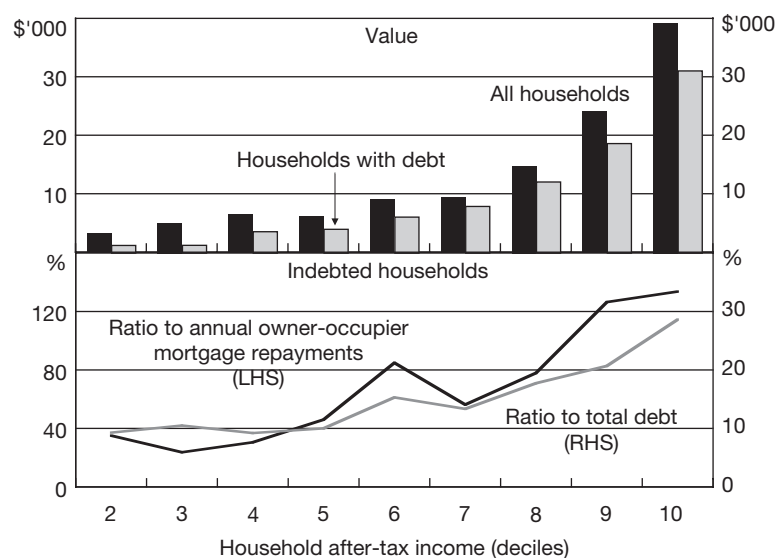
households (Graph 15). These high readings were relatively uncommon among upper income groups, and low-income households with owner-occupier mortgages appeared more financially vulnerable to an adverse shock. One fifth of these households had debt-servicing ratios above 50 per cent, though they were comparatively few in number and their levels of gearing were generally moderate. Around 1 per cent of households had both a debt-servicing ratio greater than 50 per cent and a property-gearing ratio above 75 per cent, increasing only slightly to 1.8 per cent of households if the threshold for the debt-servicing ratio is 40 per cent. Again lower income groups were overrepresented in this group.<sup>9</sup>

Liquid assets, those assets that can be quickly turned into cash, are also an important financial buffer to consider for those with property debt-servicing obligations. For households owning residential property, access to housing equity – either through outright sale or further borrowing – may diminish in an environment of falling house prices, particularly if lenders act to tighten the availability of credit. More widely, liquid asset holdings across all households are of interest as a potential buffer for an income shock. According to the HILDA Survey, the value of liquid asset holdings increased with income but indebted households had less liquid assets on average than those without debt, consistent with a tendency for indebted households to direct

<sup>9</sup> A debt-servicing ratio of 50 per cent of after-tax income in 2002 was equivalent to a before-tax debt-servicing ratio of just less than 40 per cent for many households, though this varied with the demographics of each household.

surplus income into repaying debt rather than into financial assets (Graph 16).<sup>10</sup> For indebted households, liquid assets increased with income both as a proportion of debt and of owner-occupier mortgage repayments. As a result, indebted low-to-middle income households appear to be somewhat less liquid and more financially vulnerable to a period of unemployment or other income shock.

Graph 16 – Liquid assets



Source: HILDA 2002

## Conclusion

The substantial increase in household indebtedness implies that households with debt are generally more vulnerable to a loss of income and higher interest rates than was previously the case. Implications of greater household indebtedness for the financial system and macroeconomy depend, in part, on the distribution of debt.

The HILDA Survey shows that the majority of household debt, particularly property debt, was held by higher income households. Gearing data suggest that most households, particularly those high income groups owing the bulk of debt, could withstand a reasonably large fall in house prices before facing a negative equity situation. And debt servicing data suggest that those owing the bulk of debt are best placed to cope with a rise in interest rates – provided they maintain employment. Most households with a mortgage had some financial leeway provided by excess mortgage repayments and holdings of liquid assets. Nonetheless, there were a number of households, predominantly with lower incomes, where debt repayments occupied more than half of after-tax income, suggesting their debt-servicing capacity is highly vulnerable to a rise in interest rates or fall in income.

Overall, though distributional information suggests that the bulk of households have some important buffers to help withstand financial stress, vulnerabilities associated with higher levels of household debt remain. Measures of gearing and debt servicing can deteriorate abruptly in difficult economic circumstances such as falling house prices or unemployment. And if an economic shock prompted the household sector to broadly reassess the structure of its balance sheet – and rein in spending to reduce debt levels and servicing burdens – macroeconomic weakness could be aggravated, with associated negative implications for the financial sector.

<sup>10</sup> Liquid assets include deposits with financial institutions, investments in cash management trusts, equities, managed funds, property trusts, bonds, debentures, and certificates of deposit, and the cash value of life insurance.

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*Carl Schwartz (Reserve Bank of Australia)*

## WORKSHOP F

# Financial accounts – general issues and country experiences

Chair: Reimund Mink (European Central Bank)

Papers: **Compiling the flow of funds of the Spanish economy**  
Pedro Abad (Bank of Spain)

**Developing quarterly financial accounts: experience of Latvia**  
Aiga Ose (Bank of Latvia)

**Updated Philippine flow of funds: based on the 1993 SNA and 2000 MFSM**  
Marriel M. Remulla (Central Bank of the Philippines)

**The financial systems of European countries: theoretical issues and empirical evidence**  
Laura Bartiloro and Riccardo De Bonis (Bank of Italy)

**Artificial neural networks for data editing**  
Claudia Biancotti, Raffaele Tartaglia Polcini (Bank of Italy)

**Workshop F: Financial accounts: general issues and country experiences**  
**Discussion paper**  
Durant

# Compiling the flow of funds of the Spanish economy<sup>1</sup>

*Pedro Abad*  
(*Statistics and Central Balance Sheet Data Office*)

## 1. Background

The purpose of this note is to present the Banco de España's experience in the compilation of the Spanish flow of funds. After a brief introduction on previous compilations of this statistic by the Bank, a description of the conceptual framework and the main features of the Spanish flow of funds is given in section two. Section three explains the key elements that constitute the linkage of the accounting system and which are the core of the Spanish flow of funds compilation system. Finally, the importance or "value added" of this statistic for the analysis of the financial flows of the economy is underscored in section four. To this end, summary data from the last annual edition of the Financial Accounts of the Spanish economy (1990–2003) are shown in the Annex.

In the early 1980s the Banco de España started to compile the flow of funds or financial accounts statistics on an annual basis. This set of accounts became the general framework for the assessment and analysis of the financial and investment flows between the different sectors of the economy addressed in the Annual Report of the Banco de España. Also, the financial accounts were used within the Banco de España as the scenario for programming monetary growth, providing a consistent framework for the interaction of the forecasts and targets for the monetary aggregates and their counterparts.

Up to the financial accounts of 1999, the main frame of reference for the Spanish financial accounts was the 1979 version of the European System of Accounts (hereafter, ESA 79). This was also the case for most European countries. The financial accounts included both the financial transactions and the balance sheets of the sectors. Nevertheless, the situation was not fully satisfactory, as we explain below.

The scope of the ESA 79 was not as complete as the present system and it lacked guidance for compiling the financial balance sheets; in this context the Spanish financial accounts mostly maintained the valuations of the original sources to show consistency with them. This situation was neither satisfactory for the compilers nor for the analysts, due to the fact – more relevant in the case of securities data – that the valuations applied by the holding sectors (market value in some cases, historical cost in others) did not coincide with the valuations of the issuing sectors. This caused some homogeneity problems and affected the data of the households and non-financial corporations sectors in certain items where they were residually calculated. In recent years the distortions derived from this situation became more apparent due to the increase in the volume of securities outstanding; to the significant weight of financial institutions in their intermediation; and also to the rise in the value of securities in the late 1990s, since, against the background of lower interest rates further to monetary convergence, they had been issued at higher interest rates. The adaptation to the new frame of reference in 1999 was to some degree welcome.

Commencing 1999, the Banco de España started to disseminate on its website unofficial quarterly data on financial accounts that, basically, were compiled in the same way as the annual ones, except for the fact that certain details were simplified in order to develop a new compilation procedure, which was fully integrated for IT purposes with the statistics databases. Nevertheless, the main reference for the Financial Accounts of the Spanish economy (hereafter, FASE) remained the annual publication. Thus, both series coexisted for some time.

Finally, in June 2000, the Banco de España implemented the methodology laid down in the European System of Accounts (Regulation CE 2223/96), known as ESA 95, to compile the FASE. This entailed a thoroughgoing transformation of the process, not only in terms of

<sup>1</sup> Note prepared by Pedro Abad. Statistics and Central Balance Sheet Data Office Department. July 2004.



compilation, based on the quarterly financial accounts disseminated on the website, but also of presentation.

## 2. Conceptual framework and main characteristics of FASE<sup>2</sup>

### 2.1. Conceptual framework

The financial accounts are a part of the system of national accounts whose compilation in Spain is divided between the INE (National Statistics Institute), which is responsible for the whole system except for the financial accounts, and the Banco de España, which is entrusted with the financial accounts. Also, the IGAE (National Audit Office) plays an important part in all matters pertaining to the General Government accounts, in conjunction with the former institutions.

In the system of national accounts, economic agents' transactions are classified in a limited set of accounts whose balances or differences between resources and uses are considered relevant to analyse and describe economic agents' behaviour. The description of the whole system is not the purpose of this paper; nevertheless, the following features are worth mentioning:

- *Financial assets* represent rights and liabilities between economic agents; in ESA 95 financial assets are classified in a limited set of categories taking into account their liquidity and legal characteristics. The economic agents are classified in a limited set of institutional sectors according to their main activity and sources of financing.
- The *balance sheets* show the assets, liabilities and net worth as at a certain date. The difference in the value of assets between the beginning and end of an accounting period is explained by the transactions registered in the *accumulation accounts*, i.e. the capital account, the financial transactions account and the other changes in assets account.
- In the *capital account*, the resources are: saving (or the balance of current transactions) and net capital transfers received, and the uses are the acquisitions minus the sales of non-financial assets; the net balance (resources minus uses) shows in what measure one sector or the national economy as a whole generates excess resources to finance other sectors of the economy (or the rest of the world) or, on the contrary, the available resources are insufficient to pay for the non-financial investments and, thus, it needs financing from other sectors (or from the rest of the world).
- The *financial transactions account* shows the creation, exchange and liquidation of financial assets, or transactions, as a consequence of the interaction of economic agents, both as a result of pure financial transactions – the counterpart is also of a financial nature – or as a result of a non-financial transaction.
- The *other changes in assets account* shows the revaluation and other changes in the volume of assets, which are not actual transactions, but changes in the valuation of assets or liabilities, reclassifications or new entries or disappearance in the system of goods or assets that have not been originated in the period.
- Lastly, the *net worth* of the sectors is the difference between the positions on assets – financial or non-financial – and liabilities of the balance sheet; and the *change in net worth* over a period is explained by saving, capital transfers received and the net balance of other changes in assets and liabilities over the period.

Table 1 (below), taking as an example the Households and NPISHs sector, shows the balance sheets, the capital account and the other changes in assets account for the year 2003. The value of stocks and flows due to revaluations and other changes in the volume of non-financial assets (grey shaded area) are estimates (INE does not compile this information). It can be observed that, in 2003, non-financial assets amounted to 73% of total households' assets and that the loan indebtedness rate was 9% of their total wealth or 34% of their financial wealth. The fluctuations in this type of indicator are normally monitored in the Banco de España's reports to evaluate households' wealth.

<sup>2</sup> The publication *Financial Accounts of the Spanish Economy* includes a Methodological Note that can be consulted for further information on the characteristics and the compilation process of this statistic (See [www.bde.es](http://www.bde.es))

Table 1 – Households and NPISHs (2003)<sup>1</sup>.(EUR billions)

	Balance sheet (2002)		Accumulation accounts				Balance sheet (2003)	
			Capital and financial transactions accounts		Other changes in assets account			
	A	L	U	R	U	R	A	L
Non-financial Assets / net worth								
Net worth <sup>2</sup>		3645.1				674.6		4344.1
Saving (net)				19.1				
Capital transfers (net)				5.3				
Non-financial assets (stocks) <sup>2</sup>	2980.9				598.8		3601.7	
Gross capital formation			53.9					
Consumption of fixed capital			-31.9					
Statistical discrepancy	-	-	-3.7	-	3.7	-	-	-
Financial assets / liabilities	A	L	NAFA	NIL	NAFA	NIL	A	L
Currency and deposits	476.5	-	29.7	-	-0.3	-	505.9	-
Securities other than shares	26.8	-	3.2	-	5.8	-	35.8	-
Loans	-	374.8	-	69.7	-	-0.7	-	443.8
Shares and other equity	378.0	-	22.2	-	70.0	-	470.2	-
Insurance technical reserves	174.9	-	15.3	-	1.0	-	191.2	-
Other accounts receivable/ payable	41.9	59.1	7.4	2.0	-3.0	2.1	46.3	63.2
Total	4079.0	4079.0	96.1	96.1	676.0	676.0	4851.1	4851.1

(A) = Assets; (L) = Liabilities, (U) = Uses, (R) = Resources, (NAFA) = Net acquisitions of financial assets, (NIL) = Net incurrence of liabilities.

<sup>1</sup>Source: Financial Accounts of the Spanish Economy (1990–2003). June 2004.

<sup>2</sup>Data in grey area are estimates. Stock of non-financial assets is a Banco de España's staff estimate for research purposes. It includes only housing.

## 2.2. Main characteristics of FASE

They can be ordered as follows:

- The FASE are a quarterly statistic. Thus, the annual data are consistent with the quarterly data. This means that the annual financial balance-sheet series, being a stock variable, are identical to the Q4 financial balance-sheet data for the same year, while the annual financial transactions-account series, being a flow variable, are the sum of the financial transactions-accounts for the four quarters of the same year. At present, the series are available as from 1990, and work is under way to extend time series back to 1980 on an annual basis.
- The FASE comprise the financial balance sheets, the financial transactions accounts and the other changes in financial assets and liabilities account (revaluations and other changes in volume of assets). In the publication the first two are shown as time series with the detail of financial instruments and counterparty sectors. The third one is only displayed for the last year. A summary table for financial balance sheets and financial transactions accounts can be seen in Table A of the Annex for 2003.
- In the FASE, for every financial asset or liability of a sector, the counterparty sector is also given. This is observed both in the financial balance sheets and in the financial transactions accounts; in other words, the FASE shows whom-to-whom information for all the sectors of the economy. This high level of detail in the information is not only very useful for analysts but also for compilers who can contrast the base data of both sectors intervening in a transaction and detect any inconsistency.
- The FASE are updated every quarter on the Banco de España's website (www.bde.es). This is done during the fourth month after the month of reference. The print version publication is released once a year, in June, in conjunction with the edition of the Banco de España Annual Report on the Spanish economy. Revisions of previous quarters are made in every update.

Revisions can go as far back as 8 quarters (this information is given to analysts in a note explaining changes). Normally, changes in methodology or of a similar nature are concentrated in the annual edition.

- The FASE are compiled in accordance with the ESA 95 methodology taking into account the particularities of the Spanish financial system and the availability of base data. In the publication, a number of schemes detail these particularities. The FASE present information for all the financial assets (of which there are 19, summarised in 7 categories) and for all the institutional sectors (5) and sub-sectors (12).
- As mentioned before, the FASE observe the standards established in ESA 95, whereby balances sheets are evaluated by their market value and transactions by their settlement value; this criteria is of special relevance in the case of securities. The goal is to compile the securities portfolio of the main sectors from a security-by-security database, applying the corresponding market values as is already the case for the main financial institutions' portfolios (credit and portfolio investment institutions, insurance corporations and the rest of the world).

### 3. Compilation process and structuring of the accounting system

#### 3.1. Compilation process

Financial accounts, as part of the national accounts system, are themselves an integrated system of information insofar as they comprise information relating to different sectors and financial instruments which are interrelated and built on a set of common principles and rules; for instance, in relation to the time of recording the transactions, valuation criteria, etc. The financial accounts system enables the financial flows of the economy as a whole to be explained and the net flow of financing granted/ received by a particular sector against the remaining sectors, or in the case of the economy as whole against the rest of the world, to be determined. It further determine the wealth positions of different sectors, etc in a coherent way between different perspectives of the information, which is probably one of the main sources of attractiveness for users.

To build the financial accounts system it would be easier if data for all financial transactions for a given sector were available from a single data source that were to ensure consistency of information. However, this is not the situation. To compile financial accounts it is necessary to consider data from different economic sectors, which requires a specific integration effort in order to make criteria compatible and in line with those set up in the reference manual. In this respect, the FASE play an integrating role. This consists of adapting the information from different sources and designed to serve different purposes in such a way that it lends itself to a common reading; to this end, various techniques are used during the compilation process, such as the reorganisation of the information on the underlying financial statements, the revision of the valuation criteria, estimations (use of complementary information, grossing up, apportioning, etc), etc.

Both the above-mentioned roles of the FASE – as an integrated system of information and in its function of integrating data from different sectors, administrative registers, financial markets, etc. – explain the structuring of the accounting information in the compilation process.

The FASE are compiled from information stored in the time series database system of the Banco de España. The system has been developed in the FAME framework and it stores more than 500,000 time series of the different sectors of the Spanish economy and markets (accounting information, complementary statements on securities portfolios, surveys, administrative registers, data from securities markets, etc.). These databases are called *primaries* as they are the first step in the collection of aggregated data. Additional public information disseminated by the Banco de España in its publications is stored in other databases.

The compilation process of the FASE is fully integrated with the primary databases; to compile the Accounts, financial instruments circulating in the Spanish economy are classified in a matrix of 40 categories of financial assets and 20 institutional groupings, which are later aggregated in the categories established in the ESA 95. In this process it is necessary, for each financial instrument, to select the right data source, to identify the counterpart sectors, to assess the consistency between balance sheets and flows, etc. An important aspect is how the accounting scheme is structured to compile the financial accounts.

#### 3.2. Structuring of the accounting scheme

We can distinguish four relevant aspects in the compilation process where, in the light of recent experience, the FASE have arrived at solutions that are worth mentioning. These are: the setting

of priorities between data sources; the relationship between the three dimensions of the information: balance sheets, transactions and other changes; the link between non-financial and financial accounts; and finally, the residual character of the sectors non-financial corporations and households, which, as we will see later, requires some clarification.

### 3.2.1. *The setting of priorities between data sources*

During the FASE compilation process, it is necessary to select the most reliable of the various data sources for a particular financial relationship (*holding sector \* financial instrument \* issuing sector*). For instance, the amount of credits received by non-financial corporations from monetary financial institutions can be ascertained from the financial statements of the former institutions or from the information of the Central Balance-Sheet Data Office (which collects data from financial statements of non-financial corporations). In the FASE, the general criterion is to give preference to data sources that provide information about the total volume of such financial instruments and that allow most counterpart sectors to be identified. For example, in the case of deposits and credits intermediated by credit institutions, the accounting information of these institutions is used, while in insurance technical reserve transactions, information is derived from the sectors of which they are a liability.

When full accounting information is available for a given sector and information for a particular item is replaced by that from the counterpart sector, there are several possibilities in relation to the likely discrepancies arising between them; for example, carrying the difference to a residual sector in the same category or under the heading of other accounts receivable/payable. In the FASE, these discrepancies are considered to be of a similar nature to accounting lags, i.e. they are caused by entering transactions in the accounts at different moments in time and, for this reason, as a general rule, no balancing item is introduced in the sector in which information has been replaced. However, these discrepancies are used to monitor consistency between different data sources. In certain circumstances, such as an increasing or decreasing trend, a link with other variables, significant volatility, etc., discrepancies may indicate a poor sector or instrument classification in the base information, inadequate valuation criteria, etc. which will have to be revised.

### 3.2.2. *The relationship between three dimensions of the information: financial balance sheets, transactions and other changes*

The FASE present information for sectors of the Spanish economy on financial balance sheets (B), the financial transactions account (F) and other changes in the financial assets and liabilities account (C). For each financial instrument, the information recorded in these accounts must satisfy the accounting identity:

$$B_t = B_{t-1} + F_t + C_t$$

and then:

$$\Delta B_t = B_t - B_{t-1}$$

It is not possible to estimate directly and incorporate into the system the three dimensions of the information, as this may create some inconsistencies; but, depending on each financial instrument, the equation can be solved in one or other direction to obtain one variable as the difference of the other two. That is to say, the following situations can be considered:

- *Estimation by difference of financial transactions* ( $F_t = \Delta B_t - C_t$ ). This is the most common situation; it is used in the categories of loans, deposits, securities portfolio, insurance technical reserves, and other accounts payable/receivable. For this purpose, data from accounting balance-sheets is used, and also from profit and loss accounts to estimate adjustments due to gains/losses in foreign currency and securities transactions, write-offs, etc.;
- *Estimation by difference of other changes in assets and liabilities* ( $C_t = \Delta B_t - F_t$ ). This is used on the liability side, in the categories of securities (securities other than shares, and shares and other equity) in which, normally, valuation at market prices of the securities as stocks and of security flows (including accrued interest) can be calculated or estimated from financial markets information;
- *Estimation of balance-sheets by accumulating flows* ( $B_t = B_{t-1} + F_t + C_t$ ). Currently, this is exceptional. It is only used when data are not available for stocks and they are estimated by

accumulating flows with the necessary corrections: initial estimate of certain items of the international investment position, general government trade credits, etc.

### 3.2.3. *The link between non-financial and financial accounts*

The capital account includes, on one hand, resources (=saving) and, on the other, investment: in this way its balancing item reflects, if positive, surplus capacity to finance other sectors, and, if negative, a need for financing. As is known, the same concept materialises in the net acquisition of financial assets less net incurrence of liabilities (which in the FASE are called net financial transactions), whereby it can be estimated from both the non-financial and financial sides of the national accounts. The fact that both estimates are not equal imply an adjustment or statistical discrepancy.

Two different situations can be distinguished in how the accounting relationship between non-financial and financial accounts is structured in the FASE

#### a) *Sectors for which non-financial and financial accounts are compiled on the basis of complete base information*

*Financial institutions, general government* and, with some qualifications, the rest of the word sector are cases in point here.

In theory, it would be possible to perform the exercise of reorganising the accounting information of financial institutions (balance-sheets and profit and loss accounts) and the budgetary information of general government to obtain the variables of national accounts, in such a way that the net balances of non-financial accounts and financial accounts are consistent. However, in practice these accounting identities do not occur. This is due to the fact that the base information is not complete (for instance, the movements between own resources and other headings of the balance sheets are not fully known), the allocation of certain items in the national accounts categories are not clear (for example, the distinction between interest and holding gains), or that, during the compilation process, it is necessary to replace certain items with counterpart information.

In the rest of the word sector the situation is similar, though for different reasons. The Spanish balance of payments, which is the main data source for the non-financial and financial accounts, presents a discrepancy between the net balance of the capital account and the financial account that is known as errors and omissions. This, in addition to the reasons indicated by its traditional name, is also explained by the leads and lags between receipts and payments of exports and imports and, to some extent, reflects the existence of undetermined transactions of resident sectors on financial assets against the rest of the world.

Under these circumstances, there are three possibilities, i) to maintain explicitly the discrepancy between the non-financial and financial accounts; ii) to take as a common net balance that of the financial transactions account, which will mean making an adjustment in one of the non-financial accounts, for instance, as unspecified income; and, iii) to take as a common net balance that of the non-financial account, which will similarly involve making an adjustment in, for example, the category of other accounts receivable/payable.

In the FASE, at present, it is considered that the net balance of both accounts should be the same in these sectors (financial institutions, general government and rest of the word) due to the fact that the base information is substantially the same; furthermore, it is considered that discrepancies reflect mostly the limitations of the information from the financial side, and because of that the net balance of the capital account is taken as the common one. These limitations can be explained by the existence of accounting adjustments in the balance sheets, difficulties in estimating certain flows (for example, on foreign currency), the integration of information of other data sources, etc. This treatment involves the inclusion of the statistical discrepancy as a *reconciliation adjustment* under the heading of other accounts receivable/payable and the allocation to the other resident sectors: non-financial corporations and households as counterparts. This adjustment is not accumulated in the financial balance sheets.

Table 2 *Adjustment between non-financial and financial accounts* shows some statistics to assess the nature of the reconciliation adjustment: average (a) and standard deviation (s). The main conclusions are:

- In the sector *monetary financial institutions, non-monetary financial institutions and general government*, the reconciliation adjustment is recorded under the heading of *other accounts*

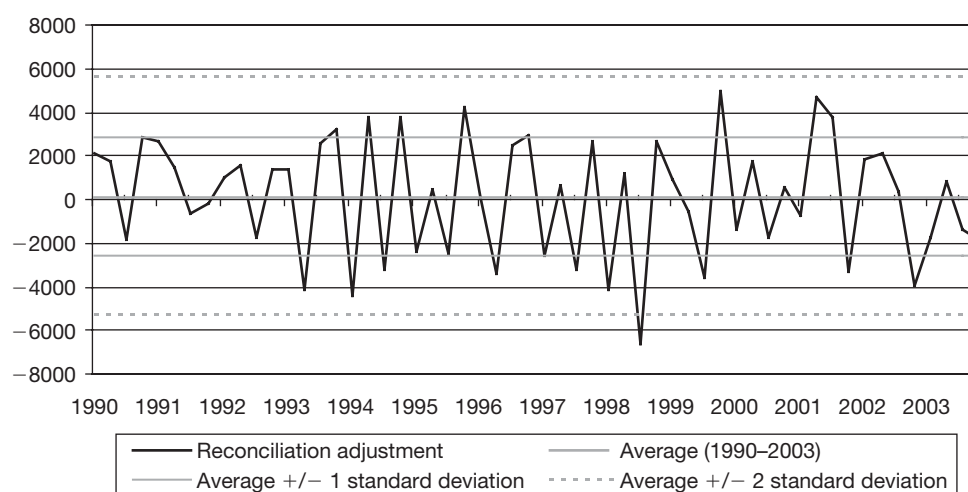
*payable*. The net effect over the period can be seen to be very small, at around  $-0.01\%$  of GDP, with a standard deviation of  $0.33/0.37\%$  of GDP. The fact that the average of these adjustments is close to zero in all sectors upholds its accounting-lag nature as a result of the different time of recording financial transactions or between the latter and non-financial transactions, more than the existence of a systematic transaction measurement problem or the fact that some of them were not included in the system.

- As earlier indicated, the counterpart of this adjustment is carried to other resident sectors (non-financial corporations and households) under the same heading; the overall amount of this adjustment represents  $0.03\%$  and  $0.55\%$  of GDP, of average and standard deviation, respectively. The following chart 1 depicts the values of the reconciliation adjustment of other resident sectors. It can be seen that all observations (with the exception of 1998 Q3) are in the range of  $\pm$  twice the standard deviation and most of them (39 of 46) under the interval of the average  $\pm$  one standard deviation.
- In the rest of the world sector, the net effect of the reconciliation adjustment over the period is also small,  $0.18\%$  of GDP, with a standard deviation of  $0.43\%$  of GDP. As explained before,

Table 2 – Adjustment between non-financial and financial accounts in the sectors financial institutions general government and rest of the world (quarterly series 1990–2003)

	EUR millions		% GDP	
	Average (a)	Standard deviation (s)	Average (a)	Standard deviation (s)
(1) Monetary financial institutions	-21	1848	-	0.37
(2) Non-monetary financial institutions	-46	1612	-0.01	0.33
(3) General government	-60	1608	-0.01	0.33
(4) Other resident sectors	126	2723	0.03	0.55

Chart 1 – Reconciliation adjustment, other resident sectors



the reasons for this adjustment differ from previous sectors; in this case, the origin lies in the existing discrepancy in the Balance of Payments between the capital account and the financial account which is called errors and omissions. The counterpart to this adjustment is also allocated to the sectors non-financial corporations and households under the heading other accounts receivable as an unclassified asset.

The Balance of Payments concept of errors and omissions amounts to  $0.19\%$  of GDP, with a standard deviation of  $0.09\%$  of GDP; the latter value is below that of the reconciliation adjustment



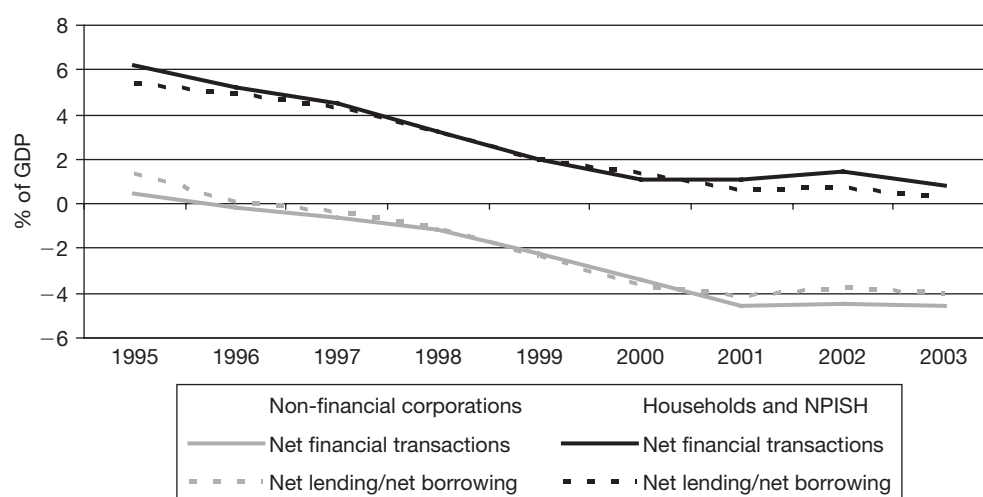
in the financial accounts. This fact indicates that a significant part of the volatility of this adjustment in the FASE originates in the compilation process, both of the non-financial national accounts and the financial accounts, due to the need to introduce information from data sources other than the Balance of Payments in certain items to retain consistency between sectors. This situation is not satisfactory and highlights the need to enhance the consistency between Balance of Payments data and other data sources used in the compilation of financial accounts.

*b) Sectors for which non-financial and financial accounts are compiled on the basis of incomplete or heterogeneous base information*

For non-financial corporations and households, the decision taken by the institutions responsible for the compilation of national accounts in respect of the linkage between non-financial and financial accounts has been to maintain explicitly the discrepancy between them.

The main argument, as will be explained in the next item of this note, is that relevant data sources for both sets of accounts are compiled independently, on the basis of different underlying information and that there is a certain heterogeneity in them arising from the to some extent residual nature of these sectors in some categories. These discrepancies can be related also to some methodological differences or to administrative procedures, revision policy, etc. To some

Chart 2 – Financial assets of non-financial corporations and households. By sectors



degree, maintaining the discrepancies of both data sets sends a warning to users that the information is not perfect; furthermore, it entails a test for statisticians about the quality of their work. Chart 2 *Differences between the net balance of capital account and the net balance of financial transactions account* reflects the discrepancies between both accounts, which are compiled by the INE and the Banco de España, respectively, on an annual basis (currently, the INE does not compile quarterly non-financial accounts of institutional sectors). In summary, they are in the range of between -0.3% and 0.8% of GDP, with an average of 0.3% of GDP over the period 1995–2003.

**3.2.4. Residual nature of the sectors non-financial corporations and households**

Once the main characteristics of the structuring of the accounting system in the compilation process have been described, it is worth referring briefly to the non-financial corporations and households sectors. As with other sectors of the economy, information for these sectors can be obtained from their own data sources (accounting databases, surveys, etc) or from the counterpart sectors. In the FASE, the compilation process for these sectors is to some extent *residual*, although it is necessary to specify the scope of this denomination; strictly speaking, this can only be applicable to the securities portfolio and to the reconciliation adjustment that has to be introduced in the accounting system. As a general criterion, in the compilation of the FASE it is



aimed to avoid the introduction of adjustments or the elaboration of non-financial corporations and households on a residual basis. In practice, several situations can be distinguished:

- For the categories currency and deposits, loans, insurance technical reserves, and other accounts receivable/payable, except trade credits, information is obtained from counterpart sectors.
- For the categories of securities, as liabilities, and the estimation of trade credits, own information from security markets and central balance sheet data are used.
- Finally, for the categories of securities, as assets, first, the aggregated information for the total of non-financial corporations and households holdings is estimated on a residual basis; the amounts are then distributed between its two components by applying structures deduced from the statement on securities deposited at credit institutions.

As can be seen, as far as possible the system seeks to prevent errors in the measurement of other sectors being allocated to either the non-financial corporations or households sectors, as would be the case if one particular sector of both were directly estimated and the other were the residual of the system. However, this procedure reinforces the need to introduce external checks for both sectors, in particular in the case of non-financial corporations with the highly detailed information from the Central Balance-Sheet Data Office.

#### 4. Value added of the financial accounts

The FASE provide information on the financial performance of the economy from different perspectives: sector accounts, issues and holdings of financial instruments, the link between stocks, transactions, revaluations and other changes, etc. From this information, there are several areas that can be identified where the FASE contain relevant information for the analysis of the financial flows of the Spanish economy: the structure and development of the financial balance sheets, financial wealth and debt of non-financial sectors, financing and financial investment of sectors, inter-sectoral flow of funds, etc. which attract analysts' attention not only in respect of assessing the monetary conditions of the economy, but also of evaluating the general trends of the financial system, the solvency of non-financial sectors, etc. The following points indicate some aspects of greater value added of the financial accounts. To this end, tables 2 to 6 of the annex present summary information from the FASE for the period 1990–2003.

- *Structure of the financial system.* The FASE contain information on financial assets and liabilities for each sector and for the total economy (total of resident sectors plus the rest of the world), and the distributions by sector and instrument. This provides an overall framework for the analysis of financial developments in the Spanish economy. As can be seen in table 1 of the annex, during this time the total volume of financial assets grew substantially, boosted by events such as the surge of new financial intermediaries and more complex financial instruments, the assumption of greater risks by investors and the globalisation of the economy.
- *Financial wealth of non-financial corporations and households.* The FASE provide information about the financial wealth of non-financial corporations and households, including breakdowns by financial instrument and counterpart sector. As can be seen in table 2 of the annex, recent trends reflect a loss of importance of currency and deposits in respect of total financial wealth against other financial assets. This can be explained by a significant increase in securities holdings due to different reasons (strength of investments abroad by non-financial corporations, greater preference of households for risk), the strong rise in the value of marketable financial assets, the development of new financial instruments, the expansion of non-monetary financial intermediaries, etc.

The foregoing highlights the need to frame traditional monetary analysis in a broader set of variables covering a greater portion of financial wealth. Along these lines, analyses of financial conditions in the Spanish economy conducted by the Bank in its reports incorporate liquidity indicators of non-financial corporations and households, which, in addition to liabilities of monetary financial institutions (deposits, securities, etc), include other liquid assets such as participations in mutual funds or deposits abroad.

- *Debt of non-financial sectors.* The FASE provide detailed information about the indebtedness of non-financial corporations, general government and households. This information is more complete than that offered by traditional credit aggregates compiled as a counterpart to liquidity aggregates. This information is useful not only for assessing the monetary conditions of the economy as a whole, but also for evaluating other aspects relating to the stability and the risks of the financial system, the financial burden on economic agents, etc. As can be seen in table 3, during this period, there has been a strong increase in the debt of non-financial sectors as a whole; in particular, during the recent years of expansion of the economy and low

interest rates, the increase has intensified in non-financial corporations and households, while general government debt has fallen. These developments are monitored regularly by the Banco de España in a set of monthly debt indicators in line with the FASE.

Moreover, the FASE provide the basis for the data on Public Debt which has to be compiled to comply with the Excessive Deficit Procedure (EDP). The only differences between Public Debt according to EDP and the same variable in the FASE refers to the valuation criteria, either *nominal value* or *market value*, respectively; and the consolidation of intra-general government positions.

- *Net lending /net borrowing of the sectors.* The net balance of the financial transactions account or net financial transactions of the sector is a measure of the net flows of financing granted/received to/from the other sectors of the economy and the rest of the world. It is thus a summary indicator of the financial conditions of each sector. Traditionally, this variable has been analysed for the total economy (through the net balance of the Balance of Payments' capital account) and more recently it has become relevant for the general government in the framework of the Excessive Deficit Procedure and the Stability and Growth Pact. However, the Banco de España also attaches importance to this variable in the non-financial corporations and households sectors in its periodic analyses. As in other countries, table 4 of the annex shows that, habitually, non-financial corporations and general government have a need for borrowing, while households and, to a lesser extent, financial institutions have net lending capacity. On the whole, Economy (which is the opposite of the rest of the world sector) ran a surplus or a deficit of resources, depending on the cyclical situation of the economy.

Table A – Spanish financial accounts summary by sector and transaction. 2003 (EUR millions)

	Total Economy (unconsolidated)		Financial institutions		Other resident		Transac-tions between resident sectors	Total Economy (consolidated)	Rest of the world	Total	
	<i>S.1</i>	<i>S.12</i>	Monetary financial institutions	Non-Monetary financial institutions	General government	Total					Non-financial corporations
	<i>S.1</i>	<i>S.121/2</i>	<i>S.123/5</i>	<i>S.13</i>	<i>S.11/4/5</i>	<i>S.11</i>	<i>S.14/5</i>	<i>S.1*</i>	<i>S.2</i>	<i>S.1 + S.2</i>	
<b>Financial transactions account</b>											
I. Outstanding financial assets	4,979,223	2,184,849	1,659,873	199,829	2,594,545	1,345,126	1,249,418	4,107,528	871,695	1,143,854	6,123,077
AF.1 Monetary gold and SDRs	5,886	5,886	5,886	–	–	–	–	–	5,886	–5,886	–
AF.2 Currency and deposits	1,141,332	443,597	338,744	58,097	639,638	133,731	505,907	972,456	168,876	317,864	1,459,197
AF.3 Securities other than shares	594,140	514,401	285,814	11,591	68,149	32,312	35,837	314,395	279,745	257,451	851,591
AF.4 Loans	999,225	928,863	867,140	32,181	38,180	38,180	–	930,919	68,305	181,070	1,180,295
AF.5 Shares and other equity	1,354,858	243,829	147,882	55,995	1,055,034	584,832	470,202	1,062,326	292,532	346,972	1,701,830
AF.6 Insurance technical reserves	220,346	11,513	–	–	208,832	17,626	191,206	217,319	3,027	–	220,346
AF.7 Other accounts receivable	663,436	36,759	14,407	41,965	584,711	538,444	46,267	610,111	53,324	46,383	709,819
II. Outstanding liabilities	5,257,268	2,172,233	1,653,679	466,449	2,618,586	2,111,677	506,909	4,107,528	1,149,740	865,809	6,123,077
AF.2 Currency and deposits	1,290,321	1,288,014	1,280,384	2,307	–	–	–	972,456	317,864	168,876	1,459,197
AF.3 Securities other than shares	571,846	201,974	122,892	357,812	12,060	12,060	–	314,395	257,451	279,745	851,591
AF.4 Loans	1,111,989	10,752	6,346	70,129	1,031,108	587,351	443,757	930,920	181,070	68,305	1,180,295
AF.5 Shares and other equity	1,409,298	416,620	209,673	–	992,678	992,678	–	1,062,326	346,972	292,532	1,701,830
AF.6 Insurance technical reserves	217,319	215,877	7,439	–	1,442	1,442	–	217,319	–	3,027	220,346

Table A – (continued)

	Total Economy (unconsolidated)		Financial institutions		General government		Other resident		Transactions between resident sectors	Total Economy (consolidated)	Rest of the world	Total
	S.1	S.12	S.121/2	S.123/5	S.13	S.11/4/5	S.11	S.14/5				
AF.7 Other accounts receivable	656.494	38.995	26.946	12.048	36.202	581.298	518.146	63.152	610.111	46.383	53.324	709.819
III. Net financial assets (I = I-II)	-278.045	12.617	6.194	6.423	-266.620	-24.041	-766.550	742.509	-	-278.045	278.045	-
Financial transactions account												
I. Net acquisition of fin. assets	487.844	276.569	192.609	83.960	5.505	205.770	127.949	77.821	376.244	111.600	126.377	614.220
F.1 Monetary gold and SDRs	22	22	22	-	-	-	-	-	-	22	-22	-
F.2 Currency and deposits	83.671	47.727	26.785	20.942	-4.203	40.146	10.435	29.711	77.790	5.881	56.023	139.694
F.3 Securities other than shares	85.342	72.597	51.480	21.118	3.820	8.925	5.732	3.193	32.590	52.751	41.947	127.288
F.4 Loans	127.645	125.901	107.566	18.334	2.050	-306	-306	-	125.327	2.318	20.517	148.162
F.5 Shares and other equity	102.056	28.291	5.850	22.441	1.324	72.441	50.216	22.226	66.725	35.331	6.397	108.453
F.6 Insurance technical reserves	17.754	724	-	724	-	17.031	1.705	15.325	17.574	180	-	17.754
F.7 Other accounts receivable	71.354	1.308	906	402	2.514	67.532	60.166	7.366	56.238	15.116	1.515	72.869
II. Net incurrence of liabilities	502.643	265.994	183.520	82.475	3.025	233.623	161.873	71.750	376.244	126.399	111.578	614.220
F.2 Currency and deposits	133.813	133.641	134.628	-988	173	-	-	-	77.790	56.023	5.881	139.694
F.3 Securities other than shares	74.537	73.700	41.397	32.304	1.861	-1.024	-1.024	-	32.590	41.947	52.751	127.288
F.4 Loans	145.844	-3	49	-52	333	145.514	75.780	69.735	125.327	20.517	2.318	148.162
F.5 Shares and other equity	73.122	35.310	6.136	29.173	-	37.812	37.812	-	66.725	6.397	35.331	108.453
F.6 Insurance technical reserves	17.574	17.802	684	17.118	-	-228	-228	-	17.574	-	180	17.754
F.7 Other accounts payable	57.753	5.545	625	4.920	659	51.549	49.533	2.016	56.238	1.515	15.116	72.869
III. Net financial transactions (=I-II)	-14.799	10.575	9.090	1.485	2.480	-27.854	-33.924	6.071	-	-14.799	14.799	-

Source: Financial Accounts of the Spanish Economy (1990–2003). June 2004. Table II.2.

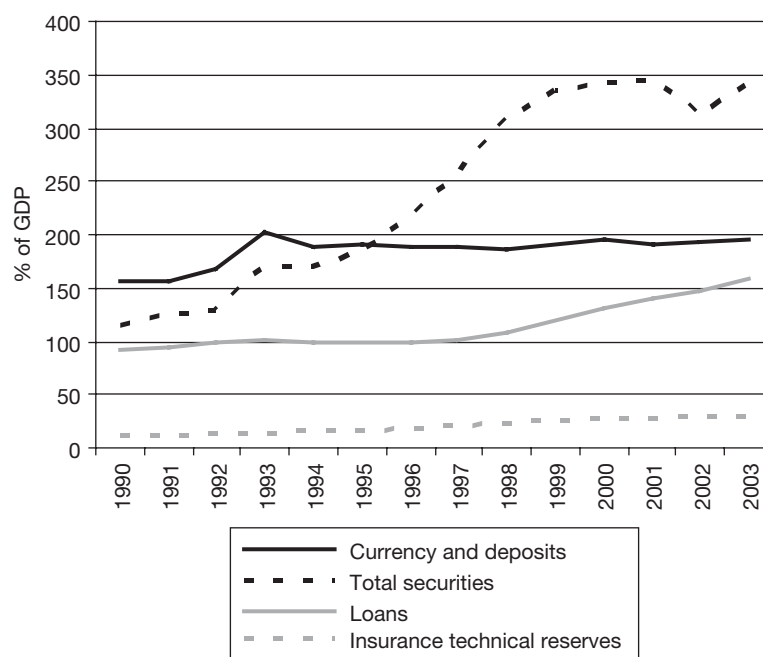
Annex

Table 1 – Outstanding financial assets= Liabilities of the Spanish economy

	1990	1995	1999	2003
				% of GDP
<b>By financial instruments</b>				
AF.2 Currency and deposits	157.0	191.3	191.7	196.4
AF.3 Securities other than shares	53.3	68.7	94.7	114.6
AF.4 Loans	91.4	97.9	118.4	158.8
AF.5 Shares and other equity	60.6	115.0	241.1	229.0
AF.6 Insurance technical reserves	10.8	17.0	24.8	29.7
AF.7 Other accounts receivable/payable	75.8	72.2	86.2	95.5
<b>Total</b>	<b>449.0</b>	<b>562.4</b>	<b>756.8</b>	<b>824.1</b>
<b>Liabilities of:</b>				
S.12 Financial institutions	185.8	223.8	277.2	292.3
S.121 Banco de España	21.8	19.5	20.3	14.3
S.122 Other monetary financial institutions	150.5	173.4	192.5	208.3
S.123/5 Non-monetary financial institutions	13.5	30.9	64.4	69.8
S.13 General government	49.9	73.6	75.4	62.8
S.11/4/5 Other resident sectors	186.2	213.9	314.6	352.4
S.11 Non-financial corporations	142.6	170.9	261.6	284.2
S.14/5 Households and NPISH	43.5	42.9	53.0	68.2
S.2 Rest of the world	27.2	51.1	89.7	116.5

Source: *Financial Accounts of the Spanish Economy (1990–2003)*. June 2004. Tables II.6 and II.22.

Graph 1.1 – Total financial assets (= liabilities) of the Spanish economy. Main financial assets



Graph 1.2 – Total liabilities of financial institutions and rest of the world

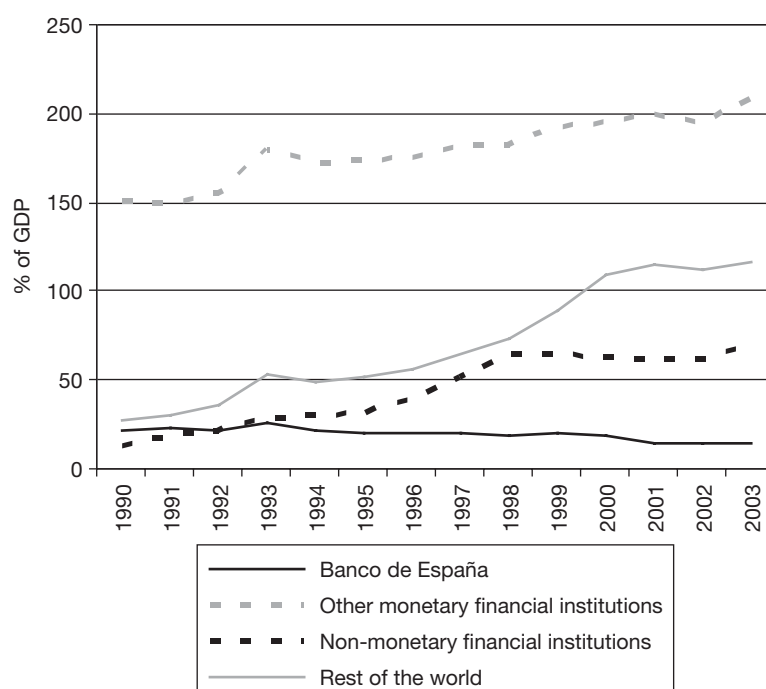
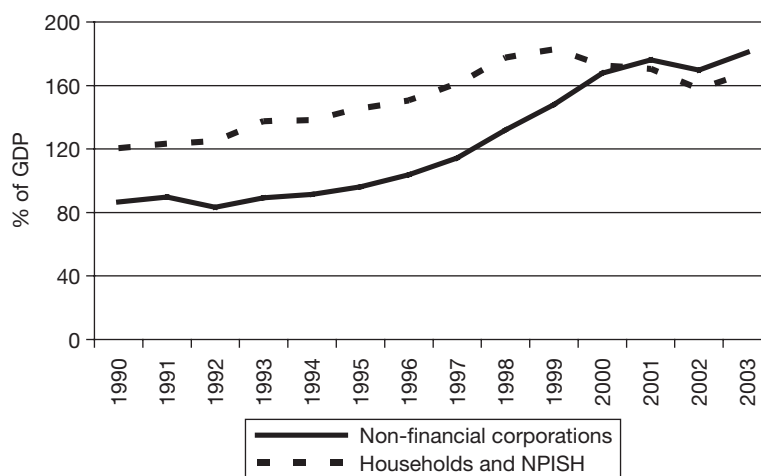


Table 2 – Financial assets of non-financial corporations and households

	1990	1995	1999	2003
				% of GDP
By financial instruments				
AF.2 Currency and deposits	88.0	87.4	82.5	86.1
AF.3 Securities other than shares	13.2	8.3	8.1	9.2
AF.4 Loans	0.9	2.4	2.8	5.1
AF.5 Shares and other equity	34.1	70.7	144.8	142.0
AF.6 Insurance technical reserves	10.1	16.3	23.8	28.1
AF.7 Other accounts receivable	60.9	56.5	68.6	78.7
Total	207.1	241.6	330.6	349.2
By sectors				
S.11 Non-financial corporations	86.6	96.2	147.9	181.0
S.14/5 Households and NPISH	120.5	145.5	182.7	168.1
				% of total assets
By financial instruments				
AF.2 Currency and deposits	42.5	36.2	24.9	24.7
AF.3 Securities other than shares	6.4	3.4	2.5	2.6
AF.4 Loans	0.4	1.0	0.8	1.5
AF.5 Shares and other equity	16.5	29.3	43.8	40.7
AF.6 Insurance technical reserves	4.9	6.7	7.2	8.0
AF.7 Other accounts receivable	29.4	23.4	20.8	22.5
Total	100.0	100.0	100.0	100.0
By sectors				
S.11 Non-financial corporations	41.8	39.8	44.7	51.8
S.14/5 Households and NPISH	58.2	60.2	55.3	48.2

Source: *Financial Accounts of the Spanish Economy (1990–2003)*. June 2004. Tables II.7 and II.21.

Graph 2.1 – Financial assets of non-financial corporations and households. By sectors



Graph 2.2 – Financial assets of non-financial corporations and households. By instruments

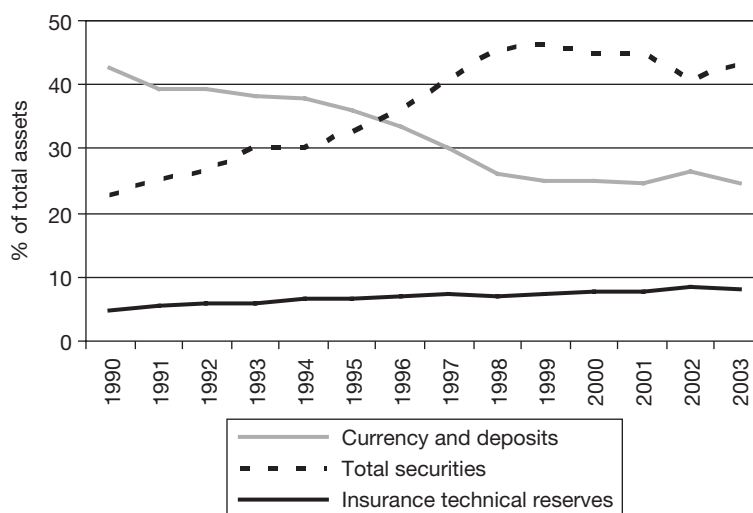




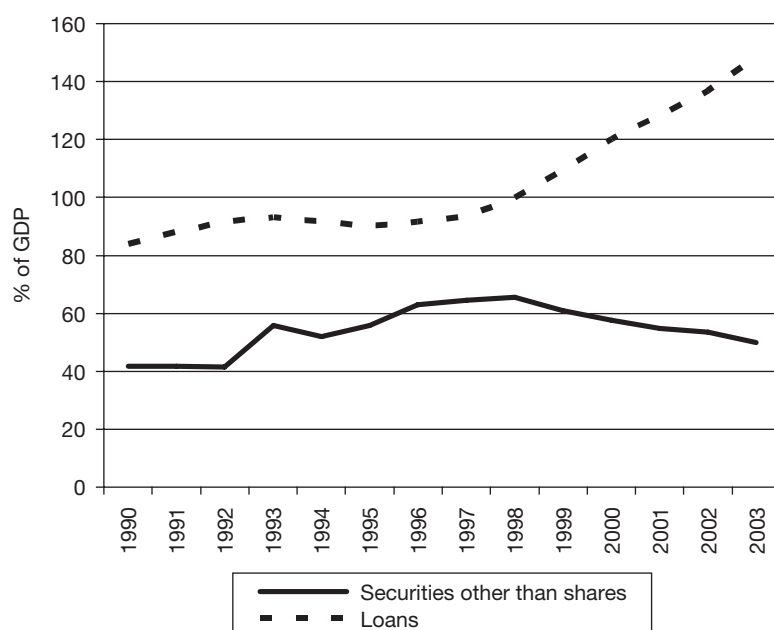
Table 3 – Debt of the non-financial sectors

	1990	1995	1999	2003
				% of GDP
By instruments				
AF.3 Securities other than shares	41.7	55.8	61.0	49.8
AF.4 Loans	84.0	90.2	109.4	148.2
By borrowing sectors				
S.13 General government	42.5	66.7	69.5	57.6
<i>General government (EDP)<sup>1</sup></i>	<i>43.8</i>	<i>64.0</i>	<i>63.1</i>	<i>53.4</i>
S.11/4/5 Other resident sectors	83.2	79.3	101.0	140.4
S.11 Non-financial corporations	51.4	47.1	57.2	80.7
S.14/5 Households and NPISH	31.7	32.2	43.8	59.7
By lending sectors				
S.12 Financial institutions	107.8	114.4	131.0	146.3
S.13 General government	1.1	2.3	3.6	5.0
S.11/4/5 Other resident sectors	9.5	5.5	2.6	1.6
S.11 Non-financial corporations	2.2	1.6	1.6	1.0
S.14/5 Households and NPISH	7.4	3.9	1.0	0.5
S.2 Rest of the world	7.3	23.7	33.2	45.1
Total	125.7	145.9	170.4	198.0

Source: *Financial Accounts of the Spanish Economy (1990–2003)*. June 2004. Table II.4

<sup>1</sup>Excessive Deficit Procedure (March 2004 notification). Nominal valuation.

Graph 3.1 – Debt of the non-financial sectors.  
By instruments



Graph 3.2 – Debt of the non-financial sectors.  
By borrowing sectors

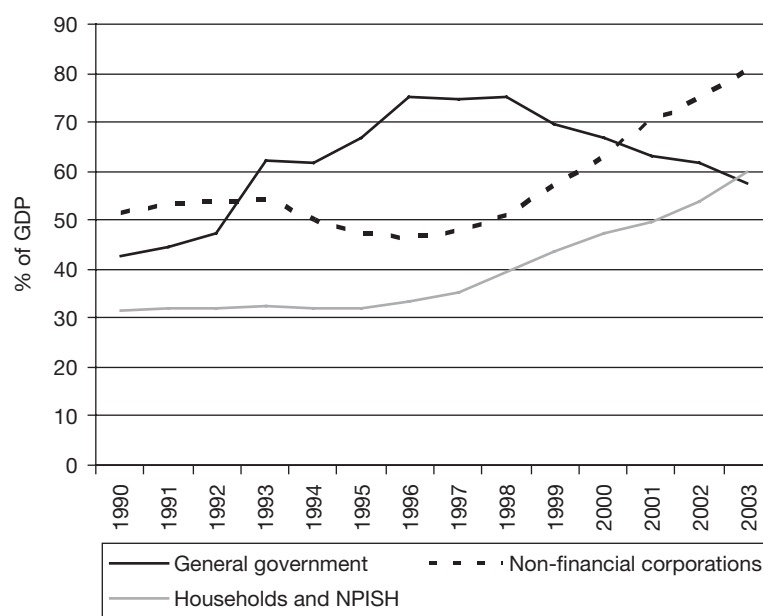
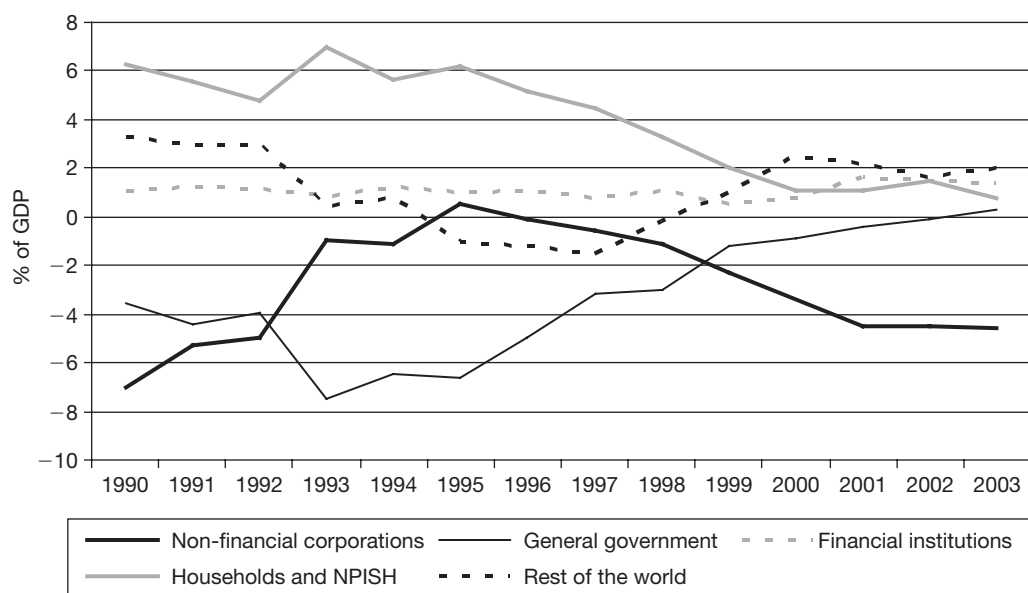


Table 4 – Net financial transactions<sup>1</sup>

	1990–1994	1995–1999	2000–2003
			% of GDP
Resident sectors with net borrowing			
S.11 Non-financial corporations	-3.9	-0.7	-4.3
S.13 General government	-5.2	-3.8	-0.3
Resident sectors with net lending			
S.12 Financial institutions	1.1	0.9	1.3
S.14/15 Households and NPISH	5.9	4.2	1.1
S.2 Rest of the world	2.1	-0.6	2.1

<sup>1</sup>Net lending (+) or net borrowing (-)

Graph 4.1 – Net financial transactions



# Developing quarterly financial accounts: experience of Latvia

*Aiga Ose\* (Bank of Latvia)*

## 1. Historical issues and distribution of responsibility

At the beginning of the 1990s, a special department for National Accounts was established at the Central Statistical Bureau (CSB). Its functions, of course, included also financial accounts compilation, since financial accounts are part of the National Accounts System. Financial accounts were a new issue in Latvia, and in the first years, CSB experts faced a significant scope of work, such as mastering of the relevant methodology and launching a pilot project of compiling financial accounts.

Some years later, in 1995, the CSB finished the pilot project and published the first National Accounts of Latvia for the reference period of 1992, including financial accounts. Although the compilation of financial accounts started at the beginning of the 1990s, the 1995 data are considered the first official financial accounts data in Latvia. The CSB still compiles financial accounts data with the same frequency (annual) and breakdown of financial instruments (AF.1/F.1, AF.11/F.11, AF.12/F.12, AF.2/F.2, AF.21/F.21, AF.22/F.22, AF.29/F.29, AF.3/F.3, AF.4/F.4, AF.5/F.5, AF.6/F.6, AF.7/F.7)<sup>1</sup> and sectors (S.11, S.12, S.13, S.14, S.15, S.2)<sup>2</sup>. So far no revisions have been made to financial accounts historical data. The period of annual financial accounts compilation, however, has been reduced to T + 15 months.

Since 2001 the Bank of Latvia (BoL) has been gradually joining the CSB in the financial accounts compilation. Initially experts from the BoL Balance of Payments Division and Banking and Monetary Statistics Division helped the CSB to allocate the correct financial instrument code to every item coming from the aggregated surveys of monetary financial institutions (MFI) sector (S.121 and S.122) and the rest of the world sector (S.2). Shortly thereafter, the BoL was informed by the European Central Bank about new ECB requirements for Monetary Union financial accounts (MUFA) compilation with a quarterly frequency and a higher degree of detail for financial instruments, sectors and counterpart sectors. Taking into account the aim of Latvia to join the European Union and the European Monetary Union, as well as the situation in Latvia in the field of financial accounts compilation at that time, the BoL decided to start negotiations with the CSB on production of the financial accounts with quarterly frequency.

During the negotiations, which were started in 2002, some major problems, such as the timeliness and financial instruments breakdown of financial accounts, were identified. First and foremost, these problems had to be solved for annual financial accounts. Besides annual financial accounts data were requested by the Eurostat, while MUFA related to the statistics of eurozone and were requested by the ECB, implying that the main institution responsible for MUFA compilation should be the BoL. Hence a decision to sign the agreement on division of responsibility for financial accounts was made.

On 30 January 2003, the agreement between the BoL and the CSB was signed. According to the agreement, as of 30 January 2003 the CSB is responsible for the compilation of annual financial accounts, while the BoL – for quarterly financial accounts. Besides there was a clause stating that the BoL compiled quarterly financial accounts as a pilot project for one year, i.e., until January 2004. Afterwards the General Economic and Financial Statistics Division was established at the Statistics Department of the BoL. Two experts from the Banking and Monetary Statistics Division were transferred to the new division, particularly for the purposes of quarterly financial accounts compilation.

\* *The views expressed here are those of the author and do not necessarily reflect those of the Bank of Latvia.*

1 *Codes of financial instruments are in conformity with the European System of Accounts 1995.*

2 *Codes of sectors are in conformity with the European System of Accounts 1995.*

## 2. Work done so far

First the new experts started to investigate the relevant methodology, as they had insignificant experience in financial accounts compilation. To clearly understand the concept of financial accounts, experts began to compile financial accounts for the first quarter of 2003 as a pilot project, at the same time identifying and highlighting different problems.

In the meantime, it was decided to proceed with compiling financial accounts step by step. The idea was to go through every sector, investigating the situation in Latvia regarding the institutional units belonging to each sector and its sub-sectors and regarding the quarterly surveys that could be used as direct data sources for financial accounts and their timeliness (aggregated information about the timeliness and breakdown of financial instruments and counterpart sectors of data sources are shown in tables 1 and 2). The first step was to gather information about the institutions from which the aggregated data of institutional units could be obtained in Latvia. The following institutions were selected:

- CSB, which collects data from all companies that produce products and provide non-financial services, financial auxiliaries and financial intermediaries that do not submit their reports to the Financial and Capital Market Commission (e.g. leasing and factoring companies);
- Financial and Capital Market Commission (FCMC), which is a supervisory authority for financial institutions. It obtains data from financial institutions, such as insurance companies, private pension funds, investment management firms, investment brokerage companies, credit institutions, etc.;
- BoL, which compiles Latvia's balance of payments and produces statistical data of credit institutions, credit unions and the central bank;
- State Revenue Service, which obtains data from all institutional units in Latvia; however, the survey is not for statistical purposes;
- Lursoft, which maintains a database containing data provided to the Company Register, e.g., data of companies' fixed capital and shareholders;
- Riga Stock Exchange and Central Depository of Latvia;
- Treasury, which has the data of the state budget and state and municipal budget institutions;
- Ministry of Economy, which has data on the privatization process.

Information about the MFI sector (S.121 and S.122) was obtained shortly thereafter. A special data request (a quarterly survey, including breakdowns by financial instrument and counterpart sector for stocks and transactions) has been prepared and forwarded to the Accounting Department of the BoL. Currently, the Information Systems Department is working out algorithms for automatic data transmission from the database to this survey. The aggregated balance sheet data of the BoL are provided in T + 15 days. The aggregated monthly financial position report of credit institutions provides timely (T + 1 month) information about banks, branches of foreign banks and credit unions in breakdown by financial instrument and counterpart sector. Moreover, this year a new survey for credit institutions has been prepared. It allows the BoL to obtain information about changes in prices of securities. In the survey, the other financial intermediaries (OFI) and financial auxiliaries sectors (S.123 and S.124) are joined in one sector, and the currency breakdown for resident sectors still is in the groups of currencies (LVL, OECD and other currencies).

The FCMC holds all necessary data on the insurance corporations and private pension funds sector (S.125). Currently, this sector includes life and non-life insurance companies, private pension funds and pension plans that are managed by private pension funds, as well as funds of the state defined contributions funded pension scheme that are managed by investment management firms and the Treasury in Latvia. As the FCMC is a supervisory authority in Latvia, the BoL has devoted much effort to supplement supervision requirements with statistical requirements, introducing necessary breakdowns of financial instruments, counterpart sectors, currencies and countries for the surveys of insurance companies, private pension funds (including pension plans) and funds of the state funded pension scheme. The supplemented quarterly surveys for private pension funds and pension plans came into force this year, which means that information for quarterly financial accounts can be obtained in T + 70 days starting with the first quarter of 2004, while the supplemented surveys for insurance companies will be submitted beginning with 2006 in T + 60 days. The data for the state funded pension scheme are also provided in T + 60 days after the reporting period. Thus a full coverage of instruments, sectors, currencies and countries for this sector will be ensured as from 2006. Pending the introduction of the surveys developed for the purposes of quarterly financial accounts in the FCMC information system, the BoL also aggregates the data of these surveys from individual institutional units. The consultation process with regard to the delimitation of sectors for these surveys also is within the BoL competence.

Table 1 – Information about the timeliness of data sources for quarterly financial accounts in Latvia<sup>1</sup>

Data obtained from	Sector (ESA 95)	Timeliness			
		1 <sup>st</sup> quarter	2 <sup>nd</sup> quarter	3 <sup>rd</sup> quarter	4 <sup>th</sup> quarter
Central bank	S.121	T + 15 days	T + 15 days	T + 15 days	T + 15 days
Credit institutions and credit unions	S.122	T + 1 month	T + 1 month	T + 1 month	T + 1 month
Life and non-life insurance companies	S.125	T + 60 days	T + 60 days	T + 60 days	T + 60 days
Private pension funds	S.125	T + 70 days	T + 70 days	T + 70 days	T + 70 days
Pension plans	S.125	T + 70 days	T + 70 days	T + 70 days	T + 70 days
Funds of the state funded pension scheme	S.125	T + 60 days	T + 60 days	T + 60 days	T + 60 days
Investment brokerage companies	S.123	T + 30 days	T + 30 days	T + 30 days	T + 30 days
Investment funds	S.123	T + 30 days	T + 30 days	T + 30 days	T + 30 days
Other financial intermediaries	S.123	T + 85 days	T + 85 days	T + 85 days	T + 8 months
Investment management firms	S.124	T + 30 days	T + 30 days	T + 30 days	T + 30 days
Other financial auxiliaries	S.124	T + 85 days	T + 85 days	T + 85 days	T + 8 months
State budget	S.1311	T + 80 days	T + 80 days	T + 80 days	T + 80 days – operational data T + 7 months – final data
State budget institutions	S.1311 S.1314	–	T + 4 months	T + 4 months	T + 7 months
Municipal budget institutions	S.1313	–	–	–	T + 7 months
Reallocated enterprises	S.13	T + 85 days	T + 85 days	T + 85 days	T + 8 months
Non-financial institutions	S.11	T + 85 days	T + 85 days	T + 85 days	T + 8 months
Rest of the World	S.2	T + 90 days	T + 90 days	T + 90 days	T + 90 days

■ Problematic areas

<sup>1</sup>The data for the households and non-profit institutions serving households are derived from indirect data sources as counterpart information.

The next step was to gather information about the OFI sector (S.123) in Latvia. The BoL experts have defined that this sector includes leasing and factoring companies, exports and imports financing companies, pawnshops, investment brokerage companies and investment funds that are managed by investment management firms in Latvia. The FCMC provides data of investment brokerage companies and investment funds. In the same way as for the insurance corporations and pension funds sector (S.125), the quarterly surveys of investment brokerage companies and investment funds used for the supervision purposes were supplemented to introduce statistical requirements. The BoL also aggregates the data of these surveys from individual institutional units until the introduction of the surveys in the FCMC information system. The supplemented surveys came into force in 2003. Thus quarterly information from investment brokerage companies and investment funds can be obtained in breakdown by financial instrument, sector, country and currency for the needs of quarterly financial accounts in T + 30 days starting with the first quarter of 2004. Quarterly data from other institutional units that belong to the OFI sector (S.123) can be obtained from the CSB, which collects the quarterly balance sheet survey (with the financial instruments breakdown) from OFIs. The CSB provides the aggregated survey of OFIs in T + 85 days for the first, second and third quarters. However, the aggregated data for the fourth quarter are provided in T + 8 months, and this survey has not been improved, taking into account that data providers for this survey are OFIs. A lot of work still has to be done to improve this survey by introducing an appropriate breakdown by financial instrument, counterpart sector, currency and country. Moreover, the CSB also collects data from investment brokerage companies, which in parallel provide data to the FCMC. Currently, the BoL experts have discussions with the CSB experts with the aim to relieve the reporting burden of investment brokerage companies and to improve the survey so as to meet statistical requirements.

Table 2 – Information about the breakdown of data for quarterly financial accounts in Latvia<sup>2</sup>

Data obtained from	Sector (ESA 95)	Breakdown of		Notes
		Instruments	Counterpart sectors	
Central bank	S.121	+	+	
Credit institutions and credit unions	S.122	+	Partly	S.123 and S.124 are not separated
Life and non-life insurance companies	S.125	+	+	Full counterpart sectors breakdown will be provided beginning with 2006
Private pension funds	S.125	+	+	
Pension plans	S.125	+	+	
Funds of the state funded pension scheme	S.125	Partly	+	Short and long term securities can not be clearly separated
Investment brokerage companies	S.123	+	+	
Investment funds	S.123	Partly	+	Short and long term securities can not be clearly separated
Other financial intermediaries	S.123	+	–	
Investment management firms	S.124	+	–	
Other financial auxiliaries	S.124	+	–	
State budget	S.1311	+	+	
State budget institutions	S.1311	Partly	Partly	Some of the financial instruments are not separated. Counterpart sector information is purely available.
	S.1314			
Municipal budget institutions	S.1313	Partly	Partly	
Reallocated enterprises	S.13	+	–	
Non-financial institutions	S.11	+	–	
Rest of the World	S.2	+	+	

■ Problematic areas

<sup>2</sup>The data for the households and non-profit institutions serving households are derived from indirect data sources as counterpart information.

Major institutions included in the financial auxiliaries sector (S.124) are the FCMC, the Central Depository of Latvia, the Riga Stock Exchange, investment management firms, etc. The CSB collects the quarterly survey from all institutions of this sector. Investment management firms are subject to double reporting (to the CSB and the FCMC). As in the case of investment brokerage companies, the BoL has discussions with experts from the CSB about relieving the reporting burden of investment management firms.

Until 2003, annual data for the general government sector (S.13) were taken from indirect data sources. Besides no attempts were made to segregate the sub-sectors of the general government sector. Much effort was made by the BoL to establish a working group for the purposes of Excessive Deficit Procedure, Government Finance Statistics and quarterly financial accounts



for general government. Experts from the BoL explained the necessity of separating sub-sectors and obtaining data from direct data sources, taking into account the new requirements in the field of quarterly financial accounts for general government and Excessive Deficit Procedure. Thereafter the situation in Latvia was investigated. State budget, state and municipal budget institutions and reallocated enterprises are included in the general government sector (S.13) in accordance with European System of Accounts 1995 (ESA 95). Besides, one of the state budget institutions is the State Social Security Agency, which according to the rules of ESA 95 has to be included in the Social Security Funds sub-sector (S.1314). The situation for quarterly financial accounts compilation is not the best. Aggregated stock data for municipal budget institutions are provided only once a year (only annual data) in T + 7 months. An assumption has been made by the BoL experts to use the previous quarter stocks. State budget institutions submit stock data for the second, third and fourth quarters in T + 7 months. Information for the state budget is partly available in T + 80 days on a quarterly basis, mainly for debt, and currency and deposits. Moreover, the surveys for budget institutions do not meet statistical requirements for timeliness and frequency and breakdown by financial instrument, counterpart sector, currency and country. As a result, a lot of improvements still has to be made for the surveys of the general government sector (S.13). At present, the negotiations between the Treasury and the BoL have been started with the aim to improve the surveys so as to meet statistical requirements in the field of quarterly financial accounts for the general government sector.

The non-financial enterprises sector (S.11) includes institutions producing goods and providing non-financial services. Largest non-financial enterprises regularly submit balance sheet data to the CSB, while medium and small size enterprises submit data, based on the sampling that has been made by the CSB. However, the quarterly survey does not fulfil statistical requirements for the quarterly financial accounts with regard to timeliness (for the first, second and third quarters T + 85 days, for the fourth quarter T + 8 months) and breakdown by financial instrument, counterpart sector, currency and country. The BoL experts have made a decision to proportion financial instruments, based on the annual data. In the meantime, negotiations between the BoL and the CSB have started to meet the statistical requirements in the field of quarterly financial accounts.

Information for the sectors of households and non-profit institutions serving households (S.14 + S.15) is obtained from indirect data sources. There are no plans to introduce a special survey for these sectors. Quarterly data from Latvia's International Investment Position and Balance of Payments are provided in T + 90 days for the purposes of compiling the sector of the rest of the world (S.2). The information on the rest of the world is regularly compared with that provided by other sectors, taking into account specific statistical requirements for the international investment position and balance of payments.

The result of the investigation process was as follows:

- Improved surveys for different sectors;
- Agreements between the BoL and the FCMC and the BoL and the CSB about providing data for the purposes of quarterly financial accounts compilation;
- Negotiations between the BoL and Lursoft, the BoL and the Central Depository of Latvia, and the BoL and the Treasury about providing data for the purposes of quarterly financial accounts compilation;
- Negotiations between the BoL and Lursoft, the BoL and the CSB, and the BoL and the Treasury about improving surveys to meet statistical requirements in the field of quarterly financial accounts compilation.

The description of the methodology for quarterly financial accounts compilation in Latvia is being gradually produced and regularly supplemented. During the investigation process, the BoL experts participated in the MUFA Working Group (ECB), financial accounts Working Group (Eurostat), Quarterly Financial Accounts for General Government Task Force (Eurostat and ECB) and Pension Schemes Task Force (Eurostat). Participation in these working groups has been very useful, as it allowed the BoL to gather new information and get into contact with experts from other EU Member States. A good cooperation was achieved between the experts of the BoL and colleagues from Finland. Moreover, Finnish colleagues readily offered their advice, and the BoL and CSB experts visited Finnish colleagues to discuss and solve unclear methodological issues.

The compilation of quarterly financial accounts as a pilot project also comprised the division of work among the experts. Taking into account the experience in other EU Member States and the situation in Latvia, it was decided to divide compilation work by sector. As a result, one expert compiles financial accounts for the MFI (S.121 and S.122) and non-financial institutions sectors (S.11), while another – for the insurance corporations and pension funds (S.125), OFI

(S.123), financial auxiliaries (S.124) and general government (S.13) sectors. The sector of the rest of the world (S.2) is compiled by an expert from the Balance of Payments Division of the BoL Statistics Department. After compiling the quarterly financial accounts as a pilot project, it was also clear that the data have to be compared and balanced between the sectors.

Although quarterly financial accounts compilation was carried out only for the first quarter of 2003, the BoL experts found it a good experience allowing to solve some of the detected problems. At present, the compilation of quarterly financial accounts for the first quarter of 2004 has been started based on the described methodology, and it is planned to finish the compilation by mid-September.

### **3. Encountered problems**

Despite the improvements made, the scope of work yet to be undertaken with regard to quarterly financial accounts is considerable.

A lot of work still has to be done within a short period of time – improvement of data sources, investigation of methodology and development of information system, ensuring also the quality and timeliness. Thus one of the problems encountered is staff capacity.

There are no international seminars for quarterly financial accounts where experts from different countries could exchange their views and experience regarding methodological issues and do some theoretical and practical case studies of financial accounts compilation. In many cases, the experience of senior EU Member States could be indispensable for experts from the new EU Member States. As a result, experts from the new Member States cannot immerse in the methodology, while experts from senior Member States are going further and the problems raised by new Member States seem elementary to them.

Despite the immense scope of work done so far, there still are data sources that have to be improved for quarterly financial accounts compilation. By now only some best estimates have been introduced in the quarterly financial accounts compilation in Latvia, e.g., transactions are calculated as a difference between stocks, exchange rate fluctuations, price changes for securities and other changes, and proportional calculations for counterpart sectors are made. As the BoL recently started to compile quarterly financial accounts, no decision regarding the revision policy for quarterly financial accounts has yet been made. Moreover, revisions for annual financial accounts have not been made at all. Data are only being compiled for the current period. Historical data with a quarterly frequency have not yet been compiled and the possibilities to compile historical data are very negligible. The timeliness is another problem that is not so easy to solve, because some of the data sources are being provided too late for quarterly financial accounts compilation due to the long process of data aggregation, and quarterly financial accounts compilation is not computerised.

All the above problems might seem elementary and might be history for the senior EU Member States. Nevertheless, they are key problems in the financial accounts compilation process. Finding the solution would allow experts to make further progress and perform a deeper study and analysis of the methodology and the quality of data.

### **4. Future plans**

At present, the key problems for quarterly financial accounts compilation are dealt with, more or less. Future plans, of course, envisage finding a solution and eliminating the problems. To speed up the compilation process and to reduce compilation period, negotiations with the Information Systems Department of the BoL have been initiated about the development of an information system for the needs of quarterly financial accounts. The information system will be developed step by step, beginning with the MFI data processing.

It is planned to involve more experts from the other Divisions of the Statistics Department of the BoL in the quarterly financial accounts compilation process, thus speeding it up.

After the first real compilation of quarterly financial accounts, a decision about historical data series and the revision policy will be taken. The BoL will continue negotiations with the Eurostat or the ECB about the best estimates and specific methodological issues. Some publications of the quarterly financial accounts are also planned.

**Summary of presentation (Abstract)**

*Since the beginning of the 90's the Central Statistical Bureau of Latvia (CSB) has been the main institution responsible for the compilation of the financial accounts. The Bank of Latvia (BoL) joined the CSB in the compilation of the financial accounts step by step, starting with the sectors of monetary financial institutions and the rest of the world. The agreement of 30 January 2003 between the BoL and the CSB on the compilation of the financial accounts in Latvia was an outcome of the close cooperation between the CSB and the BoL and of the new requirements from the European Central Bank (ECB).*

*According to this agreement, the responsibility for quarterly financial accounts was assigned to the BoL and for annual financial accounts – to the CSB. Shortly thereafter the General Economic and Financial Statistics Division has been established within the Statistics Department of the BoL. Currently, the CSB has the responsibility for the annual financial accounts, but the BoL compiles quarterly financial accounts based on the statistical reporting requirements of the ECB and quarterly financial accounts for general government.*

*The BoL has made many improvements since 2003 with regard to the quarterly financial accounts; namely, has investigated and improved the relevant methodology, has worked out proposals for improving direct data sources to meet statistical requirements and make sector delimitation, and has launched a pilot project for the quarterly financial accounts. Nevertheless, the scope of work yet to be undertaken is considerable, for example, the capacity issue, methodological issues and timeliness.*

*To ensure a good quality of quarterly financial accounts and to solve the problem of timeliness the BoL has started discussions with the Information Systems Department about the development of an information system for the purposes of financial accounts compilation. Some publications of the quarterly financial accounts are also planned.*

*The presentation will cover historical issues, the distribution of responsibility, work done so far, problems encountered and future plans.*

*Aiga Ose  
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# Updated Philippine flow of funds: based on the 1993 SNA and 2000 MFSM<sup>1</sup>

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## I. Background

The Philippines began compiling the Flow of Funds (FOF) in 1980. The compilation continued until 1994, after which there was a lull as the reorganization in 1993 of the Central Bank of the Philippines into the Bangko Sentral ng Pilipinas (BSP) imposed additional demands on statistical activities. Subsequently in 2000 after another round of reorganization, this time confined to the Department of Economic Research, the compilation was reactivated, which extended the series to 1999. Until then the series still maintains the old system of compiling the FOF, which was based on the framework that was developed independent from the System of National Accounts.

To enhance the relevance for policy use, the Philippine FOF has undergone revisions, starting with the 2000 FOF to implement the recommendations of the revised international standards in the compilation of the FOF, in particular those of the 1993 System of National Accounts (SNA) and the 2000 Monetary and Statistics Manual (MFSM). Changes were introduced in these harmonized frameworks in the light of the changing roles of institutions and the growing sophistication of financial institutions and instruments. The updating of the FOF framework will ensure the consistency of the Philippine FOF estimates with the revised Philippine BOP statistics that have migrated to Balance of Payments Manual 5 (BPM5), and with the Philippine Monetary and Financial Statistics and the Philippine System of National Accounts (PSNA), which are also moving towards the implementation of the revised manuals.

## II. The PFOF framework

The operational framework for the PFOF is the integrated capital and financial accounts to ensure consistency in the sectoral estimates for these two accounts. Under the Philippine set-up the PFOF is independently compiled from the PSNA that is the responsibility of the National Statistical Coordination Board (NSCB).

### 1. Sector classification

The sector and sub-sector classification adopted were as recommended in the harmonized frameworks that includes the financial corporations, non-financial corporations, general government, households and the rest of the world (ROW). Under the general government, social security agencies were covered as a separate sub-sector from the national government (NG) and local government units (LGUs). The financial sector included sub-accounts for depository corporations, insurance and pension funds and other financial corporations. IMF accounts are included with the BSP as the monetary authority.

A separate grouping to account for undercoverage was included under the domestic economy because of the limitations in the data support for non-financial corporation sector and other

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financial corporations.<sup>3</sup> All other unaccounted statistical discrepancies in the domestic and ROW accounts were lodged in this residual sector.

## **2. Details in transactions**

Transactions in the accumulation of non-financial assets included acquisition less disposal of valuables and acquisition less disposal of non-produced non-financial assets, in addition to fixed capital formation and inventories.

Transactions in financial assets covered the recommended classifications with the following breakdown:

- Monetary gold and special drawing rights (SDR), monetary gold and SDRs shown separately
- Currency and deposits, broken down into currency, transferable deposits and other deposits and by national and foreign currency
- Securities other than shares
- Loans
- Shares and other equity
- Insurance technical reserves sub-classified into net equity of households in life insurance and pension funds, and prepayment of premiums and reserves against outstanding claims
- Accounts receivable/payable broken down into trade credits and advances, and others accounts receivable/payable

Derivatives were not included due to lack of data support.

A memorandum item on net foreign direct investment showing details on equity and loans is shown under the non-financial sector.

## **III. Sources and methods**

### **1. Data sources**

Transactions in the capital accounts of the total domestic economy and household saving were sourced from the PSNA. External transactions in both the capital and financial accounts were taken from the Philippine BOP. While the current PSNA already includes institutional income and outlay accounts that provide sectoral estimates on saving, except for household saving, these were only used as indicators for validation since the sectorization is not yet aligned to the requirements of the updated Philippine FOF framework.

Sectoral estimates for both capital and financial accounts were sourced from either the individual or from the consolidated financial statements. Data sources for the sectoral details include the annual reports of the NG, LGUs and Government-Owned-and-Controlled Corporations (GOCCs), the annual reports of the Insurance Commission, Government Service Insurance System (GSIS), Social Security System (SSS), the consolidated financial statements of banks and other financial institutions submitted to the BSP, the balance sheet of the BSP and the database for the top 5000 corporations.

Outstanding debt, national government cash operations report and other data/studies were used for validation of basic data sources.

### **2. Estimation methodologies**

#### **2.1. Control totals**

The general assumption followed in the compilation of the updated FOF is to accept some data sets as firmer. For the transactions with the ROW in the capital account, the choice was biased towards using the Philippine BOP for the net lending and net capital transfers, instead of those of the PSNA. The PSNA's total economy capital accumulation was considered and saving consequently adjusted. The usual practice is to take saving as the more reliable aggregate and adjust capital accumulation. The BOP provided the control totals for the financial transactions with the ROW.

<sup>3</sup> The coverage for the non-financial corporations are limited to those included in the top 5000 corporations and does not include the quasi-corporations.

For the capital account, adjusted net saving of the domestic economy was derived by working back from net lending, that is net lending plus capital accumulation of the PSNA less net capital transfers of the BOP. As such, all statistical discrepancies (SDs) arising from the difference in net lending between the BOP and the domestic economy were lodged in saving.

For the financial account, estimate of the control totals for the total economy were provided by the Philippine BOP together with assumptions on which transactions of the covered sectors in the domestic economy are more reliable. It is assumed that data on resources (liability side) were firmer for currency and deposits, securities other than shares, shares and other equity and technical reserves, while uses (asset side) were considered more reliable for loans. While the MFSM takes the resources of the covered sectors as the control total for all financial assets, in the case of the PFOF data support for the use side of loans was more reliable.

## **2.2. ROW account**

Transactions for the ROW account were taken from the Philippine BOP. Before consolidation for the annual figures, the monthly data were converted using the monthly average exchange rate. The detailed transactions in the financial account of the BOP broadly classified into direct investment, portfolio investment, other investments and reserve assets, were transformed to the classification of the FOF based on the guide provided in the 1993 SNA on the correspondence of the BOP transactions in financial assets to the SNA categories. (Please refer to annex 1 for the sample BOP bridge table for 2002)

Since the ROW account is viewed from the point of view of the ROW, the assets from the BOP (viewed from the point of view of the compiling country) were recorded as liabilities of the ROW and vice versa. In the absence of details on currency and deposits from the BOP, this was assumed to be other deposits except when there was a recorded domestic claim on currency, in which case a corresponding ROW liability in currency was shown in the ROW account.

## **2.3. General estimation procedures for the domestic sectors' accounts**

The following general procedures were adopted in the estimation of the sectoral integrated capital and financial accounts:

- Identification and classification of variables – Bridge tables were prepared to transform the items in the balance sheets to the FOF classification. As in any compilation work, it is the matching of the data with the requirements of the framework that is difficult, where misclassification errors can occur given that the available data were not intended for the compilation of the framework.
- Estimation of transactions – The transactions were derived as the change between two years' balance sheets. To the extent data on revaluation and provisions were available flows were adjusted so as to account only for changes due to transactions.
- For private corporations the basis was the database for the top 5000 corporations which does not provide for comparative previous year's figures and therefore necessitates the matching of corporations with those covered in the previous year. The derived flows from the matched sample flows were blown up taking the aggregate private non-financial corporations in the top 5000 as the population. For this sector bridge tables were prepared using the blown-up flows.
- Where data were available, saving and consumption of fixed capital were estimated using the income and expense statements (IES), the appropriate source. Saving from the IES is net income after tax and after payment of dividends, adding back any provisions included in expense and subtracting any non-recurring incomes, such as sale of fixed assets.
- In the integration of the capital and financial account estimates, SDs result when net lending from the capital account and net financing from the financial account do not match. The SD's need not be eliminated but large SD's signal weakness in the estimates. Estimates were refined to reduce the SDs to the extent data can support, otherwise these were shown in the respective accounts.

## **2.4. Estimation procedures specific to certain sectors**

For the national government and the local government units, consumption of fixed capital estimates was taken from the PSNA.



The household sector estimates were taken from what were assumed as more reliable bases. For the capital account, household saving was derived from the PSNA. Household capital accumulation for 2000 was estimated using benchmark parameters from the 1990 Social Accounting Matrix, coupled with aggregate private sector data on inventories and capital formation and growth indicators, sourced from the PSNA.<sup>4</sup> Household estimates for most of the transactions in financial accounts were derived from the creditors and debtors, specifically:

- Deposits of households were estimated from bank reports on deposit liabilities by type of depositor.
- Currency holdings of the household were estimated as a residual item with the assumption that the other unaccounted sectors' holdings of cash was minimal and more of deposits.
- Loans, in addition to those provided by banks to households, include those granted by the GSIS, SSS, and life insurance companies, and all loans granted by specialized government corporations such as Philippine Crop Insurance and Home Development Mutual Fund, Small Business Guarantee and Finance Corporation and National Home Mortgage and Finance Corporation, assumed to have households as recipients.
- Net equity of households in life insurances reserves and in pension funds are transactions between the financial sector and the households so that total liabilities on this financial asset were entered as assets of the households.
- Household's other accounts payable was derived as a residual, the difference between the net lending from the capital account and net financing, and were recorded under others in this category. Furthermore, since this is net of the resources and uses within this sector, positive values were recorded under uses.

There were no recorded financial assets on securities other than shares for the household sector due to data gap. While households may have holdings of this financial asset it may be small as compared to those in the unaccounted for sectors. This assumption was based on a study on securities and bond market in the Philippines which showed that more than ninety percent are government securities and primary holders are corporations where majority hold on to the securities until maturity.

## 2.5. Adjustments

There are transactions of certain sectors for which the counterpart transactors can be identified or assumed. For such transactions, contra entries were first recorded before deriving transactions for the residual sectors.

Net capital transfers recorded in the ROW that was not accounted for in the domestic economy were recorded under the national government.

For the accumulation account any unaccounted difference in the acquisition/disposal of land within the domestic economy were recorded under households.<sup>5</sup> Most of the recorded transactions on land were with the government, which were assumed to have been purchased from households. When a reported net disposal of non-produced non-financial asset in the BOP was determined to be other than sale or acquisition of land, this was entered as a transaction with the ROW under acquisition/disposition of non-produced non-financial assets.

Liabilities of private insurance companies on prepayment of premiums and reserves against outstanding claims net of incurrence of same asset were recorded as assets of non-financial corporations, in the absence of indicator for allocation to other sectors. These are non-life insurance transactions assumed to be big for non-financial sector.

The GSIS liability on prepayment of premiums and reserves for outstanding claims under its general insurance fund (non-life) were recorded as asset of the NG, being its sole client. The other accounts receivable of the NG (assumed to include this transaction), was adjusted by the same amount.

Data gaps in transactions such those on liabilities in securities other than shares of public other financial corporations and non-financial corporations were estimated using administrative based records. Data from the Bureau of the Treasury and the Securities and Exchange

<sup>4</sup> *The PSNA compiles data on fixed capital formation and inventories for public and private sectors, but unpublished. No further breakdown is provided for the private sector.*

<sup>5</sup> *For the accumulation account, the guidelines provide that the domestic economy's acquisition of land should equal disposition except when a change in economic boundary is involved, then transaction on land is recorded between the ROW and the domestic economy. Other than this, transactions on land between residents and non-residents are recorded as financial transactions.*



Commission on issuances of securities and bonds were used to estimate liabilities on securities other than shares of public other financial and non-financial corporations, where these financial assets are not explicitly shown in the respective balance sheets.

## 2.6. Estimation for the undercoverage

Transactions for the undercoverage were estimated residually after accounting for the household transactions and adjustments in the covered sectors' estimates. All resources that have not been accounted for as uses in the covered sectors are recorded under the use column of the undercoverage and all uses that have not been accounted for as resources of the covered sector were recorded under its resources column .

The transactions in the financial account of the residual sector were net of transactions within the sector and only reflected transactions with the rest of the sectors and also included all the errors and omissions.

## IV. Highlights of the PFOF 2000–2002

The initial estimates are unofficial, being very preliminary and subject to revisions after further validation and resolution of issues. As such the updated Philippine FOF tables were not included in this paper. For purposes of presenting the highlights, however, summary table on net financing by major institutional sector and major financial asset classification were shown.

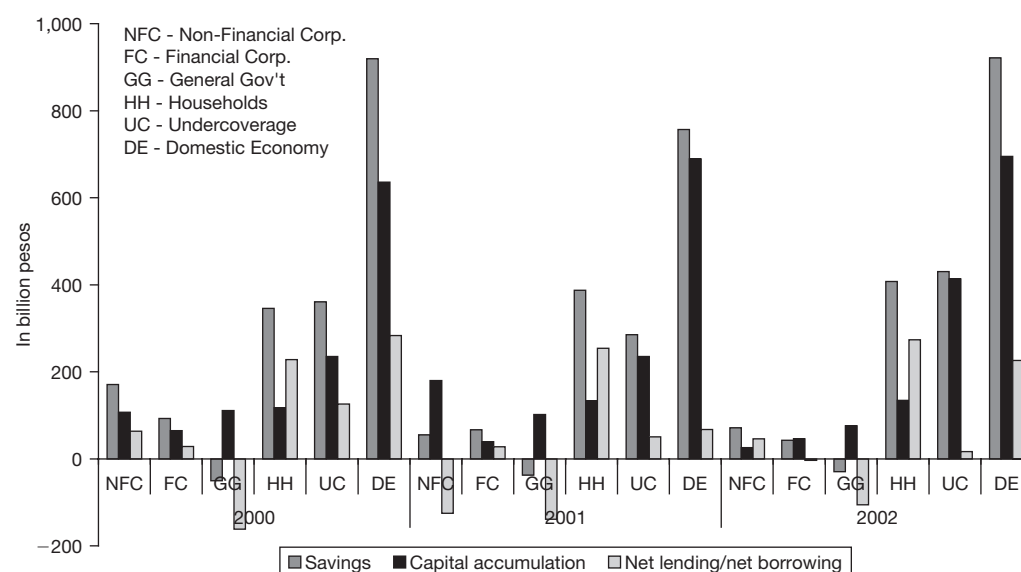
### 1. Capital account

The aggregate saving and net capital transfers of the domestic economy were more than sufficient to finance its capital accumulation, resulting in surpluses or net lending for the period covered.

All accounted sectors except for the general government generated savings during these years. Savings remained largest in the household sector, which maybe attributed to increased income as a result of improved employment and wage conditions and growth in remittances of overseas Filipino workers, coupled with manageable consumption expenditures due to the generally manageable inflation during the period.

On the other hand, the general government persistently had dissaving mainly on account of the national government, which continued to incur deficit as growths in its expenditures (due largely to increases in interest payments and subsidies to local government), outpaced those of the revenue collections.

Chart 1 – Capital account CY 2000–2002



Of the accounted sectors, except for financial corporations all had large investments in non-financial assets in 2000 and 2001. In 2002, however, a substantial reduction in capital accumulation was recorded in the non-financial corporations. General government also reduced capital spending. It appears that the growth in bank lending resulting from lower lending rates in 2002 translated to increased non-financial investment only in the financial and households sectors and the quasi corporations included under the undercoverage.

The household sector remained the major net lender with the general government the consistent largest borrower for the three year period. In 2001, non-financial corporations also incurred deficits due to its substantial investment in non-financial assets that exceeded its saving. In 2002, in addition to the general government, the financial sector also incurred net borrowings due to deficits in the insurance and other financial corporations.

The residual sector accounted for a large proportion of the domestic economy's saving and capital accumulation.

## **2. Financial account**

The domestic economy's net lending or net financing estimated from financial account was lower than the net lending recorded in the capital account due to the unaccounted transactions.

For the three years covered, net lending of the domestic economy were largely financed by other accounts receivable, where in 2001 this was the main source of net lending of the economy. In 2000 net holdings of foreign currency and deposits was also a source of external financing as the domestic sectors invested surplus resources in foreign currency in view of the weakness of the peso and the sluggish stock market during this year. In 2002 in addition to other accounts receivable, the domestic economy provided financing to the ROW through investments in securities other than shares (P36 billion) and the repayment and granting of loans resulting to a net outflow of P86 billion in this financial asset. These need further validation.

The household sector as the major net lender was the major source of financing of the financial intermediaries. The excess funds of the households were held in currency and deposits made available to the banks and in technical reserves of insurance and pension fund companies. An increasing trend was observed in the net holding of currency and deposits by the household, from P49 billion in 2000, to P61 billion in 2001 and P131 billion in 2002. On the other hand household assets in technical reserves which increased to P33 billion in 2001 from P25 billion in 2000, was substantially reduced to P20 billion in 2002. In 2002, the household sector provided additional financing to the rest of the sectors with their repayment of loans.

The general government sector, the consistent and major net borrower, recorded considerable liabilities in securities for these three years as well as on loans in 2002. In 2000 and 2001 this sector recorded a net lending on loans amounting to P3 billion and P41 billion, respectively, as the NG increased re-lending to government owned and controlled corporations.

The financial sector recorded increasing net liabilities in currency and deposits, from P76 billion in 2000, to P206 billion in 2001, to P212 billion in 2002, reflective of the confidence in the banking system. The financial intermediaries' investments were largely in government securities. Loans provided to other sectors only amounted to P40 billion, P33 billion and P37 billion, for the same years.

## **V. Limitations of estimates**

The initial compilation of the updated Philippine FOF is very preliminary. While there were some issues in the operationalization of the conceptual guides, the major constraint recognized is mainly data support, which is the case in any compilation process.

There are unresolved issues on the operationalization of the conceptual guides, in particular on the classification of the transactions in financial assets and liabilities as reported in the balance sheets to the required classification in the framework. It should be noted that financial statements have not been compiled for the purpose of addressing the requirements of the FOF. This could be the reason for the large recorded SDs in the government and the financial sectors' accounts.

A major problem on data support is in private non-financial corporations and in other financial corporations, other than the insurance and pension funds. Except for the top 5000 corporations, the other submissions of financial statements to the regulatory agency need to be consolidated. Available data have limited details and even those with relatively more details provided such as those of the depository corporations, still lack the requirements of FOF compilation.

Net changes in financial position by institutional sector and by financial asset<sup>P/</sup> CY 2000–2002 (billion pesos)

Transaction categories	Non financial corp.	Financial corp.	General government	Households	Under-coverage <sup>1/</sup>	Domestic economy <sup>2/</sup>	Rest of the world	Total
<b>2000</b>								
Net change in financial position <sup>3/</sup>	63	30	-160	228	13	174	-174	0
Monetary gold and SDRs	0	0	0	0	0	0	0	0
Currency and deposits	13	-76	-14	49	92	65	-65	0
Securities other than shares	42	103	-142	0	-80	-77	77	0
Loans	-10	40	3	-25	-98	-90	90	0
Shares and other equity	79	-16	6	0	-102	-34	34	0
Insurance technical reserves	2	-32	5	25	0	0	0	0
Other accounts receivable/payable	-63	11	-18	179	202	310	-310	0
<b>2001</b>								
Net change in financial position <sup>3/</sup>	-125	-8	-138	254	63	46	-46	0
Monetary gold and SDRs	0	1	0	0	0	1	-1	0
Currency and deposits	2	-206	-48	61	113	-77	77	0
Securities other than shares	24	171	-169	0	-33	-7	7	0
Loans	-277	33	41	-50	254	1	-1	0
Shares and other equity	-136	-14	-3	0	100	-53	53	0
Insurance technical reserves	0	-39	5	33	0	0	0	0
Other accounts receivable/payable	261	45	36	210	-371	181	-181	0
<b>2002</b>								
Net change in financial position <sup>3/</sup>	46	-49	-108	-273	-42	120	-120	0
Monetary gold and SDRs	0	-1	0	0	0	-1	1	0
Currency and deposits	16	-212	68	131	-35	-32	32	0
Securities other than shares	44	236	-118	0	-126	36	-36	0
Loans	90	37	-134	80	12	86	-86	0
Shares and other equity	-70	-33	2	0	-2	-103	103	0
Insurance technical reserves	2	-22	-1	20	0	0	0	0
Other accounts receivable/payable	-36	-54	74	43	108	135	-135	0

<sup>P/</sup>Preliminary

<sup>1/</sup>Provided to account for the recognized undercoverage in non-financial and other financial sectors excluding insurance and pension funds, as well as the statistical discrepancies in the domestic and ROW accounts.

<sup>2/</sup>Taking the net lending/borrowing and net capital transfers from the ROW as control, the statistical discrepancy is lodged with domestic saving

<sup>3/</sup>Acquisition of financial asset less incurrence of financial liabilities

= sum of the net changes in financial assets

Annex 1 – Bridge table: BOP to financial accounts transactions Annex 12002 (billion pesos)

Balance of payments		Financial accounts	Monetary Authorities	General Gov't	Banks	Other Sectors	Total
Standard Components	Details						
Assets							
Reserve Assets	Monetary gold SDRs	Monetary gold and SDRs Monetary gold SDRs	-0.8 -0.5 -0.3	0.0	0.0	0.0	-0.8 -0.5 -0.3
Other investments	Currency & deposits	Currency and deposits	-99.1 0.0	0.0 0.0	-24.5 -24.5	36.5 36.5	-87.0 12.1
Reserve assets res. post'n. in the Fund	Deposits 1		0.0				0.0
Reserve assets foreign exchange other claims	Currency & deposits Currency & deposits		-99.1				-99.1
Portfolio investment	Debt securities Bonds & notes & securities Money market instruments & financial derivatives	Securities other than shares	79.6	0.0	17.2	4.5	101.3
Reserve assets foreign exchange other claims	Bonds & notes & securities & financial derivatives Debt securities		0.0 0.0	0.0 0.0	17.2 0.0	6.0 -1.5	23.2 -1.5
Direct investment in reporting country abroad	Debt securities issued by direct investors Debt securities issued by affiliated enterprises	Loans	79.6	0.0	18.2	0.7	79.6
			0.0	0.0	18.2	0.7	18.8

## Annex 1 – (continued)

Balance of payments		Financial accounts	Monetary Authorities	General Gov't	Banks	Other Sectors	Total
Standard Components	Details						
Other investment Reserve assets res post'n in the fund	Loans		0.0	0.0	18.2	0.7	18.8
Direct investment abroad	Loans	Shares & other equity	0.0	0.0	0.0	4.4	4.4
	Equity capital; claims on affiliated ent					2.6	2.6
	Reinvested earnings					0.4	0.4
	Other capital (debt securities issued by affiliated ent.)						
in reporting economy	Equity capital; claims on direct investors						
Portfolio investment	Equity securities		0.0	0.0	0.0	1.4	1.4
Reserve assets	Equities						
foreign exchange	Equities	Insurance technical reserves	0.0	0.0	0.0	0.0	0.0
other claims							
Other investment other assets	Net equity of holds in life ins res & in pension funds						
	Prepayment of premiums & reserves against o/s claims	Other accounts receivable	0.0	0.0	-11.7	661.9	650.2
Direct Investment abroad (other capital in reporting econ. (o. cap.)	Other claims on affiliated ent						
Other investment	Other claims on direct inv						
	Trade credits						
Other assets	Others minus ins tech res of other sectors		0.0	0.0	0.0	661.9	661.9
		Total assets	-202	0.0	-0.8	708.0	-11.7
							686.9



Annex 1 – (continued)

Balance of payments		Financial accounts	Monetary Authorities	General Gov't	Banks	Other Sectors	Total
Standard Components	Details						
Other investment other liabilities	Net equity of holds in life ins res & I pension funds Prepayment of premiums & reserves against o/s claims	Other accounts receivable	0.0	0.0	3.3	512.2	515.4
Direct Investment abroad in reporting economy Other investment	Other liab of direct investors Other liab to direct inv	Total Liabilities	0.0	0.0	0.0	511.8	511.8
Other liabilities	Trade credits Other liab minus ins tech res		0.0	0.0	3.3	0.4	3.6
			44.8	-13.6		589.1	566.6
							227.2
							-1.0
							226.2
							0.0
							226.2
							686.9
							460.7
							566.6
							-105.9
							226.2

<sup>1</sup>includes all reserve position in the fund

<sup>2</sup>includes use of fund credit & loans from the fund

## VI. Ongoing and future activities towards improvement of the estimates

### 1. On the conceptual issues

The compilers will be seeking the assistance of a technical expert with extensive experience on FOF compilation based on the revised guidelines to help in addressing the problems on operationalizing the conceptual guides. It is deemed more efficient to solicit the guidance of an expert after having gone through the process since the problems have been identified.

### 2. On the data support

It would have been ideal if the updating of the PFOF was done after the PSNA has migrated to the 1993 SNA and IMF standardized reporting formats for the balance sheets of central banks and depository corporations have been implemented.<sup>6</sup> These would have greatly facilitated the compilation of the Philippine FOF. There are now ongoing activities on these two concerns and a timetable set for their implementation.

There is also continuing coordination with primary data producers for the generation of required data support. Introduction of the required details including the sectorization of transactions in the reporting forms of financial and non-financial corporations have been made. These will not only improve the estimates for these institutions but provide better basis for the estimation of the household sector's account. Household transactions in financial account are best derived from the records of the institutions that they transact with.

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## Abstract

*This paper highlights the changes made on the Philippine Flow of Funds (PFOF) as a result of updating the framework based on the revised guidelines recommended in the 1993 System of National Accounts (SNA) and the 2000 Monetary and Financial Statistics Manual (MFSM). It discusses the features of the updated PFOF and the compilation procedures adopted. A summary of the PFOF 2000 to 2002, problems and issues on the compilation process and future activities towards the improvement of the accounts are also presented.*

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<sup>6</sup> Even when the PSNA would have migrated to the 1993 SNA, the compilation of the Philippine FOF may still be with the BSP, since the complete sequence of accounts may not yet all be implemented.



# The financial systems of European countries: theoretical issues and empirical evidence

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## 1. Introduction

Financial systems facilitate the transfer of resources from savers to economic agents in need of funds, channel households' savings to the corporate sector and allocate liquidity among firms. They make possible inter-temporal smoothing of consumption by households and expenditures by non-financial corporations.

Recent years have seen a resurgence of interest in the design of financial systems, prompted by the need to understand the different models of capitalism and the interconnections between finance and economic growth, the focus in Europe on financial integration and convergence of national systems after the creation of the single internal market in 1993, the launch of the common monetary policy in 1999 and the physical introduction of the euro in 2002. Alongside these motivations there is also concern that differences between national financial systems may hamper the transmission mechanism of monetary policy. If financial structures differ greatly, monetary policy may be difficult to implement: even in presence of a common shock, the impact of changes in the official rates set by the European Central Bank (ECB) may differ from country to country, owing to heterogeneous transmission channels. In this paper we will not deal with monetary policy issues which were recently analysed in a Eurosystem research project.<sup>2</sup>

The availability of harmonized financial accounts data for most of European countries allows us to delineate similarities and differences between financial structures in Europe with more precision than in the past. Nowadays the financial accounts data of EU Member States conform with the rules of the European System of National and Regional Accounts (ESA95), promoted by Eurostat.

The paper is divided into five sections. After this introduction, Section 2 provides a brief review of some theoretical issues, such as the link between finance and growth, the prospects of growing financial integration and convergence and the contrast between market-based and intermediary-based systems. In the light of the questions raised by the economic literature, Section 3 describes the main characteristics of European economies as defined by large financial aggregates and other indicators. Section 4 focuses on the composition by instrument of financial assets and liabilities, with a specific focus on firms' liabilities and households' financial wealth.

We try to answer five main questions.

- a) Are financial systems different in European countries ?
- b) Are banks losing market shares ?
- c) Do countries differ in their financial openness as measured by financial assets and liabilities held by non residents ?

1 *Economic Research Department. The authors would like to thank Professor F. Allen for his valuable suggestions and support. E. Breda, F. Columba, A. Gerali, G. Marchese, R. Massaro, F. Signorini provided useful comments on previous drafts of the paper, which were presented at the OECD meeting of "National accounts experts" held in Paris on October 10, 2002, and at the ECB seminar on "Financial Markets and Instruments Statistics" held in Frankfurt on November 13–14, 2002. The authors are grateful to all seminar participants for fruitful discussion. Miria Rocchelli provided excellent research assistance. The views expressed are those of the authors and do not necessarily reflect those of the Bank of Italy.*

2 *See Angeloni, Kashyap and Mojon (2003).*

- d) Are national systems converging towards a uniform ratio of financial assets/liabilities to GDP ?
- e) What are the most important features in the composition of financial assets and liabilities and how did it change in Europe between 1995 and 2002 ?

Lastly, Section 5 sets out the paper's principal conclusions.

## 2. The theoretical framework

### 2.1. Finance, growth, financial integration and convergence

*Finance and growth.* The study of financial structures in Europe is a prerequisite to understand how finance can be improved to contribute to faster economic growth. According to a large body of literature, still subject to intense scrutiny, there is a nexus between economic growth and the size and development of the financial system, the latter being measured by the level of financial innovation and corporate governance rules. A large enough financial system is a necessary but not a sufficient condition for a country's economic growth, as was unhappily demonstrated in Japan, where the huge expansion of the financial system during the Eighties was followed by a severe economic downturn.<sup>3</sup>

Goldsmith (1969) was among the first to underline a statistical link between "financial deepening" and economic growth. Many studies are trying to assess whether the correlation implies causality. Notwithstanding methodological difficulties, the predominant finding is that financial development causes economic growth.<sup>4</sup> In addition the "new comparative economics" has underscored that institutions, including financial intermediaries, exert a profound influence on economic development.<sup>5</sup> Given the posited relationships between the size and the development of a country's financial system and its economic growth, in Section 3.1 we will present financial indicators of European countries, comparing them with the dimensions of the economies.

*Financial integration.* The debate on financial structures is often interwoven with that on financial integration. The latter is an ubiquitous concept, applied to different markets, or market segments and financial instruments and invoked in connection with economic, statistical and regulatory issues.<sup>6</sup> Starting in the seventies European financial and banking directives sought to ensure a level playing field for banks and other intermediaries, a precondition for integration.<sup>7</sup> In appraising integration special attention has been given to the distinction between business with residents and with non-residents in each country, on the premise that competition is sharper in business with non-residents. The commercial integration of Europe, the harmonization of financial regulation, the single monetary policy and the physical introduction of the euro are among the factors that will probably enhance financial integration, even if economic barriers between countries will persist.

The measurement of financial integration is not an easy task. The literature has gauged the financial integration of the euro area for the various sectors and products that make up the financial system, using several quantity and price indicators.<sup>8</sup> Joining this debate in Section 3.2 we present measures of countries' financial openness taken from the flow of funds statistics, discussing the links with the size of the financial structure, the international investment position and the home-bias behaviour of economic agents.

*Financial convergence.* Harmonisation of financial regulation aims at providing equal competitive conditions for intermediaries but it is neither a necessary nor a sufficient condition for convergence of financial structures. Moreover, although many studies have investigated the convergence of growth rates of per capita GDP, no economic theory of long-run convergence of financial structures has been developed.

3 See Hoshi and Kashyap (2000) on Japan and The Economist (2003a) for the progress and the remaining problems of Asian finance after the crisis of 1997–1998.

4 See, among others, Giannetti et al. (2002).

5 See North (1990) and Djankov et al. (2003). Not all the contributions of the new comparative economics include financial intermediaries among the relevant institutions.

6 See Ferrando and Vesala (2004) for a survey of concepts and measures of financial integration; Flood and Rose (2004) for a new methodology to test for asset integration; Baele and Ferrando (2004) on bond and equity market integration; Hartmann, Maddaloni and Manganelli (2003) for a summary of the policy initiatives to foster financial integration in Europe; Lane and Milesi-Ferretti (2003) for a description of the trends in international financial integration; and Affinito, De Bonis and Farabullini (2004) and Manna (2004) on banking integration in Europe. Baele, Ferrando, Hordahl, Krylova and Monnet (2004) provide a synthesis of the different empirical approaches.

7 See Dermine (2002) for a recent survey.

8 See, for instance, Calcagnini, Farabullini and Hester (2000), Adam et al. (2002), ECB (2002).

On the one hand, several factors help to make European financial systems more homogeneous in the future. European stock exchanges are highly correlated; capital flows were liberalised more than ten years ago; banking and financial regulations are largely harmonised; 12 of the 15 first members of the European Union belong to a monetary union. On the other hand, convergence may be hindered by the difference in the composition of European banks' balance sheets. These differences reflect, among the others, the peculiarities of the local economy, the product specialisation and importance of small firms, and the legal framework, e. g. the provisions of private law and the efficiency of the civil justice system.<sup>9</sup> There is no clear evidence that the industrial structure will become homogeneous across European countries; some differences may persist and even intensify: countries with high-tech and large firms need forms of finance which are probably different from those required by countries where traditional and small firms prevail. Harmonisation of the legal framework is as yet incomplete or very recent: the regulation on prospectuses was approved in 2003, those on take-overs and on investment services in 2004; the new regulation on insider trading, recently extended to any kind of market abuse, still needs to be implemented at national level. The degree of enforcement will probably remain different in the national contexts. Taking into account the complexity of this debate, we will resort to a statistical approach: to understand whether European financial systems are going to converge, we will perform an econometric exercise in Section 3.3 measuring  $\beta$ - and  $\sigma$ -convergence for the ratio of financial assets and liabilities to GDP.

## 2.2. Market-based versus intermediary-based financial systems

Financial structures may be classified in many ways. The most common distinction is between market-based and intermediary-based structures.<sup>10</sup> In the former assets are mainly placed through markets; in the latter, financial intermediaries play a significant role in making financial assets and liabilities available to the final users. Deposits, loans, mutual fund shares and technical reserves are included among intermediated assets; short-term securities, bonds and shares are non-intermediated assets (even if they are commonly sold throughout intermediaries' branch networks). Some financial instruments, such as trade credits and other minor items, which cannot be easily fitted into either category, are omitted from this distinction.

Traditionally, Anglo-American countries based their development on stock exchanges and funds raised directly through financial markets. As far back as the sixties, a number of authors examined the empirical evidence, seeking to understand the national routes to financial development. Cameron (1967) studied how banks contributed to industrial development in Japan, the United States and some European countries. According to Goldsmith (1969), in poor countries banks have been traditionally at the center of the financial structure. When nations become richer, other intermediaries develop and the stock exchange comes of age. Gerschenkron (1962) underlined the role of banks in the economic growth of Germany and Italy, countries historically characterised by weaker financial markets than those of the Britain and the United States. Financial systems are also shaped in reaction to financial crises (Rajan and Zingales, 2000). According to this political economy point of view, countries faced their major banking crises either by weakening financial markets and then relying on banks and intermediaries, as in France and Germany, or by regulating them, as in the UK and the US.

Moving from historical analysis to the plane of theory, the first argument in favour of intermediary-based systems derives from the theory of financial intermediation. Starting from the (questionable) assumption that market-based systems are more efficient than intermediary-based ones, the existence of imperfect and incomplete financial markets, and specifically of transaction costs and asymmetric information, makes the intervention of intermediaries necessary.

According to this approach, there should therefore be an inverse correlation between the efficiency of financial markets and the role of intermediaries. Intermediaries should be needed in the presence of market failures, such as agency problems, incomplete markets, transaction costs, lack of information.<sup>11</sup> But notwithstanding the presence of intermediaries, firms still face financing difficulties, mainly due to agency problems. This is why internal finance arises and why it is so important. According to the pecking order theory, firms should finance themselves first using internal funds and then with debt, resorting to share issuance only as a third source

<sup>9</sup> On the connections between law and finance see La Porta et al. (1998).

<sup>10</sup> In the literature a variety of expressions are used to describe this distinction: centralised versus decentralised, bank-oriented versus market-oriented credit markets, among the others.

<sup>11</sup> It is important to recall the role played by banks acting as delegated monitors, as shown by Diamond (1984).

of financing. This expectation is confirmed by empirical evidence. In short, internal finance is due to incomplete markets. Without asymmetric information and agency costs for external finance, there would be no need for internally generated funds. In a sense, firms act as financial institutions, because financial markets are incomplete.

One may be tempted to conclude that where financial markets are complete and efficient, no intermediary is needed. Were this true, developed financial systems would be without financial intermediaries; banks, in particular, would be replaced by markets.<sup>12</sup> Despite the popularity of this naive theoretical proposition in the eighties, banks did not decline and they confirmed their *raison d'être* in taking deposits repayable on demand and originating largely non-marketable loans. Mayer (1988) underlined that markets were not substituting banks as the main providers of resources to firms.<sup>13</sup>

Another explanation for the role played by intermediaries is risk management: by hedging appropriately, intermediaries can offer customers safer products. Customers thereby incur lower search costs and, since products created by intermediaries may be attractive because of their relatively stable distribution of returns, lower monitoring costs too. As a consequence, individuals find it cheaper to turn to mutual funds, which let them diversify their investment; hold the same portfolio of assets directly would necessitate buying and monitoring a huge number of securities. Still, mutual funds have often come under criticism for poor performance, high commissions and conflicts of interests.

The complexity of some new financial instruments, e.g. derivatives, is another justification for the existence of intermediaries who are able to trade with these products. Even when new technological facilities, such as Internet and trading-on-line, reduced the costs of trading, financial intermediaries continued to grow. Trading-on-line, in fact, proved to be just a passing fashion.<sup>14</sup> The future of retail securities trading via electronic platforms is unknown, but even if trading-on-line revives and expands, financial intermediaries will be necessary.

Rajan and Zingales (2003) recently summarised the arguments in favour of market-oriented systems. Intermediary-based systems make price signals obscure, make financial distress more probable because assets in banks' portfolios are mostly illiquid, are more prone to panics, tend to finance physical asset-intensive industries rather than high-tech, R&D-based industries and tend to protect mature, incumbent firms.

More uncertain is the result of the comparison between the two models as regards matters such as sensitivity to bubbles or the possibility to take over a badly managed company. On the latter point, banks closely connected with companies might play the same disciplining role of markets, but this has not often happened in practice. The recent history of large corporate defaults does not suggest the superiority of one model to the other.

The excellent performance of American capitalism in the nineties has been one of the justifications to sustain the market-based system against the Rhenish model. But this discussion is not resolute, given the superficial wisdom in the German and the Japanese financial structures which was common in the US in the Eighties, having regard to the exceptional economic performance of Germany and Japan until the beginning of the Nineties.

In a nutshell, we criticise an excessive emphasis on the distinction between market-based and intermediary-based financial systems. Highly developed financial markets coexist with banks and other institutions. Asset trading and risk shifting have become important activities for banks and insurance companies; the traditional distinction between the financial market, where firms directly meet savers, and intermediaries, whose main activity is to transform deposits or technical reserves into loans and other assets, no longer holds.

Coming back to the relationship between finance and growth, we share the view that what matters is the overall development of the financial system, not the relative importance of banks and intermediaries versus the stock market. Intermediary-based systems do not have a different impact on economic growth, the birth of new firms or their access to external finance, than

12 Fama (1980) was among the first to argue that banks might be replaced by other intermediaries, money market funds in his example, providing liquidity service and raising funds to finance firms. But Fama (1985) recognised the specificity of bank loans, stating, like Goodhart (1986), that banks' peculiarity must be identified on the asset side of their balance sheet.

13 See Rajan (1996) for a summary.

14 Trading-on-line grew considerably from 1998 to 2000 but declined in 2001 on account of the poor performance of the stock exchange (Christiansen, 2001). Many enthusiastic traders on line experienced dramatic losses and withdrew to traditional types of investment and trading. Trading-on-line is usually limited to domestic equities. Foreign equities and other types of securities are perceived as too complex, and therefore not directly tradable. In the US, where trading-on-line is most developed, on-line traders are traditional equity investors, who have merely changed the way they trade. In Europe, trading-on-line has brought only a few new investors into the market.

market-based ones.<sup>15</sup> Both systems have their costs and benefits.<sup>16</sup> Allen and Gale (2000) summed up this discussion by concluding that market-based systems reach good results in financing innovation and providing risk sharing for economic agents, while bank-based systems achieve better results in ensuring inter-temporal sharing of risk.

In Sections 3.4 and 4 we will examine the composition of European systems in terms of the prevailing types of financial institutions and instruments.

### 3. Financial assets, banks and financial intermediaries in Europe

#### 3.1. The size of financial assets and liabilities

We start from the composition of European<sup>17</sup> financial assets and liabilities of residents, comparing it with the composition of European GDP (Table 1).<sup>18</sup> Financial links with non-residents involve special issues and are treated in Section 3.2.

The countries can be divided in two groups: those whose share of total assets and liabilities is greater than the share of GDP (the UK, France, the Netherlands, Sweden and Belgium) and those for which the opposite is true (Germany, Italy, Spain Austria, Denmark, Finland and Portugal). The data highlight the striking importance of the British financial system: the UK ranks first in financial assets and liabilities, but second in terms of contribution to European GDP.

Table 1 – Europe: financial assets and liabilities held by residents and GDP (2002, percentages)

	Financial assets	Financial liabilities	GDP
United Kingdom	23.96	23.95	18.19
Germany	21.30	21.14	23.92
France	18.48	18.17	17.24
Italy	11.01	11.06	14.26
Spain	6.45	6.69	7.89
Netherlands	6.16	6.18	5.04
Belgium	3.54	3.38	2.95
Sweden	2.97	3.03	2.90
Austria	1.89	1.96	2.47
Denmark*	1.90	1.94	2.08
Finland	1.06	1.14	1.58
Portugal*	1.28	1.35	1.47
EU	100.00	100.00	100.00

\*Financial assets and liabilities refer to 2001.

Some countries have a high ratio of residents' financial assets(liabilities)/GDP (Table 2): the UK, the Netherlands and Belgium. The ratio is lowest in Italy, Austria and Finland.<sup>19</sup>

One explanation for this first finding is the difference between countries' social securities schemes. In the UK and the Netherlands public pension schemes are not very important, so that households have to rely on private pension provision to ensure they have sufficient income after retirement. These private schemes are funded, so that they accumulate reserves that are recorded among households' assets as insurance technical reserves. In other countries, such as Italy and Germany, pension schemes are mainly public pay-as-you-go systems: no fund is accumulated as a liability of the general government sector and no corresponding asset is recorded for households. *Ceteris paribus*, this makes the British and Dutch financial systems larger than the Italian and German.

15 See Demirguc-Kunt and Levine (2001) for this position. On the same subject see Levine and Zervos (1998).

16 Rajan and Zingales (2003) conclude that "which system is preferable ... depends crucially on the environment".

17 In this paper we analyse data for 12 of the 15 "old" (i.e. pre-enlargement) EU member countries; Luxembourg, Greece and Ireland are excluded as they do not yet publish harmonised financial accounts.

18 An important variable that will not be taken into account in this paper is households' housing wealth. House purchases may be an alternative to the acquisition of financial assets and are influenced by the cost and the availability of financing.

19 Allen and Gale (2000) obtained the same relationship studying the UK and Germany.



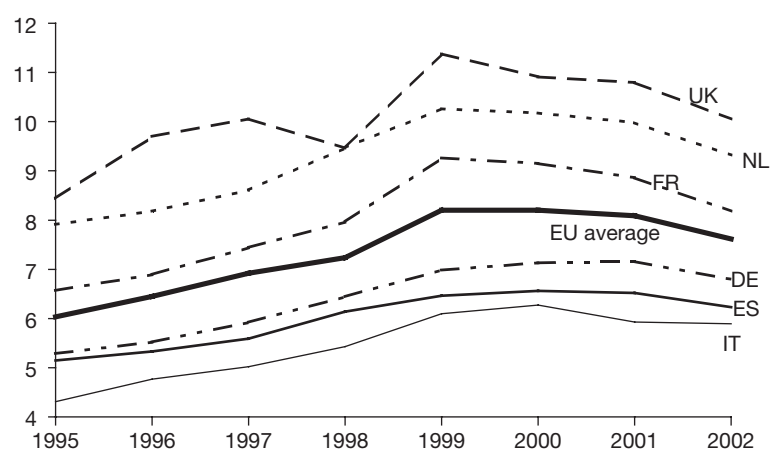
Table 2 – Europe: financial assets and liabilities held by residents/GDP (2002)

	Assets/GDP	Liabilities/GDP
United Kingdom	10.05	10.05
Germany	6.79	6.75
France	8.18	8.05
Italy	5.89	5.92
Spain	6.23	6.48
Netherlands	9.32	9.37
Belgium	9.15	8.76
Sweden	7.83	7.99
Austria	5.76	5.97
Denmark*	6.95	7.12
Finland	5.12	5.49
Portugal*	6.66	7.03
EU	7.33	7.42

\*Financial assets and liabilities refer to 2001.

While steadily increasing from 1995 to 1999 in all European countries, the ratio financial assets held by residents/GDP has begun to deteriorate in 2000 (Figure 1). This is largely the consequence of the trend of stock prices, which rose in the period 1995–1999, notwithstanding stable or diminishing saving rates, and turned downwards in 2000.<sup>20</sup> At first glance, the ratios computed for the different countries do not seem to converge to a common value. Section 3.3 presents an econometric exercise to measure convergence of these financial aggregates.

Figure 1 – Main European countries: financial assets held by residents/GDP



A frequently used indicator of financial development is the ratio of banking deposits to GDP. According to a widespread interpretation, financial systems develop if the ratio decreases, this being a signal of new possibilities for agents' investments. In Spain, Belgium, Austria and Portugal there has been a reduction in the ratio of deposits to GDP (Table 3), apparently in favour of more innovative financial instruments. These countries are improving their financial systems, even if they still show higher ratios than the others. Surprisingly the ratio increased in the UK, France and the Netherlands. The deposits/GDP ratio must be treated with caution because the numerator often includes, like in the first column of Table 3, interbank deposits as well as the holdings of households and firms.

<sup>20</sup> See Barclays Capital (2002) and Grillet-Aubert and Mpacko Priso (2001).

Table 3 – European countries: deposits/GDP ratio

	Residents' deposits/GDP		Households' deposits/GDP	
	1995	2002	1995	2002
United Kingdom	2.20	2.91	0.64	0.71
Germany	1.51	1.81	0.65	0.64
France	1.65	1.77	0.60	0.60
Italy	1.11	1.09	0.69	0.58
Spain	1.79	1.54	0.76	0.70
Netherlands	1.26	1.66	0.57	0.60
Belgium	2.08	1.93	0.77	0.78
Sweden	0.76	0.92	0.34	0.27
Austria	1.69	1.57	0.81	0.73
Denmark*	1.04	1.06	0.41	0.38
Finland	0.81	0.79	0.44	0.34
Portugal*	1.84	1.66	0.95	0.86
EU	1.48	1.56	0.64	0.60

\*Financial assets and liabilities refer to 2001.

### 3.2. Financial openness

European countries have different financial links with the rest of the world. Table 4 shows the ratios to GDP of foreign assets held by residents and of residents' liabilities held by the rest of the world.

Countries with a greater degree of international openness also show higher ratios of resident financial assets (liabilities) to GDP, for example the UK, Belgium and the Netherlands. Italy, Spain and Germany, by contrast, have both lower degrees of international openness and lower ratios of resident assets and liabilities to GDP. It is not easy to assess the causality link between financial openness, size of the financial system, trade integration and economic growth. Even if directions of causality are difficult to ascertain, the size of a financial system directly correlates with the size of its international capital flows.

By contrast, the evidence that small countries have a high degree of financial international openness is weak. Belgium is a small, open economy with a high degree of international financial integration but Austria, Denmark and Finland do not share the latter characteristic. Probably the future availability of statistics for Ireland and Luxembourg will place these two countries together with Belgium.

Table 4 – Europe: assets and liabilities of residents with the rest of the world/GDP (2002)

	Foreign assets held by residents/GDP	Residents' liabilities held by the rest of the world/GDP	International investment position
United Kingdom	3.24	3.25	-0.01
Germany	1.44	1.40	0.04
France	1.65	1.54	0.11
Italy	0.94	0.99	-0.05
Spain	1.13	1.37	-0.24
Netherlands	3.03	3.07	-0.04
Belgium	3.33	2.94	0.39
Sweden	1.73	1.90	-0.17
Austria	1.43	1.65	-0.22
Denmark	1.54	1.71	-0.17
Finland	1.42	1.80	-0.38
Portugal	1.30	1.68	-0.38
EU	1.85	1.94	-0.09

Between 1995 and 2002, all the EU countries recorded an increasing international openness, confirming the progress made towards financial integration. As financial accounts data do not currently show the breakdown of the rest of the world sector, we are unable to check whether these larger financial flows are inside or outside the euro area. However, information derived from the balance of payment shows an increase in intra-EU financial flows.

The UK, Belgium and the Netherlands rank high in terms of foreign assets and liabilities. London is the world's leading interbank credit market and the UK leads the ranking of US foreign direct investments. A similar explanation holds for the Netherlands: the existence of many Dutch multi-national firms, which have intense interactions with foreign branches, implies large capital inflows. The Belgian case raises some difficulties of interpretation.

While the ratio of foreign assets and liabilities to GDP is quite stable, i.e. the UK and the Netherlands were more open than the other countries also in the past, the difference between the two items, i.e. the international investment position, is more volatile. If the international investment position is positive, the country invested funds abroad; when it is negative, the country had to collect foreign funds to finance investment and consumption. Out of the 12 countries included in this analysis only Germany, France and Belgium had a positive international investment position in 2002 (Table 4). Spain and Portugal data confirm that economies catching-up have a large and negative international investment position: these countries financed their growth with external resources. By contrast more mature economies, such as Germany, France and Italy, show small figures for the international investment position.

Summing up, the UK, the Netherlands and, to a lesser extent, Belgium and Sweden have large financial systems, very open to international trade and have (except Belgium) a debtor international investment position. On the other hand, countries like Germany, Italy and Spain have smaller financial systems and are less open. France is an exception; it is not very open financially, but its financial system is large. French authorities systematically pursued policies – such as privatization, creation of new markets and de-specialization of banking – to strengthen the country's financial system. The key aspect was the French successful reaction to the growing competition from the financial centers of London and Frankfurt.<sup>21</sup>

The statistics confirm the “home-bias” in international portfolios among industrialized countries, well documented by recent international finance studies.<sup>22</sup> Home-bias is stronger for France, Germany, Italy and Spain; it is weaker in the UK, the Netherlands and Belgium, where foreign assets account for approximately one third of total assets held by residents. The data also suggest that, for each country, the ratio of domestic to foreign assets decreases smoothly over time. This empirical finding has been recently modeled, leading to a new view of the intertemporal approach to the current account.<sup>23</sup> There is an optimal proportion of total assets invested in foreign assets, towards which each country tends to converge in the long run, with short-run deviations. The home-bias has trended downward recently, thanks to globalization, the prospect of the introduction of international accounting standards and a more liberal regulatory environment worldwide. Nonetheless the long-term optimal benchmark portfolio obtained in the absence of regulatory obstacles, capital controls, transaction costs and information asymmetries is still far from being achieved.

### 3.3. Measuring convergence

To test whether European economies tend to converge to a common size of their financial structures, we conduct some exercises on  $\beta$ -convergence and  $\sigma$ -convergence for the ratio of financial assets (liabilities) held by residents to GDP.  $\beta$ -convergence shows whether countries tend to adjust to a long-run common benchmark value, while  $\sigma$ -convergence measures whether countries tend to become similar over time in terms of deviations from the benchmark. The exercises must be interpreted cautiously given the few observations used.

$\beta$ -convergence. In order to measure  $\beta$ -convergence we estimated the following equation:

$$\Delta \log \left( \frac{FinAss}{GDP} \right)_{i,t} = \beta \log \left( \frac{FinAss}{GDP} \right)_{i,t-1} + u_i + \varepsilon_{it}$$

21 Schmidt, Hacketal and Tyrell (1999) find intense transformations of the French financial markets.

22 See Pesenti and Van Wincoop (2002) for further references.

23 See Kraay and Ventura (2003).



where

$\left( \Delta \log \left( \frac{FinAss}{GDP} \right)_{it} \right)$  is the dependent variable, the first difference of the logarithm (corresponding to the growth rate) of the ratio of financial assets (liabilities) held by residents to GDP for country  $i$  at time  $t$ ; the explanatory variable  $\left( \log \left( \frac{FinAss}{GDP} \right)_{i,t-1} \right)$  is the logarithm of

the ratio of financial assets (liabilities) held by residents to GDP for country  $i$  at time,  $t-1$ ;  $u_i$  is the fixed effect, that takes into account the different countries' structural heterogeneity (different for each country but constant over time);  $\varepsilon_{it}$  is the residual of the regression. The results of the panel regression are shown in box 1.

**Box 1 – Panel regression, fixed effect model**

Number of observations = 60		Number of groups = 12	
Group variable (i): country		min number of obs = 5	
Time variable (t): year		F(1, 47) = 3.99	
R-sq: within = 0.0782		Prob > F = 0.0516	
between = 0.0005		corr(u_i, Xb) = -0.7891	
overall = 0.0149			
	Coef.	Std. Err.	z P >  z  [95% Conf. Interval]
$\log \left( \frac{FinAss}{GDP} \right)_{i,t-1}$	-15.34159	7.680668	-2.00 0.052 -30.7931 .1099249
constant	38.03266	15.84942	2.40 0.020 6.147745 69.91757
sigma_u	4.236582	sigma_e	6.7268795 rho .28399935 (fraction of variance due to u_i)
F test that all u_i = 0: F(11, 47) = 0.75 Prob > F = 0.6875			

The existence of a correlation between the fixed effects and the regressors does not allow us the use of the random effects model. The  $\beta$  coefficient is negative and significantly different from 0. This result suggests that countries with lower values of the indicator financial assets/GDP tend to increase this ratio faster than the others.

Another interesting result of the regression is the limited weight of the variance of the permanent component (reported in Box 1 as sigma\_u) with respect to total variance (sigma\_e), which amounts to about 28 per cent. The F test shown at the end of Box 1 points out that fixed effect, as a whole, are not significantly different from zero. These two results would suggest that there are no significant structural differences among European financial systems.

*σ-convergence.* The easiest way to test for *σ-convergence* is to measure the standard deviation of the log of the chosen indicator across countries. We computed the cross section standard deviation of the log of the ratio of financial assets (liabilities) held by residents over GDP at the beginning and at the end of the available time span. In 1995 the standard deviation of the ratio of financial assets held by residents over GDP was equal to 0.104, while in 2002 it rose to 0.197. There is no *σ-convergence* in the time span examined.

*A brief summary.* The second indicator contradicts the trend to convergence suggested by *β-convergence*: absence of *σ-convergence* may be consistent with presence of *β-convergence*.<sup>24</sup>

*β-convergence* results mean that European economies are moving towards a common value of the ratio financial assets/GDP, i.e. that financial structures are becoming more similar than in the past. This movement is, nonetheless, hindered by random noise factors, that may temporarily increase national disparities.

<sup>24</sup> See Barro and Sala-i-Martin (1995, page 383) and Quah (1993) on the relationship between *β-* and *σ* convergence.

**3.4. Financial intermediation ratios**

A possible way to distinguish between market-based and intermediary-based financial systems is the use of the financial intermediation ratio (FIN). FIN compares assets held by financial

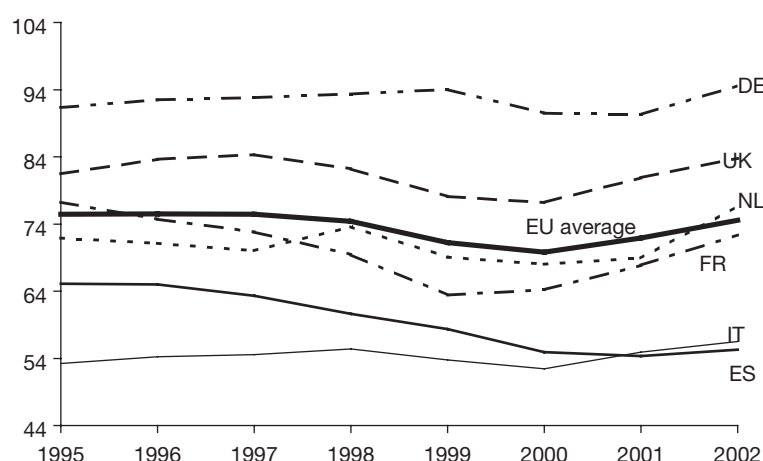
Table 5 – Financial intermediation ratios (2002)

	Financial assets of Financial corporations/Financial assets of Non-financial sectors and Rest of the World	Financial assets of banks/ Financial assets of Non-financial sectors and Rest of the World
United Kingdom	0.84	0.48
Germany	0.95	0.71
France	0.72	0.49
Italy	0.56	0.34
Spain	0.55	0.40
Netherlands	0.77	0.41
Belgium	0.54	0.38
Sweden	0.46	0.29
Austria	0.88	0.66
Denmark	0.83	0.52
Finland	0.34	0.24
Portugal	0.62	0.43
European average	0.67	0.45

corporations (the central bank, banks, other financial intermediaries, insurance corporations and pension funds) with assets held by non-financial corporations (firms, general government, and households)<sup>25</sup>. As far as all financial corporations are concerned, in Europe FIN was on average 0.67 in 2002 (Table 5, first column).

FIN is higher in Germany, Austria, the UK, the Netherlands and Denmark. Besides the great importance of pension funds, financial corporations in the British financial system are less

Figure 2 – FIN: financial corporations (percentages)



important than in Germany and Austria. Financial corporations are dominant in some countries that do not have a large financial system, such as Germany, Austria and Denmark.

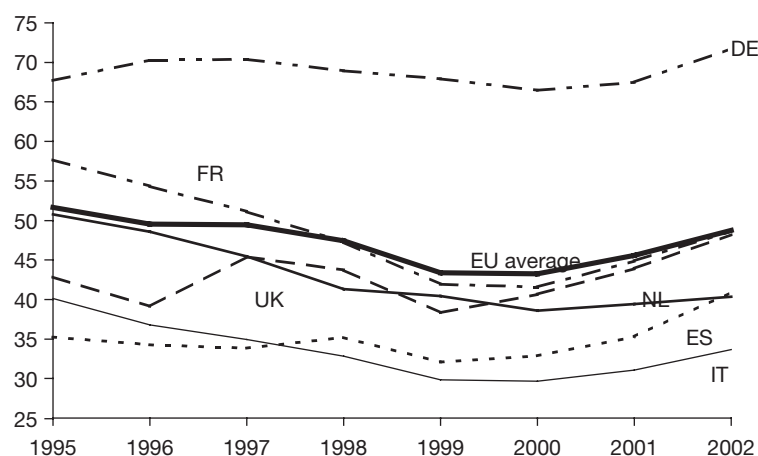
Figure 2 shows the recent pattern of the FIN, that is quite stable for almost all the six leading European countries, with the exemption of Spain that recorded a decrease.

<sup>25</sup> For the different definitions of FIN see Goldsmith (1969).

FIN values are not converging among European countries; the dispersion increased over the period, as measured by the standard deviation that rose from 14.10 in 1995 to 19.11 in 2002.

To better understand the role of banks, we calculate the ratio of financial assets of banks to the financial assets of non-financial sectors and the rest of the world (Table 5, second column).

Figure 3 – FIN: Banks (percentages)



FIN for banks is much higher in Germany than in other European countries, because of the large universal banks and of a low degree of separation between banking and commerce. However, all over Europe the importance of banks reduced in the period 1995–2000, but increased again in 2001 and 2002 (Figure 3), reaching for some countries higher levels than in 1995, because of the fall in share prices and the increase in deposits and loans after 2000. France and the Netherlands are experiencing a clear reduction of the role of banks.

National characteristics remain strong: the standard deviation of FIN computed for banks increased from 10.39 in 1995 to 14.05 in 2002.

In a few words, and going back to the discussion of Section 2.2, countries have different types of financial intermediaries. In Germany the importance of universal banks explains both the large value of the FIN for financial corporations and the low significance of non-bank institutions. On the contrary Italy and the UK have the highest weight in Europe of the “other financial institutions”: mutual funds are important in both the countries; intermediaries engaged in lending are predominant in Italy; in the UK securities and derivatives dealers are essential. This picture is also the legacy of regulatory and institutional patterns. In Italy specialization of financial business prevailed until the beginning of the Nineties; in UK there has been traditionally a cultural separation between commercial banks and investment banks or, better, between institutions offering deposits and loans and intermediaries trading in securities and shares on their own and/or on behalf of their customers. This peculiarity remains true even though in London banks created large financial conglomerates in the Nineties, in which the commercial business coexists with the investment banking function. A well known subject are the shareholding patterns between intermediaries, a crucial aspect in defining the central role of banks in financial systems.

## 4. Financial instruments in Europe

### 4.1. Diffusion of financial instruments

This section analyses the composition of financial assets and liabilities in Europe by instruments. The focus is on the whole economy, on non-financial corporations and households, while we will skip the other institutional sectors.

*The economies as a whole.* In the second half of the Nineties the most important development was the growth of the item “shares, other equity and mutual fund shares” (Table 6). This is a heterogeneous aggregate which includes security and equity mutual funds, quoted and unquoted shares. The aggregate rose from 20 per cent of total financial instruments in 1995 to a peak of 31 per cent in 2000. The causes of this growth include favorable tendencies in share

Table 6 – EU, total economy: composition by financial instrument (percentages)

Financial Instrument	1995	1998	2000	2001	2002
Deposits	27.8	24.6	23.0	24.1	25.5
Securities other than shares (including FD)	16.9	16.4	15.4	16.3	17.7
Loans	21.3	18.5	18.3	19.4	20.6
Shares, other equity, mutual fund shares	20.4	27.5	30.9	27.8	23.8
Insurance technical reserves	7.5	7.8	7.5	7.5	7.3
Other accounts receivable/payable	6.2	5.1	4.9	5.0	5.1

prices, privatization of State owned firms, progress in the asset management industry.<sup>26</sup> In the meanwhile deposits and loans decreased and the incidence of securities other than shares remained constant. After the year 2000, the downturn of the Stock Exchange caused a strong

Table 7 – European countries, total economy: composition by financial instrument (2002, percentages)

	Deposits	Securities other than shares	Loans	Shares, other eq. and mut. fund shares	Insur. tech. Res. and pens. funds	Other accounts receiv./ pay.
United Kingdom	32.3	13.3	20.8	21.4	10.2	2.0
Germany	27.8	18.6	22.5	19.5	7.6	4.1
France	22.7	18.3	15.4	29.6	5.2	8.5
Italy	19.0	25.2	20.1	24.8	5.2	5.7
Netherlands	20.5	17.0	28.2	20.4	11.6	2.3
Spain	25.4	13.6	19.4	25.2	3.8	12.6
Belgium	24.7	20.0	17.5	29.7	3.8	4.1
Sweden	13.1	17.9	23.5	30.5	6.3	8.6
Austria	25.9	25.8	24.2	18.7	3.9	1.4
Denmark	16.5	26.0	21.8	22.6	7.6	5.4
Finland	14.1	17.5	24.2	34.2	3.5	6.5
Portugal	28.8	14.1	23.5	21.1	3.8	8.8
European average	22.6	18.9	21.8	24.8	6.0	5.8

decrease in the resources absorbed by mutual funds and shares and a re-composition of financial instruments towards deposits and securities.

Looking at national situations, banking disintermediation invested all the countries but important differences persist (Table 7). Deposits are more important in the UK and Germany, because of the interbank activity in the first country and the central role of banks in Germany. In Italy and the Netherlands deposits are below the European average.

These tendencies in the evolution of financial instruments may be better understood by focusing the analysis on firms' financial liabilities and households' financial assets.

*Firms' liabilities.* As far as the non-financial corporations' liability items are concerned, "shares and other equity" increased from 1995 to 2000 but were subsequently hit by the decrease in stock prices (Table 8). Loans granted to firms decreased from 1995 to 2000 but rose later because of the Stock Exchanges' bad performance, the need of firms to finance mergers and acquisitions, the Universal Mobile Telecommunication Systems (UMTS) auctions which took place in many countries. In 2002 shares and other equity remained the most important source of funds in all the European countries, with the exemption of Germany and Austria, where the dominance of banks seems really unique. Firms' securities issues are important in UK and France, while they remain low in Spain, Germany and Italy, notwithstanding the boom of bond issuance in the euro area that started in 1999.

Trade credit is important in many Southern countries, like Spain, France, Italy and Portugal, while it is unimportant in Northern countries of Europe, with the notable exemption of Sweden

<sup>26</sup> See *The Economist* (2003b) for a survey of asset management.

Table 8 – EU, non-financial corporations financial liabilities: composition by instrument (percentages)

Financial instrument	1995	1998	2000	2001	2002
Securities other than shares incl. FD	4.09	3.57	3.94	4.75	5.45
Loans	33.26	26.28	25.62	28.63	32.93
Shares and other equity	46.84	57.95	59.44	54.80	48.82
Pension funds	n.a.	n.a.	1.16	1.24	n.a.
Other accounts receivable/payable	13.96	10.76	9.81	10.57	11.33

Table 9 – European countries, non-financial corporations financial liabilities: composition by instrument (2002, percentages)

	Securities other than shares	Loans	Shares, and other equity	Pens. Funds. and severance pay	Other accounts receiv./ pay.
United Kingdom	10.6	30.7	53.0	0.0	5.7
Germany	2.3	43.2	40.7	5.7	8.2
France	7.3	24.3	52.9	0.0	15.5
Italy	2.1	32.8	47.3	3.9	14.0
Netherlands	5.5	46.4	48.1	0.0	0.0
Spain	1.2	29.7	41.5	0.1	27.6
Belgium	3.8	23.1	69.9	0.0	3.3
Sweden	4.1	36.3	44.2	1.1	14.4
Austria	6.0	56.3	35.1	0.0	2.6
Denmark*	6.2	40.2	48.0	0.0	5.6
Finland	5.1	30.8	55.6	0.0	8.5
Portugal*	4.5	36.6	39.0	0.5	19.4
European average	4.9	35.9	47.9	0.9	10.4

\*Financial assets and liabilities refer to 2001.

(Table 9). This evidence must be interpreted cautiously because the estimation of trade credit is troublesome and not yet harmonised among countries.<sup>27</sup>

*Households' assets.* Shares and other equity were households' most preferred investment from 1998 to 2000 (Table 10), followed by insurance technical reserves. Both these instruments increased in the years 1995–2000, meanwhile deposits and securities other than shares

Table 10 – EU, households financial assets: composition by instrument (percentages)

Financial Instrument	1995	1998	2000	2001	2002
Deposits	35.5	29.2	26.6	28.6	31.8
Securities other than equities incl. FD	11.2	8.1	6.9	7.4	8.4
Loans	0.5	0.2	0.1	0.2	0.2
Shares, other eq. and mutual fund shares	22.8	30.0	32.4	28.4	23.9
Insurance technical reserves	27.5	30.3	31.9	33.2	33.2
Other accounts receivable/payable	2.5	2.1	2.1	2.2	2.5
Total	100.00	100.00	100.00	100.00	100.00

decreased. In the last few years the decline in the stock exchanges induced households to move towards less risky investments, chiefly deposits.<sup>28</sup>

<sup>27</sup> Bartiloro and Coletta (2003) provide a first analysis of statistics on trade credit in Europe.

<sup>28</sup> See Massaro and Lääkäri (2002) on households' investments in the second half of the Nineties and Massaro (2004) on the most recent developments.

There are important differences between European households' portfolios (Table 11). Households' deposits are high in Austria, Spain, Portugal, Germany, countries where the banking system prevails and financial markets are relatively weak. In Italy and Sweden households invest less in deposits than the European average. Investments in securities are very large in Italy and Belgium, as a consequence of the great general government's debts.

Countries manifest a large variance of household stockholding.<sup>29</sup> Households' mutual funds, shares and other equity are important in Finland, Italy, France, Sweden, reflecting the progress of capital markets in these countries. There are also idiosyncratic factors, such as the importance of small firms issuing other equity in countries like Italy. However, when comparing the years 1995–2002, the increase in stock market participation and mutual funds units was especially strong in France, Italy and Finland, where the very large size of Nokia plays an important part in the explanation of the story. After the equity market bubble burst the weight of risky assets decreased in all European countries. Households first re-balanced their portfolios towards deposits and securities; in 2003 they slowly came back to risky assets.<sup>30</sup>

Taking into account the share of financial assets held by every institutional sector in each country, at the end of 2002 as well as in 1995, Italian households had the highest share among European households. This result seems to be linked to the high saving ratio in Italy<sup>31</sup>.

Insurance technical reserves also exhibit a very large dispersion of their weight on households' financial assets. The European average is 29 per cent, but for the UK and the Netherlands, where State pensions are small, the ratio is over 50 per cent; on the contrary it is under 20 per cent in Spain, Belgium, Portugal, Italy, where pay-as-you go systems are still predominant. Not only the weight of autonomous pensions funds is different in single countries but also the composition of their assets. While securities issued by the General government are among the predominant choices in the majority of countries, investment in cash and deposits and land and building is important in Portugal and Italy, while shares are preponderant in the UK and the

Table 11 – European countries, households' financial assets: composition by instrument (2002, percentages)\*\*

	Deposits	Securities other than shares	Shares, and other equity	Ins. tech. reser. and pens. funds	Other accounts receiv./ pay.
United Kingdom	27.9	1.4	15.5	51.7	3.2
Germany	35.9	11.3	21.0	30.2	1.6
France	31.7	2.3	32.7	28.9	3.7
Italy	26.8	22.5	35.3	14.8	0.6
Netherlands	24.1	3.9	11.8	57.4	2.6
Spain	44.7	2.0	33.5	16.1	3.8
Belgium	28.8	22.8	32.4	16.2	0.0
Sweden	17.5	2.7	30.4	40.1	8.9
Austria	55.7	7.7	15.4	20.5	0.7
Denmark*	24.3	8.9	25.4	40.2	1.3
Finland	33.5	1.2	39.3	21.4	4.3
Portugal*	46.8	6.0	29.4	16.1	1.6
European average	33.2	7.7	26.8	29.5	2.7

\*Financial assets and liabilities refer to 2001.

\*\*Loans granted, that amount to very small figures, are not included; therefore the sum is not exactly equal to 100.

Netherlands; corporate bonds are considerable in Denmark, Finland and the Netherlands.<sup>32</sup> This assets' mixture reflects the development of financial markets in each country.

29 Guiso, Jappelli and Haliassos (2001) compare the stock ownership among households in Europe and the US.

30 See PGAM (2004) on the Italian case.

31 Saving ratios are often calculated according to different methodologies; see OECD (2004b).

32 See OECD (2004a) for statistics on pension funds.

#### 4.2. On firms' and households' indebtedness

A large theoretical and empirical literature investigates how firms' financial conditions and capital structure may influence their value and activity, particularly investment. This intellectual history includes the Modigliani-Miller theorem, the discussion on how taxes influence debt, the static tradeoff theory, the pecking order proposition, models with agency costs between shareholders and managers, models with incomplete contracts between intermediaries and firms and/or conflicts between debt and equity investors. In this section we do not review this literature,<sup>33</sup> limiting ourselves to a comparison of the ratios of debt (i.e. securities plus loans) and capital (i.e. shares and other equity) to GDP in European countries.

Table 12 – European countries, non-financial corporations' liabilities, securities other than shares and loans/GDP

	1995	1998	2000	2001	2002
United Kingdom	0.64	0.70	0.89	0.96	0.97
Germany	0.51	0.54	0.65	0.68	0.68
France	0.74	0.71	0.83	0.88	0.87
Italy	0.51	0.51	0.58	0.60	0.61
Netherlands	0.90	0.94	1.09	1.09	1.13
Spain	0.49	0.51	0.64	0.72	0.76
Belgium	0.61	0.66	0.75	0.76	0.78
Sweden	1.25	1.24	1.40	1.49	1.45
Austria	0.57	0.68	0.77	0.79	0.78
Denmark	0.59	0.60	0.63	0.73	0.70
Finland	0.77	0.70	1.02	1.04	1.02
Portugal	0.64	0.74	0.91	1.01	0.96
European average	0.68	0.71	0.85	0.89	0.90

Looking at the weight of securities issued and loans received by non financial corporations, countries may be divided into two groups. In the Netherlands, Finland and Sweden firms are heavily indebted, while in Germany and Italy they have very low ratios of debt to GDP (Table 12).

Turning to the ratio of shares and other equity to GDP, the contribution of financial markets in ensuring funds to firms is strong in Belgium, Finland, Sweden, France, where financial

Table 13 – European countries, non-financial corporations' liabilities, shares and other equity/GDP

	1995	1998	2000	2001	2002
United Kingdom	1.33	1.59	1.94	1.63	1.24
Germany	0.53	0.84	0.93	0.87	0.61
France	1.03	1.98	2.54	2.04	1.46
Italy	0.44	0.69	1.03	0.90	0.88
Netherlands	0.99	1.43	1.62	1.35	1.04
Spain	0.79	1.30	1.40	1.31	1.03
Belgium	1.18	1.69	1.91	2.00	2.02
Sweden	1.10	1.65	2.16	1.94	1.59
Austria	0.16	0.23	0.41	0.42	0.44
Denmark	0.60	0.77	0.95	0.75	0.73
Finland	0.61	1.60	2.95	2.14	1.58
Portugal	0.98	1.07	1.06	0.96	0.91
European average	0.81	1.24	1.57	1.36	1.13

markets are essential (Table 13).<sup>34</sup> It is slightly surprising that in the UK the ratio of firms' shares to GDP is around the European average. Austria, Denmark, Germany and Italy show low values of the ratio, confirming the relative backwardness of their capital markets.

<sup>33</sup> Myers (2000) is a useful survey.

<sup>34</sup> In 2004 Austria revised the figures of the item "shares and other equity" starting from the year 1999.



Table 14 – European countries, non-financial corporations' leverage ratio (percentages)

	1995	1998	2000	2001	2002
United Kingdom	32.49	30.67	31.36	36.95	43.78
Germany	48.80	39.30	41.09	43.67	52.75
France	41.65	26.28	24.59	30.05	37.33
Italy	53.87	42.38	36.07	40.07	41.03
Netherlands	47.77	39.53	40.34	44.68	51.95
Spain	38.47	28.17	31.44	35.28	42.63
Belgium	34.05	28.22	28.15	27.44	27.77
Sweden	53.03	42.93	39.27	43.40	47.74
Austria	81.89	76.96	65.50	65.42	63.98
Denmark	49.66	43.74	39.69	49.16	49.16
Finland	55.67	30.37	25.60	32.59	39.23
Portugal	39.37	41.02	46.10	51.31	51.31
European average	48.06	39.13	37.43	41.67	45.72

A comprehensive picture of firms' financial conditions is provided by the leverage ratio, measured by the ratio of securities issued and loans to the sum of securities, loans and shares (Table 14).

In Europe leverage decreased from 1995 to 1999, on account of the propitious situation of the Stock Exchanges, while it increased from 2000 to 2002 because of the resurgence of securities issued and of the growth in banks' loans. In 2002 the ranking of countries shows high leverage ratios in Austria, Germany, Portugal and the Netherlands, because of, for the first 3 countries, the importance of banks. Germany is an interesting case: in 2002 the country had the highest leverage ratio after Austria, while in 1995 it was only in sixth position. Finland and Italy represent the opposite cases, having reached the largest reduction in Europe in leverage ratios between 1995 and 2002. Overall, financial conditions of European firms worsened since 2000 but still appear more positive than in 1995. We do not investigate the important subject of the strong differences in leverage ratios inside firms' population, e.g. between large companies and small firms.

Finally, also households' debt may be a concern for business trends and financial stability (Table 15). Households' loans as a percentage of GDP increased in all European countries between 1995 and 2002.

Italian and Finnish households are the least indebted in Europe, while households have large amounts of debt in the Netherlands, Denmark and the UK. In all countries households receive funds mainly as mortgage loans and consumer credit. In countries like Italy, where sole proprietorships play an important role in the economy, also loans for business activity are essential. Notwithstanding the increase in houses' prices, the low level of interest rates favored the increase in mortgage loans in all countries. Moreover, in the Netherlands and the UK households benefited from the mechanism of "mortgage equity withdrawal" (MEW). MEW occurs when the households sector increases borrowing secured on housing assets without spending the proceeds on improving or enlarging the housing stock<sup>35</sup> but rather devoting the funds to home improvements and consumption. There are several determinants of households' debt, ranging from cultural attitude towards banks' loans to regulatory issues concerning mortgages, from the saving propensity to the memory of intense inflation periods. Large saving ratios and high interest rates, often linked to past inflation experiences, have been a traditional explanation for low ratios of households' loans to GDP.

## 5. Conclusion

This paper tried to provide empirical answers to some theoretical issues on financial systems, drawing mainly on the flow of funds statistics of European countries.

Taking into account the economic literature, we outlined the importance of such matters as the size of financial systems as a necessary, but not a sufficient, condition for economic development,

<sup>35</sup> This definition is taken from Bank of England (2003). See Walton (2004) on the financial position of households in the UK. On the persistent rise of household debt in the Netherlands see DNB (2003). On households' modest debt and the increase in property prices in France see Deutsche Bank (2004).



Table 15 – Households' loans/GDP

	1995	1998	2000	2001	2002
United Kingdom	0.66	0.64	0.71	0.76	0.82
Germany	0.66	0.70	0.73	0.73	0.72
France	0.37	0.36	0.37	0.38	0.39
Italy	0.17	0.20	0.23	0.23	0.24
Netherlands	0.66	0.79	0.92	0.95	1.02
Spain	0.33	0.39	0.47	0.50	0.54
Belgium	0.39	0.41	0.40	0.38	0.39
Sweden	0.52	0.47	0.52	0.55	0.57
Austria	0.37	0.37	0.46	0.47	0.48
Denmark	0.83	0.94	0.92	0.96	0.93
Finland	0.36	0.30	0.31	0.32	0.34
Portugal	0.29	0.47	0.64	0.67	0.64
European average	0.47	0.50	0.56	0.57	0.59

the growing financial integration of Europe, the uncertain prospects of convergence in financial structures and the issue of the different types of intermediaries active in the European economies. Coming back to the questions outlined in the introduction, our conclusions can be summarised into five points.

First, as far as the size of financial systems is concerned, national differences persist in Europe in the ratio of financial assets and liabilities to GDP. The UK has the highest financial assets/GDP ratio, thanks to its advanced markets, the London financial market's links with large international banks, the presence of non-bank financial intermediaries and the country's traditional commercial openness. Germany, Italy and Spain have lower financial assets/GDP ratios. France is an intermediate case, reflecting the growing influence of financial markets in last years.

Second, with regard to financial corporations, German banks continue to play a central role, while banks' assets are lower and decreasing in most European countries. Italy and the UK have a low ratio of bank assets to other sectors' financial assets, by virtue of the importance of other financial institutions, such as mutual funds (in both countries), intermediaries engaged in lending (in Italy) and securities and derivatives dealers (in the UK). In the Netherlands and the UK insurance technical reserves and pensions funds are much more important than in other countries, where pay-as-you go State pension schemes are still prevalent.

Third, with reference to international integration, countries also differ by the amount of financial transactions with non-residents: the UK and the Netherlands have a higher proportion of foreign assets and liabilities, while Germany and Italy have more closed financial systems. The causes of international openness remain difficult to evaluate. Notwithstanding the trend towards financial globalisation, home bias of portfolios remains strong.

Fourth, with regard to financial convergence, a preliminary statistical measurement of  $\beta$ - and  $\sigma$ -convergence for the ratio of financial assets of national residents to GDP produced mixed results. There are signals of  $\beta$ -convergence but not of  $\sigma$ -convergence. This might indicate a trend to convergence, still hindered by temporary noise factors. Dispersion of the FIN ratios also increased between 1995 and 2002. The  $\beta$ -convergence exercise must be evaluated with caution, given the limited available data.

Finally, national differences also persist in the composition of financial assets and liabilities by instrument. Between 1995 and 2000 the most important phenomenon was the reduction in loans and deposits and the increase in shares, other equity and mutual fund shares. These trends were stronger in France and Italy, weaker in Germany. The fall in the value of shares prices since the spring of 2000 contributed to the decline in "shares, other equity and mutual fund shares" in 2001 and 2002. Bond issuance jumped after the creation of the euro area but they are important in firms' liabilities only in the UK and France.

Considering the concern for the financial position of the non-financial corporate sector and the household sector, we found that in all European countries firms' debt (bank loans plus securities issued) increased as a percentage of GDP between 1995 and 2000; however, notwithstanding its increase since 2000, the leverage ratio was lower in 2002 than in 1995. In Europe households' debt increased between 1995 and 2002; it is lowest in Finland and Italy, highest in the Netherlands, Denmark and the UK.

Flow-of-funds data are still under-exploited in the analysis of financial structures. Among the possible issues for further research we suggest a more sophisticated measurement of financial

convergence, comparisons with the Japanese and the American systems and cross-countries econometric exercises on the nexus between financial assets/liabilities and economic growth.

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# Artificial neural networks for data editing

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## 1. Introduction<sup>1</sup>

A vast literature exists on the subject of measurement error in survey data<sup>2</sup>; the main concern of researchers is the quality of estimates based on inaccurate information. Even in the optimistic scenario where errors do not introduce any bias, the variance of all estimates is larger than it should be: it is the sum of two parts, one of which does not exist if the data portray reality truthfully. The first part, known as sampling variance, is inherent in the process of extracting a sample instead of observing the whole population; the second one, known as non-sampling variance, is introduced by the fact that measurement error itself has its own distribution, presumably different from the sampling distribution of the variable of interest. This happens even for the simplest estimates and the most apparently inoffensive error structures. For example, imagine that we want to estimate the mean  $\mu_x$  of a random variable  $X$  of variance  $\sigma_x^2$ , on the basis of the erroneous measurement  $Y = X + e$ . Let us assume that  $E[e] = 0$ ,  $\text{Var}[e] = \sigma_e^2$ . In the “classical” measurement error case,  $\text{Cov}[X, e] = 0$  holds. Under these minimal conditions, the expected value of the sample mean of  $Y$ ,  $E[(1/n)\sum(X + e)]$ , is the same as the expected value of the sample mean of  $X$ ,  $E[(1/n)\sum X]$ , which in turn is equal to the true mean: the estimator is still unbiased. On the other hand, the variance of the sample mean of  $Y$  turns out to be equal to  $\sigma_x^2 + \sigma_e^2$ , hence larger than the one we would have for an exact measurement, i.e.  $\sigma_x^2$ . This translates to a confidence interval around the population mean being larger than expected.

It is not easy to separate the two: most large-scale household and business surveys have complex designs, preventing the exact calculation of the sampling variance even for simple estimates such as totals and variations. Standard errors have to be estimated by way of simulation methods such as bootstrapping, and they end up incorporating both types of variance.

Handling measurement error is a twofold endeavour. On one hand, the mistakes need to be found and corrected; on the other hand, it is not always possible to do so. For example, under some sets of assumptions concerning the errors, removing visible wrong information may not even be the wisest course of action, in case it serves as a balance for records that seem correct but instead contain mistakes of the opposite sign. Assuming that every record in a large data set could be individually checked for errors, not all of them could be located anyway: some mistakes are blatant (e.g. a firm stating that 180% of its employees have part-time contracts), some are easy to detect with a measure of attention to internal consistency of the data (e.g. a household claiming to consume 40,000 euros worth of goods per month but declaring their monthly income is 15,000 euros, no gifts, no wealth variations), but some are impossible to see by someone who does not have external sources for double-checking (e.g. a business owner who claims to put 70 hours per week of work in his company but actually delegates 30 of these 70 hours to his son). And even if we had a perfect map of all errors, the actions to take would not be clear-cut: should the records be deleted or imputed (and how)? Hence theories must be developed to predict how errors with certain assumed features affect estimates, and possibly prevent them from doing so.

Each of the sides to the problem spawns specialised work. A strand of studies, broadly referred to as “data quality literature”, touch upon topics such as these: how to measure the reliability of a data set, how to detect measurement error, what to do once wrong information is

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2 *We are only going to outline the basic tenets here. For a comprehensive review, see e.g. Biemer and Trewin (1997).*

found, how to strike a balance between the cost of looking for errors and the benefits of removing them. Other studies concentrate on how to reduce the effect of errors on specific estimates.

Our research belongs to the first group. We strive to understand whether artificial intelligence (AI) methods can be useful in reducing the effort needed to find wrongly measured values in data sets with a large number of both variables and observations, and in suggesting what to do (recontact, discard, impute).

Our basic reasoning goes as follows: traditional methods for error detection, such as the use of logistic regressions to determine the probability of a value being incorrect<sup>3</sup>, hinge on the fact that the researchers think they know what determines the errors, and they also think they know how the causes are related to the effect. In other words, they assume they know which variables should be included in the model, and what the functional form of the model should be. Several specifications are normally tried, but practical constraints often lead to choosing one of them although the fit could possibly be improved; moreover, the chosen model and specification tend to be oversimplified even if they are only used for predictive (as opposed to explanatory) ends, in order to retain clear inferential properties<sup>4</sup>. The combination of necessary assumptions and simplifications can sometimes lead to unsatisfactory results: slight departures from the “true” structure of reality in one or more elements of the concoction yield low predicting power, and attempts at enhancing it eat away lots of time.

Machine learning methods<sup>5</sup>, on the contrary, exploit the abundance of computing power now available to researchers in order to simultaneously consider a very high number of possible models and specifications; the structure of the problem at hand can be ascertained by trial-and-error on a very large set of possible models. Let us give a computer the value of the variable(s) we want to predict and the value of all variables that possibly exert an influence on it for a number of known cases, along with a broad indication on the structure we believe to be appropriate for the model (e.g. linear or non-linear, recursive or non-recursive). The computer learns the exact details of the problem, e.g. the parameters or even the functional form connecting various parts of it, by trying iteratively to formulate a set of rules that allows it to reproduce all known outcomes with as much precision as possible<sup>6</sup>. A number of machine learning strategies exist: where economic information is concerned, the most popular models are Artificial Neural Networks (ANNs) and Support Vector Machines (SVMs), respectively used to deal with large and small data sets. The Classification And Regression Tree (CART) algorithms are also quite used in such domains as credit scoring. Given the nature of our problem (classification in a large data set), we choose to focus on ANNs<sup>7</sup>.

Section 2 gives an overview of data quality issues in the Bank of Italy’s two main business surveys. Section 3 briefly discusses the ANN methodology. Section 4 outlines our error detection experiments and their results. Section 5 concludes. The Appendix details implementation choices.

## 2. Data quality control in the Bank of Italy’s business surveys

The Bank of Italy has been carrying out business surveys since 1972. The initial waves only covered the medium and large firms of industrial transformation; the reference population grew in time, and today’s survey includes firms with at least 20 employees, belonging both to the industrial sector (excluding construction) and to services (excluding banking and insurance). The

3 See, for example, *Biancotti, D’Alessio and Neri (2004)*.

4 *Most logistic models are based on a single latent variable, even if there is reason to believe that the latent phenomena impacting on the quality of a single data item are more than one.*

5 *For a discussion of machine learning in the broader context of AI, see Russell and Norvig (1995). The general principle of supervised machine learning, also known as example-driven machine learning, is not very distant from the idea of a researcher trying all possible models and specifications until he reaches one with a level of approximation he deems acceptable. Only, it does not go anywhere near the same amount of required time and attention.*

6 *A metaphor for comparing traditional classification/regression methodologies and AI methods that is quite popular in the machine learning literature (see for example Cristianini and Shawe-Taylor, 1998) goes as this: suppose we want to teach a child to tell sports cars from other cars. We might do it by presenting him with a list of features of sports cars, asking him to memorize it, and then apply the rules in order to classify each car he sees. That’s akin to regressing a dummy variable saying what’s the type of a car on a number of variables measuring features such as shape of the car, maximum speed, number of seats, and so on. Or we might show the child several examples of sports cars; he child will then identify by himself the set of rules; he will become able to distinguish between the two, and to tune the rules every time he sees a new kind of sports car. That’s what generally happens in reality, and it is way quicker than writing and studying (potentially incorrect, non-exhaustive) lists, because humans are naturally endowed with parallel reasoning skills, i. e. they are able to relate an output – in this case, the “sports car” quality of an object – to several inputs considered simultaneously. Artificial parallel reasoning will be presented further on in the paper.*

7 *For the foundations of SVM theory, see Vapnik (1998).*



sample includes some 4,000 firms; variables observed range from investments and revenues to indebtedness and other sources of financing. In many cases levels (expressed in '000 euros) are observed.

Sources of measurement errors in this context are, for example, misclassification of aggregates to be considered in the amounts provided; mergers or acquisitions not taken into account; euro units instead of '000 euros (or vice-versa); former national currency units instead of euros; misreadings in the paper questionnaire (either manual or through optical character recognition).

Data quality is cared for in several fashions. At data-entry level, a check is implemented, by preventing, for example, negative values where these cannot be attributed economical meaning or by not accepting values out of the list of valid values for discretely coded responses.

A further level of check considers average ranges (minimum – maximum) for some responses, based on historical distributional evidence or opinions from subject matter experts, sometimes related to other variables: if the entered value is outside the indicated range, the interviewer is asked to activate a flag in case the value is further confirmed by a double-check. Flags are then pigeonholed to spot ranges revealed *ex-post* exceedingly broad or narrow or to detect particularly confirmation-prone interviewers.

The final stage of measurement error monitoring relies on a procedure inspired by the vast literature on significance editing and explored by Battipaglia (2002). A simple model for the values of the published aggregates (for example, rates of change for investments and revenues) is stated and the prediction of that model is instrumentally trusted as the “true” value under the model; units whose impact to the “true” estimate – evaluated through a first-order Taylor approximation and therefore called the “score” of the selected unit – is “significant”, are flagged as eligible for recontact. Thus, businesses whose values of the published aggregate are “too far away” from the predicted are ordered by priority and recontacted to get a confirmed or revised value, until a satisfactory quality of the estimate is reached.

The latter procedure ensures quality enhancement of the final estimate<sup>8</sup> via selection of the significant units to be recontacted. This way, however, a segmentation of the sample is achieved, between “more often monitored” and “less often monitored” units<sup>9</sup>, so that it does not appear particularly fit for raising overall quality of microdata.

Furthermore, selective editing techniques quite often undergo a rather low “hit rate”, i.e. confirmations are far more numerous than revisions for recontacted businesses<sup>10</sup>: if effectiveness of the quality enhancement is to be coupled with reduced burden for respondents and reduced cost for the statistical agent, this calls into question the prediction capability of the chosen model.

### 3. The artificial neural network approach: methodology

Artificial neural networks (ANNs) have raised growing interest in the last dozen of years also out of their native field of application, which traditionally was discriminant analysis and pattern recognition. The name recalls the very activity of the human brain, structured in collection of information, learning by training and subsequent validation; it carries a suggestive flavour and may possibly raise misplaced enthusiasm for a new promising tool.

Research in ANNs dates back to the forties of 20th century (McCulloch and Pitts, 1943) but gained momentum only starting from the sixties, as growingly available computing power made possible the widespread implementation of complex ANN algorithms. The seminal idea of a linear combination of observed values to separate (classify) units is found in the work of Rosenblatt (1962). The re-emergence of ANNs in the Eighties is marked by the textbook by Rumelhart and McClelland (1986).

From an econometric point of view, ANNs can definitely be viewed as powerful prediction tools with strong connections with the classical framework of multivariate regression models. Sistematization of ANN theory under the category of statistical computing started with the classical paper of Cheng and Titterton (1994); a discussion which punctually parallels ANNs and non-linear regression tools, comparing also the respective jargon, can be found in Martin and Tan (1997).

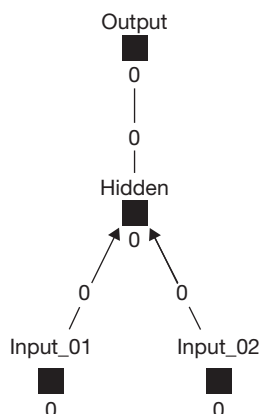
Neural networks can be fully represented by means of partially connected graphs, as in figure 1.

<sup>8</sup> This class of data quality control proceedings is consequently called “macroediting”.

<sup>9</sup> Typically, for estimates of totals and rates of change the biggest firms are more likely to be considered influential and therefore recontacted.

<sup>10</sup> This would not automatically guarantee that the scrutinized values are revealed as actually free from measurement error. The solution could be automatic imputation in some data quality control settings; at the Bank of Italy, instead, the choice is to attribute to a limited number of anomalous but confirmed values a unit weight.

Figure 1 – A basic model of feed-forward neural network



Units, or nodes, are called “neurons” in the ANN parlance; nodes and arches are organised in layers. The first layer contains inputs, i.e. right-hand side variables; the last final layer contains outputs, i.e. left-hand side variables. Layers between the initial and the final ones, if present, are called “hidden” layers, as their values are fed from within the network and do not represent observed variables.

In a feed-forward network, information flows from input to output only, with no arches reverting to a node belonging to a preceding layer. This is perfectly intuitive as we maintain constant in mind the comparison with regressions models, to which only feed-forward ANNs can be reconducted. Impulses (=values) coming from input and intermediate layers are magnified or inhibited through appropriate weights and then fed (=weighted sum) to the subsequent layer. Prior to that, the signals are processed through a function, called a “squasher” or activation, that calibrates the sensitivity of the nodes to the stimuli. Activation functions are typically sigmoidal (e.g. logistic or cumulative normal) or threshold.

“Learning” means that the output of the network is compared to desired output by means of a loss function. If the value of the loss function is not minimum, an appropriate rule (typically the gradient method) adjusts the weights, whose values are propagated back through the network. This way of iterating is not unique, but typical, and called backpropagation. The learning process ends when the distance between desired and predicted output is minimum, i.e. global loss is minimum.

If the desired value of the output is compared to the network for learning (=fitting) we speak of “supervised” learning. This is so far the only type of ANNs that has proven of use for concrete applications, as unsupervised learning poses expectedly formidable methodological problems.

Supporters and critics of ANNs balance their arguments: a proven high predictive capability stands against some unresolved issues that still punctuate the existing theoretical framework: for example, the absence of optimality criteria for the choice of the network topology (e.g. how many hidden layers, how many hidden units, how to place arches), the activation function, the learning algorithm, the weight adjustment rule; the want of a quality assessment for the predicted values. These lacks underpin the often supported “blackbox” indictment against ANNs.

From an applied mathematical perspective, however, neural networks can claim the *universal approximation property* (Hornik, Stinchcombe and White 1989; for a heuristic, suggestive proof and extensions, see Ripley 1996): any real-valued, continuous function of real variables can be uniformly approximated on compacta by a neural network with a logistic or threshold squasher and one hidden layer.

From this point of view, ANNs can be seen as computer-intensive, specification-free nonlinear fitters which include as restrictions many existing multivariate regression models. In our research, aimed at efficient error-spotting and effective data quality enhancement rather than interpretability, ANNs come as a tool apt to exploit for detection many diverse variables and their interaction, without having to state possibly poorly performing “structural” equations of the ties between the respondent’s observed features and her erring propensity.

When it comes to predict a zero-one dichotomously classifying variable, as in our case, the logit modelling framework appears a natural competitor. In fact, there is perfect coincidence between a particular class of artificial neural networks, i.e. two-layer, feed-forward networks with a single logistic activation function (at the output node), and multinomial logit (Ripley 1996); the enhancement offered by neural networks equipped with hidden layers belongs in the fact that they can natively account for nonlinearities in the hypothesised relationship (Bentz and Merunka 2000).



Use of neural networks for data editing is a relatively new topic. In the literature we spotted, among others, the work of Larsen and Madsen (1999) and Nordbotten (1995, 1996). We follow in the line of experimenting with ANN-based error detection models and seeing whether they perform better or worse than traditional statistical tools; our work includes a comparison between the usual logit probability modelling and the performance of the neural network as a nonlinear extension.

#### 4. Artificial neural networks for the detection of measurement error

The first model we propose is a basic classifier: we want to predict the probability of a given vector of information containing at least one error. In order to do this, we take the final datasets for the last two waves of the survey, which we assume not to contain errors; while we can not be sure of this, these datasets are the result of a number of editing procedures that should insure that major mistakes no longer exist. We then randomly introduce in the “true” records several types of known errors. In particular, those are: wrong currency unit (old Italian lire in lieu of the recently introduced euro), wrong scale (euros instead of thousands of euros), random digits inserted into or eliminated from the true values as a result of inaccurate data entry, zeros instead of missing values and, finally, values belonging to one firm but attributed to another as a consequence of wrong merging of the databases. The different types of errors are introduced independently.

We end up with a simulated dataset which contains 19 input variables, corresponding to the most relevant surveyed phenomena, and one output variable, a dummy telling us whether one of the errors described above has been introduced in the input variables or not. It is studied with a basic feed-forward network with one input layer, one hidden layer of 6 neurons, and one output layer. Implementation choices concerning activation and output functions can also be found in the Appendix. The training set and the validation set used to estimate the network weights are two randomly selected halves of the simulated dataset.

In Table 1, we show the performance of the network versus what could be obtained with a traditional logistic model. The network gives correct predictions in about 88 per cent of the cases, against the 58 per cent of the logistic regression (since about half of the records were perturbed, the logistic model is only slightly more accurate than a random prediction).

The results from the simulation appear to be encouraging, but we need to test them against real information, i.e. see how well our network detects errors in the actual data. We do this by using historical information from the last wave of the surveys. The fieldwork period for the survey lasts three months, during which the controls detailed in Section 2 routinely take place, leading to the correction of individual data items whenever the surveyed units agree to it. This process is tracked and it yields a dummy indicating whether the record for a specific firm has been edited or not; this is the dependent variable for our model. We can then build a dataset that includes the answers that were given by each firm at the start of the survey, and a dummy that tells us whether at least one of these answers was then modified along the way. The type of information is homogeneous with the one extracted from the simulation: we can fit the network weights estimated during the simulation on the observed first-version answers and see if the predictions for each firm match with the true value of the error dummy or not. The predictions turn out to be correct in about 86 per cent of the cases, against 56 per cent for a logistic model with the same variables<sup>11</sup> (Table 2).

Table 1 – Performance of a simple feed-forward neural network for error detection on simulated data, compared with a logistic model  
(percentages)

	Neural network	Logistic model
Correct predictions	88.48	58.50
Zeros classified as ones	8.51	28.76
Ones classified as zeros	3.01	12.74

<sup>11</sup> The same methodology that we used for error detection can be transposed into the field of binary imputation. There is a major conceptual difference between the two exercises; the networks for error detection should look at the input dataset to see whether it contains mistakes, while the networks for imputation should look at the input dataset believing that it is true in order to single out clusters of units that are prone to exhibit similar behavior with respect to the dependent variable. This notwithstanding, the learning process is technically identical: the difference lies in the interpretation of the estimation procedures, not in their mathematical structure. We conducted an experiment on a binary variable indicating whether a firm is dissatisfied with its credit supply, with an input dataset containing 36 related indicators; a simple feed-forward ANN managed to correctly classify around 91 per cent of the responses, hinting at a possible good imputation performance.

Table 2 – Performance of a simple feed-forward neural network for error detection on 2003 Data, compared with a logistic model (percentages)

	Neural network	Logistic model
Correct predictions	85.54	56.30
Zeros classified as ones	9.19	23.67
Ones classified as zeros	5.27	20.03

Table 3 – Confusion Matrix, 2003 Data (frequencies, percent, row percent, column percent)

		Predicted		Total
		0	1	
TRUE	0	3420	380	3800
		82.69	9.19	91.88
		90.00	10.00	100
		94.01	76.31	–
	1	218	118	336
		5.27	2.85	8.12
		64.88	35.12	100
		5.99	23.69	–
	Total	3638	498	4136
		87.96	12.04	100
–		–	–	
100		100	–	

It must be noted that, while we found the overall prediction capability of the net quite satisfactory as it naturally minimizes the total probability of misclassification (B+C), not the same can be said of its “discriminating power” (Table 3). The apparent error rate (see, for example, Johnson and Wichern 1998) is  $100 - 82.69 - 2.85 = 14.46$ , but Table 3 shows that there is a probability of 0.2369 of correctly spotting the data record when it is erroneous. This is not optimal as the costs related to misclassification types (B) and (C) can be fairly different. The discriminating power of the net should be improved, for example by adding other relevant variables.

## 5. Concluding remarks

This paper discusses the use of artificial neural networks in the context of data editing in large sample surveys. After briefly presenting the main issues related to the detection of measurement error, both theoretically and in the Bank of Italy’s business surveys, we give an outline of how artificial neural networks work and how they can be employed to reduce the cost of identifying problem data. Experiments conducted on simulated data show that a simple network can formulate predictions that are, on the whole, reasonably good on the correctness of data. This conclusion holds with actual survey information: the network-based estimates match the outcome of the current multi-stage data editing procedures to a satisfying degree. Some difficulties still exist: misclassification of correct information is a very rare occurrence, but erroneous data are labeled as non-erroneous with a frequency that, while lower than the one yielded by traditional methods such as the logistic regression, seems to be too high for our purpose: room for improvement exists in this area, possibly via the use of more complex networks.

**Appendix**

This Appendix briefly presents the ANN architecture we chose for this paper, and the detail of some implementation choices.

**1. ANN architecture**

A neural network is fully defined once we have chosen the following features: a) the network topology; b) the input transfer function; c) the weight adjustment rule with its parameters; d) the output transformation function.

a) We chose the classical feed-forward network topology. A feed-forward network has vertices which can be numbered so that *all* connections go from each vertex to another with a higher number. Nodes are organised in layers with connections available only from lower-number to higher-number layers. In practice, signals flow in one direction only (from input to output). This recalls the familiar feature of ordinary regression models, where we feed values in right-hand variables and get the resulting output from the left-hand side.

$$y_k = f_k \left( \alpha_k + \sum_{j=1}^k w_{jk} f_j \left( \alpha_j + \sum_{i=1}^j w_{ij} f_i(x_i) \right) \right)$$

Given the universal approximation property shown, for example, in Hornik, Stinchcombe and White (1989), one hidden layer is enough for our aims. The number of nodes in the hidden layer has demonstrated to have to do more with the speed of learning than to learning (fitting) in itself; by trial-and-error we chose to have 6 hidden nodes, a dimension that allowed to have a the smallest MSE (i. e. additional nodes did not generate a better performance, while they imply longer computations). Such a network can be represented by the transformation (Ripley, 1996)

explicitly, a (possibly) non-linear regression function<sup>12</sup>. The  $f(\cdot)$  's are called the activation functions;  $w_{ij}$  are the weights assigned to each node and account for the approximation of the  $y_k$  through the network. As seen in paragraph 3, a network with linear input and a single logistic output can be seen as an extension of the logistic regression; they coincide if we get rid of the hidden layer.

$$w^{(n+1)} = w^{(n)} - \eta \left. \frac{\partial d}{\partial w} \right|_{w=w^{(n)}}$$

b) The input transfer function has been chosen as threshold, as this type of input has proven able to learn and converge on our data.

$$w^{(n+1)} = w^{(n)} - \eta \left. \frac{\partial d}{\partial w} \right|_{w=w^{(n)}} + \zeta (w^{(n+1)} - w^{(n)})$$

c) We chose backpropagation as the rule for weight updating as it closely resembles the usual iterative sum-of-square-distance minimisation procedure. If we have “examples”  $(\mathbf{x}, \mathbf{t})$  ( $\mathbf{t}$  fitting  $\mathbf{y}$ ) and the output of the network is  $\mathbf{y} = f(\mathbf{x}; \mathbf{w})$  the parameter vector  $w$  should minimise  $d(\mathbf{t}, \mathbf{y})$ , where  $d$  is an average distance function. If this distance is convex, e.g. a sum of squares, the “steepest descent” method can be used for updating the weights: the rule is of the type

<sup>12</sup> Obviously, we could get rid of the bias coefficients  $\alpha_j$  simply by writing  $w_{0j} = \alpha_j$  and consequently modifying the formula slightly:

$$y_k = f_k \left( \sum_{i=0}^k w_{ik} f_i(x_i) + \sum_{j=0}^k w_{jk} f_j \left( \sum_{i=0}^j w_{ij} f_i(x_i) \right) \right)$$

where  $\eta$  marks the rate of adjustment ( $\eta \leq 1$ ) and is called the “learning rate” in this context.

It is also possible to add a “momentum parameter”,  $\zeta$ , to try help the convergence:  $\zeta$  accounts for additional flexibility during the iterations, in case the second term alone cannot reduce the sum of squared errors.

This procedure is referred to as “learning” in ANN jargon; it is in fact a least square fit achieved through an iterative algorithm due to the structure of the model. As seen in the literature, backpropagation, being basically a gradient convergence method making use of the first derivative only, can be rather slow.

## 2. ANN software

The experiment was conducted by means of a software package called JavaNNS (Java Neural Networks Simulator, version 1.1) under a PC Windows NT (ver. 4.0) architecture.

JavaNNS is a simulator for neural networks developed at the Wilhelm-Schickard-Institute for Computer Science (WSI) in Tübingen, Germany. It is based on the Stuttgart Neural Network Simulator (SNNS) 4.2 kernel, with a new graphical user interface written in Java.

Currently, JavaNNS is distributed by the University of Tübingen and only as a binary. Although it is available free of charge, it is not public domain.

All relevant information on this package can be found at the Web address:  
[http://www-ra.informatik.uni-tuebingen.de/software/JavaNNS/welcome\\_e.html](http://www-ra.informatik.uni-tuebingen.de/software/JavaNNS/welcome_e.html)

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### **Abstract**

*This paper discusses the use of artificial neural networks in the context of data editing in large sample surveys. The production of high-quality micro-level data is especially important if surveys are regarded as a part of an integrated, consistent system also encompassing aggregate statistics such as the ones presented in the National and Financial Accounts. After briefly presenting the main issues related to the detection of measurement error, both theoretically and in the Bank of Italy's business surveys, we give an outline of how artificial neural networks work and how they can be employed to reduce the cost of identifying problem data. Experiments conducted on simulated information show that a simple network can formulate predictions that are, on the whole, reasonably good on the correctness of individual data. The network-based estimates match the outcome of the current multi-stage data editing procedures to a satisfying degree. Some difficulties still exist: misclassification of correct information is a very rare occurrence, but erroneous data are labelled as non-erroneous with a frequency that, while lower than the one yielded by traditional methods such as the logistic regression, seems to be too high for our purpose. Room for improvement exists in this area, possibly via the use of more complex networks.*

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## Workshop F: Financial accounts: general issues and country experiences

### Discussion paper

“Compiling the flow-of-funds of the Spanish economy” – Pedro Abad-July 2004

“Developing quarterly financial accounts: experience of Latvia” – Aiga Ose-August 2004

“Updated Philippine flow-of-funds: based on the 1993 SNA and 2000 MFSM” – Marriel M. Remulla

The three papers present a national experience in compiling financial accounts. It is obvious at first glance that all of them **refer to a different history and thus are at a different stage in the compilation experience.**

Spanish financial accounts history began in the early 80s and regularly adapted to the change in international regulation. They are now among the most complete and accurate financial accounts in Europe and in the world (this is not in the paper...).

Philippines also started compiling financial accounts in 1980, but due to the reorganisation of the Central bank and to an interruption in the production of data, they were faced recently with the need to implement a deeply renewed international regulation, what they did in 2000.

Latvia first compiled annual financial accounts in 1995. It has now to compile quarterly accounts to cope with the ECB guideline on monetary union financial accounts. Much work has already been done but the paper confess that there is still much to do in a short time.

Above these differences, all the three papers are especially appealing for financial accounts compilers and users, because all of them bring to attention some crucial points.

**The main point, which is common to all the papers, is the attention paid to the quality of the data produced.** Several criteria may be used to assess quality, among them:

- 1) compliance with the international regulation: this is particularly mentioned by Marriel Remulla as it underpins the revision of Philippines financial accounts in 2000 and by Aiga Ose, who asks for exchange of experiences with senior member states, on the most complex aspects of the methodology. In fact, senior member states themselves, paid attention to these more complex aspects, after several years of compilation only, when the other problems had been solved. The Spanish annual financial accounts were built at first on ESA79, the development of quarterly accounts having introduced the new ESA95 regulation.
- 2) appropriateness of the data sources, regarding the type (flows, outstanding amount with appropriate valuation) breakdowns, and timeliness. If the data sources do not fit with statistical requirements, there are some risks of misclassification, mentioned by Marriel Remulla, or some risks of miscalculation. In that respect, a regulatory obligation is of good help to obtain the appropriate information from the supervisory institutions and institutional units, even if the requirement is on the Central banks and not to the latter. In Latvia for example, in many cases, supplementary information was obtained for statistical purpose only. However, even a well fitted reporting system may be put in question, the latter threat on the established reporting systems being the adoption of IAS, as mentioned in a previous paper by Yekaterina Prokunina. The sometimes very strong reaction of the private sector to the statistical burden may be another threat. I would like to question the authors on the difficulties they may have or not, to impose or maintain an appropriate reporting. And alternatively, on the part of estimation that they allow.
- 3) Internal consistency which is three-fold, and as such, a very specific feature of financial accounts, as insisted on by Reimund Mink in his presentation : a) consistency between stocks, flows, revaluation and other changes in volumes (three dimensional consistency), b) consistency between financing and investment (“horizontal” consistency) and finally, c) consistency between financial and non financial transaction, that embodies in the net lending/net borrow-

ing, as a touchstone (“vertical” consistency). Internal consistency is all the more difficult to obtain as financial accounts are an integrated system, that gather information from different sources, as Pedro Abad mention it. His paper gives some clues for the three dimensional consistency. A way to cope with the horizontal consistency is to extend the scope of whom-to-whom, using for exemple a security-by-security database, as mentioned in Pedro Abad’s paper. On the way to a full who-to-whom, there may be some steps, allowing for a residual sector, as in the Philippines for exemple. “Vertical” consistency is another challenge. Reducing the difference between net lending/net borrowing on the one hand and net financial transaction implies a thorough exam of data and probably discussions with the statistical office in charge of the non financial accounts. I think it would be interesting that Pedro Abad developp the Spanish experience on that point.

**Another point relates to institutional arrangements.** Whatever they are -compilation of annual and quarterly financial accounts by the Central bank as in Spain and the Philippines, compilation of annual financial accounts by the statistical office and quarterly financial accounts by the Central bank as in Latvia- they imply an intensive cooperation between both of them, and with supervisory authorities, Ministry of finance and Balance of payments. This is linked to the previously mentioned integration function of the financial accounts.

Papers pinpoints two major area for cooperation:

- designing common reporting forms for the reporting agents and more generally, obtaining the basic information, as mentioned in Aiga Ose’s paper. It may be interesting to exchange vues on difficulties encountered in that field, especially when cooperating institutions have to cope with their own regulatory requirements.
- exchanging with the statistical office on the net lending/net borrowing, the capital account and the non financial assets accounts. The interest is two-fold: firstly operational, in order to reduce the statistical discrepancy, as previously mentioned, secondly analytical, because a relevant analysis of financial account’s should not omit the financing gap, as it is mentioned in Pedro Abad’s paper. Regarding outstanding amounts, there is also some interest in studying the whole asset accounts, financial and non financial, of the economic agents. Cooperation may be extended to interests and dividend, for which the Central bank may have more accurate information.



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## WORKSHOP G

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# Financial accounts – domestic sectors

Chair: Grazia Merchese (Bank of Italy)

Papers: **Net lending of households and non-profit institutions serving households: an analysis of discrepancies between financial and non-financial accounts**  
Audun Grønn (Norges Bank)

**Investment and financing of the enterprise sector – what is the value-added of using financial and national accounts data?**  
Elmar Stöss (Deutsche Bundesbank)

**Measures of financial positions of households and non-financial corporate sectors**  
Richard Walton (Bank of England)

**Interpreting South African credit aggregates following the implementation of new accounting standards**  
Johan Van Den Heever (South African Reserve Bank)

**Corporate profitability and leverage: an international comparison in the framework of national accounts**  
Jean Cordier and Dominique Durant (Banque de France)

# Net lending of households and non-profit institutions serving households: an analysis of discrepancies between financial and non-financial accounts\*

*Audun Grønn (Norges Bank)*

## Introduction

Monetary and financial stability constitute prime objectives for central banks. Monetary policy decisions are taken on the basis of information concerning developments in a number of economic and financial indicators. It is important that these indicators are reliable at an early stage, i.e. that they have good real-time properties, so that they can provide relevant input for interest rate decisions. Norges Bank releases financial and monetary statistics on a monthly and quarterly basis. These statistics form part of the input upon which the Bank's monetary policy decisions are based<sup>1</sup>. Among the statistics are quarterly financial accounts for households and nonprofit institutions serving households (NPISH), which are compiled in the database system FINSE (FINancial SEctor accounts).

In Norway, considerable attention has been paid to the discrepancy between net lending/net borrowing in the financial and non-financial accounts, respectively, which has grown in recent years. There has been an increasing lack of consistency in the derived relationship between the resources generated by disposable income and borrowing on the one hand, and the use of resources on consumption expenditures and the acquisition of non-financial and financial assets on the other. A supply of financial resources that exceeds use may lead to the question: where does the money go?

Transparency is important to enable users to achieve a better knowledge of financial accounts and to facilitate the use of the statistics. This paper is intended to describe the main concepts of the financial accounts compiled in Norges Bank. The discussion is based on the FINSE system and mainly addresses issues linked to the financial accounts for households and NPISH. The purpose of the analysis is to draw attention to the weaker points in the financial accounts with the aim of providing an explanation for the causes of the observed discrepancies between the non-financial and the financial accounts.

## 1. Institutional arrangement

Statistics Norway (SN) has the overall responsibility for classification, methods and principles in the Norwegian statistical system. SN also compiles and releases statistics on non-financial accounts. Responsibility for financial accounts is shared between SN and Norges Bank (NB). NB has the main responsibility for compiling and releasing statistics on securities market and the financial corporations sector. This also implies compilation of indicators for financial aggregates (money supply and credit supply) and compilation of financial accounts, which takes place in the database system FINSE. NB releases quarterly financial accounts for households and NPISH (i.e. the household sector), while annual financial accounts for all institutional sectors are released when financial accounts data are transmitted to Eurostat. SN is responsible for compiling accounting statistics for insurance enterprises and pension funds and has released a set of annual financial balance sheets for the period 1993 to 1997 (main instruments and main sectors).

\* The article was presented at Workshop F: Financial accounts: domestic sectors at the Irving Fisher Committee Conference on "Central Bank Issues Regarding National and Financial Accounts", held in Basel, 9–10 September 2004. The main contributing author was Jon Ivar Røstadsand.

<sup>1</sup> Real-time properties and the degree of revisions of Norges Bank's statistics were analysed in the Bank's quarterly Economic Bulletin, 3/2003.

## 2. Framework and observed discrepancies

In the national accounts system we face several identities, which in principle should be fulfilled. In our context this is also the case for the relationship between non-financial and financial accounts. In theory, net lending derived from the non-financial accounts should be identical to net financial transactions<sup>2</sup> derived from the financial accounts. However, experience shows that significant discrepancies occur for the household sector.

To start with, it is essential to emphasise that discrepancies in data may be ascribed to flaws and shortcomings in both sets of accounts. In both the non-financial and the financial accounts the balancing items are calculated on the basis of large aggregates. Even relatively small errors in these aggregates may result in large fluctuations in balancing items like net lending and net financial transactions. There are also differences in input statistics. Therefore, we are faced with a major challenge with regard to harmonising principles, methodologies and data sources in order to reduce these discrepancies as much as possible. This should, however, enhance user confidence in both sets of accounts.

The tasks of quantifying the financial assets, liabilities and financial transactions of the household sector are particularly demanding, as the data to a large degree come from indirect sources. A very limited portion of the statistics is based on household surveys appropriate for compilation purposes. The sector's financial accounts are therefore mainly based on data from administrative sources or counterpart sector information. Accounting statistics with reconciled operational accounts and balance sheets, which may be used to check compilation results, do not exist for the household sector.

The relationship between non-financial and financial accounts is illustrated in Chart 1. Both net lending and net financial transactions are calculated as residual items. In non-financial accounts, net lending is calculated as the difference between all income items and all expenditure items including consumption expenditures and the acquisition of non-financial assets.

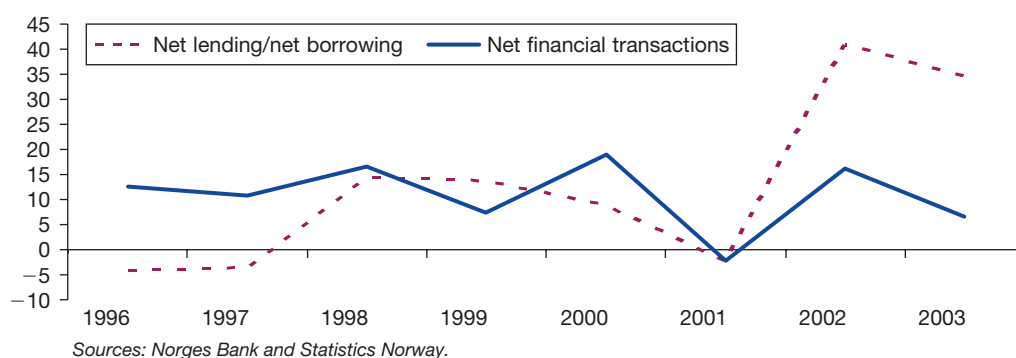
In the financial accounts, transactions in every financial instrument on the financial balance sheet of the household sector are summarised by net financial transactions. To a large degree,

Chart 1 – Framework

Opening balance sheet	Transactions accounts	Revaluations account	Other change in volume account	Closing balance sheet
	Disposable income + adjustment, pension funds - consumption expenditures + net capital transfers - net acquisition of non-financial assets = <b>Net lending (B9)</b>			
	<b>Discrepancy</b>			
Net financial assets	<b>Net financial transactions (B9)</b>	Net changes due to holding gains/losses	Net change due to other change in volume	Net financial assets
=	=	=	=	=
..	Net acquisition of financial assets	..	..	..
-	-	-	-	-
..	Net incurrence of liabilities	..	..	..

2 We will use the term net financial transactions for the balancing item B9 in financial accounts.

Chart 2 – Households and NPISH. Net lending (+) / net borrowing (–) and net financial transactions. Billion NOK



financial accounts are based on statistics on stocks of financial instruments. The most widely used method in FINSE is to quantify financial transactions as residuals, subtracting all other known changes in assets from changes in stocks in the same period. For some financial instruments, directly observed transactions are used in the compilations. In these cases, the consistency between stocks and flows is maintained by the holding gains and losses quantified residually.

Chart 2 shows the discrepancy between non-financial and financial accounts. The chart covers the years 1996 to 2003 and is based on the most recently released statistics. The chart shows that the discrepancy is largest at the beginning and at the end of the eight-year period. For the years 1998 to 2001 the discrepancy is moderate and the general picture is quite consistent. However, the discrepancy widens considerably over the last two years of the period. The recent developments can be explained by high income growth and high growth in indebtedness. Developments in the household sector's consumption expenditures and their acquisition of non-financial and financial assets have not kept pace. The imbalance is shown as a large and growing discrepancy between non-financial and financial accounts.

### 3. Why do discrepancies occur?

#### 3.1 Cycles of revisions – when do we have final statistics?

Discrepancies in published statistics are often explained by lack of accuracy in the first preliminary versions. This is an important problem, which concerns the assessment of the real-time properties of the statistics. For decision-makers it is a problem if the preliminary general picture changes substantially when final versions of the statistics are released. An essential question is: when can statistics be regarded as final?

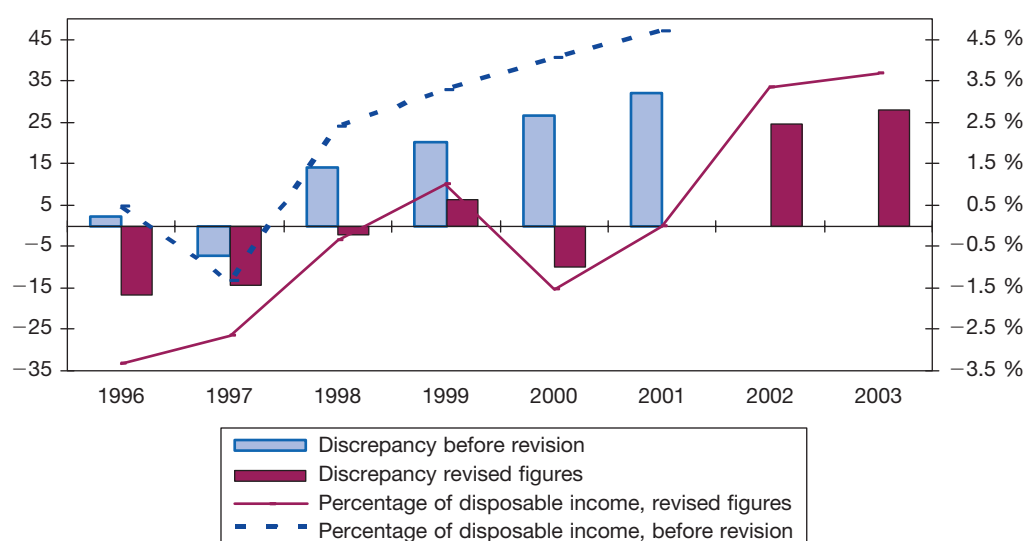
The answer to this question will depend, inter alia, on the frequency and the cycles of the revisions. Two types of revisions occur in the statistical system. The first type is the general or main revision. These are exhaustive revisions which take place periodically. In these processes, classifications, the quality and adequacy of the basic data and the methods of compilation are examined. The overall picture can change considerably after this main revision. The second type of revision is what we call current data revisions. These are revisions in time series caused by changes in the input data from indicator-based statistics and preliminary estimations to final primary statistics.

#### • General revisions of the system

Table 1 gives an overview of the three general revisions of the system which have been made in the last decade. The national accounts have been subjected to two of them and the financial accounts system to one. The table shows that it may take a considerable time before accounts are "final". The final versions of the national accounts, in particular, are available with such a long time lag that they have no direct relevance for current policy decisions at the time of their publication. The results of the revisions may, however, be relevant for a general understanding of economic processes. The revised national accounts form part of the basis for compiling preliminary national accounts statistics and are thus indirectly of significance for the assessment of the prevailing economic situation.

Table 1 – General revisions of the statistical system in the last ten years

Finished	Released time series	Part of the system	Main objective
June 1995	1988 to 1992	National accounts system, Statistics Norway	Implementation of SNA 93/ESA 95 and data sources/statistics not used as input in old system
June 2002	1995 to 1999	National accounts system, Statistics Norway	Implementation of new structural business statistics
October 2003	1st quarter 1996 to 2nd quarter 2003	Financial balance sheets and financial accounts, Norges Bank	Implementation of ESA 95 and data sources/statistics not used as input in old system

 Chart 3 – Households and NPISH. Discrepancies<sup>1</sup> before and after revisions in 2002 and 2003. Billion NOK (left) and discrepancies as percentage of disposable income (right).


Sources: Norges Bank and Statistics Norway.

Chart 3 shows the effects of the revisions in 2002 and 2003 on the discrepancies between the non-financial and financial accounts. The discrepancies were substantially reduced during the period. In the first two years covered by the chart, the discrepancy increased somewhat. In 1996 it amounted to 3.3 percent of disposable income. The picture for the remainder of the revision period is substantially improved. The average absolute values of the discrepancies, as a percentage of disposable income, decreased from 3.7 per cent to 0.7 per cent a year during the period 1998 to 2001. The major changes in the general picture after the revisions in 2002 and 2003 are partly attributable to the implementation of new structural business statistics in non-financial accounts. New structural business statistics were established in the 1990s, but in the interests of maintaining long time series<sup>3</sup>, only development trends from the new statistics were implemented in the non-financial accounts during the 1990s (value indices combined with the existing value

<sup>1</sup> Net lending / net borrowing minus net financial transactions.

<sup>3</sup> National accounts place great emphasis on long and consistent time series. Breaks in time series are avoided.

figures), while the implementation of new nominal value figures was postponed until the 2002 revision. This is of great importance for the discrepancy between the accounts, as the relationship between non-financial and financial accounts is based on differences between macro-aggregates in nominal terms (see chapter 2). In the general revision of financial accounts in 2003 the main task was to implement new concepts and classifications and to adjust calculation methods, while the implementation of new statistics was a less central task. However, the incorporation of a new time series for foreign assets made an important improvement in financial accounts for the household sector<sup>4</sup>.

#### • *Data revisions*

In the financial accounts, data revisions are made continuously and revised primary statistics are implemented as soon as they are available. The first preliminary figures from the financial accounts for the first three quarters are available three months after the end of a quarter. This work is completed with the publishing of “Household sector, financial accounts”. The first fourth quarter figures are available four months after the end of a year, while preliminary annual financial accounts for all institutional sectors are available with a time lag of six months. SN publishes the first preliminary annual data from the national accounts three months after the end of the year.

Both the financial and the non-financial accounts are available in final versions with a time lag of two years. The revisions have been larger in the non-financial accounts than in the financial accounts. This can be explained by the fact that the core statistics in the financial accounts are available in final versions after a short time lag (four months). Experience from the years prior to 2002 and 2003 indicates that the discrepancies were reduced between the preliminary and the final versions of the accounts. After the finalisation of the last two general revisions, the picture has unfortunately deteriorated substantially. The discrepancies in both 2002 and 2003 were large, and in 2003 was as high as 3.7 per cent of disposable income.

### **3.2 Core statistics**

Money and banking and securities market statistics are a central data source for the household financial accounts. These statistics comprise detailed counterpart sector information and cover financial instruments such as deposits, loans, insurance technical reserves, mutual fund shares and marketable instruments such as bonds and shares. The money and banking statistics are released on a monthly basis, while the securities market statistics are released on a quarterly basis. Analyses show that the real-time properties of these statistics are very good (see note 2). Revisions are mainly small and insignificant. Nor is there any indication that the revisions are systematic.

The money and banking statistics cover almost 95 per cent of the value of the household sector's total debt. The good real-time properties of these statistics imply that the debt side of the balance sheet is revised only to a limited extent and that the financial accounts with a short time lag provide a reliable picture of household sector debt. The money and banking and securities market statistics cover 80 per cent of the value of the household sector's financial assets. Revisions in net financial transactions relate almost without exception to the asset side of the balance sheet.

### **3.3 Harmonised classifications**

One of the main tasks of the general revision of financial accounts in 2003 was to implement the ESA classifications of financial instruments and institutional sectors. The sector classification in FINSE following the revision is in line with the official institutional sector classification co-ordinated by SN. In the previous financial accounts system there were borderline problems caused by financial holdings corporations and financial auxiliaries. These sub-sectors were not specified in the old system and assets and liabilities were included in the non-financial sector's

4 *The results of the revision of the national accounts were presented for the year 1997. Households' final consumption expenditures and acquisition of non-financial assets were adjusted upwards, thereby reducing saving and net lending. Minor adjustments were made to disposable income. The saving rate was adjusted downwards 2.0 percentage points to 2.9 per cent in the revised version of the national accounts.*

financial balance sheets. The implementation of new accounting statistics for these sub-sectors has made it possible to move them to the financial corporation sector. This has also improved the data basis for the financial accounts for the household sector, since the new accounting statistics provide counterpart information, which can be utilised in the compilations.

### **3.4 Non-harmonised compilation methods**

One remaining task is to clear up the discrepancies for the financial corporation sector. The accounting statistics for this important sector are inputs for the compiling of both the non-financial and the financial accounts. The discrepancies are probably caused by non-harmonised compilation methods. Accounting statistics for financial corporations are important sources when the households sector's assets and liabilities are quantified, and non-harmonised compilation methods for these sectors may also cause discrepancies for the household sector. The problem is particularly relevant for the instrument insurance technical reserves and the flows (income and capital) associated with this instrument.

### **3.5 Lack of information, divergence in timing and valuation**

The weakest points in the present system relate to household holdings of unquoted shares and foreign assets. There are few data sources with information on these assets and the compilations are based on weakly founded assumptions.

The main sources of data for quantifying foreign assets are balance of payments (BOP) statistics and tax return accounts statistics. The main data source for BOP is a payment-based international transaction reporting system<sup>5</sup>. Households are in principle included, but cannot be identified and transactions with the rest of world have to be estimated indirectly. The payment-based BOP statistics also deviate from the accrual accounting principle in the national accounts. The tax return accounts statistics provide direct information on households' foreign assets and liabilities. However, problems are linked to underestimated foreign assets as a result of unreported foreign assets and figures at assessment value, which diverge from the recommended market value.

Shares are derived using information from two sources: the Norwegian Business Register, where all shares issued by domestic joint-stock companies are registered, and the Norwegian Central Securities Depository (VPS), which provides data on shares quoted on the Oslo Stock Exchange (OSE) and unquoted shares registered in VPS on a voluntary basis. The VPS register is the source for compilations in the financial accounts of quoted and unquoted shares issued by joint-stock companies registered in VPS.

The VPS register cannot provide any data on the vast majority of unquoted companies. The total holdings by private non-financial corporations and the household sector of shares not registered in the VPS can be estimated as a residual, by combining business register data with data from the VPS register and holdings of shares by other sectors. The residual is split between the two sectors and the estimations are executed in a simple manner; the data are valued in nominal terms and transactions are estimated as changes in stocks by convention.

The data problems associated with unquoted shares and foreign assets cause serious noise in the financial accounts data and place limitations on the utilisation of the data for policy purposes.

## **4. Experience of recent years**

For the past year, the focus of work on the financial accounts has been concentrated on two issues. The first is related to an amendment of fiscal legislation, which consists of a proposed new rule for the taxation of dividends in the hands of shareholders. The other issue is the increased interest in the acquisition of real estate abroad.

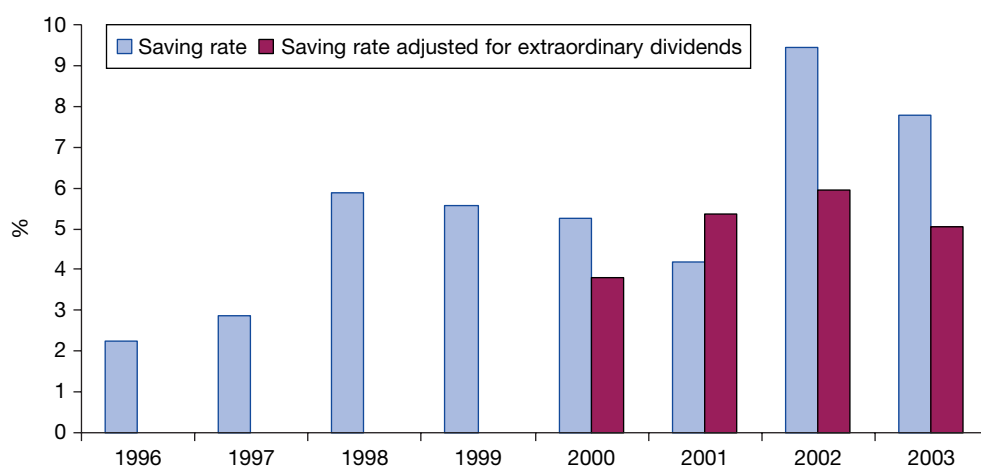
### **4.1 The link between dividends and transactions in unquoted shares**

During the four-year period 2000 to 2003, shareholders have withdrawn extraordinary large dividends from their corporations. The change in behaviour has been prompted by the proposed change in dividend taxation. A significant share of dividends is reinvested in corporations as equity and loans to corporations. The purpose is to avoid taxation in the future (i.e. withdrawal

<sup>5</sup> This will be changed to a survey-based direct reporting system from 2005 onwards.



Chart 4 – Households and NPISH. Saving rate (published) and saving rate adjusted for extraordinary dividends. Percentage of disposable income.



of equity is not subject to taxation). These financial resources are assumed not to contribute to consumption demand or acquisition of non-financial assets, but increase the household sector's saving and net lending.

Taxation of dividends in the hands of shareholders was introduced for a short period, from September 2000 to the end of 2001. The change in the tax regime significantly affected dividends received by the household sector. Dividends were sharply reduced in 2001, while dividend payments to shareholders were substantially higher in the years 2000, 2002 and 2003 compared with the previous four-year period from 1996 to 1999.

We have attempted to quantify the extraordinary dividends for the period 2000 to 2003. The estimates are based on the assumed relationship between dividends and annual results for selected joint-stock companies<sup>6</sup>. Results are shown in Chart 4, but must be interpreted with caution. According to the estimates, the household sector received more than NOK 50 billion in extraordinary dividends, which is 40 per cent of total dividends received in the four-year period. Adjusted saving rates – estimated as a percentage of disposable income on the basis of normal dividends – for the years 2002 and 2003 are 3.5 and 2.5 percentage points, respectively, lower than the official saving rates released by SN (see Chart 4). Tax return accounting statistics indicate that extraordinary dividends are reinvested in corporations<sup>7</sup>. The household sector's financial transactions in unquoted shares and loans to non-financial corporations are therefore adjusted upwards in the same proportion, i.e. 3.5 and 2.5 per cent of disposable income in 2002 and 2003, respectively.

#### 4.2 The household sector's foreign assets

The household sector has changed its net foreign assets position during the last few decades.

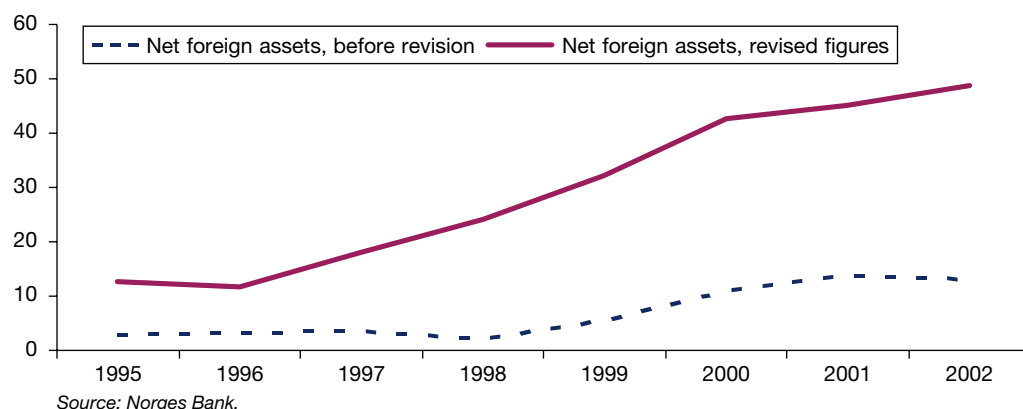
Higher income and technological advances have increased both interest in and access to securities markets. Since these markets are to a large degree global markets, the threshold for acquiring foreign securities has been reduced. More frequent travelling abroad has also increased interest in buying real estate in other countries. This has led to the establishment of estate agents who specialise in selling foreign real estate to domestic households. This is part of the background for the initiative taken to improve the compilation of the household sector's foreign assets in connection with NB's general revision, which took place in 2002 and 2003. During the revision a project was launched. The main task was the estimation of a new time series for the household sector's foreign assets.

Chart 5 shows the effect of the revision on net foreign assets. The household sector's net foreign assets have been substantially adjusted upwards for the revision period, especially from the

<sup>6</sup> The method is straightforward. Normal dividends are estimated in the same proportion to the companies' annual results as the observed average for the four-year period 1996 to 1999.

<sup>7</sup> Observations based on time series covering the period 1998 to 2002 for a sample consisting of 12 800 shareholders, which have been drawn from the tax return accounts statistics.

Chart 5 – Households and NPISH. Net foreign assets. Billion NOK.



year 1997. Adjustments are due to the incorporation of tax account statistics and improved estimations<sup>8</sup> of domestic households' acquisition of real estate abroad. Interest in foreign real estate increased in the late 1990s and explains much of the development in net foreign assets shown in Chart 5. Asset transactions with the rest of the world, measured as a percentage of disposable income, were adjusted upwards by about 1 percentage point in the last year of the revision period.

## 5. Conclusion

The financial account for households and NPISH is regarded as important input to Norges Bank's monetary policy decisions. Our judgment is that the financial accounts provide a reliable description of households and NPISHs financial position and their financial transactions. This view is supported by reliable input statistics with good real-time properties, which cover the main financial instruments on the balance sheet with some few exceptions.

The problems relate to the asset side of the financial balance sheet and the discussion shows that there is still considerable potential for improvements. Financial assets with the weakest information base are unquoted shares and foreign assets. This is due to inadequate primary statistics in both the short- and long-term perspective and may explain much of the discrepancies. Non-harmonised compilation methods in the different parts of the statistical system may also contribute to observed discrepancies for households and NPISH.

However, the increase in the discrepancies in net lending has been considerable in recent years. Major upward revisions of transactions in unquoted shares and foreign assets have not prevented the observed discrepancies between non-financial and financial accounts from reaching historically high levels. This implies that other explanations have to be taken into account. These explanations may be found in the national accounts released by Statistics Norway.

The national accounts serve two main objectives. The system provides statistics on nominal values and growth rates for macro-aggregates. However, in the current national accounts attention is paid to the recent economic developments and computation of economic growth trends is given priority at the expense of estimation of nominal values of macro-aggregates. This particularly affects areas which are less thoroughly covered by statistics, such as households' and NPISHs' final use of goods and services. Important aggregates, such as household consumption expenditures and acquisition of non-financial assets, have to be compiled in an indirect manner (households and NPISHs are often regarded as the residual sector). Estimating the nominal values of these macro-aggregates is particularly challenging. Underestimation of the nominal values of these final use components may be one explanation for the observed discrepancies.<sup>9</sup>

<sup>8</sup> Estimates are made by combining tax return accounts statistics, price information from real estate agents and independent market surveys.

<sup>9</sup> Two factors can be put forward. The first concerns cross-border shopping. Cross-border shopping has grown to high proportions in recent years. The question is whether national accounts manage to incorporate all expenses attached to direct purchases abroad by resident households. The second concerns the extraordinary high dividends paid to households over the last four year period. A fair question is whether some of the dividends are used on the acquisition of valuables, and how this is dealt with in the national accounts.

In attempting to respond to the problems described in the introduction, we would suggest that a major part of the discrepancies in net lending / net borrowing can probably be explained by lack of relevant statistical information on

- foreign assets,
- unquoted shares,
- the nominal value of household consumption expenditures and acquisition of non-financial assets, and by
- non-harmonized compilations methods.

In our view, discrepancies between non-financial and financial accounts should be published. These discrepancies underline the need for awareness of quality issues in financial accounts for households and NPISHs. In future work, harmonising methods and principles for compiling of the financial corporation sector between non-financial and financial accounts will be an important task. A very important event will be the launch of a shareholder register, which will take place this autumn. The register will provide information on an area currently covered inadequately. Thus, a major objective in the forthcoming work is to renew efforts to reduce observed discrepancies.

### Appendix:

#### HOUSEHOLDS AND NPISH. National accounts and financial accounts. In billions of NOK

	2001	2002	2003
<b>A. NATIONAL ACCOUNTS</b>			
Disposable income	667	732	764
Adjustment, households pension funds	12	18	17
Final consumption expenditure	651	680	722
Saving	28	69	60
Capital transfers, net	-1	-1	-1
Net acquisition of non-financial assets	29	28	24
Net lending	-2	41	35
<b>B. FINANCIAL ACCOUNTS</b>			
Financial assets (stocks)	1370	1446	1602
Currency and deposits	481	530	556
Securities other than shares, excluding financial derivatives	22	23	28
Loans	9	16	23
Shares and other equity	152	159	188
Mutual funds shares	77	60	84
Insurance technical reserves	490	506	559
Other assets	140	152	164
Liabilities (stocks)	1011	1104	1214
Securities other than shares, excluding financial derivatives	0.0	0.1	0.2
Loans	934	1026	1137
Other liabilities	78	78	77
Net financial assets	359	342	388
Change in net financial assets	-34	-17	46
Net changes due to holding gains/losses and oth. change in vol.	-32	-33	40
Net financial transactions	-2	16	7
<b>C. MEMO</b>			
Resources	774	848	889
Disposable income, adjustment pen. funds & cap.transfers net	679	749	781
Net incurrence of liabilities	96	99	108
Uses	774	823	861
Final consumption expenditure	651	680	722
Net acquisition of non-financial assets	29	28	24
Net acquisition of financial assets	93	116	115
Statistical discrepancy (resources minus uses)	0	25	28

Sources: Statistics Norway and Norges Bank.

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# Investment and financing of the enterprise sector – what is the value-added of using financial and national accounts data?\*

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## **1. Introduction**

In order to analyse investment and financing of enterprises business accounts contain important information. For many countries in the industrialised world enterprise balance sheet statistics have been built up. The so called BACH data base is a very prominent example for a multi-country data set resulting from merging available national statistics.<sup>1</sup> Besides direct enterprise information also highly aggregated data sources exist which provide information with respect to the enterprise sector. According to the required sectoral breakdown in national and financial accounts data for investment and financing can also be derived. These statistics are available for most industrialised countries. For new EU members this kind of data is obligatory.

The question follows immediately which aspects are in favour or against of the alternative statistics. Section 2 of this paper deals with a few pros and cons of the data sets mentioned. In section 3 it is shown that for the period 1991 to 2003 a few very interesting results for the investment and financing behaviour of German enterprises can be found even when using highly aggregated information. Nevertheless the final conclusion of this paper is that more emphasis must be put on the admittedly difficult link between direct firm data and national as well as financial accounts statistics (see section 4).

## **2. Enterprise balance sheet statistics versus overall economic data**

### **2.1. Characteristics of enterprise balance sheet data**

From a statistical point of view direct information from the sector which is under consideration should be preferred. Normally such data are more reliable than other sources. Whereas for households direct information is often missing the enterprise sector is obliged to produce data due to existing accounting rules and requirements for publication. This obligation more or less holds for all firms of an economy. In so far in principle a complete coverage is possible. Another aspect is that accounting on the firm level is mostly very detailed. Not only profit and loss accounts including turnover and cost components are available, but also balance sheets which show a lot of different positions for the asset and liability side. Finally the data provided by firms must meet certain standards as the reports serve as the basis for information within the firm and for outsiders, e.g. tax authorities or shareholders and rating agencies in case of listed companies.

Central banks often have their own enterprise balance sheet statistics, additionally commercial institutions collect such data and offer balance sheet data to the public. Irrespective of its origin such information is very intensively used for economic analysis or research. Concerning the Bundesbank's own enterprise balance sheet statistics two groups of studies must be distinguished:<sup>2</sup> on the one hand articles have been published in recent years which are based

\* *This article represents the author's personal opinion and does not necessarily reflect the views of the Deutsche Bundesbank.*

1 *The data base BACH (Bank for the Accounts of Companies Harmonised), prepared by the European Commission, consists of data for eleven EU-countries, the US and Japan.*

2 *For an overview see Stöss (2001).*

on micro data and panel econometric techniques. The topics of the various projects mainly concentrated on the borrowing and investment behaviour of firms.<sup>3</sup> On the other hand studies using a higher aggregation level (either by exploiting the whole data set or certain sub-samples of firms differentiated by legal form, size or branch) even have a very long tradition. Within this range nearly each year a monthly report is published which discusses the profitability and financing of German enterprises (e.g. Deutsche Bundesbank, 2003).

In spite of all these positive aspects there are also a few disadvantages of existing enterprise balance sheet statistics. Here the discussion concentrates on the following criteria: coverage, timeliness, periodicity and international comparability.

Even if – as mentioned above – all firms have to provide profit and loss accounts and balance sheets in practice it is not the case that existing enterprise balance sheet statistics are based on all these information. Mostly they are limited samples of all firms. For example the “old” Bundesbank’s balance sheet statistics before 1999, the start of EMU, covered at maximum about 60 000 to 70 000 enterprises and was at that time without any doubt the best firm data source in Germany.<sup>4</sup> But nevertheless the number of firms seems to be small compared to the total number of about 3 million at that time. But to be fair it must be added that due to the construction of the statistics the coverage for the industrial sector was much more representative. It has to be concluded that the coverage of enterprise balance sheet data is a critical issue. This finding does not only hold for Germany, but also for other countries.

Another problem is timeliness. Big listed firms publish their yearly obligatory reports a few months after the calendar year, but in most countries the majority does not belong to the group of listed firms. Consequently the availability of these data is relatively late. A time-lag of about twelve months or even longer cannot be excluded. The consequence is that e.g. data for the year 2003 are available not before the beginning of 2005 or even later. It is obvious that such a delay reduces the usefulness for the current economic analysis significantly.

Direct firm data are normally yearly figures. In so far balance sheets statistics must have a yearly periodicity. The only exception are once again big listed firms which have to provide selected quarterly information. But dependent on the specific publication rules these data are restricted to a very small set of figures and cannot be considered as complete quarterly reports. For the analysis of structural aspects annual data are sufficient, but for the analysis of the current economic situation a quarterly periodicity would of course be more appropriate.

The last aspect which should be mentioned here is comparability. Accounting rules for enterprises depend very much on the specific legal form of firms and on country specific characteristics. E.g. the experience of a common Banque de France/Deutsche Bundesbank project has shown that it is very difficult and time consuming to at least partly harmonise different national business accounts (see Friderichs and Sauve, 1999). The solution which was chosen for the BACH data base to overcome the problem of comparability to a certain extent was to restrict on incorporated companies only. In so far the legal form ‘partnerships’ was excluded whereas according to ESA 95 partnerships belong to the enterprise sector ‘non-financial corporations’.

## 2.2. Usefulness of macroeconomic data

National and financial accounts data are derived data bases, respectively secondary statistics. In principle they rely on a lot of different primary sources. For national accounts the main sources are e.g. industrial production, retail trade, imports and exports, data for employment, prices and wages etc. For financial accounts e.g. banking data, capital market and balance of payments statistics as well as data for the government sector can be mentioned. The main workload of statisticians/economists in these fields is to produce a coherent and consistent picture of the economy by merging all the different data sources. It is similar to a puzzle, but there is a big difference. Here usually not all parts fit together perfectly as based on tradition or special purposes each statistics often has its own characteristics. Therefore several adjustments of the original figures are necessary. Where primary data are missing estimations or residual calculations are unavoidable to fill the cells. The last step of the whole compilation process is the “horizontal balancing” of the asset and liability side (for each instrument) in order to achieve internal

3 In *Kremp/Stöss/Gerdesmeier (1999) the determinants of a debt function are analysed for French and German firms. Von Kalckreuth has investigated the investment behaviour with respect to uncertainty (2000) and with respect to financial constraints (2001).*

4 For more details see *Deutsche Bundesbank (1998) and Stöss (2001). The statistical problems of the “old” data base due to EMU and the attempt to build up a new statistics, the so called ‘data pool’, is discussed in Stöss (2001). First results based on the new data pool will probably be published in 2005.*



consistency. Another problem is that in most countries different institutions are responsible for national and financial accounts. A prominent exception is the United Kingdom where national and financial accounts are simultaneously produced by the statistical office (but of course with the support of the Bank of England). The consequence is that the co-operation between the relevant institutions must work smoothly and effectively in order to gain a common overall account for the economy as a whole and for the different sectors. Only then a satisfactory analysis based on aggregated data seems to be reasonable.

Having in mind this difficult pre-work national and financial accounts together have a few advantages compared to enterprise balance sheet statistics. The first is that the information holds for the whole economy. Concerning the enterprise sector not only manufacturing or other specific industrial branches are covered, but in principle all branches. Nevertheless this does not mean that the coverage is always perfect, it depends necessarily on the quality of primary statistics. E.g. the coverage of the services sector within national accounts is less satisfactory than for other branches.

Most industrialised countries are able to publish GDP figures on a quarterly basis and very fast after the year or the quarter. For more detailed “real” figures for the enterprise sector the time-lag is usually longer. In Germany quarterly enterprise data are not available yet, figures are published only on a yearly basis. The statistical office of the United Kingdom has a time-lag of only 90 days after the quarter. In that respect the United Kingdom is best practice. The plan is to establish quarterly sector-specific data and to reduce this time-lag to about 90 days for all EU countries. A regulation for quarterly national accounts is just in preparation. For financial accounts the situation differs from country to country, too. A few European countries already compile complete quarterly financial data. In Germany the Bundesbank is still publishing yearly figures only. According to the current schedule the complete set of transaction data (in combination with specific national accounts figures) are published in June each year. In so far the financing and investment behaviour of firms can be analysed much earlier compared to the availability of direct micro-based figures (for more details see section 3). Based on an ECB Guideline quarterly financial accounts are already in preparation and the complete set of data (with respect to sectors and instruments) will be available in near future. Then periodicity and timeliness will be much more satisfactory than now.

As for national and financial accounts common international standards are binding the international comparability should be very high. For the EU countries progress is supported due to the strong co-operation between Eurostat, the ECB and the individual member countries. For the comparison with US statistics a few difficulties still exist (see e.g. ECB, 2004). The great advantage of applying ESA 95 principles is that a clear scheme for the different positions and sectors is available. Above all the exact definition of the enterprise sector proved to be a very crucial issue in the past. Another important aspect is the clear separation between transactions and stocks. Finally the attempt to apply market values for stock data makes a comparison more easy, albeit some problems for specific items, e.g. unquoted shares or other equity, continue to exist.<sup>5</sup>

Apart from the necessity to improve the status quo, especially with respect to periodicity, all the advantages mentioned above support the conclusion that for the current economic analysis of the enterprise sector aggregated data are more adequate than direct firm data. This holds not only for business cycle or monetary policy issues, but also for aspects of financial stability which have gained much importance in the last few years.<sup>6</sup>

### **3. Investment and financing behaviour of German enterprises 1991–2003: which patterns can be derived from highly aggregated data?**

In this section it is shown that national and financial accounts data include a lot of valuable information for the analysis of the German enterprise sector.<sup>7</sup> It has to be emphasised that for Germany the production of financial accounts is closely linked to the results of national accounts

<sup>5</sup> *The Working Group on Unquoted Shares mandated by Eurostat has tried to develop methods and recommendations for a more harmonised valuation procedure of unquoted shares (see Durant/Massaro, 2004).*

<sup>6</sup> *See above all the IMF-project “Financial Soundness Indicators”. Here also indicators for the enterprise sector are required (see e.g. Sundararajan et al, 2002). Mink/Silva (2003) discuss the use of financial accounts for financial stability.*

<sup>7</sup> *This section is mainly restricted to a descriptive analysis of the enterprise sector. There are also attempts to use econometric methods to study the real and financial side simultaneously by using macro data. See e.g. Hall (2001) who discusses the financial accelerator mechanism (interactions between corporate financial positions and fixed investment) for the United Kingdom.*



via the “vertical balancing” procedure.<sup>8</sup> Therefore the standard table for the sector ‘non-financial corporations’ which is part of the Bundesbank’s yearly special statistical publication “Financial accounts” (see Table 1) shows first the capital account and below in detail the financial account. In order to combine both accounts and to receive an integrated picture of firm activities we usually publish another table in the June Bundesbank’s monthly report where the artificial split of the real and financial side is given up (see Table 2): here the uses of funds (fixed and financial investment) and the sources of funds (internal and external financing) are presented similarly to reporting tables of firms. Additionally the breakdown of instruments differs between Table 1 and Table 2 to be able to highlight certain aspects such as the distinction between the firms’ demand for bank loans versus the demand for loans from other creditors. Based on Table 2 three aspects are highlighted in the following paragraphs:<sup>9</sup> the development of the main items from 1991 to 2003, specific characteristics of investment and changes in financing since the beginning of the nineties.

Figure 1 shows the development of the main transaction positions from 1991 to 2003 and as a reference the German real GDP growth rate. The first interesting fact is that German enterprises were net borrowers (fixed investment including changes in inventories business exceeded saving or, in other words, net acquisition of financial assets was negative) only until 2001. In the last two years, however, firms offered funds to other sectors mainly reflecting weak investment activities in machinery and equipment as well as construction. Although a net borrowing position seems to be adequate for enterprises, in other countries a positive financial balance emerged, too. The most prominent example is Japan where net lending was extraordinary high in the last years. Secondly certain time series are highly correlated. This observation gives a rough impression about specific expenditure-financing relationships. On the one hand fixed investment and internal financing (usually defined as retained profits including capital transfers and depreciation) seem to be positively linked, on the other hand financial asset acquisition and external financing show a co-movement underlined by a correlation coefficient of 0.96. Whereas fixed investment and internal financing were rather stable over the whole time period independent of GDP growth rates, the other positions mentioned showed a much more volatile evolution measured by standard deviations. From 1997 to 2000 a steep increase could be observed parallel to the growth of GDP or to the rise of share prices, after 2000 external sources of financing as well as acquisition of financial assets came down sharply to a level even a little bit lower than before 1997.

The different evolutions of fixed and financial investment series are shown in Figure 2. Total capital spending increased from 13½ % of GDP in 1997 to 27 % three years later. Two driving factors were behind these figures. The budgets for fixed investment expanded, namely from 11 % to 13½ % (the figure for 2000 also includes the expenditure of telecommunication companies for UMTS-licenses) and the dynamics of financial asset formation nearly “exploded” from 2½ % of GDP to 13½ %. This period was characterised by a very strong external firm growth in the form of M&A activities which was one of the characteristics of the stock market boom and the needs of globalisation. Based on information from balance of payments statistics also loans of German enterprises to non-resident firms, above all to subsidiaries, were much higher than in the first half of the nineties (see Table 2). With the bust of the stock market bubble financial investment returned to a normal level, fixed capital formation also went down.<sup>10</sup> As already indicated the story of capital spending based on macroeconomic data is strongly determined by specific groups of enterprises. The M&A activities were dominated by big firms, especially enterprises of the telecommunication sector (including non-resident companies) played a major role. Furthermore these companies were also involved in purchasing the UMTS-licenses which were offered by the German public authorities in 2000.

The strong increase of investment had a direct impact not only on the demand for internal and external funds but also on the structure of financing (see Figure 3). The first aspect is the role of internal financing which serves as the main source for fixed investment. The time series seems to be once again strongly influenced by the stock market boom and by the activities of big listed firms. In the period before 1997 the internal financing ratio was on average about two third (of total financing) and decreased until 2000 to roughly 30 %. Afterwards a strong

<sup>8</sup> The statistical discrepancy between the capital and financial account is the result of a residual term which is part of the German balance of payments statistics due to unclassifiable transactions with non-residents.

<sup>9</sup> For more details see Deutsche Bundesbank (2004a) or the corresponding June articles of the years before.

<sup>10</sup> Concerning the decrease of fixed asset formation there was an intensive discussion whether financial indicators such as high debt played a major role for the recent development in the enterprise sector (see e.g. Jaeger, 2003, where also macro econometric results for Germany and the US are presented, and the ECB, 2003, discussing this relationship for the euro area).

Table 1 – Non-financial corporations (€ billion)

item	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Acquisition of non-financial assets and saving</b>											
Net capital formation	38.04	45.92	51.41	41.67	44.84	55.01	55.95	63.64	33.85	13.66	20.83
Gross capital formation	182.43	195.09	204.80	198.39	204.49	218.14	222.78	236.78	212.85	196.54	203.65
Consumption of fixed capital	144.39	149.17	153.39	156.72	159.65	163.13	166.83	173.14	179.00	182.88	182.82
Acquisitions less disposals of non-financial non-produced assets <sup>1</sup>	0.65	0.68	0.59	0.60	0.45	0.58	0.55	34.40	0.42	0.47	0.41
Saving and capital transfers	-4.30	-0.63	148.08	28.66	20.78	25.78	-12.25	-24.73	-2.07	26.92	24.90
Saving	-19.29	-11.94	15.94	18.20	10.69	13.99	-22.29	-35.95	-19.32	11.71	9.08
Capital transfers (net) <sup>2</sup>	14.99	11.31	132.14	10.46	10.09	11.79	10.04	11.22	17.25	15.21	15.82
Net lending/net borrowing <sup>3</sup>	-42.99	-47.23	96.08	-13.61	-24.51	-29.81	-68.75	-122.77	-36.34	12.79	3.66
Statistical discrepancy <sup>4</sup>	-17.12	-7.80	-12.68	-3.57	-6.83	-2.94	15.67	-24.22	1.94	-5.92	-3.03
<b>Acquisition of financial assets</b>											
Monetary gold and special drawing rights	-	-	-	-	-	-	-	-	-	-	-
Currency and deposits	23.97	17.27	10.55	29.44	-15.68	11.66	-4.93	5.45	33.71	-8.5	21.58
Currency and transferable deposits	10.22	4.77	16.3	25.09	-4.21	15.26	1.68	10.2	10.36	-13.33	9.32
Time deposits <sup>5</sup>	14.14	12.32	-8.15	2.91	-12.8	-4.61	-6.4	-4.66	24.39	5.04	11.51
Savings deposits <sup>5</sup>	-0.1	0.02	1.08	0.61	0.5	0.59	-0.24	-0.31	-0.57	0.03	0.52
Savings certificates	-0.28	0.16	1.32	0.83	0.82	0.42	0.03	0.21	-0.47	-0.23	0.23
Money market paper	1.94	-3.38	1.24	-3.28	-0.55	-0.51	-4.55	14.67	14.24	15.19	16.8
Bonds	0.51	20.97	-8.08	-11.04	-9.78	2.51	39.67	35.81	20.63	-35.59	-52.68
Financial derivatives	0.28	-0.38	0.21	2.23	3.88	3.42	1.09	6.15	-3.93	-6.6	6.7
Shares	1.16	4.18	15.38	11.88	13.17	47.56	81.89	140.13	21.01	63.82	-5.53
Other equity	2	7.03	3.18	6.1	10.39	16.99	42.2	45.83	12.2	-8.87	5.67
Mutual funds shares	1.77	8.35	2.72	5.54	10.39	10.87	10.85	3.17	3.54	-0.12	13.14
Loans	4.54	8.92	13.77	9.41	6.9	23.66	31.67	39.11	14.3	-17.8	-1.31
Short-term loans	4.52	5.94	5.34	15.69	9.15	17.54	25.88	32.31	4.42	-29.3	-8.22
Longer-term loans	0.02	2.98	8.43	-6.28	-2.25	6.12	5.79	6.8	9.88	11.5	6.91
Claims on insurance corporations <sup>6</sup>	1.63	1.54	2.6	2.11	2.42	1.59	1.23	0.38	1.66	1.06	1.99
Short-term claims	1.63	1.54	2.6	2.11	2.42	1.59	1.23	0.38	1.66	1.06	1.99

Table 1 – (continued)

item	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Longer-term claims	–	–	–	–	–	–	–	–	–	–	–
Claims from company pension commitments	–	–	–	–	–	–	–	–	–	–	–
Other claims	16.7	-13.32	12.81	18.72	25.74	16.53	-14.35	-17.77	22.85	58.49	30.78
Total	54.5	51.18	54.39	71.11	46.88	134.27	184.76	272.94	140.2	61.08	37.12
<b>External financing</b>											
Currency and deposits	–	–	–	–	–	–	–	–	–	–	–
Currency and transferable deposits	–	–	–	–	–	–	–	–	–	–	–
Time deposits <sup>5</sup>	–	–	–	–	–	–	–	–	–	–	–
Savings deposits <sup>5</sup>	–	–	–	–	–	–	–	–	–	–	–
Savings certificates	–	–	–	–	–	–	–	–	–	–	–
Money market paper	-2.62	-2.97	-0.1	0.06	1.09	-0.66	4.45	6.25	6.36	-0.4	11.11
Bonds <sup>2</sup>	49.56	49.24	-82.68	-4.45	-4.05	-3.1	-3.16	3.34	3.4	6.38	15.85
Financial derivatives	–	–	–	–	–	–	–	–	–	–	–
Shares	5.69	10.24	11.83	14.65	2.34	45.6	59.7	69.68	37.22	1.27	-7.74
Other equity	8.47	9.05	4.66	9.47	14.37	15.07	16.08	121.11	26.49	17.56	24.33
Mutual funds shares	–	–	–	–	–	–	–	–	–	–	–
Loans	50.31	33.24	40.6	65.42	52.84	100.86	140.63	207.92	85.67	7.98	-37.34
Short-term loans <sup>2</sup>	-8.63	4.14	19.97	25.33	12.81	26.77	45.65	86.64	1.69	-45.8	-7.23
Longer-term loans <sup>2</sup>	58.94	29.1	20.64	40.08	40.03	74.09	94.97	121.28	83.97	53.78	-30.11
Claims on insurance corporations <sup>6</sup>	–	–	–	–	–	–	–	–	–	–	–
Short-term claims	–	–	–	–	–	–	–	–	–	–	–
Longer-term claims	–	–	–	–	–	–	–	–	–	–	–
Claims from company pension commitments	4.22	5.42	7.11	3.55	3.55	6.5	6.33	8.22	8.22	9.62	11.06
Other liabilities	-1.02	2	-10.45	-0.4	8.08	2.75	13.81	3.41	7.25	11.8	19.21
Total	114.61	106.21	-29.02	88.3	78.22	167.03	237.84	419.93	174.61	54.2	36.48
Net acquisition of financial assets <sup>7</sup>	-60.11	-55.03	83.41	-17.19	-31.34	-32.75	-53.08	-146.99	-34.4	6.87	0.64

<sup>1</sup>In 2000 including the acquisitions less disposals of UMTS licenses. – <sup>2</sup>In 1995 including the assumption of the Treuhand agency's debt by the Redemption Fund for Inherited Liabilities. – <sup>3</sup>Saving and capital transfers (net) less net capital formation and acquisitions less disposals of non-financial non-produced assets. – <sup>4</sup>Net acquisition of financial assets less net lending. – <sup>5</sup>Up to 1998 deposits with savings and loan associations are included under savings deposits and from 1999 (in accordance with the banking statistics) under time deposits. – <sup>6</sup>Including private pension funds as well as occupational pension schemes and supplementary pension funds. – <sup>7</sup>Acquisition of financial assets less external financing.

Table 2 – Non-financial corporations investment and financing (Mrd €)

Item	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Investment</b>													
Gross capital formation	204.3	203.4	182.4	195.1	204.8	198.4	204.5	218.1	222.8	236.8	212.9	196.5	203.7
Gross fixed capital formation	197.6	206.6	192.4	195.1	201.6	201.3	204.8	212.0	221.2	236.4	226.6	208.7	201.1
Changes in inventories	6.7	-3.2	-9.9	-0.1	3.2	-2.9	-0.3	6.2	1.6	0.4	-13.8	-12.1	2.6
Acquisitions less disposals of non-financial non-produced assets	0.3	0.5	0.7	0.7	0.6	0.6	0.5	0.6	0.6	34.4	0.4	0.5	0.4
Acquisitions of financial assets with banks <sup>1</sup>	70.7	36.9	54.5	51.2	45.1	71.1	46.9	134.3	184.8	272.9	140.2	61.1	37.1
Short-term	8.2	12.4	24.0	17.3	10.6	29.4	-15.7	11.7	-4.9	5.4	33.7	-8.5	21.6
Longer-term	8.9	13.7	26.6	18.4	5.2	25.3	-17.6	11.1	-7.7	6.6	33.8	-7.5	20.6
in securities <sup>2</sup>	-0.8	-1.3	-2.6	-1.1	5.4	4.2	1.9	0.5	2.8	-1.2	-0.1	-1.0	1.0
in equities <sup>3</sup>	16.4	9.0	4.5	25.6	-3.9	-6.6	3.9	16.3	47.1	59.8	34.5	-27.1	16.0
in Germany	19.3	11.5	3.2	11.2	18.6	18.0	23.6	64.5	124.1	186.0	33.2	54.9	0.1
abroad	0.7	-2.0	-8.1	-2.6	-6.9	-6.2	-2.2	3.7	48.8	142.4	-22.0	18.1	-20.8
Loans <sup>4</sup>	18.6	13.6	11.2	13.8	25.5	24.2	25.7	60.8	75.3	43.6	55.2	36.8	20.9
to residents <sup>5</sup>	25.4	2.1	21.2	-4.4	17.3	28.1	32.6	40.2	17.3	21.3	37.2	40.7	29.5
Short-term	20.2	17.9	19.4	-15.0	5.9	6.2	13.2	18.0	-19.9	-27.8	28.2	66.2	26.1
Longer-term	20.1	17.6	19.0	-19.2	8.8	14.5	18.3	17.2	-20.0	-28.4	23.9	61.2	24.4
to non-residents	0.1	0.3	0.4	4.2	-2.9	-8.4	-5.1	0.8	0.1	0.6	4.3	5.0	1.7
Short-term	5.2	-15.7	1.8	10.6	11.5	21.9	19.4	22.2	37.2	49.2	9.0	-25.6	3.4
Longer-term	4.7	-15.7	2.2	11.8	9.4	19.9	16.5	16.9	31.6	42.9	3.4	-32.0	-1.9
with insurance corporations	0.6	0.0	-0.4	-1.2	2.1	2.1	2.9	5.3	5.7	6.2	5.6	6.5	5.2
Total <sup>5</sup>	275.3	240.9	237.6	247.0	250.5	270.1	251.8	353.0	408.1	544.1	353.5	258.1	241.2
<b>Financing</b>													
Internal financing	140.7	143.0	140.1	148.5	181.5	185.4	180.4	188.9	154.6	148.4	176.9	209.8	207.7
Net retained income <sup>5, 6</sup>	16.8	6.8	-4.3	-0.6	28.1	28.7	20.8	25.8	-12.3	-24.7	-2.1	26.9	24.9
Depreciation allowances	123.9	136.2	144.4	149.2	153.4	156.7	159.7	163.1	166.8	173.1	179.0	182.9	182.8
<i>Memo item</i>													
Internal financing ratio <sup>5, 7</sup>	51.1	59.4	59.0	60.1	72.5	68.6	71.7	53.5	37.9	27.3	50.1	81.3	86.1
External financing	129.1	105.2	114.6	106.2	81.7	88.3	78.2	167.0	237.8	419.9	174.6	54.2	36.5
via banks	90.1	49.7	37.0	18.1	57.9	50.4	44.0	68.9	71.2	46.6	34.9	-21.8	-39.0
Short-term	34.3	1.8	-10.5	0.5	19.0	13.5	7.4	19.9	10.2	13.2	1.7	-27.4	-25.3
in Germany <sup>5</sup>	27.7	3.3	-7.9	3.5	16.5	12.2	4.7	19.1	-5.3	19.0	6.3	-24.2	-24.7

Table 2 – (continued)

Item	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
abroad	6.6	-1.4	-2.7	-3.0	2.5	1.3	2.7	0.8	15.5	-5.7	-4.6	-3.2	-0.6
Longer-term in Germany <sup>5</sup>	55.8	47.8	47.5	17.6	38.9	36.9	36.6	49.1	61.0	33.3	33.2	5.6	-13.7
abroad	55.5	46.7	45.3	16.3	39.1	37.2	36.1	47.3	58.2	31.9	21.5	3.5	-11.6
via other lenders <sup>4</sup>	0.3	1.1	2.2	1.2	-0.2	-0.3	0.5	1.7	2.7	1.4	11.8	2.1	-2.0
in Germany	11.5	13.6	12.3	17.1	3.4	14.6	16.9	34.7	83.2	164.7	58.0	41.6	20.9
Short-term	0.1	6.9	7.9	6.7	-7.8	-1.5	0.6	6.2	16.2	6.6	5.9	21.3	12.8
Longer-term	0.3	0.5	0.1	0.9	0.0	-0.2	-0.2	-1.1	1.7	4.1	-0.3	-0.2	6.9
abroad	-0.2	6.5	7.8	5.7	-7.8	-1.3	0.7	7.2	14.5	2.6	6.2	21.5	5.9
Short-term	11.4	6.7	4.4	10.4	11.3	16.1	16.4	28.5	67.1	158.1	52.1	20.3	8.0
Longer-term	7.4	1.7	0.8	8.7	6.0	14.2	12.5	7.0	39.7	82.5	6.5	-17.0	11.2
in the securities market <sup>5, 8</sup>	4.0	4.9	3.6	1.8	5.2	2.0	3.9	21.5	27.4	75.6	45.6	37.3	-3.2
in the form of equities <sup>3</sup>	3.8	21.4	46.9	46.3	-3.3	-4.4	-3.0	-3.8	1.3	9.6	9.8	6.0	27.0
in Germany	16.5	12.1	14.2	19.3	16.5	24.1	16.7	60.7	75.8	190.8	63.7	18.8	16.6
abroad	14.2	16.2	15.8	17.0	14.0	24.9	12.7	58.0	57.1	80.9	55.7	6.3	-6.2
Pension fund provisions	2.3	-4.2	-1.7	2.3	2.5	-0.8	4.0	2.7	18.6	109.9	8.0	12.6	22.8
Total <sup>5</sup>	7.2	8.5	4.2	5.4	7.1	3.6	3.6	6.5	6.3	8.2	8.2	9.6	11.1
Net acquisition of financial assets <sup>6</sup>	269.7	248.2	254.7	254.8	263.2	273.7	258.6	355.9	392.4	568.3	351.5	264.0	244.2
Statistical discrepancy <sup>9</sup>	-58.4	-68.3	-60.1	-55.0	-36.5	-17.2	-31.3	-32.8	-53.1	-147.0	-34.4	6.9	0.6
Net lending/net borrowing <sup>5, 10</sup>	5.6	-7.3	-17.1	-7.8	-12.7	-3.6	-6.8	-2.9	15.7	-24.2	1.9	-5.9	-3.0
	-64.0	-60.9	-43.0	-47.2	-23.9	-13.6	-24.5	-29.8	-68.8	-122.8	-36.3	12.8	3.7

<sup>1</sup>In Germany and abroad. – <sup>2</sup>Money market paper, bonds (including financial derivatives) and mutual fund shares. – <sup>3</sup>Shares and other equity. – <sup>4</sup>Including other claims or liabilities. – <sup>5</sup>In 1995 after the elimination of transactions associated with the transfer of the Treuhand agency's debt to the Redemption Fund for Inherited Liabilities. – <sup>6</sup>Including net capital transfers received. – <sup>7</sup>Internal financing as a percentage of total asset formation. – <sup>8</sup>Through the sale of money market paper and bonds. – <sup>9</sup>Corresponds to the balancing item in the financial account with the rest of the world owing to statistically unclassifiable payment transactions with non-residents. – <sup>10</sup>Internal financing less gross capital formation and acquisitions less disposals of non-financial non-produced assets.

Figure 1 – Investment and financing patterns of non-financial corporations

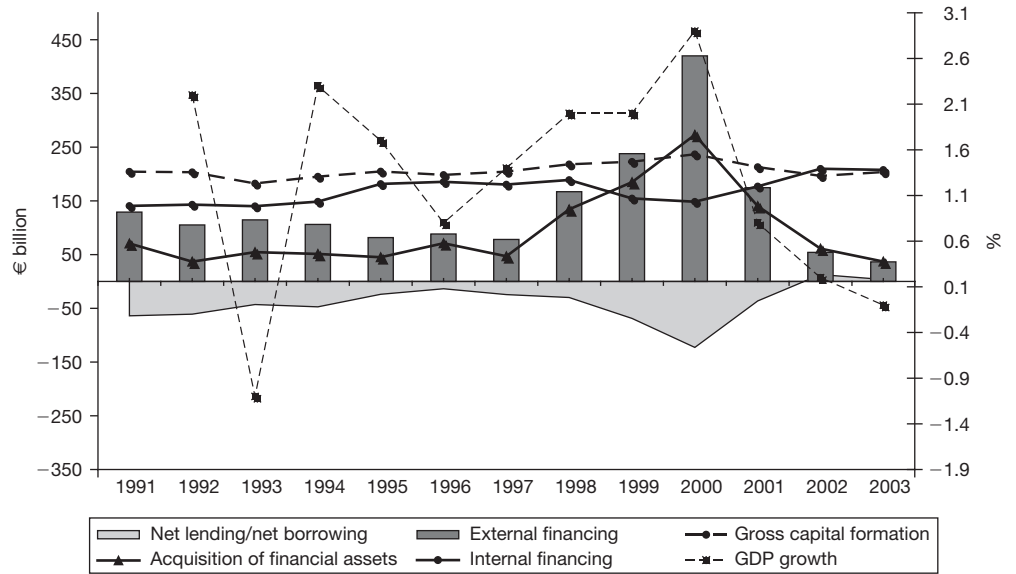
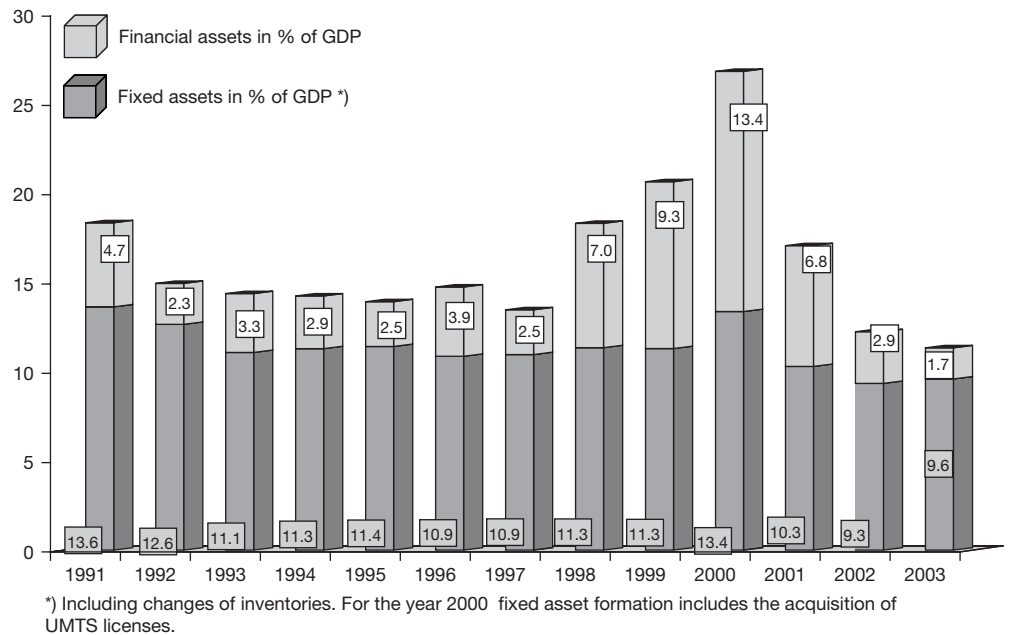


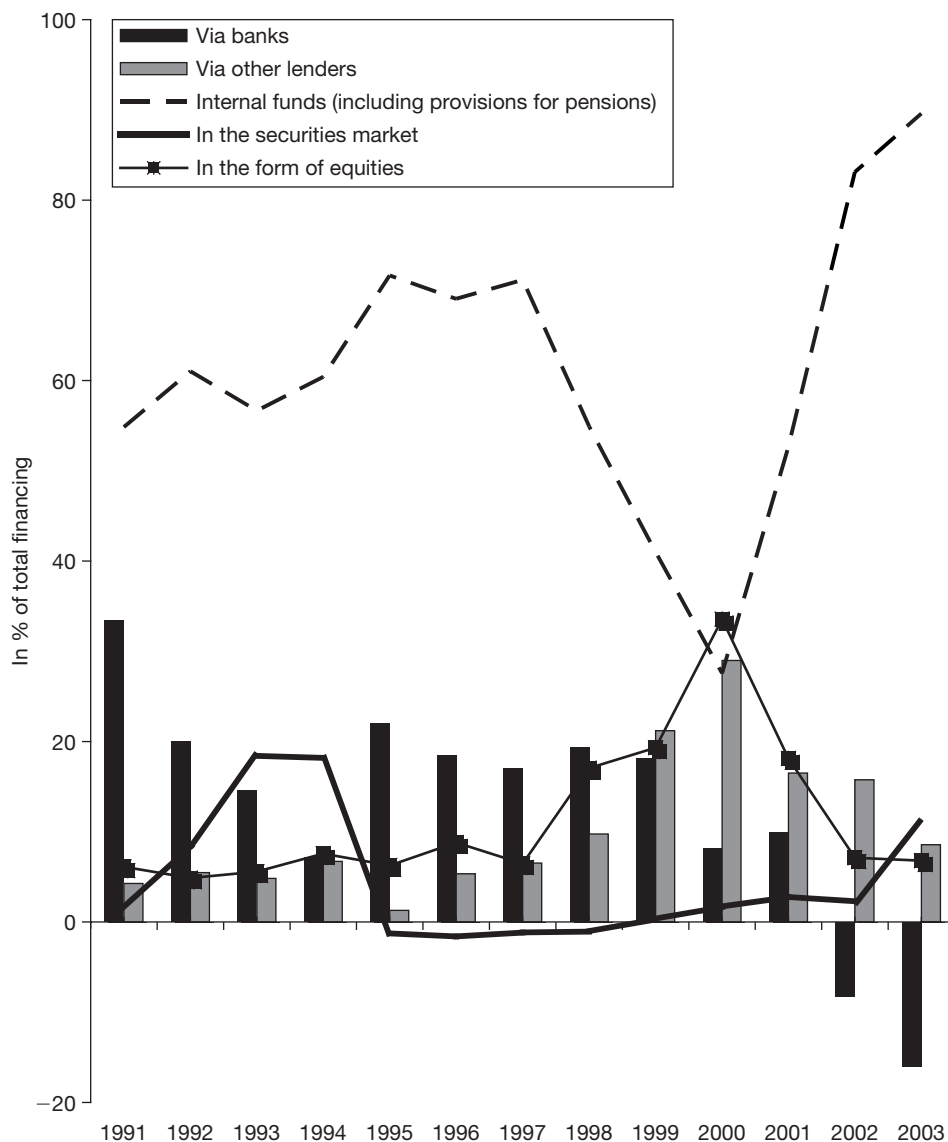
Figure 2 – Capital spending of non-financial corporations



correction took place and in 2003 the ratio reached a level of about 90 %. Two reasons were responsible for the meantime reduction of this indicator: the amount of internal funds decreased while a very high demand for external funds took place. The main factor behind the decrease of internal funds was the shareholder value philosophy of market-based financial systems. Furthermore driven by tax considerations the distribution of profits to the shareholders was preferred to retaining profits.

The enormous demand for external funds was of course highly correlated with the financing needs due to financial asset formation as described above. With respect to external funds significant structural shifts could be observed for the period 1991–2003. Concentrating on the instruments loans, bonds and shares there is no doubt that for German firms loans were the most important source of financing from outside. From 1991 to 2003 loans on average accounted

Figure 3 – Financing of non-financial corporations



several years. But in selected periods (1992 to 1994 and 2003) the issuance of such securities (including money market paper) increased very much and exceeded even the demand for loans. The amount of equity financing (shares and other equity) was closely linked to the development of the stock market boom. The same holds for loans from creditors other than banks (see Figure 3). From 1999 to 2001 these funds, mainly from abroad, were even higher than bank loans.<sup>11</sup> With respect to bank loans the demand by enterprises showed a decreasing trend since 2000. In 2002 and 2003 firms even repaid bank loans a fact that could not be observed in the years before. Once again this observation is closely linked to the financing activities of big firms and must not be interpreted as a supply side restriction from banks. The dominance of bank loans for external financing of German enterprises is still valid even if a certain loss of importance due to disintermediation has to be admitted. Both facts can be confirmed by using

<sup>11</sup> Due to tax advantages in trade earnings tax these loans were often granted by non-resident subsidiaries (e.g. located in the Netherlands) to German parent companies. The subsidiaries themselves have issued bonds to receive the corresponding funds (see Deutsche Bundesbank, 2004b).



financial accounts stock data. In 2003 bank loans accounted for about 50% of the total outstanding debt compared with two-thirds at the beginning of the nineties.

#### 4. Final remarks: combining firm-level information with aggregated data

It has been shown in the section above that the investment and financing behaviour of German firms can be well described even by using highly aggregated data with a yearly periodicity. The big advantage is that these statistics already provide information for the year 2003 when no direct information for the enterprise sector is available. In case of quarterly periodicity which is the final aim for national and financial accounts in Europe empirical research might even use sector-specific data with a higher frequency. There is no doubt that such an improved data base would enable a much more detailed analysis of the macroeconomic development as well as financial stability.

Nevertheless the analysis in section 3 emphasises how important it is to know whether specific firm groups determine the figures or whether a more general and wide-spread phenomenon is at work. Such knowledge is even more relevant for economies where big listed firms seem to behave very different to small and medium-sized firms or where the majority of firms is restricted to certain size classes. Besides these aspects there are also other critical issues of aggregated data: firstly results based on direct versus indirect information may differ sometimes. A well known example is the own funds ratio which very much depends on using either financial accounts or enterprise data. E.g. the own funds ratio for German enterprises (according to financial accounts) was about 50% of total liabilities in 2001 and exceeded the corresponding figure from the Bundesbank's enterprise balance sheet statistics by more than 30 percentage points. The main reason for this significant discrepancy are different valuation principles. Due to the introduction of IAS the problem may be reduced, but cannot be eliminated completely. The decisive question is how to reconcile such different results in order to avoid misinterpretations or "statistical confusion". A second critical aspect is that via indirect information normally not all the firm relevant information can be collected. Banking statistics can provide data for loans granted by banks to firms, but information on financial loans or trade loans between resident firms can only be derived from direct enterprise data.<sup>12</sup> The amount of these kinds of credit is indeed not negligible and becomes relevant when presenting non-consolidated data. Another example where direct data may be the only possible information source is the position 'other equity' of private limited firms and partnerships.

In so far the main implication of this paper is to try to combine specific information from direct firm data with very timely aggregated data to make use of the advantages of both reporting systems as much as possible.<sup>13</sup> This task will become a major challenge for the final establishment of the quarterly national and financial accounts of the European Union member states.

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<sup>12</sup> Loans between resident and non-resident firms are included in balance of payments statistics. These loans are considered as loans between different sectors (between resident enterprises and rest-of-the world).

<sup>13</sup> The interesting approach of the Banco de Espana (2004) to combine available (yearly and quarterly) enterprise balance sheet information with macro data may serve as a basis for further discussion in the relevant working groups of the ECB and of Eurostat.

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## Abstract

*When analysing the enterprise sector several data sources at the micro and macro level can principally be used. Most studies are based on direct information, respectively enterprise balance sheet statistics. Since the nineties a lot of articles were published exploiting panel data. The most prominent example is the estimation of the investment function. An essential reason for concentrating on micro econometric research were the disappointing results of former macro-based studies. Nevertheless also a few recent articles investigated investment behaviour of firms by using financial and national accounts data. This paper tries to discuss the pros and cons of both data sources. Some aspects concerning coverage, timeliness and periodicity as well as comparability are emphasised why it may be advantageous to work with highly aggregated data. Finally it is shown for the case of Germany that very useful economic information can be derived from financial and national accounts data for the period 1991 to 2003.*

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# Measures of financial positions of households and non-financial corporate sectors

*Richard Walton (Bank of England)*

The views expressed here are those of the author and do not necessarily reflect those of the Bank of England. The author worked at the Office for National Statistics, 1999–2001 where he developed an international survey of company profitability.

This paper describes three indicators of the financial position of the household and corporate sector which have been derived from the conceptual framework of SNA 93 and ESA 95. These indicators are: the net lending/borrowing and profitability of the non-financial sector and the saving ratio of the households sector. The methodology behind the indicators and some recent trends are presented.

At present the accounts of households and the non-financial sector sectors are not publicly available across all member states of the European Union. The introduction of quarterly institutional sector accounts for the European Union and Euro area in 2006 will provide the opportunity to improve the quality of national accounts data. The introduction of this new set of sector accounts will enable consistency in terms of transactions; consistency between the non-financial accounts and GDP; consistency between non-financial accounts and the rest of the world accounts; and consistency between the rest of the world accounts and the Balance of payments accounts. In moving towards these objectives, the indicators described in this note would become harmonised for countries in the EU. Users will for the first time have available a consistent data set which allows EU comparisons of the position of company and household sectors. Although not yet publicly available, the table below reviews data for the euro area which were published by the ECB in their monthly bulletin in February 2004.

## **Net lending/borrowing of the non-financial corporate sector**

Net lending/net borrowing in the UK is the final balancing item of the non-financial account. This is a flow concept which represents the balance on the financial account and is the difference between changes in financial assets and changes in financial liabilities. As such, it represents – if there is a deficit – the amount the sector (in a net sense) is borrowing.

The table below shows net lending/borrowing as a percentage of GDP for the UK since 1995. It also includes data for the Euro area and US which are not publicly available yet, but were published by the ECB in their monthly bulletin in February 2004.

In the UK, private non-financial companies (PNFCs) ran a cumulative financial deficit in 1997–2001, of £49 billion. With weaker profits in 2001, unusually strong dividend payments and capital investment still at a high level, companies' net borrowing was large, at £16 billion. Companies financed this borrowing through capital market issues and bank borrowing. In contrast, in 2002, UK non-financial companies had a financial surplus of over £1 billion, despite very little change in profitability. The main reasons for this change in their financial position were a sharp reduction in dividends and a fall in interest payments to banks, together with a cut back in investment and inventories. In 2003, the company sector was in financial surplus (a record £15 billion), driven by stronger profits mainly in service sector industries, a further fall in taxes on income and a fall in investment. A further surplus was recorded in the first quarter of 2004.

In the Euro area, there was a similar increase in net borrowing, from 1995–2000 which according to the ECB<sup>1</sup> reflected lower profit levels and the increase in capital spending which included the acquisition of the third generation mobile phone licenses in the euro area. In

<sup>1</sup> *ECB Monthly Bulletin, February 2004*, Developments in private sector balance sheets in the euro area and United States.

Net lending/-borrowing, 1995–2003 (percentage of GDP)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Euro area	2.1	−0.2	−0.8	−0.8	−1.7	−3.5	−1.9	−0.8	
US	−0.5	−0.2	−0.4	−1.2	−1.8	−2.6	−0.7	0.6	
UK	0.2	0.4	−0.6	−0.6	−1.5	−1.1	−1.6	0.1	1.4

Sources: Office for National statistics, *Quarterly National accounts, Q1 2004*. ECB Monthly Bulletin, February 2004, *Developments in private sector balance sheets in the euro area and United States*.

UK Private Non-financial companies net rates of return, 1995–2003. (Per cent)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
All companies	12.4	13.1	13.7	13.9	13.3	13.1	12.4	12.1	13.0
Manufacturing	11.4	12.0	13.1	11.3	9.9	8.2	7.9	6.6	7.0
Services	15.0	15.7	17.0	19.0	17.7	16.6	15.4	15.4	15.9

Sources: Office for National Statistics, *profitability of UK companies, Q1 2004*.

addition to the increase in capital spending, non-financial corporations in both the euro area and the US increased considerably their acquisitions of financial assets, mainly in the period from 1999–2001. The rise was related to mergers and acquisition activity. The financing needs of Euro area non-financial corporations over the period from 1995 to 2002 rose more strongly than those of US non-financial corporations, partly related to lower profits and higher financial investment in the Euro area. The subsequent reduction in the US financing gap in 2002 was stronger, reflecting a stronger recovery in profits and a sharper cutback in non-financial investment.

**Profitability of the non-financial corporate sector**

Rates of return can be calculated in many ways<sup>2</sup>. The ONS produces quarterly rates of return ratios in a Press Release, *Profitability of UK companies*. This release provides the quarterly net rates of return for UK private non-financial corporations: Manufacturing companies, service companies and United Kingdom Continental Shelf companies. The table above shows rates of return for UK companies since 1995.

The UK ONS measure of profitability expresses the ratio of operating surpluses to capital employed. These ratios measure the ‘accounting’ rates of return achieved in a particular year against total capital employed. The net rate of return uses capital estimates which are net of capital consumption. Net rates are more widely used than the gross rate of return. The sources of profits data in international surveys carried out by the ONS<sup>3</sup> were national accounts in most countries; but for a few countries they used company balance sheets and the profit and loss data.

In the UK, net rates of return fell from 1998, in each of the four subsequent years for both UK manufacturing and service companies. For manufacturing, at 6.6%, the rate of return in 2002 was the lowest since 1992. For the service sector, net rates of return peaked at 17.1% in the second quarter of 1998, before declining sharply to 13.8% in the first quarter of 2002. For 2003, there was a rise in non-oil companies’ profitability. For service sector companies, the net rate of return for 2003 was 15.9%, the highest since 2000. Service sector profitability in 2004 Q1 was at its highest level since 2002 Q4. The net rate of return for manufacturing companies in 2003

2 The numerator could be defined exclusive of net interest. Profits could be after tax or based on financial accounting standards. Similarly, capital could be measured at historical cost rather than at current cost and could include goodwill an intellectual property. Or the denominator could be equity or sales.

3 See latest Survey, *International comparisons of company profitability (UK Economic Trends, 15 October 2002)*.

Household sector saving ratios 1995–2003 (Per cent)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Euro area	12.6	12.1	11.3	10.3	9.2	8.9	9.4	9.6	
Euro area (adjusted)	11.4	11.0	10.3	9.2	8.2	7.8	8.3	8.5	
US	4.6	4.0	3.6	4.3	2.4	2.4	1.8	2.0	1.3
US (adjusted)	1.2	0.7	−0.8	0.2	−1.1	−1.2	−2.2	−1.2	
UK	10.0	9.3	9.5	6.4	5.3	5.5	7.0	5.8	6.0

Sources: Office for National statistics, *Quarterly National accounts, Q1 2004*. ECB/OECD study: *Comparison of household savings ratios: Euro area/United States/Japan. 9 June 2004*

was 7.0%, 0.4 pp higher than in 2002. Manufacturing profitability in 2004 Q1 was at its highest level for two years.

For the EU as a whole, rates of return have been calculated by the ECB<sup>4</sup>. Their review shows that EU rates of return are below those of the US. US non-financial companies' profitability averaged 11.4% since 1995, higher than the comparable EU figure of 8.3%.

### Household saving ratios

The household saving ratio is an indicator of the financial position of households, for which SNA 93 and ESA 95 provide the conceptual framework.

In the UK, the savings ratio is calculated as households' saving as a percentage of total available households' resources (disposable income plus D.8, the adjustment for the change in net equity of households in pension funds). Total available resources represent the sum which households have available to spend or save.

Disposable income is defined by the Office for National Statistics as: the addition of savings and household private consumption and comprises the current income of households from production plus property and transfer receipts (such as interest, dividends and social benefits) minus payments (such as interest payments and income tax). Household saving is derived by deducting household consumption from total available resources. In the UK, data are quarterly and are derived from the national accounts. The UK data for households also include non-profit institutions serving households.

In a joint OECD-ECB project<sup>5</sup>, experimental 'adjusted' saving ratios were derived for the Euro area, US and Japan. Adjustments were made for:

- 1) Household consumption of public services
- 2) Income taxes versus taxes on production and imports
- 3) Social security schemes versus private pension schemes.

However, no adjustment was made for household saving via household durables, although it is noted that this adds around 3pp to the savings ratio.

Over recent years, these 'adjusted' ratios for the Euro area follow a similar profile to the unadjusted series: a decline since the mid-1990s. However, the adjusted ratio shows dissaving by the US household sector. The household durables adjustment would push the US savings rate back into positive territory. Gale and Sabelhaus (1999)<sup>6</sup> calculate a durables adjustment.

In the UK households' sector capital account, the financial balance is defined as the difference between saving and investment. The decline in the household sector financial surplus over the past ten years has mirrored broadly an accompanying fall in the savings ratio which has declined to levels similar to lows touched in the late 1980s, at least in nominal terms.

The savings rate tends to rise with inflation when households are net holders of nominal wealth, as savers try to compensate for the falling real value of their nominal assets, making it

4 ECB Monthly Bulletin, January 2004, *Measuring and analysing profit developments in the euro area*.

5 Comparison of Household Saving Ratios: *Euro area/United States/Japan. 9 June 2004*.

6 Gale, W. G., and Sabelhaus, J., (1999), 'Perspectives on the Household Saving Rate', *Brookings Papers on Economic Activity*, Vol. 1, pp 181–224 (see <http://www.brookingsinstitution.org/views/articles/gale/1999-1.pdf>).

more difficult to compare the real level of saving across periods of different inflation. An inflation-adjusted saving ratio can be calculated; work has already been done in-house to adjust the UK savings rate for inflation<sup>7</sup> and also by Gale and Sabelhaus (1999)<sup>6</sup> for the US savings rate. These measures correct for the loss of real wealth induced by inflation. This adjustment is more significant in high inflation periods, e.g. the 1970s. In the recent past, the durables adjustment is more significant.

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<sup>7</sup> See 'Saving, wealth and consumption', from the Spring 2001 Bank of England Quarterly Bulletin (<http://boe-intra-w2s/internet/qb/qb010104.pdf>).

# Interpreting South African credit aggregates following the implementation of new accounting standards

Johan Van Den Heever<sup>1</sup> (South African Reserve Bank)

## Introduction

Recent changes to accounting standards are set to have a significant impact on the interpretation of banks' balance sheet data. South Africa was one of the first countries to implement these new accounting standards. This paper outlines the statistical impact and implications for monetary policy oriented analyses in South Africa which arose from the implementation of the new standards. The relevant accounting standards are first introduced. The key South African credit aggregates and the building blocks underlying them are then outlined. Thereafter attention is focused on the changes in the levels and behaviour of these aggregates which resulted from the new standards. Some observations are then made regarding how analyses of developments in the credit aggregates were adapted in order to continue to provide relevant inputs for monetary policy formulation, followed by concluding remarks.

## New accounting standards

International Accounting Statement IAS 39 establishes principles for the recognition, measurement and disclosure of information relating to financial instruments in the financial statements of enterprises. South Africa has a diligent accounting profession which is willing to be one of the first in the world to adopt improvements to accounting standards. On the basis of International Accounting Statement IAS 39, the South African Institute of Chartered Accountants issued South African Statement of Generally Accepted Accounting Practice AC 133 – *Financial instruments: recognition and measurement* in April 2001, with further amendments contained in a revised Statement issued in September 2002. It was decided that Accounting Statement AC 133 would come into effect for companies' year-ends commencing on or after 1 July 2002. As envisaged, the impact of AC 133 became evident only in 2003, when companies reported their interim and annual financial statements on the new basis. (In important parts of the world IAS 39 is still under discussion and has not yet been implemented.)

AC 133 requires recognition of a financial asset or liability on the balance sheet when an institution becomes a party to the contractual provisions of the instrument. For instance, all the contractual rights or obligations under derivative instruments have to be recognised as assets or liabilities on the balance sheet. Furthermore, financial instruments have to be classified into predetermined categories. Depending on the asset classification used, fair value changes are reflected in income and expenditure or directly in equity.

There are four primary asset categories:

- originated assets, which are carried at amortised cost;
- held-to-maturity assets, which are carried at amortised cost;
- held-for-trading assets, which are measured at fair value with changes in fair value recorded in the income statement; and
- available-for-sale assets, which are carried at fair value with unrealised fair value changes deferred in equity until realisation or permanent impairment.

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Reporting entities are required to designate financial instruments into these categories on initial recognition, and the designation is final, thereby effectively determining the future accounting treatment of the instrument on either an amortised-cost or a fair-value basis (South African Reserve Bank 2004a: 50–51).

### Composition of the key South African credit aggregates

Traditionally the most closely monitored credit aggregates in South Africa were the monetary institutions' or banks' total claims on the domestic private sector, and their total domestic credit extension.

*Total claims on the domestic private sector* consists of the elements indicated in the table below, shown with their values at the end of 2002 – just before the new standards started to make themselves felt.

#### Claims on the domestic private sector, end 2002

Category	R billion
Investments	31.2
Bills discounted	9.0
Instalment sale credit	76.6
Leasing finance	31.3
Mortgage advances	286.0
Other loans and advances	269.2
Total claims	703.4

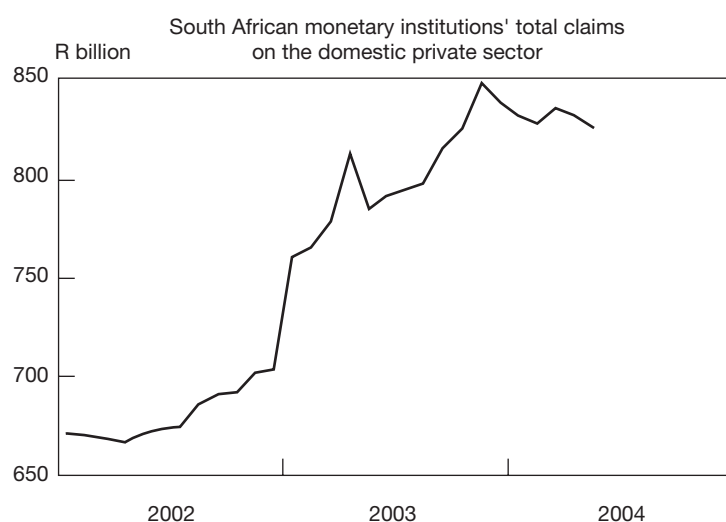
South African banks' *total domestic credit extension* consists of their total claims on the domestic private sector, plus their net claims on the government sector:

#### Total domestic credit extension, end 2002

Category	R billion
Total claims on domestic private sector	703.4
Net claims on government	41.6
Gross claims	84.9
Less government deposits	43.3
Total domestic credit extension	745.0

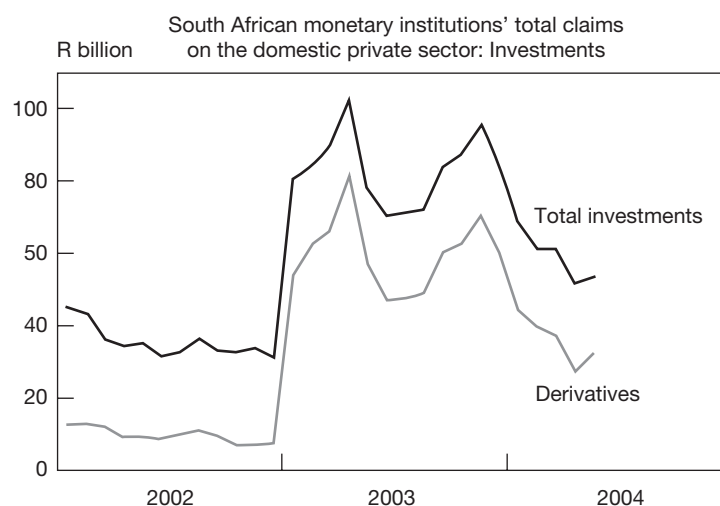
### Changes to the credit aggregates arising from the new standards

In practice South African banks did not all move to the new accounting standards at once, but implemented the new standards at various dates during the four months from January to April 2003. The sharp increases in their reported total claims on the domestic private sector in early



2003 are reflected in the accompanying graph. Rates of increase over twelve months in these claims accelerated from less than 10 per cent in late 2002 to more than 21 per cent in April 2003.

Virtually all of the increase in total claims on the domestic private sector in early 2003 originated in the investments category, which rose from R31.2 billion at the end of December 2002 to R80,9 billion at the end of January 2003. Within the investments category, in turn, it was the derivatives subcategory that was responsible for the lion's share of the increase. This is reflected in the graph below. Previously, coverage of on-balance sheet derivatives was narrower and netting of derivatives with positive and negative fair value was widespread. The new requirement of comprehensive coverage of derivatives on the balance sheet together with strict criteria which had to be met before netting could be considered, led to the sharp increase shown in the graph.



Whereas the increase in the level of investments in early 2003 was considerable, it was to some extent a one-off event. Of more lasting concern is the mark-to-market impact on balances outstanding measured at each successive month-end; this is likely to introduce additional volatility on an ongoing basis to investments. With a significantly higher level of investments reported on the balance sheet, a given percentage mark-to-market adjustment implies a larger absolute change in investments.

The composition of banks' derivatives assets by type, at fair value, is presented below.

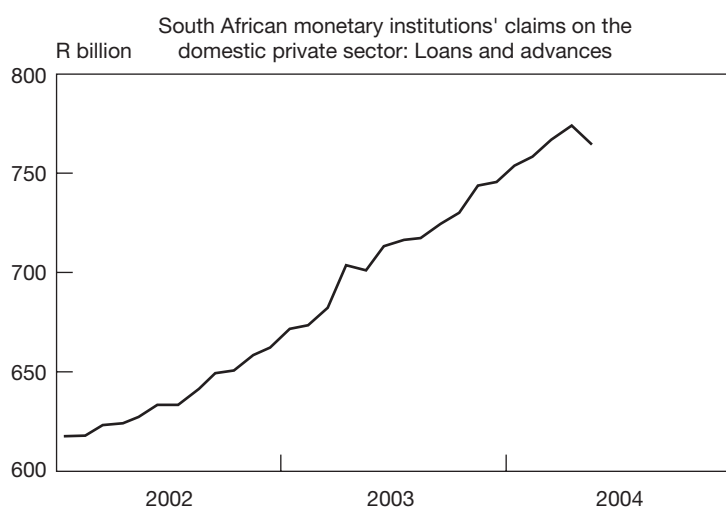
#### Composition of banks' derivatives assets at fair value, end June 2004

	Percent
Money market interest rate derivatives	35.5
Capital market interest rate derivatives	15.5
Foreign exchange derivatives	42.8
Equity and index derivatives	4.8
Commodities derivatives	1.4
Total	100.0

Foreign exchange derivatives constitute the largest category of derivatives contracts. The exchange rate of the rand – a floating currency – displays a fair amount of volatility, which translates into significant mark-to-market adjustments to the fair value of derivatives assets. For example, the exchange rate of the rand against the US dollar has moved from R8.66 per dollar at the end of 2002 to R6.24 per dollar at the end of July 2004. Its absolute percentage change from one month-end to the next has averaged 5 per cent since the end of 2002 to date. The one-month implied volatility in rand-dollar foreign exchange options amounted to 20 per cent in July 2004. Interest rates in the South African setting also at times display a fair amount of variation; for instance, the South African Reserve Bank's key accommodation rate was lowered in several steps from 13.5 per cent in early June 2003 to 8.0 per cent by mid-December 2003. All of this suggests that derivatives assets will display large movements on account of revaluation changes.

### Adapting the analyses of the credit aggregates for monetary policy purposes

Traditionally if the outstanding balance of banks' claims on the domestic private sector rose, it was interpreted as signifying a flow of credit to this sector. This interpretation clearly has serious limitations in an environment where important items are marked to market on every reporting date. Accordingly, as far as the analysis of outstanding balances is concerned it has firstly become necessary to shift the focus to the banks' loans and advances categories, where, unlike with investments and to a lesser extent with bills discounted, marking to market does not have a significant impact. Banks' loans and advances are *originated assets* in the terminology of AC133, and are therefore carried at amortised cost. The significantly more stable behaviour of loans and advances is displayed in the graph below. It should however be pointed out that loans and advances to the domestic private sector denominated in foreign currency are subject to mark-to-market changes as exchange rates change. Fortunately, these are quantitatively unimportant in South Africa – at least at present: At the end of June 2004 less than one per cent of monetary institutions' claims on the domestic private sector was denominated in foreign currency.



Focusing on loans and advances does not imply that the broader claims on the domestic private sector should no longer be compiled, analysed and disseminated.

Secondly, it has become more important than before to compile and analyse data on credit flows in addition to the data on outstanding balances. An integrated framework, in which credit extension balances and flows are presented together and analysed every period, is ideal. An example of such a presentation based on South African data in respect of instalment sale and leasing advances is shown below.

#### Stock-flow reconciliation: Banks' instalment sale and leasing finance in the second quarter of 2004

	R billions
Opening balance on 31 March 2004 <sup>1</sup>	132.0
Plus: New business payouts during period	21.9
Plus: Interest accrued during period	5.5
Minus: Repayments received during period	-17.7
Plus/Minus: Other debits and credits	-3.8
Equals: Closing balance on 30 June 2004 <sup>1</sup>	137.9

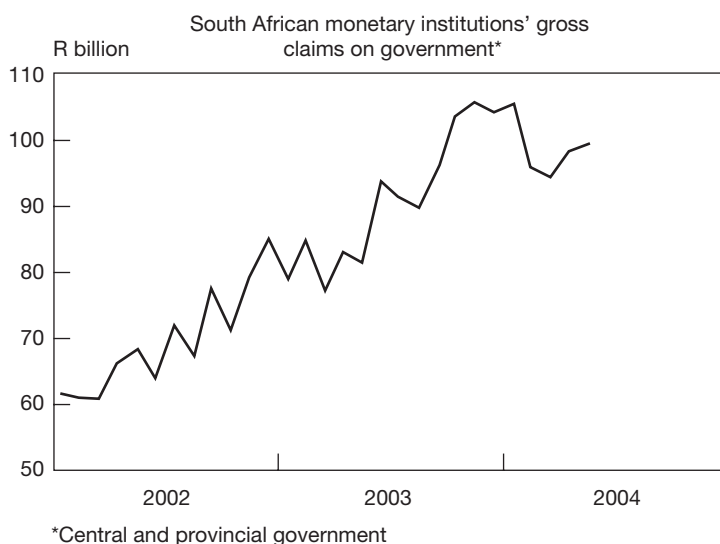
<sup>1</sup>These balances would not be equal to the total of instalment sale and leasing finance shown in the appendix, since the appendix only includes claims on the domestic private sector.

Requesting flow data *by type of counterparty* from the banks to take the analysis in the above table a step further might impose costs on the banks in excess of the analytical benefits to be obtained from such an exercise.

In the case of the balances and flows in respect of derivatives assets it may be even more difficult to obtain good data. The tracking of flows and revaluation changes by type of derivative and by type of counterparty, with netting and set-off also complicating matters further, introduces

many dimensions and implies a heavy burden on respondents. While balances outstanding by type of counterparty and by type of derivative may reasonably be obtained, requesting *flows* at such a disaggregated level could be asking too much of respondents.

Thirdly, in the monetary analysis where *broad-money liabilities* of the monetary sector equals the sum of *net foreign assets*, *domestic credit* and *other items net*, changes in *domestic credit* from one period to the next may now more often have a statistical counterpart in *other items net*. *Other items net* is where derivatives liabilities are included; these of course also have to be marked to market. Previously the expectation may have been higher that a change in *domestic credit* would largely have its counterpart in *broad-money liabilities* or *net foreign assets*.



Fortunately the new accounting standards do not appear to have introduced significantly more volatility to banks' reported gross claims on government or net claims on government. This is largely due to the fact that banks have little or no derivatives contracts with government which could be brought onto the balance sheet. Marking to market of banks' government bonds held in their trading portfolio had already been done over a long period. Accordingly, the mark-to-market volatility observed in the level of gross claims on government did not change appreciably.

## Conclusion

Changes in the consolidated monetary sector's total claims on the domestic private sector have become more volatile and less related to actual credit flows as a result of new accounting standards. Rather than focusing primarily on total claims, it is suggested that more emphasis be placed on the loans and advances component of total claims in the analysis of the monetary sector's balance sheet to obtain an indication of underlying credit growth. Revaluation effects are far less important in determining the level of loans and advances than in determining the level of total claims on the domestic private sector. This is not to suggest that total claims on the domestic private sector should no longer be compiled and disseminated. While that task should continue, however, the loans and advances subset of total claims should be more closely followed. It is also suggested that it is worthwhile to compile and analyse data on credit flows in addition to the data on outstanding balances.

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Appendix – Credit extension by all monetary institutions<sup>1</sup> (R millions)

End of	Credit extended to the domestic private sector <sup>2</sup>										Total	
	Loans and advances						Bills discounted	Investments				Total
	Instalment sale credit	Leasing finance	Mortgage advances	Other loans and advances	Total	Derivatives		Other	Total			
2002:	Jan...	65 714	29 976	261 033	261 060	617 782	8 460	12 778	32 408	45 186	671 428	
	Feb	66 447	30 253	265 020	256 589	618 309	8 329	13 004	30 595	43 598	670 236	
	Mar	67 802	30 680	266 447	258 621	623 550	8 548	12 436	24 074	36 510	668 608	
	Apr	68 494	30 668	268 553	256 810	624 524	8 388	9 434	25 074	34 507	667 420	
	May	69 618	31 454	271 901	255 216	628 190	8 248	9 390	25 714	35 104	671 542	
	Jun	70 311	31 598	274 924	257 158	633 991	8 118	8 928	22 921	31 849	673 959	
	Jul	71 202	31 472	277 751	253 671	634 095	8 169	9 925	22 889	32 814	675 079	
	Aug	72 441	31 457	280 286	257 201	641 385	8 309	11 101	25 524	36 626	686 319	
	Sep	73 115	31 035	279 949	265 343	649 442	8 615	9 719	23 489	33 208	691 265	
	Oct	74 141	31 412	281 764	263 748	651 066	8 832	7 094	25 761	32 855	692 753	
	Nov	75 692	31 876	284 850	266 417	658 834	9 033	6 966	26 966	33 932	701 800	
	Dec	76 619	31 329	286 002	269 217	663 167	8 967	7 594	23 653	31 246	703 381	
2003:	Jan	77 669	31 375	289 003	273 833	671 878	7 530	54 366	26 492	80 861	760 271	
	Feb	78 910	31 976	292 702	270 778	674 366	5 714	62 754	21 814	84 568	764 648	
	Mar	79 839	31 812	296 468	274 662	682 781	5 300	66 272	23 513	89 784	777 866	
	Apr	81 100	32 767	300 115	290 146	704 127	5 119	81 387	21 169	102 557	811 802	
	May	82 344	33 865	304 291	281 189	701 689	5 291	56 705	21 231	77 936	784 916	
	Jun	83 192	33 818	307 059	290 197	714 259	6 324	47 440	22 772	70 211	790 802	

## Appendix – (continued)

Credit extended to the domestic private sector <sup>2</sup>											
End of	Loans and advances						Bills discounted	Investments			Total
	Instalment sale credit	Leasing finance	Mortgage advances	Other loans and advances	Total	Derivatives		Other	Total		
2003: July	85 184	33 315	311 055	287 289	716 839	6 299	47 833	23 323	71 155	794 296	
Aug	86 070	34 510	314 943	282 660	718 183	7 325	49 170	22 777	71 947	797 454	
Sep	87 346	34 836	318 711	284 057	724 950	6 556	60 162	23 796	83 958	815 464	
Oct	89 390	34 866	323 300	283 436	730 991	7 030	62 952	24 385	87 337	825 359	
Nov	87 835	35 479	328 342	292 481	744 137	8 044	70 426	24 993	95 419	847 600	
Dec	89 209	37 166	331 843	287 900	746 119	7 785	59 994	24 316	84 310	838 214	
2004: Jan	89 982	37 157	334 737	293 087	754 963	7 449	44 107	24 544	68 652	831 063	
Feb	91 658	37 515	339 009	291 097	759 280	6 493	39 583	21 785	61 367	827 140	
Mar	93 049	38 581	344 911	290 999	767 541	5 935	37 188	24 248	61 437	834 913	
Apr	94 160	38 688	349 429	292 352	774 629	5 312	27 749	24 007	51 756	831 697	
May	95 956	39 102	354 633	275 948	765 639	6 420	32 074	21 519	53 593	825 652	
Jun	97 566	39 748	361 749	278 654	777 717	5 269	31 690	22 337	54 027	837 013	
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											

<sup>1</sup>Monetary institutions: Consolidation of the central bank plus other depository corporations.

<sup>2</sup>Domestic private sector more precisely refers to all domestic sectors excluding central and provincial government. Components may not add up to totals due to rounding.

# Corporate profitability and leverage: an international comparison in the framework of national accounts<sup>1</sup>

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Profitability of non financial companies is a feature of utmost importance in the competition for international financing. It is usually analyzed from two different points of views:

- return on capital reflects operating results (earnings before interest and taxes) and doesn't reflect financing decisions;
- return on equity reflects all the decisions, both operating and financial, taken by firms and is mainly valued by share holders.

The difference between return on capital and return on equity is known as leverage. It isolates the consequences of financing decisions on profitability and depends on:

- the difference between the return on capital and the cost of debt;
- the net debt to equity ratio, known as leverage ratio.

International comparison of profitability by means of an analytical model of leverage helps to depart factors linked to the macro-economic environment, such as business cycle, inflation, interest rates and tax rate, from factors that firms can handle such as profit share and indebtedness.

National and financial accounts are especially indicated for international comparisons as they are harmonized under SNA 1993 or ESA 1995 and as their accounting principles are usually relevant for economic analysis. However, the implementation of harmonized rules remains faced to national features (see Askenazy (2003)). That is why the results of this paper are to be submitted first to national and financial accountants, in order to detect what differences in level or variation are caused by country specific statistical features. Regarding the accounting principles, valuation of transactions and outstanding amounts at current prices is common rule, but where it is not directly available in basic accounting data, it is estimated with conventional methods. This should lead the user of the data to be very cautious. Two very difficult points are to be mentioned: the estimation of non financial assets and the exclusion of holding gains and losses from the profits, while taxes are paid for them.

The paper is based on work which has considered aggregated data for non financial companies. It has not controlled for structural differences between countries due either to relative importance of the diverse branches, which affects more especially the productivity of capital, or to the size of companies, which is of importance in the cost of debt.

The paper is structured as follows: section 1 shows that leverage does not evenly influence profitability across a set of countries (United States, Japan, Germany, France and United Kingdom) in the 1987–2002 period; section 2 analyses the return on capital (before tax) which is a major input in the assessment of profitability and leverage; section 3 documents the impact of real interest rates on leverage and section 4 questions whether leverage has effectively induced corporations to increase indebtedness. Annex 1 gives a detailed presentation of the underlying analytical model. And Annex 2 provides longer series (1979–2002) for France and the US.

## 1. Profitability and leverage

An usual analysis of corporate profitability stems from a model which breaks down return on equity into return on capital and leverage (Maarek (1984), Levy–Garboua and Maarek (1995))

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$$R_E = R_C + \underbrace{(R_C - r) \times \frac{ND}{NE}}_{\text{leverage ratio}} \times \text{leverage}$$

with  $R_E$ , return on equity,  $R_C$  return on capital,  $r$  real cost of net debt,  $ND$  net debt and  $NE$  equity (see annex 1 for the complete model). Debt and equity are net, because assets of the same type (asset bearing interest in the case of debt, shares held in the case of equity) are deducted from the liability side. Both return on equity and return on capital may be computed before or after tax. For the computation of leverage, they were computed after tax (see Box 1).

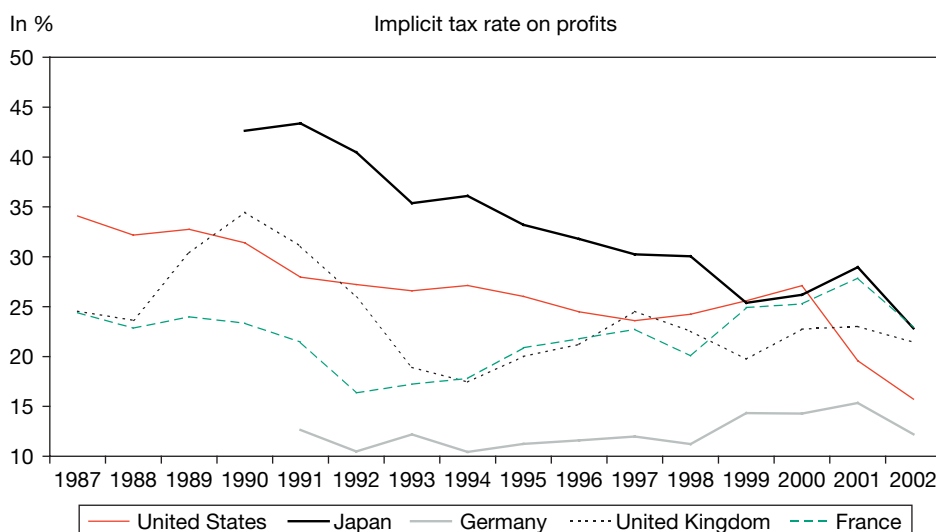
In graph 1, the return on equity and the return on capital (after tax) are pictured from 1987 onwards for the US, Japan, Germany, France and the UK.

**Box 1 – Tax on profit and leverage**

*National accounts provide taxes effectively paid on profit series. The corresponding amount is naturally deducted from the profit after tax and interest payments which is used at the numerator of the return on equity ratio.*

*Breaking down the return on equity into return on capital and leverage implies to allocate this effective tax burden to each component of the profitability ratio. In every country, interest paid are deductible from the tax base and the relative cost of debt is consequently lower after tax. To allow for the asymmetric tax treatment, the net operating surplus is diminished with the tax that would be paid on it if no interest was due, and the interest rate is discounted with the tax save entailed by the payment of interest.*

*In order to make these calculations, an implicit tax rate is obtained by dividing tax effectively paid by the tax base i.e. profit after interest payments. Contrary to the nominal tax rate, the implicit tax rate takes into account the absence of payment by companies incurring losses. It is much lower than the “face” tax rate. The tax that would be paid if the firm had no debt, to be deducted from the net operating surplus at the numerator of return on capital after tax, is computed as net operating surplus time the implicit tax rate on profit. This amount of tax is higher than the tax effectively paid by the firms. The save on tax due to deductibility of interest payments, to be deducted from the interest paid after tax, is computed as net interest time the implicit tax rate. Finally, the tax that would be paid without debt minus the tax save due to interest payments equals the tax effectively paid by firms.*



$$\tau = \frac{T}{NOS - NIP} \Leftrightarrow T = (\tau \times NOS) - (\tau \times NIP)$$

$\tau$  = implicit tax rate on profits after interest payments

NOS = net operating surplus

NIP = net interest paid

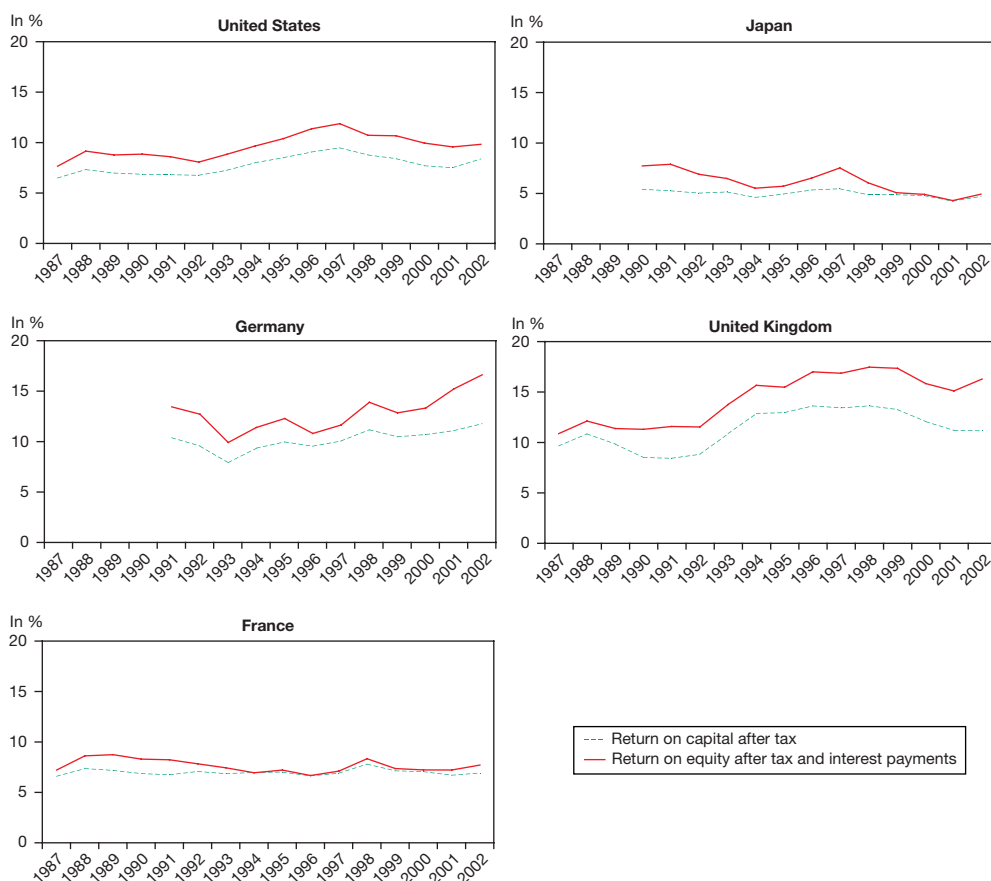
T = tax effectively paid on profits

It is worth noting that the implicit tax rate is especially low in Germany, while the nominal tax rate is similar to other countries. As a consequence, the return on capital after tax is higher, relative to other countries, than the return on capital before tax.

From graph 1, an overall assessment can be made.

- The return on equity is mainly shaped by the return on capital. Following the slowing down period of the early 90s, the return on capital had improved until 1997 in the US, Japan and until 1998 in Germany, France and the UK (in the UK the recovery looks to have been fairly strong in 1993 and 1994). Then the ratio went on a declining trend everywhere until 2001 but in Germany where it started to increase again in 2000. In 2002 the ratio seems to have stopped declining in the UK and moved up in the other partners. At the end of the period the return on capital ratio looks rather “high” in the UK and Germany (11–12 %), rather “low” in Japan (at 5%) and in between in the US (8–9%) and in France (7%).
- The gap between the two lines reflects leverage. It looks quite steady around 2–3% in the United States. In Europe, it seems to have progressively widened since 1996, up to 5% in Germany and the UK whereas the evolution is much less strong in the case of

Graph 1 – Leverage after tax: return on equity after payment of interest and return on capital, both of them after tax

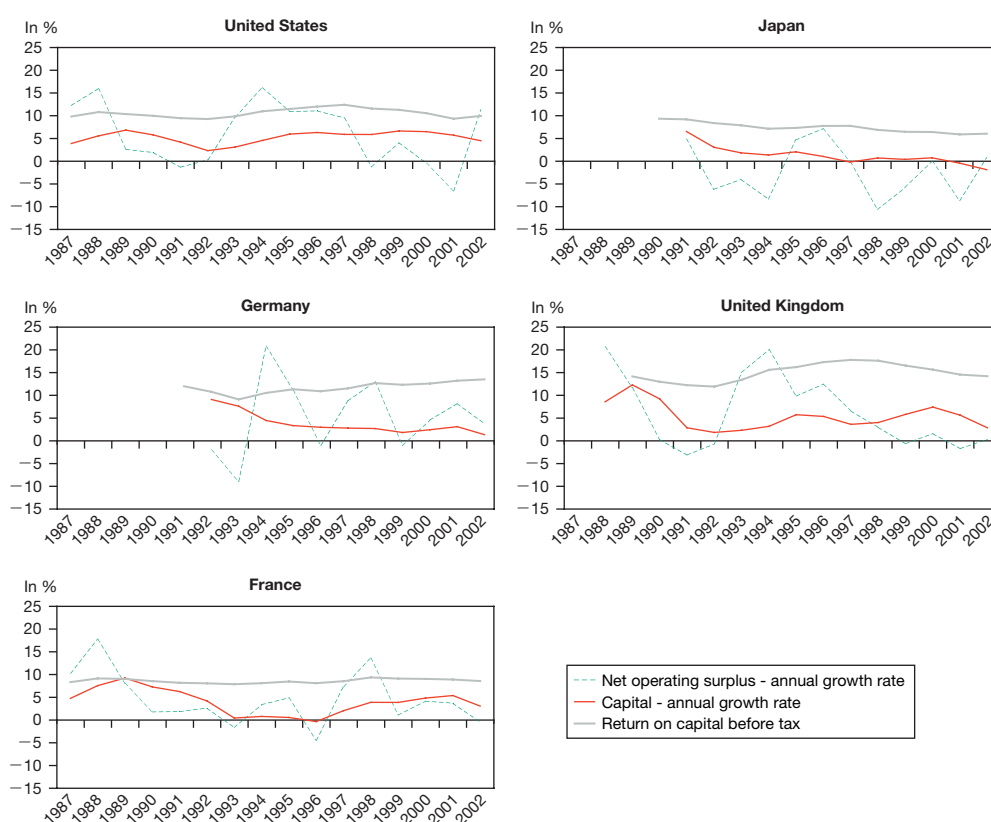


France. Conversely, leverage decreased in Japan in 1998 and 1999 and has remained nil since then.

## 2. Return on capital is decisive for profitability

Estimating the return on capital is an essential step when assessing profitability and leverage. This measure of profitability is well documented (see among others ECB (2004), Sylvain (2001), Walton and Citron (2002) for international comparisons and Wolff (2003) for the US). The return on capital has showed a cyclical pattern in graph 1. Graph 2 gives some more insight by showing both the annual growth rate of net operating surplus (the numerator of the ratio) and the annual growth rate of capital (the denominator of the ratio). The first component is of course much more sensitive to activity than the second one which is very slow to adjust.

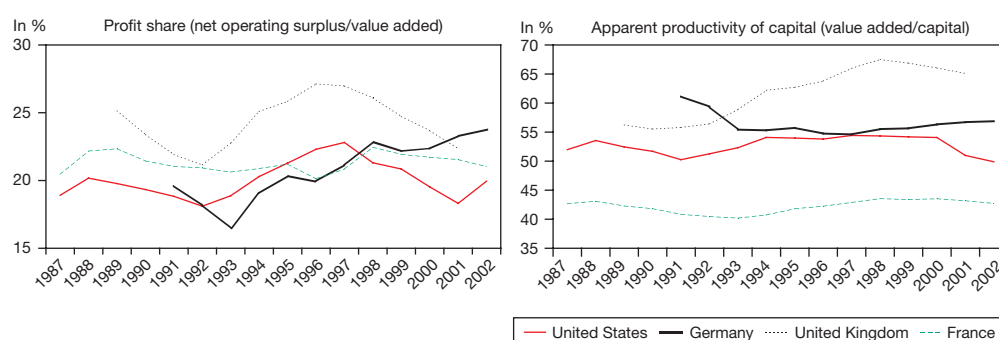
Graph 2 – Change in the return on capital (before tax): annual growth rate of the net operating surplus and annual growth rate of the capital



Focusing on the apparent downward move experienced from 1998–1999 until 2001, it may be worth mentioning the following observations.

- In the US, the cyclical slowdown in operating surplus went hand in hand with a steadily high growth rate of capital.
- In Japan, the return on capital has been partly preserved by the slow down of capital. The growth rate reached zero in 1997 and has been at a standstill since then. This was not sufficient however to offset the recession of the operating surplus on average over the period.
- In Germany, the capital growth rate recorded a declining move also, even if it stayed at a higher level. The operating surplus still recorded on average a significantly positive growth rate over the period, which lead to the upward trend in profitability.
- In the UK, like in the US, the negative impact on the return on capital of the slowdown of the operating surplus was reinforced by the steady evolution of the capital stock until 2001. The result was the cyclical move in return on capital.

Graph 3 – Change in the return on capital before tax: profit share and capital turnover



– In France, the capital growth rate stayed steady as well and slightly above the operating surplus growth rate affected since 1999 by the cyclical slowing down.

Those rough observations can be confirmed by the analysis of the return on capital in terms of profit share and capital productivity. Graph 3 picture the breaking down of the return on capital (before tax) into profit share and productivity of capital, according to the usual formula:

$$\text{return on capital} = \text{profit share} \times \text{productivity of capital}$$

$$\frac{NOS}{NC} = \frac{NOS}{GVA} \times \frac{GVA}{NC}$$

with NOS, net operating surplus, GVA gross value added and NC net capital.

Clearly, the cyclical component of the return on capital stems from the profit share: usually there is a lag between the rise in activity and value added on the one hand, the increase in labor costs on the other hand. The higher variability of the return on capital in the United States and the United Kingdom comes from the high cyclical variability in profit shares, which is not experienced to such an extent in France and Germany. Moreover the cyclical pattern is difficult to exhibit in Germany where the profit share seems to have followed a catching up trend after the German unification.

Of course, the apparent productivity of capital is more structural: it is impacted by the labor to capital ratio and by the productivity of labor; the higher they are, the higher the productivity of capital is. It may also be analyzed as the inverse of the service life of capital: the more rapidly capital is retired, the higher its productivity. This type of approach would help to pinpoint structural differences between countries if only the measurement of capital could be further harmonized (see Box 2). With the measures of capital used in the paper and focusing again on the 1997–2001 period, it appears that the productivity of capital in the UK, high and rapidly rising until 1998, supported high return on capital and partly absorbed the decline in profit share until the end of the period. In Germany the rather high and resilient capital productivity added its impact to the upward trend in profit share. In the US also, capital productivity was rather high and resilient and it contributed there to compensate for a rather low profit share. In France the apparent capital productivity remained at a low level despite a phase of progressive improvement and weighted on return on capital.

**Box 2 – Measurement of capital stock and net equity**

*The stock of capital, also used to calculate net equity, is defined as the stock of fixed assets resulting from the gross fixed capital formation plus the circulating capital i.e inventories, trade receivables net of payables and net leads and lags.*

*Measuring the value of the stock of fixed assets and the related consumption of fixed capital in a comparable manner in the different countries is crucial to obtain comparable results for profitability. The net return on capital is especially sensitive as the stock of capital*

appears on the denominator and the consumption of fixed capital is deducted from the numerator.

National accounts usually use a perpetual inventory method which proceeds as follows (OECD (2001)):

- the gross capital stock is first estimated by accumulating gross fixed capital formation;
- the consumption of fixed capital is then estimated by applying a depreciation formula to the capital stock. Usually, the depreciation formula allows for the fall in the price of an asset that should stem from the reduction of its remaining life length. The time at which the asset is discarded is determined by a mortality function and depends on the kind of asset considered. Moreover the national accounts, in some countries also take into account the fact that, during their service life, capital assets already in use become usually less and less efficient. Older capital assets should then be depreciated compared to newer capital assets because they are less efficient, even in the absence of obsolescence. This gives rise to a depreciation function that links the age-price profile of an asset to its age-efficiency profile;
- the consumption of fixed capital is deducted from the gross stock to obtain net stock of fixed capital;
- a price index is finally used to estimate the net stock of capital at current price.

The lack of comparability regarding the coefficients for the mortality and depreciation functions as well as the hypothesis of a fixed service life have been criticized. In that context, it is not sure that differences in coefficients and service life across countries reflect effective difference in the efficiency and value of capital assets. They make capital stocks hardly comparable.

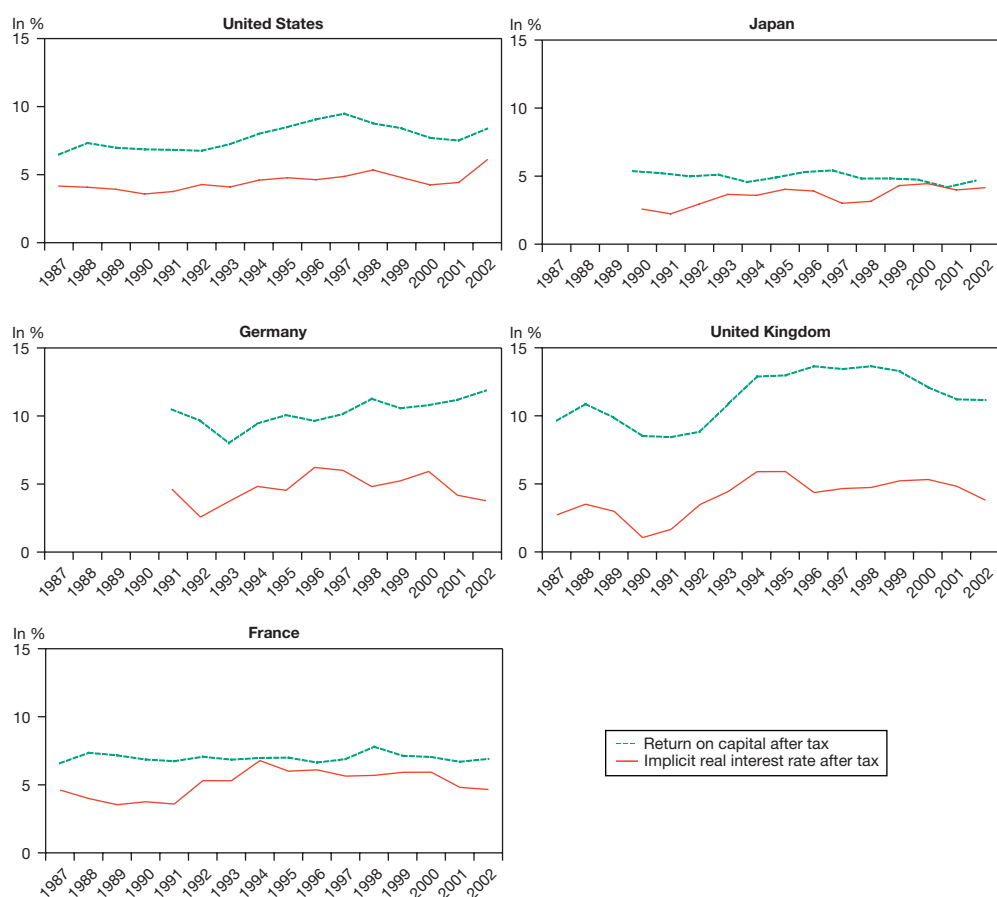
That is why the Directorate Economic Analysis and Research of the Banque de France has developed its own estimate of the net stock of fixed capital (Villetelle (2004)). The assets considered are non residential buildings on the one hand and machinery and equipment on the other hand. This hence excludes a significant part of fixed assets, especially computer software. The life length of the various types of assets has been harmonized across countries. The average life length is 10 years for machinery and equipment and 67 years for non-residential buildings – this distinction has not been made in the case of Japan, due to data availability. The corresponding age-price profiles for each type of assets in all countries have been deduced consistently from identical hyperbolic age-efficiency profiles. On the basis of available series of gross fixed capital formation and price indices, the resulting consumption of fixed capital for the private sector in all countries as well as for France has been computed. For Germany, it was assumed that the net capital stock of East-Germany was nil when the unification occurred.

This evaluation of the capital stock has been performed for the private sector as a whole. The evaluation for the non financial corporation only has been computed using ratio obtained from the national accounts (when the data was found, the stock of fixed asset of non financial corporation/stock of fixed asset of private sector and if not available, consumption of fixed capital of non financial corporation/consumption of fixed capital of the private sector).

The results may be quite different from the data extracted from national accounts. The Banque de France estimates of stock of capital are substantially higher in 2002 for France (+40%) and Japan (+28%), they are roughly similar for the United States (+7%) and smaller for the United Kingdom (–15%) and Germany (–40%). However, the consumption of fixed capital is lower in all cases and this has an overwhelming effect. The return on capital computed in this paper is smaller for France, but higher for the United States, Japan, Germany and the United Kingdom, than what it would be if the national account series of fixed capital were used for the same type of computation. Accordingly, the leverage is higher, except for France.

The net equity is defined as the sum of capital and financial assets bearing interest (that means excluding shares and other equities held) less debt. Equivalently, it is equal to shares and other equities issued plus net worth less shares and other equity held. The pros for this computation is that it overcomes the lack of harmonization among countries in the valuation of shares, especially unquoted shares. The cons are linked with the definition of net worth which includes accumulated net lending and net borrowing as well as differences in the revaluation of assets and liabilities. Thus, the changes in equity are not due only to the issue of equity securities.

Graph 4 – Difference between return on capital (after tax) and implicit real interest rate on net debt (after tax)



### 3. Return on capital higher than real interest rate induces positive leverage

Leverage is the product of two factors: on the one hand the difference between return on capital and implicit real interest rate on net debt, on the other hand the leverage ratio which is also net debt divided by net equity ratio.

Leverage is positive if return on capital is higher than implicit real interest rate on net debt. This feature is particularly important for the management of firms:

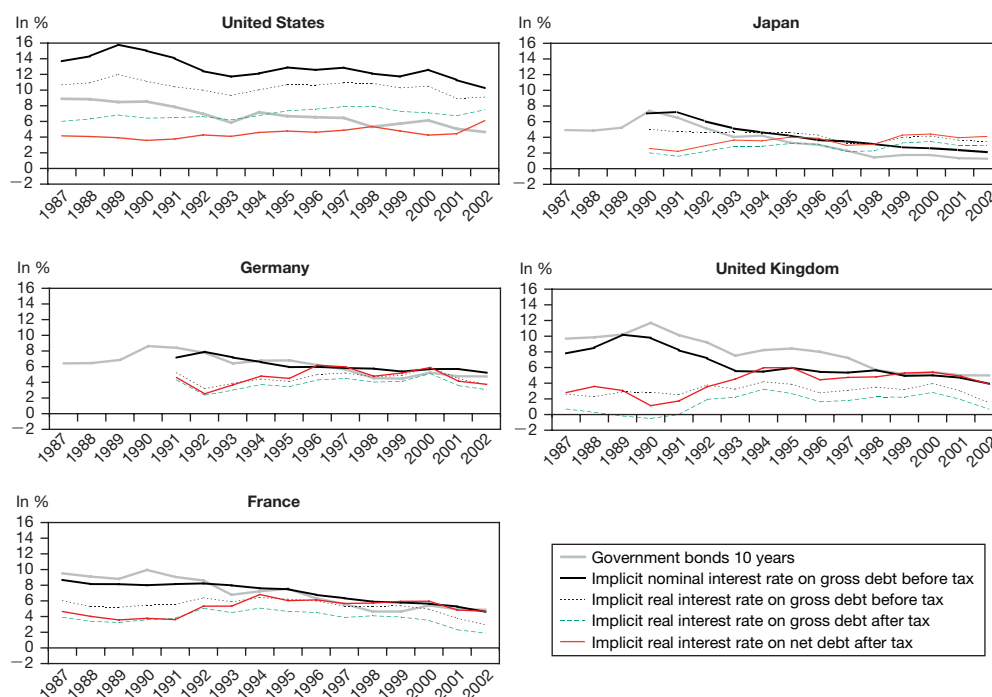
- in that case only should firms incur debt in order to get into productive activities;
- when firms are highly indebted, the reversal of the difference between return on capital and cost of debt may entail an unanticipated and sharp downturn in profitability.

Graph 4 compares return on capital to real interest rate, as it should be defined in the context of the national accounts. Box 3 gives the details about the computation of the “implicit real interest rate on net debt (after tax)” which has been used for the computation of leverage in the paper and is named “real cost of net debt” in what follows.

From graph 4, some features of the gap between return on capital and real cost of net debt may be worth noting. The gap looks especially high in the UK and Germany. On the opposite it declined to level close to nil in Japan.

- In the US, the gap reached a pick in 1996–97 and then has progressively shrunk.
- In the UK, the gap reached a higher pick in 1996 and has staid around 7% since then. The recent decline in the return on capital has been followed with some lag by a decline in the real cost of net debt.
- In Germany, the gap has increased progressively since 1996 thanks to both growing return on capital and real cost of net debt bowing slightly.
- In France the gap looks lower but it has also widened progressively since the mid nineties.
- In Japan, it has declined to very low levels since 1999 with the very specific feature in the last years of increasing real cost of net debt.

Graph 5 – From risk free rate to implicit real interest rate on net debt after tax



The real cost of net debt has tended to converge to around 5% in the considered countries. It may be of interest to uncover some factors behind this outcome.

In graph 5, looking at the different steps from spot interest rates to real cost of net debt gives some clues.

- The implicit nominal interest rate on gross debt is likely to be higher than risk free spot rates, especially when inflation is declining. This is the clear picture we get when we look at the US. But the gap is not so clear in other countries where it even happens to be negative. Going further in the diagnosis would need to look at the maturity structure of corporate debt, especially the size of the debt at variable rate indexed on money market rates. It cannot be done with national account data.
- Implicit real interest rates on gross debt are lower than corresponding nominal interest rates, except in Japan. The difference shrank until 1998–2000, due to the decrease in inflation. The analysis of longer term series (United States, France) confirms the positive impact on leverage of a high, non fully anticipated inflation. The reverse has been true in Japan in the last years.
- The decrease in implicit tax rate was significant in the United States and Japan over the period. It reduced the tax advantage linked to indebtedness. In France, Germany and the United Kingdom, where implicit tax rates have increased from 1992 until 2001, the variation of the tax advantage is smaller or nil.
- The real cost of net debt is higher than the real cost of gross debt except in the US. The difference is larger in the United Kingdom and France (almost 3 points in 2002) than in Japan and Germany. That means that the return on assets bearing interest is substantially lower in these countries than the interest rate paid on debt. Thus we may wonder why European non

### Box 3 – The cost of debt

*The cost of debt, as calculated in our model, is an implicit interest rate, adjusted for inflation, tax and holding of financial assets bearing interest.*

*Firstly, it is an implicit interest rate. Computed as effective interest paid divided by the average debt over the period, it differs from current set of spot rates at end of period in two manners:*

- *it takes into account debt incurred in the past and not only debt incurred during the current year and thus strongly depends on the firm's debt structure by maturity. As a consequence, the recent fall in interest rates was shown in our cost of debt with some lags.*



– it includes an average risk premium on securities and loans which depends on the health of companies over the cycle.

What is regarded is the average cost of existing debt. One may wonder if the decisive variable is not the marginal interest rate on new debt. This information is available but the marginal return on new capital, to be compared with it, is not. Our choice is thus driven by availability of information.

Secondly, it is a real interest rate, to be compared with a real return on capital. It is computed as effective interest paid less the depreciation (relative to other variables such as net operating surplus recorded at transaction value, capital recorded at replacement cost) of the debt recorded at nominal value -i.e. loans and deposits. When inflation is high or rising, anticipated inflation *ex ante*, as witnessed in the nominal interest rates, may be lower than realized inflation *ex post*. This may lead to negative real interest rate ; inflation pushes to higher indebtedness. The decrease in inflation in every countries, not totally anticipated in the interest rates, had a negative impact on leverage and may have incited companies to incur less debt.

Thirdly, the interest paid being deductible from the tax base, the cost of debt should be reduced from the subsequent tax save (see Box 1). The decrease in nominal tax rate enhance the return on equity and the return on capital but reduces the tax advantage of indebtedness.

Fourthly, the interest rate is computed on the debt, net of asset bearing interest (deposits, loans and securities other than shares). If return on assets bearing interest is lower than the cost of debt, non financial companies margin on this type of operations is negative. It thus increases the cost of net debt. The parallel increase in financial assets and financial liabilities made these negative margin on financial transactions more substantial, especially in France and the UK.

The following formula summarizes the adjustments that are made to the cost of debt.

$$r = \frac{(1-\tau) \times NIP - \pi NDNV}{ND}$$

*NIP* = net interest paid

*ND* = net debt

= interest bearing liability (deposits, loans, securities other than shares) – interest bearing asset (deposits, loans, securities other than shares)

$\pi$  = inflation rate

*NDNV* = net debt at nominal value (deposits, loans)

$\tau$  = implicit tax rate on profits after interest and adjustments

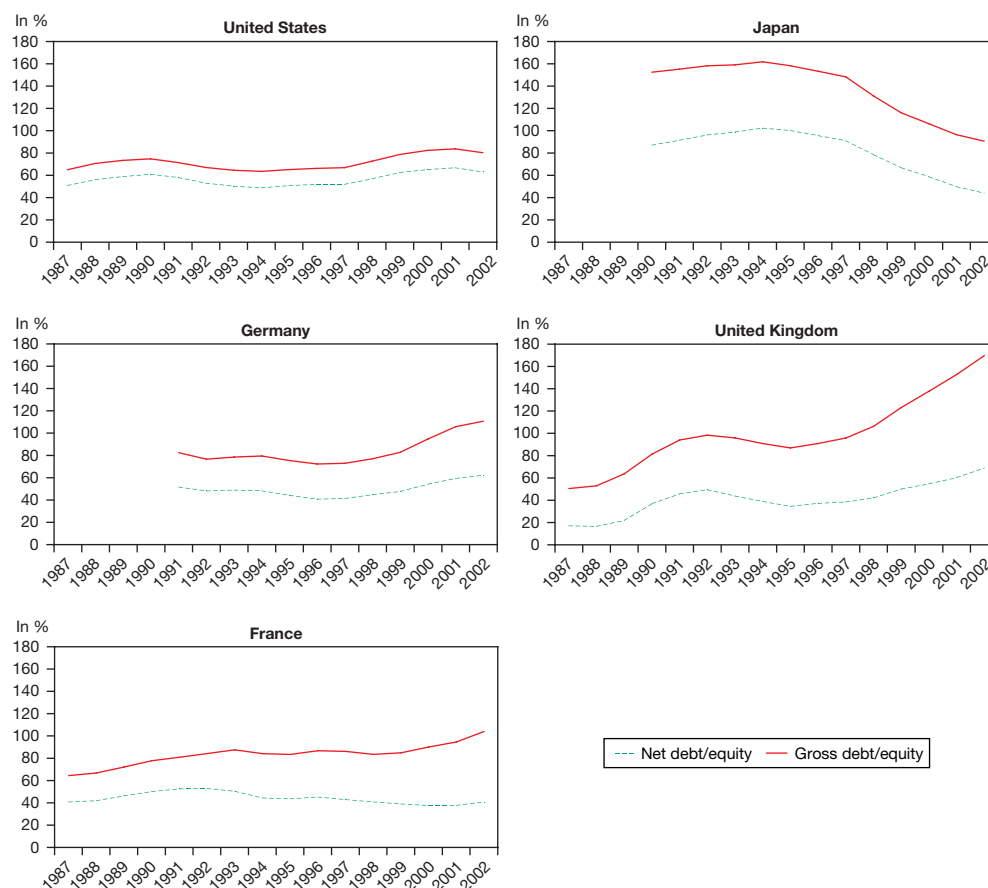
financial corporation hold more and more financial assets bearing (low) interest. One explanation may be the concentration of companies within larger groups and the grant of loans between affiliates. A similar reason could be the need for cash due to intense re structuring. The phenomenon is not observable in the United States because data are consolidated within the non-financial corporation sector.

#### 4. Are companies incited to incur debt?

The leverage ratio is defined as net debt on equity. As such it is not only an indicator of indebtedness but also an indicator of financial soundness. It measures the ability of companies to reimburse their debt by selling financial assets or stemming their capital, when they are faced to a sharp fall in profits.

Its evolution is strongly influenced by the change in net debt. For a constant capital stock, incurring gross debt impacts positively the numerator and negatively the denominator, giving rise to an increase in leverage ratio. On the opposite, investing in assets bearing interest impacts negatively the numerator and positively the denominator, pushing the leverage ratio down. It is thus of some interest to depart the consequences on the leverage ratio of the indebtedness policy from the influence of the financial investment policy. This is done by computing a “gross” leverage ratio (gross debt/equity) beside previously defined “net” leverage ratio (net debt/equity).

Graph 6 – Gross and net leverage ratio



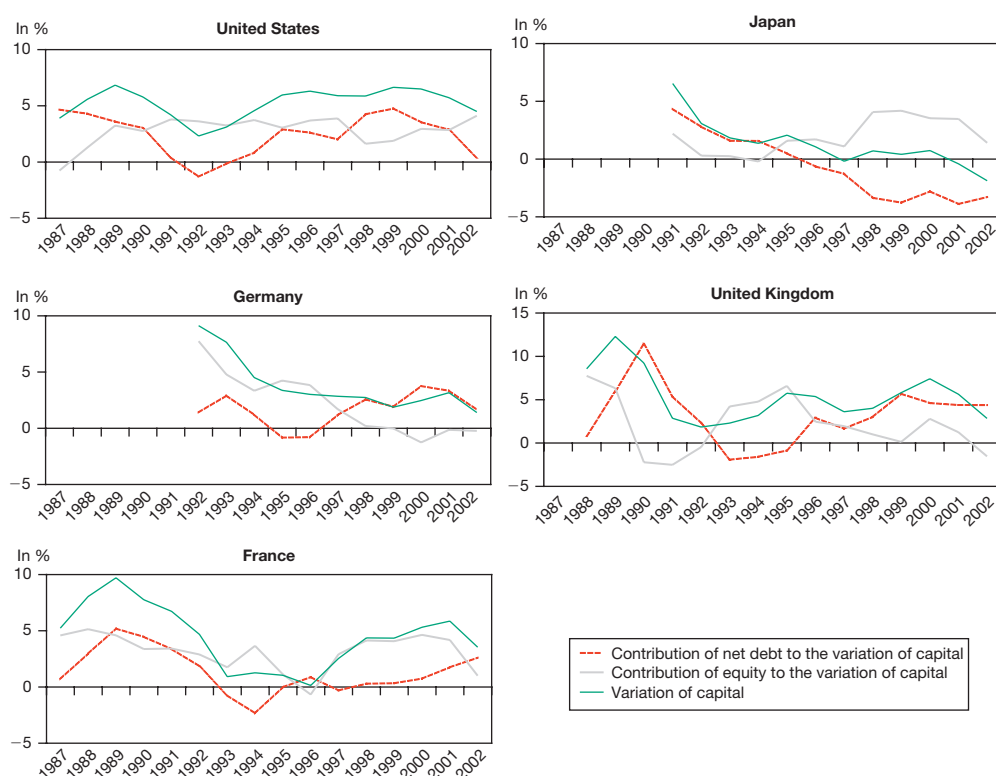
Graph 6 shows the evolution of both gross and net debt to equity ratios. They have rather increased in recent year except in Japan.

- In Japan the two ratios have fallen sharply since 1995 in parallel.
- In the US the ratios are quite close and do not fluctuate much. They only slightly increased in 1998–2001.
- In Germany, the gross ratio has increased since 1998 but the picture is much less pronounced when looking at the net ratio.
- France has experienced a more typical situation. While the gross ratio has increased again since 1999, the net ratio has continued to decline to reach again its low level of the mid 80s: the gross debt has financed financial assets bearing interest (including cash).
- An even stronger appetite for financial assets bearing interest (including cash) is felt by the firms in the UK. But both ratios have strongly increased reaching record high.

The leverage ratio mainly reflects the arbitration made by firms between debt financing and equity financing in order to cover a given capital stock. In our model, equity financing results together from the issue of equity securities, the accumulation of profit or a higher revaluation in assets than in liabilities. To show more clearly the elements of this arbitration, the contributions of net debt on the one hand and of equity on the other hand to the variation of the capital stock have been figured in graph 7. Globally data show that any fall in the contribution of debt is usually partly compensated by an increase in the contribution of equity, the main exception being France in 1993–1996. However, this only partial compensation allows for some trends (Japan, Germany) and for cyclical movements (United Kingdom, United States, France) in the variation of capital.

- In Japan, the increase in equity does not totally compensate for the decrease in net debt, the result being a decrease in the leverage ratio and a slower increase or even a decrease in the stock of capital.
- In Germany, in the wake of the shock of the unification, the continuous decrease in the contribution of equity resulted in a slowdown of capital and a decrease of the leverage ratio until

Graph 7 – Contributions of net debt and equity to the growth rate of capital



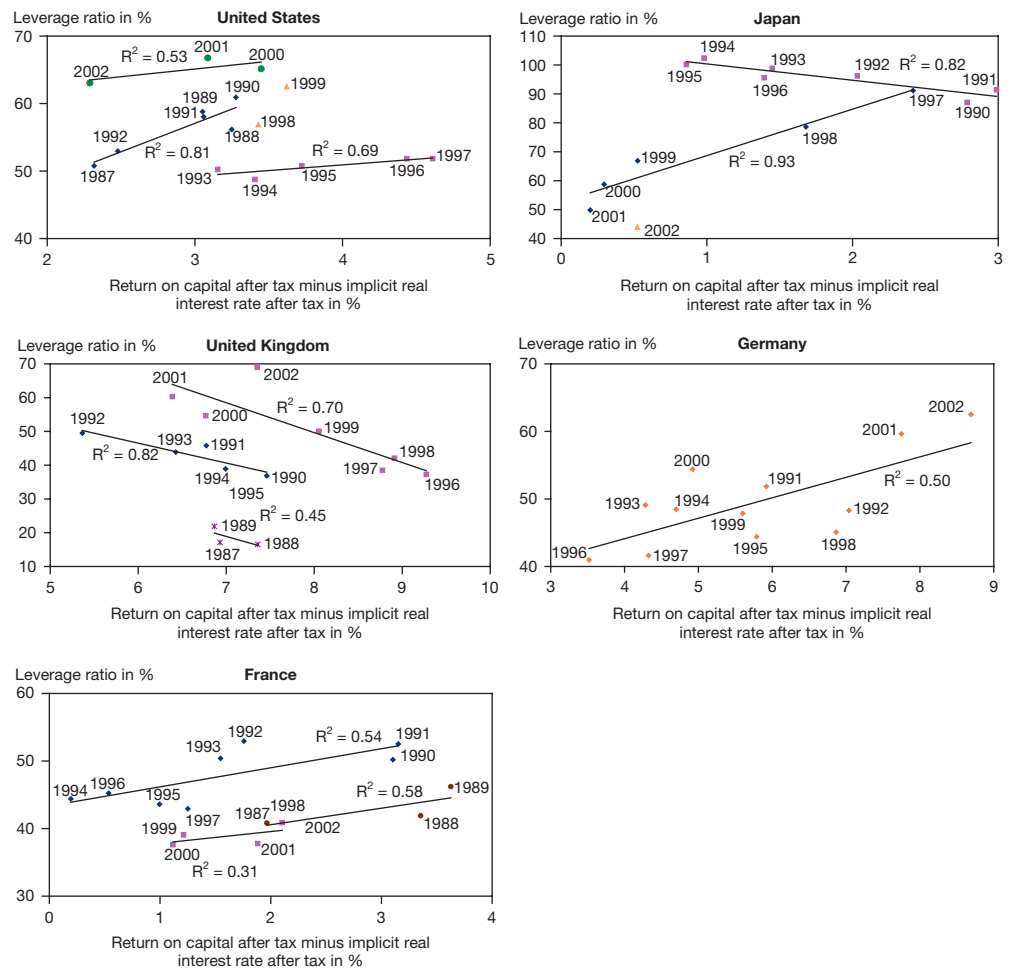
1996 (see Deutsche Bundesbank (2003) for an in-depth analysis). From then, the growth in net debt has compensated for the fall in the contribution of equity stabilizing the growth of capital and increasing the leverage ratio.

- The US experienced more usual cyclical falls in the contribution of net debt in 1991–92 and 2000–02, which were not offset by rises in the equity contribution and resulted in temporary falls in the annual growth rate of capital and downward phases for the leverage ratio. The contribution of equity, which is usually much more steady, weakened in 1987–88 and in 1998–99. That resulted in upward moves in the leverage ratio.
- In the United Kingdom about the same cyclical movements of the debt were experienced but they were much more offset by opposite movement in equity. The rise in the contribution of equity to the variation of capital, due to high increase in net operating surplus, largely compensated for the fall in the contribution of net debt from 1992 to 1995. This resulted in a temporary decline in the leverage ratio. From then, the increase in the contribution of net debt has pushed up the leverage ratio.
- In France a cyclical fall in the contribution of debt occurred in 1990–1994. Reinforced by the weakness of the contribution of equity, except in 1994 just after the trough of the cycle, it resulted in a fall in the leverage ratio and a slowing down of capital from 1990 to 1996. From then the contribution of equity was predominant in the growth rate of capital until 2002. In 2002 it declined, pushed down by the operating surplus, and it naturally resulted in an increase in the leverage ratio.

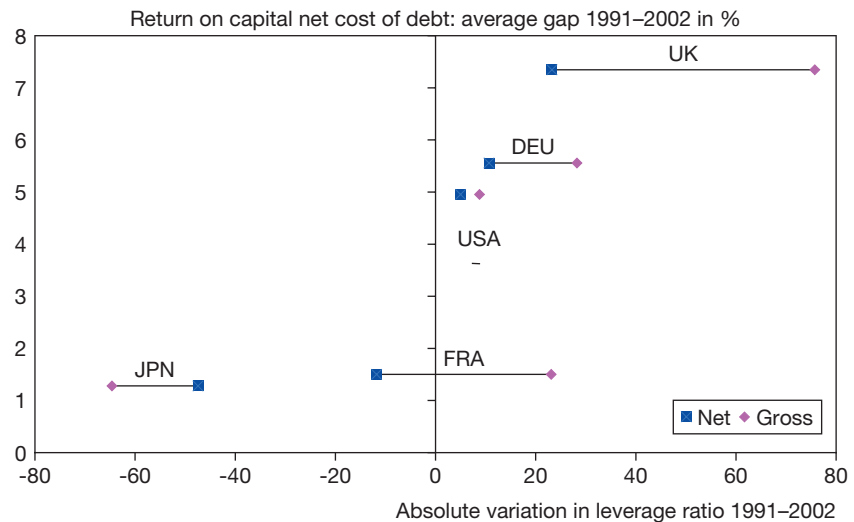
Finally, we may wish to go beyond the simple analytical model and question about some likely causalities. As firms can decide their level of debt, we may suppose that a high positive spread between the return on capital and the cost of debt invites firms to incur more debt, which increases the leverage ratio whereas a small or negative spread invites them to reduce their debt, pushing down the leverage ratio.

Graph 8 pictures the correlation between, on the one hand, return on capital minus real cost of net debt and, on the other hand, the leverage ratio. When observed on limited sub-periods, this correlation looks positive, except in the UK where it is negative whatever period is chosen, and in Japan before 1997 where the leverage was very high. From 1997 in Japan the correlation becomes positive as the leverage falls sharply and the gap between return on capital while real

Graph 8 – Short term correlation between indebtedness and the relative cost of debt



Graph 9 – 1991–2002: average gap between return on asset and real cost of net debt/variation of the leverage ratio?



cost of net debt is reduced to nil. In the United States and France, the shifts between the different sub-periods should be further documented and explained. In Germany, a positive correlation appears for the whole sample.

A positive correlation looks more firmly established over long period when considering graph 9. This graph crosses the average gap between the real cost of net debt and the return on capital on the 1991–2002 period on the one hand, with the change in the net leverage ratio between the beginning and end of period on the other hand. The correlation is not so good using the gross leverage ratio.

These results should be confirmed by introducing some dynamics in the model. The current experiment is limited by the use of average effective cost of debt and return on capital in place of the marginal cost of debt and return on capital, which is theoretically the variable taken into account by firms deciding new investment projects.

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As a whole, **conditional on the assumptions of the exercise** (harmonized depreciation functions for capital, equity being defined as share plus net worth, cost of debt being computed as an average effective net interest rate on net debt and being corrected for inflation and tax. . .), some main analytical features of profitability in the considered countries can be stated.

- In the United States return on equity is estimated to have reached about 10 % in the early 2000s, coming from a peak of almost 12 % in 1997. The slight decline is due to the cyclical downturn in profit share which has weighted on return on capital. Leverage does not seem very strong but significant and steady, partly due to a stemmed real cost of net debt. The spread between return on capital and real cost of net debt is about one point lower than in European countries, due to higher ex post inflation and positive influence of the management of interest bearing assets (including cash). Notwithstanding the relative stability of this spread, the leverage ratio has increased somewhat and remained around 55% in the early 2000s.
- In Japan return on equity has also experienced a decline from 1997 and seems to have stayed around 5% since 1999. The decline does not seem due to return on capital which despite a decreasing operating surplus (before tax) has been supported by a slowing down of the capital, now at a standstill, and substantial tax rate cuts. On the other hand leverage has had a negative impact on return on equity. Leverage has almost disappeared as the spread between return on capital and real cost of debt slid to nil. Real cost of debt, which used to be low until 1998, happened to be rather on the upward move in the last years of observation because of the price evolution. The decline in the spread seems to have triggered at last a downward adjustment of the leverage ratio which went down from over 90% in 1997 (over 100% in 1994) to around 45% in 2002: a sharp speed up of equity has gone hand in hand with a sharp cut in the corporate debt and a slowdown or even a decline of the capital stock.
- In Germany return on equity looks on an upward trend since 1994. On the one hand return on capital has moved up almost every year, with a break in 1996 and 1999. It has been sustained by an increasing profit share (before tax), which looks as if it were catching up after the record low reached in 1993. It has also benefited from a rather low effective tax rate, notwithstanding a slight rise from 1999–2001, and from a slowdown of capital. On the other hand the leverage has also had a growing positive impact since 1997. The gap between return on capital and real cost of net debt has widened. The net leverage ratio has reached above 60 %, record high in the country. Indeed, it seems that the contribution of equity to capital growth has sharply declined to become negligible since 1998.
- In France the evolution of return on equity looks rather flat. In the computation of the return on capital, the recovery of capital since 1997 has offset the impact of the growth of operating surplus. So the apparent capital productivity remains lower than elsewhere, whereas there is some clues that the estimation of capital stock could be biased upwards. The leverage has not a substantial influence. Certainly the spread between return on capital and real cost of net debt has widened somewhat. But surprisingly the net leverage ratio rather declined over the 90s to stabilize around 40 %. Most of the capital growth has been covered by equity. The growth of net debt was almost nil until 2000 and has increased significantly only since 2001. In fact interest bearing assets (including cash), have absorbed much of the gross funding, competing with capital as a cause for raising funds.
- In the United Kingdom return on equity reached record high levels in 1996–1999, around 17%, and slightly declined until 2001. It is mainly due to return on capital which benefited from a strong cyclical upturn in profit share and a rise in the apparent productivity of capital.

Leverage also added a positive impact. The spread between return on capital and real cost of net debt widened in 1994–1996, as the return on capital increased and the real cost of net debt reached a ceiling at about 5%. Despite this feature the net leverage ratio has only recently increased, since 1999, to reach record high around 65 %, while the spread has somewhat declined. Indeed equity has not contributed any longer to capital growth and gross debt has covered both capital growth and building up of interest bearing assets (including cash). So that the gross debt to equity ratio looks specially high in the UK, above 160% in 2002.

To end with a very positive tone, let us finally remind that the figures for the last available year, 2002, give the impression of a general improvement in all the countries. This apparent turning point will have to be confirmed and documented further with additional data.

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Annex 1

Analytical model of leverage

$$R_E = R_C + (R_C - r) \times \frac{ND}{NE} + toth$$

$$R_E = \frac{NOS - NIP - T + \pi NDNV + oth}{NE}$$

$$R_C = \frac{(1 - \tau) \times NOS}{NC}$$

$$r = \frac{(1 - \tau) \times NIP - \pi NDNV}{ND}$$

$$toth = \frac{(1 - \tau) \times oth}{NE}$$

$$\tau = \frac{T}{NOS - NIP + oth}$$

$R_E$  = return on equity

$R_C$  = return on capital

$r$  = implicit real cost of net debt

$\tau$  = implicit tax rate on profits after interest and adjustments

$\pi$  = inflation rate

$NC$  = net capital

$ND$  = net debt

= interest bearing liability (deposits, loans, securities other than shares) – interest bearing asset (deposits, loans, securities other than shares)

$NE$  = net equity =  $NC - ND$

= net capital + interest bearing asset (deposits, loans, securities other than shares) – interest bearing liability (deposits, loans, securities other than shares)

= (in principle only and valued at capital replacement cost) shares and other equity issued + net worth – shares and other equity held

$NDNV$  = net debt at no min al value (deposits, loans)

$NOS$  = net operating surplus

$NIP$  = net interest paid

$T$  = tax effectively paid on profits

$oth$  = other net income = net operations linked with insurance, net current transfers

$toth$  = other net income ratio

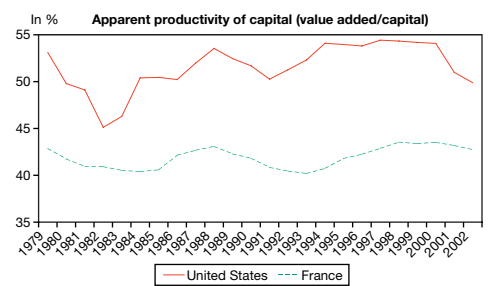
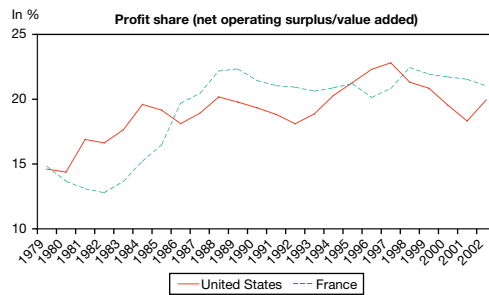
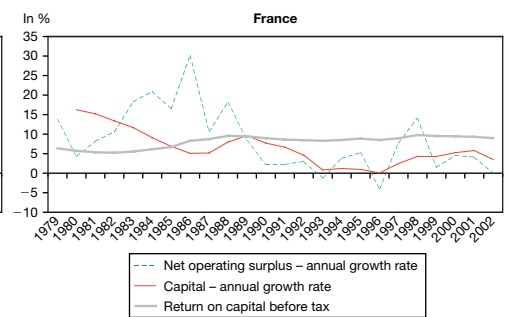
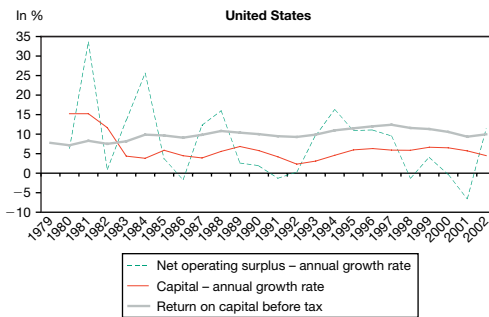
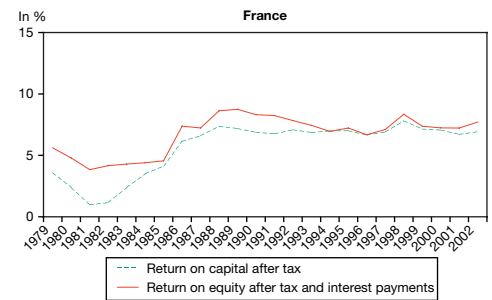
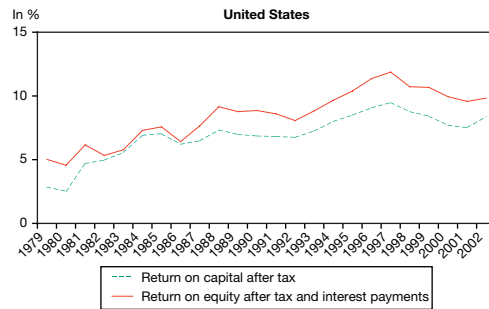
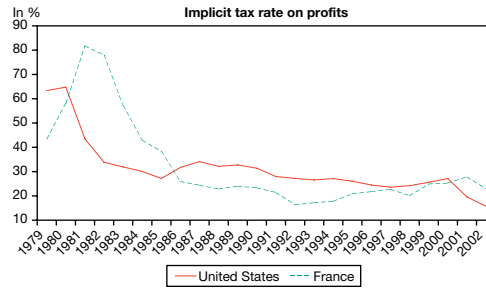
Remark: Other net income are usually negligible, they are included in the computation but omitted in the economic presentation of the model and explanation of the results.

$$\begin{aligned} R_E &= \frac{NOS - NIP - T + \pi NDNV + oth}{NE} \\ &= \frac{NOS - NIP - \tau(NOS - NIP + oth) + \pi NDNV + oth}{NE} \\ &= \frac{(1 - \tau) \times NOS - (1 - \tau) \times NIP + \pi NDNV + (1 - \tau) \times oth}{NE} \\ &= \frac{(1 - \tau) \times NOS}{NC} \times \frac{NC}{NE} - \frac{(1 - \tau) \times NIP - \pi NDNV}{ND} \times \frac{ND}{NE} + \frac{(1 - \tau) \times oth}{NE} \\ &= \frac{(1 - \tau) \times NOS}{NC} \times \frac{NE + ND}{NE} - \frac{(1 - \tau) \times NIP - \pi NDNV}{ND} \times \frac{ND}{NE} + \frac{(1 - \tau) \times oth}{NE} \\ &= \frac{(1 - \tau) \times NOS}{NC} \times \frac{NC}{NE} - \frac{(1 - \tau) \times NIP - \pi NDNV}{ND} \times \frac{ND}{NE} + \frac{(1 - \tau) \times oth}{NE} \\ &= \frac{(1 - \tau) \times NOS}{NC} \times \frac{NE + ND}{NE} - \frac{(1 - \tau) \times NIP - \pi NDNV}{ND} \times \frac{ND}{NE} + \frac{(1 - \tau) \times oth}{NE} \\ &= R_C + (R_C - r) \times \frac{ND}{NE} + toth \end{aligned}$$

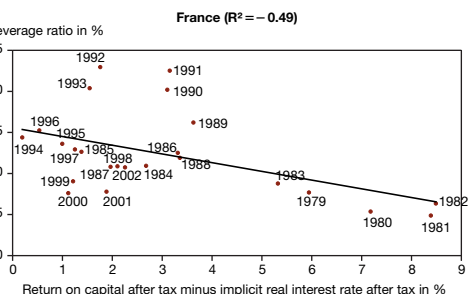
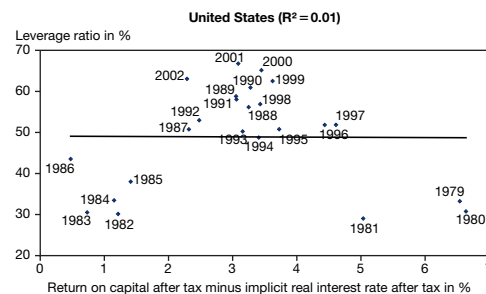
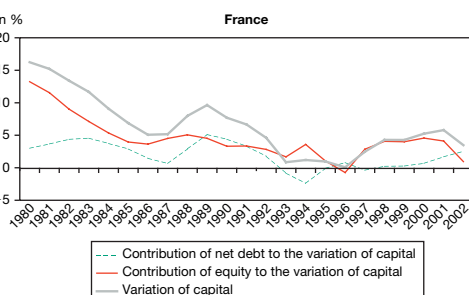
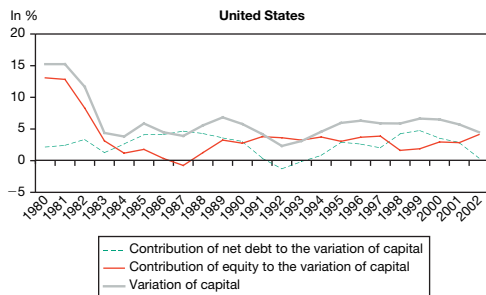
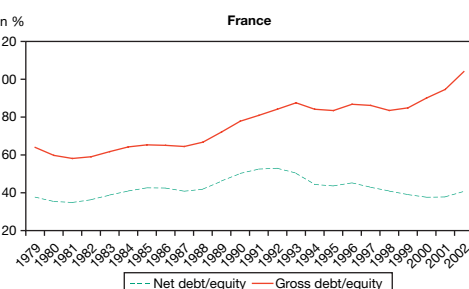
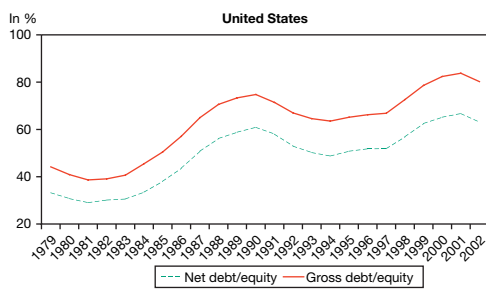
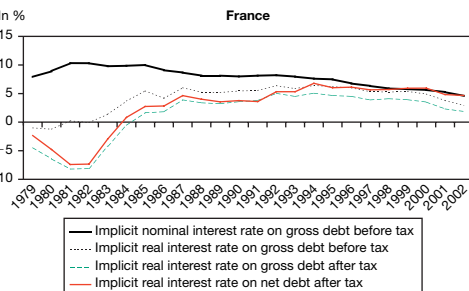
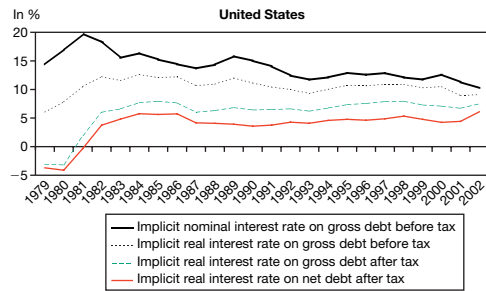
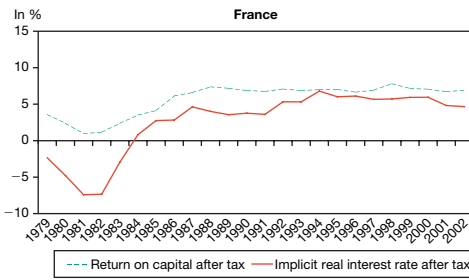
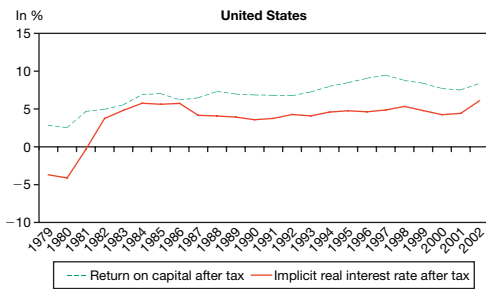


Annex 2

Long term data for United States and France



Annex 2 (continued)



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## WORKSHOP H

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# Financial accounts – linkage with balance of payments

Chair: Neil Patterson (International Monetary Fund)

Papers: **The revisions to the balance of payments methodological guidelines**  
Neil Patterson (International Monetary Fund)

**The statistical links between the financial accounts in the euro area BOP/IIP  
and the MUFA rest of the world account**  
Celestino Girón Pastor, Carlos Sánchez Muñoz (European Central Bank)

**Linking financial accounts with the BoP, portfolio investment and external  
debt positions: the case of the Czech Republic**  
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Central Bank of Austria)

**Cross-border lending and local bank presence: an overview**  
Dirk van der Wal (De Nederlandsche Bank NV)

# The revisions to the balance of payments methodological guidelines

Neil Patterson<sup>1</sup> (*International Monetary Fund*)

## Summary

Measurement of the external transactions and positions of member countries has been a central feature of International Monetary Fund operations since inception. Such measurement is conducted in the dual context of IMF responsibility for the surveillance of countries' economic policies and the provision of financial assistance in support of adjustment measures to correct balance of payments disequilibria. Consequently the IMF has a compelling interest in developing and promulgating appropriate international guidelines for the compilation of sound and timely balance of payments and international investment position (IIP) statistics. Such guidelines, which have evolved to meet changing economic circumstances and analytic requirements, have been embodied in successive editions of the IMF's *Balance of Payments Manual* since its first edition was published in 1948. Successive editions were published in 1950, 1961, 1977, and 1993.<sup>2</sup>

Against the background of significant changes in the international and financial environment since the fifth edition (*BPM5*) was published in 1993, the IMF Committee on Balance of Payments Statistics (IMF Committee)<sup>3</sup> decided that it would be appropriate to revise *BPM5*. The revision is being coordinated with the simultaneous review of the *System of National Accounts (1993 SNA)*, which is being undertaken under the auspices of the United Nations. Because the balance of payments accounts are an articulation of the rest of the world accounts of the national accounts, it is regarded as critically important that the two systems remain consistent to the maximum extent possible.

It is expected that the new manual will place greater emphasis on the IIP to facilitate balance sheet analysis. An extensive process of development, consultation, and review is now underway to produce new guidelines with a target date of late 2008. The target date fits well with the proposal to complete a review of the *System of National Accounts 1993* by 2008.

## 1. Needs for a revised manual

Despite changes in economic circumstances and policy since *BPM5*, it is considered that the existing guidelines have been robust and that the *overall structure* of the international accounts will be essentially unchanged in the new manual. However, there will be differences in detail. Specifically the factors that led to the decision to produce a new edition are the needs to:

- (a) take into account financial innovations that engender new types of financial assets and liabilities and increase growth in financial services;
- (b) clarify selected areas (e.g., scope of direct investment, services, the borderline between use of an asset and sale of an asset);
- (c) increase emphasis on the international investment position to facilitate the growing importance of balance sheet analysis and show the IIP fully interlinked with transactions and other flows;

1 This paper should not be reported as representing the views of the IMF. The views expressed are those of the author and do not necessarily reflect the views of the IMF or IMF policy.

2 A supplement to the 1993 (fifth) edition – covering the measurement of financial derivatives – was published in 2000.

3 A committee of senior statistical experts, from IMF member countries and from international organizations, who advise the IMF on balance of payments and international investment position statistics, and foster greater coordination among countries.

- (d) demonstrate the integration between international accounts statistics and other macroeconomic statistics, taking into account changes made as part of the review of the *System of National Accounts 1993 (1993 SNA)* and the publication of the *Monetary and Financial Statistics Manual 2000* and the *Government Finance Statistics Manual 2001*;
- (e) take account of developments in international accounting standards;
- (f) take into account specialized manuals, emphasizing the consistency of basic concepts of the inter-agency *Manual on Statistics on International Trade in Services*, inter-agency *External Debt Statistics: Guide for Compilers and Users*, IMF *Coordinated Portfolio Investment Survey Guide*, IMF *International Reserves and Foreign Currency Liquidity: Guidelines for a Data Template*, IMF *Compilation Guide on Financial Soundness Indicators*, and *OECD Benchmark Definition of Foreign Direct Investment*; and
- (g) deal with the special issues related to currency unions and other regional monetary and economic arrangements.

## 2. Structure of the new manual

The proposed structure of the new manual is somewhat modified from that of *BPM5* in order to present the IIP as a central element of the framework. Further, a sequence of chapters is proposed that lays out the accounting principles and conceptual framework, and describes financial instruments, before discussing financial positions and financial and nonfinancial flows. Also proposed are a chapter that will discuss uses of balance of payments and IIP data.

## 3. Processes of development, consultation, and review to produce the new guidelines

The IMF Committee has established a process of development, extensive consultation, and review that is well underway in order to prepare the revised manual on a target date of 2008. This is also the target date for completing the review of the *1993 SNA*.

### 3.1. Annotated outline

In April 2004, the IMF Statistics Department released for public comment the *Annotated Outline for the Revision of the Balance of Payments Manual, fifth edition (AO)*. The *AO* raises issues that have been identified and points to possible solutions. The Attachment to this paper lists and explains some of these issues.<sup>4</sup> The *AO* is designed to provide a framework for discussions on the updating of *BPM5*. To assist reviewers, questions about key issues are included. The *AO* is circulated to give statisticians and users an opportunity to provide views, and is posted on the IMF's website.<sup>5</sup> It is being translated into Arabic, Chinese, French, Russian, and Spanish.

### 3.2. Establishment of technical expert groups

To assist in the research and resolution of more complex methodological issues and to undertake a general review of the draft of the manual, three technical experts groups have been established. These groups are:

- (1) Direct Investment Technical Expert Group (DITEG). A range of issues are associated with direct investment. DITEG is a joint group of OECD and IMF. The work of DITEG is to be coordinated with the OECD revision of the *Benchmark Definition of Foreign Direct Investment*.
- (2) Currency Union Technical Expert Group (CUTEG). The issues associated with currency unions are specialized and will be given increased priority in the new manual, so this group will assist in dealing with the issues identified.

<sup>4</sup> The listed issues have been selected for consideration also in the review of the *1993 SNA* and the note emphasizes how they might affect that system.

<sup>5</sup> See <http://www.imf.org/external/np/sta/bop/bopman5.htm>.

(3) Balance of Payments Technical Expert Group (BOPTEG). This group will examine all other issues related to the update of *BPM5*.

Terms of reference for the TEGs have been drawn up and the membership established. The membership of these groups includes 44 experts from IMF member countries in all regions of the world and seven other international organizations. The documents of these TEGs (such as list of topics, issues papers, outcome papers) are posted on the IMF's website for information and comment.<sup>6</sup> Specific questions and comments on the papers of the three TEGs are welcome and should be emailed to [bpm5update@imf.org](mailto:bpm5update@imf.org). DITEG may complete its work by March 2005 and the other two TEGs may complete their work by 2006 or 2007.

In addition to the TEGs, various interagency task forces/groups will provide inputs for *BPM5* update. In particular, the Inter-Agency Task Force on Statistics of International Trade in Services and Inter-Agency Task Force on Finance Statistics will advise the Committee on the services-related and external debt-related issues.

### **3.3. Process for the update**

The next two years are particularly important for the update process because this period encompasses the most intensive review of and consultation on the methodological issues. Continuing contact will be maintained between the balance of payments community, and the Intersecretariat Working Group on National Accounts (ISWGNA) and the Advisory Expert Group on National Accounts (AEG), established by ISWGNA to assist in the *1993 SNA* review. By April 2006, the balance of payments community needs to report to the ISWGNA on the balance of payments issues that affect the *1993 SNA* review, after which no more substantive methodological changes are to be considered. After October 2006, new issues will not, for the most part, be considered for inclusion in the revised manual. Later in 2006, a draft of all chapters is scheduled for release on the IMF website for public review. Specific questions or comments on draft chapters or on the general update of *BPM5* can be emailed to [bpm5update@imf.org](mailto:bpm5update@imf.org).

In 2007–08, a program of broad consultation and review of the draft chapters will take place. It is planned that the Committee will approve a final draft of the manual at its meeting in late 2008, at which time the final draft, subject only to editing, will be placed on the IMF website. It is expected that the revised manual will be made available in hard copy in 2009 in English, with publication in other languages to follow.

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<sup>6</sup> See <http://www.imf.org/external/np/sta/bop/bopman5.htm>.

# A selection of rest of the world account-related issues for review in both the BPM5 revision process and 1993 SNA updating program

## 1. Meaning of “national economy”

The concept of “national economy” underlies the System but its definition receives very limited discussion in the *1993 SNA*. Offshore financial centers and zones of joint sovereignty are two cases that have emerged for which elaboration of principles for identifying the “national economy” would be useful.

In addition, the production of accounts for economic or monetary unions is of increasing interest. The aggregation of data for national economies raises some additional issues that could usefully be covered. As well, the sector and residence of institutions of the union and their national agents in national data needs to be discussed.

### ***Current treatment***

The concept of “national economy” appears in only a very limited way in Chapters I and II of the *1993 SNA*. Chapter XIV (paras. 14.9–11) has more discussion under the slightly different term “economic territory of a country,” but the definition of territory uses two criteria (*viz.*, “administered by a government” and “persons, goods, and capital circulate freely”) which may contradict each other in some cases.

### ***Possible changes***

- Should the SNA Chapter II define and elaborate on the “national economy”? Possible changes could include definition of an economy in terms of administration rather than free circulation; the specific inclusion of offshore financial centers with the possibility of separate data; and possible treatments of zones of joint sovereignty.
- Should the SNA refer to the possibility of data for economic and monetary unions as well as national economies? If so, should it provide any guidance on particular issues?

## 2. Application of the concept of “transaction”

### (a) “Change of ownership”

The principle of ownership is central to the determination of the timing of recording of transactions in financial and nonfinancial assets (including transactions in goods). The term “economic ownership” better reflects the underlying reality economic accounts are attempting to measure. Legal, physical, and economic ownership can be defined. Economic ownership takes account of where the risks and rewards of ownership lie.

### ***Current treatment***

The *1993 SNA* does not explicitly define ownership. Often it seems to imply legal ownership (paras. 3.97, 3.100), but in some instances it relies on the concept of economic ownership when legal ownership remains unchanged (paras. 6.118). In general, a change in legal ownership also involves a change in economic ownership. In some cases, a change of economic ownership takes place even though the legal ownership remains unchanged (for example, financial leases and



transactions between an enterprise and its foreign branches). In other cases, such as for repurchase agreements involving the provision for cash of securities, the risks and rewards attached to the asset remain with the original holder.

### **Possible changes**

- Should the term “change in economic ownership” be used to determine when a transaction occurs between two entities?
- If accepted, a definition of “economic ownership” needs to be added along the lines described in the *1993 SNA* (paras. 6.118, 10.44, 11.31, 14.58). These paragraphs state that a change in ownership from an economic point of view means that all risk, rewards, and rights and responsibilities of ownership in practice are transferred.

### **(b) Assets, liabilities, and personal effects of individuals changing residence (called “migrants’ transfers” in BPM5)**

#### **Current treatment**

The flows of goods and changes in financial accounts arising from a change in residence of individuals are treated as imputed transactions in the *BPM5*, which are offset in the capital account by capital transfers called migrants’ transfers (paras. 352–355). The *1993 SNA* is not explicit about changes in financial account and migrants’ transfers (as capital transfers), but it includes migrants’ effects (goods brought by migrants) in imports and exports of goods (para. 14.92).

The flows of goods and changes in financial account result from a change in the owner’s residence status, and hence, should not constitute transactions. Similarly, migrants’ transfers are different in nature and motivation from other kinds of transfers, which involve an intention of wealth transfer. Also treating migrants’ transfers as transactions involves an exception to the change of ownership principle. Migrants’ transfers involve no transfer in that the asset stays in the same hands.

#### **Possible changes**

- Should changes in financial claims and liabilities due to change in residence of individuals be treated as reclassifications in the other changes in assets accounts? This treatment would be conceptually correct. Such treatment will eliminate imputing capital transfers (migrants’ transfers) in the capital account and have no impact on balance sheets. The goods account would exclude the personal effects of migrants.

### **(c) Application of accrual principles to debt in arrears**

#### **Current treatment**

Debt arrears occur when scheduled payments (repayment of principal or coupons) are not made by their due-for-payment date. The current statistical manuals seem to follow two separate bases for time of recording for repayments of debts, namely the due-for-payment basis and the accrual basis. The due-for-payment basis is followed in *BPM5* (paras. 123 and 528), *External Debt Guide* (para. 2.29), and *GFSSM 2001* (para. 9.19). When a debt liability goes into arrears, the due-for-payment basis records transactions as if the repayment of debt liability had been made and then replaced by a new short-term liability. The imputation of transactions gives the impression that the debtor has the ability to repay and borrow. According to the accrual basis, repayments of debts are recorded when they are extinguished (such as when they are paid, or rescheduled, or forgiven by the creditor). Under this approach arrears will continue to be shown in the same instrument.<sup>7</sup> This approach would also avoid complicated and artificial imputation

<sup>7</sup> Under the accrual basis, if the terms and characteristics of financial instruments change when a liability goes into arrears, this reclassification is to be treated as other changes due to reclassification of instruments.

of transactions. This treatment is in line, in principle, with the *1993 SNA* (paras. 3.94 and 11.101) and *MFSM 2000* (paras. 225, 238, 179).

Data on arrears are useful for various types of policy analysis and solvency assessments. The *External Debt Guide* (para. 4.4) explicitly distinguishes arrears under other debt liabilities and intercompany lending. The *GFSM 2001* (para. 7.144) suggests that each classification be divided into the amount not in arrears and the amount in arrears as well as that total amounts in arrears be shown as a memorandum item. The *BPM5* table on Selected Supplementary Information (Table 8) includes various categories of arrears on exceptional financing that are needed to derive an analytic presentation, as published in the IMF's *International Financial Statistics*.

### **Possible changes or options**

- Which time of recording principle is appropriate for recording repayments of debts? (1) the due-for-payment basis (involving imputation of transactions that the liability had been repaid and then replaced by a new short-term debt (representing the arrears)); or (2) the accrual basis (involving no imputation of transactions but continuing to show arrears in the same instrument until the liability is extinguished), but either requiring arrears to be shown in the balance sheets as a sub-group under relevant instrument or to be shown as memorandum or supplementary items<sup>8</sup>?
- If the accrual basis is followed; do we need subheadings or memorandum items on all arrears or selected arrears? If selected items, which arrears are needed?

### **3. Residence**

With globalization, there are an increasing number of institutional units with connections to two or more economies. As a result, identification of the territory of residence is less straightforward and more elaboration of the concepts would be useful.

For households, identification of the residence of temporary workers and mobile individuals can be difficult. It is desirable for the principles for territory of residence to be developed in conjunction with those for demographic, migration, and tourism statistics. In addition, interest in temporary workers is increasing.

For companies, residence can be unclear for those that have premises in two or more territories.

There also needs to be elaboration of the residence of entities that hold financial assets and liabilities but have little or no physical presence in any territory. Examples include special purpose entities, shell companies, limited liability partnerships, and holding or ancillary companies that are located in different territories to their related companies. (This issue is also related to the question of whether these entities are separate institutional units for statistical purposes, discussed below.)

### **Current treatment**

Residence is defined in *1993 SNA* paras. 4.15–16 and 14.12–34. One of the guidelines for households is based on maintaining a principal dwelling for one year or more, but with some exceptions and discretion. The guidelines on residence of corporations in para. 14.22 focus on physical presence in a territory where the corporation engages in production for a significant period. The *External Debt Guide* and *Coordinated Portfolio Investment Survey Guide* have already adopted territory of incorporation or registration in cases of entities with little or no physical presence.

### **Possible changes**

- Should the SNA definition of residence be extended to “predominant center of economic interest” to recognize better that some units have connections to two or more territories and to focus attention on how to select between alternatives?

<sup>8</sup> In the new *Balance of Payments Manual*, a distinction will be made between memorandum and supplementary items. Memorandum items are required information whereas supplementary items are optional.

- Should the principles for residence of households be harmonized with demographic, immigration, and tourism statistics? Should the one-year guideline for individuals be made more rigorous so as to increase international consistency? Should any specific principles be provided for temporary workers?
- Should the principles for determining the residence of corporations be clarified to emphasize the territory of incorporation as the criterion in cases when the entity has little or no physical presence? In the case of quasi-corporations (such as unincorporated branches or limited liability partnerships) that have little or no physical presence, would territory of registration or regulation be appropriate?

#### 4. Institutional units

With increasing interest in financial markets and asset management, there is a need to develop principles to decide whether entities that are used to hold assets but do not undertake production should be regarded as separate institutional units. Such entities often use the legal structures of special purpose entities, shell companies, limited liability partnerships, international business companies, or trusts. Some of these entities simply hold assets, while others may also incur liabilities, for example in the case where the vehicle raises funds for on-lending a parent, or where the entity uses gearing to fund increased acquisition of assets.

Another situation that gives rise to issues concerning the status of units is where a single legal entity has operations in more than one economic territory. In the cases where the entity has separate accounts for its operations in each territory, the entity can be split based on its operations, i.e., the case of unincorporated branches treated as quasi-corporations. In other situations, the entity may be operated seamlessly across multiple territories (e.g., SAS Airlines and *societas europea*). In these cases, it appears that the alternative treatments are to allocate to the predominant territory or to use pro rata splitting. Principles for these cases need to be reconsidered and elaborated.

#### **Current treatment**

Corporations are defined in *1993 SNA* para 4.23 as entities created for the purpose of producing goods or services. While some entities that hold financial assets and liabilities also undertake some production, some do nothing but hold financial assets and/or liabilities. The recognition of such units and their classification to institutional sectors appear to be a gap in the *1993 SNA*.

The combination of ancillary entities with their owners is recommended in *1993 SNA* paras. 4.42–44, but the case where the units are in different sectors or territories is not mentioned. According to *Monetary and Financial Statistics Manual* para. 71, an ancillary enterprise is treated as a separate institutional unit if it is located in a different jurisdiction from the parent corporation.

The possible splitting of multiterritory enterprises is mentioned briefly in *1993 SNA* paras. 4.50 and 14.23.

#### **Possible changes**

- For entities that only hold financial assets and/or liabilities: Should they generally be treated as separate institutional units or combined with owners? If they are not separate units in general, should they be separate in cases when the unit is located in another territory to that of its owners, or when there are several owners, or when the owners are in different sectors? In which institutional sector should they be included?
- Should holding companies, management and other ancillary companies be treated as separate units when the unit is located in another territory to that of related entities? In which institutional sector should they be included?
- For business entities that operate in two or more territories (e.g., SAS Airlines, or unincorporated branch): Should the principles for identification of a quasi-corporation (branch) be reviewed? Should there be any additional guidance on when and how a seamless multiterritory operation should be split between territories?
- Should ancillary units be treated as separate entities if they are resident in a different territory to their owners?

## 5. Goods sent abroad for processing

Goods sent abroad for processing could potentially be recorded on a net basis (i.e., just the processing charge) or gross basis (i.e., the full value include both as imports and exports). Factors to be taken into account in considering the alternatives are whether a transaction is viewed as having occurred in the underlying goods; the desirability of large self-offsetting gross flows of low connection to the economy; as well as the practical issue of the ability to identify these goods separately from other goods.

### **Current treatment**

Goods sent abroad for processing are covered in *1993 SNA* paras. 14.61–64, and 14.91. The goods flows are shown at gross values when there is substantial processing (defined as bringing about a change in the classification of the goods at the three-digit level of the Central Product Classification), while only the net change is shown for less significant processing.

As a practical matter, *BPM5* suggests a convention that all processing be assumed to be substantial.

### **Possible changes**

- Should goods sent for processing abroad be recorded on a gross or net basis? Can a distinction be made between different levels of processing?

## 6. Merchanting

“Merchanting” is a term used in *BPM5* for the activity of trading in goods that do not enter the territory of a trader. In such cases, there is an issue of whether the gross goods flows should be recorded in the trader’s territory of residence or just the margin earned.

### **Current treatment**

This issue is not covered in the *1993 SNA*. In *BPM5*, para. 207, the treatment is to report only the margin earned in the territory of the trader, except for changes in inventories, which are shown as imports (negative if inventories decrease). The treatment is asymmetric in that the data concerning purchasers of the goods will identify only the gross value.

### **Possible changes**

- Should the gross flows or the margin earned be shown for merchanting? Is the inclusion of changes in inventories in the imports data suitable?

## 7. Interest and related issues

### **(a) Debt instruments indexed to foreign currency**

Debt instruments with both principal and interest indexed to a foreign currency have characteristics of both indexed instruments (because of the indexation mechanism) and foreign currency instruments. For indexed instruments, changes in the value of principal arising from indexation are recorded as interest (transactions), whereas changes in the value of principal due to changes in exchange rates for foreign-currency bonds are recorded as holding gains (valuation changes—other economic flows). Should foreign-currency bonds be treated differently from bonds indexed to a foreign currency?

### **Current treatment**

The *1993 SNA*, *BPM5*, and other manuals mention exchange rates as one of various indicators to which indexation can be linked. However, they are not explicit on whether debt instruments

with both principal and interest indexed to a foreign currency should be treated similarly to indexed-linked instruments or foreign currency debt instruments.

### **Possible changes**

- Should debt instruments with both principal and interest indexed to a foreign currency be treated similarly to foreign-currency debt instruments as amounts associated with both debt instruments are determined using the currency in which they are denominated or linked (directly or through index-linking)? Foreign currency-linked debt instruments function as if they are denominated in the currency to which they are linked.<sup>9</sup>

### **(b) Interest at concessional rates**

Loans with concessional interest rates could be seen as providing current transfers equal to the difference between the concessional interest and the market equivalent. Such arrangements are common in loans provided by international financial institutions and developed countries to developing countries as part of international cooperation and assistance programs. If such transfers were recognized, interest recorded would be adjusted by the same amount. However, commercial situations are different in that concessional interest rates may be used to encourage the purchase of the goods, and so should not be treated in the same way. Concessional interest explicitly provided as transfers would need to be distinguished from pure price differences.

### **Current treatment**

The current statistical standards do not mention concessional interest. At present, the transfer element is not recognized. The *External Debt Guide* describes concessional debt (para. 6.22).

### **Possible changes**

- Should concessional interest be recognized as including a transfer element? If not, should a memorandum item be suggested to identify the transfer element?
- How should concessional interest including a transfer element be distinguished from other interest rates provided at lower than market rates?

### **(c) Fees payable on securities lending and gold loans**

For **securities lending/borrowing**, typically, a custodian, acting on the security lender's behalf, delivers a security to another financial intermediary (usually a broker) so that the latter can make delivery (settle a transaction). Legal ownership is transferred to the "borrower" but the economic risks and rewards of ownership remain with the original owners. In return, the "lender" receives a fee from the "borrower" for delivering the security. **Gold loans** are similar in nature to securities lending. Under a gold loan, gold is "lent" by the owner to the "borrower" for a given period of time; the ownership of the gold is transferred, but the risks and benefits of price change remain with the "lender". A comparable payment to that for securities lending is often made by the recipient of the gold to the "lender". In both cases, the value of the fee is related to the value of the underlying asset provided, and the length of time until the "borrower" returns the underlying asset.

### **Current treatment**

Neither the *1993 SNA* and *BPM5* discusses the issue. The Committee at its 2000 meeting set up a Technical Group on Reverse Transactions, which reviewed the issue but could not agree on a satisfactory approach (BOPCOM-03/12).

<sup>9</sup> In identifying foreign currency debt, the *External Debt Guide* includes both foreign currency and foreign-currency-linked debt (para. 7.19).

**Possible changes**

- What is the appropriate statistical treatment of fee payable on security lending and gold loans? The fee for securities lending is for putting a financial instrument at the disposal of another unit, but it does not fit with the definition of interest. The fee payable on gold loans appears to be a payment for services as gold in this instance is nonmonetary gold (such gold is not treated as a financial instrument in the *1993 SNA*).
- If fee payable on securities lending is treated as property income, under which type of property income does it fall?

**8. Activation of guarantees and calling on of collateral**

Debt liabilities can be guaranteed by a third party. Activation of a debt guarantee will create a new liability and the guarantor now becomes the new debtor. This raises issues on how to treat flows between the original debtor and creditor and between the original debtor and the guarantor (the new debtor). A similar issue is how to treat flows between a debtor and creditor when collateral is called by the creditor.

**Current treatment**

No treatment is given in the *1993 SNA*. The *External Debt Guide* (para. 2.30) notes that *once the guarantee is called, the debt payment is attributed to the guarantor, and the arrear of the original debtor is extinguished, as though repaid*. When a government decides to repay specific borrowing or payments on behalf of another institutional unit without the guarantee being called or the debt being taken over, the *External Debt Guide* (para. 8.49) states that the debt stays recorded solely in the balance sheets of the original debtor. The *GFSM 2001* (para. 9.33) deals with activation of guarantees in the context of public corporations, but states that the activation of a guarantee is the acquisition of equity (if no evidence exists that it is a capital transfer) or a capital transfer (a possible option) to the defaulting party. Appendix II (paras. 4–6) of the *GFSM 2001* describes the treatment of debt assumption involving the general government. The relationship between the government and the original debtor is recorded as (i) an acquisition of financial assets by the government with the original debtor if the government acquires effective claims on the original debtor (effective in the sense that there is a realistic probability that the claims will be paid), or (ii) an acquisition of equity by the government if the original debtor is a on-going public corporation and if the government does not acquire an effective claim on the original debtor, or (iii) a capital transfer if the original debtor is bankrupt or is not owned and controlled by government and if the government does not acquire an effective claim on the original debtor. Where the original debtor-enterprise is liquidated, capital transfers as well as other volume changes may seem possible treatments.

**Possible changes**

- How should flows between the original debtor and creditor and between the original debtor and guarantor be treated when guarantee is activated?
- How should flows between a debtor and creditor be treated when collateral is called by the creditor?

**9. Valuation of loans and deposits**

The valuation of loan positions is not clear-cut and there are alternative perspectives. The nominal value is one perspective, which is useful in that the debtor is liable for the full amount until the liability is written off. However, the effective value to the creditor may be less than the nominal value because of the risk of default, so the nominal value could be seen as a misleading financial position. In the case of insolvent debtors, the likely repayment could be much less than the nominal value. Moreover, where interest rates have changed, the present value of fixed rate loans will have changed in the opposite direction.

The same issues also apply to deposits, when the depository corporation is insolvent and fixed rate deposits after interest changes.



The difference between nominal values and those taking into account default risk and/or interest rate changes is particularly evident when a loan or deposit is sold to another entity. The difference is also apparent when other loans or deposits of a similar nature are traded, but the potential overvaluation issues are also relevant even for liabilities that are not traded at all.

The accounting profession is considering the use in some cases of “fair value” as a concept for the valuation of creditors’ positions, i.e., a measure of what the loan or deposit would be worth if traded.

### **Current treatment**

The *1993 SNA* adopts the nominal value (para. 13.72) as the principle for valuation of loans until the liability is written off as being uncollectible (paras. 10.140 and 12.51). It notes that provisions for bad debts, as internal book-keeping entries, are outside the System.

*BPM5* (para. 471) adopts nominal or face value for valuation of loans, but states an exception only for loans of heavily indebted countries. In cases when such loans are traded at a discount, the transactions are valued at market prices, while the positions are shown at nominal value for the debtor and market value for the creditor (with each to provide supplementary information on the other valuation basis for reconciliation purposes).

The *Monetary and Financial Statistics Manual* adopts the same principles for valuation of loans, which are described as “book value” (para. 206). It also recommends that data on expected loan losses be provided separately as a memorandum item (para. 207). Provisions for loan losses are included as “other accounts payable” by the creditor (para 179).

### **Possible changes**

- In view of a) the differences in approach in each of the manuals, b) increased emphasis being placed on fair value accounting, c) the problem that valuing impaired loans at nominal value leads to the overstatement of the assets of the lender. and d) that a single valuation principle for all loans in all instances may be inappropriate, should alternative valuation principles be considered (such as fair value, present value, written down value) instead of nominal value? Should alternative valuations be used in supplementary presentation?

## **10. Financial assets classification**

With increasing interest in financial markets, some issues have arisen about terminology and classification.

### **Current treatment**

The financial assets classification (given in *1993 SNA* Annex to Chapter XIII) does not show the groupings of instruments into “equity” and “debt” that is made in *BPM5*.

The term “securities other than shares” is used in the *1993 SNA*, which differs from the term “debt securities” which is used for the same concept in *BPM5*. The *BPM5* term seems clearer because of making the word “debt” explicit. The term “debt securities” was not used in the *1993 SNA* as the instrument class also covered exchange-traded derivatives. As financial derivatives are now included in a separate instrument class, there is no need to retain a somewhat clumsy and less meaningful term “securities other than shares.”

All types of financial derivatives are currently treated as a single item, but there is interest in splitting financial derivatives into forwards and options, which have different behavior. If employee stock options are to be treated as financial derivatives, it may also be desirable to identify them separately.

### **Possible changes**

- Should “equity,” “debt,” and “other” groupings be introduced to the classification of financial assets because of analytical use and to bring about more consistency with balance of payments statistics? Which assets should be included under each heading?



- Should the term “debt securities” be adopted to replace “securities other than shares”?
- Should more detail be shown for financial derivatives?

### **11. Insurance and reinsurance**

These issues already appear on the SNA agenda in a wider context than the rest of world account. The same concerns about catastrophic losses and inconsistent treatments of direct and reinsurance also arise for international transactions. However, while the general approach in the draft paper on insurance is supported, the perspective of measuring international transactions in an internationally symmetric way highlights problems with the particular aspects of the proposed solutions for:

- the possible treatment of catastrophic loss claims as either current or capital transfers without a clear basis for distinguishing them;
- the treatment of insurance companies equalization provisions as transactions and consequently as assets of potential claimants. These provisions are not actually due to identifiable claimants because they depend on future events and appear to have the qualities of internal accounting entries rather than transactions.

# The statistical links between the financial accounts in the euro area BOP/IIP and the MUFA rest of the world account<sup>1,2</sup>

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## Introduction

Financial accounts are a useful analytical tool to support the conduct of monetary policy and other tasks of the Eurosystem. They provide information on financial investment and financing and on other developments of financial assets and liabilities across the economy, thus contributing to shedding light in particular on the way monetary policy may affect the euro area economy<sup>3</sup>. Financial accounts are also a useful tool in achieving consistency between different financial statistics and can therefore be seen as aiding the European Central Bank's (ECB's) duty to contribute to the harmonisation, where necessary, of the rules and practices governing the collection, compilation and distribution of statistics in the areas within its fields of competence<sup>4</sup>.

External statistics are mostly targeted to the analysis of cross-border transactions and positions. They encompass balance of payments (b.o.p.), international investment position (i.i.p.) and international reserves statistics. The euro area b.o.p. shows, for a specific time period, the economic transactions of euro area residents with the rest of the world (RoW). The main objective of the euro area b.o.p. is to show items affecting monetary conditions, exchange markets and other external factors. The euro area i.i.p. is the financial balance sheet of the external financial assets and liabilities of the euro area. It contributes to the assessment of the euro area Member States' external vulnerability and to monitoring the developments in holdings of liquid assets abroad by the money holding sector. The international reserves template is a monthly statement of the reserve assets, other foreign currency assets and reserve-related liabilities held by NCBs and by the ECB, which complements the data on reserve assets included in the euro area b.o.p. (flows) and i.i.p. (stocks).

This paper focuses on the compilation of quarterly data of euro area financial transactions and outstanding amounts vis-à-vis non-residents for the euro area RoW account as part of the quarterly Monetary Union Financial Accounts (MUFA)<sup>5</sup>. Because of their conceptual equivalence, euro area b.o.p. and i.i.p. will become the prime source for the RoW account in MUFA. This will minimise the reporting and compilation burden and will avoid presenting users with conflicting data.

From a methodological point of view, the financial accounts of the euro area b.o.p. and the euro area i.i.p. are essentially equivalent to the RoW within the quarterly MUFA.<sup>6</sup> However, the

1 *The views expressed in this paper are those of the authors and do not necessarily reflect the views of the European Central Bank.*

2 *This paper is basically an update of a document approved by the ESCB Statistics Committee in 2003 on the statistical links between the euro area Balance of Payments (b.o.p.) and the euro area International Investment Position (i.i.p.), on the one hand and the Rest of the World (RoW) account in the Monetary Union Financial Accounts (MUFA) on the other hand.*

3 *Refer to Mink (2002) for an insight into uses of financial accounts for monetary policy purposes.*

4 *Refer to European Central Bank (2000) for an overview of the statistical data collected and compiled by the ECB.*

5 *Refer to European Central Bank (2002) for a description of financial accounts data published for the euro area.*

6 *The theoretical equivalence of the two sets of statistics, and the articulation between the different classifications used in certain parts of the two sets, are set out both in Annex 1 of the Balance of Payments Manual (1993) and in Annex 2 of the System of National Accounts (1993). A similar account is in Appendix 4 of the "External Debt Statistics; guide for compilers and users" (2003).*

requirements for the quarterly MUFA, mainly derived from the standards set out in the European System of Accounts (ESA 95)<sup>7</sup>, are different in terms of financial asset categories/sub-categories and institutional sectors/sub-sectors than those required by international standards for the b.o.p. and the i.i.p. statistics. In addition, the use of the b.o.p. in the monetary analysis has determined a structure for the euro area b.o.p./i.i.p. which slightly differs from the standards in the IMF Balance of Payment Manual, 5th edition (BPM5)<sup>8</sup>. These two factors explain, at least partly, why some breakdowns required for the financial accounts are not currently available in the b.o.p. and i.i.p. at the euro area level. The ongoing work towards updating the System of National Accounts (SNA 93) and therefore also the ESA 95 and the BPM5 is an opportunity to ensure the conceptual consistency between the two sets of statistics, especially for the sector breakdown of the euro area in the b.o.p./i.i.p.

This paper is in four sections. The first section explores the general differences between the two frameworks (in terms of financial asset categories and sector breakdowns) and proposes a detailed translation of the prevailing euro area b.o.p./i.i.p. breakdowns into the financial asset categories and institutional sectors required in MUFA. Additionally, it intends to identify how additional detail of the b.o.p. and i.i.p. data could improve their contribution to quarterly MUFA. The second section deals with the main changes required in the euro area b.o.p./i.i.p. for a proper integration of the RoW sector in the MUFA. Such changes are ranked according to a prioritisation established on the basis of the importance for the MUFA needs. The third section addresses the changes that have been ultimately introduced in the euro area b.o.p./i.i.p. partly as a result of the feedback received from statisticians in charge of the MUFA compilation. Conclusions are presented in the final section.

## **1. Links between the euro area b.o.p./i.i.p. functional and sectoral categories and the MUFA financial asset and sector breakdowns**

### **1.1. General differences between the euro area b.o.p./i.i.p. and the MUFA frameworks**

#### *1.1.1. Financial asset vs. functional classification*

The prime analysis of the euro area i.i.p. and of the b.o.p. financial account is a functional one, by virtue of which financial instruments are classified as direct investment, portfolio investment, financial derivatives, other investment, and reserve assets. MUFA concentrate on an analysis by legal/ economic category (financial assets), which applies equally to all institutional sectors. However, much financial asset detail is already available within the b.o.p./i.i.p. functional categories.<sup>9</sup>

#### *1.1.2. Analysis by euro area sector*

The b.o.p./i.i.p. analyses the portfolio and other investment accounts by euro area sector: Eurosystem, other Monetary Financial Institutions (MFIs), general government, and ‘other sectors’ together.<sup>10</sup> However, euro area b.o.p. and i.i.p. are not yet in a position to deliver a resident sector split of portfolio investment liabilities<sup>11</sup>.

In the compilation of quarterly MUFA, there is some scope for choice over whether to identify the counterpart sector for each financial asset held and for each liability incurred by a sector, which adds value for economic analysis and assists the plausibility-checking and thus the relevance and reliability of the statistics. In any case, the sector analysis in MUFA should be done in the framework of the so-called “seven sector approach”, which implies that the ‘other sectors’ shown in the b.o.p./i.i.p. would need to be split into insurance corporations and pension

<sup>7</sup> Eurostat 1996.

<sup>8</sup> To some extent, this also applies to MUFA and ESA95.

<sup>9</sup> Sometimes a financial asset category can be derived from the sum of several b.o.p./i.i.p. items. For instance, loans can be found in the direct investment, other investment and reserve assets sub-accounts of the b.o.p. and the i.i.p.

<sup>10</sup> A special effort has been recently made to fully identify MFIs’ positions with non-residents, to enable a ‘monetary presentation’ of the euro area b.o.p., thus linking the b.o.p. and monetary statistics at the euro area level.

<sup>11</sup> Much progress is expected in the euro area b.o.p./i.i.p. with the extension of security-by-security data to be collected from 2008 onwards in all euro area countries (see section III). Among others, liabilities of portfolio investment will be split by resident sector.

funds, other financial intermediaries (including financial auxiliaries), non-financial corporations, and households (including non-profit institutions serving households).<sup>12</sup>

## **1.2. Correspondence between the euro area b.o.p./i.i.p. functional categories and the MUFA financial asset breakdowns**

This sub-section follows the financial asset classification of the financial accounts, trying to establish an equivalence with the functional classification and the instruments contained in the b.o.p./i.i.p. Only those instruments so far covered by the published MUFA are touched upon.

### *1.2.1. Currency (ESA 95 code F/AF21)*

#### *1.2.1.1. Assets of euro area residents*

The euro area b.o.p./i.i.p. and the financial account statistics in principle need to measure euro area claims on the RoW in respect of euro area holdings of foreign currencies. At present the only data available for the b.o.p./i.i.p. are the MFI statistics for MFI holdings. Holdings by other euro area sectors are in practice not recognised and the respective amounts are most likely not significant.

#### *1.2.1.2. Liabilities of euro area residents*

The euro area b.o.p./i.i.p. is recognising non-euro area resident holdings of euro banknotes. Initially, the estimate was mostly intended to take into account the effect of the euro cash changeover on b.o.p. transactions in 2002 and was based on euro banknote shipments from/to euro area MFIs. Since 2003, holdings of euro banknotes by non-residents have been estimated using a variety of indirect methods. The MUFA incorporate the same figures thus being consistent with b.o.p./i.i.p. statistics.

### *1.2.2. Deposits (ESA 95 code F/AF22+29) and loans (ESA 95 code F/AF4)<sup>13</sup>*

#### *1.2.2.1. Deposits and loans of euro area MFIs in MBS versus the euro area RoW*

Euro area MFI consolidated balance sheet statistics (MBS) are comprehensive and well validated, and using them ensures consistency across statistics. However, the calculation method applied in MBS to derive transactions from stocks is constrained by the requirements set out in the Regulation ECB/2001/13<sup>14,15</sup>. Nonetheless, consistency between the relevant accounts of the b.o.p./i.i.p.<sup>16</sup>, and MFIs' financial assets in deposits and liabilities in loans are regularly checked within the euro area, as it is indispensable for the 'monetary presentation of the b.o.p.'

For the split between deposits and loans in the b.o.p./i.i.p. 'other investment account', it might be reasonable to use the existing convention (in e.g. international reserves statistics) that funds placed with/lent to MFIs (or their equivalent outside the euro area<sup>17</sup>) are 'deposits', and that funds placed with/lent to other entities are 'loans'. For cross-border transactions in foreign currency deposits and loans, the MUFA will in principle be more accurate if they use the more refined calculation method of the b.o.p.

#### *1.2.2.2 Deposits of euro area non-MFIs in the b.o.p./i.i.p. versus the euro area RoW*

In the b.o.p./i.i.p. 'other investment', the deposit assets are available separately from loans since 2004. This is one of the achievements in the b.o.p./i.i.p. area resulting from the need to integrate these statistics as the RoW account in MUFA (see section III).

<sup>12</sup> Refer to section III for the progress achieved in this field.

<sup>13</sup> The instruments covered under this category by both statistics are the same (in particular, repos are included).

<sup>14</sup> Regulation (EC) no 2423/2001 of the European Central Bank of 22 November 2001 concerning the consolidated balance sheet of the monetary financial institutions sector, OJ L 333, 17.12.2001, p. 1

<sup>15</sup> Among such constrains, data for the currency composition of stocks denominated in non-euro currencies (necessary for the exchange rate adjustment) are only required quarterly. On the basis of that information and by using monthly average and end-month exchange rates, the exchange rate adjustment is compiled on a monthly basis. As b.o.p. statistics focus on the production of transactions, the exchange rate adjustments are more precise, using all the information available (on e.g. currency breakdowns). Whenever better or higher-frequency information is available to the b.o.p. compiler, it is used to improve the results. Moreover, the later deadline established for the transmission of b.o.p. data allows national compilers to implement more comprehensive quality checks.

<sup>16</sup> In particular "Other investment", "Direct investment/other capital" and "Reserve assets/currency and deposits"

<sup>17</sup> MBS does not have a complete breakdown of loans/deposits by non-euro area resident counterparties. Furthermore, there is no distinction between loans/deposits.

According to the suggestion of using the nature of the cash-taker – i.e. MFIs (or their equivalent outside the euro area) or non-MFIs – to determine the split between deposits and loans in the b.o.p./i.i.p., the item deposits taken by non-MFIs (liabilities) would not exist in the b.o.p./i.i.p. since all related transactions would then be classified as loans.

*1.2.2.3. Loans of euro area non-MFIs in the b.o.p./i.i.p. versus the euro area RoW*

In the b.o.p./i.i.p., loans granted by euro area non-MFIs to non-resident counterparts are covered in principle within ‘Direct investment/other capital mostly intercompany loans’<sup>18</sup> and ‘other investment’ (available separately from deposits since 2004) without any split by maturity. The short-/long-term split is a low priority, given the absence of such a split for loans by MFIs to the RoW.<sup>19</sup>

According to the convention stated earlier, MFIs take deposits and non-MFIs are financed via loans in the b.o.p./i.i.p. The MUFA instrument ‘loans’ (liabilities) may be derived from the sum of ‘direct investment in the euro area / other capital, mostly intercompany loans’ and ‘other investment / general government / liabilities’ plus ‘other investment / other sectors / liabilities’. There is no general short-/long-term split. This is a rather low priority, but probably more useful on the liability (to give more information on sectors’ debt) than on the asset side.

*1.2.3. Securities other than shares excluding financial derivatives (SOTS) split short-/long-term (ESA 95 code F/AF.33)*

*1.2.3.1. Euro area assets*

In the b.o.p./i.i.p., the ‘SOTS’ assets are covered within ‘portfolio investment’ and ‘reserve assets’. The series ‘bonds & notes’ and ‘money market instruments’ under ‘portfolio investment/debt instruments’ and ‘reserve assets/foreign exchange/securities’ cover all RoW ‘SOTS’ held by euro area residents. The split into short-/long-term original maturity (which coincides with the b.o.p./i.i.p. split by instrument into ‘money market instruments’ and ‘bonds & notes’) is at 1 year, as suggested by ESA 95 par. 5.22.

*1.2.3.2 Euro area liabilities*

In the b.o.p./i.i.p., the ‘SOTS’ liabilities are covered within portfolio investment: the series ‘bonds & notes’ and ‘money market instruments’ cover all euro area ‘SOTS’ held by the RoW. As for assets, the split into short-/long-term original maturity is consistent.

*1.2.4. Quoted shares (ESA 95 code F/AF.511); mutual fund shares excluding money market fund shares (part of F/AF.52); money market fund shares (rest of F/AF.52)<sup>20</sup>*

*1.2.4.1. Euro area assets*

At present, the euro area b.o.p./i.i.p. data cover all – quoted and unquoted – shares and other equity without any further split by type of instrument, within ‘portfolio investment/equity’ and ‘direct investment / equity capital and reinvested earnings’. Quoted and unquoted shares are not separately distinguished, though most transactions in unquoted shares are presumably recorded in direct investment. Therefore, a rough estimation of the total investment in quoted shares could encompass the whole of ‘portfolio investment / equity’ and part of ‘direct investment/equity capital and reinvested earnings’. As of 2006, the euro area i.i.p. will show annual stocks in direct investment / equity split into listed and non-listed companies (see section III). The production of a whole marked-to-market valuation for FDI in non-listed companies might be one of the deliverables resulting from the enhancement of direct investment stock statistics quoted in section III.

Mutual (including money market) fund shares are covered, indistinguishably, within ‘portfolio investment/equity’.

18 *The b.o.p./i.i.p. item ‘Direct investment / other capital, mostly intercompany loans’ could theoretically, in addition to intercompany loans, also encompass debt securities and financial derivatives issued and acquired by related companies. However, virtually the whole item relates de facto to intercompany loans.*

19 *In practice the bulk of the required information is covered in the b.o.p./i.i.p. item ‘Direct investment / other capital mostly intercompany loans’.*

20 *Within the ESA 95 one-digit (F/AF.5) category ‘shares and other equity’, the financial accounts distinguish quoted shares partly because the required detail is more readily available but also because it is analytically useful. Additionally, MUFA distinguish money market funds shares in order to facilitate the reconciliation of the financial accounts with M3.*

*1.2.4.2. Euro area liabilities*

The coverage in the b.o.p./i.i.p. is the same as on the asset side. Similar assumptions on the instrument allocation can be made. Total euro area MFI issues of money market fund shares, and holdings by the RoW, are available in the MBS statistics (from January 1999).

*1.2.5. Insurance technical reserves (ESA 95 code F/AF.6): comprise net equity of households in life insurance and in pension funds reserves (F/AF.61) + (identified separately) pre-payments of insurance premiums and reserves for outstanding claims (F/AF.62)*

*1.2.5.1. Euro area assets*

There may be significant (re-)insurance business with non-euro area countries in Europe (e.g. United Kingdom, Switzerland) and/or the United States. The first sub-instrument (net equity of households) may be particularly difficult to measure without counterpart information, since it is by definition an asset of the household sector. In the b.o.p./i.i.p. concepts, this business is covered indistinguishably within ‘other investment’.

*1.2.5.2. Euro area liabilities*

The positions on the liabilities side should be easier to measure, as they are liabilities of corporations (rather than assets of – mainly – households for F/AF.61) and in principle should be covered by b.o.p./i.i.p. collection systems<sup>21</sup>. However, so far in the euro area b.o.p./i.i.p., this business is covered indistinguishably within ‘other investment’.

The identification of insurance technical reserves within the b.o.p./i.i.p. framework must be linked to the long-term progress towards further sector breakdowns of the b.o.p./i.i.p., which should in turn separately identify insurance corporations out of the ‘other sectors’ (see section III).

## **2. Prioritisation of work for compiling a MUFA RoW account**

From a MUFA perspective, the priorities for compiling the financial balance sheets and transactions of the rest of the world accounts are broadly as follows.

The highest priority is to link the available data on short-term financial investment of the non-financial sectors (as shown in the MUFA statistics) with the monetary aggregates. The work now completed in respect of deposits held abroad is also important, as they may be close substitutes to some M3 components.

For the other instruments shown in the current MUFA, the first priority is the non-financial sectors’ loan liabilities vis-à-vis the RoW (because of their relevance for monetary analysis and for the analysis of non-financial sectors’ debt). The second priority are assets and liabilities in securities other than shares, quoted shares and non-money market mutual funds, and deposits and loans not covered by the higher priorities; finally, insurance technical reserves.

Quarterly stocks, as well as transactions, contribute to structural analysis and permit the calculation of growth rates. Stocks are also important to allow the approximate derivation of revaluations.

Knowing the euro area counterpart sectors to the RoW is important for deposits and loans (to use the information in the monetary analysis, as mentioned above), but also, at a somewhat lower priority, for other financial asset categories. In general, the breakdown of financial transactions and balance sheets by counterpart sector is a requirement of the financial accounts analysis.

Short/long-term splits, where not available, are a lower priority. These splits are already available for debt securities and MFIs loans and deposits.

The MUFA will be extended to the remaining instruments, i.e. to the other parts of ‘shares and other equity’ (ESA code F/AF.5), to financial derivatives (F/AF.34), and to ‘other accounts receivable / payable’ (F/AF.7), with an appropriate breakdown by counterpart sector. It is important to take this development into account in any further design of the reporting systems. Financial accounts for the euro area will become the main framework for integrating ECB financial statistics on a quarterly basis.

<sup>21</sup> *Though practical problems are very likely to exist, especially in the case of transactions.*



### **3. Related actions accomplished and ongoing in external statistics**

#### **3.1. Split by institutional sector of portfolio investment liabilities**

The work towards a full monetary presentation of the b.o.p. requires that euro area securities held by non-euro area residents should as a minimum be split into securities issued by MFIs and by non-MFIs. Even beyond that request, a full breakdown by issuer sector of the euro area portfolio investment liabilities will be possible as of June 2006, when all euro area countries will start reporting portfolio investment transactions and positions with euro area securities broken down by issuer sector.

Additionally, by March 2008 all countries will start collecting quarterly portfolio investment stocks on a security-by-security basis. This will significantly enhance the quality of portfolio investment statistics and will provide additional details on portfolio investment instruments and institutional sectors, in line with the MUFA requirements.

#### **3.2. Split of deposits and loans within the other investment account**

This split, which initially was not considered essential for the euro area b.o.p./i.i.p. analysis, is now provided for b.o.p. (transactions) from 2004 onwards and will also be progressively collected for quarterly and annual stocks in the course of 2004. The merits of such an additional requirement are not only connected to its use as a building block for the RoW financial account but also to the monetary analysis assessing data on deposits held abroad by non-MFIs.

#### **3.3. Split of direct investment equities between quoted and unquoted shares**

By end-September 2006, the euro area i.i.p. will show annual stocks in FDI equity split into listed and non-listed companies for positions corresponding to end-2004 and end-2005. For listed companies, both FDI equity stocks at market values and own funds at book value will be available (thus allowing a global estimate of FDI stocks at market value for non-listed companies based on ratios market value to own funds at book value).

#### **3.4. Increase in the frequency of stocks**

At present the annual euro area i.i.p. is available after 9-months while quarterly stocks are an integral part of MUFA.

With a view to meeting this need as well as in anticipation to likely changes in international standards<sup>22</sup>, the euro area i.i.p. will be compiled on a quarterly basis (with a 3-month delay) as of end-December 2004.

#### **3.5. Expansion of the 'Other sectors' category towards consistency with the seven sector approach in MUFA**

At the request of the ECB, the Balance of Payments Committee invited the IMF to include a possible expansion of the "Other sectors" category in the Draft Annotated Outline of the forthcoming Balance of Payments Manual. The issue is currently discussed in the IMF Balance of Payments Technical Expert Group.

### **4. Conclusions**

Although different in the approach to classify transactions and positions, b.o.p. (financial account) / i.i.p. and financial accounts standards are in substance equivalent. Furthermore, the design of the corresponding manuals (BPM5 and SNA 93/ESA 95) was co-ordinated. It is a requirement of the ECB that the forthcoming BPM and SNA/ESA manuals are completely

<sup>22</sup> The forthcoming version of the IMF Balance of Payments Manual is expected to assign more prominence to the compilation of stock statistics.



integrated, i.e. they should present and explain in detail the statistical links between both financial asset and liability classifications and should refer to the same accounting rules in terms of valuation and time of recording for both financial transactions and balance sheets.

In terms of compilation practices, the full integration of international manuals provides obvious synergies for the resolution of statistical discrepancies. The differences between the financial and the capital accounts of the Rest of the World sector and the b.o.p error and omissions respond to the same statistical drawbacks. Their resolution should not be considered as independent initiatives but rather as a common undertaking involving statisticians of both areas.

Furthermore, the implementation of new requirements in the field of securities for both external statistics and financial accounts purposes will be much facilitated in the euro area by the gradual adoption of the security-by-security portfolio investment data collection by all euro area countries. The implementation of largely flexible data collection and compilation methods may serve the purposes of different statistics, thus maximising cost-efficiency and reducing the burden on respondents.

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## Abstract

*The ‘Rest of the World’ (RoW) account in the Monetary Union Financial Accounts (MUFA) comprises euro area residents’ transactions in and holdings/outstanding amounts of financial assets vis-à-vis counterparts resident outside the euro area. The euro area balance of payments (b.o.p.) and the euro area international investment position (i.i.p.) should be the primary sources for compiling the RoW account for transactions and stocks respectively.*

*This paper describes the relevant differences between the b.o.p./i.i.p. items and the components of the RoW account in the MUFA (on both conceptual and practical grounds) and explores the possibilities to overcome them. The experience of the euro area in aligning methodologies and practices in both areas may illustrate possible avenues for the generalised use of the b.o.p./i.i.p. for financial accounts purposes.*

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# Linking financial accounts with the BoP, portfolio investment and external debt positions: the case of the Czech Republic

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## *Financial accounts statistics – EU legal framework*

The legal framework for providing financial accounts in the EU Member States is set out in Council Regulation 2223/96. The regulation requires all Member States (excluding those with a derogation) to submit financial accounts annually from the year 2000. Member States with a derogation will provide national financial accounts in the ESA framework subject to agreed time delays, with a complete set of annual financial accounts expected from 2005 onwards. The second important document is the Guideline of the European Central Bank of 21 November 2002 on the statistical reporting requirements of the ECB in the field of quarterly financial accounts. The guideline requires euro area Member States to submit financial accounts quarterly. The data cover the period from the fourth quarter of 1997 to the quarter to which the transmission relates. The reporting obligation is on NCBs, but co-operation with the competent national authorities is possible. The derogations granted are listed in Annex III of the Guideline. For reasons of consistency, the ECB's requirements in the field of quarterly euro area financial accounts should be based as much as possible on the Community statistical standards laid down by Council Regulation (EC) No 2223/96 of 25 June 1996 on the European system of National and Regional Accounts in the Community, as last amended by Regulation (EC) No 359/2002 (ESA95).

The Czech Republic became an EU member on 1 May 2004 and European Union law is now valid on its territory. New regulations will have to be implemented and EU statistical requirements will have to be enacted in the national legislation. For the Czech National Bank, the following legislation is relevant to the statistical data collection system:

- Foreign Exchange Act No. 219/1995 (especially Article 5 regarding the non-bank sector) as a basis for BOP/IIP statistical data;
- Czech National Bank Act No. 6/1993 (especially Article 41 referring to the financial sector).

## *Financial accounts statistics in the Czech Republic – institutional aspects*

The Czech Statistical Office (CZSO) is responsible for compiling financial accounts on an annual basis. The financial accounts are produced as an integral part of the yearly compilation cycle of the National Accounts. Financial accounts were published annually (time series of main aggregates from 1995 to 1999) approximately the second year after the end of the reference year in the National Accounts chapter of the Statistical Yearbook of the Czech Republic. But the structure of the financial accounts was not as detailed as required by the Regulation. In 2003, the CZSO and the Czech National Bank agreed to change the system of compilation and presentation of the financial accounts to cover the Eurostat (annual data) and ECB (quarterly data) requirements by the end of the 2005 at the latest.

\* IFC conference on "Central Bank Issues Regarding National and Financial Accounts" Basel, 9–10 September 2004

*Linking financial accounts with the bop, portfolio investment and external debt positions – the case of the Czech Republic*

The CNB is responsible for external sector statistics (with the exception of statistics on the export and import of goods) and will cover the “rest of the world” for the compilation of the Financial Accounts of the Czech Republic. For the purposes of the Financial Accounts Statistics, quarterly data on the International Investment Position (IIP) and Balance of Payments of the Czech Republic are available. The Czech National Bank has decided to follow the ECB recommendation to use the IIP data for the rest of the world statistics in the Financial Accounts. There are small differences in the structure of data presentation between the IIP statistics and the requirements of the Financial Accounts Statistics.

For the compilation of the “rest of the world” assets and liabilities for the purposes of the Financial Accounts it is essential to collect IIP statistics data quarterly, as using BoP transaction data to estimate stock data could be misleading.

It is necessary:

- to distinguish between financial and non-financial assets and liabilities;
- to distinguish between financial transactions and other changes in financial assets and liabilities.

Certain changes in the volume and value of financial assets are not connected with transactions<sup>1</sup>:

- nominal holding gain/loss (defined as the change in the value of an asset/liability as a result of a change in prices or exchange rates);
- write-offs and write-downs of bad debt by creditors;
- allocations and cancellations of SDRs;
- monetisation and de-monetisation of gold.

The above-mentioned principles are applicable to the Czech Republic. It is also necessary to mention the influence of government privatisation income related to the inflow of foreign direct investment.

Unquoted shares are the predominant part of the portfolio and foreign direct investment denominated in shares in the Czech Republic. Only a minority of joint-stock companies are listed on an official stock exchange in Prague. The Czech National Bank will follow the Eurostat recommendation for valuation of unquoted shares using the “capitalisation method” with some modalities due to the limited number of listed companies on the Prague Stock Exchange (limited number of sectors). In the area of other accounts the CNB compiles quarterly data from a sample of companies (approximately 200 major exporters and importers) to obtain data on export and import trade credits (including advances), the level of financial resources held abroad and financial credits vis-à-vis non-residents. Statements from 3,700 companies with direct foreign ownership are collected by the Czech National Bank on a yearly basis to cover data on equity capital, trade and financial credits received and extended, accounts held abroad, etc.

## Conclusions

The balance of payments data are generally consistent with the financial accounts compilers’ needs for the “Rest of the World” sector. The sector and instrument classifications in the balance of payments are not fully in line with the financial accounts. The concept of foreign direct investment is not a source of difficulties, but there might be some divergences as regards valuation of stock data (including items under foreign direct investment). There is limited information (sampling) from the balance of payments data in the area of other accounts (trade credits and advances), and insurance technical reserves must also be added from other sources. The compilation of the international investment position (structure and timeliness) in the Czech Republic on a quarterly basis is a good starting point for compiling financial accounts for the “Rest of the World” column. The specific needs of the financial accounts will be taken into consideration with regard to changes in the reporting system for balance of payments purposes.

<sup>1</sup> *European Commission Eurostat, Manual on Sources and Methods for the Compilation of ESA95 Financial Accounts, first edition, 2002.*

Also, alternative sources of information (for example data from the Czech Statistical Office) will be used to minimise gaps and estimates for the compilation of the annual and quarterly financial accounts of the Czech Republic in the “Rest of the World” area. Later on (2010), after the adoption of the euro in the Czech Republic, it will be necessary to implement additional statistical information into the balance of payments reporting system (mainly a territorial breakdown of the international investment position) to cover the ECB’s requirements for monetary union financial accounts.

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# Balance of payments as data source for financial account<sup>1</sup>

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## 1. Introduction

As part of the international economic relations statistics, the Croatian National Bank (CNB) is responsible for the Balance of Payments (BOP) and the International Investment Position (IIP) Statistics. Both statistics are based on official data sources (like those from the Croatian Bureau of Statistics (CBS)) and data compiled inside the CNB (from the International Transactions Reporting System (ITRS), specialised statistical surveys, data on reserves assets etc.).

This text concentrates on usability of the Croatian BOP in future compilation of financial account (FA). International guidelines are presented in first part of text, followed by description of linkages between the BOP and the FA. After that, usability of Croatian BOP for compilation of the FA is presented, together with first estimates of the FA for the rest of the world. Finally, the text concludes with recommendation of further developments of the FA in Croatia.

## 2. International guidelines

When it comes to the rest of the world part of the financial account, two standard statistical reports (balance of payments and international investment position) represent good data sources for its compilation. Both the BOP and the IIP, together with their linkages with the SNA, are well defined in the Balance of Payments Manual, 5th Edition 1993 (BPM5). Another important methodological manual that is of great importance for this paper is the System of National Accounts 1993 (SNA93).

According to the BPM5, BOP is a statistical statement that systematically summarises, for a specific time period, the economic transactions of an economy with the rest of the world (IMF 1993). There are two types of transactions: current and capital transactions. The first one is part of the current account (BOP\_CA), while the latter is classified under the capital (BOP\_KA) or financial account (BOP\_FA).

The IIP is a statistical statement comprised of (1) the value and composition of the stock of an economy's financial assets, or the economy's claims on the rest of the world, and (2) the value and composition of the stock of an economy's liabilities to the rest of the world (IMF 1993). The IIP summarises the impact of transactions and other changes on stocks (non-transaction adjustments that lead to changes in net external positions of an economy) showing external position for each domestic sector (central bank, government, banks and other sectors), value of foreign direct investments (FDI) stocks, total external debt etc. The BOP\_FA covers transactions in same instruments as the IIP; actually, BOP\_FA is part of the IIP.

In the system of national accounts, financial account records transactions that involve financial assets and liabilities and that take place between institutional units and between institutional units and the rest of the world (SNA93). Financial assets and liabilities are classified under major categories as in BOP or IIP. Part of the financial account that covers transactions between residents and nonresidents, column 'rest of the world' (FA), can be directly linked with the BOP\_FA and corresponding column of the IIP.

<sup>1</sup> *The views expressed in this paper are those of the authors and do not necessarily reflect the views of the Croatian National Bank.*

### 3. Linkage between the balance of payments and the financial account

Before we turn to usability of BOP\_FA as data source for FA, we will shortly mention some identical methodological concepts, similarities and dissimilarities of their structure and sector breakdown.

Most important issues to be considered in creating external economic relations statistics are residents, valuation of transactions, time of recording, and conversion procedures.

The SNA and the BOP define residents on basis of the concept of economic territory and the centre of economic interest. According to BPM5, country's economic territory is actually the geographic territory administered by a government, even when this territory is located in another country (like embassies). Beside land, economic territory also covers airspace and waters. Centre of economic interest can be viewed through institutional unit's engagement in economic activities and transactions; if these activities last for one year or more, or will last that long, we can consider that unit as a resident of an economy.

Valuation of transactions is based on market prices. This means that transactions should be recorded using information on amounts agreed by transactors (BPM5). If that information is not available, then the price of similar items or some other approximation can be used.

Time of recording is the same in both cases; principles of accrual accounting should be followed, meaning that creation, transformation, exchange or transfers of economic value are considered transactions. For example, reinvested earnings should be recorded in a moment of their creation, while transactions in financial instruments are created in a moment when both the seller and the buyer enter the claim and the liability on their books (BPM5).

Conversion procedures of transactions denominated in non-reporting currencies are the same. Market exchange rate prevailing at the moment of transaction should be used, measured as midpoint between buying and selling rates or as the average for shortest period possible.

Classification of transactions in BOP\_FA and FA are similar, although not the same. Structure of BOP\_FA defined by the BPM5 is based on functional type of investments: (1) direct investments, (2) portfolio investments, (3) other investments and (4) reserve assets. Appendix to BPM5 on financial derivatives (IMF, 2000) and its latest addition (June 2002) define that financial derivatives should be classified in new sub-category, so there is a total of 5 functional types<sup>2</sup>.

Beside functional classification, breakdown by sectors is another important classification in BOP\_FA; using it, one can link BOP and other sources of statistics (like external debt, international investment position, government finance etc.). BPM5 recognises four sectors: monetary authorities, general government, banks and other sectors. Central bank is the only part of the monetary authorities sectors for most countries, while local and general government together with institutions financed and controlled by the government bodies form government sector. Banks cover deposit financial institution as defined in country's banking act. Everything else that can not be classified under one of those sectors is regarded as part of other sectors. Unfortunately, this breakdown is less applicable for compilation of the FA, as will be explained soon.

Structure of FA depends on three major criterions: the liquidity of the financial instrument, its form and sector (SNA93). As in the BOP, this structure enables analysis of the sources and uses of financing for each sector, although definitions of sectors are more detailed than in the former case; contrary to the BOP, functional classification is not relevant, although foreign direct investments are presented as memo item (with breakdown of transactions into equity, loans and other).

SNA93 defines eight main components of FA: (1) monetary gold and special drawing rights (SDRs), (2) currency and deposits, (3) securities other than shares, (4) loans, (5) shares and other equity, (6) insurance technical reserves, (7) financial derivatives and (8) other accounts receivable/payable.

Monetary gold and SDRs are a monetary authority's foreign asset and part of reserve assets, as in the BOP\_FA. Currency and deposits can be found in both assets and liabilities; all sectors can hold currency, but only financial corporations and monetary authorities can have them as a liability. Deposits are further divided into transferable and other deposits; the latter formed by all kinds of deposits beside those that are exchangeable on demand, freely transferable and usable for payments (SNA 1993). Asset and liabilities in securities other than shares (both long-term and short-term) cover debt instruments that are traded in financial markets (bonds, treasury

2 *Financial derivatives transactions between affiliated enterprises are very hard to identify for BOP compilers and reporting institutions. As a consequence, although not recommended, part of these transactions may be classified under the foreign direct investments – other capital.*



bills and similar). Loans include those assets and liabilities that are created when creditor lends funds directly to debtor, except from advances and other trade credits. Shares and other equities issued by residents and owned by nonresidents form liabilities of compiling economy. On the other hand, investments of residents in foreign companies' equity capital create asset side of this item. No distinction between direct and portfolio investments is made<sup>3</sup>. Insurance technical reserves are further divided between net equity of households in life insurance reserves and pension funds and prepayments of premium and reserves against outstanding claims. Financial derivatives are classified in separate sub-group and can be found on both assets and liabilities. Finally, other accounts receivable/payable are created by advances and trade credits for goods and services. These are mainly short-term instruments, although long-term trade credits can be significant in some cases. All other accounts receivable/payable not included elsewhere form residual category 'other accounts'.

It is obvious that common methodological concepts and structure of both BOP\_FA and FA ease compilation of one report if other is already developed. In order to benefit from a report that has been well developed, which is to our knowledge always BOP, it is of great importance to define the linkage between them, as clearly shown in the BPM5. Table 1 summarises this linkage: for each item of FA corresponding BOP\_FA standard component is identified, separately for assets and liabilities.

#### 4. Balance of payments statistics in Croatia

Croatia started to compile the BOP immediately after the break-up of Yugoslavia. The quality of the BOP has improved since then, even during the war, especially of the BOP\_FA by replacing less confident, mainly cash-based data sources with registers and surveys designed in line with methodology recommended by the BPM5.

There are three types of data sources of the BOP in Croatia: statistical reports of other institution (like Central Bureau of Statistics and Ministry of finance), the CNB databases (on international transactions, external debt or monetary statistics) and specialised statistical surveys conducted by the CNB (on tourism revenues and expenditures, foreign direct investments etc.).

BOP\_FA data sources are: survey on foreign equity investments, survey on trade credits, survey on insurance services, database of external loans, data on currency and deposits of banks and other sectors according to banks' reports and the Banks for International Settlements (BIS) reports. Current account items on investment income are also compiled from same data sources as corresponding BOP\_FA items. Reserve assets of the CNB are compiled from the Accounting department reports.

Survey on foreign equity investments is a sample based survey and is conducted on quarterly basis since 1997<sup>4</sup>. The legal definition of that survey can be found in National Gazette 150/2003. Data collection process is organised in two stages. First, it is crucial to obtain basic figures from the population (mainly position data). Second, based on first step results, a sample of enterprises will be selected which will receive additional forms to provide data on stocks, transactions, reinvested earnings, country breakdown etc. BOP\_FA foreign equity aggregates, both direct and portfolio, are produced from these forms.

Survey on trade credits covers period beginning with 1996. Both assets and liabilities on trade credits and advances are included; the methodology is designed in such a way that new increases are netted with previous period increases (now regarded decreases). Exchange rate changes are excluded from transactions. Starting with 2003, a new survey that covers actual transactions of reporting sample (stratified sample) is used for estimation of transactions for trade credits and advances.

3 *Direct investment is the category of international investment that reflects the objective of a resident entity in one economy obtaining a lasting interest in an enterprise resident in another economy (IMF 1993). The key phrase here is "lasting interest", implying a long-term relationship, meaning that foreign investor is interested in getting control over the resident enterprise (because that enterprise has a well known brand, it has easier access to certain markets, specific knowledge, lower costs etc), not only in earning the difference between today's and future price. Direct foreign investor has a significant degree of influence on the management of the direct investment enterprise. The IMF defined 10 per cent in voting power as a rule of thumb: any equity investment that results in a share less than 10 per cent of the ordinary shares or voting power will be classified as equity portfolio investment.*

4 *Originally, the survey was designed to enable reporting of equity and debt (other capital) direct investment transactions, but after the introduction of external loans databases there was no need to keep debt part of the survey.*



Table 1 – Linkage between BOP\_FA and FA

FA item	BOP_FA asset	BOP_FA liabilities
F1. Monetary gold and SDRs	Reserve assets <ul style="list-style-type: none"> <li>• Monetary gold,</li> <li>• Special drawing rights.</li> </ul>	
F2. Currency and deposits	Asset, other investments <ul style="list-style-type: none"> <li>• Currency and deposits.</li> </ul> Reserve assets <ul style="list-style-type: none"> <li>• Reserve position in the Fund,</li> <li>• Currency and deposits (part of foreign exchange and other claims).</li> </ul>	Liabilities, other investments <ul style="list-style-type: none"> <li>• Currency and deposits.</li> </ul>
F3. Securities other than shares	Direct investments abroad <ul style="list-style-type: none"> <li>• Part of other capital – claims on affiliated enterprises</li> </ul> Direct investments in reporting economy <ul style="list-style-type: none"> <li>• Part of other capital – claims on direct investors</li> </ul> Asset, portfolio investments <ul style="list-style-type: none"> <li>• Debt securities – bonds and notes and money market instruments</li> </ul> Reserve assets <ul style="list-style-type: none"> <li>• Securities – bonds and notes and money market instruments (part of foreign exchange and other claims)</li> </ul>	Direct investments abroad <ul style="list-style-type: none"> <li>• Part of other capital – liabilities to affiliated enterprises</li> </ul> Direct investments in reporting economy <ul style="list-style-type: none"> <li>• Part of other capital – liabilities to direct investors</li> </ul> Liabilities, portfolio investment <ul style="list-style-type: none"> <li>• Debt securities – bonds and notes and money market instruments</li> </ul>
F4. Loans	Assets, other investments <ul style="list-style-type: none"> <li>• Loans</li> </ul> Reserve assets <ul style="list-style-type: none"> <li>• Loans (part of reserve position in the Fund)</li> </ul>	Liabilities, other investments <ul style="list-style-type: none"> <li>• Loans</li> </ul>
F5. Shares and other equity	Direct investments abroad <ul style="list-style-type: none"> <li>• Part of equity capital – claims on affiliated enterprises</li> <li>• Part of reinvested earnings – claims</li> </ul> Direct investments in reporting economy <ul style="list-style-type: none"> <li>• Part of equity capital – claims on direct investor</li> <li>• Part of reinvested earnings – claims</li> </ul> Assets, portfolio investments <ul style="list-style-type: none"> <li>• Equity securities</li> </ul> Reserve assets <ul style="list-style-type: none"> <li>• Securities – equities (part of foreign exchange and other claims)</li> </ul>	Direct investments abroad <ul style="list-style-type: none"> <li>• Part of equity capital – liabilities to affiliated enterprises</li> <li>• Part of reinvested earnings – liabilities</li> </ul> Direct investments in reporting economy <ul style="list-style-type: none"> <li>• Part of equity capital – liabilities to direct investor</li> <li>• Part of reinvested earnings – liabilities</li> </ul> Liabilities, portfolio investment <ul style="list-style-type: none"> <li>• Equity securities</li> </ul>

Table 1 – (Continued)

FA item	BOP_FA asset	BOP_FA liabilities
F6. Insurance technical reserves	Assets, other investments <ul style="list-style-type: none"> <li>• Part of other assets</li> </ul>	Liabilities, other investments <ul style="list-style-type: none"> <li>• Part of other liabilities</li> </ul>
F7. Financial derivatives	Assets, financial derivatives	Liabilities, financial derivatives
F8. Other accounts Trade credits and advances	Assets, other investments <ul style="list-style-type: none"> <li>• Trade credits</li> </ul>	Liabilities, other investments <ul style="list-style-type: none"> <li>• Trade credits</li> </ul>

Source: BPM5, table 4.

Survey on insurance services is designed primarily for BOP current account compilation. A part of questionnaire that covers transactions arising from life insurance is applicable for BOP\_FA compilation.

Database of external loans is one of most complicated databases in the CNB. Both assets and liabilities covering stocks and transactions, including data on income, must be reported by residents on loan by loan bases. Standard reports include everything needed for compilation of BOP, IIP and External debt. This database covers whole population of residents that are in position of creditor and/or debtor with nonresidents.

Currency and deposits are compiled for banks and partly for other sectors. Data sources are CNB's monetary statistics and standard BIS reports, respectively. In the first case, transactions are estimated by combining stocks and currency composition of banks' foreign assets and liabilities, while transactions for other sectors are provided by the BIS.

Finally, reserve assets transactions are reported by the Accounting department; in the past, BOP compilers estimated transactions by combining data on stocks with currency composition of reserve assets.

## 5. Croatian financial account, rest of the world

Development of Croatian FA depends on development of other similar reports. Rest of the world part of the FA can be directly linked with corresponding BOP\_FA items, as described previously. In the following paragraphs usability of Croatian BOP\_FA in compilation of FA will be explained for each standard FA component.

*Monetary gold and SDR's* transactions in these instruments are part of changes in official CNB reserves, so these can be identified in corresponding part of BOP\_FA reserves assets items. First transactions in monetary gold are recorded in 2001. resulting from allocation of former Yugoslavia's reserves to succeeding countries. Sale of gold is also recorded in the same year (that transaction and its counterpart are both recorded under reserve assets), so net transaction equals zero. Contrary to monetary gold, SDR transactions can be found in the whole period of BOP compilation. These two items of BOP\_FA reserve assets can be directly used in FA compilation (table 2)<sup>5</sup>.

*Currency and deposits* cover foreign currencies (assets) or liabilities of the CNB to nonresidents who hold certain amount of kuna, Croatian national currency. 'Deposits' part cover transferable and other deposits. The CNB reserve assets cover transactions in reserve position in the Fund and currency and deposits that can be found in respective sub-items of BOP\_FA reserve assets. Data on government sectors assets that are part of this item are supplied by data provided by the government agencies that hold some amounts abroad. It is possible that we miss some amounts, but, to our knowledge, these are mainly short-term transferable deposits. Banks assets and liabilities that are part of this item are derived from monetary statistics reports. Using data from their balance sheets and information on currency composition of foreign assets or liabilities,

<sup>5</sup> Please note that sign convention in the BOP statistics defines that any increase of foreign assets and decrease of foreign liabilities must be presented with a minus sign. Decrease of foreign assets and increase of foreign liabilities are recorded as positive values. All tables in this text showing BOP\_FA transactions are presented in accordance with this convention.

Table 2 – Monetary gold and SDRs, BOP\_FA transactions mil USD

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Monetary gold	0	0	0	0	0	0	0	0	0	0	0
Special drawing rights	-1	-4	-141	10	-30	-73	36	33	33	112	2

Source: CNB, balance of payments data

it is possible to estimate transactions separated from exchange rate changes<sup>6</sup>. While the amount of foreign currencies held by non-bank or non-government residents will remain unknown, which is a great problem especially during summer season when unknown share of transactions are denominated in euros and cleared outside banks (mainly in household sector<sup>7</sup>), there are some data sources that show stock (BIS) or flows (BIS and ITRS or estimates) for this item. Currently, only BIS data is used for BOP\_FA compilation due to poor quality of other data sources which were used in period between 1993 and 1998. BOP\_FA data for all sectors can be used for compilation of respective FA item (table 3).

*Securities other than shares* are debt financial instruments traded in financial markets. In case of Croatian residents, these are mainly bonds (long-term) and money market instruments (short-term) that can be found as both assets and liabilities. Under the item 'direct investments – other capital', both sides, there are no investments in debt securities that would be part of this FA item. However, if something like this occurs, it will be classified under this item. Other BOP\_FA items are of greater importance for this FA item. The CNB investments in securities form significant part on assets side. These are derived from bonds, notes and money market instruments part of BOP\_FA reserve assets. Similar investments of banks can be found in their balance sheets. In order to estimate transactions, stocks are combined with currency composition of foreign assets. Other sectors have no significant interest in these investments, although we can expect certain developments in the near future because new Foreign Exchange Act (National Gazette 96/2003) enterprises do not have to have a permission to invest abroad. For the moment, only investment funds submit needed data that can be used for the compilation. However, methodological development of more comprehensive data source is being developed: Central Depository Agency (CDA) and resident custodian will submit aggregate reports for both investments in Croatia and abroad. Combination of these reports with special reports provided by other residents who have bypassed custodians when investing abroad will give us the whole picture of portfolio investments. Liabilities show somewhat different picture. After the end of war (1995), Croatia has gained access to international financial markets. As a result, BOP\_FA records significant net increase of government sector external debt. Other sectors part in these inflows is still very low, but can change in the near future. In either case, external loans database, aggregate CDA and custodian reports combined with investor reports will form unique data source with excellent coverage of transactions. It is obvious that BOP\_FA data for all sectors can be used for compilation of respective FA item (table 4).

*Loans* form the largest part of Croatian BOP\_FA. They are created whenever Croatian resident is granted or extends a loan directly to nonresident; however, trade credits (with advances) are not part of this item. Data source for these items is external loans database. Each loan, no matter the amount, has to be registered; residents are obliged to provide detailed data using special reporting forms. Among other things, there are parts of the reporting form, which help

6 This process is a two-step process. First, stocks should be distributed according to known currency composition of foreign assets or liabilities. Then, transactions are calculated as difference between original stocks. By applying average monthly exchange rate to these transactions and current exchange rate to stocks, it is possible to calculate stocks and transactions in reporting currency; the difference between opening stock plus transactions and closing stock represents adjustment due to exchange rate changes.

7 Summer season in Croatia is very important for national economy. Foreign travelers and tourists who have spent few days in paid and unpaid accommodation, or just travel through Croatia to other countries, generate high inflows of foreign currencies. Part of them will be shown in banks' accounts, while unknown part will stay in household or will be transferred abroad (although we have some active capital controls: according to Foreign Exchange Act (National Gazette 96/2003) residents are allowed to have deposits abroad only if granted by the CNB).

Table 3 – Currency and deposits, BOP\_FA transactions (mil USD)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Currency and deposits											
Assets	-630	-755	222	291	2	544	-263	-1142	-313	-63	-2081
Monetary authorities	-465	-740	-197	-468	-151	175	-637	-171	-582	-569	232
Government	-5	0	-16	-33	31	-22	14	-26	-16	-31	28
Banks	-205	-189	-452	-589	-372	406	193	-902	-1602	1344	-2309
Other sectors	45	174	887	1381	494	-15	167	-43	1887	-807	-32
Liabilities	0	46	274	26	271	-176	36	-105	201	1160	1355
Government	0	0	0	0	0	0	0	0	0	0	0
Banks	0	46	274	26	271	-176	36	-105	201	1160	1355
Other sectors	0	0	0	0	0	0	0	0	0	0	0

Source: CNB, balance of payments data

Table 4 – Securities other than shares, BOP\_FA transactions (mil USD)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Securities other than shares											
Assets			-105	-76	-237	-253	184	-467	-894	-796	-1404
* Short-term			0	0	11	0	-10	-5	-13	13	15
* Long-term			-105	-76	-248	-253	194	-462	-881	-809	-1419
Monetary authorities			-105	-76	-248	-253	222	-444	-765	-239	-1625
Government											
Banks					11		-38	-23	-130	-531	220
Other sectors										-26	1
Liabilities				629	550	14	590	730	716	333	834
* Short-term				0	0	0	10	-6	18	-27	39
* Long-term				629	550	14	580	736	699	360	795
Monetary authorities											
Government				629	550	14	547	736	699	246	593
Banks											
Other sectors							43	-6	18	87	241

Source: CNB, balance of payments data

identifying the direct investment relationship between creditor and debtor, country of nonresident, the amount of loan, repayments of principal and interest etc. When a resident creditor extends a loan abroad to its foreign owner, transactions from this loan will be classified under FDI in Croatia – other capital as disinvestments from abroad. Consequently, if the same resident receives a loan from its foreign owner, an increase in FDI investments will be shown in BOP and IIP. If there is no direct investment relationship between creditor and debtor, a loan will be classified as other investments according to the institutional sector of resident<sup>8</sup>. As table 5 shows, on assets side there are some loans classified under government sector, while majority of them can be found under items that cover assets of banks and other sectors. On liabilities, CNB liabilities

<sup>8</sup> In both cases, flows of investment income will be reflected under BOP current account – income.

Table 5 – Loans, BOP\_FA transactions (mil USD)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Loans											
Assets							-97	-94	35	-55	-40
*Short-term							-10	0	-6	-5	-10
*Long-term							-88	-94	41	-50	-30
Monetary authorities							0	0	0	0	0
Government							1	0	-3	1	-1
Banks							-25	3	-9	-20	-2
Other sectors							-74	-96	47	-36	-36
Liabilities	-117	-29	426	666	1474	1045	598	800	-154	603	3151
*Short-term	97	10	470	217	248	36	27	240	-388	24	590
*Long-term	-214	-39	-44	449	1226	1009	571	560	234	579	2561
Monetary authorities	-24	106	98	-4	37	-9	-10	-10	-5	-186	375
Government	-119	-132	-47	269	96	-61	186	301	-190	390	571
Banks	-21	6	218	200	399	312	-6	101	128	66	1125
Other sectors	48	-10	157	202	942	804	428	407	-87	333	1080

Source: CNB, balance of payments data

result from the IMF loans and repos, while all other sectors show significant build up of Croatian gross external debt.

*Shares and other equities* owned by our residents, as well as those issued by Croatian residents and owned by nonresidents are part of 'shares and other equity' FA item. Both direct and portfolio equity investments are covered by the survey that is used to collect data on direct and portfolio investments in Croatia and abroad. A sample covering more than 95% of total foreign owned equity is obliged to provide data needed for compilation of equity investments.

As previously noted, there are two steps in the data collection process. After the collection of basic figures from the population (like position data), a sample of enterprises is selected which receives additional forms to provide data on stocks, transactions, reinvested earnings, country breakdown etc.

The position data on capital and the share of foreign capital invested in the reporting enterprise, including data on reporting enterprise's investments abroad are provided in first step and used to identify a sample of enterprises that will be surveyed through quarterly forms. According to the Accounting Act, the capital position includes subscribed capital, share premium, revaluation reserves, reserves generated from profit (legal reserve, statutory reserve, reserve for own shares, and other reserves), profit or loss from previous years and profit or loss for the current (reporting) year. The equity position presents the subscribed capital that consists of shares/equity capital with voting rights (excluding nonparticipating shares/equity capital). Also, subscribed but yet not paid share of equity should be provided: IIP position data will not include its value. The total percentage of equity held by foreign investors at the end of the reporting year should be reported, as well as the total book value of equity capital invested by the reporting enterprise in foreign institutions.

After the initial introduction of the Survey, it was clear that FDI aggregates miss the data on initial investments, at least until the end of the year. In order to overcome this problem, another form was introduced to collect data regarding the initial equity investment transaction between resident and nonresidents.

By combining data collected in step one, the CNB defines and updates a sample for respective year and collects more detailed data. Reporting forms used in second stage of data collection are quite complicated, but they provide everything that is needed for compilation of BOP\_FA equity investments items, including identification of direction of investment. BOP\_FA data can be used to compile 'shares and other equity' FA item (table 6).

*Insurance technical reserves* liabilities are the only item that can be partially compiled from the BOP\_FA because nonresidents can not be found in Croatian pension funds, at least not on significant scale. As a result, net equity of households in pension funds (liabilities) equals zero.

Table 6 – Shares and other equity, BOP\_FA transactions (mil USD)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Shares and other equity											
Assets	-19	-6	-6	-18	-181	-78	-46	-34	-124	-598	-156
Direct inv. abroad	-19	-7	-6	-24	-181	-78	-46	-34	-124	-529	-90
Direct inv. in Croatia	0	0	0	0	0	0	0	0	0	0	0
Portfolio inv. Abroad	0	1	0	6	0	0	0	0	0	-69	-66
Monetary authorities	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	-3	0
Banks	0	1	0	0	0	0	0	0	0	-2	0
Other sectors	0	0	0	6	0	0	0	0	0	-64	-66
Reserve assets, equity	0	0	0	0	0	0	0	0	0	0	0
Liabilities	121	127	119	504	416	706	1312	805	982	880	1505
Direct inv. abroad	0	0	0	0	0	0	0	0	0	0	0
Direct inv. in Croatia	120	117	114	511	400	704	1331	805	968	816	1485
Portfolio inv. in Croatia	0	10	5	-7	16	1	-19	0	14	64	20
Banks	1	3	2	3	12	0	-4	0	-4	39	-2
Other sectors	0	7	2	-10	4	2	-14	-1	18	26	23

Source: CNB, balance of payments data

Table 7 – Insurance technical reserves, BOP\_FA transactions (mil USD)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Insurance technical reserves											
Assets											
Liabilities										1	1
Other sectors										1	1

Source: CNB, balance of payments data

On asset side of this item, we also do not have anything; the same is true for insurance technical reserves assets<sup>9</sup>.

Survey on insurance services collects separate data for several items including reinsurance, freight and life insurance. One part of questionnaire deals with nonresidents assets in resident insurance companies arising from life insurance and that is the only part usable for FA compilation. The same would be true for assets side, the only problem which can not be solved is how to identify reporting population among households. Table 7. presents BOP\_FA transactions resulting from life insurance.

*Financial derivatives* are not included in BOP\_FA compilation because methodology is still in early stage of development. Once when it is finalised, we should have data on claims and liabilities for banks and other sectors.

Final item to be covered before we present first estimate of Croatia's financial account for the rest of the world is item *trade credits and advances*, part of *other accounts*. These credits are of great importance for Croatia because we have permanent trade deficit that is mainly financed by using these instruments.

In period 1993–1996 main BOP data source was the ITRS. Due to its methodological limitations (cash basis), there was urgent need to estimate these credits that were part of *net errors and omissions* BOP item, using available and designing new data sources.

<sup>9</sup> Although development of BOP\_FA is in its final stage, we still miss some items on households because it is impossible to get anything from them; this is especially true for life insurance and currency and deposits held abroad because both are not allowed by the Foreign Exchange Act.



Table 8 – Trade credits and advances, BOP\_FA transactions (mil USD)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Trade credits and advances											
Assets				36	18	-20	-271	95	48	-77	-160
Other sectors	0	0	0	36	18	-20	-271	95	48	-77	-160
Liabilities				390	218	-467	311	277	73	474	-256
Government	0	0	0	0	0	0	1	-3	1	0	2
Other sectors	0	0	0	390	218	-467	310	280	72	474	-258

Source: CNB, balance of payments data

Table 9 – Croatian financial account, rest of the world in 1993–2002 (cumulative) (mil USD)

Assets	Financial account, rest of the world	Liabilities
6267	F. Net acquisition of financial assets	
	F. Net incurrence of liabilities	17853
25	F1. Monetary gold and SDR's	
2108	F2. Currency and deposits	1733
2644	F3. Securities other than shares	3562
4	Short-term	-5
2640	Long-term	3567
211	F4. Loans	5313
20	Short-term	982
191	Long-term	4331
1109	F5. Shares and other equity	5971
0	F6. Insurance technical reserves	1
	F7. Financial derivatives	
170	F8. Other accounts	1275
170	Trade credits and advances	1275

Source: CNB, balance of payments data

There are two data sources for respective BOP\_FA items: database on external loans and the survey. Everything explained for loans is the same for long-term trade credits. Short-term trade credits are not part of external loans statistics (as defined by the Foreign Exchange Act), so they have to be based on something else. Due to large population of exporters and importers, only a sample of them can be addressed to become reporting enterprises for the survey on trade credits.

First survey was started in 1996, covering most significant importers and/or exporters. Due to 1996. Foreign Exchange regulation, resident had to report on all financial loans (short-term and long-term), as well as on trade credits with maturity 91 days or more. As a result, the survey was asking only questions on trade credits created during the reporting quarter. In the following quarter, these values were netted with newly created trade credits; as a result, we had BOP estimation for drawings and repayments, separately for assets and liabilities. During 2001., a 90 days period was extended to 150 days so this methodology was not usable anymore for quarterly BOP compilation, but it still can hold for longer time periods.

During 2003, new Foreign Exchange Act extended 150 to 365 day, so during the same year a new survey was created that is now in use. For this survey, sample of resident importers and exporters provides data on advances and trade credits, separately for drawings and repayments, both assets and liabilities. In this way, we have data on actual monthly payments and drawings that are of much higher quality than data from previous survey. Beside distinction between advances and trade credits, latter have to be divided into two groups; up to 6 months and between 6 months and 1 year; this proved as a good decision because more than 95% of total trade credits must be repaid in less than 6 months.

Data from external loans database for long-term trade credits combined with results of both surveys for short-term credits are part of BOP\_FA and can be used for FA compilation (table 8).

Finally, by summarising transactions presented in tables 2–8 and by changing signs for assets, we can create first estimate of Croatia's FA column *rest of the world accounts*. Table 9 shows



Table 10 – Croatian financial account, rest of the world in 2003 mil USD

Assets	Financial account, rest of the world	Liabilities
3839	F. Net acquisition of financial assets	
	F. Net incurrence of liabilities	6589
–2	F1. Monetary gold and SDR's	
2081	F2. Currency and deposits	1355
1404	F3. Securities other than shares	834
–15	Short-term	39
1419	Long-term	795
40	F4. Loans	3151
10	Short-term	590
30	Long-term	2561
156	F5. Shares and other equity	1505
0	F6. Insurance technical reserves	1
	F7. Financial derivatives	
160	F8. Other accounts	–257
160	Trade credits and advances	–257

Source: CNB, balance of payments data

exactly that for period 1993–2002, while table 10. shows latest data for 2003. Both tables are based on BOP\_FA data (actually, already available data sources used for BOP\_FA compilation) and follow presentation defined in SNA93, table 11.1 Account III.2: Financial account<sup>10</sup>.

## 6. Conclusion

In this paper we have shown that Croatian Balance of Payments (BOP) is good data source for compilation of Financial Account (FA) because its methodology is based on international concepts that define residents, valuation of transactions, time of recording and conversion procedure in the same way as in the System of National Accounts. It is primarily usable for *rest of the world* part of the financial account that presents financial transactions between residents and nonresidents; in other words, financial account in the BOP (BOP\_FA) shows Croatia's net financing from abroad.

Although not the same as that of financial account, structure of balance of payments enables identification of four institutional sectors (monetary authorities, government, banks and other sectors) and their transactions grouped by type of financial instruments and their maturity thus enabling direct linkage to most of the financial account items.

Considering 1993–2003 period, most significant claims in Croatian FA are investments in debt securities (\$4 bln) and currency and deposits (\$4.2 bln), while transactions in loans (\$8.5 bln), equity (\$7.5 bln) and bonds (\$4.4 bln) have highest weight (aprox. 80%) in the liabilities. Cumulative net transactions in assets (\$10.1 bln) are smaller than those in liabilities (\$24.4 bln) showing that Croatia has a net debtor position.

Further developments of FA in Croatia should take at least two steps, no matter in which order: (1) development of other parts of FA using already developed statistics for banking and some other sectors and (2) usage of these statistics (including BOP) to compile detailed flows of funds accounts that can be used to fill gaps in other sectors, especially households. The latter will demand some interventions in present data sources and/or their reports so that transactions can be grouped for other SNA sectors defined in SNA93 which are not important for current presentation in standard reports (for example, *other sectors* in BOP statistics could be divided into households and nonfinancial corporations).

<sup>10</sup> Appendix 1 shows quarterly FA data for 2003.

## Appendix 1

## Quarterly data for the rest of the world

Since BOP is published quarterly, it is possible to create quarterly FA for the rest of the world. Table 11 shows quarterly transactions between residents and nonresidents that are recorded in BOP during 2003.

Table 11 – Croatian financial account, rest of the world in 2003 (quarterly data) mil USD

2003Q1	2003Q2	2003Q3	2003Q4		2003Q1	2003Q2	2003Q3	2003Q4
385	575	1259	1621	F. Net acquisition of financial assets				
				F. Net incurrence of liabilities	1343	1505	967	2773
-1	0	0	0	F1. Monetary gold SDR's				
-307	-400	961	1827	F2. Currency and deposits	101	491	-29	792
586	845	217	-245	F3. Securities other than shares	663	224	-62	9
-3	-6	-5	-2	Short-term	0	12	19	9
589	851	222	-243	Long-term	663	212	-81	0
-11	-26	43	34	F4. Loans	553	284	1172	1142
9	-3	2	2	Short-term	184	20	280	106
-20	-23	41	32	Long-term	369	264	892	1036
40	33	41	42	F5. Shares and other equity	130	524	39	812
0	0	0	0	F6. Insurance technical reserves	0	0	0	0
				F7. Financial derivatives				
78	123	-4	-37	F8. Other accounts	-104	-18	-153	18
78	123	-4	-37	Trade credits and advances	-104	-18	-153	18

Source: CNB, balance of payments data

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## Abstract

*As part of the international economic relations statistics, the Croatian National Bank compiles the balance of payments and the international investment position statistics. This text concentrates on usability of the Croatian balance of payments in compilation of financial account.*

*Balance of payments methodology is based on international concepts that define residents, valuation of transactions, time of recording and conversion procedure in the same way as in the system of national accounts. It is primarily usable for compilation of the rest of the world part of financial account that shows financial transactions between residents and nonresidents. Although not the same as that of financial account, structure of balance of payments enables identification of four institutional sectors (monetary authorities, government, banks and other sectors) and their transactions grouped by type of financial instruments and their maturity thus enabling direct linkage to most of the financial account items.*

*The structure of the paper is the following: international guidelines are briefly presented in the first part of text, followed by description of linkages between balance of payments and financial account. Usability of Croatian balance of payments for compilation of financial account is then presented for each standard component and the first estimates of financial account for the rest of the world are given. The text concludes with recommendation of further developments of financial account statistics in Croatia that should be based on detailed flows of funds created from available data sources.*

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# The role of balance of payments statistics in the compilation and analysis of financial accounts in Austria

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## 1. Introduction

The conditions for monetary and economic policy-making have changed a lot in recent years due to the ongoing globalisation and the creation of a monetary union in Europe. Both developments have generally altered the transmission channels of financial streams, but they have also, and even more so, accelerated cross-border capital flows. In this context it is worth examining the statistical framework designed to support the governance process.

This paper illustrates what role balance of payments (BOP) statistics and international investment position (IIP) data play in the compilation and analysis of Austria's "rest of the world" component of the financial accounts.

The BOP and IIP data on cross-border transactions and stocks are the primary statistics on the basis of which the financial accounts' rest of the world aggregate is compiled. In analysing these data, we arrive at a much better understanding of the underlying economic transactions when we combine the functional approach of BoP and IIP with the different methodological approach underlying the financial accounts, which provides for a breakdown by financial instruments. We call this a "twin analysis" approach. Similarly, BOP and IIP information on the geographical allocation of foreign assets and liabilities rounds off the information available from the sector breakdown within the financial accounts statistics.

To examine these issues, the paper is structured as follows. Section 2 provides a general assessment of the use of BOP data for the rest of the world sector within Austria's financial accounts. This section also presents the decision tree should sectoral data on individual financial instruments be available from more than one source. Section 3 describes in detail the bridging exercise from the functional BOP structure to the breakdown of data by financial instruments in the financial accounts. Section 4 discusses the cross-border shares of financial assets and liabilities especially in the area of securities, shares and other equities, with a view to illustrating how important the rest of the world sector is for an open economy like Austria. Section 5 looks at the geographical allocation of BOP data as an additional tool for the analysis of individual regional areas. Given the particular relevance of the euro area for Austria, the emphasis is put on euro area aggregates.

## 2. Use of BOP data for the financial accounts

The institutional arrangements for the compilation of balance of payments statistics and of financial accounts data in Austria are as follows: BOP data have to be compiled by the central bank under Austria's Exchange Control Law. The compilation of national accounts data is regulated by Council regulation (EC) No. 2223/96 (European System of National Accounts, ESA95). In practice, a division of labor has been established: The national statistical institute compiles the non-financial accounts within the national accounts, except for major parts of the rest of the world account (which are derived from the current and capital account of the BOP); and the

<sup>1</sup> *We would like to thank Eva Maria Nesvadba, Ingeborg Schuch, Irmgard Wenko, Rene Dellmour and Robert Zorzi for their contributions. The views expressed in this paper are solely those of the authors and do not necessarily reflect the views of the Oesterreichische Nationalbank.*

central bank compiles the financial accounts. Specifically, this task has been assigned to the Balance of Payments Division, a division of the Statistics Section of the Oesterreichische Nationalbank (OeNB).

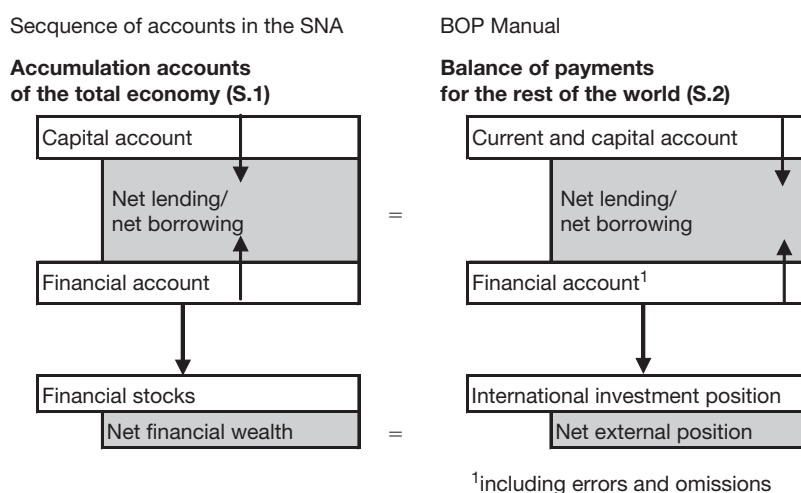
Apart from the advantage of the close cooperation between BOP-compilers and “financial accountants” from the operational viewpoint the use of the balance of payments statistics for the rest of the world sector account in the financial accounts is one of the results of the strategy in Austria by setting up a list of certain rules in the process of compiling financial accounts. It was agreed that “consistency” should be a key priority. The balance of payments is normally – in contrary to other primary statistics – a statistical framework which includes information both for the non-financial accounts and for the financial accounts. Our starting point and thus the defining element for the compilation of the financial accounts is the net lending/net borrowing of the total economy, which should of course be equal<sup>2</sup> to the net lending/net borrowing registered in the rest of the world account of the non-financial accounts as derived from BOP data. Using BOP flow data has the additional advantage that these flow figures are integrated in the compilation of the international investment position (IIP). Consequently the balance sheet (stocks) pertaining to the sector “rest of the world” (sector 2 in accordance with ESA 95) draws heavily on the IIP<sup>3</sup>. The concept is based on the accounting identity shown as follows:

Net lending/borrowing in terms of non-financial accounts:

$$\text{Investment (I) – Saving (S) = Current account + Capital transfer (within BOP),}$$

In the financial accounts:

$$\text{Financial investment – Financing = Net capital outflow/inflow + Errors and omissions}^4 \text{ (within BOP)}$$



Finally, regarding the concepts underlying the balance of payments and the system of national accounts, the two data sets are broadly reconcilable because the IMF standards set out in the 5<sup>th</sup> edition of the Balance of Payments Manual (BOP5, 1993) are largely consistent with the European System of Accounts (ESA, 1995) derived from the System of National Accounts (SNA, 1993).

Given the decision to integrate BOP statistics into the matrix for compiling the financial accounts, it takes a decision tree to select data for a given matrix cell if information can be obtained from more than one source. This is especially the case for cross-border assets of the financial sector<sup>5</sup>. In the Austrian case, data selection decisions refer first to financial sub-sectors and second to financial instruments:

With regard to data selection, the following rules apply: Data on central bank operations are derived directly from the databases maintained by the OeNB’s accounting division (valued at

2 Taking into account the opposite sign of the value.

3 In line with current practice, data from sources other than the IIP are in some cases incorporated into the statement of cross-border claims and liabilities, in particular in cases where the breakdown of the IIP is inadequate (e.g. data for the central bank). Differences in valuation may also arise.

4 In the case of Austria “Errors and omissions” is regarded as part of financial flows, based past evidence.

5 The financial sector consists of the central bank (S.121), other monetary institutions (S.122), other financial institutions (S.123), financial auxiliaries (S.124), insurance corporations and pensions funds (S.125) according to the System of European accounts (ESA95).

market prices) and reconciled with the corresponding entries in the balance of payments statistics. For all other entities within the financial sector, different rules apply for different financial instruments. For deposit and loan<sup>6</sup> totals, the value established by IIP calculations is used as the starting point, but deposits or loans are classified as they appear in banks' (or other financial institutions') balance sheets. The statistics on securities and shares (including mutual fund shares) draw heavily on the OeNB's security-by-security compilation system, both for holdings of domestic investors (regardless of the sector of the issuer) and for holdings of non-residents in domestic securities. Details are described in section 3. Additional data on cross-border foreign direct investment are derived from FDI statistics, including the transformation of the directional principle into the assets/liabilities principle.

### 3. Bridging exercise from BOP data to financial accounts data

In the financial accounts according to SNA 93/ESA 95, financial transactions (and stocks) are broken down by financial instruments, primarily based on liquidity and legal features<sup>7</sup>. The balance of payments statistics according to the BPM5, by contrast, above all rely on a functional breakdown, which does require financial instruments to be allocated to different categories, but not to the extent that would be required under the financial accounts framework. The table below shows how these functional categories are reorganised to fit into the structure of Austria's financial accounts.

Balance of payments statistics/international investment position

Direct investment		Portfolio investment			Financial Der.	Other Investment				Reserve assets					
Equity capital	Other capital	Equity sec.	Bonds and notes	Money market instrum.		Trade credits	Loans	Deposits	Other	Mon. Gold	SDRs	Reserve position with the Fund	Currency and deposits	Securities	Other claims

**Financial accounts**  
rest of the world  
sector account

Monetary Gold and SDRs										X	X				
Currency and deposits								X				X	X		
Securities other than shares	Short-term securities			X											X
	Long-term securities			X											X
	Financial derivatives					X									X
Loans	Short-term							X							
	Long-term		X					X							
Shares and other equity	Shares and other equity	X		X											X
	Mutual funds shares			X											X
Insurance technical reserves 1)															
Other accounts receiv./ payable	Trade credits and other advances						X								
										X					X

<sup>1</sup>No data are available, neither by the balance of payments statistics nor by other means.

The transformation is possible because Austria has decided to take also into account the requests of the financial accounts statistics when designing the structure for the balance of payments statistics according to the IMF Manual BPM5. In both the balance of payments statistics and the financial accounts, the sectoral classification refers to domestic sectors. The coverage of the sectors monetary authorities (central bank), other monetary financial institutions and general government is consistent between BPM5 and ESA 95. In the financial accounts, the balance of payments statistics residual sector "other sectors" is subdivided into other financial institutions, financial auxiliaries, insurance corporations and pensions funds as well as non-financial corporations and households including non-profit institutions serving households (NPISH). This breakdown by sector is already available in a detailed database inter alia serving the balance of payments statistics.

<sup>6</sup> Loans also comprise overdue loans which is different from the treatment in the balance of payments statistics.

<sup>7</sup> The memorandum item direct investment is an exception.

In Austria we put specific attention on the following areas:

1. Foreign direct investment (FDI) capital is split into equity and other capital (on the basis of the asset/liability principle)
2. Portfolio investment data in the financial instruments securities other than shares, quoted shares and mutual fund shares are available on a security-by-security basis.

Regarding information on FDI, data are compiled on the basis of the directional principle, as required by the BPM5, and are thus available as flows – and related stocks – between the non-resident direct investor and the domestic corporation (inward investment) or between the domestic direct investor and the non-resident direct investment company (outward investment). However, both outward and inward investment capital streams are split into assets and liabilities, which allows Austria to swap between the directional principle and the asset/liability principle. For analytical purposes, FDI data are in fact stored according to both underlying concepts in the financial accounts database.

With reference to portfolio investment, we use a comprehensive and reliable compilation system that was initially designed for BOP statistics but has, over time, been extended to cover domestic and cross-border portfolio investment flows and stocks as well. This compilation system was developed and continually modified during 1988–98 in order to improve the reliability of portfolio investment data. The main reasons for implementing such a system were:

- Experience showed that instructions to reporting agents to classify individual securities under certain aggregates were becoming increasingly complicated in fast developing international financial markets.
- Additionally the users of these statistics have expanded continuously their requests which cannot be captured by a compilation system based on reported aggregates.

Therefore, the reporting of securities is now based on the International Securities Identification Number (ISIN code) for each individual security: (i) monthly stocks<sup>8</sup> of each individual security reported by banks acting as primary custodians held for their own account or on behalf of their resident and non-resident customers. (ii) Stocks<sup>9</sup> of securities held with banks abroad or in self custody have to be reported by domestic non-banks on a yearly basis.

The Balance of Payments division within the Statistics section generates an internal master file from data provided by commercial data providers and from additional information reported by Austrian banks providing information on the main feature of each security (e.g. nominal amount outstanding, currency of denomination, maturity, sectoral allocation and interest rate). Supplementary data on quotation are stored in the master file. The database is updated at least on a weekly basis. Comprehensive quality checks and amendments are made by the Balance of Payments Division in order to improve the information received from external sources.

This system allows the following data to be compiled for each holding sector<sup>10</sup> on a “who to whom” approach for all issuance sectors:

- Amount outstanding at the end of reporting period (valued at nominal price and at market price)
- Transactions during the reporting period, partly derived from stocks and valued at market price
- Other changes in volume, split into exchange rate changes, price changes and other adjustments (like reclassification).

Additionally, accrued interest based on the debtor approach is compiled for securities other than shares.

The security-by-security collection system is one of the key pillars of Austria’s financial accounts compilation system. It is worth noting that the securities reported under this system accounted for as much as 40% of the total value of financial assets and liabilities of the Austrian economy at the end of 2003. This gives an illustration of the high importance in economic as well as in compilation terms.

Furthermore, this system allows us to compile BOP and financial accounts data on an ongoing basis without having to make major changes to the reporting structure; we do, however, discuss further requests. To list some examples: the new BOP Manual will probably change the definition of the functional category portfolio investment; the idea is to reclassify non-traded equities as “other investment”. Therefore a split of shares into listed and unlisted is envisaged;

<sup>8</sup> Stocks are reported at nominal value.

<sup>9</sup> Stocks are reported either at nominal value or at market value.

<sup>10</sup> Central bank, other monetary financial institutions, other financial institutions including insurance corporations and pensions funds, general government, households including NPISH and the rest of the world sector.



the OECD is currently working on the proposals to split mutual fund shares into categories representing the underlying financial instruments: bonds, shares, mixed and money market instruments.

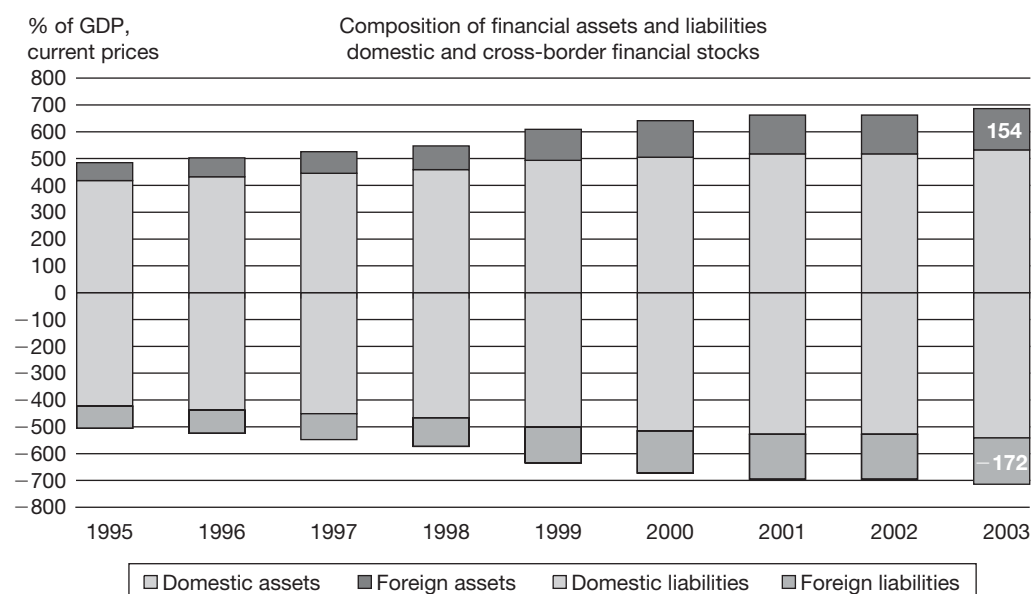
Turning to the international level, let us add that the ECB has established a statistical database for a security-by-security collection system on a European-wide level, called Centralised Securities Data Base (CSDB).

#### 4. Cross-border investments in the Austrian economy

This section of the paper contains some quantitative information on the amounts and shares of financial assets and liabilities that result from cross-border activities, especially in the area of securities, shares and other equities. This information is meant to illustrate empirically how important the rest of the world sector is for an open economy like Austria.

At the end of 1995, the cross-border assets of the Austrian economy totalled EUR 115 billion; this represented 15% of the financial assets of the total economy. At the same time the foreign liabilities stood at EUR 143 billion, representing 18% of the total financial liabilities of the Austrian economy. In the following years changes in the financial behaviour boosted cross-border financial investment both on the asset side and on the liability side mainly due to the introduction of the euro and the start of Monetary Union (1998/1999). The outstanding amount of assets abroad accelerated to EUR 228 billion, 21% of the total financial claims at the end of 1999. Domestic debtors increased their liabilities vis-à-vis non-residents to the amount of EUR 264 billion. Between 1995 and 1999, cross-border financial stocks doubled, and total assets and liabilities increased by 40%. Since the introduction of the euro, the proportion of the cross-border financial investment has grown more rapidly than overall financial stocks but with lower annual growth rates than in 1998 and 1999. At the end of 2003, the financial assets of the total economy amounted to EUR 1.348 billion, containing EUR 344 billion of external assets (26%). On the liability side the outstanding amount held by non-residents totalled EUR 387 billion, representing 28% of the total liabilities (EUR 1.387 billion). The degree of internationalisation, an additional indicator for the openness of the economy, reflects the increase of the cross-border financial assets in terms of GDP. Austria's external assets came to 154% of GDP at current prices in 2003, compared with less than 70% of GDP at current prices ten years earlier.

The graph below illustrates the growing share of cross-border assets and liabilities in financial stocks between 1995 and 2003:



To improve our understanding of the driving forces behind the increase in cross-border capital streams as reflected by BOP statistics, we have examined how the financial behaviour of the different sectors of the Austrian economy has changed.

For households (including non-profit institutions serving households) the flow of funds indicated that, between 1995 and 2003, by and large the total financial assets and major parts of

all financial liabilities are claims and debt vis-à-vis the domestic financial sector. Currency and deposits with domestic banks accounted for the bulk of financial assets. The proportion of investment in mutual fund shares and insurance technical reserves increased while the holdings of bonds decreased in the observation period between 1995 and 2003. Consumer loans and mortgage loans granted by domestic banks were the key debt instruments used by households.

The cross-border financial assets of non-financial corporations stepped up more rapidly than the increase of the total financial assets. The proportion amounted to 22% in 1995 and to 39% in 2003. The driving force behind this development was the growth of the holdings of foreign equity other than mutual fund shares caused by FDI activities. The main reason for these activities has been the “discovery” of Eastern European markets after 1989. On the liability side cross-border financial stocks went up from 17% of total liabilities in 1995 to 27% in 2003. These activities influenced also FDI capital streams on the asset side. Foreign companies<sup>11</sup> have established their regional headquarters in Austria for their investment in the Eastern European countries, accelerating inward direct investment in Austria in the last decade. In turn, financial flows triggered by FDI activities were an additional reason for the increase of financial assets and liabilities. As cash pooling and loans between affiliated companies increased, demand for bank loans diminished. The table on FDI-related financial assets and liabilities in the statistical annex reveals the importance of FDI within the equity financing of non-financial corporations between 1995 and 2003. Finally the issue of corporate bonds, especially in foreign denomination (preferably in Swiss francs) supported the higher importance of foreign creditors for non-financial corporations in Austria.

In recent years, the biggest change in the ratio of foreign debt to domestic debt has occurred for the government sector. The outstanding amount of foreign debt (marked to market value) of the government sector totalled EUR 36 billion in 1995 or roughly 30% of the total unconsolidated debt<sup>12</sup>. At the end of 2003 the foreign debt, mainly driven by the development in securities, amounted to EUR 107 billion, accounting for 62% of the total debt. The share of domestic financial sector assets in total government liabilities dropped considerably from 63% to 28% between 1995 and 2003 and therefore nearly compensated the increase by foreign investors. Data from the security-by-security collection system (see section 3) incorporated in the BOP statistics accompanied by data from the Austrian Federal Financing Agency (debt manager of the central government) and information from the clearing bank Oesterreichische Kontrollbank support the analysis of these figures. In 1989 an auction system – in the form of price and yield auction<sup>13</sup> – was implemented to issue central government bonds. During the last decade, strongly influenced by the introduction of the euro, a growing number of tenderers (in 2003: 24) were foreign banks. Consequently an increasing part of the new issuances has been sold to non-residents.

Mirroring these changes in the financial behaviour of the non-financial sectors, the composition of the asset side of the financial sector changed accordingly between 1995 and 2003. On the one hand banks operating in Austria increased their cross-border financial investment partly due to the reduction of domestic loans. On the other hand mutual funds and insurance corporations, which absorbed a high proportion of the financial investment of households, changed their portfolio allocation due to new benchmarks after the launch of the euro in 1999. The results can be observed in the financial accounts data: In 1995 the stake of foreign assets in overall financial assets accounted for 21% and increased to 34% at the end of 2003. The change is even more impressive if one deducts the inter-bank working balance from the total financial assets. The breakdown by financial instruments indicates that the holdings of foreign bonds were the driving force behind the cross-border financial investment in the observation period. Besides this major impact the strategy of banks and insurance corporations to enter the domestic markets of the Eastern European countries (most of which became Members of European Union in May 2004) has led to acquisitions of foreign financial institutions (in the kind of FDI) in recent years.

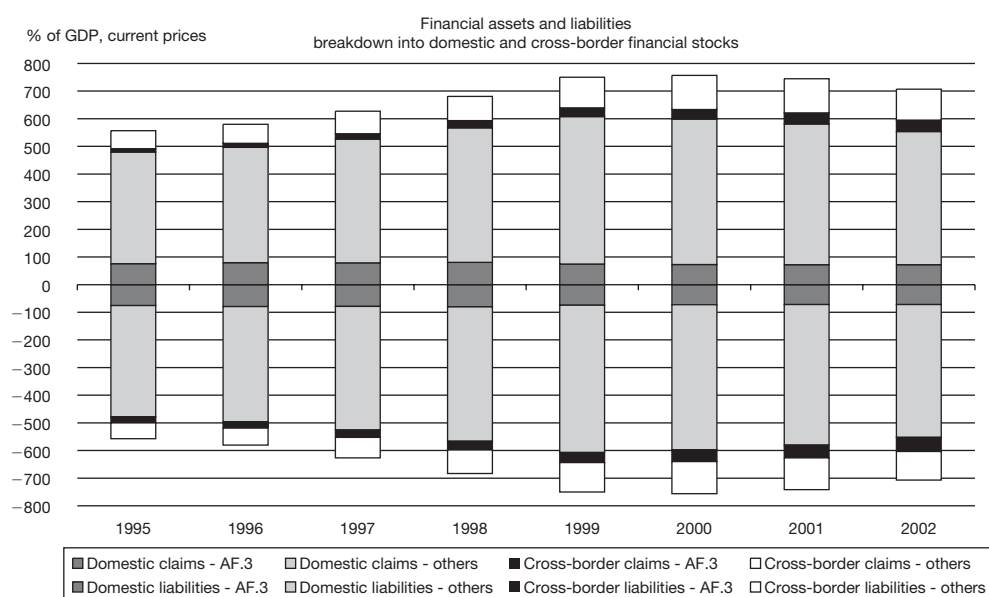
A comparison of the developments in Austria’s cross-border claims and liabilities with those of other euro area countries shows a similar pattern in all countries. There is clear empirical evidence that financial stocks in the euro area<sup>14</sup> comprise an increasing share of cross-border financial assets and liabilities. This progressive international diversification has been identified over the whole period, with the highest growth rate for 1999 and 2000. The introduction of the euro has had an additional impact on the ongoing globalisation. In 1995 on average 14% of total national assets were claims vis-à-vis nonresidents; cross-border liabilities also amounted to

11 *At present there are regional headquarters of roughly 300 international companies like Coca Cola, IBM and Siemens, which are located in Vienna.*

12 *In contrary to the compilation of consolidated debt (intra government liabilities are extracted), according to the “Excessive deficit procedure” of the member states of the European Union.*

13 *Details of the auction system for Government Bonds are published in the report “The Austrian Financial Markets, 2003”. The publication is issued by Oesterreichischer Kontrollbank and Oesterreichische Nationalbank.*

14 *Financial accounts data are available for all Euro Area countries except for Greece, Ireland and Luxemburg.*

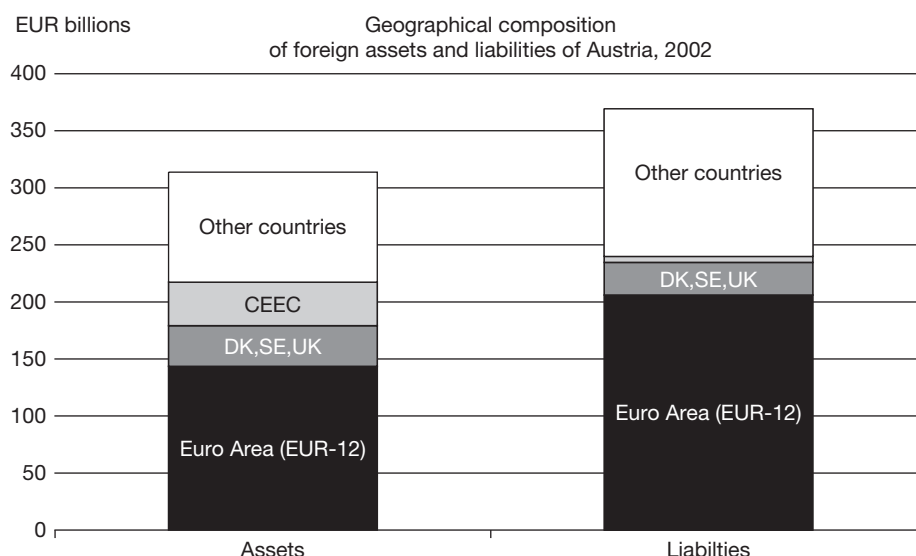


14%. Both external claims and liabilities rose by 8 percentage points in the group of the nine euro area countries under consideration between 1995 and 2002. The breakdown by financial instruments confirms that in Austria cross-border holdings of bonds were important in pushing up the degree of internationalisation. The share of foreign bonds held by domestic investors in overall holdings of securities other than shares in euro area countries increased by 20 percentage points between 1995 and 2002.

The following graph illustrates the development of cross-border financial assets and liabilities in relation to the development of the overall financial claims and liabilities of selected EU countries between 1995 and 2002.

### 5. Geographical allocation of cross-border assets and liabilities

The globalisation of the economy has been accompanied by the internationalisation of financial stocks, with a strong emphasis on “European integration” (in terms of the 25 EU countries) in



Sources: IMF (CPIS), OeNB (International Investment Position)

the case of Austria. IIP figures, which allow financial assets and liabilities to be allocated geographically, provide clear empirical evidence that at the end of 2002 debtors located in the EU-15 or in Central and Eastern European countries accounted for the biggest share of foreign claims (70%), mainly in the form of portfolio investment holdings of foreign securities as well as deposits with foreign banks and loans granted to non-residents located in other euro area states (45% of the total foreign assets). On the liability side the proportion of foreign holders of domestic securities<sup>15</sup> and creditors of deposits and loans located in the euro area came to 58% of the total financial liabilities of the Austrian economy.

<sup>15</sup> *The geographical allocation of portfolio investment liabilities has been derived from the Coordinated Portfolio Investment Survey (CPIIS) provided by the IMF (including internal estimates).*

## Statistical annex:

## Financial assets of the Austrian economy broken down by main categories of the financial instruments

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Currency and deposits	280	289	286	308	330	337	364	346	365
o/w: foreign assets	43	44	41	38	45	44	56	42	42
as % of total	15%	15%	14%	12%	14%	13%	15%	12%	12%
Loans	240	252	263	274	299	333	353	361	371
o/w: foreign assets	29	31	37	44	55	69	76	78	85
as % of total	12%	12%	14%	16%	18%	21%	21%	22%	23%
Securities other than shares	124	138	152	159	179	196	205	231	244
o/w: foreign assets	24	30	39	50	73	90	102	123	133
as % of total	19%	22%	25%	31%	41%	46%	50%	53%	55%
Shares and other equity	91	105	133	160	210	240	244	253	278
o/w: foreign assets	11	13	23	31	48	71	68	67	78
as % of total	12%	12%	17%	19%	23%	30%	28%	27%	28%
Totals <sup>1</sup>	787	840	893	963	1.088	1.180	1.244	1.274	1.348
o/w: held abroad	115	125	147	169	228	280	307	316	344
as % of total	15%	15%	16%	18%	21%	25%	25%	25%	26%

## Financial liabilities of the Austrian economy broken down by main categories of the financial instruments

Currency and deposits	283	298	303	333	366	384	403	382	401
o/w: foreign liabilities	46	52	58	64	81	91	95	78	79
as % of total	16%	18%	19%	19%	22%	24%	24%	20%	20%
Loans	220	231	236	240	260	286	302	318	324
o/w: foreign liabilities	9	10	9	10	16	23	25	35	37
as % of total	4%	4%	4%	4%	6%	8%	8%	11%	12%
Securities other than shares	161	171	186	198	229	259	281	300	311
o/w: foreign liabilities	61	63	73	89	124	153	178	192	201
as % of total	38%	37%	39%	45%	54%	59%	63%	64%	65%
Shares and other equality	100	116	140	165	198	221	228	239	263
o/w: foreign liabilities	20	23	30	36	36	52	52	54	63
as % of total	20%	20%	22%	22%	18%	23%	23%	22%	24%
Total	811	866	920	996	1.120	1.222	1.289	1.320	1.387
o/w: held abroad	143	154	176	204	264	326	356	366	387
as % of total	18%	18%	19%	20%	24%	27%	28%	28%	28%

Figures in billions of EUR if not indicated otherwise

Source: OeNB (Financial Accounts), compilation as of September 2004.

<sup>1</sup>excluding monetary gold and SDRs

FDI related financial assets of non-financial corporations in Austria broken down by financial instruments main categories of the financial instruments

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Shares and other equity <sup>1</sup>	29	32	41	42	53	54	55	63	67
o/w: foreign assets	6	6	11	12	17	23	26	31	33
o/w: FDI	n.a.	6	9	11	15	20	24	29	30
Loans <sup>2</sup>	2	3	4	5	9	13	15	15	15
o/w: foreign assets	2	3	4	5	9	13	15	15	15
o/w: FDI	n.a.	2	2	2	4	4	5	7	7
Total	79	85	99	101	121	130	133	143	154
o/w: foreign assets	17	17	24	24	36	46	52	57	61
o/w: FDI	n.a.	8	10	12	18	24	29	36	37

FDI related financial liabilities of non-financial corporations in Austria broken down by financial instruments main categories of the financial instruments

Shares and other equity	48	53	65	73	81	86	90	98	108
o/w: foreign liabilities	13	15	18	22	24	30	35	37	42
o/w: FDI	n.a.	12	14	17	20	25	29	32	34
Loans	97	104	111	118	128	145	154	157	162
o/w: foreign liabilities	5	5	4	4	7	12	15	18	20
o/w: FDI	n.a.	3	2	2	3	3	5	6	6
Total	159	169	193	209	233	255	268	279	299
o/w: foreign liabilities	27	27	34	39	49	59	66	71	80
o/w: FDI	n.a.	15	16	19	23	29	34	38	40

Figures in billions of EUR if not indicated otherwise

Source: OeNB (Financial Accounts), compilation as of September 2004.

<sup>1</sup>Holdings of mutual fund shares are excluded.

<sup>2</sup>Loans granted to other non-financial corporations and to households are not included.

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# Cross-border lending and local bank presence: an overview\*

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## Summary

Over the last decade internationally active banks have shifted from cross-border lending to local presence. Dutch banks, for example, now lend 80 eurocent locally against each euro that is lent cross-border. In analysing this development this paper elaborates on the advantages local presence offers compared to cross-border lending. Moreover, the potential stimulating effect of this shift on economic growth in host countries is analysed.

## Introduction

Traditionally, banks are taking deposits in one country and make loans in another country. This way of international banking has been gradually supplemented, or sometimes even replaced, by global or multinational banking, where banks take deposits and offer loans in various markets. The BIS (McCauley et al., 2002), among others, has elaborated on this shift from international to global banking.

The first section of this paper updates the observed trends with recent figures. In addition to global developments, special attention will be paid to Dutch banks. Since the aforementioned study of the BIS, new data have become available showing that banks in the Netherlands, unlike their European counterparts, are strongly involved in local markets. The second section outlines the benefits local presence may provide compared to cross-border lending through focussing on the Foreign Direct Investment (FDI) characteristics of local bank presence.

Finally, some suggestions will be made about the economic effects of the shift to more global banking, in particular on less developed countries (LDC).

## Overview

### ***BIS consolidated banking statistics***

Consolidated banking statistics comprise cross-border claims in all currencies plus local claims in all currencies. Statistically, cross-border claims reported to central banks also include foreign currency claims of banks' local offices abroad.<sup>1</sup> However, only local currency claims on local residents of reporting banks' foreign offices are reported separately. The shift to global banking cannot be measured precisely therefore. Still, the focus in this paper is on the consolidated banking database, because we are interested in the causes and consequences of risk exposures of national banking systems. From a financial stability perspective consolidated banking data are better suited.

### ***Foreign claims of all banks***

Since the start of the consolidated banking statistics in 1983, foreign claims of reporting banks have been rising (chart 1).

\* Paper presented for the Irving Fisher Conference 9–10 September 2004, Basel (final version)

1 Whether a currency is foreign or domestic (local) is seen from the point of view of the debtor country.



Chart 1 – Foreign claims of BIS reporting banks

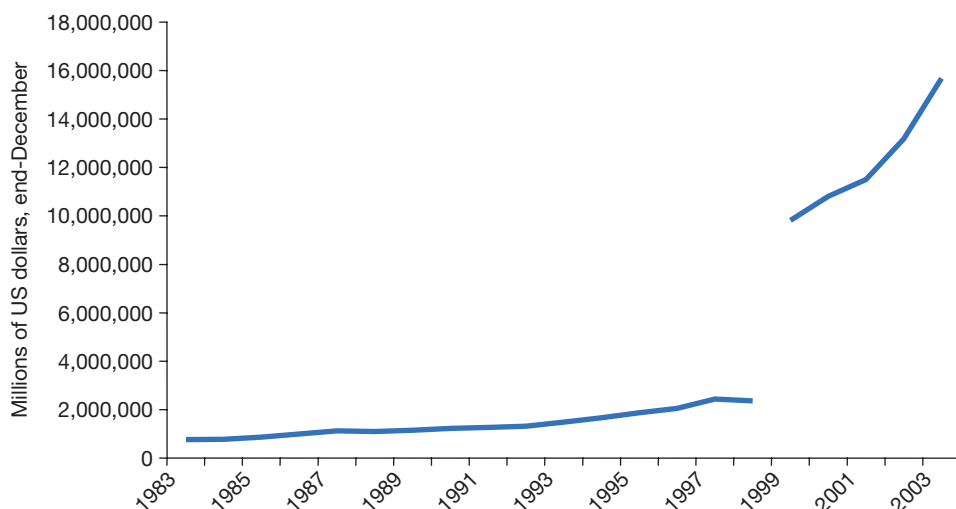
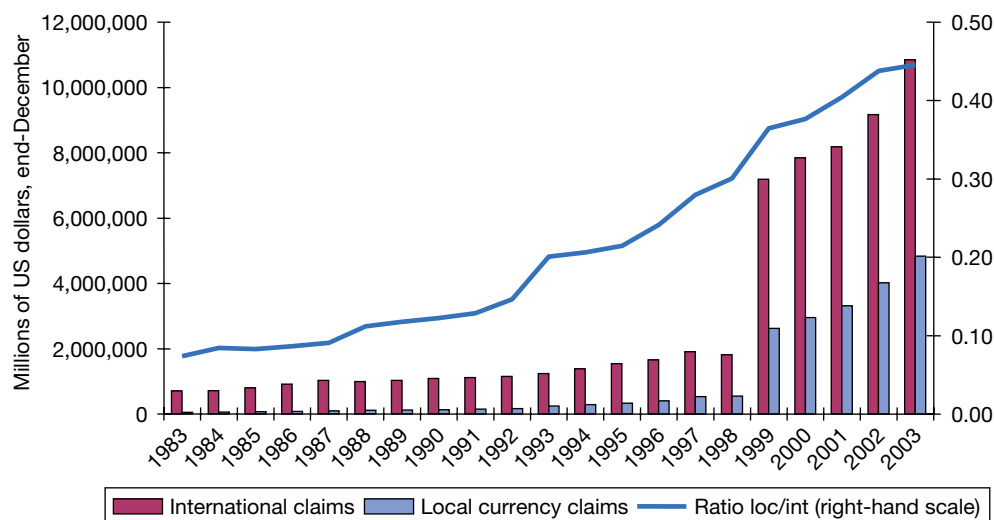


Chart 2 – Foreign claims of BIS reporting banks



As can be seen, there was a major break in series in 1999 due to the inclusion of reporting countries as vis-à-vis countries. There were other, smaller, breaks too, but these are not shown for simplicity purposes. In addition, correcting for smaller breaks – e.g. the introduction of new reporting countries<sup>2</sup> – still leaves the upward trend in tact.

Chart 2 decomposes the foreign claims into international claims<sup>3</sup> and local claims in local currency. Both types of exposures have increased. International claims, starting in 1983 on USD 700 billion rose to nearly USD 11.000 billion end of 2003. More dramatically, local currency claims of foreign bank offices climbed from 51 billion dollars to 4.000 billion dollars twenty years later. This higher growth rate of local claims is reflected in an increasing ratio of local to international claims (chart 2).

Local exposures of all reporting banks now amount to, on average, 45% of their international claims. This average masks a wide dispersion among countries, as McCauley et al. (2002) have shown.

2 BIS Press release Consolidated banking statistics for the fourth quarter of 2003, April 2004.

3 This concept adds local claims of reporting banks' foreign offices in foreign currency to total cross-border claims. In this paper the shift from international to global banking will also be formulated as a shift from cross-border to local lending, since this is more appealing.

### Emerging markets regions

Other than industrial countries, there are no serious breaks for loans to LDC regions.<sup>4</sup> Chart 3.1–3.3 show international and local claims on former Eastern Europe, Latin America and Asia.

Although international claims on countries in *Eastern Europe* seem to rise on average, increases alternate with decreases (e.g. in 1991–1994) or stagnation in the aftermath of the Russian crisis of 1998. Claims in local currencies on local entities however, grew steadily over the last twenty years. The only exception was 1999 when those claims decreased as a result of the Russian default. Clearly, these two developments resulted in a strong rise in the local to international ratio. This is consistent with the findings of De Haas & Van Lelyveld (2002). They combined BIS consolidated banking data with the Bancscope database, finding that foreign bank subsidiaries' credit to residents in Eastern European countries grew in importance. Local offices<sup>5</sup> of BIS reporting banks, therefore, seemed to exert a stabilising influence on the capital flows to residents in this region.

Chart 3.1 – Foreign claims of BIS reporting banks on Eastern Europe

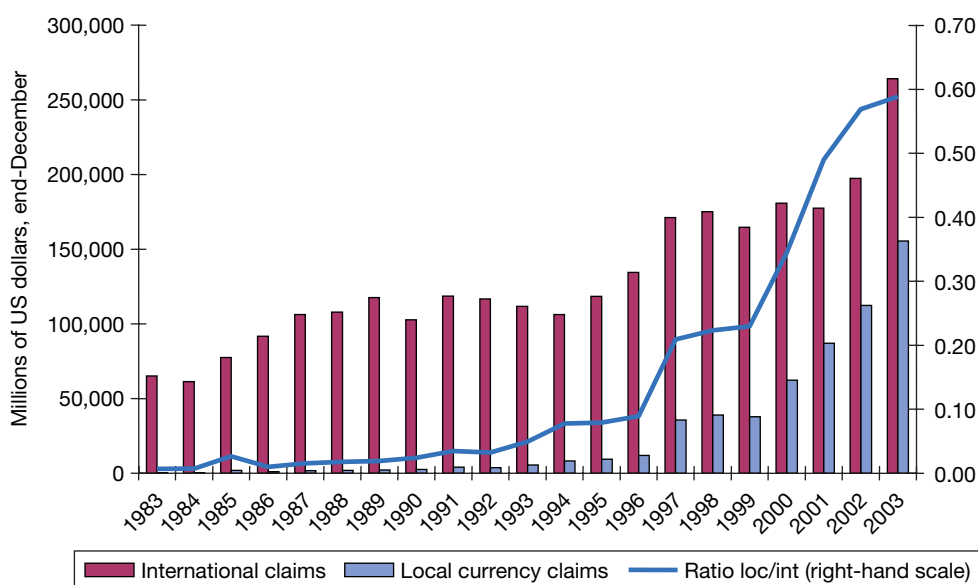
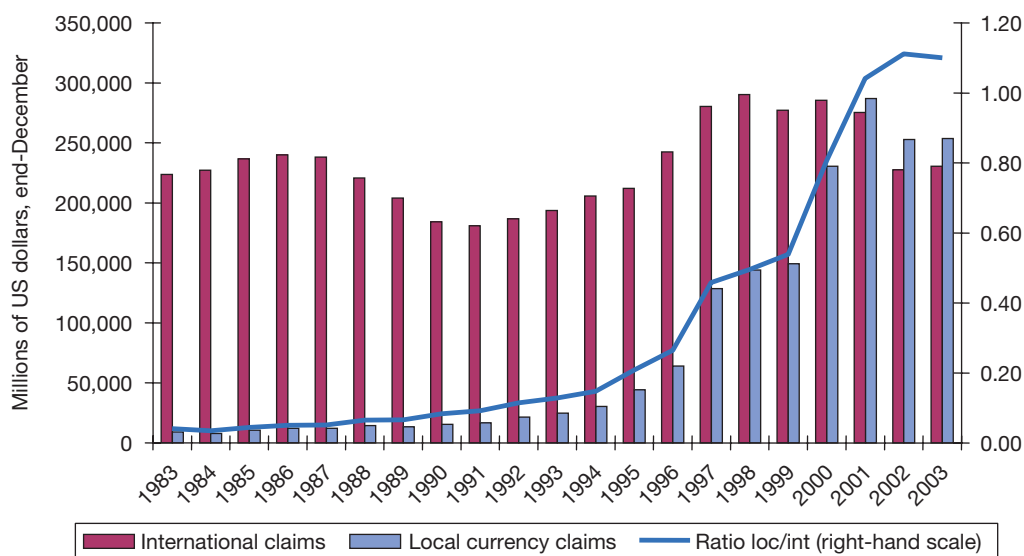


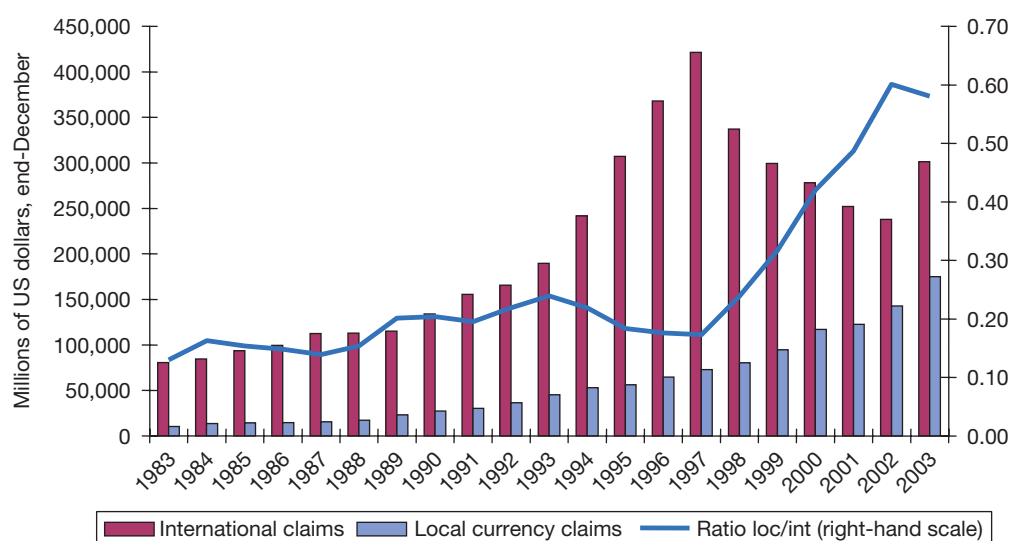
Chart 3.2. – Foreign claims of BIS reporting banks on Latin America



<sup>4</sup> Loans summarise for simplicity all on-balance sheet items including securities.

<sup>5</sup> Other than defined in De Haas & Van Lelyveld (2002) local offices in the BIS statistics consist of subsidiaries and branches.

Chart 3.3. – Foreign claims of BIS reporting banks on Asia



International claims of BIS reporting banks on countries in *Latin America* fluctuated considerably during the past decades (chart 3.2). After the amount of loans reached a top in 1998, one year after the Asian crisis, loans decreased. End-2003 international credit was on the same level as in the late 1980s. Local currency lending on the contrary increased since the mid-1990s. In 2001 they even surpassed international claims. As a result the local to international ratio has been rising almost continually.

Local currency claims on *Asia* grew steadily during the whole period (chart 3.3). The Asian crisis that broke out in the middle of 1997 did not seem to affect local offices' lending activities. International claims however, reached a peak in 1997 and declined afterwards. Clearly, international active banks retrenched from several Asian markets. Only in 2003 international loans exposures have raised again.

In sum, international claims on emerging markets have been much more volatile than local claims. This conclusion is not only consistent with De Haas and Van Lelyveld (2002) for Eastern Europe but also with observations by Peek and Rosengren (2000) for Latin American countries as well. They found that foreign bank penetration into Latin America increased and even expanded during troubled times in the host country.

### Foreign claims of Dutch banks

Since long, Dutch banks have been active in international banking. In 1824, King William I created the *Nederlandsche Handel Maatschappij* (NHM)<sup>6</sup>, one of the forerunners of ABN AMRO. Its purpose was to stimulate trade between the Netherlands and the Dutch East Indies, which had suffered due to the French occupation. NHM started as a trading company and changed into a bank in 1882. Before, offices were established in Jakarta in 1826, in London and in Singapore in 1858, in Malaysia in 1889. In the beginning of the twentieth century followed Shanghai (1903), Hong Kong (1906) and Saudi-Arabia (1926) to mention a few.

Another internationally active predecessor of ABN AMRO was *Hollandsche Bank-Unie*. It established its first branch in South America in Buenos Aires in 1914. Soon a network of agencies was opened to generate funding for its corporate lending portfolio. In 1917 the first branch in Brazil opened its doors. In 1919 the *Hollandsche Bank* built a base in countries around the Mediterranean, such as Turkey.

Jumping to modern times, ABN Bank laid in 1979 the foundation for the prominent position of this bank in the United States by acquiring LaSalle National Bank. Other acquisitions in the States followed.

Other important Dutch banks, ING Bank and Rabobank, though not active abroad for such a long time, embarked on the M&A road in the eighties. They now are exposed to substantial

<sup>6</sup> (English: *Netherlands Trading Society*). The following summary is derived from Kalff (1999).

Chart 4 – Geographical dispersion foreign claims Dutch banks, 2003

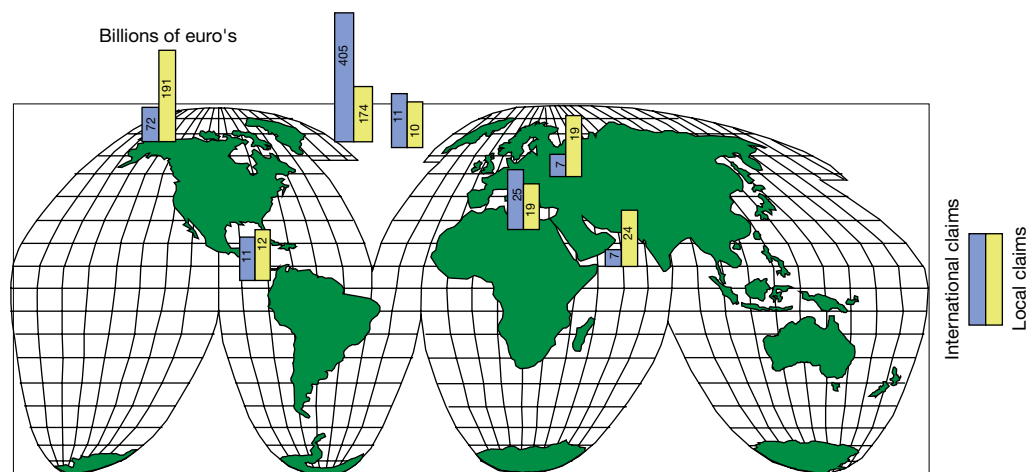


Table 1 – Ratio local to international assets of domestically owned banks, end-2003

UK	ES	NL	FR	BE	DE	IT	IE	PT
1,11	0,98	0,94	0,55	0,41	0,28	0,26	0,15	0,09

Source: BIS Quarterly Review June 2004.

foreign claims. These internationalisation efforts resulted in the following geographical dispersion of international and local claims in major regions in the world (chart 4).

As can be seen, most international loans are destined for Europe. Apart from Europe and South East Asia, local claims dominate international claims. Claims on Eastern Europe and on Latin America are of about equal size. As a result, Dutch banks now rank 6<sup>th</sup> in foreign claims and even 2<sup>nd</sup> in local claims in local currency. This is reflected in a high local to international ratio, unlike the other European counterparts (table 1).

Although we acknowledge that size should be treated with caution, it does matter in finance. Unfortunately, it is not possible to show how this geography developed because local claims (of Dutch banks) on industrial countries were not reported before 2002.<sup>7</sup>

There are consistent series for foreign claims on less developed countries, however. Chart 5.1 – 5.3 show the developments of Dutch banks' international and local claims on three emerging market regions.

Both types of claims on countries in former *Eastern Europe* took off in the middle of the nineties. The steep rise in local loans is due, among other factors, by the acquisition of the Polish Bank Slaski by ING Bank. Local lending in *Latin America* showed a higher growth rate than international loans (chart 5.2). Before the turn of the century, ABN AMRO bought Banco Real and Banco do Estado de Pernambuco. In 2003 Banco Sudameris was acquired. Both types of exposures, however, stagnated for some years after the Asian crisis. International claims continued to decline, partly due to (valuation) losses and because of retrenchments and withdrawals. Local claims picked up again in 2003.

Just as had been the case with other BIS reporting banks, Asian international claims of Dutch banks reached a top in 1997–98, but declined afterwards (chart 5.3). Local loans appeared more stable; these stagnated only after 1998 and increased again from 2003.

As a result, the local to international ratio soared since the beginning of the nineties for all emerging market regions (chart 6). For Eastern Europe this ratio seems to have stabilised. For the other regions there appears from the graph room for a further increase.

<sup>7</sup> Based on data up to 2001 it was concluded in McCauley (2002) that Dutch banks were not locally active and that this observation was consistent with the European picture. This paper shows that banks in the Netherlands are very active in local markets.

Chart 5.1 – Foreign claims of Dutch banks on Eastern Europe

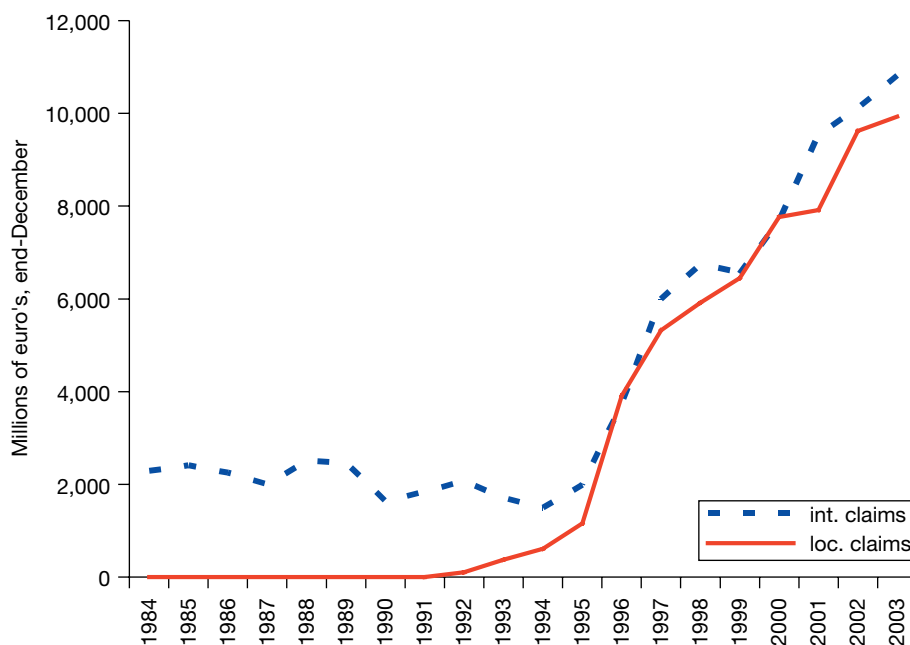
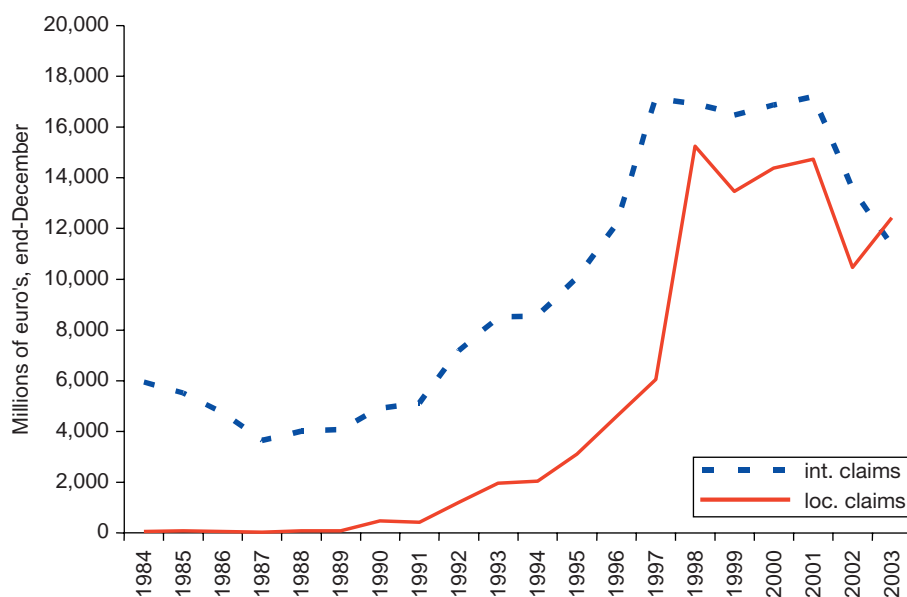


Chart 5.2 – Foreign claims of Dutch banks on Latin America



### Some explanations

The shift from cross-border lending to local presence implies that foreign banks preferred to make foreign direct investments (FDI) in host countries. Direct investment include transactions relating to the acquisition of shareholdings by enterprises in firms abroad (by means of establishment, merger or acquisition) with the aim of obtaining a degree of management control. Direct investments are of course long-term decisions, and cannot be reversed easily. Establishing branches abroad (greenfields investments) or taking over existing local banks by means of M&A are phenomena that could be viewed within the theoretical framework of FDI. This theory tries to answer the question why a firm would like to produce in a foreign location (where local firms have superior knowledge of the market) instead of exporting or entering into a licensing arrangement with a local firm (Lim, 2001). On a theoretical level, the location choice of FDI is determined by relative profitability. Dunning (1981) took the individual firm as a starting point. He argued that a number of conditions must be met for a firm to engage in FDI. One is the existence of a firm-specific competitive advantage to undertake FDI successfully.

Chart 5.3 – Foreign claims of Dutch banks on Asia

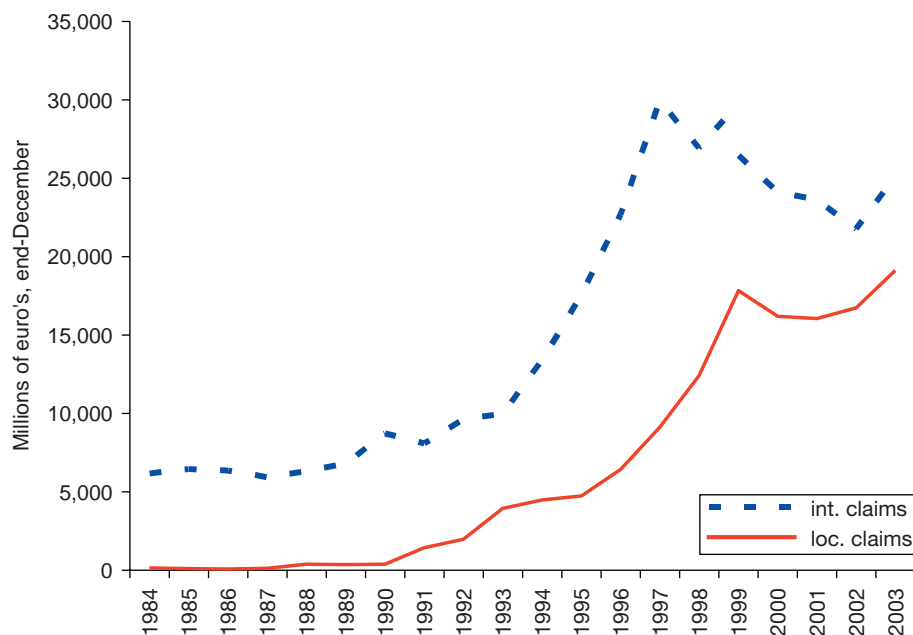
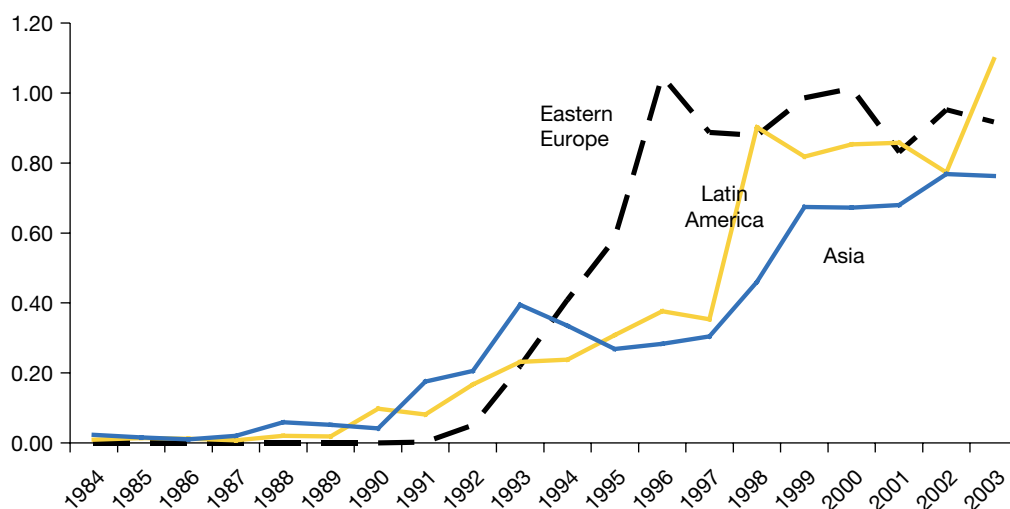


Chart 6 – Ratio local to international: Dutch banks



This competitive advantage generally arises from firm-specific assets such as production knowledge and skills, marketing capabilities and brand name or superior management capabilities. For this advantage to be profitable, it should be combined with the presence of locational advantages. According to the literature these variables consist of entry to regional markets, labour market situation, government policy towards FDI including taxes, quality of the infrastructure, and economies of agglomeration (Cheng and Kwan, 2000). Lim (2001) summarises the literature on the determinants of FDI in making the well-known distinction between horizontal and vertical FDI. Horizontal FDI try to serve markets better. Setting up foreign locations to supply the market there could be motivated by the proximity to the market and being able to respond to (changing) local circumstances and challenges. As such, horizontal FDI will tend to replace exports (for the equivalent in banking one could think of cross-border loans) if the costs of market access through exports are higher than the costs of setting up local affiliates. Vertical FDI tries to get lower-cost inputs. It relates to the vertical chain of production and relocating part of it in a low cost situation.<sup>8</sup>

<sup>8</sup> It seems that vertical FDI has less relevance for a service industry like banking; buying inexpensive inputs in one location and selling the output in another has more relation with manufacturing.

In sum, FDI are seen to be determined by a long-term decision to gain and maintain control over local firms, where the acquiring firm possesses ownership of specific assets. Further, the location offers specific advantages to this enterprise that enables it to better serve the local market.

Within this general framework, many observed FDI could be explained. A decisive factor for ABN AMRO to enter the Brazilian market was the creation of a third home market. This is a ‘focus area’ that is characterised by a favourable macroeconomic environment, a homogeneous market offering critical mass, no serious entry barriers and a sustainable top 5 Universal Banking position. Banking services are delivered to all customer segments through every available channel of distribution (Kalf, 1999). Local presence offers also additional benefits. Local credit, for instance, is not necessarily affected by payment moratoriums (McCauley, 2002). Moreover, other than cross-border lending, local loans are not subject to classical transfer and sovereign risk. However, local business will of course be influenced by bad macroeconomic policies of governments, or by natural disasters.

Local presence also enables a firm to benefit from locally available information. Other than cross-border lending a bank could monitor outstanding loans better from inside the country. It is not a surprise that the rise of local lending took place in the nineties. Economic expansion in home countries increased earnings and equity prices. The pool of capital available for investment abroad widened. In particular, high stock prices tend to facilitate M&A transactions, as highly valued equities can be used as means of exchange to pay for acquisitions (OECD, 2001). Therefore, the prolonged economic expansion in the US and also in Europe over the greater part of the nineties played an important role in the rapid increase of cross border M&A.

Last, the general trend towards liberalisation and privatisation policies and regulatory reform influenced cross-border M&A considerably; it increased the availability of targets of M&A (Group of Ten, 2001). In Latin America, for instance, the deregulation process made room for the entry of foreign companies into key economic sectors as banking, telecommunications and utilities. In addition, the valuations of Latin American companies, including banks, are much lower than those of European or American companies (De Paula, 2002). This will make it easier to attain large market share at a lower cost. Although Brazilian banks are profitable, Belaisch (2003) argued that they are also less efficient than banks in other Latin American countries. Empirical investigation showed that the banking sector in Brazil is not fully competitive, but behaves oligopolistically. This might explain why incentives to improve efficiency are weak and why the interest rate spread is large. When troubled local banks are open for sale in these circumstances, sometimes called ‘fire sale opportunities’, foreign bank penetration could rise quickly (see also chart 3.2).

### ***Impact on economic growth?***

In this section it will be discussed whether the shift toward more local lending by foreign banks stimulated economic growth in the host countries, in particular in LDCs.

This observation is consistent with the long-term nature of FDI which aim to gain control over the management of the acquired enterprise. Therefore, we can argue that FDI in banking, and the subsequent lending operations to local residents, could have a stimulating impact on economic growth in the host country. For this hypothesis we can put forward the following arguments.

- FDI are ‘bolted down’ and cannot leave the country so easily at the first sign of trouble (Loungani and Razin, 2001). Well-capitalised foreign banks may be able and willing to continue lending to domestic firms during troubled economic conditions (De Haas en Van Lelyveld 2000). Cross-border loans instead, in particular when of short-term nature, may be driven by speculative considerations based on interest rate differentials and exchange rate expectations.
- FDI allows the transfer of technology that cannot be achieved by cross-border loans. FDI increases the rate of technical progress in the host country through a ‘contagion effect’ from the more advanced technology and management practices used by foreign firms (Lim, 2001). This contagion effect (or efficiency ‘spillovers’) can lead to improvement in productivity in local firms (e.g. training of local workers, best practices in governance, in accounting etc.).
- Local financing uses information, which is specific to that location. Cross-border loans to local companies could not benefit from these information advantages or only at high costs. Therefore, a better allocation of funds might result.
- FDI in banking could promote domestic competition. This offers a stimulus to increase efficiency in local banks (Loungani and Razin, 2001). As a result the domestic banking sector



will undergo a shake-up phase in which most efficient banks will survive. Fewer, but viable banks will stay in business, continuing the supply of credit. Financial stability will thus be preserved.

- By increasing the supply of bank credit, foreign owned local banks can reduce the costs of obtaining loans for domestic firms (De Haas en Van Lelyveld 2000). This will lower real interest rates and foster domestic investment and growth.

### **Empirical findings**

Empirically, there appears to be convincing evidence that FDI efficiency spillovers indeed exist. There is no strong consensus, however, on the associated magnitudes (Lim, 2001). A determinant of the impact of spillovers seems to be the size of the technology gap between domestic and foreign firms. The smaller the size of this gap, the greater the spillovers. At the economy-wide level, empirical work has tended to find a positive correlation between FDI and economic growth. It turns out to be important that the host economy has achieved a certain threshold of development (Lim, 2001). Bosworth and Collins (1999) found that FDI had a stronger impact on domestic investment in LDC than did loans or portfolio investment. So, there exists evidence that FDI benefits growth. Still, some health warnings seem appropriate as much evidence is based on manufacturing firms: research on FDI in the banking sector is scarce. It seems therefore that an important research agenda is open as to test empirically the impact of local bank presence on economic growth.

### **Conclusions**

In this paper we elaborated the rise in local lending, compared with cross-border loans, by foreign banks. We showed that local loans, granted by a banking branch or subsidiary once established, showed also a far more stable development than did cross-border loans. This was true for all BIS reporting banks taken together, and was also illustrated by Dutch banks as a group. We pointed out that this development could be explained to a great extent by the theory of FDI. In this framework, FDI are determined by long-term considerations to gain control of domestic firms. The acquiring firm is endowed with specific assets, while the local environment offers advantages to serve the local market better. Because there appears ample evidence that FDI stimulates economic growth in the host countries, it is assumed that the increased local penetration of foreign banks contributed to growth too.

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# Formulating a strategic plan for financial data

## *A perspective from Canada\**

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

### 1. Introduction

There is a growing importance of financial issues – such as accelerating globalization, financial stability and financial innovation – facing many countries around the world.<sup>1</sup> At the same time, on a more micro-level, continued market, regulatory, and technological developments are having a significant impact on financial and nonfinancial enterprises via:

- consolidation among providers of financing within and across borders (more complex and interconnected);
- increased focus on transparency by investors and regulators (corporate governance, accounting standards, and Basel II);
- more complex, nonstandard products or delivery mechanisms (income trusts or income participating securities, derivatives, securitization, and syndicated loans);
- growing use of technology (enhanced speed and capacity of operations).

As markets and participants evolve with new approaches and new instruments, financial data are key inputs to understanding issues important to ensuring the stability of the financial system and monetary policy. However, the framework for analysis of the financial system has been characterized as being where analysis of monetary policy was some thirty years ago.<sup>2</sup> For instance, the monetary policy framework allows those providing advice to policy makers, or the policy makers themselves, to ask “what if” questions using a model, or models, comprising the framework. Model responses can be used with some assurance that they are providing insights that will help the formulation of policy. Models can be built and evaluated because there are databases appropriate to the questions being asked about monetary policy. Such databases are yet to be developed for the financial system. As a result, analysts and researchers cannot pose and address the range of questions necessary to build a complete, modern framework for the financial system.<sup>3</sup>

Over the last decade, the Bank of Canada, like other central banks, has increased its work on various aspects of the financial system (i.e., financial institutions, financial markets, and the

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1 *Borio and White (2004) argues for moving “financial factors, and financial imbalances, from the periphery to the core of our understanding of business fluctuations” and outlines why there should be mutually supportive anchors for the monetary and financial system spheres.*

2 *Borio (2003) says that “the search for appropriate policy responses to financial instability resembles the state of monetary policy in the early 1970s. Now, as then, both researchers and policymakers are beginning to sharpen their understanding of the “enemy”. Now, as then, they are groping for solutions.” p.17. Michael Foot, Managing Director, The Financial Services Authority, United Kingdom, takes a different tack to say something similar, see Foot (2003).*

3 *It is important to note recent efforts to build such a framework or parts of it. For example, the International Monetary Fund is coordinating work on financial soundness indicators (IMF (2003) and Slack (2003)) and the Bank for International Settlements on identifying the location of ultimate risk.*

clearing and settlement systems).<sup>4</sup> In doing so, it became clear that existing data in some areas were quite restrictive, either in terms of availability or quality or both. Limited data constrain research work and lead to questions about the credibility of results/recommendations based on them. Initial explorations of ways to address some of these gaps suggested that possible solutions could be quite expensive and multi-faceted, requiring some time to make choices and to begin to implement them. Hence, the focus is on a forward-looking, strategic approach.

A multi-year, cross-departmental project was established to develop a strategic plan for financial data that complements a key objective of the current medium-term plan – to “excel in the promotion of a safe, efficient financial system.” In particular, a strategic plan is needed because work at the Bank, and elsewhere, to provide the analytical base for understanding elements of the financial system identified significant data gaps. At this stage, there is not so much a strategic plan as a discussion document to achieve consensus on what should be in the strategic plan. The aim is to have widespread buy-in within the Bank on the long-term objectives for financial data consistent with the Bank’s responsibilities and agreement on a path to move us toward these objectives. Ultimately, the main goal is to have the information infrastructure required to build a better framework for analyzing the stability of the financial system.

This paper discusses the Bank of Canada’s experience to date in moving towards a strategic plan for financial data. It begins by providing some background information on the Bank of Canada then turns to reviewing the motivation for the exercise. Next the approach is outlined, including the steps taken to understand and provide solutions to questions surrounding the data. In answering these questions, the paper investigates the cost parameters of compiling/obtaining data via a variety of sources and outlines some tentative recommendations for discussion.

## 2. Some background on the Bank of Canada

“Our statistical needs are fundamentally shaped by what we are expected to do under our mandate.”<sup>5</sup>

A key function of the Bank of Canada is to conduct Canada’s monetary policy in order to preserve confidence in the value of money. However, similar to other central banks, it has important responsibilities for the financial system, including an oversight mandate for designated payments systems, and for funds management, in particular as the fiscal agent of the Government of Canada.<sup>6</sup> As part of its work in the financial system area, the Bank undertakes extensive research, and twice a year, updates Canadians on new developments, issues and research by publishing its *Financial System Review* (FSR).<sup>7</sup> It also helps Canada’s payment system function smoothly by settling accounts on its books and by providing funds on an overnight basis to any institution that is unable to cover its payments obligations on a given day. Finally, the Bank is the lender of last resort and provides short-term emergency loans to a solvent financial institution that faces a liquidity crisis.

Like other central banks, the Bank of Canada generates a significant amount of statistical information itself and, for doing so, either has legislated authority or the reputation as the established source.<sup>8</sup> Work in the financial system function is shared across departments at the Bank on the basis of their comparative advantage. Each of these areas examines various components or aspects of financial institutions, financial markets and/or the clearing and settlements systems (or payment systems). Furthermore, each area collects and analyzes financial data, in some cases assembling existing data, in other cases building databases. Given the dispersion of work on the financial system across the organization, efforts are underway to ensure that there is a

4 During the past few years, the Bank has defined the financial system as a core function and focused on developing a better understanding of how to carry out its work in this area.

5 David Dodge, Governor of the Bank of Canada. Speech to the Conference of European Statisticians, “It All Starts With The Data,” Geneva, Switzerland, 11 June 2003.

6 The Bank’s other main functions include currency and retail debt services. The supervision and regulation of banking institutions does not fall under its mandate. A separate agency is charged with this responsibility, called the Office of the Superintendent of Financial Institutions (OSFI).

7 Although similar documents have been prepared internally for some time, the FSR is a relatively new publication with the first issue appearing in the spring of 2003. The FSR is subject to Goodhart’s (2004) observation on such reviews – “there is no overall, coherent model lying behind it all, as is the case for the Inflation Report.”

8 Various acts (the Bank of Canada Act and the Canadian Payments Act, for example) give the Bank information gathering authority which is judiciously used to meet its data requirements for fulfilling its responsibilities. The Bank is also a significant user of Statistics Canada’s data, and increasingly, uses data (and related information) produced by private firms.

widespread and active sharing of knowledge about data, a key part of which is a cross departmental meta data project.<sup>9</sup>

Major themes in the Bank's current medium-term plan (2003–2005, now extended to include 2006) involve, among other things, increasing the breadth of our research and analysis on the structural and sectoral issues that affect the macroeconomy; developing policy approaches in the areas of lender of last resort, payment systems, and financial markets; and investing in the infrastructure that supports decision-making and risk management in the area of funds management (*The Way Forward – Medium-Term Plan 2003–2005*). Through our efforts to broaden research in these areas, various information sources were explored to help us assess risks and uncertainties.<sup>10</sup>

### 3. Motivation

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. Despite these efforts, a widely accepted theoretical or empirical framework that provides an integrated explanation of financial behaviours is still lacking.<sup>11</sup> Even if there was a good theoretical framework, empirical implementation could be affected by the need to use data designed for purposes other than for understanding the overall financial system (see Tucker (2002), and Gracie and Logan (2002)).<sup>12</sup>

The articulation of a need for better databases to support work on the financial system in Canada began with questions on the robustness and efficiency of Canadian capital markets.<sup>13</sup> At the broadest level, the questions were how do Canadian firms raise capital and what are the incentives and barriers? More specific questions were: how do changes in interest rates affect a firm's cost of capital, investment and output? what are the key operational features of the Canadian financial system? what are the early warning signs of increasing financial risk or imbalances? how do Canadian capital markets compare to those in other industrial countries for allocation, cost of capital, and degree of information asymmetry? The existing data did not allow these questions to be explored as fully as the Bank would have liked.<sup>14</sup>

To answer these questions, it would have been useful to have a database that linked information on individual firm characteristics and financial statements with securities trading information (prices, volumes, volatilities, bid-ask spreads). While the initial focus was on capital markets, it became clear that such a firm database could be helpful, once aggregated to a sectoral level, in answering some of the questions being raised in our macroprudential analysis. Partly driving this broadened focus, were questions as to whether better data on the intermediation practices of some large nonfinancial firms (vendor financing) in particular sectors might have given early warning on the sharp downturn in the market in 2001/2002 and the resultant fallout for savers and investors.

Subsequent consultations with senior management and staff suggested that there was a need to broaden the exercise to provide for exploration of an even wider range of financial behaviours. Specifically, these consultations indicated a need for more disaggregated data not only on firms but also on households, clearing and settlement systems, and financial institutions to allow progress on the priorities in the Bank's existing medium-term plan, priorities that were expected to continue as such in the next. Behind the desire to increase understanding across sectors and components of the financial system were several factors identified in the literature.

The immediate objective of developing a better understanding of financial behaviours and their implications is to limit instability in the financial system. The ultimate objective is to avoid significant output loss. Borio (2003) notes that the costs of banking crises can run into double digits of GDP and “numb the effectiveness of standard macroeconomic tools,” giving Japan as an example of the latter effect. Hoggarth and Saporta (2001) discuss the empirical evidence and associated measurement issues arising from banking crises or banking and currency crises for developed and emerging market economies. They find that crises usually last longer in developed economies and conclude that “whether banking crises cause or are produced by

<sup>9</sup> See Appendix I for more details on the meta data project.

<sup>10</sup> Besides the financial system database project described in this paper, several other financial data (and related) initiatives have developed recently in Canada and abroad (see Appendix I).

<sup>11</sup> While the aim is to maintain stability of the financial system, sometimes it is easier to define what you are trying to avoid, see Davis (2001).

<sup>12</sup> While Borio and Lowe (2002) demonstrates the predictive power of two key indicators for systemic banking stress, it also identifies the need to do further work on “more and better data.” See also Borio and Lowe (2004).

<sup>13</sup> The material in this paragraph and part of the next draws heavily from input by Michael King, one of our colleagues.

<sup>14</sup> To get a sense of how Bank researchers went about answering these and related questions see: Chouinard and Lalani (2002); Freedman and Engert (2003); King and Segal (2003 and 2004); Murray and Powell (2002); and Schembri (2002). For an overview of some of this work and the implications for further research see Bank of Canada (2004), especially the article by Hendry and King.

recession, they exacerbate subsequent output losses (and are often costly to resolve).” Even when the label financial crisis is not applied, there can be large losses to an economy because of misallocations of resources based on misreporting of financial data. DeLong (2002) notes that “Billions of dollars of financial capital and a great deal of human capital was wasted – allocated to the wrong industry sectors at the wrong time – as a consequence of the way that WorldCom misrepresented itself.”

It would seem that the best way to obtain an understanding of various gaps and solutions to them is to take a holistic view. Indeed, this point was made quite clearly by Tucker (2002). He noted that the challenge for those assessing the health of the financial system “has been to develop ways to adapt or cannibalize existing data sources” since “available data have been generally (if not universally) designed and collected to meet specific purposes that do not map precisely to the needs of financial stability analysis.” Ideally, the data should allow analysts to know who is obtaining what kind of funding for what purpose and how various risks are dealt with in the process. From a financial system perspective, the question of who is obtaining funds would usually be addressed at a more aggregated level than that of an individual firm, an industry sector for example, because of the macroprudential focus. At the same time, researchers concerned with financial market efficiency want to use micro data to enhance their understanding on the questions sketched above.

The literature on developing a more quantitative framework is advancing. Davis (1999) discusses key indicators of risks to domestic financial stability. Evans et al. (2000) examine macroprudential indicators of financial soundness. Benito et al. (2001) investigate an approach to assessing risks in the United Kingdom’s corporate and household sectors. Eklund et al. (2001) look at a model for analyzing credit risk in the enterprise sector for Norway. At the Bank of Canada, there has been work on macroprudential indicators, including work noting the difficulties posed by the lack of a comprehensive model of financial stability. More recently, Illing and Liu (2003) built an index of financial stress for Canada.

Despite the continuing efforts on developing better frameworks and indicators, Alves (2002) and Porter (2002) still felt the need to advocate for a more rigorous economic framework, i.e., a model of some sort. Haldane et al. (2004) lends support to the conclusions of Alves and Porter. Haldane and his colleagues use a set of macroeconomic models to show that “frictions in financial markets and institutions together with macroeconomic shocks can have quantitatively significant and behaviourally important implications for the macroeconomy.” They interpret their work as indicating “a compelling rationale for developing an effective framework for financial stability policy.” Goodhart (2004) reports on work done to lead “the way towards a quantitative measure and model of systemic, aggregate financial stability, which can complement the continuing risk measurement of individual institutions.”

### 3.1. Summary

There is consensus, or close to it, in the literature that instability in the financial system is costly, that there is not yet a rigorous economic framework for understanding the financial system and that existing databases were not designed specifically to meet the needs of financial system analysis. Indeed, the increased focus on the financial system by many central banks has increased the trend toward having to access and analyze greater amounts of information, sometimes at the same time as budget constraints begin to bind. More narrowly, some important work at the Bank of Canada to improve our understanding of various elements of the financial system has been limited by gaps in financial data.

## 4. Approach

A first step in this exercise was to form an interdepartmental team with representation from those departments most directly focused on the performance of Canada’s financial system. Specifically, the team, called the Financial System Database Review Team, was composed of staff from the Financial Markets Department and the Monetary and Financial Analysis Department. It was formed late in 2002 of staff who were expected to continue to meet other responsibilities as well as those associated with the project.<sup>15</sup>

<sup>15</sup> *As an aside, it is worth noting that the team had available to it not only the material from the exploration of gaps in capital market data and a very preliminary proposal from Statistics Canada for meeting them but also a report (2001) from an interdepartmental committee considering options for the organization of the data management areas at the Bank.*



While the team was expected to consult and to share what it learned widely, there was a formal reporting structure. The fate of new initiatives with significant implications for the Bank are decided by the Executive Management Committee (EMC), comprising members of the Governing Council and senior finance, legal and strategy people. Most such initiatives, as did that for the financial system database, have an executive sponsor or sponsors to facilitate them by opening doors, by sharing the concerns of senior management, by providing practical advice, etc.

Since the financial system database review project had many implications for the Bank (ability to ask questions, ability to attract and retain people, potential ramping up of the data budget, potential change in the organizational structure), the EMC members would want to know that every effort had been made to consult with all interested parties. More specifically, they would want to know, if at all possible, what additional questions important to the Bank would be able to be considered with any proposed solution. In other words what are the likely benefits to the Bank. Ideally, they would be quantifiable and greater than the costs associated with putting the solution(s) in place.

Once the team was formed, the second step was to determine how best to make progress on the initiative. In broad terms a two-track approach was taken to gather the information the team felt that it needed to have. The first track involved seeking views on gaps and on “best practices” from a wide range of people at the Bank and elsewhere (see section 4.2). The second and parallel track comprised investigating options and their potential price (see section 4.3).

To focus its efforts the team had to reach a joint understanding of the framework it would use for choosing and assessing information. In addition, it had to confront the tension raised by the potential for rapid change in the financial system and the time that it takes to put a database in place once a decision is taken. That is, minimize the risk that the database ends up solving yesterday’s problem and not today’s. One way the team addressed this was to discuss some broad categories of questions associated with financial databases and research based upon them to provide a starting point.

#### **4.1. Database questions related to infrastructure and research**

To ensure a common understanding at a high level, team members discussed early in 2003 what should be the most obvious characteristics of the financial system database(s). Here, we focus on six broad types of questions – half related to the perceived strengths and weaknesses of existing databases, half related to developing the appropriate framework for analysis, research and policy formulation. Ultimately, the team hoped to identify specific, policy-relevant questions that a better financial data infrastructure would allow to be addressed in order to indicate in a concrete and transparent manner some of the benefits.

Questions on the strengths and weaknesses of databases have to do with: completeness (ability to support a wide-range of monitoring activities and research); adaptability (in the sense of including new products and processes); and flexibility (so that different approaches can be taken to finding answers to the questions posed).

- Is the database complete enough to support the range of questions posed for understanding financial behaviours? This question is important to policy makers for ensuring the appropriate checks and balances exist for full consideration of the risks to the system and good policy formulation.
- Is there adaptability of the database so that it can reflect changes in institutions and markets, innovations in products and services, and the changing roles of financial and nonfinancial institutions in providing financing or sharing risks?<sup>16</sup> It is important that policy makers have information similar to that available to the financial institutions and market participants being monitored and/or overseen. Existing databases seem to be straining under this challenge.<sup>17</sup>
- Does the flexibility of the database allow different approaches to questions (e.g., micro versus macro, market versus institutional)? To the extent that the financial system is considered to be like “an eco-system in which each element is dependent on all other elements” (Crockett, 2003), it is important to look at the relationships from many perspectives to ensure robustness of understanding.

<sup>16</sup> For a paper that suggests ways in which risk management can be extended beyond its traditional realms see Shiller (2004).

<sup>17</sup> Commercial databases tend to specialize (instruments, companies, countries, etc.) so may be current on some innovations or certain markets, but incomplete for examining the financial system. Meanwhile, public sector databases are not always able to respond quickly to innovations whether because of concerns about historical continuity or dated capturing systems.



Broad questions from the perspective of the framework have to do with: establishing the framework(s) for analyzing the stability of the financial system; stressing the framework(s); and incorporating changes to the framework(s).

- To establish the framework, the fundamental questions are: what matters? how much do they matter? and when do they matter? These are core questions for analysts and researchers since the extent to which they can be answered form the basis of their understanding and recommendations.<sup>18</sup>
- To understand the robustness of the framework, once established, some basic questions are: what financial behaviours are consistent with those underlying the framework? what shocks are similar to those in the empirical data that could be drawn upon to quantify the framework? and how policy invariant is the framework?<sup>19</sup>
- To anticipate substantive changes in the framework, analysts and researchers have to be proactive in terms of staying on top of new products, processes and relationships, and to make inferences about their potential implications under different scenarios. To do the latter requires a good understanding of such changes in the past and an ability to make linkages between those developments and current ones to understand implications for the future.

Consideration of these questions led the team to ask whether it would be possible to construct an integrated database of firm financial data flexible enough to be used both for market microstructure work and macroprudential work. In addition, the team became more sensitive to the need to have a system in which change management could be handled effectively and efficiently. The next step was to encourage their colleagues not only to indicate existing gaps but also to anticipate future gaps wherever possible.

## 4.2. Seeking views

To date, there have been several strands to the exploration of what should be in a financial system database and how it should be realized. Various methods were used to obtain feedback from staff, i.e., workshops, one-on-one discussions, and a Bank-wide environmental scan. In addition, the Bank posted a “Call for Input” to seek feedback from interested external parties and reviewed approaches at other central banks.

### 4.2.1. Staff input: environmental scan

Early in 2004, in anticipation of having to prepare a strategic plan, the team conducted an environmental scan.<sup>20</sup> In establishing its strategic direction, the Bank regularly begins with an exercise to identify the environmental challenges that it is most likely to face over the next medium-term planning horizon. Subsequently, it determines the strategic direction for the Bank and its main functions. This information is then used for: setting business line objectives and the associated performance measures; putting in place a risk management strategy; and establishing a budget allocation path. Hence, conducting an environmental scan for financial data before drafting a strategic plan for financial data would be consistent with Bank culture.

Staff members most likely to be affected were asked what they saw to be the challenges vis-à-vis financial data that they would have to overcome in undertaking their research and analysis (refer to Appendix II for questions posed). As might be expected, most of the responses focused more on describing existing gaps and problems – the implication being that if something is not done soon the trend will be a widening gap between what Bank researchers can do and what they should do. Moreover, responses indicated that limited and/or poor quality data not only restrict the type of work done but also raise questions about the quality and credibility of the work based on such data, particularly for work using both market and financial statement data for Canadian firms.<sup>21</sup>

<sup>18</sup> Houben et al. (2004) outlines a basic framework for financial stability analysis.

<sup>19</sup> For an introduction to stress testing see Jones et al. (2004).

<sup>20</sup> There had been a similar, but less formal, initiative in early 2003 involving participants from all areas of the financial system.

<sup>21</sup> An observation is that the coverage of relevant Canadian data by private sector entities is poor, and the reason for this is difficult to perceive. Indeed, there is a perception that the choice of Canadian firms included in commercially available databases is arbitrary since no specific criteria are provided. In such a situation, questions arise about data consistency, reliability and accuracy.

Several trends important to constructing a strategic plan for financial data are evident from the Bank-wide environmental scan.<sup>22</sup> At the highest level, the globalization trend noted in responses applies to financial data in a number of ways. Canadian companies source and use their funds in Canada and other countries, and Canadian households invest funds in Canada and abroad. These behaviours provide additional incentives to the usual ones of benchmarking best practices, intellectual curiosity, and publication objectives for analysts and researchers to compare and contrast financial behaviours/developments in Canada with those elsewhere. So, while the focus is on how to improve Canadian financial data, it has to be kept in mind that the Bank's researchers and analysts will want to use financial data on other countries, especially the United States, in order to deepen their understanding of the behaviours being examined.

Feedback from the environmental scan pointed to certain demand and supply-side trends for financial data. Taking a demand-side perspective, two major trends are: (1) the need to be able to use more than one financial database; and (2) the need for more disaggregated financial data on firms, households, institutions and markets. Macroprudential and market microstructure research and analysis are important in both cases as is the desire to have access to databases attractive to potential external research partners. From the supply-side perspective there are two trends implying the potential for enhanced supply and one that could limit supply. Improving supply are institutional and market factors such as technologically-advanced processing and market growth, and the trend towards greater transparency in corporate governance. Potentially reducing supply for a given budget is the trend towards exploiting databases to generate revenues. There would seem to be a role for the Bank to work with external partners to facilitate the supply of data relevant for making good financial policy.

#### **4.2.2. External Outreach**

A major consideration in forming a strategic direction involved consulting external partners. A substantial portion of financial data will be used in analysis and research of a public policy nature and some partners will be supplying the financial data to fill some of the gaps. To date, external partners have seemed relatively passive about gaps in financial data, perhaps taking a wait-and-see attitude on the Bank's efforts. The other possibility is that they have different interests from the Bank. For example, academics focused on publishing in high quality journals may find this easier if financial data on the United States are used. Regardless, Heads of Agencies have been regularly briefed on developments in the exercise.

A "Call for Input: Improving Financial System Data in Canada" was issued on the Bank's website and mailed directly to selected people (see Appendix III). The call for input broadly described the need for better data on the financial system, and requested views on current and future data gaps, as evidenced in the following quote:

"A broad and complete repository of financial system data is critical to the considerable efforts that the Bank and others put into assessing developments and trends in both domestic and international financial systems...The Bank would like to know where analysis and research have been limited, rather than enhanced, by available data. It would also like to know what types of data will be needed looking ahead a few years and anticipating the challenges to be faced then."

A handful of responses were received from the call for input. The responses boil down to general interest in the initiative but, for the most part, with few specific insights on the Canadian situation or offers of resources to further explore what would be needed.

Discussions have also taken place with staff at the Bank for International Settlements (BIS) and other central banks to see what they are doing ("best practices"). There are a number of similarities in the approaches used by other central banks to obtain data as found in a recent review undertaken by one of the authors of central banks considered to be of most relevance to Canada (see O'Reilly, 2004). At the risk of oversimplification, it can be said that most of them collect and disseminate data on their banking sectors and on series derived from banking statistics; most rely heavily on external sources – the national statistical office(s) for economic statistics, and commercial suppliers for financial and exchange market data; and most continuously evaluate and upgrade their databases to adapt to changes in the economy and financial markets. These results were presented at a data users' group meeting hosted by the BIS in late 2003.

<sup>22</sup> This paper simply notes the broad trends implied by the responses.

Central bank representatives at that meeting, a broader group than explored in the paper, continued to view the “traditional model” (central banks collect and disseminate critical financial data) as best practice. Several of the participants emphasized the benefits of having control over critical data, one of which was reinforcing the independence of the central bank.

There was some exploration of what are the standard databases and tools for financial data available in the academic world. For example, in consultations with staff and others, there were suggestions that particular databases (COMPUSTAT) and an integration tool for accessing a number of financial databases (Wharton Research Data Services) were “the standards” in finance departments at universities in the United States and Canada. Experience at the Bank with some of these products has uncovered shortcomings with respect to data on Canada (coverage of firms, data points, etc.).

We have not found much to suggest that central banks are actively involved in leading large-scale efforts to improve financial system data.<sup>23</sup> This perception may result not only from the lack of a unified theoretical framework but also from the absence of a well-coordinated international initiative to exchange ideas and information concerning financial data. The IFC’s conferences and the BIS’s recent pilot survey are steps in the right direction.<sup>24</sup> With respect to having more transparent information in this area, a goal would be to provide, at a minimum, reasonably solid, and widely shared, answers to the following questions:

- broadly speaking, what types of financial data are collected and disseminated by central banks, how is this done and at what cost (as a proportion of central bank operating expenditures)?
- how are central banks structured in terms of data production, acquisition, and dissemination for financial data and why (lessons to be shared)?
- what are some of the key gaps, why are they considered to be important and how are they being addressed?

### 4.3. Considering options

Reflecting the roots of this initiative, team members devoted a sizable portion of their time to investigating sources of data on firm characteristics, company financial statements and financial instruments and the potential for linking them over time. Concurrently, the team encouraged colleagues at the Bank to propose alternatives for meeting their data needs for work on macro-prudential analysis (sectoral information on household and firm financial positions, including that for financial firms), on financial market analysis (market pricing data, etc.) and on analysis of payment systems (detailed payment data by institution).

Various options were explored, such as producing at least part of the requisite data internally and externally (i.e., company and instrument data). This involved identifying potential sources and evaluating their relative strengths and weaknesses. Where possible, the team generated/obtained cost estimates in 2003 dollars. The high level requirements in the costing exercises began with what was available in an existing Bank of Canada database – the Capital Markets Statistical System (CMSS).

Staff at the Bank build, maintain and update CMSS – a repository of data on debt and equity instruments issued and retired by Canadian-domiciled corporations and all levels of government. The Bank via CMSS is the only source providing a time series of net issuances, retirements and debt outstanding for financial and non-financial firms in Canada. These data are used to assess business credit conditions and to monitor the financial situation of nonfinancial firms. However, outside of these monitoring type roles CMSS data are rarely used for research and analysis on the financial system at the Bank or elsewhere.<sup>25</sup> The CMSS was built some years ago using outdated technologies and is due for modernization at potentially significant cost. The question on how best to proceed involved three avenues: discontinue the CMSS (and its related data); enhance the CMSS in-house; or engage a third-party to build an expanded CMSS.

Discussions with staff and external parties on the CMSS provided two clear lessons. First, the current core set of users definitely want to continue to get the data that they receive now but

<sup>23</sup> This observation could be considered to be debatable. In the United States, the three member agencies (FDIC, FRB and OCC) of the Federal Financial Institutions Examination Council (FFIEC) have been working to develop a central data repository for Call Reports to be implemented with the September Call Reports. We view this initiative more as a rationalization of approach to collecting and disseminating data rather than a fundamental change but such a change can still involve substantial resources and work.

<sup>24</sup> A central bank survey was to be conducted in the spring of this year. Its main purpose was to find areas for cooperation in central bank statistics and the role of the Irving Fisher Committee (IFC). The Bank of Canada completed a pilot version of the survey but had not received the final version as of the end of July.

<sup>25</sup> For exceptions see Freedman (2002) and Freedman and Engert (2003).

have no strong views on how the data are produced as long as the quality is maintained. Another lesson is that it is difficult to get people who have not seen a need to use CMSS to express an opinion on enhancing it in order to potentially increase its set of users.

#### 4.3.1. *In-house solution*

Given that the Bank built and has maintained CMSS for a long period of time, there has been some exploration of the implications of continuing to do so ranging from a pared down to an enhanced version. Further work is being done on assessing the in-house option so only a few observations will be made here.

The most general positive observation about having CMSS in-house is consistent with that provided in the feedback at the BIS Data Users Group meeting in late 2003. It has allowed timely access to very detailed information to shed light on at least one important question – one affecting the priorities of the Bank and the actions it would have taken. Such timely and complete access from an external provider might have been very difficult. The most general negative observation is that it is very difficult, if not impossible, to know the confidence level to assign to the data in CMSS.<sup>26</sup>

To date there is little evidence of demand for an enhanced version of CMSS but this may be because the lack of user-friendliness of the current version limits experimentation with it, and hence the opportunities to see new possibilities. One thing seems fairly clear though and that is an enhanced version of CMSS would not in itself provide the links between instrument and company/firm data demanded by some users. The reason is that there is not a common identifier to link instrument and firm data over time.

The rough-and-ready estimates for having a slightly enhanced version of CMSS (enhanced by the addition of credit ratings and secondary pricing data, for example) indicate one-time development costs of between two-fifths and three-fifths of the amount budgeted for all data in the Bank in 2004 and operating costs of about one-tenth of this budgeted amount.<sup>27</sup> Note that the overall amount budgeted for data comprises almost 3 per cent of the amount budgeted for all Bank outlays. Early on in the team's investigation, it was thought that the Bank's CMSS database could be used as one of the elements in building the requisite database and that a partnership with Statistics Canada would be worth exploring in some depth.

#### 4.3.2. *Statistics Canada*

Statistics Canada, as Canada's central statistical agency, has the legislative authority to collect and disseminate data on a wide-range of areas, and a comparative advantage in producing statistical information. The two main types of business data generated by Statistics Canada are production and financial.<sup>28</sup> A comprehensive Business Register is maintained to support both its financial and production surveys. Production data are directly linked to individual lines of business and are captured through management accounting systems (i.e., collected at the operational-level by the establishment). Financial data are linked to wider business activity and are captured through financial accounting systems (i.e., collected at the enterprise-level or for each legal entity). These data measure the overall results of the business rather than single business activities and are compiled using guidelines of the Canadian Institute of Chartered Accountants (responsible for administering the Generally Accepted Accounting Principles for Canada), and subject to external audit. Financial data are of principal interest to senior management of business, shareholders, researchers, and the financial markets. Often, financial data cannot be easily allocated to the operating lines of activity.

Three phases were envisioned for the joint initiative with Statistics Canada. Phase 1 would begin with replicating the contents of the CMSS database and adding twenty-five new variables (e.g., credit ratings, etc.). In subsequent phases, there would have been a linking of financial data to characteristics of enterprises from Statistics Canada's Business Register and to financial statements of enterprises, and, further out, the inclusion of off-balance sheet products. Development of the first phase would take place over 22 months and was estimated to cost about

<sup>26</sup> *The way that this is addressed at present is to have the entire database open for revision all the time.*

<sup>27</sup> *We could have reported everything in Canadian dollars but believe it is more meaningful for an international audience to relate the numbers to the Bank's overall, ongoing data budget.*

<sup>28</sup> *Financial data referenced here is more narrowly defined than that used elsewhere in the paper. See Appendix IV for details on Statistics Canada's view of the business world in terms of structure and complex enterprises.*

25 per cent more than an in-house development of a slightly enhanced CMSS. This estimate could be substantially higher if offices outside of Statistics Canada's premises were needed or if the costs of data suppliers increased. Operational costs were subject to the same caveats and were estimated to be about 50 per cent of the Bank's existing annual budget for data-related work and about five times the estimate for operating an enhanced CMSS in-house. To be clear, implementation of only the first phase of the initiative to move towards the long-run objective would require a substantial increase in the annual budget devoted to data-related activities at the Bank.

There are several obvious benefits associated with partnering with Statistics Canada. The most general one is that of having an assignment of responsibilities consistent with the comparative advantage of each organization. Specific advantages of partnering with Statistics Canada are: a database with a consistent set of concepts, definitions and classifications; expanded coverage (relative to commercial databases) of publicly listed companies and access to non-public financial data for many other firms; consistency in comparisons with and links to other statistics at Statistics Canada; and expansion of research on financial markets.<sup>29</sup>

There are also potential costs associated with partnering with Statistics Canada. Most importantly, there is the reduction in flexibility at the Bank arising from the commitment of a substantial portion of its budget to Statistics Canada. For example, research might be restricted somewhat because budget constraints may limit the Bank's ability to buy other databases. In addition, there would be costs associated with complying with the process for accessing data deemed to be confidential under the Statistics Act, including a provision whereby Statistics Canada committee(s) review Bank research proposals for relevance to Statistics Canada's mandate. In the end, the opportunity costs of partnering with Statistics Canada seemed high enough to justify delaying a decision on going this route in order to explore alternatives more fully, in particular what was available from commercial suppliers.

#### 4.3.3. Commercial databases

The number of firms supplying financial market and company fundamental data has grown considerably over the past decade. To determine their ability and/or willingness to meet the Bank's financial data needs, the Bank undertook a Request for Information (RFI). In particular, the team was interested in the feasibility of them providing data (cross-section, time series) with links among the information on the firm – characteristics, financial statements and issuances of financial instruments, including the evolution of secondary market pricing of these instruments.

Nine vendors responded to the Bank's RFI.<sup>30</sup> The range of responses included: stated non-compliance; stated compliance; packaged data feeds that required us to perform all the linkages; and turnkey systems that stated compliance. The vendors who performed the best were those we had expected to submit responses based on our previous work. However, each of the vendors who made it to the detailed evaluation stage failed in some way to give us a complete proposal. In particular, none provided credible evidence that they could link securities data to corporate information and financial statements.

The RFI did, however, provide some relevant information. At least some vendors raised the possibility of partnering with other external organizations or of acting as an integrator to meet our data requirements. Similarly, some vendors left us with the impression that they could do cross-sectional links. No vendor gave us much confidence that they could build a time series linking instrument and financial statement data. As to cost, vendors did not all price the same thing and did not provide enough detailed information to allow us to adjust estimates to put them on a basis where we could compare across vendors. Of note, the most complete and comprehensive submission, but still incomplete relative to what was wanted, had an estimate for set up costs below that for in-house development but an estimate for annual operating costs that were three times those for an in-house partial solution.

<sup>29</sup> Commercial databases are, not surprisingly, biased toward the largest, publicly-traded companies; many of them are oriented to the provision of global data and consequently restrict each country's universe to larger firms. On the positive side, this facilitates cross-country comparisons for larger firms as suppliers make some attempt to standardize data across countries. At the end of April 2004, there were nearly 1300 companies listed on the Toronto Stock Exchange. This figure would typically represent the upper limit of the data available from commercial sources. To provide some perspective on this, the 5000 largest enterprises in Canada (i.e., those with revenue of at least \$25 million) account for about 60% of total business revenues.

<sup>30</sup> The Bank limited its review to those vendors with products that have gained the widest use in financial markets and in academic research. Of particular interest were suppliers likely to provide the best coverage of Canadian firms and their liabilities.



So to conclude on the RFI, there is certainly some willingness to make an effort to meet the Bank's needs although the actual cost to the Bank is not clear. As to the feasibility of making links between instruments and financial statements, especially as a time series, the vendors' responses imply that there would be a fairly significant upfront investment but do not state what it would be.

#### **4.3.4. Summary**

The environmental scan and various interactions with potential suppliers (i.e., Statistics Canada and private sector vendors) suggest that implementing a large, interlinked database of financial data would be risky both in terms of costs and deliverables – a leap of faith is required.<sup>31</sup> As a result, the team proposed taking an evolutionary approach, at least for an interim period, in order to explore further whether we can exploit existing sources of financial data. To support this, there should be a process incorporating a regular assessment of the value-added of databases with a culling of those considered to provide low value-added and positive feedback on promising databases. In other words, devote more resources to understanding, acquiring, and managing financial data.

### **5. Evolution: moving towards a strategic plan**

Building a large, complex database that would incorporate firm characteristics and financial statements linked to market data on financial instruments, if it could be built as envisioned, would have provided data useful for asking a range of questions pertaining to the business sector (financial and nonfinancial: market-related, macroprudential, credit). However, such an approach was assessed as being too risky by the team given that it could not obtain a sufficient degree of comfort on achieving the full set of deliverables and the cost estimates were both large and open-ended. In addition, such an approach would not provide a database sufficient to address the whole range of activities under the financial system function.

These facts, and wanting to see the outcome of the forces currently at work to increase supply, led the team to lean towards more of an evolutionary approach. Given that databases as the infrastructure for analysis and research are often long-lasting, actions taken today to address current needs are likely to be steps on a path to attain the right data at the right time. Taking this as true, the question becomes how to minimize false steps and maximize promising steps. The financial system database review team outlined for discussion the elements of a strategic plan that would contribute towards minimizing false steps.

#### **5.1. Elements of a strategic plan**

The team indicated that a broad-spectrum of improvements could be made just by putting the right processes in place. These processes would be set-up to operate on an ongoing basis and the degree of success in implementing them would be evaluated as part of the Bank's normal stewardship exercise. The team proposed four main categories of changes for moving forward many of which respond to the feedback received in the environmental scan. They involved: (1) strengthening governance and focus on data; (2) identifying resources to make decisions on data; (3) facilitating institutional understanding of available data; and (4) developing with senior management a communications/advocacy strategy for data. Each of them would contribute to mitigating some of the risks to which such a project is exposed.

For strengthening the governance and focus on data, the team made three points. There should be a five-year rolling plan for filling data gaps, with priorities and risks reviewed annually. To facilitate this review and limit its contribution to bureaucratic overhead, the team proposed that the organizational arrangements for the financial data strategy should be integrated into the Bank's budgeting, planning and stewardship processes. Finally, the team advocated specific probing in the planning/stewardship meetings on whether data gaps limit the ability to address key questions. By using existing organizational structures, but having them refocus at least some of their effort, and a five-year rolling plan, the team hoped to mitigate the risks of

<sup>31</sup> *There is broad agreement in the Bank with the point made by Bull (2004) that "more or better statistics can prevent policy mistakes, it is worth spending a lot on them." The issue is how to draw the line between a lot and too much. One way, as Bull's book makes clear, is by preparing well and defining beforehand what needs you intend to meet.*

losing momentum, drifting in the wrong direction and having insufficient resources. For example, the use of a five-year rolling plan allows identification both of progress in meeting the data needs of the various components of the financial system and of increasing risks because of a lack of progress. The regular review would allow the plan to be adjusted in light of changing priorities at the Bank.

With respect to identifying resources, the team suggested that business lines continue to be responsible for making the case for their data infrastructures but with a clearer focus on overall Bank priorities – tradeoffs may be required. As part of this effort, there should be a regular review of the value-added of databases with a culling of those seen to have low value-added. Indeed, the team speculated that an interdepartmental group within the Bank might oversee these regular reviews. In addition, the team argued that efforts should be made to coordinate within and across business lines all aspects of data acquisition and production. By tightening up these processes somewhat the team expected to reduce the risks of moving in the wrong direction and of having insufficient resources.

Information sharing allows the wide diversity of experience in a central bank to be brought to bear when assessing the relative strengths and weaknesses of different data options. As a result, there can be a reduction in the costs associated with relearning something that is already collectively known. To encourage informed discussion on data needs for Bank and business line priorities, the team suggested that further work be done to facilitate institutional understanding of data already available to Bank staff and to achieve better timeliness in informing staff about data acquisitions. As noted earlier, there is a cross-departmental meta data project at the Bank to provide staff with better information about available statistics. In addition, the team suggested that the annual orientation session for new staff could be used to increase awareness of data and tools.

The team saw the need to develop a communications/advocacy strategy involving senior management. It believes that the central bank has a key role to play in informing data suppliers about the data needed to support policy formulation and evaluation. On the basis of the feedback received, the team concluded that existing channels for making data suppliers aware of Bank concerns on their database(s) were not working well.<sup>32</sup> As a result, it suggested that the profile of such efforts had to be raised by involving members of senior management. Such an approach should help to mitigate the risk of being ineffective in persuading suppliers to increase coverage of Canadian firms and the financial instruments issued by them.

The broadest risk seen by the team was that, with an evolutionary approach, the Bank would always be behind financial and technical innovation in terms of providing financial data. It viewed the mitigating factors here to be the linking of data priorities to the business line priorities in the Bank's medium-term plans (a forward-looking approach) and the active, informed use of a range of suppliers.

## **5.2. Some thoughts on a communication strategy**

The financial system database review team encouraged the development of a communications strategy but did not elaborate on one. Below, we provide our thoughts on what may be involved.

The proposed communications strategy, as we see it, would involve strengthening the Bank's relationships with suppliers through creating a focal point within the Bank. The objective would be to facilitate a two-way flow of information so that suppliers know where the Bank sees gaps in financial data from a public policy perspective and the Bank knows how suppliers intend to evolve their database. In our view, this work could be formalized through the creation of a Financial Data Suppliers (FDS) Program.

The FDS Program could consist of a dedicated staff member to act as a focal point for communicating and addressing the issues and concerns of both the Bank and the data suppliers, e.g. Statistics Canada and commercial data suppliers. This individual would be responsible for articulating and rationalizing the Bank's data requirements, presenting new requirements, and communicating regularly with data suppliers both directly and indirectly via a member of senior management at the Bank. The goal would be to encourage an environment where we can deal with suppliers on their terms, by using their language, and exploiting their information/records in an optimal way. The fundamental objectives would be to: enhance the Bank's working relationships; improve the quality of financial data, in terms of completeness and accuracy; and learn more about their business.

<sup>32</sup> Bank experience suggests that sales people are not the most effective way to channel feedback.



Several government bodies, both within and outside Canada, have recently developed and implemented similar programs, albeit backed by some statutory authority.<sup>33</sup> In Canada, in addition to the Bank, two other agencies have similar programs Statistics Canada and the Office of the Superintendent of Financial Institutions (OSFI). Generally, these programs have received good reviews. Where the proposed initiative would differ is that, for the most part, it would rely entirely on persuasion/negotiation since the suppliers would have no statutory obligation to provide data. In terms of implementing the FDS Program, we think that it would be important for there to be involvement at a relatively senior level to underscore the importance of the effort.

Internationally, several statistical agencies have implemented similar relationship building programs. Australia was the first in the mid-nineties (second was Canada). Other countries include: the Netherlands, Switzerland, the United Kingdom, and the United States (Bureau of Census). It is not known whether other central banks have similar programs. In general, however, there appears to be a growing trend, both nationally and internationally, to develop programs (or formal processes) for strengthening relationships with key data suppliers.

In summary, a number of organizations are willing to provide financial data to the Bank for a price. For these organizations, the Bank should introduce a formal structure to provide feedback on the adequacy of their coverage of Canada. There is also a role for external partners in that a substantial portion of the data will be used in analysis and research of a public policy nature and some partners will be supplying the financial data needed to fill some of the gaps. This strategy should likely be supported by increased or continuing business for those organizations responsive to feedback from the Bank, other things equal. An element of this approach would involve the potential for seed money when circumstances warrant.

## 6. Conclusion

Considerable work has been undertaken at the Bank of Canada towards preparing a strategy for financial data to be implemented over the next medium-term plan horizon (starting in 2007). As policy-makers, central bankers often demand additional, more timely, and more accurate information. The increased focus on work related to various aspects of the financial system led to the discovery of limitations in some areas of financial data. These gaps were particularly evident for work on the efficiency of Canadian capital markets and for work on the stability of the Canadian financial system. Initial explorations of ways to address some of these gaps suggested that possible solutions could be quite expensive and multi-faceted, requiring time to make choices and to begin to implement them.

The paper reviews in a summary manner some of the inputs used in formulating the proposed strategic plan before subsequently outlining elements of it for discussion. The experience in exploring possible partnerships for creating a large, complex database – first with Statistics Canada and then with commercial suppliers – led the Financial System Database Review Team to conclude that there were major risks in terms of both costs and deliverables. As a result, the team recommended beginning with more of an evolutionary than revolutionary approach. The approach is more evolutionary in the sense of exploring further how responsive different vendors will be to meeting clearly-stated Bank needs. The team saw this approach as a reasonable one for the early years of the strategic plan in the light of institutional and governance trends that might increase the supply of financial information. The main risk seen by the team is that such an approach would mean that data availability would always lag Bank needs.

A more evolutionary path would still involve increases in the data budget. Accountability would be met by the obligation of a regular report detailing the value-added to the Bank's work of all purchased data services, including those covered under existing budgets. Complete implementation would require aggressively managing databases, including representations to providers of higher value-added sources to fill in any perceived gaps in Canadian data. In parallel, further consideration is being given to the extent to which the Bank's Capital Market Statistics System (CMSS) might be enhanced and modernized to be more useful to analysts and researchers.

The key long-term objective involves having the right data at the right time to do the analysis required but the plan at this time is to leave the specifics to the business lines. The reason is that without an encompassing framework, choices will have to be made and business lines are best placed to make their cases for specific types of data. An organizational framework, that has

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<sup>33</sup> The Bank introduced a Reporting Managers (RM) Program in 2002 to enhance relations with the statutory reporting managers at Canada's major banks. Judging from participants' feedback, the RM program has been a resounding success in the sense of opening the lines of communication.

yet to be finalized, will help to: ensure priorities for acquiring data reflect overall Bank objectives; resolve any competing demands for funds; and ultimately, optimize the effectiveness of expenditures in this area. Better data management is vital because it allows the gathering of information needed to make a rigorous assessment of the relative value to the Bank of the various options available for fulfilling its financial data needs.

This data project has created an opportunity to enhance the Bank's ability to meet its mandate both now and in the future. A review of the literature and consultations with other central bankers indicates the need for a model to analyze the financial system and for a database specifically designed for work on the stability of the financial system. However, there are clear signs of progress. A major challenge is to understand what has been learnt and how to adapt the lessons to the unique situation of each central bank. The results of the Bank's project confirm a strong need for a framework for financial data, yet as with any database initiative there is the dynamic need to be able to respond to innovations in products and practices in the financial system. With respect to the communication strategy briefly outlined in this paper, consultations are ongoing to determine if this is an appropriate approach.

The next step is to solidify the strategic plan on financial data on the basis of feedback from various parties (e.g., senior management, staff, other central bankers, etc.). At least some of the work to be done will depend upon questions/suggestions that arise from these consultations.

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## Appendix I

### ***Other financial data (and related) initiatives***

Aside from the efforts detailed in this paper, there are various national and international initiatives involving Bank staff to provide measures relevant to assessing the health of the financial system. The overall aim, of which, is to enhance the availability and quality of financial data and related information.

#### ***International initiatives:***

1. Last year, the IMF completed a Report on the Observance of Standards and Code (ROSC) – Data Module that involved, in part, Canada’s collection of monetary and financial statistics. It resulted in greater collaborative work between the Bank and Statistics Canada.
2. The Bank has also been negotiating and consulting with the banks to ensure Canada complies with the new BIS requirements for the Consolidated Banking Statistics (expanding data on ultimate risk and off-balance sheet items).
3. Work has been undertaken to identify, as part of the IMF initiative, national Financial Soundness Indicators (FSI) in order to begin their dissemination in 2006.
4. The Financial Stability Forum (FSF) at the BIS encourages consistency and comprehensiveness of international financial standards and codes.
5. Research is being conducted on various aspects of Basel II, including its data implications for market participants.
6. A formal BIS survey conducted in the spring of 2004 is investigating the approach of central banks to statistics. The main purpose is to find areas for cooperation in statistics and to clarify the role of the Irving Fisher Committee (IFC). The survey focused on central bank statistical activities by certain domains and organizational aspects of these activities. The IFC role will be discussed in a high-level meeting in September prior to the IFC conference.

#### ***Country-specific initiatives:***

1. Participate in intensive exercise with our public sector partners (Finance, Statistics Canada, OSFI, and CDIC) to review what is currently demanded from deposit-taking financial institutions and to promote greater co-operation in our data collection processes.
2. Projects have been initiated at the Bank to obtain data from the operators of Canada’s payment, clearing and settlement systems (PCSS). Part of this involves identifying and assessing key data points for analytical purposes, along with their desired frequency.
3. A cross-departmental project is underway at the Bank to create a central meta data repository that would provide staff with easy access to better information about the statistical data that they use in their work. These statistical meta data will assist staff to identify, locate, retrieve, interpret and analyze statistical data contained in individual and continuous data sets. The databases are being documented for three central purposes: preservation, re-use of individual data sets, and research and analysis including building upon and replicating research.
4. In the first quarter of 2004, Statistics Canada began producing quarterly, market-value based National Balance Sheet Accounts.
5. In 2002, the Bank implemented the Reporting Managers (RM) Program to encourage open and transparent communications with statutory reporting managers at Canada’s major banks through regular, informal meetings. Most recently, two-hour information sessions were provided to the Chief Accountant’s Department of the 5 largest banks to assist them in understanding the Bank’s use of their data and our continued desire for high-quality, timely information.
6. A Tri-Agency (Bank, OSFI and CDIC) data collection system was implemented in the late 1990s to enhance the efficiency of banks’ data reporting processes.
7. Preliminary work has begun to create a Financial Stress Index for Canada that uses a variety of measures of probable loss, risk and uncertainty. Development work is continuing in this area.
8. An initiative to centralize all information related to various economic seminars and workshops at the Bank (i.e., research on preliminary papers and questions) was implemented earlier this year. A recent Bank-wide survey indicates it has significantly enhanced our ability to share information and knowledge on a wide-range of research issues undertaken at the Bank. For example, the Bank has hosted a number of presentations by commercial data suppliers (e.g., Datastream, Moody’s, Ipson-Reid, etc.) that were attended by staff from across the organization. Efforts are being taken to broaden its scope to other central banks.

## **Appendix II**

### ***Environmental scan questions***

- What types of financial data do you need to do your work effectively and efficiently now and five years from now (what are the trends)?
- How you would see the Bank's limited budget for financial data being most effectively spent (i.e., developing a comprehensive financial database (at the Bank, at Statistics Canada, at a commercial vendor); buying data from various vendors; etc.) and why (what are the trends)?
- How can the Bank best manage the risks associated with obtaining the right financial data in a world where theoretical models are constantly changing in response to the results of innovation and globalization?
- Put simply, how can you have more time to spend on analysis and research as opposed to manipulating inadequate data to get something close to the concept you need?

Note: staff members were encouraged to respond to their own questions if they found those posed to be too limiting.

### Appendix III

#### ***Call for input: improving financial system data in Canada (posted on the bank's web site and mailed directly to selected persons)***

NOTICE – Thursday, 20 February 2003, 2:30 p.m. (EST)

Canada's financial system consists of financial institutions, financial markets, and clearing and settlement systems. It is a key part of the infrastructure of our economy. The Bank of Canada is one of several federal and provincial organizations that promote the efficiency and safety of Canada's financial system. The Bank's perspective is unique in that it takes a macro-economic or system wide point of view on the financial system, similar to what it does for its monetary policy responsibility.

A broad and complete repository of financial system data is critical to the considerable efforts that the Bank and others put into assessing developments and trends in both domestic and international financial systems. Data that provide insight into the financial system come from a wide array of sources. For example, information on the balance sheets of firms allows an assessment of exposures to movements in financial markets. From another perspective, information on specific financial instruments allows an understanding and evaluation of aggregate activity in broad classes of markets. Other types of information suit other purposes.

The Bank is in the process of reviewing the financial data available for undertaking analysis and research on the financial system in Canada. This review focuses on the data needed to evaluate the efficiency of specific markets and understand the risk exposures of Canadian firms. The Bank would like to know where analysis and research have been limited, rather than enhanced, by available data. It would also like to know what types of data will be needed looking ahead a few years and anticipating the challenges to be faced then.

To ensure that it has a complete view, the Bank invites those with suggestions for improvements in financial data to provide them to the Bank by mid-April 2003. Where possible, such submissions should indicate how having such data would benefit Canadians. Each and every submission will be read, thus giving the contributor a chance to have an influence on the financial data collected in Canada. To acknowledge receipt of the submission, the Bank will thank senders either by e-mail or by letter, depending on how the submission is made.



## Appendix IV

**Statistics Canada's view of the business world<sup>64</sup>**

According to Statistics Canada, the hierarchical structure of a business is as follows:

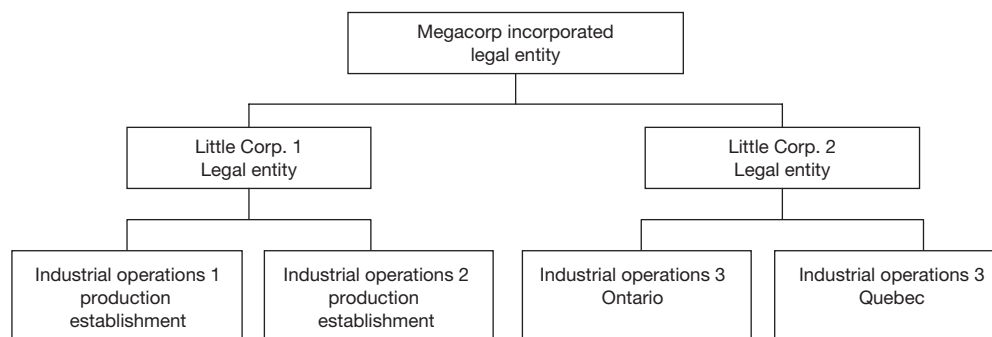
- Enterprise – a complete set of financial statements is available
- Company – investment center, can provide operating profit, assets and liability to measure capital employed
- Establishment – profit center or cost recovery center, can provide revenues, wages, and cost of inputs
- Location – cost center or sales center, can provide number of employees

Legal structure and statistical structure should not be mixed. Statistics Canada uses four standard units in its business statistics. As illustrated above, the highest in the hierarchy is the enterprise, which is a family of businesses under common ownership and control, relatively independent of any higher units. It is defined as the lowest level of structure at which financial data, or consolidated financial results, can be obtained. A company represents a unit within the enterprise, for which operating profit and capital employed are accounted for on a quarterly basis, but whose funding is dependent on decisions at the enterprise level. Establishments are the smallest operating entity which produces as homogeneous a set of goods and services as possible for which records provide data on the value of output together with the cost of resources employed. Finally, the establishment may have operating units at one or more locations. Most business surveys at Statistics Canada target either the enterprise or establishment. Figure 1 provides an example of an enterprise structure and illustrates the various data collection options.

In the Canadian economy there are over three million legal entities engaged in business activity, of which approximately a third are corporations and the remainder are individuals reporting business income (legal entities are either a proprietorship, partnership, or corporation). Most businesses have a simple structure consisting of one legal entity which owns and controls one operating entity. However, these businesses only account for about 15% of the economic activity in the country. The vast majority of business activity is concentrated in a small percentage of large firms. In fact, the 5,000 plus enterprises with revenues in excess of \$25 million account for a substantial portion of total business activity, and the top 300 businesses account for about one-third of all business income.

These large enterprises are of the utmost importance to the data collection process and quality assessment framework at Statistics Canada. For statistical purposes, the term 'complex' is often used to refer to large, multi-dimensional enterprises.<sup>35</sup> A complex enterprise is one which has operations in more than one province, or has two or more establishments, or has two or more locations, or is engaged in more than one activity, or has more than one legal entity (i.e., multi-province/multi-industry/multi-legal entity). There are approximately 10,000 complex enterprises in Canada – the top 10% of which account for more than 80% of the share of revenue and more than 70% of employment from complex enterprises. Given their importance within the business universe, Statistics Canada has worked to enhance relations with them.

Figure 1 – Enterprise Structure



<sup>34</sup> Information in this appendix was partly obtained from a Statistics Canada document (see Statistics Canada, 2000). We thank Joanne Proulx of Statistics Canada for her input.

<sup>35</sup> The term complex in the case of enterprises is a statistical concept that is not particularly relevant outside of Statistics Canada.



## Abstract

*Financial data are key inputs to understanding issues important to ensuring the stability of the financial system (i.e., financial institutions, financial markets, and the clearing and settlement systems) and monetary policy. Given the growing importance of financial issues – such as accelerating globalization, financial stability and financial innovation – facing many countries around the world the need to do analysis and research using financial data will continue to be a growth industry. At the same time, budget constraints and good governance practices will require central banks to be clear about their strategic priorities and the paths proposed for achieving them.*

*The paper discusses the Bank of Canada's experience to date in designing a strategic plan for financial data to be implemented substantively in its next medium-term plan period (starting in 2007). It documents the steps taken to understand and provide solutions to questions surrounding the data: what are current or potential data gaps? what are best practices at other central banks? what is the best way to fill these gaps that reconciles the differing needs of staff working in the various functional areas of the Bank? In answering these questions, consideration is given to the cost parameters of compiling/obtaining data in various ways. Finally, the paper outlines some issues and recommendations for further discussion.*

*The current assessment is that the path leading into the next medium-term plan period should be more evolutionary than revolutionary to provide time to assess how changing governance and transparency requirements will impact the supply of financial data. To support this exploration, staff would have access to funds for encouraging greater service in data provision, including seed and partnership money. To ensure accountability, there would be a regular review of the contribution of different databases to the work of the Bank with an aggressive culling of lower value-added sources. To facilitate progress, a communications strategy would be developed for making representations to providers of higher value-added data on the gaps in their financial data for Canada.*

*“Statistics are like glasses through which policy-makers and all other economic agents view macroeconomic reality.”<sup>36</sup>*

*Brian O'Reilly and Greg Haymes (Monetary and Financial Analysis Department, Bank of Canada)*

<sup>36</sup> *Jean-Claude Trichet. Speech delivered at the second ECB Conference on Statistics, “Euro area statistics and their use for ECB policy-making,” Frankfurt am Main, 22–23 April 2004.*

# Note for panel discussion

- The paper presented is very much stimulating and does in fact form a scientific underpinned blue print for similar projects at other central banks. I'm confident that all of us will have to go through a stage during which we have to reflect on the new objectives of the central bank, given the changing environment in the economy in which monetary policy is acting, the growing importance of financial stability surveillance and the safeguarding of the payment systems. Globalisation but also the changing nature of financial intermediation is forcing central banks to do so.
- Coming to the concrete procedure at the Bank of Canada, I found very clear standards which should direct the process. These include :
  - \* the clear definition of the missions of the central bank;
  - \* the accountability of the different business lines.

Implicit from the approach I understand that statistics are clearly seen as a service unit to the benefit of other users within the bank. I miss somewhat the concrete mission of statistics as business line within the project. This impression, which may be wrong, is based on the fact that statistics, as entity, is apparently not represented in the cross-departmental project team.

- As it was stated in the presentation, the collection of data is not for free and a cost-benefit analysis - against the missions of the central bank - is a compulsory part in the decision process. In collecting data, a central bank has to rely on external entities, as they do not have legal competencies to collect data from all actors or have not even the legal right to access all individual data (this may even hold for very detailed data on f.i. the price indices). In case crucial data is lacking or not accessible, central banks could take the necessary steps to obtain legal competencies to do so.
- The users, not only at the Bank of Canada, do express needs to get access to individual data to refine their analysis and for a better understanding of what is exactly happening in the economy. We as statisticians are very familiar with demands for more detailed information. It is also our experience that an "all in one" database is not the solution to the problem. From a practical point of view one needs a core database in which common definitions are used. Especially the conversion between classifications is important. Data can be collected from different entities and stored in different databases but these databases must be able to "talk with each other". Besides, the nature of the data prevents a complete mega-database. And moreover, the needs of the different users-group diverge and may require different IT-tools. As a consequence the identification of data to be exchanged must be fully standardised. This last point could be added to the item "flexibility" as one of the required strengths of the database structure.

However one remark on the micro data. These are of course very useful for structural analysis and detailed ex post analysis. In my opinion tendencies at macro level and meso level keep entirely their utility as they can be estimated in much shorter delays. The need for individual data needs alliances with the NSI.

- The integration of data is a very noble exercise and should not be seen as an argument to narrow down the relevant different sources of data, because these provide us with the possibility for cross checking and double-checking of statistics.
- A rationalisation can be achieved in analysing and defining the data collection in a way as to serve as many users as possible. In former days, business lines started data collection for their needs only, which lead to a multitude of reportings by the financial sector which are in fact partly pictures of the same phenomenon. Several years ago already the National Bank of Belgium started to cooperate closely with the Prudential Control Authority to integrate the reporting by banks into a simple reporting system. This approach is still followed in other domains, through which the reporting burden can be brought down.

- A broad communication with the reporting population is extremely important. Reporters too might be interested in data which is lacking and integrating their needs creates goodwill. They may make suggestions for a more valuable reporting and for a better understanding of the data.
- And a last comment; regarding commercial data vendors, experience shows that data is not always useful and the content may vary substantially over time, which make it not possible to create long term series, an essential requirement by researchers.

*Rudi Acx (National Bank of Belgium)*

# Building a data warehouse for a central bank – CDBMS\*

*Ashok.K.Nag, Anujit Mitra*  
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## Introduction

Decision-making in any large and complex modern organization is necessarily information driven. Notwithstanding the critical importance of human intuition, it may be truly said that information is the key ingredient to decision making. Normally a central bank's operational span encompasses the entire economy. It must necessarily, therefore, be information rich and information requirement of its analysts and strategists would be enormous. This latter group of people would like, so to say, to be provided a rich menu of analysis ready information in a timely manner. This is a daunting task, by any measure. However, the modern data warehousing and Online Analytical Processing (OLAP) technology provides one possible solution.

The Reserve Bank of India (RBI), the central bank of India, has built an enterprise wide data warehouse and released it to its internal users in the second half of the year 2002. This is a unique initiative in the sense that this is a first time a central bank has embarked upon building an enterprise wide data warehouse named Central Database Management System (CDBMS). Conceptualising an enterprise wide data model for a central bank is a challenging task and the RBI experience in this regard is valuable not only for pedagogical purpose but also provides a template for future practitioners in this area. This paper takes a critical look into the entire life cycle of the project- its various phasing details, challenges encountered during the various phases and strategy adopted to overcome them, how the contours of the data model were drawn and the building blocks therein were identified etc. The paper is divided into six sections. The first section gives some background information about the organization and its extant management information system. The second section is on planning of a data warehouse project. The next three sections deal respectively with details of three phases of the project. The sixth section summarizes the post-implementation issues and also the lessons learned.

## Section I: The organization

RBI, headquartered in Mumbai, is a large organization with 18 head office departments and 17 branches / regional offices spread over the entire country. Unlike its counterparts in many developed countries, RBI performs a myriad of tasks – monetary policy making, supervising and regulating the banks and almost all other deposit taking financial institutions, providing banking as well as merchant banking services to the central and state governments, managing the domestic currency and country's forex reserve, determining the country's exchange rate policy etc. This wide divergence in its functional areas is accompanied with a wide divergence in the level of workflow mechanization in different functional areas. To discharge its regulatory and monitoring roles in different areas, the Bank has built over a fairly long time, an elaborate system of data flow from its regulated institutions like banks, financial institutions, non-bank financial companies etc. to its various departments.

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### **Characteristics of current information management system**

Given the above background, we need to understand and assess the principal characteristics of the current information management system of the Bank. Firstly, we have to note that there is a good deal of heterogeneity in level of computerisation in different parts of the organization. As the computerisation of these departments and regional offices were not done as per a centrally drawn roadmap, it is observed that a plethora of operating systems and application software have found their way to some parts of the organisation. Still there are a number of manual systems running in different places. Also there are large transactional systems, which use the latest technology. In other words there are information systems at various levels of computerisation. Anybody aware of the data warehousing technology would realise that this is an ideal situation where one would derive immense benefit by consolidating organizational data using this technology. Commensurate with the benefits, however, one has to reckon with the extreme complexity that a data-warehousing endeavour would entail in such a situation.

The second characteristic, which makes it different from most other organisations, is that here, the source systems are mostly islands of small MIS systems rather than transactional systems. This needs further elaboration. To discharge its regulatory and supervisory role the Reserve Bank calls for information in specified formats from different financial institutions including banks. Information submitted by these agencies through various specified returns is mostly summary information culled out from the transactional systems running in individual agencies. As a result it may be extremely difficult if not impossible to ensure data consistency and integrity across various return systems. At the same time since aggregation reported in each return may provide a unique classification of transaction level granular data, the warehouse may have to live with different values of the same aggregate, with different embedded hierarchies.

The first characteristic described in the earlier paragraph explains the formation of islands of data, which cannot be accessed easily. The seeker of any information has to heavily depend on the IT personnel of the respective systems. But even before that she needs to identify which system or systems is likely to have the information being sought. More importantly she needs the metadata associated with each category of data to make sense of it. Availability of this metadata would only help her to identify the correct answer to her query in a situation when multiple results for the same query are obtained from multiple systems.

The second characteristic is common to database of any regulatory organization and calls for an appropriately calibrated approach to management of data quality and consistency within the warehouse framework.

The foundation to build the data warehouse for a central banking organisation was dealt in detail in a paper by Barman and Nag<sup>1</sup> (1999). They also proposed a structure and the subject orientation of the data warehouse of a central bank.

## **Section II: Planning the project**

### **Project objectives**

A project begins with a clear statement of its goals and objectives. It is found useful to formalise this statement through preparation of a well-articulated vision statement for the project, which may be called an approach paper. The approach paper should also lay down a broad road map for the project and enumerate the likely benefits to the organization arising out of the project. The approach paper has to be internally debated and receive the approval of the top management, giving the project its required corporate sponsorship. For CDBMS the stated objectives of the project were – developing an integrated repository of current and historical data encompassing important operational and research areas, conforming to high statistical standards and to provide decision support infrastructure for understanding the macro and micro perspectives. This would include data dissemination through Web, multidimensional view, on line analytical processing and data archiving.

### **Key success factors**

A data warehouse project is fundamentally different from any standard application oriented traditional software projects. The latter type of projects follows a functionally parallel approach

<sup>1</sup> *A Financial information system for India: Data Warehousing approach by Dr.R.B.Barman and Dr. Ashok K.Nag (1999)*

with little or no cross-functional integration. Such an approach, if adopted for a DW project, would lead to development of stovepipe systems. As an enterprise wide DW integrates the entire enterprise data encompassing different functional areas, a cross-organizational and cross-functional development approach is required to make a DW project successful. A successful DW project must ensure that the project development process has built in steps to “discover, communicate, integrate, document, and control the overlapping as well as the diverging functional view of all business units (Adelman, Sid)”. As a result, a DW project cannot be successful if there is no enduring top-level commitment and corporate sponsorship for the project (See Kimball and others<sup>2</sup>).

Another key success factor for an enterprise wide DW project is the organizational readiness. Among the many attributes that are germane to readiness factor, two most important are – prevalence of analytical culture within the organization and availability of required data itself. A central banking institution is usually well placed on both these counts. Central banks like RBI are known for strong analytical reports and a culture of painstaking data analysis. RBI is also one of the pioneers in building large computerized databases in the country.

### ***Approach for development – Turnkey solution or phased development***

Many of the IT projects are taken as turnkey projects, where the entire project deliverables are identified beforehand. This approach would be extremely difficult to follow in case of data warehouse, as it is more of a process than a project. The requirements cannot really be frozen even during the development time as it continuously evolves. For this reason the deliverables have to be specified at a little higher level than required for a turnkey project. Phased development gives more flexibility to accommodate these changes.

### ***In-house development vs. outsourcing***

One key management decision that is required to be taken at the initial stage of such a project is regarding the desirability and then its extent of involvement of outside vendors in the project. There are obvious advantages and disadvantages with the two possible approaches. While the outsourcing brings the experience of the outside agencies with the Data Warehousing technologies, it is to be recognised that the domain knowledge is immensely important for this kind of projects. It needs to be emphasized at this point that data warehousing is not an off-the-shelf product that can be configured and delivered. It is a process that constantly requires being fine-tuned to meet the analytical requirement of the business managers. Since it is not possible to state in an algorithmic way the analysis path that an analyst would like to take while exploring data, it is imperative that internalisation of the analytical perspective happens implicitly within the DW development process. This is possible if and only if a strong internal team with rich domain expertise as well as sound grounding in DW technologies works closely and guides the team of outside vendor, if, for organizational reason, it is decided to outsource the project. Associated with the decision of outsourcing is the question of broad architectural issue that needs to be resolved at an early stage of the project. The issue is whether a sequential departmental data mart centric development approach should be adopted or an architected data warehouse building approach should be undertaken.

In the DW literature, one finds a lot of theological debates on this issue between camp followers of two data warehouse giants namely Inmon and Kimball. But a careful study of writings of these two experts would show that the difference in their respective prescriptions is more of emphasis rather than fundamental.

In Reserve Bank of India it was decided that the design should be for the enterprise-wide data warehouse covering the entire organisation. This needs to be done to avoid the integration problem afterwards. However, the implementation would be done in a modular way and subject area wise.

Another general issue that requires an early decision, when outsourcing has been accepted as the only feasible alternative, is regarding the broad development cycle that the vendor would be asked to follow. One possible development cycle could begin with development of a prototype by competing vendors, followed by full-scale development on acceptance. In the case of RBI, this was found infeasible as the resources needed to support a reasonable prototype development would be considerable and no vendor would commit such resources as investment on their part.

2 *The Data Warehousing life cycle tool kit* by Ralph Kimball, Laura Reeves, Margey Ross and Warren Thornthwaite



At the same time, a kind of prototype is required to be developed to sensitise the business analysts about the potential of OLAP analysis and get their cooperation at the time of requirement analysis. Associated with this issue is the development of internal team with adequate exposure to DW technologies. In the RBI case these problems were resolved by developing a small prototype based on a small slice of organization's data by the internal team with the help of an outside consultant. This step equipped the internal team with the required knowledge of DW technologies and helped immensely in the actual execution of the project. The composition of internal project team is also an important issue having bearing on the success of the project. It has been established by various data warehouse experts that the IT department is not the best suited department for this, as many a times they do not have the perspective of the analyst or decision makers of the organisation. At the same time there may not be any other single operational department, which has the overall business knowledge of the enterprise. A research department is the nearest solution for this role provided they have some background of IT (See Kimball and others<sup>3</sup>).

### ***Role and commitment of top management***

It is a well-known fact that the continued commitment of the top management is the single most important factor for success in this kind of project. To ensure the unhindered institutional support, a strategy could be to form a very high level group consisting of top executives of the organisation along with reputed IT experts to guide and steer the project. Thus it could be ensured that views and concerns of all functional areas were fully taken into account during the process of building the enterprise wide DW. Throughout the development period of the project all the major issues could be discussed and decided by this group and appropriate sub committees constituted by it.

### ***Project plan and phasing details***

Any project must begin with a project plan. This need not be very detailed to begin with but should clearly spell out the overall roadmap for the project. The milestones and the time to reach these milestones need to be realistically identified. The broad level activities and their interdependencies also need to be clearly pointed out.

The task of building of the CDBMS was divided into three phases. The Phase I consisted of two distinct set of activities – studying and creating a detailed inventory of the existing information systems and business requirements study. Phase II was the designing phase, during which data model was built based on the deliverables of the phase I and system architecture was prepared. The third and final phase was planned as the system Integration and development phase. This would be done based on the deliverable of phase II deliverables. We would have a look into further details about the phases in the subsequent sections.

### ***Multiple or single vendor***

Once it is decided that the project would be undertaken with the help of an outside vendor, the immediate question that arise is regarding the selection of vendors for different phases. Although it may seem that a single vendor for all the three phases taken together would be the ideal solution, there are a number of reasons why it may not suit in this case. Firstly, it is not possible to have any realistic idea of the effort estimation for the development phase without completing the first and second phase. And it is obvious that the first phase vendor must undertake the second phase activities also. Moreover, the skill set required for execution of the first two phases of the project is materially different from that required for execution of the third phase of the project. As a result a combined tender for the entire project may not help the contracting organization in the price discovery process. So for CDBMS, it was decided that a consulting vendor should be hired initially for the phases I and II of the projects. There would be a fresh tendering process for the phase III. Since the success of the third phase and indeed for the entire project, would depend on the quality of deliverables of the first two phases, it was felt that it would be necessary

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3 *The Data Warehousing life cycle tool kit by Ralph Kimball, Laura Reeves, Margey Ross and Warren Thornthwaite*



to make the consulting vendor accountable in some way for successful implementation of the third phase. Accordingly the contract for the consulting vendor stipulated that it would be required to supervise the work of the third phase vendor and ensure successful completion of the project.

While searching for the consulting vendor, more weightage should be given on the business or domain knowledge of the vendor. This was the key as the success of the project very much depends on understanding the source systems and business requirements of the users. The vendor selection process and the evaluation matrix may be built accordingly.

Extra caution is needed while selecting the consultant for the project. It is a common experience that the bidders claim to be associated with many big projects of similar nature. But it is important to know what was their exact role in those projects as in a large data warehousing project normally multiple vendors play various roles at various stages of the project. One way is to ask them to share the methodology that they are going to use for this project. Many a times vendors are reluctant to share these details citing the proprietary nature. However, they might be persuaded to at least share the various templates that they are going to use. Many a times these templates reveal the experience and knowledge of the vendor in the area. Though each data warehouse project is unique, the templates can be customised suitably and they can provide a lot of help in moving faster with the job.

### **Section III: Phase I – Inventory taking and requirement study**

The time period for Phase I was estimated to be twelve months. The major deliverables in this phase were identified as (1) Building a complete inventory of existing operational information systems prevailing in different departments of the Bank (2) Construction of complete Data Flow Diagram for the entire organisation (3) User's requirement from the CDBMS – which means identification of users and their needs and (3) Identification of business processes (in the sense of Kimball) and their mapping to information systems.

#### ***Source system study***

It is quiet possible in a large organisation that a central information base is unavailable for the different applications running in it. First this information is needed to be collected. The work could start with framing of a questionnaire to be canvassed to all the departments. Through this questionnaire, information would be collected on a number of aspects of departmental information systems – its operating system, software platform, entity-relation diagram if available, data flow diagram, input and output structure, availability of historical data, system documentation etc. In RBI, the survey result brought out in sharp relief the yawning gap in the knowledge about existing system in many parts of the organization. It is also a reflection of almost total absence of corporate metadata in electronic form. Thus this exercise became a first step to build a corporate metadata repository also.

However, the questionnaire-based survey only provides some basic ingredients for building a fully annotated source system metadata. This information needs to be supplemented with further details that can only be obtained with personal interaction with source system administrators. The CDBMS experience shows that this exercise is time and resource intensive and unless adequately planned and provided for, there is substantial risk of time overrun for the project.

#### ***Business discovery process or requirement survey***

The requirement survey is another activity that demands deployment of very skilled personnel with deep domain knowledge on the part of the consulting vendor. The RBI experience shows that lack of adequate domain knowledge may render the exercise futile and needs lot of re-work. Since the dimensional modelling is required for building the OLAP databases and the usefulness of such a model would depend upon how best it enables the users to navigate the database in her preferred way, it should be possible to understand this preferred navigation path at the time of requirement survey. And this would be ensured only if the members of the survey team could talk to the users on the same wavelength and gather the required information adequately and comprehensively. Thus it is so important that the consultants visiting the departments should have adequate domain knowledge and be familiar with the role and working of

the department. They should also fully understand the scope, objective and deliverables of the departments.

On the other hand, to prepare the users, a presentation with a prototype could be very useful. A very important point to remember is that the users are not necessarily familiar with the data warehousing and business intelligence at the time the project is taken up. It is not expected that they would be able to articulate their requirements and the navigation path at the outset. As there are further interactions and familiarity about the technology, the requirement changes. Project team should be flexible enough and be prepared to accommodate this change in the requirement.

### ***Procedure for acceptance of deliverables***

The first draft of the departmental Phase I report prepared by the consulting vendor, covering the vendor's understanding of the working of the department and the details of the information systems running in the departments needs to pass through a vigorous review process by the project team itself. After getting rid of obvious mistakes and misunderstandings, which are expected to be there in the first draft, it needs to be rigorously reviewed and validated by a group consisting of experts drawn from respective departments and outside in structured review meetings where the vendor may make presentations on its departmental reports. The vendor should be able to report on how queries would be handled, how hierarchies would be navigated etc. Based on the feedbacks thus received the reports needs to be further revised and finally accepted.

### ***Identification of subject areas***

The next big job was to identify and build the subject areas or data marts, which transcend the departmental framework. The terminology of subject area is used here differently and should not be confused with subject-oriented nature of a data warehouse that we have discussed earlier. The subject area delineates a coherent segment of data warehouse that meets the information requirement of a specific group of users. This arguably was one of the most critical exercises, which require deep understanding of the data warehousing technology as well as the domain knowledge including functioning of the departments and the organisation as a whole.

Although the departments are structured along the lines of different roles that the organisation is required to perform, statutorily or otherwise, there are important intra-department differences and inter department similarities with regard to the analytical perspective that the users in various departments employ to use information for decision support. For example, the data frameworks required for regulatory monitoring of financial health of the institutions under the jurisdictions of departments like banking supervision department, non-banking supervision department, urban co-operative banks department etc. may have a lot of commonalities among them and a single broad analytical framework may be worked out to meet the information requirements of concerned users. Needless to say that there would be some important differences in the regulatory framework of different type of banking or financial institutions when considered in detail, but such differences can easily be accommodated within a single broad framework. On the other hand, there could be substantial differences in respect of analytical framework for information requirement among users located in the same department.

For most of the users of data warehouse, requirement for data and analysis are largely predictable. For a group of identified users it is entirely possible to anticipate the way the users would navigate through the mass of related data. Once the central theme of such navigation is understood, it increases the performance of data delivery and presentation mechanism by manifold if data are specially organized following certain standard methodologies around the central theme. The critical issue is to identify and understand the central theme and users' analytical requirement for information around the central theme. To do this what is needed first is to map the information requirements of users as expressed in the user requirement survey undertaken during the first phase of the project into a list of important business concerns of the Bank. This mapping exercise would result in delineating subject areas so that each subject area would exhibit the following features:

- (1) uniformity in analytical perspective,
- (2) similar business concern for the target users and
- (3) similarity in certain attributes of data elements to be covered by the subject area.

The consultant carried out this exercise following a bottom up approach, which is the right thing to do.

In the case of CDBMS, this process took some time and a lot of hard work and brainstorming. Initially eleven subject areas were proposed but soon these were further consolidated and finally eight subject areas emerged after the initial report was subjected to the detailed review process described earlier. The business queries listed earlier are now regrouped subject area wise. Finally the consultant prepared the subject area wise reports, giving analytical perspective for each subject area, its main business functions and main business queries. These reports again went through a rigorous review process before final acceptance by the bank.

This also marked the end of Phase I. There was some overshooting of the time limits set, as the acceptance procedure was long. But the consultant started the groundwork for the next phase even before the official acceptance of the Phase I, by setting up the team and initiating preparatory work towards building the database architecture for the CDBMS.

#### **Section IV: Phase II – Designing CDBMS**

The deliverables of this phase includes the design of the database architecture for CDBMS. The main components of this architecture are – the rules and designs of ETL process, high level logical enterprise data models for the data warehouse, detailed data model for selected subject areas, design of security architecture and access policies.

The core of the Phase II development work lies in the construction of the high-level enterprise wide data model. This data model would provide the foundation on which the entire subsequent development work would rest. The data model would also provide the running conceptual thread that would bind together all individual analytical requirements of decision makers and analysts at all levels so that the main business goal of the organisation is not lost sight off. To a certain extent, the paper by Barman and Nag (referred earlier) did provide a point of departure in this respect for the consultant to begin the work. The main challenge in this work is to unravel the conceptual underpinning of various BPAs (Business Process Analysis) that have been identified during the first phase of the project. It may be truly said, based on CDBMS experience, that the primary responsibility for this conceptualisation has to be taken by the members of the organisation and not the consultant who may act only as facilitators. For many lines of business, standard data models are available in the literature<sup>4</sup> and any vendor can begin its work by customizing the available data model to take care of the specific requirements of the organisation it is working for. For example, for the commercial banking area, IBM has published a standard data model. Unfortunately, a standard data model for a central bank is not available in the literature and in this respect, CDBMS should prove to be a pioneer.

Once the high-level logical data model is prepared, it automatically leads to identification of main conformed dimensions and hierarchies to be incorporated in such dimensions. It became obvious from the interactions with database administrators and business analysts in various departments that IT systems and regular information framework in use in these departments are in flux and rapidly evolving. This would mean that data warehouse would be required to undergo many changes to meet the evolving requirement of business processes and also to cope with the changes in the source systems' database structures. It became apparent that a data warehouse based only on star schema would be a risky proposition as atomic level data with most of the attributes should be available in the data warehouse to cope with any future changes in requirement as well as database structure of the source system.

The challenges in this phase were many. First of all, the logical architecture of the data warehouse was to be worked out. Next, based on this architecture and the report of Phase I, which gives the size of the source systems, it was possible to get some idea about the size of the data warehouse. Also by the end of this phase, the System Integrator and Developer (SI&D) needed to be appointed so that Phase III could commence without any delay. However, this step is having some dependency on the Phase II deliverables, as the "Request for Proposal for the SI&D" needs to specify clearly about the scope and size of the deliverables of the third phase. Without these detailed information it would not be possible for any vendor to make any realistic bid.

4 *The Data Model Resource Book Vol 1 & 2 by Len Silverston.*

It may be noted that this design activities were supposed to be carried out without any reference to any specific Data warehouse or reporting and query tool as no decision regarding tool was taken at this stage of the project. In case of CDBMS, it was later realized that nature of a software tool did have a role to play in determining certain specifics of database design. For example, some query tools are not good at managing unbalanced hierarchy and special care needs to be taken at the design time itself to handle such issues. Some of the most challenging problems that arose during the design phase were – how to get a list of validated members of a conformed dimension, managing multiple hierarchies within a single dimension, building of a conformed date dimension table which is capable of handling both stock and flow data of various frequencies.

It is to be also noted that the entire design exercise should be undertaken with the help of a good modelling tool. These tools help in building up the data dictionary, proper documentation and metadata. They later also help in implementation of the design. Most importantly this approach helps in accommodating the design changes without substantial rework.

The selection of Hardware and Software tools should begin roughly at the middle of Phase II, so that Phase III does not get delayed for the lack of infrastructure. It must be realised that the Hardware and Software selection and selection of the SI&D cannot be independent. The prospective developers might not have same level of competency and preference in all kind of platforms. The cost of development on different platforms may also vary depending on the skill sets required for different solution architecture. And most importantly the SI&D vendor should be made fully responsible for the quality of development irrespective of the platform chosen. In other words, the selected vendor must guarantee that all requirements as enumerated in the Phase I documents can be met with the selected hardware and software solution architecture. In this respect, selection of Hardware and Software and the selection of SI&D vendor are intertwined.

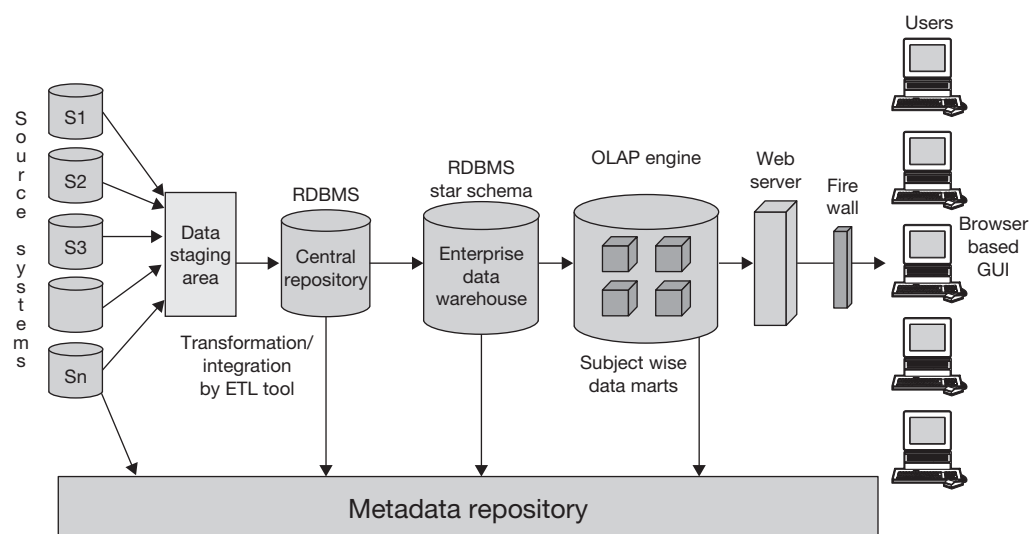
For the selection of hardware and software some basic framework might be needed to be put in place. Based on technical considerations about the scalability, stability, robustness, high availability and security features as well as keeping in mind the skill sets available within the organisation, the Operating System (UNIX or NT) and the RDBMS may be chosen. Also data warehouse experts recommend a software solution where the coding requirement would be minimum. For data warehousing this is very important as data warehouses are not static but evolving, in response to the changes in the source systems as well as the business requirements. If the coding is not kept at minimum the maintenance of the software may become unmanageable rendering the data warehouse unusable after sometime. Another important aspect that was considered while selecting software tools is metadata-exchanging capabilities of different tools. In absence of this capability the tool would become an island of its own and this would entail serious workflow integration problems.

Apart from the basic OS and the RDBMS, tools required for the data warehouse are mainly of three types. These are (a) data staging tools (ETL), (b) OLAP and data access tools and (c) the metadata management tool. There were two different strategies available for selection of these tools. One strategy advocates going for end-to-end solution or suite of products from or supported by single vendor. The other one favours the best of the breed approach. The best-of-the-breed approach leverages primarily on the relatively better expertise of vendors in a particular category. The end-to-end single vendor solution on the other hand overcomes the acute problem of integration between the tools. Our experience shows that the problem of integration is a real one and even availability of a tool on any particular version of OS does not automatically guarantee that it would be readily available and certified for performance on an upgraded version of the OS or application server. This also brings forth the difficulty in managing multiple vendors. However, if a set of features is specified as minimum requirement for a tool to be considered for selection, the best-of-the-breed approach becomes the only feasible option.

To address the twin issue of selection of the platform as well as the selection of the vendor for the role of the system integrator and developer, a two-stage selection process was adopted, in the present case. At the first stage, a single RFI (Request for Information) with necessary technical details was issued to invite technical proposals for software and hardware solutions and also for appointment of SI&D. Bidders were free to suggest multiple combinations. It was planned that the final technical and commercial quotations for the platform and the SI&D would be called for in the second stage. While the Hardware and software would be through another open tender, the bids for the SI&D would be only from the short listed vendors.

This process would help in discovering the comfort level of each of the vendors with different tools available in the market. From the short listed bids, the tools available in each of the category could be short listed for further consideration. Apart from vendor presentations and

Figure 1 – Logical architecture of CDBMS



technical question-answer sessions, client visits are also required to be made to evaluate proposed solutions and vendor capabilities.

After the selection of the software tools, the candidates for the role of SI&D could be further pruned to only those who expressed their competency in these set of products.

A major strategic decision was taken for the CDBMS was to go for single vendor approach, as far as practicable, for acquiring the hardware, software and network products for the CDBMS. It must be understood that this strategy might prove to be costlier but the vendor manageability would be addressed by this approach. This assumes more importance if best of breed approach is adopted while selecting the software tools. Hence, for CDBMS it was decided to acquire the entire 'Computing Environment' rather than acquire individual components. The computing environment is broadly consisting of three parts – the hardware, software and networking components. At this stage the software components were all decided. The bidders for the supply of computing environment were required to suggest the rest of the solution.

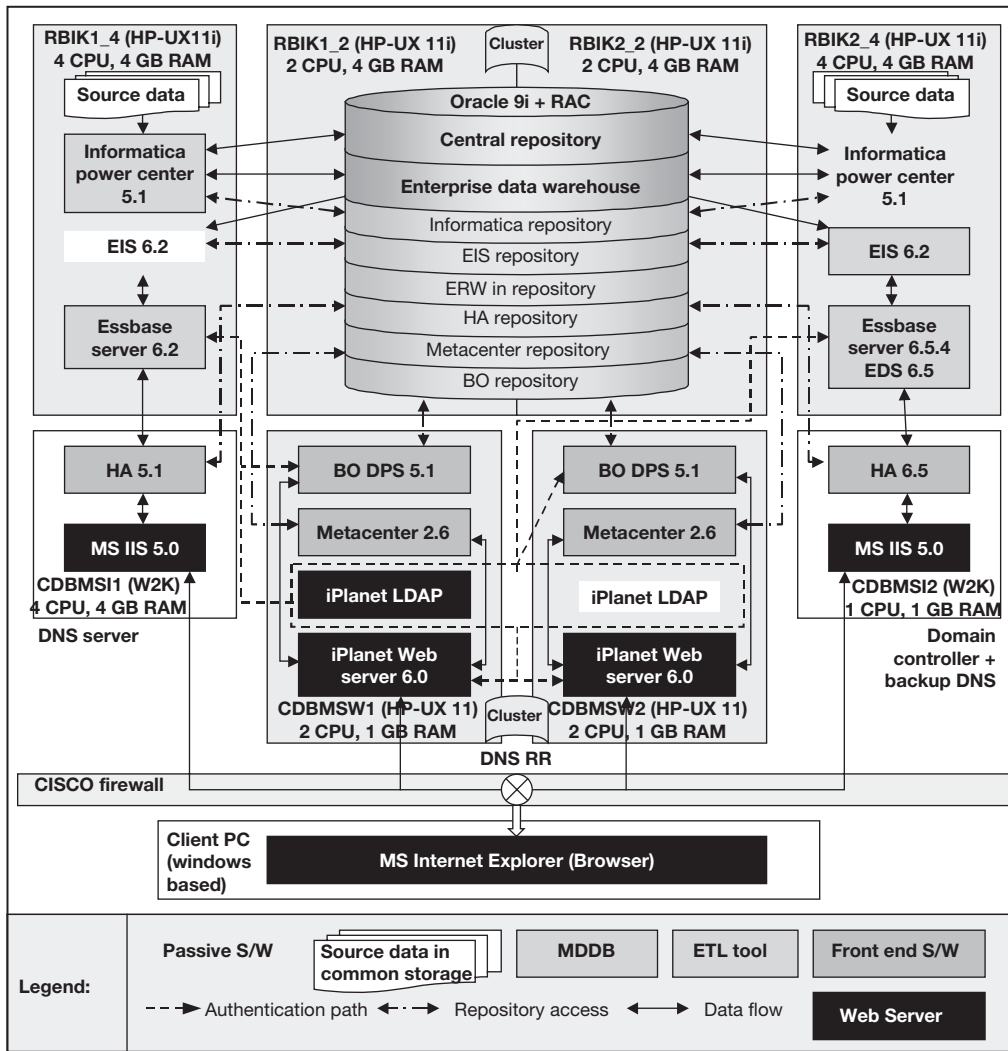
The technical architecture for CDBMS was arrived at with some inputs from the consultant. It was a 3-tiered architecture consisting a) Database layer b) Application layer and c) Web Server. Database Layer holds both Staging Area Server and Enterprise Data warehouse.

The application server was planned to host Metadata repository and Reporting and viewing tools. The Web Server was to run the information delivery subsystems and the user authentication and management tools. End users would generally connect with a browser from their desktop over a network. Simultaneously, the issue of hardware characteristics and sizing was addressed. This again was found to be complicated as different vendors suggested different matrix and different sizing depending on the advantages they are having in that segment over their competitors. However, from all these inputs as well as based on the experts' opinions a long list of minimum features were arrived at. These include the TPC-H ratings for the servers, the size of the SAN etc. It was felt that the high availability and scalability were very important features. It was also stressed that the entire architecture should not have any single point of failure. At the same time highly desirable advanced features like partitioning and dynamic reconfiguration were recommended. As a part of the bid the vendors were required to quote upgrade prices of the components, which would be valid for next six years and also to indicate each and every component needed to scale up the particular module. It was also stipulated that bids should include all the other costs including 'Facilities Management', AMC and Software ATS. It was declared that the bids would be first technically evaluated and then the commercial bids for the short listed bids would be evaluated. The final criterion of selection would be the minimum Total Cost of Ownership (TCO) for a specific period. For the evaluation purpose RFP (Request for Proposal) document provided a hypothetical upgrade plan during the specific period and the rate of depreciation to arrive at the present value of the TCO.

The bidders put multiple bids in partnership with the different hardware and software vendors. Finally with the SI&D vendor in place and the Computing Environment decided, the stage was set to enter into the third phase of the project.



Figure 2 – CDBMS complete hardware and software architecture



**Section V: Phase III – System integration and development**

Even if a single vendor approach is taken for supply of the entire computing environment, in most cases it is unavoidable to have multiple vendors for the data warehouse. Managing the vendors, fixing responsibilities on them and managing the conflicts is an arduous job. By a fortuitous circumstance, the selected supplier of the Computing Environment and the SI&D turned out to be same. Thus any residual problem of conflict management between supplier of Computing Environment and SI&D vendor got eliminated. Setting up of the configuration of the Computing Environment to the satisfaction of SI&D became an internal affair of the selected vendor and the usual problem of sharing of responsibility and accountability between two vendors was avoided.

Having a single vendor for the two roles of the third phase was not an unmixed blessing, as it came to be realized later. For example the job of acceptance testing of the Computing Environment was initially included as the deliverables of the SI&D. Since the same company was the supplier of the computing environment, it did lose some of the credibility and usability. However, the acceptance test was also included in the Phase III deliverables of the consultant. They pointed out some deficiencies, which were rectified by the supplier.

A major problem that arose during this phase when test data started arriving and loading process started, related to data quality issue. Many data quality issues that had remained undetected or unappreciated during Phases I and II of the project, cropped up during this time and

without successful resolution of the same, the project could not go ahead. In case of CDBMS the number of source systems were too many and the associated problems were also much more than expected. In some cases it was found that the data structure initially supplied by the source systems were not fully correct. There are instances when the source system has migrated to a different platform since the completion of the phase I study. Most difficult cases were those where it was found that the historical data is not in retrievable position as the data archiving was not proper. The media in which the data is kept were no longer readable or simply the database was corrupted.

Even if historical data is loaded successfully in the warehouse, it does not guarantee success of the data warehouse. Regular flow of data is a must to keep the data warehouse from going stale. This requires a very high level of inter-departmental co-ordination on a sustained basis. To achieve this, it was decided that resource persons should be identified for each source system. Such resource persons are envisaged to be the interface between the data warehouse team and the data supplier and user departments. To ensure enduring departmental commitment to CDBMS, in respect of maintenance of dataflow, an appropriate organisational structure was established.

The data-warehouse tools may require more bandwidth than many other transactional systems operating over the corporate networks. In case of CDBMS also the bandwidth available initially turned out to be insufficient. But over a period of time there were rapid improvements as the leased lines with higher bandwidth supplemented the earlier available VSAT based connectivity. Accessing CDBMS through this network became smoother over the period.

Apart from system integration challenges, the development work also threw up a number of design challenges. At the time of physical implementation of the design worked out during the second phase, it was observed that it could not accommodate many queries to the satisfaction of the end users. As a result, the design document underwent a number of iterations even in the third phase. This was expected in this kind of gigantic design work. Thus, having the consultant in the role of supervisor in Phase III proved extremely beneficial as they could rectify any design related issue as it arose during the implementation stage. Moreover, they, on behalf of the Bank carried out the important task of acceptance and validation of work done by the SI&D vendor.

CDBMS was made accessible to the users in the INFINET (a closed user group network for all the banking and selected financial companies) for testing in August 2002. Finally the phase was treated as completed with the acceptance of the deliverables of the Phase III.

## **Section VI: CDBMS – Post implementation**

Initially it was thought that an internal team would be taking over maintenance work from the SI&D after the final acceptance of the third phase deliveries. However, for some reasons the internal team could not be organized to take over the maintenance work. As a result, the 'Production Support and Maintenance' work was assigned to the SI&D vendor on Time and Material Basis with flexible team size.

It is now felt that outsourcing of data management related jobs on a long-term basis may not be the best solution for a number of reasons. Firstly, due to high turnover of persons in the vendor's team minimum domain knowledge necessary to process source data received from various departments does not get built up and as a result the ETL process encounters frequent breakdown and avoidable errors. Secondly the follow-up activities for non-receipt of required data at scheduled interval necessarily have to be carried out by in-house persons and this creates an additional layer of activities and resulting co-ordination problems and delays. Thirdly the solution is not very cost effective.

Another major lesson learned during the post-implementation phase is that data warehouse is not a packaged solution delivered once and then maintained, more or less unaltered, for a long time to come. Data warehouse environment is a very dynamic one as organization adds new source systems, modifies the existing system, adds new hardware software, discards old systems and in fact closes old departments and creates new ones. To take care of all these alterations, modifications and changes, database designs will have to undergo continuous restructuring. Hence data warehouse maintenance is not an ordinary software application maintenance work but involves substantial developmental activities also. Herein lies another important human resource issue. As maintenance job is generally looked down upon mundane job in the software industry, vendors invariably assigns relatively less experienced persons to such jobs. Such persons may fail to meet the stringent skill demand that a data warehouse maintenance job entails. As a result the quality of application runs the risk of deterioration over time. Therefore, the



maintenance contract must include clauses for prior approval of composition and profile of maintenance team in terms of skill set and relevant work experience.

Finally we come to the most important issue of usage of database- the *raison de etre* for building and maintaining a data warehouse. A discussion of usage issue may appear to be putting the cart before horse. An organization is supposed to embark on a data warehouse project after it has properly assessed readiness of the organization for building a data warehouse. One of the factors that determine the extent of readiness is the prevalence of analytical culture and data driven decision-making system with the organisation. If the readiness factor has been properly assessed, then lack of usage of a constructed data warehouse would only mean that data warehouse architects have not been able to deliver and meet the expectation of the users. However, for a large public sector organization like RBI the usage issue is more complex than this. Moving from a dirigisme regime of control and micro-management to an environment where decisions are taken in response to emerging market trends, where analysis of mass of information becomes pre-requisite for informed decision making, building a data warehouse becomes almost a part of the business re-engineering process. Therefore, a concerted attempt to increase usage of Data warehouse is needed to bring about the paradigm change in organizational functioning. Further, to institutionalise the regular flow of data to the data warehouse, it may be important to make the data warehouse as the gateway of all data that flow out of the organisation.

The usage volume and frequency of the CDBMS has been somewhat uneven. A need for sustained handholding training is strongly felt to increase usage to expected level. One of the factors that have a bearing on usage pattern is the currency of data. The business managers in operational departments look for most current data as against economic researchers who need long historical data for model building and trend analysis. To keep the data in CDBMS up-to-date we need timely data flow from source systems, which in turn would ensue only if there is close cooperation between source system managers and data warehouse maintenance team. Thus here also we find the crucial role that internal team has to play in keeping the data warehouse alive and usable.

### **Lessons learned**

The CDBMS experience provides us some useful lessons regarding management of a very large and complex data-warehousing project as well as issues relating to its architecture and design. Based on our discussion above we enumerate the most important of them below.

- (a) High level sponsorship and top management commitment to such a project should be ensured not only at the initiation of the project but during the entire course of the project and more importantly thereafter too.
- (b) A project of such magnitude, the span of which cuts a swathe across the entire organization must be driven by a strong internal team, members of which should be drawn from various functional areas of the organization. The team should be a good mix of business analysts with capacity to appreciate technological innovations and data warehouse specialists.
- (c) The resource requirement for building and stabilizing ETL process should never be underestimated and data quality issues are extremely important, as it would also impinge upon final usage of data warehouse.
- (d) Integration of multiple tools is a very complex task and project plan should account for this both in terms of time and effort required.
- (e) Design of data warehouse databases will always follow an iterative path and we should be prepared for substantial changes in the initial design document delivered.
- (f) Most of the end users are not data explorers as defined by Bill Inmon and dimensional model is extremely useful for any data warehouse. However, dimensional models are subject to many changes if they are to retain their usefulness over time and in this respect we need to have a central repository where source data are retained with minimal loss of information but organized as per basic principle of data warehouse i.e. subject orientation.
- (g) Building business metadata is extremely important for end users but it is also very difficult and arduous job.

*Reserve Bank of India Ashok.K.Nag, Anujit Mitra*