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Denmark – Sources and Methods across Quarterly Financial and Non-financial Accounts - Practices and Challenges

To be presented in Session 4 by Tue Mollerup Mathiasen and Ole Berner

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Denmark – Sources and Methods across Quarterly Financial and Non-financial Accounts - Practices and Challenges

In this paper we describe the main sources, practices and challenges across the Danish quarterly financial and non-financial sector accounts. The financial and non-financial accounts are produced in two separate systems, but the accounts are reconciled at the publication level. To support this consistency, work is concentrating on developing consistent sources and methods across the two domains while the reconciliation itself supports the quality of both set of accounts.

The integrated quarterly sector accounts describe both real and financial movements in the economy. Therefore, they can be used for highlighting the behaviour of e.g. households and non-financial corporations throughout the most recent economic cycle. The statistics do not directly say anything about causality, but provide a good basis for modelling more theoretically based correlations – for instance between households' financial wealth and their consumption and investment. In the paper we also give some examples of the analytical use of consistent quarterly sector accounts.

1. Quarterly Financial Accounts

Building block approach

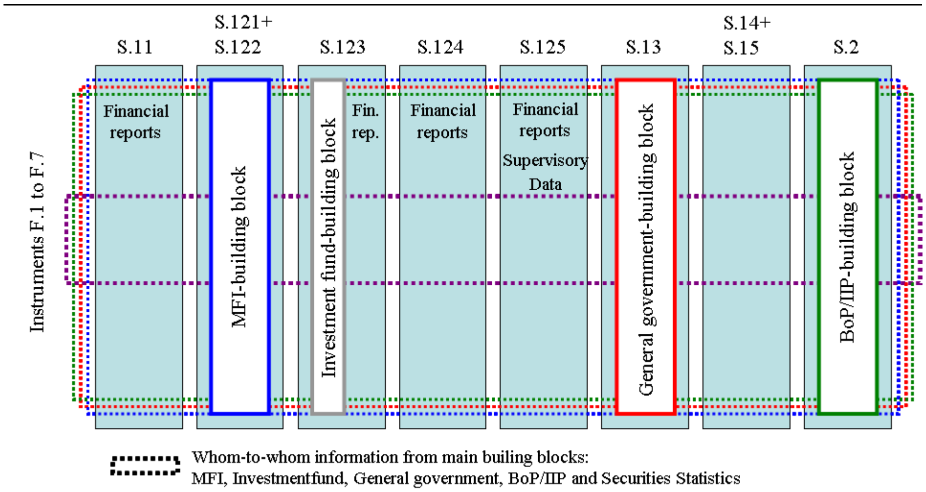
The Danish quarterly financial sector accounts are based on a building block approach, to a large extent supported by European legislation. The building blocks comprise detailed instrument classifications and, in various degrees, whom-to-whom information on balances, transactions and revaluations following as closely as possible National Accounts (NA) principles. In general, however, direct reporting adherence to NA principles has to balance the reporting needs for statistical purposes and the reporting agents' reporting possibilities.

The main building blocks cover the MFI sector (S.121+S.122), General Government (S.13), BoP/IIP (S.2), Investment funds (substantial part of S.123) and securities statistics. Other sources of information include financial reports and tax information. Each of the building blocks poses different characteristics and different problems and challenges to consistency within and between blocks and with relation to NA principles of recording and valuation. Given the integrated nature of financial accounts the quality and consistency of building blocks are essential for the overall quality of quarterly sector accounts and ultimately the description of the households and non-financial corporations sectors.

The building block approach is illustrated in Chart 1. While the MFI, the investment fund, the General Government and the BoP/IIP building blocks contribute to all instruments in the respective sector, the securities statistics building block contributes with information on securities across sectors. The whom-to-whom information from the building blocks and financial reports contribute to cover the remaining areas across all sectors and all instruments.

MAIN SOURCES CONTRIBUTING TO THE SYSTEM OF QUARTERLY FINANCIAL ACCOUNTS

Chart 1



Note: Illustration of how the main sources contribute to the system of financial accounts. Note that the investment fund building block only contributes to a part of the OFI sector (S.123).

Business register

Crucial for a building block approach (and NA statistics in general) is the consistent use of a single high quality business register across all economic and financial statistics, across reporting agents[1] and across various producers of statistics. The Danish business register is supported by European legislation. An extended version of the register, including NA sector references, is maintained by Statistics Denmark (SD) with the input of Danmarks Nationalbank (DN).

MFI sector building block

As input to the MFI building block, the MFI sector is covered by monthly direct reporting, governed by the European requirements in this area. As from 2010 these requirements have been expanded whereby the NA user needs will be even better served.

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[1] E.g. MFI reporting agents have access to monthly updated business register information thereby supporting high quality whom-to-whom reported information

The *current Danish implementation of the MFI reporting regulation* supports a detailed whom-to-whom dimension of instrument classifications within loans and deposits and other specific instruments. The instrument classifications further support NA, BoP/IIP and specific financial stability purposes at national and EU level.

Quality issues concerning both whom-to-whom information and instrument classifications exist. This may be illustrated by the fact that the total Danish MFI deposits in Danish MFIs reported on the asset side significantly differ from the total reported on the liability side – a phenomenon also known in the BoP domain.

Further challenges include inconsistencies between MFI reporting agents' internal registrations of customers and official business register information. Work is now being put into utilizing internal MFI registrations as input to an ongoing quality checking procedure of the official Danish business register.

Furthermore, inconsistencies within building blocks and between building blocks may also relate to the issue of accounting principles regarding time of recording (transaction versus settlement principle) and valuation (market versus other principles). Related to the MFI block, Danish accounting rules for the MFI sector allow for different accounting principles regarding the use of the transaction versus settlement principle. In order to facilitate quality checking of statistical reporting against published accounts and to minimize the reporting burden, the same flexibility is allowed for in the reporting framework resulting in inconsistencies at the reporting level.

Finally, also incomplete reporting of accumulation accounts (transactions, revaluations and other changes in volume) gives rise to some uncertainty about the quality of statistical output. E.g., the highly volatile net borrowing/net lending figures on a monthly and quarterly basis of individual MFI reporting agents is an issue of concern.

Implementation of the new MFI reporting regulation

In the upcoming implementation of the new MFI reporting regulation, major steps are being taken to improve consistency and adherence to NA recording and valuation principles.

First, in the new MFI reporting scheme, complete flow information (transactions, revaluations and other changes in volumes) will be added to balance sheet information on a detailed instrument and whom-to-whom level. This will minimise the need for estimations and allow for further checking of the overall quality of the reporting by comparing (in a transformed manner) net borrowing/net lending figures with published financial reports.

Second, detailed information on securities holdings and issues on ISIN code level – currently reported under the securities building block – will be included in the reporting framework. Reporting MFIs, using settlement principle for financial reporting purposes, will be requested to also report not yet settled transactions on ISIN code level (balances and revaluations). Valuation principles used will be specified on ISIN code level to support market valuation throughout the financial accounts.

Securities building block

The securities statistics is another major building block in relation to quarterly financial accounts (as well as to property income in the non-financial accounts). The statistics contain security-by-security (s-b-s) information on a whom-to-whom basis and follow largely the recommendations of the handbook on securities statistics[2].

The *main data sources of the current system* contain;

- issues and holdings of Danish securities by legal entity reported by the Danish Central Depository[3]
- issues and holdings abroad of Danish securities by Danish legal entities, reported directly
- holdings of foreign securities by Danish legal entities reported by Danish custodians.

Furthermore, to adequately measure financial positions of legal units, there is a need to adjust depository positions for repurchase agreements (repos) and for holdings of Danish securities through foreign custodians. Repos and counterpart information are reported by Danish custodians.

In support of the production of consistent European securities statistics, the European Centralised Securities Database (CSDB) has been set up by the European System of Central Banks (ESCB). This database is also an essential source of information on issuers and instrument classifications in the Danish system.

A number of challenges have emerged over the last years. The use of foreign custodians has increased and so has the volume of cross-border repos implying a more challenging production environment and the need for an enlarged direct reporting population in the BoP/IIP domain.

Furthermore, the issue of using transaction date or settlement date for time of recording has become even more important. Due to rapidly increasing volumes of annual refinancing operations with large amounts of bonds issued and redeemed within few days, consistent time of recording across re-

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2 BIS, ECB and IMF, Handbook on Securities Statistics Part 1 and 2, 2010.

3 The Danish Central Depository, VP Securities, is the central organisation for registration of securities in Denmark. All Danish quoted shares, bonds and investment funds issued and deposited s-b-s, issuer-by-issuer and holder-by-holder are covered by this unique data source.

porters and statistics is critical for a close description of the Danish real-estate bond market. Today, the comparison and combination of the MFI-sector building block and the securities building block is a challenge.

Update of the securities statistics system

Over the next two years the current securities statistics system will be updated and simplified to better handle the challenges that have emerged.

First, direct s-b-s reported securities holdings, issues, transactions, both settled and unsettled, and revaluations will be included and combined with the general MFI reporting (also mentioned under the development of the MFI block). This will reduce the need for combining several different sources and support recording by transaction date.

Second, direct s-b-s reporting will possibly be expanded to cover statistically important entities in other sectors – e.g. the Insurance and Pension (I&P) sector and larger direct BoP/IIP-reporting non-financial corporations.

Third, the CSDB will be used also for accrued interest accounting, supporting consistency across countries.

Fourth, a possibly expanded CSDB with European holder information would potentially improve the counterpart information contained in the BoP/IIP and thereby financial accounts.

BoP/IIP building block

The BoP/IIP building block is different from the MFI-sector and securities building blocks, because the BoP/IIP building block itself relies on these building blocks. The BoP/IIP building block also benefits from a considerable amount of detailed direct reporting on balances, transactions and revaluations, especially from non-financial corporations and the I&P sector.

Part of the directly reported information regarding issues and holdings abroad of Danish securities by the reporting legal entities is used as input into the securities building block on an s-b-s basis.

The main strengths of the BoP/IIP building block comprises detailed instrument classifications and whom-to-whom information on balances, transactions and revaluations following quite closely to NA principles of recording and valuation. Moreover, the BoP/IIP building block is reconciled with to the non-financial accounts before being published and before entering into the financial accounts system.

The main weaknesses follow from the combination of several direct and indirect data sources – especially regarding securities holdings, deposits and repo arrangements – and uncertainty about coverage of directly reported BoP/IIP figures.

General Government

The General Government building block is part of a consistent financial and non-financial block with some whom-to-whom information. The building block primarily relies on the accounts of state and local government, but information from the MFI- and OFI-sector and securities building blocks is increasingly used for input and cross-checking. The building block is consistent with the Excessive Deficit Procedure (EDP) figures reported to the European Commission.

The main challenge with the General Government building block stems from some inconsistencies between this block and the MFI-sector block – primarily due to differences in instrument classifications, sector references and netting. Recently, intensified work has improved consistency between the two blocks with clear benefit to the reconciliation process.

Investment funds building block

The Danish investment fund statistics are governed by European requirements. They primarily rely on direct reporting from investment funds, but also use some s-b-s information from the securities statistics.

In 2011 the investment fund statistics will be extended with flows. This will significantly improve the quality of information on flows in the OFI sector since the investment funds' assets amount to more than 60 pct. of this sector.

Reconciliation within the financial accounts

The main strength of the reconciliation process is putting the primary statistical sources into a coherent framework. In this framework, inconsistencies within and between sources are displayed and reconciled and provide feedback to the quality checking processes and medium and long-term development of the individual statistical sources.

The compilation of quarterly financial accounts is based on the main building blocks described above as well as sub-systems for the I&P sector, the OFI sector, the financial auxiliaries sector and unquoted shares issued by non-financial corporations. Each input dataset is, for each instrument and sector, consistent in the balances, transactions and revaluations dimensions – i.e. stock-flow consistency.

Reconciliation within the financial accounts is carried out on an instrument-by-instrument and whom-to-whom basis, in each case choosing and reconciling the most relevant input data. The reconciliation of balances, transactions and revaluations is carried out simultaneously. In cases of stock-flow inconsistency after reconciliation, transactions are being adjusted. The size and need for adjustments are closely monitored.

Apart from the already mentioned challenges regarding inconsistencies within and between blocks, one of the weakest areas in the system relates to the holdings, transactions and revaluations in unquoted shares issued by domestic non-financial corporations and held by other non-financial corporations and households. Although some holder information is available from financial reporting databases and also some relevant information on tax-returns is accessible, uncertainty is still very high in all accounting dimensions. The market valuation of balances is an issue of its own. Following European recommendations, own funds at book value are converted into market value based on ratios for comparable listed companies.

Other weak points include:

- whom-to-whom information on certain instruments such as accrued unpaid taxes
- inadequate quarterly stock-flow information on financial holding companies and other specific parts of the OFI sector
- certain assets and liabilities issued and held by entities in the non-financial corporations sector.

2. Quarterly Non-financial Accounts

In relation to the compilation of the quarterly non-financial sector accounts (QSA) for Denmark it is worth noticing at least two general aspects.

The first is that for three sectors, the financial sector, General Government and the rest of the world, the compilation of both annual and quarterly figures takes place in separate (sub) systems. Although these compilations involve a number of challenges they will not be described in further detail here, but it should be noticed that the QSA are completely consistent with these sub-systems including the BoP.

Secondly, the compilation of the Annual Sector Accounts (ASA) is highly integrated with the compilation of the "real" accounts. In particular when compiling the final annual Supply and Use tables the information on the sector dimension in the sources used are kept as far as possible in the compilations. Roughly speaking it is only in the final balancing procedures of the Supply and Use tables that the sector dimension is not taken into account.

Together with the information on the financial sector and the General Government this leaves us with a very solid basis for a breakdown of each of our 130 industries into a part belonging to the non-financial corporation sector and a part belonging to the household sector. The result of this exercise, called the sector/industry matrix, is a complete cross-classification by sector and industry for all the items in the Supply and Use tables. These items include all transactions in products, production, intermediate consumption, gross fixed capital formation, changes in inventories and taxes and subsidies on production. Furthermore consumption of fixed capital and compensation of employees (paid) is also cross-classified according to sector and industry.

The detailed sector/industry matrix covers only years for which we have made a final calculation i.e. a year 3-4 years ago. This matrix is then extrapolated to the following years using information on VAT turnover by sector and industry. The information on VAT turnover is further used to produce initial quarterly sector/industry matrices.

Together with the quarterly information on the financial sector and the General Government and in combination with the quarterly "real" accounts it is now possible to break down each of our industries into a part belonging to the non-financial corporations sector and a part belonging to the household sector thereby estimating a complete quarterly sector/industry matrix.

The quarterly sector/industry matrix entails a sector breakdown of all the items mentioned above (transactions in products, consumption of fixed capital and compensation of employees) on a quarterly basis. Furthermore the quarterly information on the financial sector and General Government provides sufficient data for a sector breakdown of taxes on income and wealth, social contributions and social benefits. As major challenges remain the quarterly estimations by sector of property income and other current transfers. In value terms property income is by far the largest of these.

The most important item in property income is interest and for this the estimates are rather weak for the non-financial corporations and to some extent the household sector. This applies both on an annual basis and in particular on a quarterly basis. The weaknesses of the estimates also apply for the interest received and the interest paid although the reliability of the estimates of the latter is a little higher than the received interest.

The situation with regard to dividends is even worse. In particular we lack solid information in relation to unquoted shares and reinvested earnings.

3. Issues across Quarterly Financial and Non-financial Accounts

Reconciliation between financial and non-financial accounts – the analytical aspect[4]

The interaction between the real and the financial spheres of the economy is essential for understanding a business cycle. This interaction has become increasingly important in step with recent years' rise in households' financial balance sheets and the resulting increased exposure to financial market developments. The build-up of Danish financial balance sheets is to some extent a result of the wide opportunities to finance investment against real and financial assets as collateral.

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[4] This section draws on the article "Financing, Investment and Consumption in Denmark and the Euro Area", Monetary Review, 2nd quarter 2010. The publication is available at www.nationalbanken.dk/DNUK/Publications.nsf/side/Our_publications!OpenDocument. All data is published in "StatBank Denmark" at www.statbank.dk, see "national accounts", "quarterly national accounts (New presentation) – sectors".

Since the beginning of 2010 DN and SD have published integrated quarterly financial and non-financial accounts. This new analytical framework makes it possible to provide a consistent picture of Danish households' incomes, consumption, wealth, savings, investment and borrowing. It also sheds new light on investment by non-financial corporations and the underlying internal and external financing. The consistent national accounts thus provide a better basis for analysing and understanding the business cycle.

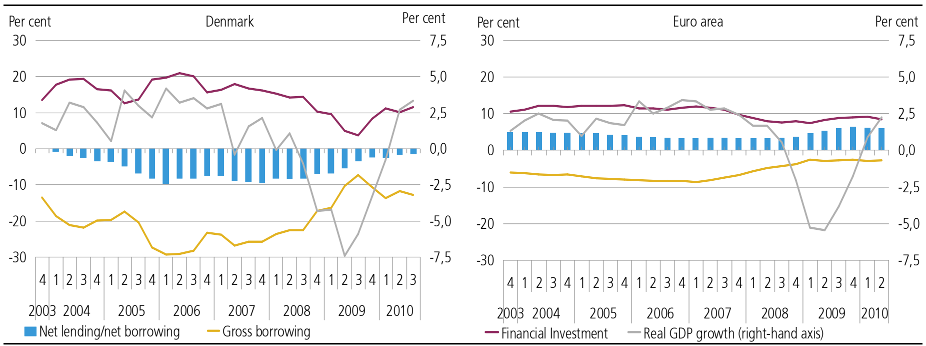
Since 2007 the ECB has also published integrated quarterly national accounts for the euro area. Another ambition is to produce similarly uniform accounts for the individual euro area member states. The new consistency in the Danish quarterly sector accounts thereby supports international comparison. The two examples below show the use of integrated accounts related to the developments in the household and non-financial corporations sectors.

Developments in the household sector

Gross borrowing by households contributes to covering both negative net lending/net borrowing and investment in financial assets e.g. equities and bonds. In 2006-07 when gross borrowing peaked, it totalled about 25-30 per cent of Danish household incomes in each quarter, cf. Chart 2. In the same period, financial investment totalled 15-20 per cent of incomes.

HOUSEHOLDS' NET LENDING/NET BORROWING, FINANCIAL INVESTMENT AND GROSS BORROWING

Chart 2



Note: The series are calculated relative to the adjusted disposable income, cf. Chart 2 and are included as 4-quarter moving averages. Net lending/net borrowing for the euro area is represented by the net lending/net borrowing from the real side of the national accounts. Gross borrowing covers the households' total transactions in financial liabilities. Real GDP growth is calculated as year-on-year growth.

Source: Statistics Denmark, Danmarks Nationalbank, Eurostat and European Central Bank.

The dynamics in households' gross borrowing and financial investment are the same. Following the economic upturn until 2007 and concurrently with the incipient decline in financial wealth, financial investment and borrowing decelerated. This deceleration was reinforced by the financial turmoil.

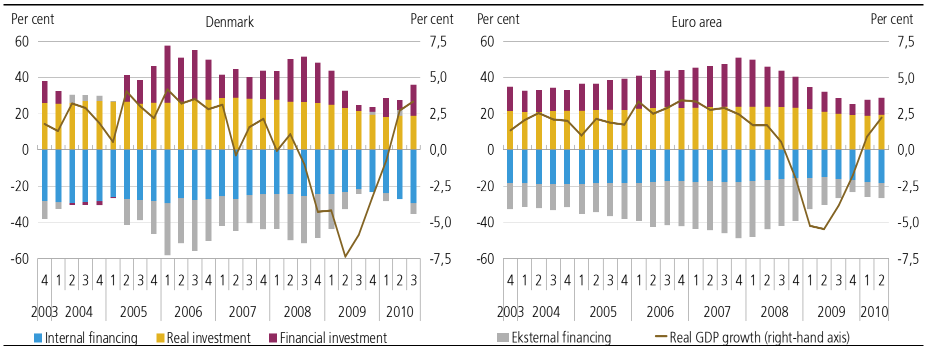
During the last quarter of 2009, as turmoil in the financial markets abated, renewed growth was observed in households' build-up of balance sheets, i.e. in their financial investment and gross borrowing. In 2010, both investment and borrowing has stabilized around respectively 10 and 12 per cent of income. The development since 2008 is implying a sharp decrease in the net borrowing position of Danish households, which has been retained in 2010 in spite of incipient economic recovery.

The dynamics in the build-up of balance sheets in the euro area are comparable to developments in Denmark – albeit much less pronounced.

Developments in the non-financial corporations sector

Total investment by non-financial corporations is dominated by real investment, meaning investment in capital equipment (gross fixed investment) and inventories, cf. Chart 3. However, financial investment, e.g. direct investment in other companies, portfolio investment and increased bank deposits, has played an important role in some periods. Financial and real investment can be financed either via internal financing (gross savings) or via external financing (borrowing, equity issues, etc.).

INVESTMENT AND FINANCING IN THE NON-FINANCIAL CORPORATIONS SECTOR Chart 3



Note: The series are calculated relative to non-financial corporations' gross value added and as 4-quarter moving averages. Real GDP growth is calculated as year-on-year growth.
Source: Statistics Denmark, Danmarks Nationalbank, Eurostat and European Central Bank.

Both in Denmark and in the euro area, financial investment and external financing became increasingly significant from mid-2005 to 2008. However, developments have been more erratic for Denmark due to a relatively stronger impact from a few major M&A transactions.

With the outbreak of the financial crisis the non-financial corporations started to consolidate – the process has continued into 2010.

In the beginning of 2009 the internal financing and real investments declined, while the external financing as well as the financial investments fell markedly. Since the second half of 2009 the corporations seem to have adjusted costs to reflect market conditions, implying a steady increase in internal financing, while the real investments seem to have stabilized at a lower level causing net borrowing to turn into net lending.

In the aftermath of the financial crisis the external financing has remained low – or in the Danish case even negative in some quarters due to repayment of short-term loans.

Reconciliation between financial and non-financial accounts – the quality aspect

Reconciliation between financial and non-financial accounts (regarding net borrowing/net lending by sector) supports improved quality of both sets of accounts – fully comparable to the separate reconciliation processes within each set of accounts.

As a first step, the quarterly financial accounts have been adjusted to meet the non-financial accounts. This does not imply that improved quality is only a matter for the financial accounts, but certain challenges in the financial accounts may be addressed when non-financial accounts are viewed as an extra source of information as the reconciliation;

- complements the current MFI building block by indirectly incorporating profit and loss accounts information from published financial reports
- improves estimates of transactions in unquoted shares, especially between the household sector and the non-financial corporations; where uncertainty about the quality of coverage and investor allocations does not affect the non-financial accounts, except for the related dividend payments
- corrects for different accounting principles regarding the use of transaction versus settlement principle – an issue that does not affect non-financial accounts
- captures other accounts payable and receivable arising from the national accounts accrual principle.

As a second coming step, several other challenges – both financial and non-financial – may benefit from data sources and consistent methodology across the financial/non-financial domains:

- *Property income*: Plausibility checks of interest and dividend payments by sector and the introduction of a whom-to-whom property income matrix – both based on MFI and BoP/IIP whom-to-whom information and securities statistics whom-to-whom and s-b-s information. Currently, this is an integrated part of the non-financial BoP system, and recently this has also been introduced for domestic sectors as a test exercise[5].

[5] In order to improve the estimates we established a project (partly financed by Eurostat) with the aim of producing interest and dividend matrices based on a whom-to-whom relationship.
The interest-flow matrix was subdivided into a number of sub-matrices:
- Interest on deposits in monetary institutions
- Interest on loans from monetary institutions
- Interest flows between monetary institutions
- FISIM flows
- Interest flows on bonds
- Interest flows from deep-discounted bonds
- Other interest flows.

(continues on page 12)

- *Accrual accounting*: More detailed specification of accruals on a whom-to-whom basis to support better quality of the financial instrument "other accounts payable and receivable". Relevant issues include the treatment of wages and taxes in financial reports compared to national accounts principles, accrued versus paid-out dividends and the treatment of taxes on the return on pension funds.
- *The life cycle of (some) companies*: (i) Handling of change of sector and transactions in unquoted shares and other equity for companies moving from sole proprietorships to corporations, (ii) accounting for dividend payments from unquoted corporations, (iii) capturing transactions in unquoted shares and (iv) the treatment of quotations of stocks.
- *Payments related to insurance in general*: Handling across sectors and instruments (insurance technical reserves and where relevant, other equity).
- *Certain pension schemes in the MFI sector*: Handling of pooled deposits in relation to received and paid property income, revaluation of investment assets and consequences for MFI net borrowing/net lending development.
- *Other specific issues concerning non-financial corporations and the household sector*; Quality of whom-to-whom information on current transfers related to General Government and on services provided by other financial intermediaries.

Finally, also the appearance of new concepts has to be considered consistently across financial and non-financial accounts. The most recent example being the consistent treatment of carbon dioxide quotas, currently looked into by various international bodies.

The procedure employed made it possible to utilize information which was not used in the ordinary compilations of interest flows. Further to this the restrictions imposed by the system increased the reliability of the necessary estimates by imposing more firm limits on the value they could take.
All in all the establishment of the interest-flow matrix improved the reliability of the sector breakdown of the interest payments on a quarterly (and annual) basis. In particular we have confidence in the estimates of the net interest payments by each sector. However, the estimates of the gross interest payments in particular for the non-financial corporations are still subject to some uncertainty.
The outcome of the exercise with a matrix for dividends was less successful in improving the reliability of the estimates although some small steps forward were attained. This was particular due to the poor estimates for unquoted shares.