ARTICLES

THE INTERPLAY OF FINANCIAL INTERMEDIARIES AND ITS IMPACT ON MONETARY ANALYSIS

Since the start of Stage III of Economic and Monetary Union, financial intermediation has evolved both in size and complexity. The financial balance sheet of nearly all sectors in the euro area has grown at a faster pace than economic activity, with the largest increases taking place within the financial sector. This points to an environment of intensified financial intermediation in the economy, with implications for the channels through which, and the lead time at which, money growth signals risks to inflation. This article analyses the role and changing patterns of financial intermediation in the euro area, and examines the implications for the conduct of monetary analysis.

1 INTRODUCTION

The monetary policy strategy of the ECB assigns a prominent role to monetary analysis in recognition of the robust relationship between monetary growth and inflation in the medium to long run.[1] Whereas the long-run link between money growth and inflation is well documented across time, policy regimes and regions,[2] the lead time of money to inflation reflects long and variable lags. The variability of this lead time is rooted in the complex interaction between money, the real economy and asset markets, in part based on financial innovation in products, processes and institutions, but also as a result of an increase in global interconnectedness.[3] For instance, the fast innovation process, combined with increased wealth accumulation in an ageing society, has led to an intensification of the process of financial intermediation and a strenghthening of the link between monetary developments and asset prices. This has affected the importance of different channels through which increased money growth can lead to risks to inflation and requires detailed data, as well as a good understanding of changes in the financial structure.

This article describes developments in the financial intermediation environment in the euro area, and illustrates its implications for monetary analysis. Section 2 describes the role, evolution and current state of financial intermediation in the euro area. Section 3 explores the available data to extract information on interlinkages and cross-sector balance sheet exposures between the institutional sectors. Section 4 analyses the effect of an increasingly complex financial environment on the task of extracting signals for inflation from monetary developments. Section 5 concludes.

2 THE EVOLUTION OF FINANCIAL INTERMEDIATION IN THE EURO AREA

This section describes the current state of financial intermediation in the euro area, as well as its evolution since 1999. It looks first at intermediation in a conceptual framework, and then examines the evolution of the balance sheets of the institutional sectors in the euro area.

THE FUNCTIONS OF FINANCIAL INTERMEDIATION

The preferences of agents on how to use their resources vary. Savers have a preference for putting funds aside for future consumption, while borrowers would rather increase their consumption today or invest in projects that will yield higher returns in the future. Typically, savers would like easy access to their savings at any time, while borrowers are likely to prefer long-term funding. Reconciling the different desires of savers and borrowers in terms of maturity and returns is one of the aims of the process of financial intermediation.[4] Financial intermediaries perform several services: (i) *maturity transformation*, which, as described, is perhaps the most obvious; (ii) *transformation of denomination*, whereby, for example, small participations in investment funds allow households to access large-denomination assets; (iii) *monitoring and information processing*,

1 See, for example, Papademos, L. and Stark, J. (eds.), *Enhancing Monetary Analysis*, ECB, Frankfurt am Main, 2010.
2 See, for example, Benati, L., "Long-run evidence on money growth and inflation", *Working Paper Series,* No 1027, ECB, Frankfurt am Main, March 2009.
3 See the article entitled "The supply of money – bank behaviour and the implications for monetary analysis", *Monthly Bulletin*, ECB, Frankfurt am Main, October 2011.
4 See, for example, Freixas, X. and Rochet, J-C., *Microeconomics of Banking*, 2nd edition, MIT press, Cambridge, Massachusetts, 2008, for a number of examples of how financial intermediations can correct market failures.

whereby the financial intermediary acts as a delegated monitor on behalf of savers, as well as performing the costly act of information gathering on behalf of small-scale investors; (iv) *payment services*, as financial intermediaries facilitate the trade and payment of goods and services between agents; (v) *liquidity transformation*, referring, for example, to the transformation of illiquid loans into a more liquid asset-backed security (ABS); (vi) *transaction cost reduction*, as financial intermediaries exploit economies of scale to perform financial transactions at lower marginal prices than small-scale investors.

Beyond this ability to perform the tasks outlined above, which in most cases can be conducted by several types of intermediaries, a clear distinction should be made between monetary and non-monetary financial intermediaries. Monetary financial intermediaries, such as banks, are the only intermediaries capable of creating money and monetary liquidity.[5]

FINANCIAL INTERMEDIATION IN THE EURO AREA

The financial exchange between savers and borrowers in the euro area is channelled either directly via financial markets or indirectly via three broad groups of financial intermediaries, namely monetary financial institutions (MFIs), insurance corporations and pension funds (ICPFs), and non-monetary financial intermediaries other than ICPFs, which are known as other financial intermediaries (OFIs). Box 1 provides a short description of the various financial intermediaries in the euro area.

5 See the article entitled "The supply of money – bank behaviour and the implications for monetary analysis", *Monthly Bulletin*, ECB, Frankfurt am Main, October 2011.

Box 1

FINANCIAL INTERMEDIARIES OPERATING IN THE EURO AREA

The different financial intermediaries present in the euro area all perform one or more of the services described above, depending on their core function. This box provides a short overview of the services provided by the different types of intermediaries, using the European System of Accounts (ESA 95) classification.[1]

MONETARY FINANCIAL INSTITUTIONS (MFIs)

Credit institutions

While credit institutions (or banks) perform most or all of the features described above, the distinctive feature of banks is that they specialise in maturity transformation and providing liquidity at the same time through their capacity to fund long-term loans by receiving short-term deposits. This specialisation implies an inherent instability in banking business. Banks remain able to lend to borrowers only as long as depositors are confident that they will be able to withdraw their deposits at any time. Apart from maturity transformation, banks provide payment services through, for example, cheques, debit and credit cards, and therefore play a crucial role in facilitating the smooth functioning of day-to-day purchases of goods and services. By the end of November 2011 there were 6,230 credit institutions in the euro area.

1 ESA 95 is a statistical standard which provides harmonised classifications of economic sectors within the European Union.

Eurosystem

The Eurosystem comprises the ECB and the national central banks within the euro area. The role of the Eurosystem in financial intermediation is to implement the monetary policy of the euro area, for example by distributing central bank liquidity, conducting foreign exchange operations (transformation of denomination) and promoting the smooth operations of payment systems. Additionally, the ECB has the exclusive right to authorise the issuance of banknotes within the euro area.[2]

Money market funds

Money market funds are funds which raise capital from private and institutional investors by issuing shares and/or units, and invest the proceeds in high quality money market instruments. For example, they change denominations and conduct liquidity management. Money market instruments comprise transferable instruments, such as treasury and local authority bills, certificates of deposit, commercial paper, medium-term notes and bankers' acceptances. These are normally dealt on the money market, rather than on the regulated markets. Money market funds are an important source of short-term funding, and are regarded as monetary financial institutions because the share/units issues are, in terms of liquidity, close substitutes for deposits. By the end of November 2011 there were 1,376 money market funds in the euro area.[3]

In addition to credit institutions, money market funds and the Eurosystem, there are other MFIs in the euro area. At end-November 2011, there were 30 other MFIs in the euro area in total. These included electronic money institutions, which are institutional units that mainly provide a means of storing money for the purpose of making payments.[4]

INSURANCE CORPORATIONS AND PENSION FUNDS (ICPFs)

Insurance corporations grant policy-holders benefits for certain specified circumstances, while (autonomous) pension funds collect, pool and invest funds to provide for the future pension entitlements of beneficiaries.[5] As such, both types of intermediaries' provisions include the service of transformation of denomination to households. ICPFs play a key role in shaping households' asset portfolios, as nearly a third of household financial assets are invested in ICPF liabilities (insurance technical reserves). This share has increased significantly over the past decade (it was less than a quarter in 1999), reflecting demographic trends and the perceived need to create complementary pension schemes. In terms of balance sheets, the ICPF sector is dominated by insurance corporations, which hold about 80% of total ICPF assets.

ICPFs are major investors in financial markets. Being long-term investors, they are generally a source of stability for financial markets. However, the size of their investment portfolios implies that markets may be moved if thier funds are reallocated or their positions unwound, as is the

2 See European Central Bank, *The monetary policy of the ECB*, Frankfurt am Main, 2011.
3 The statistical definition of money market funds has been aligned with the supervisory definition under Regulation ECB/2011/12 of August 2011. The transition period to the new statistical definition of MMFs ends in February 2012.
4 Electronic money institutions classified as MFIs are defined in Regulation ECB/2011/12. Some corporations (e.g. retailers) issue electronic money. As this is not their principal activity, these are outside the financial sector.
5 See the article entitled "Keeping the ECB's monetary and financial statistics fit for use", *Monthly Bulletin*, ECB, Frankfurt am Main, August 2011.

case for other institutional investors, such as investment funds. At end-June 2011 there were an estimated 3,400 insurance corporations and 3,200 autonomous pension funds in the euro area.

NON-MONETARY FINANCIAL INSTITUTIONS OTHER THAN ICPFs (OFIs)

Investment funds

Investment funds raise capital from private and institutional investors by issuing shares and/or units and invest the proceeds in financial and non-financial assets. As financial intermediaries, investment funds perform two main functions: (a) they offer investors the opportunity to invest in a diversified pool of assets with a single purchase of shares/units (transformation of denomination), and (b) their investments provide a source of funding to other sectors, such as MFIs, non-financial corporations and government agencies (maturity transformation).[6] In the second quarter of 2011 there were 48,913 investment funds in the euro area.

Financial vehicle corporations

Financial vehicle corporations[7] (FVCs) are entities that predominantly carry out securitisation activities (see Box 2 for more details). "Securitisation" denotes a transaction or scheme whereby an asset or a pool of cash flow-producing assets, often consisting of loans, is transferred from an originator (usually a credit institution) to an FVC. The FVC effectively converts these assets into marketable securities by issuing debt instruments with both principal and interest serviced with the cash flows produced by the asset pool. As such, securitisation is used by MFIs in order to transform non-liquid assets into liquid assets and, by doing so, free part of their balance sheet and obtain an additional source of funding. In the third quarter of 2011 there were 2,972 FVCs in the euro area.

Central counterparties

A central counterparty (CCP) is an entity that legally interposes itself between counterparties to contracts traded in financial markets, becoming the buyer to every seller and the seller to every buyer. Therefore, CCPs offer the advantage of reducing a great deal of the counterparty risk for trading parties, compared with direct trading. These intermediaries facilitate the trading in derivatives and equity markets, and have become an important actor in the repo market. At the end of November 2011 there were eight CCPs in the euro area.

Other OFIs

Aside from the three types of financial intermediaries described above (investment funds, FVCs and CCPs), the OFI sector includes other types of entities, such as financial holding companies, security and derivative dealers, venture capital and other development companies, and generally any other non-monetary and financial intermediary not classified elsewhere.

Finally, there are payment institutions, whose function is to provide payment services, such as money transmission, without being a monetary institution.

6 See the article entitled "Harmonised ECB statistics on euro area investment funds and their analytical use for monetary policy purposes", *Monthly Bulletin*, ECB, Frankfurt am Main, August 2010.
7 Along with other types of OFIs, these entities are often referred to as the shadow banking industry.

Table 1 Total financial assets outstanding in the euro area and sectoral breakdown

(percentage)

	1999	2007	2008	2009	2010
Households	24.8	21.0	20.2	20.3	20.1
Non-financial corporations	18.9	18.7	17.5	17.8	17.9
Financial corporations	51.9	56.8	58.5	58.1	58.1
- Monetary financial institutions	32.2	36.2	40.6	38.0	37.9
- Credit institutions	29.5	32.6	35.6	33.4	33.3
- Money market funds	-	1.3	1.5	1.4	1.2
- Eurosystem	2.0	2.4	3.5	3.2	3.4
- Insurance corporations	5.7	5.6	5.4	5.7	5.7
- Pension funds	1.4	1.4	1.4	1.4	1.4
- Other financial intermediaries	12.9	15.1	14.0	15.3	16.3
- Investment funds	6.6	5.9	5.2	6.1	6.7
- Financial vehicle corporations	-	-	-	2.6	2.5
General government	4.4	3.5	3.8	3.8	4.0
Total economy	**100**	**100**	**100**	**100**	**100**
Total economy (in EUR billions)	51,326	87,051	85,733	89,491	93,350
Total economy (as a percentage of GDP)	797	963	927	1,001	1,017

Sources: ECB and Eurostat.
Note: As the data are collected from different datasets with varying accounting principles, sub-sectors may add up to more than the total sector."-" indicates that data are not available.
The data are unconsolidated, so include, for example, interbank lending.

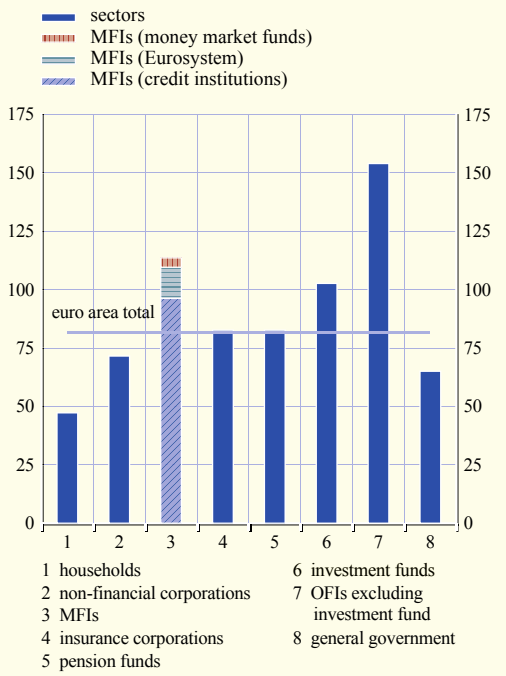
Table 1 shows the breakdown of outstanding financial assets across the various euro area institutional sectors since 1999. Financial corporations accounted for 58% of the total financial assets outstanding at the end of 2010. More than half of this was held by MFIs, with credit institutions holding by far the largest share, while a quarter was held by OFIs and the remainder by ICPFs. Households and non-financial corporations each held around 20% of the total outstanding assets, while general government accounted for only 4%.

The value of total euro area financial assets has almost doubled, compared with 1999. The overall growth in the value of financial assets has outpaced the growth in nominal GDP, as the value of outstanding financial assets relative to GDP has grown from around 800% in 1999 to just over 1,000% in 2010.

The increase in outstanding financial assets has been unequal among sectors, as the financial sector has increased its asset holdings by more than the non-financial sectors. This applies in particular to MFIs and OFIs, the financial holdings of which have more than doubled since 1999 (see Chart 1), which has resulted in an

Chart 1 Increase in financial assets from 1999 to 2010 by sector

(total percentage change)



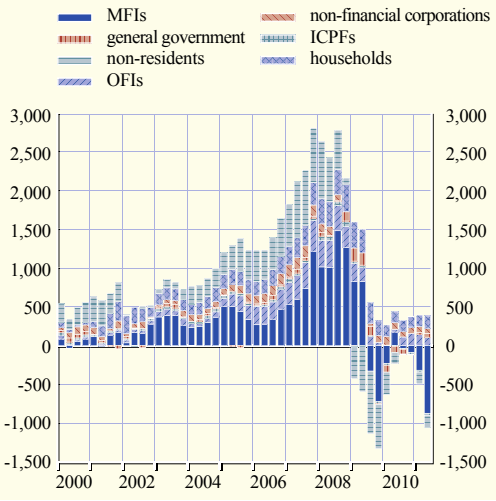
Source: ECB.
Note: Item 3 (MFIs) is broken down into the contributions of the MFI sub-sectors to the total percentage increase in the financial assets of the MFI sector. The horizontal line represents the percentage increase in total financial assets in the euro area.

increase in the share of these two sub-sectors' total value of euro area financial assets. Chart 1 shows that the increase in MFI asset holdings has predominantly been driven by credit institutions. Chart 1 also reveals that investment funds (which include hedge funds) resident in the euro area have not been the main driver of the growth in total OFI asset holdings. Market data show that securitisation activity increased tenfold between 2000 and 2008. This suggests that much of the increase in total OFI holdings can be attributed to FVCs. The increased business between MFIs and CCPs (see Section 4) also points to CCPs as being responsible for part of that increase. Households, as the sector presenting the lowest balance sheet growth, have increased their holdings of financial assets by 47%, resulting in a decreasing share of total financial assets.[6] These developments point to more and more financial interaction taking place within the financial sector itself, without the balance sheets of the non-financial sector being affected.

However, the developments in balance sheets over the years have not been without fluctuations, as illustrated in Chart 2. This depicts four-quarter cumulated transactions in deposits with MFIs. It shows a rapid increase during the years before the financial crisis, and an even more rapid decrease after the crisis. The decrease was particularly strong for deposits held by other MFIs and the external sector (mostly non-resident MFIs), pointing to higher volatility and instability in the interbank lending market, as opposed to deposit funding by the non-financial sector.

Chart 2 Deposits with euro area MFIs by sector

(four-quarter cumulated transactions; EUR billions)



Source: ECB.

3 SECTOR INTERLINKAGES AND BALANCE SHEET EXPOSURES

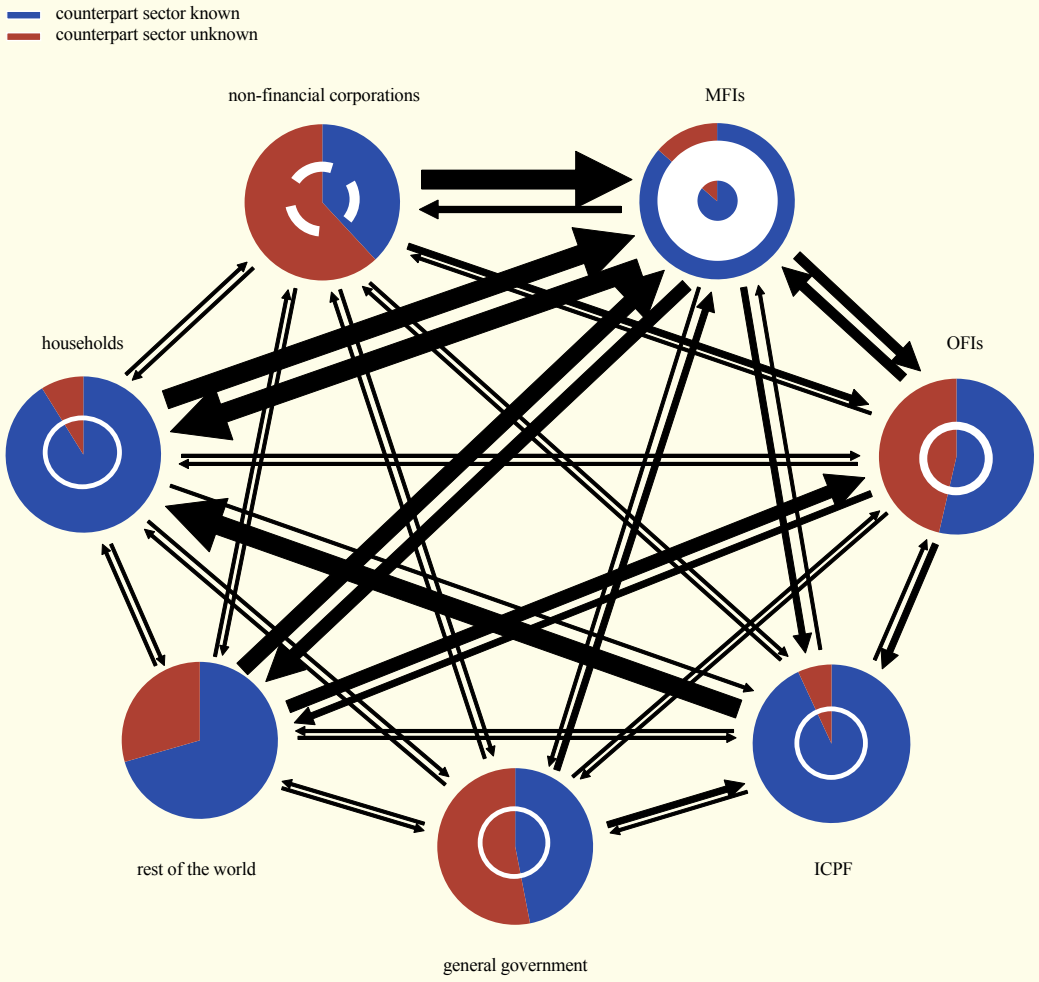
Using information from the euro area accounts, augmented by different sector-specific datasets,[7] an "exposure map" in quantitative terms can show the balance sheet interlinkages between the different sectors in the euro area and the rest of the world. The various interlinkages can only be partially traced, as a complete account of which sector holds the liability of each of the sectors (the so-called "from-whom-to-whom" accounts) is not yet fully available.

Chart 3 depicts such an exposure map. The pie charts for the individual sectors illustrate the extent to which the counterpart of each sector's liabilities can be identified. In the case of non-financial corporations, it is only possible to identify the counterparty sector for 38% of the outstanding liabilities (the blue part of the pie chart). Arrows between sectors represent their cross-sector exposures, and the direction goes from the issuer of the liabilities to the holder. The thickness of each arrow illustrates the size of the exposure. Thus, the arrows between non-financial corporations and MFIs show that MFIs hold a larger amount of the liabilities issued by non-financial corporations than vice versa. The circles within the pie charts for each

6 During this period an important increase in non-financial wealth has occurred, mainly in housing, predominantly affecting households. Non-financial assets are not, however, included in the data discussed.

7 In addition to the euro area accounts, the exposure map relies on the balance sheet item, ICPF, Investment Funds Balance Sheet and FVC statistics, which are all part of the euro area monetary and financial statistics.

Chart 3 Cross-sector balance sheet exposure in the euro area (2010)



Sources: ECB and ECB calculations.
Notes: Arrows pointing from sector A to sector B indicate that sector B holds claims on sector A, i.e. sector A liabilities are held by Sector B. The thickness of the arrows illustrates the magnitude of exposure.
The circle inside each sector pie chart indicates liabilities issued and held by that same sector. The thickness of the circle illustrates the magnitude of intra-sector exposure. For NFCs, the circle is dashed, as the internal liabilities are most likely substantially underestimated. For "rest of the world", there is no circle as, by definition, this is not covered by euro area statistics.

individual sector illustrate the liabilities issued and held by that sector. Like the arrows, the thickness of these inner circles is proportional to the amounts. According to the available data, the amount of liabilities held within the same sector is larger for MFIs than for non-financial corporations. However, as indicated by the share of unknown counterparties (the red area in the pie charts), the amount of liabilities issued and held by non-financial corporations can only be determined with a very low degree of certainty. For this reason, in the particular case of non-financial corporations, the inner circle is dashed. For similar reasons, the pie chart for the rest of the world does not contain an inner circle, given that liabilities issued and held by the rest of the world are not covered by euro area statistics.

Several key points can be derived from the exposure map. First, all sectors are interconnected, although the degree of bilateral connection varies significantly. Second, there is a high degree of heterogeneity in the share of liabilities with a known counterpart

sector. For example, liabilities of households consist almost entirely of loans, typically granted by MFIs or held by OFIs as a consequence of securitisation. The counterpart of loans is well documented in official statistics, which is why the counterpart sector of 91% of liabilities issued by households can be identified. By contrast, about half of the liabilities issued by non-financial corporations are shares and other equity. It is harder to identify the holders of these. All in all, when adding up the liabilities issued in the euro area and those issued elsewhere in the world but held within the euro area, a counterpart sector can be identified for 65% of these liabilities.[8] Both the size of the financial balance sheet of each institutional sector, as illustrated in Section 2, and the interlinkages across sectors have increased considerably since 1999. The balance sheet increase has been especially apparent in the financial sectors, particularly the OFI sector.

Another important message conveyed by the patterns in Chart 3 is that the MFI sector acts as a financial hub, especially (but not exclusively) as regards the non-financial sector. At the same time, the MFI sector is also clearly exposed to the rest of the world. This implies that, while the non-financial sector is highly dependent on a well-functioning MFI sector, it is also exposed to developments abroad through the exposure of MFIs vis-à-vis the rest of the world. Additionally, as the MFI sector itself is as interlinked as documented in Chart 3, stress in one segment of the banking sector can quickly spread to the whole banking system and on to the non-financial sectors.

The pattern of cross-exposures in 1999 was very similar to that of the end of 2010. However, the counterpart to only 48% of liabilities outstanding in 1999 can be identified. The main sources of improvement in counterparty identification have been the enhancement of MFI and investment fund statistics, and the introduction of statistics on ICPFs and FVCs. This has had a positive impact, especially on the identification of holders of OFI liabilities, but also to a lesser extent on the identification of holders of liabilities issued by ICPFs, non-financial corporations and general government. This is also the case for the rest of the world.

Overall, the description of financial intermediation above and the data shown point to an environment in which strong interactions among financial intermediaries have resulted in a lengthening of the financial intermediation chain. The potential implications of this for monetary analysis will be discussed in the next section.

4 THE IMPLICATIONS OF THE INTERPLAY OF FINANCIAL INTERMEDIARIES FOR MONETARY ANALYSIS

The monetary analysis of the ECB is grounded in the well-documented relationship between money growth and inflation: general increases in money balances will eventually induce higher consumption spending which, if not offset by increases in output, will result in inflation.[9] This section analyses how the interactions between the various financial intermediaries – both monetary and non-monetary – affect the variables that are typically used for monetary analysis (mainly money and credit aggregates), and potentially the closeness of the link between such variables and inflation. The analysis is presented in four sub-sections, which discuss the implications of the interaction among financial intermediaries for the measurement of money, the relationship between money and credit (and the process of money creation), and the link between money and consumer price inflation, including the asset price channel.

IMPLICATIONS FOR THE MEASUREMENT OF MONEY

There is a change in the overall amount of money in the economy every time an MFI

8 Identifying the counterpart does not necessarily lead to the holder of the risk being identified. Through derivatives, for example, risks can be transferred to another entity. This does not show up on balance sheets, as the market value of a derivative contract is usually zero or close to zero.

9 See, for instance, Benati, L., "Long-run evidence on money growth and inflation", *Working Paper Series,* No 1027, ECB, Frankfurt am Main, March 2009.

liability comprised in the definition of money is transferred in or out of the money-holding sector. The same occurs if the money-holding sector rearranges its holdings of MFI liabilities from instruments within money to instruments outside money or vice versa.

The amount of money in the economy decreases when, for instance, an investment fund acquires foreign equities from outside the euro area or when an FVC settles its debt with a bank for the previous purchase of a loan. However, it increases when, for example, a credit institution engages in a reverse repo with a CCP. This illustrates that a longer financial intermediation chain tends to increase the short-term volatility of broad money measures. The increased interaction between financial intermediaries not only adds volatility to the evolution of the monetary aggregates, it also increases the need to understand the institutional landscape of financial intermediation and the motivation underlying different transactions. This knowledge helps discern between movements in money that have more direct informational content for the analysis of consumer price trends and those that are of a less fundamental nature from a monetary analysis point of view. For example, a transaction between two banks through a CCP is essentially an inter-MFI transaction, which has an impact on money and credit aggregates only because it is conducted through an entity – the CCP – belonging to the money-holding sector. In conjunction with the overall information on other inter-MFI transactions, the level of inter-MFI business conducted via a CCP nonetheless provides valuable information with regard to inter-MFI funding conditions. Indeed, secured inter-MFI transactions conducted via CCPs have increased markedly since the onset of the financial crisis, as CCPs reduce counterparty risk and have partially offset the decrease observed in direct unsecured interbank business.

A more complex implication of the interactions between MFIs and other financial intermediaries relates to the securitisation technology, whereby an FVC – a non-monetary financial intermediary, and thus part of the money-holding sector – buys MFI loans and issues securities backed by these loans. While true-sale securitisation has an immediate impact on MFI loans, as the loans are no longer on the banks' balance sheet,[10] the impact on money is less straightforward. On the one hand, the purchase of MFI loans by FVCs can eventually result in a decrease in money aggregates.[11] When an FVC buys a pool of loans from an MFI, this is paid for by money collected from the proceeds of the product of the securitisation, typically ABS. If the ABS is bought by an entity within the money-holding sector, this entity may purchase the ABS with money drawn from its deposits with a bank. This would decrease the outstanding monetary liabilities within the MFI sector, thus decreasing money balances. Seen from another perspective, the pool of loans sold to the FVC is funded by the investors in the FVC securities, and no longer funded by MFI monetary liabilities. On the other hand, if the ABS is bought by a non-resident, money balances do not decrease, as the transaction involves an inflow of money from outside the euro area. The same occurs if the ABS is bought by the MFI sector – a process usually referred to as "retained securitisation", which has become the main purpose of securitisation since late 2008. Here, the monetary aggregate does not decrease either, but for a different reason: in this case, the securitisation operation is basically reduced to a mere change in the composition of MFI asset holding. With regard to credit variables, retained securitisation mechanically results in a reduction in the stock of MFI loans (assuming derecognition) offset by an equal increase in MFI holdings of OFI debt securities, with no change in the stock of total MFI credit. Box 2 provides a statistical analysis on the interaction between the euro area MFI and FVC sectors based on a set of statistics which have been available since December 2009.

10 Following the adoption of IAS39 by euro area MFIs, a traditional securitisation transaction may not lead to a one-to-one decrease in the loan holdings if part of it is not derecognised. For more details, see the article entitled "Securitisation in the euro area", *Monthly Bulletin,* ECB, Frankfurt am Main, February 2008.

11 Very short-lived movements in money and credit may occur in order to finance the securitisation operation, for instance if the FVC is granted a bridge loan to finance the process.

Box 2

SECURITISATION AND THE INTERACTION BETWEEN MFIs AND FVCs

Securitisation transactions in the euro area typically involve two types of financial intermediaries: an MFI securitises assets using an FVC. Some securitisation transactions may involve multiple FVCs, which leads to further links in the financial intermediation chain. Total assets of euro area FVCs amounted to €2.2 trillion at the end of the third quarter of 2011, accounting for around 10% of the non-MFI financial sector.

The "originate to distribute" model, whereby MFIs used securitisation to turn long-term illiquid assets (loans) into more liquid assets that could be sold to investors, came to a halt with the financial crisis. During the financial crisis, however, securitisation continued, as MFIs instead retained the securities issued by FVCs for collateral in central bank refinancing operations. In addition, there have been transfers to some "bad bank" vehicles which are part of the FVC sector.

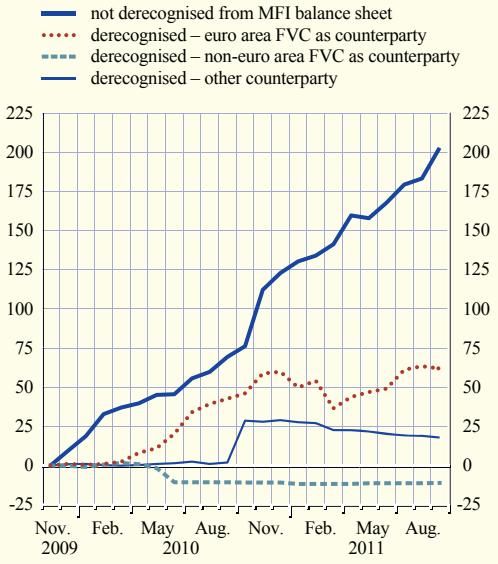
These developments can be monitored using the new harmonised statistics on securitisation by MFIs and FVCs which the ECB has published since June 2011, with time series dating back to December 2009.[1]

Euro area MFIs' use of euro area FVCs in securitisation transactions

Euro area MFIs overwhelmingly use FVCs resident in the euro area for their securitisation transactions. Euro area MFIs carried out loan securitisations or other transfers to a cumulative net amount of €271 billion between December 2009 and September 2011. Of this, €203 billion has remained on the MFIs' balance sheets (see Chart A), almost all of which was securitised through euro area FVCs.[2] The loans transferred which were removed from the MFIs' balance sheets during the period amounted to €69 billion. These loans have mainly been transferred to euro area FVCs, to the amount of €62 billion. Transfers to or from non-euro area FVCs and non-FVCs were limited over the period.

Chart A Cumulative securitisations and other transfers by MFIs from December 2009

(EUR billions)



Source: ECB.

Euro area FVCs' positions vis-à-vis the euro area MFI sector

A large part of the euro area FVC balance sheet relates to the MFI sector. In addition to the

1 See the article entitled "Keeping the ECB's monetary and financial statistics fit for use", *Monthly Bulletin*, ECB, Frankfurt am Main, August 2011, and quarterly press releases, which are available on the ECB's website (http://www.ecb.europa.eu).

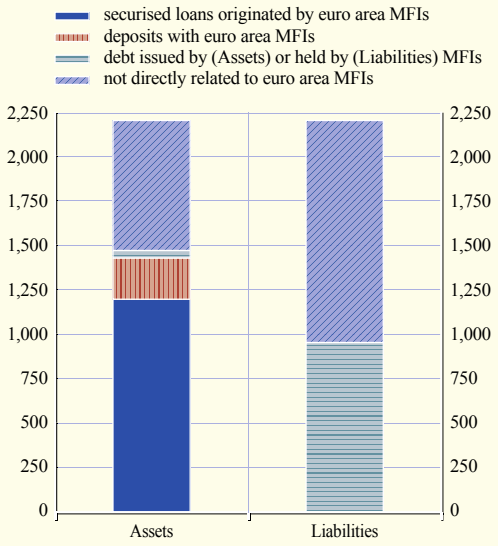
2 Outstanding amounts of loans securitised but not derecognised by euro area MFIs are also available. 95% of these are held by euro area FVCs.

securitised assets, further notable interlinkages between the two sectors arise when FVCs place deposits with MFIs and when debt securities issued by one sector are held by the other. The relationship of the euro area MFI sector with both the assets and the liabilities of euro area FVCs is presented in Chart B.

At the end of the third quarter of 2011, FVCs held €1.5 trillion worth of securitised loans, €1.2 trillion worth of which were originated by euro area MFIs (see Chart B). Two-thirds of these loans had been provided to euro area households – primarily residential mortgages, but also consumer credit, auto loans or student loans – and over a fifth had been provided to euro area non-financial corporations. Approximately half of MFI-originated loans are still recognised on the balance sheet of the originator, amounting to €590 billion in the third quarter of 2011.

Chart B Links to the MFI sector in FVC assets and liabilities in the third quarter of 2011

(EUR billions)



Source: ECB.

FVCs' holdings of debt securities issued by euro area MFIs came to €42 billion, approximately a fifth of the total debt securities held by FVCs. Out of all MFI-issued securities, €9 billion worth were held by FVCs engaged in synthetic securitisations.

On the liabilities side, debt securities issued by FVCs amounted to €1.8 trillion in the third quarter of 2011 – over 80% of FVCs' total liabilities. MFI holdings of euro area FVC securities totalled €953 billion in the same period. This indicates the degree to which MFIs have been relying on retained securitisations in the course of the financial crisis.[3]

3 Note that some of the holdings of FVC securities may relate to secondary market purchases, and may not be the product of a retained securitisation. In these cases, the valuation of the MFI holdings may indeed differ significantly from the nominal amount of principal.

IMPLICATIONS FOR THE PROVISION OF CREDIT

One of the factors determining the amount of MFI credit in the economy is the restrictions faced by MFIs owing to funding constraints. The interplay between MFIs and non-monetary financial intermediaries tends to ease this constraint, facilitating the extension of credit within the economy. Securitisation is an important example in this respect. On the demand side, this technology was encouraged by the growing demand among institutional investors, such as pension funds and insurance corporations, for securitised products prior to the financial crisis. On the supply side, transforming loans into securities is advantageous for banks for a number of reasons. Securitised assets are more liquid and, by pooling the portfolio of assets and using a variety of credit enhancement techniques, they can reach better credit quality than the original assets. Both features facilitate the tradability of banks' loan portfolios. This allows banks to either free up capital (by selling those securities) or increase their wholesale funding (by placing those securities in the repo market). There is evidence that greater access to market-based funding is associated with

an expansion of MFI credit in the euro area.[12] However, a higher level of dependence by banks on other financial intermediaries and wholesale funding in general increases the impact of financial market conditions on banks' ability to obtain funds. In fact, evidence suggests that the impact of supply-side constraints, especially those related to disruptions to banks' access to wholesale funding and their liquidity positions, has intensified since the onset of the financial crisis.[13] As explained in Box 2, the technology of securitising loans has recently been almost exclusively driven by purchases of ABS by the same originating MFI, with the intention of generating collateral that is eligible for central bank liquidity-providing operations.

IMPLICATIONS FOR THE LINK BETWEEN MONEY GROWTH AND INFLATION

While there is a long-run relationship between money growth and inflation, this is not necessarily one to one. One of the main reasons is that money is not only held for the purpose of transactions in the goods and services markets, but also as a store of value. Not all sectors in the economy make use of these two functions of money to the same extent. Households and non-financial corporations are more likely to hold money for consumption and/or investment purposes than non-monetary financial intermediaries (both OFIs and ICPFs), which predominantly hold money for portfolio considerations, to settle financial transactions and to keep reserves for potential early redemptions of liabilities. A lengthening of the financial intermediation chain typically implies more non-monetary financial intermediaries in the economy and therefore that more money is held by these intermediaries. This tends to result in a decrease in the overall share of money growth that is motivated by consumption or real investment transactions.

Monetary transactions performed by financial intermediaries are generally motivated by portfolio considerations. These institutions manage their portfolios more actively than households. As a result, the money holdings of these intermediaries present much higher income elasticity than those of households, and they tend to react much faster and more aggressively to movements in market interest rates.[14] This should naturally result in higher growth in the money holdings of these intermediaries in periods when the levels of earnings and activity in the financial markets are high.

Charts 4 and 5 illustrate these features. Chart 4 shows that the growth in M3 deposits held by ICPFs and OFIs display a much higher level of volatility than the growth in M3 deposits held by both households and non-financial corporations. Chart 5 shows that the low-frequency component of annual growth in households' money holdings is more closely related to the evolution of consumer price inflation than that of OFIs. The money holdings the latter are generally higher in periods in which financial markets are more bullish, such as in the run-up to the financial crisis or in the period of the build-up of the dot.com bubble. This feature becomes clear when comparing stock prices and the trends in M3 deposit holdings by OFIs, as in Chart 5. The Eurostoxx 50 index and the OFI money holding trends move broadly in line with a lead of longer-term movements of OFI money holdings in the period from 1994 to 2011. This supports the view that OFI money holdings are more directly linked to asset prices than to consumer prices.

Developments in sectoral money holdings therefore provide helpful insights into whether changes in overall M3 growth reflect changes in the underlying rate of monetary expansion, as well as into the channels through which the link between money growth and consumer price inflation operates. This helps to better understand potential risks to price stability and possible lead times of money growth to inflation.[15] Overall,

12 See Gambacorta, L. and Marqués-Ibáñez D., "The bank lending channel: lessons from the crisis", *Economic Policy*, Vol. 26, No 66, pp. 137-182, 2011.

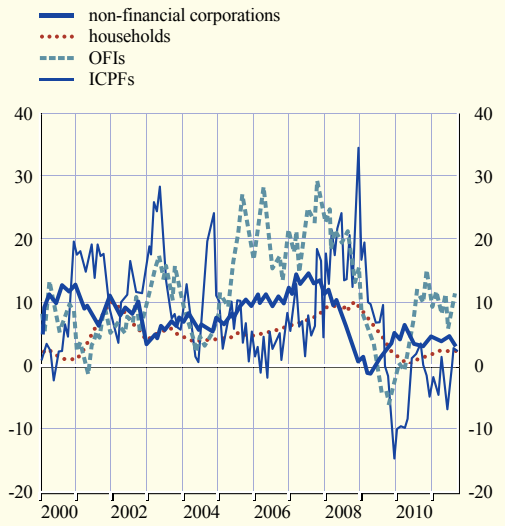
13 See the article entitled "The supply of money – bank behaviour and the implications for monetary analysis", *Monthly Bulletin*, ECB, Frankfurt am Main, October 2011.

14 See Papademos, L. and Stark, J. (eds.), *Enhancing Monetary Analysis*, ECB, Frankfurt am Main, 2010, pp. 148-149.

15 See also the box entitled "Sectoral money holdings and the information content of money with respect to inflation", *Monthly Bulletin*, ECB, Frankfurt am Main, September 2006.

Chart 4 M3-deposits in the euro area by sector

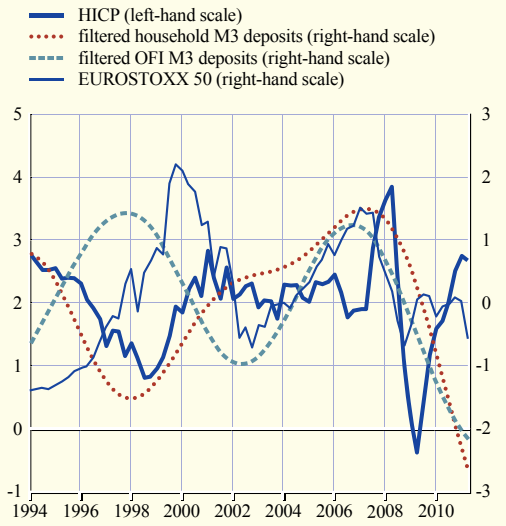
(annual percentage change)



Source: ECB.

Chart 5 Trends in sectoral M3, inflation and stock prices in the euro area

(annual percentage change; standardised annual percentage changes)



Source: ECB.
Note: The filtered household and OFI M3 series represent the low-frequency component derived using a Christiano-Fitzgerald asymmetric bandpass filter, with cycles longer than seven years considered as trend developments.

more developed financial markets may result in a clearer division between money held for consumption/transaction purposes and money held for portfolio and wealth reasons. Although they act via different channels, both play their part in signalling risks to price stability.

IMPLICATIONS FOR INFLATION AND MONETARY VARIABLES VIA THE IMPACT ON ASSET PRICES

While the increased relative presence of financial intermediaries in the economy is likely to have weakened the most immediate channel linking money growth and consumer price inflation, it is also likely to have reinforced the asset price channel. The empirical link between monetary variables and asset prices has been documented in a number of studies that have shown that money and credit growth can affect asset prices, particularly house prices, significantly.[16] The literature tends to identify the extra demand for assets derived from leveraged investment, together with increases in risk appetite,[17] as key factors explaining increases in asset prices at the aggregate level.[18] Furthermore, it is argued that this mechanism is strengthened by the active management of leverage by some financial intermediaries, adding to the increasing asset prices by boosting demand for financial assets financed by additional debt incurrence.[19] As depicted in Chart 5, there are close co-movements in asset prices and OFI money

16 See, for example, Goodhart, C. and Hofmann, B., "House prices, money, credit and the macroeconomy", *Oxford Review of Economic Policy*, Vol. 24, No 1, pp. 180-205, Oxford, 2008; and Adalid, R. and Detken, C., "Liquidity shocks and asset price boom-bust cycles", *Working Paper Series*, No 732, ECB, Frankfurt am Main, February 2007.

17 The increased risk appetite is associated with a search for yield and an increase in asset prices, as described in the literature on the "risk-taking channel". See, for instance, Adrian, T., Emmanuel, M. and Shin, H.S., "Macro Risk Premium and Intermediary Balance Sheet Quantities", *IMF Economic Review,* Vol. 58, No 1, pp. 179-207, September 2010; and Jimenez, G., Ongena, S., Peydro-Alcalde, J.L. and Saurina, J., "Hazardous times for monetary policy: what do twenty-three million bank loans say about the effects of monetary policy on credit risk?", *Discussion Paper*, No 6514, Centre for Economic Policy Research, 2007.

18 See, for example, Adrian, T. and Shin, H.S., "Liquidity and leverage", *Journal of Financial Intermediation*, Vol. 19, No 3, 2010, pp.418-437.

19 See also the article entitled "The financial crisis in the light of the euro area accounts: a flow-of-funds perspective", *Monthly Bulletin*, ECB, Frankfurt am Main, October 2011.

holdings with a lead of OFI money holdings for longer-term movements. This suggests that the increased size of the OFI sector in recent years is likely to have strengthened the link between money and asset prices, thereby reflecting the increased importance of the asset price channel for the real economy and inflation.

Changing financial intermediation patterns and financial innovation may also change the relative prices for assets along with the general price level, as well as credit developments related to this. For instance, to the extent that loans for house purchase are considered as being more suitable for the securitisation process, banks may feel encouraged to increase their supply of this type of loan, facilitating a generalised increase in real estate prices. Furthermore, if the credit risk is removed from their balance sheets through securitisation, banks may lower credit standards and monitoring efforts, possibly resulting in higher loan-to-value ratios, putting further upward pressure on real estate prices.

Additionally, the investment behaviour of ICPFs has the potential to affect long-term interest rates and pricing in the secondary market, as they are strong investors in both government and corporate long-term debt securities. This in turn has the potential to affect the yield curve and therefore money growth, as agents may move funds to liquid instruments given that low long-term interest rates imply a lower opportunity cost of holding monetary instruments. It may also affect the demand for credit from non-financial corporations. This is because lower market interest rates induce corporations to obtain funds in the markets rather than via banks. In addition, it may affect the demand for credit from households, as lower interest rates may increase the demand for loans for house purchase.

Developments in asset prices may, in turn, have several implications for monetary variables, consumer prices and macroeconomic stability. They may affect money demand as part of the broader portfolio allocation decision,[20] namely via wealth effects, with the consequent risks for consumer price inflation. They may also affect credit developments: on the supply side, higher asset prices imply higher value for potential collateral for loans; on the demand side, increases in real estate prices tend to increase the demand for loans for house purchase, with the consequent increase in the overall money balances of the economy associated with an expansion in MFI credit. Finally, asset prices may also have an impact on investment and consumption via confidence effects. For example, a rise in stock prices may signal a positive outlook for future economic activity and employment, which may boost consumer confidence and actual consumption with subsequent price pressures. Conversely, an asset price bust may trigger financial instability, inducing a sharp decrease in confidence. While such a development initially poses deflationary risks, it tends to induce an accommodative policy response, which will eventually result in higher monetary balances and the consequent inflationary pressures in the period ahead.

5 CONCLUSIONS

Over the past decade both the size and complexity of the financial system have increased significantly. Not only has the value of the total amount of financial assets increased relative to GDP, the share attributable to the financial sector has also increased. It is also clear from the evidence presented in this article that all sectors are interlinked to various degrees, making every sector vulnerable to stress in other sectors, in particular the MFI sector, which plays an important role as a financial hub vis-à-vis all the other sectors in the euro area and the rest of the world. The foremost role of financial intermediaries is to channel funds between lenders and borrowers in the non-financial sector. At the same time, the MFI sector, including commercial banks and the central bank, play a special role as deposit-taking and deposit-creating institutions with the

20 See Papademos, L. and Stark, J. (eds.), *Enhancing Monetary Analysis*, ECB, Frankfurt am Main, 2010, pp.164-180.

unique capacity to grant loans and create money at the same time. As more and more financial activity takes place among financial institutions themselves, there is a tendency for the financial system to disconnect itself from its original role of providing stable funding and diversification of risk in support of the real economy, and instead to amplify and concentrate risks emanating from the financial sector itself.

The increasing size and complexity of the financial sectors and their increased impact on economic variables and inflation is well captured by a detailed monetary analysis looking at the various transmission channels that different sectoral behaviour might imply for risks to inflation. In particular, as financial market activity increases, this has implications for developments in asset prices, which can, in turn, affect inflation in the longer term.