

The shadow banking system in the euro area: overview and monetary policy implications

From an economic perspective, one of the financial system's key tasks is to provide the non-financial sector with suitable options for financing and for acquiring financial assets. This intermediary role is increasingly also being performed by what is known as the shadow banking system, ie by financial enterprises that operate outside the regular commercial banking system. This includes entities such as special purpose vehicles and funds (money market, investment and hedge funds). In addition, specific activities (including securitisation and securities financing transactions) are also part of the shadow banking system.

The increased importance of shadow banking entities is often analysed from a financial stability perspective. However, it is also relevant from a monetary policy standpoint, because it touches on the realm of monetary analysis on the one hand and because it can impact on the effectiveness of monetary policy measures on the other. For instance, the provision of bank-like services by shadow banking entities or greater interaction between shadow banks and commercial banks may imply an incomplete or distorted representation of the money and credit supply, which is relevant for assessing economic activity and developments in goods prices. So far, the Eurosystem's monetary analysis has addressed the risk that increased shadow banking activity could reduce the information content of monetary indicators by incorporating selected shadow banking entities (money market funds) into the calculation of monetary aggregates and by adjusting these aggregates for certain transactions (eg securitisation). These corrections – in combination with a more detailed analysis of sectoral shifts in money holdings – currently ensure that the data on monetary aggregates are sufficiently meaningful.

Given the financial sector's central role in the transmission of monetary policy, the increased importance of shadow banks could, in principle, also change the way in which monetary policy works. As the corresponding research for the euro area is still in its infancy – which is probably due in part to the still insufficient statistical coverage of the shadow banking system – consideration can only be given to a number of conceptual issues. The increase in shadow banking activity is likely to broaden the non-financial sector's range of financing and investment options, which, per se, tends to weaken the transmission of monetary policy measures via commercial banks. Yet by the same token, increased shadow banking activity also implies that market-based variables, in particular asset prices, play a more central role in the monetary policy transmission process, which, taken in isolation, increases the effectiveness of monetary policy measures. Overall, then, it is not necessarily a foregone conclusion that the increased importance of shadow banks weakens the effectiveness of monetary policy; it does, however, change the relative importance of individual transmission channels.

Monetary policy in a changing financial environment

Growing ties between commercial banks and other financial enterprises ...

Financial systems have always been in a state of flux. Increasing securitisation activity and a move towards shorter-term and more market-based financing were observable in the run-up to the global financial and economic crisis. More and more of commercial banks' activities were carried out in conjunction with other financial enterprises. This had the effect that the provision of finance to the real economy, which is of particular interest from an economic point of view, increasingly involved a host of entities and financial activities that operated outside the regular commercial banking system, in what is known as the shadow banking system.¹

... with far-reaching implications for financial stability ...

The outbreak of the financial and economic crisis clearly illustrated that these developments have implications for financial stability. For example, the ties between shadow and commercial banks heighten the risk of contagion. Moreover, the shadow banking system appears to act procyclically, which might contribute to amplifying financial and economic cycles. Against this backdrop, regulators have directed more of their attention to monitoring and regulating shadow banks. At present, these two aspects are being pushed ahead as part of a coordinated international effort between the Financial Stability Board and the European Systemic Risk Board and implemented at the European level by the European Commission.²

... and potentially for monetary policy

However, the shadow banking system's growing importance also has implications for monetary policy as it affects the information content of monetary policy indicators and can impact on the effectiveness of monetary policy measures. Against this backdrop, this article first offers an overview of the shadow banking system before outlining the statistical and analytical challenges associated with this development. Of notable importance from a monetary policy perspective is the extent to which the shadow banking system touches on the realm

of monetary analysis and how it could impact on monetary policy transmission.

The shadow banking system – features and importance for the euro area

The shadow banking system in the flow of funds

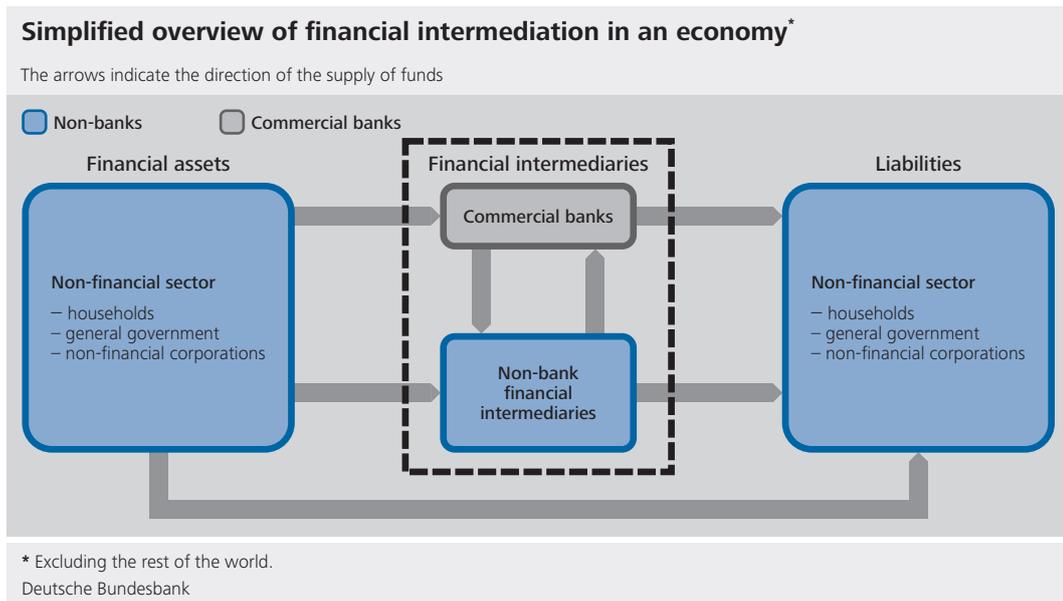
The macroeconomic flow of funds shows to what extent and in what form which sectors in an economy provide (acquisition of financial assets) and draw (financing) financial resources. The non-financial sector – above all non-financial enterprises and households – is of particular interest in this context as it is the ultimate aim of the financial system as a whole, from an economic perspective, to provide this sector, via financial intermediation, with suitable options for financing on the one hand and for the acquisition of financial assets on the other (see the chart on page 17). As part of the financial intermediation process, the financial system transforms maturities, liquidity, credit risk and lot size in the provision of debt financing, which is known as credit intermediation.³ The objective of this transformation process is, first, to offer, as far as possible, callable, liquid, low-risk and small-scale investment options to suit investors' preferences and, second, to provide the non-financial sector with a sufficiently

Acquisition of financial assets and financing in the non-financial sector

¹ A glance into the economic history books shows that the shadow banking system is not a new phenomenon. Over time, intermediation segments have regularly emerged and been taken over by non-bank financial intermediaries, with new financial products also being used to expand lending business. See R S Thorn (1958), Nonbank Financial Intermediaries, Credit Expansion and Monetary Policy, IMF Staff Papers, 6, pp 396-383.

² See Financial Stability Board (2011), Shadow Banking: Strengthening Oversight and Regulation; and European Commission (2013), Shadow Banking – Addressing New Sources of Risk in the Financial Sector, Communication from the Commission to the Council and the European Parliament; as well as Deutsche Bundesbank, The shadow banking system: small in Germany, but globally connected, Financial Stability Review 2012, pp 67-78.

³ See Financial Stability Board (2011), Shadow Banking: Scoping the Issues; and Z Poszar, T Adrian, A Ashcraft and H Boesky (2013), Shadow Banking, Economic Policy Review, Federal Reserve Bank of New York, 19(2).



high volume of low-liquidity, risk-bearing funding with the longest possible maturity.

Shadow banks are fundamentally different from commercial banks in several respects. Unlike commercial banks, shadow banks are unable to create deposit money, nor do they have direct access to central bank liquidity. Hence, they are generally more exposed to the threat of short-term liquidity fluctuations. On top of this, shadow banks' liabilities do not enjoy the same level of government protection as commercial banks' deposits. Lastly, the regulation of shadow banks is a great deal less extensive, broadly speaking, compared with that of commercial banks, even though country-specific and supranational requirements are already in place and being constantly refined for isolated shadow banking entities and activities.

... with different features

Commercial banks traditionally credit intermediaries

Traditionally, this role is played by commercial banks, in particular by providing mostly long-term loans to the non-financial sector and by creating liquid sight deposits. Commercial banks are ideally suited to performing this role seeing that their ability to create deposit money gives them a high degree of flexibility. The acceptance of deposit money is substantially supported by the deposit guarantee scheme, regulatory requirements and commercial banks' access to central bank liquidity, the latter also being the point at which commercial banks are addressed by monetary policy instruments.

Credit intermediation also via the shadow banking system ...

Besides commercial banks, what are known as non-bank financial intermediaries, too, act as financial intermediaries when it comes to providing financing and the acquisition of financial assets as part of the financial intermediation process. The shadow banking system forms part of this sector and essentially comprises all entities and activities involved in credit intermediation outside the regular commercial banking system.⁴ These include, for instance, certain activities of special purpose vehicles, funds (money market, investment and hedge funds), securities traders, financing vehicles and insurers (see the box on page 18).

In order to perform the transformation desired by the non-financial sector despite the differences to the commercial banking sector, transactions carried out by shadow banking system entities exhibit a range of special features.

Transactions by the shadow banking system tend to be more ...

- Both the financial assets and the financing instruments of these intermediaries are more

... market-based, ...

⁴ This definition was agreed by the members of the Financial Stability Board. See Financial Stability Board (2011), Shadow Banking: Scoping the Issues. For example, pure equity-based funds or venture capital companies, which do not make use of credit instruments in the financing process, do not fall under this definition.

Selected shadow banking system entities and activities

The shadow banking system comprises all entities and activities that are involved in credit intermediation outside the regular commercial banking system. This box briefly describes some typical examples.¹

Financing vehicles

Financing vehicles specialise in real estate, consumer and investment loans (eg in the form of automotive banks). These specialised credit institutions also carry out leasing and factoring business. However, unlike commercial banks, financing vehicles do not conduct deposit business – they fund themselves primarily via the capital market or through commercial banks.

Special-purpose vehicles

Special-purpose vehicles (SPVs) generally provide structured finance that is tailored to specific economic and legal circumstances.² They mainly comprise financial vehicle corporations (special investment vehicles, ABCP conduits), which buy receivables (including loans) from commercial banks or financing vehicles and bundle them in a portfolio. These receivables act as collateral for the debt securities with differing maturities that these institutions issue to fund themselves.³

Investment funds

Investment funds raise capital by issuing mutual fund shares and invest this capital in assets.

- Fund shares issued by money market funds are typically viewed by investors as an alternative to traditional bank deposits, as the perception is that they can be liquidated at any time with little risk of loss. Money market funds invest the funds they receive in short-term and secured financial transactions with other institutional investors and commercial banks.
- Other investment funds are involved in credit intermediation, for instance,

through the purchase of securitised assets. In some euro-area countries, they are also authorised to lend directly to households and enterprises.

- Hedge funds invest, *inter alia*, in structured products, if necessary using extensive leverage, which allows them to generate comparatively high yields, but also involves large risks. They are also active, amongst other things, in the market for credit default swaps (CDSs).

Insurance corporations and pension funds

Insurance corporations and pension funds (ICPF) also invest the funds they receive in the form of their customers' premium payments in structured financial instruments, but are subject to regulatory constraints. Insurance corporations may offer direct loans and are involved in the transfer of liquidity (eg via liquidity swap agreements with other financial intermediaries) and credit risk (eg in the form of mortgage insurance). In addition, insurance corporations – like pension funds, investment funds, securities traders and other institutional investors – carry out secured refinancing operations (repo transactions and securities lending).⁴

¹ See Financial Stability Board (2011), *Shadow Banking: Scoping the Issues*. The explanations here are highly simplified and abridged. For a detailed representation of the individual entities and activities in the shadow banking system, see Z Poszar, T Adrian, A Ashcraft and H Boesky (2013), *Economic Policy Review of the Federal Reserve Bank of New York*, 19(2), pp 1-16.

² An SPV is established between creditor and debtor in order to provide legal protection to the debtor from liability to the creditor in the event of payment difficulties. SPVs' activities include securitisations as well as, for instance, large project financing and acquisition financing.

³ See European Central Bank, *Securitisation in the euro area*, Monthly Bulletin, February 2008, pp 81-94.

⁴ See Deutsche Bundesbank, *The financial system in transition: the new importance of repo markets*, Monthly Report, December 2013, pp 57-71.

market-based.⁵ This facilitates maturity and liquidity transformation as these entities invest in long-term and low-liquidity, credit-based assets on the one hand and are nevertheless able to offer forms of investment which are tradable and thus easier to convert into cash and available at short notice, on the other hand.

The financial accounts can be used as a first step towards statistically approximating the shadow banking system. These accounts allow financial intermediaries to be broken down into commercial banks and non-bank financial intermediaries. The latter can again be divided into insurance corporations and pension funds (ICPFs) and into what are known as other financial intermediaries (OFIs).⁶

Statistical approximation through financial accounts ...

... fund-based ...

- Their financing instruments are more fund-based. Issuing fund shares enables them to offer large-scale loans, while also meeting small-scale investor's requirements.

With the aid of additional statistical data, it is possible to distinguish between financial vehicle corporations, money market funds and what are known as other investment funds (ie investment funds other than money market funds) within the group of OFIs. There are no statistics allowing a similar presentation of the remaining OFIs (ie other miscellaneous intermediaries).⁷ These entities are recorded in the financial accounts, but only as an aggregate and include financing vehicles (providers of consumer credit and loans for house purchase), financial leasing institutions, venture capital companies and securities traders.

... and through incorporating additional statistics

... and secured

- Finally, transactions are secured to a larger extent. This allows shadow banks to transform and separate credit risk, as does the increased use of derivative instruments.

Long intermediation chains ...

On balance, this tends to lead to long intermediation chains because the transformation process is spread over a range of activities and entities specialising in individual aspects of transformation.

... and close ties between shadow and commercial banking system

Moreover, the shadow banking system has close ties with the commercial banking sector. For example, commercial banks purchase debt securities issued by special purpose entities, extend credit lines to entities in the shadow banking system or are connected to shadow banking entities, in particular money market funds and other institutional investors, through their own refinancing activities.

While it is true that this broad approach captures all financial intermediaries that are engaged in principle in shadow banking activities, it does tend to overstate the shadow banking system given that it also includes financial intermediaries and activities which are primarily engaged in credit intermediation only sporadically or not at all. This applies, among others, to pure equity-based funds⁸ or equity traders. Insurance corporations and pension funds, too, are involved only partly in credit intermediation

Broad approach tends to overstate the shadow banking system

Statistical coverage of the shadow banking system in the euro area

Heterogeneity of the shadow banking system complicates statistical coverage

The highly heterogeneous nature of shadow banking entities, activities and instruments makes it difficult to capture them for statistical purposes. Unlike in the commercial banking sector with its very good statistical coverage, there are no clearly defined, consistent statistics for the shadow banking system in the euro area as a whole that fully cover all its entities and activities.

⁵ Hence, the shadow banking system can alternatively also be referred to as a system of market-based financial intermediation, as the entities involved fund their operations primarily through money and capital-market-based instruments. See T Adrian and H S Shin (2009), Money, Liquidity, and Monetary Policy, American Economic Review: Papers & Proceedings, 99, 2, pp 600-605.

⁶ In this section, the OFI sector also comprises money market funds.

⁷ See also European Central Bank, Enhancing the monitoring of shadow banking, Monthly Bulletin, February 2013, pp 90-99.

⁸ However, as long as pure equity-based funds are involved in securities financing transactions, they remain a part of credit intermediation in the shadow banking system.

Development of total assets of financial intermediaries in the euro area*

Item	1999 Q4		2007 Q4		2013 Q3	
	€ trillion	% total ¹	€ trillion	% total ¹	€ trillion	% total ¹
Commercial banks	15.0	58.1	27.0	56.4	27.5	50.9
Non-bank financial intermediaries	10.9	41.9	20.9	43.6	26.5	49.1
Other financial intermediaries (OFIs)	7.2	27.9	14.7	30.7	18.8	34.9
Money market funds	0.3	1.3	1.1	2.4	0.8	1.6
Investment funds other than money market funds	2.8	10.9	5.1	10.7	7.8	14.4
Financial vehicle corporations	–	–	–	–	2.0	3.6
Other miscellaneous intermediaries	4.1	15.7	8.5	17.7	8.3	15.3
Insurance corporations and pension funds	3.6	14.1	6.2	12.9	7.6	14.2
Total	25.9	100.0	47.9	100.0	53.9	100.0

Source: ECB. * Assets include deposits, loans, debt securities, equity, claims on insurance corporations and pension funds and other accounts receivable. Commercial banks' assets are calculated as assets of the MFI sector based on the financial accounts, less Eurosystem assets and money market fund shares issued by MFIs. Other financial intermediaries' assets correspond to the assets of other financial intermediaries based on the financial accounts, plus money market fund shares issued by MFIs. Data on investment funds other than money market funds refer to all investment funds other than money market funds. Data on financial vehicle corporations are only available from the fourth quarter of 2009. Other miscellaneous intermediaries' assets are calculated as a residual. ¹ As a percentage of financial intermediaries' aggregate financial assets.

Deutsche Bundesbank

and the associated transformation owing to their exposure to shares and the structure of their liabilities in the form of low-liquidity and long-term claims on insurance corporations and pension funds.

The increased importance of the shadow banking system

Importance of non-bank financial intermediaries has increased on the whole

Given that such a functional focus on credit intermediation is statistically impracticable, the shadow banking system is approximated in the following using a broad approach based on the sector of non-bank financial intermediaries.⁹ The importance of this sector in the process of financial intermediation for the non-financial sector has increased perceptibly over the past years. The share of non-bank financial intermediaries in the aggregate total assets of the entire euro-area financial sector increased significantly between 1999 and 2013. This increase was driven by the build-up of financial assets in the OFI sector. This in turn is primarily attributable to investment funds other than money market funds and to other miscellaneous intermediaries, which cannot be identified separately. Whereas the importance of non-bank financial intermediaries increased, the significance of the commercial banking sector diminished, in particular following the onset of

the crisis. The necessary balance sheet repair in the commercial banking sector is likely to have been a contributing factor in this regard.

From an economic perspective, the liabilities and claims of non-bank financial intermediaries vis-à-vis the non-financial private sector (ie non-financial corporations and households) are of particular interest in this context. However, the aggregate statistics currently available for the euro area unfortunately do not paint a complete picture of these creditor-debtor (who-to-whom) relationships. There are notably gaps in the securities data – financial accounts data only include the securities portfolio of non-bank financial intermediaries as a whole. Thus far, it has not been possible to separately present the relationships with the non-financial private sector or the holdings of securities issued by commercial banks.

Ties with non-financial private sector of particular interest ...

⁹ In its attempt to monitor the shadow banking system, the Financial Stability Board, too, initially uses a broad measure to capture credit intermediation outside the commercial banking sector. Owing to the fact that the approach is not focused on monetary policy but on financial stability, the financial assets of the OFI sector are considered. Subsequently, the focus shifts to those entities and activities that could represent a systemic risk to the financial system or that ought to be examined more closely against the background of regulatory arbitrage. See Financial Stability Board (2011), Shadow Banking: Strengthening Oversight and Regulation; and Financial Stability Board, Global Shadow Banking Monitoring Report 2013.

International comparison of financial system structures – selected country results

A comparison of the financial systems in the United States and the euro area on the basis of financial intermediaries' financial assets illustrates that the relative importance of non-bank financial intermediaries is lower in the euro area than in the United States. Whereas in the United States other financial intermediaries (OFIs, including money market funds) have, since 1999, consistently accounted for well over 40% of these assets and commercial banks for around 20%, the euro area's commercial banks have managed well over 50% of assets in some cases.

However, it should be noted that the separation of banking activities in the United States means that the OFI sector is larger owing to the legal situation alone. Under the universal banking system in the euro area by contrast, many entities whose activities can in part be attributed to the shadow banking system are not counted as OFIs but as commercial banks.

In the United States, growth in financial intermediaries' total assets was mainly driven by OFIs in the run-up to the crisis.

Their importance has since waned, however. In the euro area, by contrast, OFIs only started noticeably gaining importance relative to commercial banks once the crisis had reached its peak. Overall, commercial banks in the euro area nevertheless contributed far more to the growth in financial intermediaries than in the United States. The financial assets of insurance corporations and pension funds exhibited largely steady growth in both regions throughout the period under review.

Developments in total assets of financial intermediaries

As a percentage of GDP

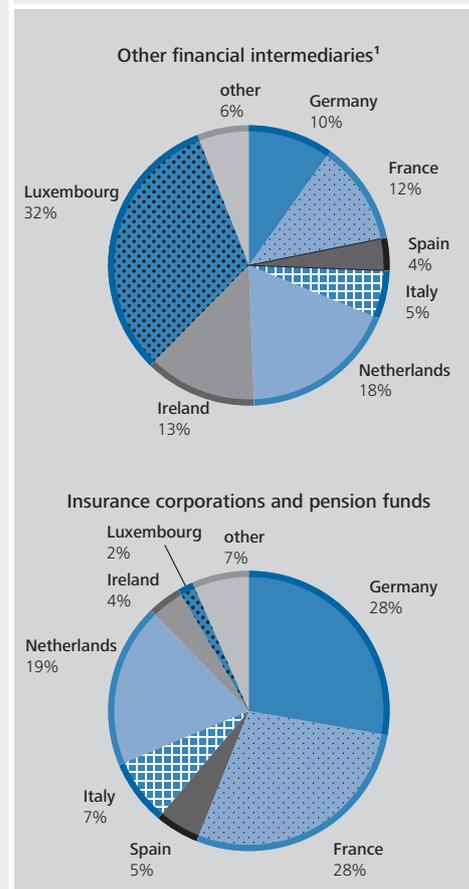
Area/country	1999	2007	2013 ¹
Euro area			
Financial intermediaries	401	530	565
Commercial banks	233	299	288
Other financial intermediaries ²	112	163	197
Insurance corporations and pension funds	56	68	80
United States			
Financial intermediaries	343	423	423
Commercial banks	70	87	91
Other financial intermediaries ²	151	207	195
Insurance corporations and pension funds	123	129	137

Source: ECB and Federal Reserve Board. ¹ As at the end of the third quarter of 2013. ² Other financial intermediaries including money market funds. For details on the calculations, see notes on the table on p 20.

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Percentage of total assets managed by other financial intermediaries and insurance corporations and pension funds in the euro area, by country

As at 2013 Q3



Source: ECB. ¹ Including money market funds.
 Deutsche Bundesbank

However, the data on the euro area as a whole masks an at times very uneven distribution of the assets under management across the individual member states. This is because the tax system in particular offers some countries considerable advantages as a financial location, which are in turn reinforced by the resulting economies of scale (data refer to the third quarter of 2013).

- Half the euro-area OFIs' financial assets are held by OFIs in Luxembourg and the Netherlands alone (32% and 18% respectively).
- Luxembourg's major importance is largely attributable to other investment funds (35%, all investment funds other than money market funds), including bond and share-based funds in particular. At 18% of assets, other investment funds are also relatively important in Germany.

- Virtually all money market fund assets in the euro area are managed in France (39%), Ireland (33%) and Luxembourg (24%).
- Just under 75% of all assets under management by financial vehicle corporations in the euro area are held in Ireland, the Netherlands, Italy and Spain, which is linked amongst others to the developments in the real estate markets in those countries prior to the financial crisis.¹
- Almost 60% of assets managed by insurance corporations and pension funds are held in Germany and France (28% each), which can be explained, *inter alia*, by the effects of the age structure on savings behaviour and the way in which social security systems are set up.

¹ For information on current developments in securitisation markets in the euro area and at country level, see AFME (2013), *Securitisation Data Report, Q3 2013*.

... and very dynamic in terms of loans

By contrast, more granular data are available on loans, allowing for an examination of who-to-whom relationships. The data show that while growth in overall loans to the non-financial private sector in the euro area continued to be dominated by commercial banks (see the chart on page 23), OFI lending grew at a faster pace than that of commercial banks – particularly in combination with the increased securitisation activity between 2006 and 2009. Since 2012, loans issued by other miscellaneous intermediaries, which count as OFIs, have been a key financing alternative for households and non-financial corporations.¹⁰ At present, OFIs are therefore making a positive contribution to the growth in loans. However, their contribution is not sufficient to compensate for the negative development observed in the commercial banking sector.

Investment behaviour and external financing of other financial intermediaries

The chart on page 24 shows the detailed structure of OFIs' external financing and investment behaviour. It is noticeable that a large overall share in external financing is made up of shares issued by money market and other investment funds. The latter use the funds raised primarily for investing in debt securities and equity. Whereas the majority of issuers of debt securities are located in the euro area, portfolio

Large share of investment funds in OFI sector, ...

¹⁰ Intra-sector lending in the non-financial corporations sector (including intra-group loans in particular) is not taken into account in these calculations. This was a key alternative source of financing to bank loans particularly during the financial and economic crisis; see ESCB Task Force (2013), *Corporate finance and economic activity in the euro area, Occasional Paper Series, European Central Bank, No 151*.

equity is mainly issued by non-financial corporations within and outside the euro area.¹¹

... with money market funds continuing to be closely interconnected with commercial banks despite massive outflows

The development of money market funds, which are not presented separately, has been strongly affected by the financial and economic crisis.¹² Their total assets have diminished substantially because major downside risks in their portfolios combined with weak returns in a setting of low short-term rates caused investors to withdraw massive sums of cash. A look at their assets reveals that money market funds primarily hold short-term debt securities, the bulk of which were issued by commercial banks and, to a lesser extent, by non-financial corporations and euro-area member states.¹³ Money market funds are also involved in the financing of commercial banks in the form of deposit business (including repo activities).¹⁴ Overall, this demonstrates the very close ties between money market funds and commercial banks.

OFI lending currently dominated more by other miscellaneous intermediaries than by securitisation activities

Besides investing in equity and debt securities, OFIs primarily grant loans. This is being driven both by other miscellaneous intermediaries – particularly of late as mentioned above – and by financial vehicle corporations. However, the latter's importance has clearly diminished in the course of the financial and economic crisis as a result of the slump in securitisation business, which is probably related to the heightened uncertainty surrounding the valuation of these securitised loans. Moreover, a substantial part of the remaining issuance is currently being used as collateral by commercial banks in Euro-system refinancing operations.

Shadow banking system and financial system efficiency

Shadow banks can generally promote financial system efficiency if they don't increase financial stability risks

Generally, the specialisation in the shadow banking system facilitates a more efficient reconciliation of financing needs and the provision of funds. From this perspective, shadow banks contribute to rounding out the financial system, benefiting the non-financial sector in terms of improved investment and financing. If

Contributions to the growth in loans to the non-financial private sector



Sources: ECB and Bundesbank calculations.
 Deutsche Bundesbank

the commercial banking system encounters short-lived bottlenecks in the supply of credit, this can stabilise the macroeconomic flow of funds while at the same time allowing risks to be diversified outside the commercial banking

¹¹ For an illustrative example of investment funds domiciled in Germany see Deutsche Bundesbank, Current developments in the mutual funds market: demand, structural changes and investment behaviour, Monthly Report, January 2013, pp 13-28; and for an example of investment funds domiciled in Ireland see B Godfrey and B Golden (2013), Measuring Shadow Banking in Ireland using Granular Data, Bank of Ireland Quarterly Bulletin 04/October 2012, pp 82-89.

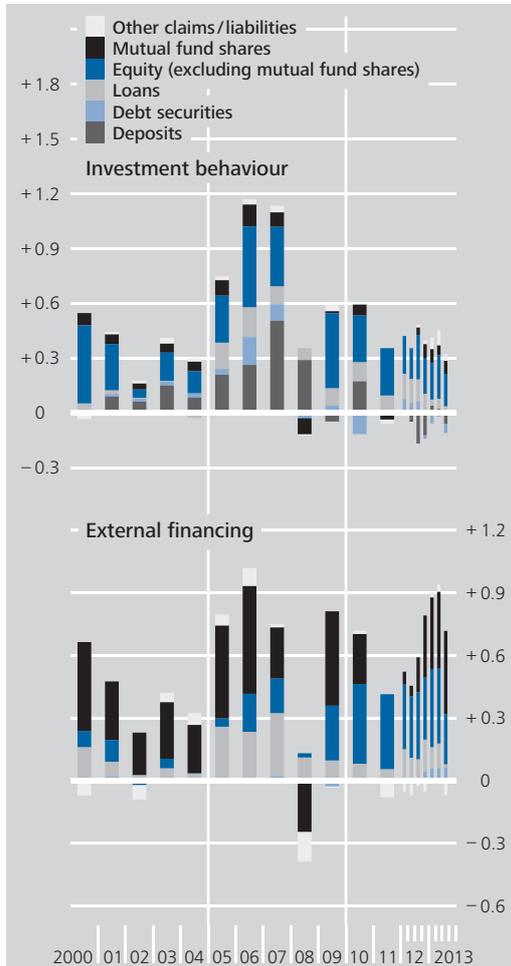
¹² For the development of European money market funds during the financial and economic crisis see E Bengtsson (2013), Shadow banking and financial stability: European money market funds in the global financial crisis, Journal of International Money and Finance, 32, pp 579-594.

¹³ See J Ansidei et al (2012), Money Market Funds in Europe and Financial Stability, Occasional Paper Series, ESRB, No 1/2012.

¹⁴ Pursuant to the requirements of the European System of Accounts (ESA 95), credit obligations of monetary financial institutions (MFIs) are recorded as deposits. Further information on the developments and implications of repo markets for banks can be found in Deutsche Bundesbank, The financial system in transition: the new importance of repo markets, Monthly Report, December 2013, pp 57-71.

Investment behaviour and external financing of other financial intermediaries*

€ trillion; based on transactions and four-quarter moving sums



Sources: ECB and Bundesbank calculations. * Including money market funds from 2006.
 Deutsche Bundesbank

sector as well.¹⁵ In this way, the activities of the shadow banking system – taken in isolation – improve the supply of funds within the financial system as long as this does not pose a threat to financial stability. The risk to financial stability can be addressed using macroprudential instruments, which can be geared to containing systemic risks in the cross-sectional dimension (interconnectedness) and in the time dimension (procyclicality). Principles such as proportionality, accuracy and adaptability should prevail when these instruments are deployed.

Despite the difficulties associated with the statistical coverage of the shadow banking system, it is broadly evident that credit intermediation via the shadow banking system has gained importance since the beginning of European monetary union (EMU). This is likely to be at least partly attributable to the activities of the shadow banking system being less regulated, which is to be viewed critically from a financial stability perspective.¹⁶ Another likely factor is the growing demand on the part of globally active investment companies, insurance corporations and pension funds as well as large non-financial corporations for forms of investment that represent an alternative to bank deposits, particularly in the short-term segment, and which are provided by shadow banks (*inter alia* via money market fund shares and short-term secured debt securities).¹⁷

The shadow banking system from a monetary policy standpoint

Importance of the shadow banking system for monetary analysis

The analysis of monetary and credit aggregates occupies a prominent role in the Eurosystem's monetary policy strategy. This is based on the experience that suitably defined monetary and credit aggregates can deliver information on developments in the real economy and on the medium to long-term risks to price stability. In a financial system dominated by commercial banks, the natural point of reference for defining these variables is the banking sector. Thus, the Eurosystem uses the consolidated balance

Analysis of monetary and credit aggregates to assess longer-term price risks

¹⁵ See N Gennaioli, A Shleifer and R W Vishny (2013), A Model of Shadow Banking, *The Journal of Finance*, 58(4), pp 1331-1363.

¹⁶ See V V Acharya, P Schnabl and G Suarez (2013), Securitization without risk transfer, *Journal of Financial Economics*, 107(3), pp 515-536.

¹⁷ See Z Pozsar (2011), Institutional Cash Pools and the Triffin Dilemma of the U. S. Banking System, Working Paper, International Monetary Fund, No 11/190.

sheet of the euro-area banking sector to calculate various monetary aggregates (M1, M2, M3) and their counterparts.¹⁸

Shadow banks as part of the financial system and the non-banking sector

So far, this article has focused on the financing perspective. This angle emphasises shadow banks' economic function of providing – together with commercial banks – investment and financing opportunities to the non-financial sector. By contrast, from a monetary policy standpoint, the focus is not on the provision of funds to the non-financial sector but on the money in circulation held by non-banks. Correspondingly, monetary analysis distinguishes between banks as the money-issuing sector and non-banks as the money-holding sector. That is why, from a financing perspective, shadow banks – together with commercial banks – are classified as belonging to the financial sector, whereas from a monetary angle, they are regarded as being part of the non-banking sector along with the non-financial sector. Owing to this special role, shadow banks pose something of a challenge for analysts and statisticians.

Impact of shadow banks on monetary aggregates through ...

This becomes particularly apparent for monetary analysis when shadow banks' activities impair the information content of the monetary and credit-related indicators used to gauge developments in the real economy and the outlook for prices (metrics which are traditionally calculated on the basis of commercial banks' balance sheets).¹⁹ The impact is twofold.

... substitution of commercial banking activities ...

– First, the growing importance of the shadow banking system could gradually shift the provision of liquid funds and the financing of the economy outside the commercial banking sector, resulting in the latter's services being substituted.

... and interaction with the commercial banking sector

– Second, shadow banks' interactions with the commercial banking sector are all factored into the monetary and credit aggregates, as shadow banks are classified as non-banks in the banking statistics. Contrary to their statistical classification, some activ-

ities between shadow banks and commercial banks in particular might be assigned more to the activities of the money-issuing sector than the money-holding sector from an economic point of view.

Shadow banks as substitutes for commercial banks

Shadow banks' role as financial intermediaries has led to these institutions assuming the function of alternative providers of short-term investments in the acquisition of financial assets for the non-financial sector through the issuance of money market fund shares, say, or short-term collateralised securities. From a monetary analysis perspective, it should be checked, then, whether any of the liabilities issued by the shadow banking system substitute traditional bank deposits – that is, whether they are comparable, say, with the bank deposits included in M3 in terms of their degree of liquidity and their risk characteristics.²⁰ If this is the case, increasing shadow banking activity would diminish the meaningfulness of monetary indicators, with the monetary aggregates needed for price determination in the goods market, in particular, being defined too narrowly.

That is why, in an ever-evolving financial system, it is crucial to regularly review the definitions of monetary aggregates. At the launch of EMU, the Eurosystem decided that the group of monetary financial institutions (MFIs) designed to capture the money-issuing sector should include not just euro-area commercial

Substituting investments at shadow banks for bank deposits ...

... could necessitate adjustments to the definition of monetary aggregates

¹⁸ See Deutsche Bundesbank, The consolidated balance sheet of the MFI sector and its significance for monetary analysis, Monthly Report, July 2013, pp 55-56.

¹⁹ Shadow banks' activities could potentially also increase the information content if this meant that, for example, certain transactions by households and non-financial corporations that were related more closely to prices of assets rather than of goods were no longer reflected in commercial banks' balance sheets.

²⁰ The extent to which these liabilities are used as money substitutes is subject to cyclical fluctuations and dependent on market developments.

banks but money market funds as well, the rationale for this move being that for investors, money market fund shares were close substitutes for bank deposits in terms of liquidity and therefore, much like bank deposits, were likely to be related to spending decisions.

However, as monetary analysis is based on the consolidated balance sheet of the MFI sector, the concept of balance sheet identity dictates that a corresponding counterpart must be entered for each newly added monetary variable. So if the Eurosystem adds the liabilities side of money market funds' balance sheets – that is, the issued money market fund shares – to the MFI sector's consolidated balance sheet, it follows that the assets side of money market funds' balance sheets likewise needs to be included. This was relatively straightforward for money market funds because they could be subjected to reporting requirements and their business activities essentially confined to receiving and investing fund assets (the latter primarily in short-term near-bank investments).

Interaction between shadow banks and commercial banks

Interaction between shadow and commercial banks influences monetary and credit aggregates

The increase in significance of the shadow banking system goes hand in hand with greater interaction between shadow banks and commercial banks. While an unconsolidated analysis of payment flows between the individual financial sector players is of interest from a financial stability perspective, monetary analysis seeks to adjust the monetary and credit aggregates affected by the interaction, if need be, so as to best capture the changes relevant to price developments.²¹

Repo and reverse repo transactions

Secured money market transactions known as repo and reverse repo transactions, which commercial banks conclude with central counterparties (such as Eurex Clearing AG, which until recently was statistically classified as a non-bank financial intermediary), are examples of this. Repo transactions (reverse repo trans-

actions) were originally presented in the banking statistics – which are crucial for monetary analysis – as an outflow (inflow) of funds for the money-holding sector. Yet for the most part, these transactions inherently constitute secured money market transactions between commercial banks in which the central counterparty merely acts as a go-between. Consequently, the money supply is not expanded at the macroeconomic level. These secured transactions grew steadily in importance over the course of the financial and economic crisis owing to the high level of uncertainty in the interbank market. They ultimately had such a significant impact on short-term monetary and credit developments, both in terms of quantity and their month-on-month volatility (see the chart on page 27), that the Eurosystem decided to exclude them from the calculation of M3 and its counterparts in August 2012.²²

Loan sales and securitisation are further examples of the increasing interaction between the commercial and shadow banking systems and the impact they have on monetary analysis. The sharp increase in lending to the euro-area non-financial private sector observed before the onset of the financial and economic crisis was accompanied by large-scale securitisation activity among commercial banks. Amongst other things, commercial banks transferred loans to securitisation vehicles with a view to shielding their regulatory capital. Given that commercial banks on the one hand and securitisation vehicles, which count as non-bank financial intermediaries, on the other are assigned to different sectors, loan sales and securitisations of this kind are recorded in the banking statistics as a decline in the respective credit aggregate. However, the loans still exist from a financing perspective, which means that the borrowed funds can continue to be used on the expenditure side by the non-financial

Loan sales and securitisation

²¹ See also European Central Bank, The interplay of financial intermediaries and its impact on monetary analysis, Monthly Bulletin, January 2012, pp 59-73.

²² This problem has since dwindled in importance as the bulk of central counterparties are now classified as MFIs.

private sector. That is why it was in the interest of monetary analysis to take these sales and securitisation activities into account – hence, since mid-2010 they have been subject to reporting requirements and the monetary data can be adjusted accordingly.²³

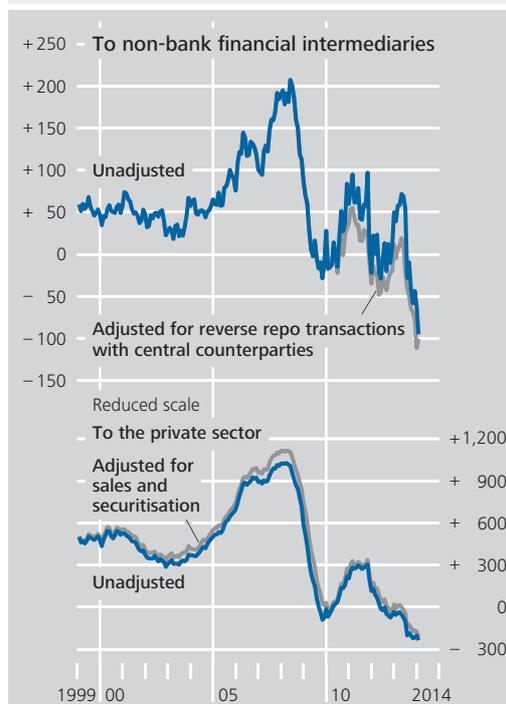
Sectoral shifts in money holding and the relationship between money supply and the price level

Shadow banking system's larger share of M3 deposits ...

Although the incomplete statistical coverage of shadow banking activities, particularly in the area of securities transactions, means that it is currently not possible to paint a detailed picture of the shadow banking system's growth in significance since the launch of EMU in terms of the extent to which it substitutes commercial bank activities as well as its direct interaction with commercial banks, the banking statistics at least provide granular information on the bank deposits held by non-bank financial intermediaries. Thus, the shadow banking system's growing importance for financial intermediation since the launch of EMU has driven sectoral shifts in euro-area M3 holdings²⁴ (see the chart on page 28). While non-financial corporations' share of the broad money stock M3 in the euro area has remained relatively constant, the share of household deposits has diminished significantly on balance since 1999 despite continual growth. Nonetheless, at just under 64% at the current end, households still hold the bulk of deposits included in M3.²⁵ By contrast, the share of M3 deposits attributable to non-bank financial intermediaries increased from 10% at the launch of EMU to 16% at the end of 2011, reflecting the expansion of the shadow banking system. However, their share of the broad money stock M3 has fallen back to just under 12% of late. Besides the exclusion of repo transactions with central counterparties since mid-2010, which accounts for a significant amount, this probably also owes something to the fact that the easing of the financial markets

Commercial bank* loans in the euro area

€ billion, cumulative 12-month changes,¹ month-end data



* Including money market funds. ¹ Excluding statistical changes.
 Deutsche Bundesbank

prompted the professional investors that dominate the shadow banking system to reduce their uncertainty-driven money holdings and invest once more in better remunerated investment vehicles not covered by the monetary aggregates.

Both the increase before the crisis and the decline in the last two years can be attributed for the most part to OFIs rather than to ICPFs. In

²³ While MFI loan flows are adjusted for loan sales and securitisation, the stock data are not. The redemption of loans that have been derecognised from the MFI sector's balance sheets is not fully captured, meaning that actual credit developments might be overstated.

²⁴ Short-term bank debt securities are not taken into account in the following because they cannot be broken down into sectoral holdings. Hence, the term money holding is confined here to M2 components (excluding cash) plus repo transactions.

²⁵ Households generally hold a considerably larger share of their financial assets in bank deposits, particularly in M3 deposits, than do enterprises and the public sector. The strong preference for liquidity reflects the relatively higher significance they attach to money holding for transactions in the goods and services market compared with other sectors.

Sectoral analysis of M3 deposits held by the domestic private sector*

%, month-end data



* As of June 2010, adjusted for repo transactions with central counterparties. ¹ Excluding statistical changes.
 Deutsche Bundesbank

the run-up to the financial and economic crisis, OFIs primarily stepped up their short-term time deposits, notably on account of the significant spread between sight and time deposits at that juncture (see the chart on page 29). Since the collapse of US investment bank Lehman Brothers at the end of 2008, heightened uncertainty distinctly increased the significance of secured money market transactions (repos).

The sectoral shifts within the broad money stock M3 need to be accounted for in monetary analysis as they might alter the information content of monetary aggregates with respect to macroeconomic activity as well as developments in goods and asset prices over time. It is evident that developments in the deposits of non-bank financial intermediaries, which are dominated by professional portfolio considerations, exhibit a certain lead structure compared with the investment behaviour of the non-financial private sector when the financial markets are in constant flux. At the current

... could change the relationship between money supply and the price level

end, it is especially conceivable that the renewed appetite for risk, which led to the aforementioned reduction of M3 deposits in the shadow banking system, will also spread to the other sectors with a certain time lag.

However, this will not necessarily entail a further weakening of M3 growth, as it can generally be assumed that households' and non-financial corporations' money holdings are predominantly earmarked for consumption and investment. Households in particular respond relatively sluggishly to changes in the macroeconomic setting when making investment decisions, whereas non-financial corporations gear their decisions more strongly to the economic cycle. This stands in contrast to the shadow banking system's demand for money, which is less closely linked to demand for goods. Rather, asset prices play a more prominent role owing to the more market-based financing instruments used by the shadow banking system and the widespread collateralisation of transactions with securities, whose prices fluctuate over time.²⁶

Monetary analysis therefore needs to consider that a persistently higher level of M3 holdings in the shadow banking system could affect the meaningfulness of monetary indicators. Thus, deposits which shadow banks hold in the commercial banking sector typically respond far more strongly to changes in market developments than deposits held by non-financial sectors. Moreover, the transactions concluded by shadow banks are influenced to a greater extent by the market setting. The fact that the 12-month rates of M3 deposits held by non-bank financial intermediaries have moved in a broader range and exhibited wider monthly fluctuations than those of non-financial corporations and households since the launch of EMU points in this direction. In terms of monetary

Shadow banking activity increases volatility of monetary aggregates ...

²⁶ See P Moutot, D Gerdesmeier, A Lojschová and J von Landesberger (2007), The role of other financial intermediaries in monetary and credit developments in the euro area, Occasional Paper Series, European Central Bank, No 75.

analysis, the increased share of M3 deposits held by the interest-rate-sensitive shadow banking system therefore also increases the overall short-term volatility of the M3 aggregate, which is something that needs to be accounted for when assessing the underlying rate of monetary expansion.²⁷

... and affects their meaningfulness for the real economy and prices

On top of this, the growing significance of the shadow banking system probably tends to impair the extent to which growth in real M1 holdings serves to indicate turning points in real economic activity because shadow banks' money holdings are far less strongly connected with real economic dynamics than those of the non-financial private sector. The same can be said for the relationship between monetary aggregates and consumer prices. While the non-financial private sector's demand for money is more closely related to the real economy and to goods prices, the determinants of developments in shadow banks' demand for money are more likely to be found in the realm of financial market variables (see the box on pages 30 and 31). Hence, it can generally be said that they probably reinforce the relationship between money growth and asset prices.

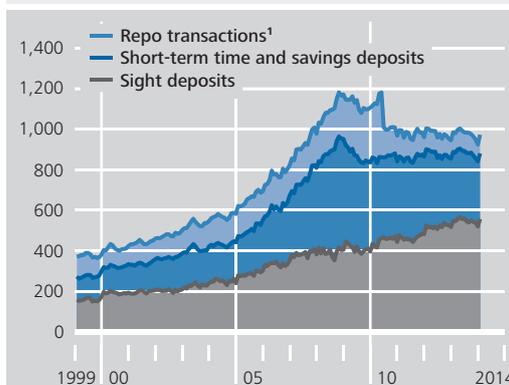
The shadow banking system and monetary policy transmission

Financial system pivotal for monetary policy transmission

The financial system is the key player in the transmission of monetary policy measures to the non-financial sector's spending and pricing decisions. Monetary policy can be transmitted via a host of channels, some of which are interlinked. For example, monetary policy measures influence general interest rates and have a knock-on effect on the non-financial sector's demand for credit and its spending behaviour (interest rate channel). They can also affect the supply of bank loans (credit channel) and change financial intermediaries' attitude towards the assumption of risk (risk-taking channel).²⁸

M3 deposits held by domestic non-bank financial intermediaries*

€ billion, month-end data



* Other than money market funds. 1 As of June 2010, adjusted for transactions with central counterparties.

Deutsche Bundesbank

Hence, shifts in the relative significance of shadow and commercial banks can essentially also have an impact on the monetary policy transmission process in the euro area. However, whether or not this is the case cannot be conclusively proven at the current juncture – empirical research into this topic is still in its infancy, probably because the underlying statistical data are largely underdeveloped at the present time.²⁹

Enhanced role of shadow banks ...

It is nonetheless possible to give consideration to a number of conceptual issues. As a source of financing, shadow banks are both a complement to and a substitute for commercial banks.

... will probably tend to weaken monetary policy transmission via commercial banks ...

²⁷ See European Central Bank, The interplay of financial intermediaries and its impact on monetary analysis, Monthly Bulletin, January 2012, pp 59-73.

²⁸ An overview can be found in European Central Bank, Monetary policy transmission in the euro area, a decade after the introduction of the euro, Monthly Bulletin, May 2010, pp 85-98.

²⁹ This is in part due to the subset of OFI sector statistics only recently becoming available and covering just a limited number of years. Other contributing factors are the statistically insufficient institutional definition of the individual shadow banking system entities and a lack of data on who-to-whom relationships as well as key financial instruments for the shadow banking system. See C Jackson and J Matilainen (2012), Macro-mapping the euro area shadow banking system with financial sector balance sheet statistics, ICF Bulletin of the Bank for International Settlements, No 36, pp 1-15.

A wavelet analysis on the determinants of developments in non-bank financial intermediaries' deposits

The information to be gleaned from monetary developments for monetary analysis can be impaired by the money holdings of shadow banks – which are, for statistical purposes, considered to belong to the non-monetary financial sector – if the relationship between the money holdings of the non-monetary sector and the macroeconomic variables relevant to monetary policy systematically deviates from that for the non-financial sector.

Wavelet analysis, as it is known, can be used to gain an insight into the empirical relationship between the deposits of non-bank financial intermediaries and other variables.¹ It allows changes in the empirical relationship between the variables under observation both over time and across the frequency spectrum (ie for fluctuations with periods of different lengths). The time series are modelled with the aid of a flexible mathematical function (known as a wavelet), which is stretched or compressed depending on the frequency under examination. Time variability is measured by establishing the approximation for every point in time via a window of neighbouring observations, with the length of the window adapted to the frequency under observation. This method can therefore be used to analyse in what frequency areas the relationship between the money holdings of non-bank financial intermediaries and other macroeconomic variables relevant to monetary policy is located, and whether this relationship has changed over time.

To this end, the empirical relationship between deposits by non-bank financial intermediaries contained in M2 and, one by one, the gross domestic product, the harmonised index of consumer prices and a share price index (DJ Euro Stoxx) was analysed.² For various frequencies and points in

time, the share of the fluctuations in the annual growth rate of each of these variables that can be explained by the fluctuations in the annual growth rate of deposits (coherence) was estimated.³

- Statistically significant, time-stable coherence with the growth rate of the real or nominal deposits of non-bank financial intermediaries was found neither for the growth rate of real gross domestic product nor for the inflation rate. Although there are a few significant coherences at low to medium frequencies, they only occur for limited periods.
- There is, by contrast, a significant relationship between the annual growth rate of the deposit variables and that of the share price index for fluctuations with periods of between six and ten years (see

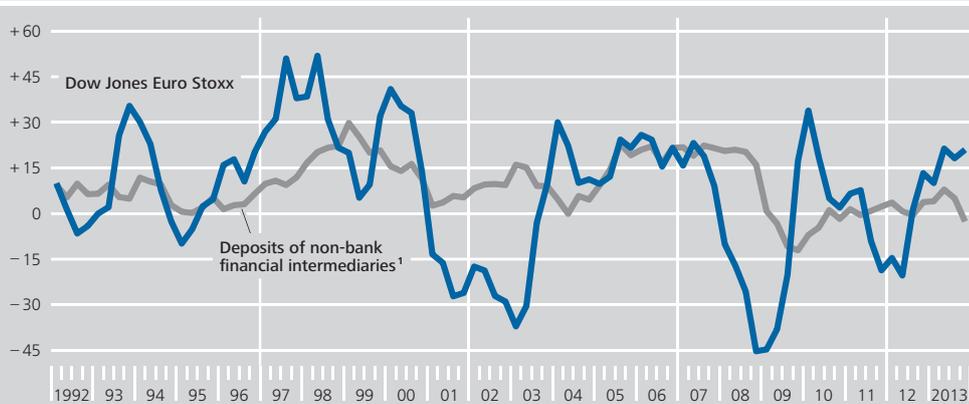
¹ For an introduction to wavelet analysis, see A Rua (2012), *Wavelets in Economics*, Economic Bulletin, Summer, Banco de Portugal, pp 71 ff; L Aguiar-Conraria and M J Soares (2013), *The Continuous Wavelet Transform: Moving Beyond Uni- and Bivariate Analyses*, *Journal of Economic Surveys*, forthcoming. Compared to the conventional rolling Fourier analysis based on a window length that is independent of frequency, wavelet transformation improves the capture of time variability at high frequencies and improves the capture of variability with respect to frequency at low frequencies.

² For every observed point in time, an increasing number of neighbouring observations is incorporated in the wavelet analysis at lower frequencies. As a consequence, the frequency spectrum for which the analysis can be carried out is limited by the length of the time series available for the variables under observation. Data on the deposits (overnight deposits, short-term sight and savings deposits) of non-monetary financial intermediaries in the euro area are available from 1991 onwards. Data on the sector breakdown of cash in circulation are only available from 1999 onwards, while data on that of marketable instruments has, in some cases, been collected for an even shorter length of time, which means that the study is limited to deposits of non-monetary financial intermediaries contained in M2 in order to allow it to be carried out for medium to long-term fluctuations as well. Index series constructed from transaction-related changes are used.

³ In simplified terms, coherence can be compared to the R^2 of a bivariate regression.

Growth rates of deposits of non-bank financial intermediaries and share price index

Year-on-year percentage change



1 Deposits of non-bank financial intermediaries contained in M2, transaction-related change.
 Deutsche Bundesbank

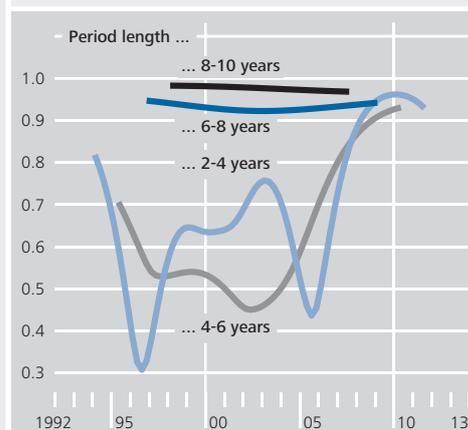
chart below). In this frequency band, coherence is even estimated to be close to 1; in other words almost all the fluctuations in the growth rate of the share price index in this frequency area can be explained by fluctuations in the deposit growth rate.⁴

These results suggest that the relationship between the money holdings of non-bank financial intermediaries on the one hand and real economic developments and developments in the price of goods on the other is fairly weak, but that the relationship between the M2 deposits of this sector and the financial market variables is significantly closer.

Further analysis of the relationship between these two variables for periods of six to ten years shows a positive relationship between the growth rates for deposits and for the share price index, which has weakened slightly over time.⁵ Looking at the time dif-

ference between deposit and share price developments, the frequency band under observation reveals a lag of roughly one year in the development of deposits with respect to share price developments, which is stable over time.

Coherence between deposits of non-bank financial intermediaries and share price index*



* Wavelet coherence between the annual growth rate of deposits of non-bank financial intermediaries included in M2 and annual growth rate of Dow Jones Euro Stoxx for various frequency areas, ie for fluctuations with different period lengths. The values show for the respective frequency area what share of the fluctuations in the annual growth rate of the share index can be explained by the corresponding fluctuations in the deposit growth rate. For a given length of the time series, the period for which coherence can be estimated is shorter the greater the period of the fluctuations, as a larger number of neighbouring observations is used for the estimation at every point in time.

Deutsche Bundesbank

4 These coherences are statistically significantly different from zero at the 5% level.

5 The relevant measure is the cross-spectral gain. It is comparable to the coefficient that would result from the regression of the growth in the share prices on the growth in deposits in the selected frequency band. Over time, its value drops for fluctuations with periods from six to ten years from roughly 0.95 to about 0.85.

- Loan securitisation vehicles are one example of shadow banks' complementary role. These vehicles enhance the tradability of credit portfolios, thereby allowing commercial banks to free up resources by selling loans. This in itself can give commercial banks greater scope for lending.³⁰ In terms of monetary policy transmission, this is also likely to result in a restrictive monetary policy measure, say, constraining the supply of bank loans to a lesser degree than would have been the case without this increased interaction between shadow and commercial banks.
- Shadow banks act as a substitute for commercial banks, for example, when they offer the non-financial sector forms of financing as a direct alternative to bank loans. Just as restrictive monetary policy measures act to constrain the supply of bank loans, so too is the impact of monetary policy, when viewed in isolation, likely to be weakened by the alternative financing opportunities offered by the shadow banking system because monetary policy is directly targeted at commercial banks and thus has an indirect impact at best on shadow banks.³¹

... and amplify transmission via asset prices

This potential weakening of the impact of monetary policy stimuli, however, contrasts with positive effects elsewhere because shadow banks tend to strengthen the role played by asset prices. The rationale for this is as follows. Lending decisions particularly entail information problems, so creditors attach considerable importance to the available collateral and the quality of the debtor's balance sheet, that is, the debtor's net wealth or capital base.³² This also applies where the debtor is a financial intermediary – the lower its net wealth and the poorer the quality of the collateral, the higher the "external finance premium", ie the additional compensation demanded by a creditor for providing the financing, is likely to be. Therefore, if falling asset prices shrink the net wealth and/or collateral value, this will tend to drive up the external finance premium and

restrict the financial intermediaries' scope for lending. The reverse also holds true. An expansionary monetary policy stance drives asset prices higher, causing the supply of loans to increase.³³

On top of this, changes in asset prices probably also have an impact on financial intermediaries' risk appetite. As a case in point, increasing asset prices in a low-interest-rate setting can give rise to a search for superior returns, prompting a greater propensity to take on risk. In this scenario, financial intermediaries might be more willing to also lend to higher-risk debtors at more favourable conditions. At the same time, an environment of rising asset prices might dull investors' perception of potential risks because it could be accompanied by diminishing volatility in the asset markets, further curbing the risk compensation demanded by creditors.³⁴

The shadow banking system is likely to increase the significance of the asset price channel in the monetary policy transmission process.

Shadow banks reinforce the role of asset prices

- Being strongly geared to the markets, the shadow banking system is more dependent than the regular commercial banking system

³⁰ See L Gambacorta and D Marquéz-Ibàñez (2011), The bank lending channel: lessons from the crisis, *Economic Policy*, 26(66), pp 137-182; as well as Y Altunbas, L Gambacorta and D Marquéz-Ibàñez (2009), Securitization and the bank lending channel, *European Economic Review*, 53(8), pp 996-1009.

³¹ See R Meeks, B Nelson und P Alessandri (2013), Shadow banks and macroeconomic instability, Working Paper, Banca d'Italia, No 939.

³² See Deutsche Bundesbank, Credit growth, bank capital and economic activity, *Monthly Report*, March 2005, pp 15-24.

³³ See P Disyatat (2011), The bank lending channel revisited, *Journal of Money, Credit and Banking*, 43(3), pp 711-734; as well as M L Gertler and P Karadi (2011), A model of unconventional monetary policy, *Journal of Monetary Economics*, 58(1), pp 17-34.

³⁴ See C Borio and H Zhu (2012), Capital regulation, risk-taking and monetary policy: A missing link in the transmission mechanism?, *Journal of Financial Stability*, 8(4), pp 236-251; as well as J Danielsson, H S Shin and J P Zigrand (2004), The impact of risk regulation on price dynamics, *Journal of Banking and Finance*, 28(5), pp 1069-1108.

on changes in the access channels to financing via the money and capital markets.

- Furthermore, given that a high proportion of their total assets are market-based, asset price fluctuations exert a stronger influence over their net wealth and capital base.
- And commercial banks' dependence on financial market conditions and shadow banks as a source of market-based funding is also likely to have a procyclical impact on their ability to raise funds and thus on their supply of credit.³⁵

This is consistent with the outcome of empirical studies, particularly on the United States, which find that leverage is more actively managed by shadow banks than by commercial banks.³⁶ Asset price growth fuels shadow banks' demand for debt-financed financial assets, driving asset prices higher still. This creates a self-reinforcing process comprising balance sheet growth, rising leverage ratios, shrinking risk premiums and increased lending to the non-financial sector.³⁷

All in all, these considerations do not clearly indicate whether increased shadow banking activity strengthens or weakens the effectiveness of monetary policy. They do, however, suggest that a relative shift in the significance of certain variables in the transmission of monetary policy measures is to be expected. Thus, increasing shadow banking activity is likely to enhance the role played by asset prices in the monetary policy transmission process.

■ Outlook

Owing to data gaps, it is impossible at the current juncture to satisfactorily obtain a comprehensive and detailed statistical picture of the shadow banking system and its ties with commercial banks and with the non-financial sector in the euro area. This explains why the Eurosystem's monetary analysis has responded hith-

erto to changes brought about by the shadow banking system on an *ad hoc* basis, and chosen to subject specific transactions or shadow banking entities to reporting requirements and factor them into the calculation of monetary and credit aggregates or include them in the constituents of the money-issuing sector once they had become sufficiently relevant from a monetary policy perspective.

More detailed analysis into the significance of shadow banks for monetary analysis and monetary policy transmission – and for financial stability, too, of course – necessitates further improvements to the underlying statistical data. The EU and the Eurosystem are already addressing these requirements. The changeover of the national financial accounts to the European System of National and Regional Accounts 2010 (ESA 2010) in autumn 2014 will see data being captured for the first time for the entire euro area on who-to-whom relationships in the area of securities. Moreover, there is a raft of – mainly regulatory – initiatives designed to shed more light on shadow banking activities and facilitate better oversight. These include, for example, the planned creation of a trade repository for securities financing trans-

... are currently being closed through changeovers in the EU and the Eurosystem statistical systems, ...

³⁵ Particularly in an increasingly tense financial market setting, shadow banks might be less willing to offer commercial banks refinancing opportunities and pledged collateral for re-use. The procyclical effects in the financial system might be amplified as a result. See D Bleich and A Dombret (2014), *Financial System Leverage and the Shortage of Sale Assets: Exploring the Policy Options*, German Economic Review, forthcoming.

³⁶ See T Adrian and H S Shin (2010), *Liquidity and Leverage*, *Journal of Financial Intermediation*, 19(3), pp 418-437. Commercial banks, too, actively manage their leverage and maximise their return on equity through variations in their total assets; see G Nuno and C Thomas (2013), *Bank Leverage Cycles*, Working Paper Series, European Central Bank, No 1524.

³⁷ See T Adrian, E Moench and H S Shin (2010), *Macro Risk Premium and Intermediary Balance Sheet Quantities*, *IMF Economic Review*, 58(1), pp 179-207; as well as M G Papaioannou, J Park, J Pihlman and H von der Hoorn (2013), *Procyclical Behavior of Institutional Investors During the Recent Financial Crisis: Causes, Impacts, and Challenges*, Working Paper, International Monetary Fund, No 13/193.

*... potentially
facilitating
deeper monetary
policy analysis
as well*

actions (repo transactions and securities lending).³⁸

From a monetary policy perspective, the improved underlying data on participants and activities in the shadow banking system will facilitate an appropriate definition of monetary indicators, the proper interpretation of the growing shifts in sectoral money holding and in credit intermediation as well as empirical research into monetary policy transmission. Along with the already ongoing complementary analysis of data from the banking statistics and the national financial accounts³⁹ – the latter addressing sectoral development – this should deliver deeper insights into this topic.

Ongoing observation and assessment of developments in the shadow banking system are

equally crucial from a financial stability angle, the main objective being to bring the regulatory framework into line with the evolving intermediation space so as to minimise risks to financial stability early on. In this context, it is important from a monetary policy perspective to also observe how these regulatory measures affect the monetary policy transmission process.

38 See European Commission, Proposal of the European Parliament and of the Council on reporting and transparency of securities financing transactions of 29 January 2014.

39 The complementary analysis of banking statistics and financial accounts data has often proven to be important hitherto, inter alia in discussions pertaining to corporate financing. One key topic of late was the extent to which the high debt levels at non-financial corporations before the onset of the financial and economic crisis subdued the supply of credit in euro-area periphery countries at the current end.