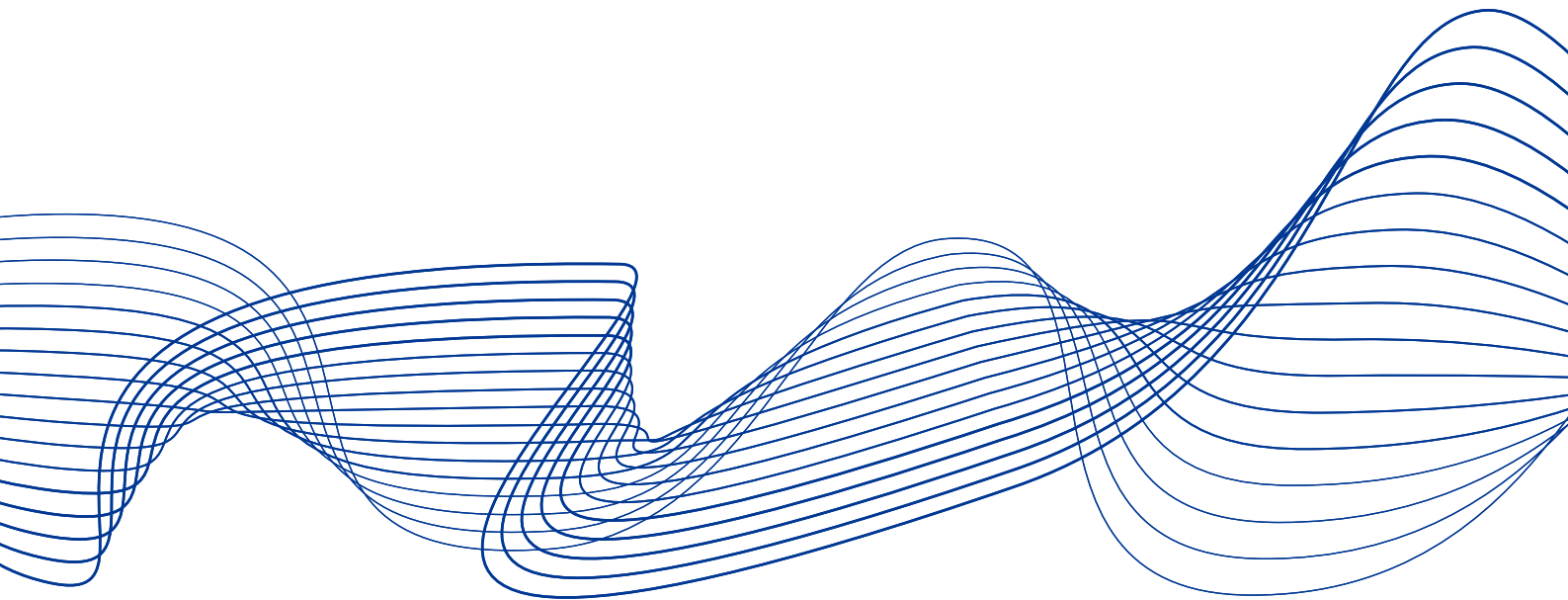


NBFI Monitor

No 4 / July 2019

EU Non-bank Financial
Intermediation Risk Monitor 2019



ESRB

European Systemic Risk Board

European System of Financial Supervision

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Executive summary

Non-bank financial institutions have become an increasingly important source of financing for the real economy over the past decade, bringing many benefits but also carrying risks.

As the capital markets union (CMU) progresses, the role of non-bank finance is expected to increase further. Although the diversification of funding sources for the real economy is a welcome development, the growing role of non-bank financial entities has been accompanied by signs of increased risk-taking. As the financial system moves towards a greater use of non-bank financial intermediation, authorities require a commensurate set of data to identify risks and vulnerabilities and a comprehensive macroprudential approach to effectively address them.

This report considers a range of systemic risks and vulnerabilities related to non-bank financial intermediation, including those related to interconnectedness, liquidity and leverage.

Its monitoring universe includes all investment funds (IFs) and so-called other financial institutions (OFIs). The size of this monitoring universe is measured by total assets under management (AUM) in investment funds and OFIs, and thus excludes the assets of banks, insurance corporations and pension funds, as well as central counterparties (CCPs) with a banking licence. In the European Union (EU), this measure fell by 1.8% to €41.9 trillion in 2018, while for the euro area (EA) it fell by 1.3% to €33.6 trillion. This largely reflects falls in asset valuations towards the end of 2018 which reversed in early 2019. This contraction was partially offset by an increase in banking assets as the overall EU financial system contracted by 0.3%, while the EA financial system grew by 0.5%. While the size of the monitoring universe is important for monitoring purposes and might contribute to the degree of systemic risk, it is not, in itself, a sufficient measure of it. Against this background, this report considers a broad range of risks and vulnerabilities, including those related to interconnectedness, liquidity and leverage.

Some non-bank financial institutions remain vulnerable to a repricing of risk, with potential spillovers to funding conditions of other financial sectors and the real economy.

Although bond funds have recently shifted their holdings towards higher-rated debt securities, this follows years of reducing the average credit quality of portfolios. However, concerns persist regarding the potential for asset repricing in debt markets to trigger rapid deleveraging and liquidity stress in certain markets. During the first half of 2019, some investment funds invoked provisions in order to manage substantial investor redemptions. While these episodes did not cause any systemic repercussions, they served as a reminder to investors that, under some circumstances, holdings in open-ended investment funds cannot be liquidated immediately. In EU commercial real estate (CRE) markets, transaction volumes and prices are near their previous peak in 2007. Given the increasing role of non-bank financial institutions, new forms of interconnectedness and transmission channels may arise. Cross-border reallocation of CRE funding can result in excessive swings in asset prices and global CRE markets may become more correlated (see Box 1). The growth of leveraged loans also reflects an increase in risk-taking (see Box 3). The low interest rate environment supports strong investor demand for such loan products which offer higher rates of return, but also carry greater risks. In an economic downturn, highly indebted borrowers may then be unable to refinance existing loans, resulting in higher default rates.



The use and reuse of financial collateral in derivatives and securities financing transactions (SFTs) can create intermediation chains which can spread funding liquidity shocks.

Haircut and margining practices in bilaterally and centrally cleared trades may force market participants to post additional cash or other cash-like collateral. CCPs are important entities in helping to reduce risks between market participants. This also creates close interconnections, linking clearing members, which are mostly banks, and their clients such as insurance companies, pension funds, hedge funds and other investment funds. These clients rely on a small number of dealer banks providing client clearing services (see Box 4). Through the use of repo transactions, interconnectedness between banks and non-banks increased in 2018, with balance sheet data for EA banks showing a 21% increase in liabilities with other entities to €254 billion.

Further work is needed to address remaining data gaps and to develop appropriate risk metrics to measure liquidity, leverage and interconnectedness.

There have been several initiatives at the national and global levels to help reduce the OFI residual which represents entities in the financial accounts for which primary statistics are not available at the EU level. This demonstrates that a large portion of the OFI residual relates to captive financial institutions. While such entities do not necessarily engage in credit intermediation, they can form complex financial intermediation chains where they may engage in SFTs or make use of leverage. Other data gaps remain in specific market segments, such as the lack of a detailed breakdown of collateralised loan obligation (CLO) end-investors which would allow for more granular risk assessments. There is still also a lack of metrics, for example, to measure leverage in the IF sector both globally and at a system-wide level. Current risk indicators for IFs tend to be based on broad fund categories such as bond or equity funds. Risk assessments based on such broad categories limit the ability to assess pockets of risk in specific business models. Moreover, to gain a more comprehensive view of interlinkages in the financial system, supervisors need to be able to link data covering activities in certain market segments, such as derivatives or SFTs to balance sheet data of the institutions engaging in these markets.



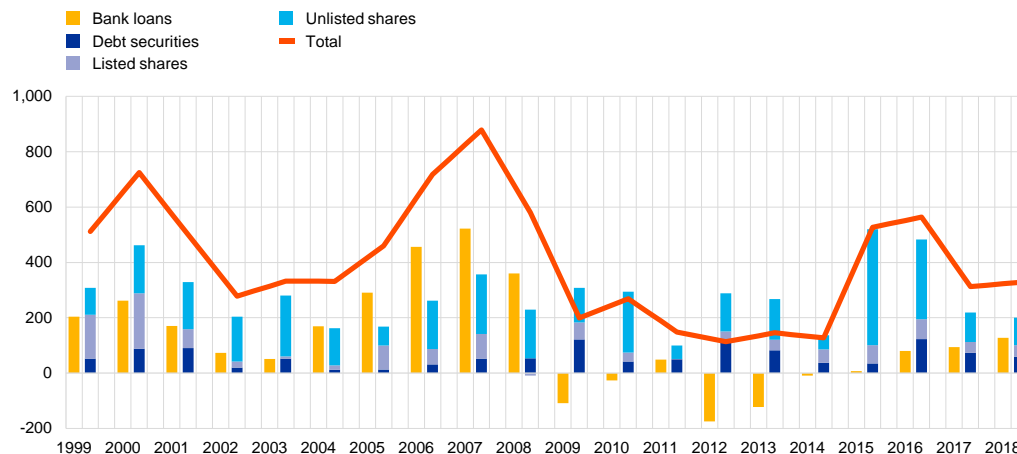
1 Overview

1.1 Developments in main aggregates

Since the global financial crisis, alternative sources of finance to traditional bank lending have grown in importance. Net finance raised by non-financial corporations (NFCs) from bank loans fell sharply after 2008, although it has started to increase over the past three years. After the financial crisis, other sources of finance such as debt securities and listed shares helped to fill the funding gap (see Chart 1/Chart A-1.1). Debt securities and listed shares issued by NFCs are mainly held by non-bank financial institutions, with a smaller share held by banks (see Chart A-1.2). For EU households, the non-bank financial sector is particularly important to help allocate assets to insurance and pension products as well as investment fund shares (see Chart A-1.3). In some EU jurisdictions, the non-bank financial sector is also becoming an important source of funding for households. For example, around 35% of new mortgages are provided by pension funds, insurers and mortgage funds in the Netherlands.¹

Chart 1
Net finance raised by euro area non-financial corporations

(EUR billions)



Sources: ECB Quarterly Sector Accounts (QSA) and ESRB calculations.

Notes: See Section 4.2. Bank loans include loans granted by banks and other monetary financial institutions (MFIs) to NFCs.

The diversification of funding sources for the real economy can help distribute risks more evenly across investors and lenders, though the emergence of new vulnerabilities must be monitored. This report therefore focuses on financial entities which engage in activities that may

¹ De Nederlandsche Bank, "DNBulletin: Dutch banks see market share in home mortgage lending stabilise", 31 January 2019.

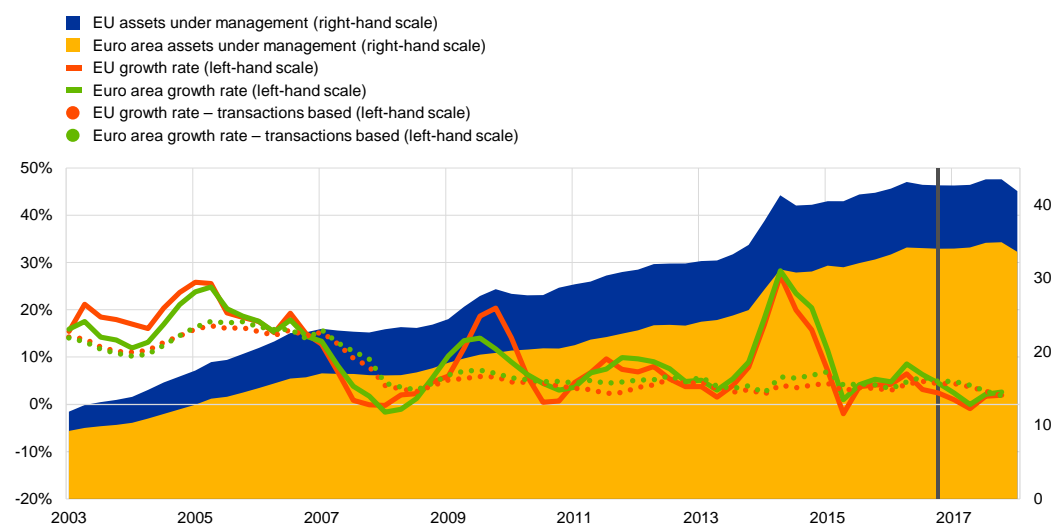


cause or contribute to systemic risks as a result of their financial intermediation (including credit intermediation), liquidity and maturity transformation, leverage and their interconnectedness with the banking system.

The monitoring universe includes all investment funds and so-called other financial institutions (OFIs) with assets under management concentrated in a few Member States. The EU (EA) investment fund and OFI sectors accounted for €41.9 (€33.6) trillion at the end of 2018 compared with €42.6 (€34.1) trillion at the end of 2017 (see Chart A-2). Assets included in the monitoring universe account for around 40% of assets in the overall financial sector. Investment funds (other than money market funds (MMFs)) are growing in significance and represent around one-third of the EU (EA) monitoring universe (see Chart A-3). At the end of 2018 total assets of EU (EA) MMFs, non-MMF investment funds and OFIs stood at €1.2 trillion (€1.2 trillion), €13.4 trillion (€11.2 trillion) and €26.8 trillion (€20.7 trillion) respectively (see Chart A-3). The countries with the six largest non-bank financial sectors in nominal terms in the EU (LU, UK, NL, IE, DE and FR) make up around 80% of the monitoring universe (see Chart A-6).

Chart 2
Assets under management in EU and euro area investment funds and other financial institutions

(EUR trillions and annual growth rates)



Sources: ECB and ECB calculations.

Notes: See Section 4.2. The continuous lines indicate annual growth rates based on changes in outstanding amounts. The dotted lines indicate annual growth rates based on transactions, i.e. excluding the impact of FX or other revaluations and statistical reclassifications. The latest observation is for the fourth quarter of 2018.

Total assets under management in investment funds and OFIs decreased in 2018, while assets in the banking sector increased. In 2018 the size of the EU (EA) monitoring universe decreased by 1.8% (1.3%) year on year, while assets held in the banking sector grew by 0.4% (1.7%) (see Chart A-3). As a result, assets in the IF and OFI sectors in relation to the banking



sector decreased to 96.4% (94.8%) at the end of 2018 compared with 98.5% (98.5%) at the end of 2017.² The share of the IF and OFI sector in the overall financial sector accounted for 38.1% (42.8%) of the EU (EA) financial sector in 2018, a slight decrease from 38.7% (43.6%) at the end of 2017 (see Chart A-3).

The decrease in assets under management in the investment funds and OFI sectors in 2018 mainly reflects lower valuations during the final quarter (see Chart A-4). For IFs, continued inflows were more than offset by asset price falls and exchange rate variations (see Chart A-4.1). In contrast, while valuation effects also contributed, the fall in AUM in the OFI sector was mainly as a result of outflows (see Chart A-4.2). The decrease in AUM in the monitoring universe was short-lived as asset valuations have increased in early 2019.

Non-bank financial entities are an important source of wholesale funding for the banking sector, which increased in 2018 across funding sources. Wholesale funding provided by non-bank financial entities to the banking sector increased by 4.2% to €2.31 trillion, up from €2.22 trillion in 2017 and €1.18 trillion in 2016 (see Chart 3/Chart A-7). While banks issued fewer debt securities to MMFs, which decreased by 12.3% in 2018, reliance increased on other funding sources. Growth was broad-based, including from securitised assets (+10%), debt securities issued to entities included in the residual OFI (+30%), as well as deposits with MMFs (+28%) and with entities included in the OFI (+4%) (see Chart 3/Chart A-7). Data on European securitisation issuance by collateral showed that the use of residential mortgage-backed securities (RMBS) decreased by 5%, while the securitisation of small and medium-sized enterprise loans doubled and asset-backed securities (ABSs) grew by 30% (see Chart A-32). Despite the recent increase in wholesale funding in absolute volumes, such funding by non-banks has remained stable as a percentage of total bank funding over the past five years, at around 8%.

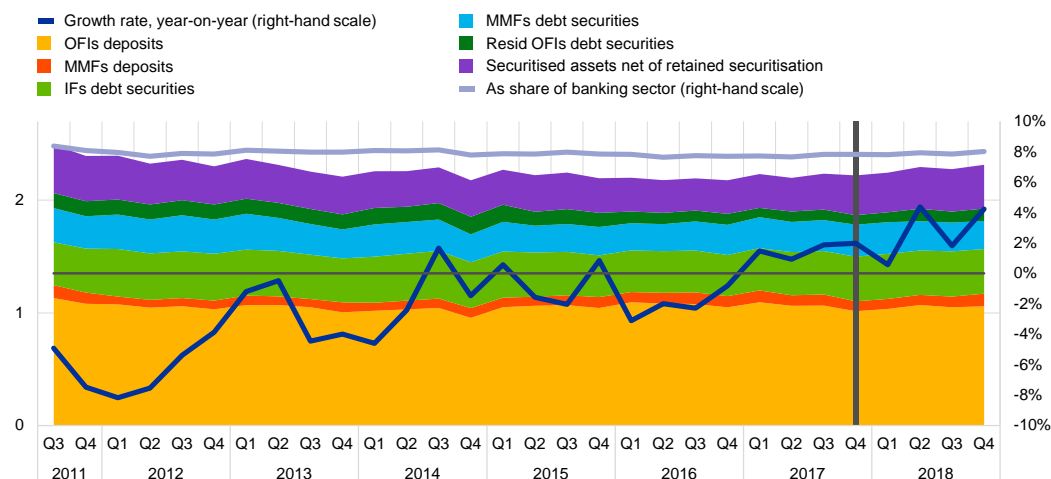
² The measures for AUM in investment funds and OFIs compared with the banking system have been amended compared with the previous version of the EU Shadow Banking Monitor, as ESCB assets have now been excluded from the banking measure.



Chart 3

Wholesale funding provided by non-bank financial entities to the banking sector

(EUR trillions and annual growth rates)



Sources: ECB and ESMA calculations.

Notes: See Section 4.2. The wholesale funding measure is the sum of: MFI funding arising from securitisation; IF, MMF and OFI deposits at EA MFIs; and IF, MMF and OFI holdings of debt securities issued by EA MFIs. "Resid OFIs" reflects the difference between the total financial sector and the known subsectors within the statistical financial accounts (i.e. assets from the banking sector, insurance companies, pension funds, financial vehicle corporations (FVCs), IFs and MMFs).

Terminology

Shadow banking and non-bank financial intermediation

In October 2018 the Financial Stability Board (FSB) announced that it would replace the term "shadow banking" with the term "non-bank financial intermediation".³ Consistent with this, the European Systemic Risk Board (ESRB) has relabelled the "EU Shadow Banking Monitor" as the "EU Non-Bank Financial Intermediation Risk Monitor".

The new terminology reflects the ESRB's monitoring universe adequately and recognises the strengthened microprudential regulation of non-bank financial intermediation. Parts of the ESRB's monitoring universe, such as equity funds or large parts of the OFI residual, do not engage in shadow banking activities. Moreover, regulatory requirements, data reporting and supervision at the EU and global level have been strengthened in a number of non-bank areas, for example OTC derivatives (EMIR), alternative funds (AIFMD), securitisation (CRA and STS), money

³ FSB, "Enhancing Resilience of Non-Bank Financial Intermediation", October 2018.



market funds (MMFR) and securities financing transactions (SFTR),⁴ also with a view to reducing shadow banking risk.

The ESRB's risk monitoring approach will continue to focus on risks and vulnerabilities in investment funds and OFIs, including shadow banking-related activities. The current ESRB monitoring framework is based on a broad approach, covering a wide range of non-bank financial entities from the other financial institutions (OFI) and investment fund sectors in the EU. It assesses their engagement in credit intermediation, liquidity and maturity transformation, leverage and interconnectedness with the banking system. This entity-based monitoring approach is complemented by activity-based monitoring of the use of certain instruments, such as derivatives and securities financing transactions (SFTs).

1.2 Overview of risks and vulnerabilities

Benefits of a growing non-bank financial sector include increased risk-sharing across the financial system and alternative sources of finance, but it can also result in new risks and vulnerabilities. In particular, non-bank financial institutions may increase the riskiness of their asset portfolios, perform liquidity transformation and take on leverage in a procyclical manner. Such vulnerabilities need to be monitored and assessed, taking into account interdependencies within the financial system, as well as the role of non-bank financial institutions in funding the real economy more broadly. Table 1 provides an overview of risks and potential vulnerabilities in the monitoring universe, which are often related given the close links across non-bank entities and activities. The remainder of this section describes the key transmission channels and recent developments in risks and vulnerabilities in the EU non-bank financial system in more detail.

Table 1

Risks and potential vulnerabilities in the EU non-bank financial system

- Risk-taking, liquidity risk and risks associated with leverage among some types of investment funds and other non-bank financial institutions
- Interconnectedness and the risk of contagion across sectors and within the non-bank financial system, including domestic and cross-border linkages
- Activities-related risks – procyclicality, leverage, and liquidity risk – created through the use of derivatives and securities financing transactions

In addition, remaining gaps in data and risk metrics prevent a more complete risk assessment and further work is required to improve risk assessments by developing metrics to measure liquidity, leverage and interconnectedness.

Note: The assessment presented in this report does not provide a ranking of risks and vulnerabilities in the EU monitoring universe in terms of likelihood of materialisation or impact.

⁴ The regulatory developments refer to the European Market Infrastructure Regulation (EMIR); the Alternative Investment Fund Managers Directive (AIFMD); the Credit Rating Agencies Regulation (CRA); the framework for simple transparent and standardised securitisation (STS); the EU Money Market Fund Regulation (MMFR); and the Securities Financing Transaction Regulation (SFTR).



1.2.1 Risk-taking, liquidity risk and risks associated with leverage

The ongoing low interest rate environment has incentivised some non-bank financial institutions and investors to take on more risk in search for higher yields. As part of their portfolio adjustments to the low interest rate environment, non-bank financial institutions have increased their exposures to riskier assets, for instance, in the bond market. This has rendered these non-bank financial institutions vulnerable to a sudden repricing of risk, with potential spillovers to funding conditions of the real and financial sectors.

Risk-taking seems to have stabilised among some types of investment funds in 2018 following several years of rising liquidity transformation. A common pattern observed until 2017 was that some EU bond funds shifted their asset allocation from higher to lower-rated debt securities. Since lower-rated debt securities are often less liquid, this indicates an increased engagement in liquidity transformation. This trend stalled in the second half of 2017 and in 2018 bond funds started to shift some portfolio holdings towards higher-rated debt securities. While the credit quality of assets held in bond funds has improved, liquidity risk, credit and interest rate risk still remain high in the sector.

Financial leverage increased during 2018 among hedge funds, but fell among bond funds. High leverage is a concern as it can amplify shocks and may trigger contagion to other fund classes when market participants are forced to deleverage in response to deteriorating economic fundamentals or a decline in asset prices. There is little evidence on the broader use of leverage among non-bank financial institutions owing to measurement and data limitations⁵. Data reported under the EU Alternative Investment Fund Managers Directive (AIFMD)⁶ show that, on average, most segments of the investment fund sector have low leverage. While hedge funds are a notable exception, the broad fund classification may also mask higher pockets of leverage within some types of investment funds. Reported data showed that 63% of the net asset value (NAV) of EU alternative investment funds (AIFs) was categorised as “Other AIFs”, which covers a wide range of investment strategies.

Non-bank financial institutions, including asset managers and hedge funds are important investors in the leveraged loan market, which has approximately doubled in size since the global financial crisis (see Box 3). In 2018 non-bank investors bought approximately 70% of financing issued in primary leveraged loan markets globally, including through dedicated loan funds and CLOs. The leveraged loan market in the EU is small compared with that in the US, but it has expanded rapidly while underwriting standards have deteriorated (see Box 3). Data gaps still prevent a more detailed assessment of exposures by the non-bank financial sectors, while the monitoring of these exposures relies to a large extent on commercial data sources.

Private debt funds, private equity funds and other non-bank financial institutions have also contributed to the build-up of leverage in the corporate non-financial sector. Although private equity funds are typically not highly leveraged, they tend to increase the leverage of the companies they acquire, in particular in the case of leveraged buy outs. Moreover, market intelligence

⁵ See, for example, EU Shadow Banking Monitor 2018 and 2017.

⁶ ESMA, “[Annual Statistical Report on EU Alternative Investment Funds](#)”, February 2019.



suggests that investment companies traditionally involved in private equity have issued loans to corporates by setting up debt funds. Alternative forms of non-bank financing, e.g. through private debt and private equity funds, can create vulnerabilities among the target companies and in the market for high-yield and leveraged assets. Higher indebtedness can make these companies more vulnerable to economic downturns and increase the risk of defaults, which may result in higher than expected losses to lenders and investors.

1.2.2 Interconnectedness and the risk of contagion

Non-bank financial institutions are closely connected both with each other and with the banking sector through direct and indirect exposures. For instance, investment funds and OFIs represent an important source of wholesale funding for the banking sector. At the same time, banks provide loans and credit lines to non-bank financial institutions or act as counterparties in derivatives transactions. Indirect exposures can arise through ownership structures in financial conglomerates, i.e. involving bank and non-bank financial institutions or from overlapping or correlated portfolios.

Interlinkages with the banking sector are more structural in nature and year-on-year changes in direct interconnectedness are usually small. For instance, despite the recent increase in wholesale funding in absolute volumes, funding by non-bank financial institutions has remained stable as a percentage of total bank funding over the past five years, at around 8% (see Chart 3/Chart A-7). Meanwhile, loans to non-bank financial institutions, debt securities and equities issued by non-bank financials, as a share of total banks' assets, remained stable at around 8%, following a decline from just over 9% in 2013 (see Chart A-8).

Repo and securities lending markets constitute further links between banks and the non-bank financial sector, including investment funds and OFIs. Banks typically use repo transactions to obtain secured funding from bank and non-bank financial counterparties, whereas non-bank financial entities use both reverse-repos for collateralised cash investments and repos for transforming securities into cash, e.g. to fulfil margin requirements in their derivatives portfolio. Activity in both the EU securities lending and repo markets increased in 2018. The EU repo market has continued to expand since 2017 (see Chart A-35), while the value on loan in EU corporate bond lending increased for the first time since 2015 (see Chart A-40).

The banking sector often plays an important role in generating non-bank exposures, but interlinkages might not always be visible from the aggregate statistics. For instance, mortgage loans held by financial vehicle corporations (FVCs) can originally be granted by banks which sell them to other non-bank financial institutions. Banks tend to also be the lead arrangers in leveraged loan markets, where typically non-banks are investing, such as private equity funds, insurance corporations and pension funds, and to a lesser extent retail funds. Other examples include non-bank consumer credit institutions, which, in some countries, tend to be consolidated into bank balance sheets which might not be visible from aggregate statistics. The lack of information and transparency about certain aspects of interconnectedness – through direct or



indirect links – continues to be a challenge for systemic risk monitoring, especially when the activities are of a cross-border nature.⁷

1.2.3 Activity-related risks in derivatives and securities financing transactions

The use of derivatives and securities financing transactions (SFTs) cuts across entities and sectors, thereby creating linkages among them. The use and reuse of financial collateral in such transactions creates intermediation chains, which may become channels for spreading funding liquidity shocks among market participants. Moreover, haircut and margining practices in bilaterally and centrally cleared trades may force market participants to post additional cash or other cash-like collateral. These market dynamics expose counterparties to liquidity risk, which needs to be monitored and managed. In addition to liquidity risk, SFTs and derivatives can be used to build up leverage, exposing market participants to counterparty risk and forcing them to deleverage if the value of collateral deteriorates.

There is some evidence to indicate that the quality of repo collateral declines while the composition in terms of the issuers remains constant during long periods of economic stability. The European repo market survey 2018⁸ shows a decline in collateral ratings from the beginning of 2012 onwards, although the quality of collateral remained stable in 2018. Lower quality collateral is associated not just with higher haircuts, but also with a more pronounced haircut cyclicity, which is particularly relevant from a financial stability perspective.⁹

The reporting obligation under EMIR has made derivatives markets more transparent for authorities who can now better monitor risks. The European Securities and Markets Authority (ESMA) published its first annual statistical report on the EU derivatives markets in October 2018. The report provides an initial view of the structures and trends in European derivatives markets, which amounted to €660 trillion of gross notional outstanding transactions in the fourth quarter of 2017.

The reporting obligation under the Securities Financing Transactions Regulation (SFTR) will help authorities monitor risks in what currently remains an opaque market. The reporting framework under the SFTR will start to be implemented in 2019, but it will take some time until the data can be used for monitoring purposes.

1.2.4 Remaining gaps in data and risk metrics

Remaining data gaps prevent a more complete risk assessment in some parts of the non-bank financial sector. Vulnerabilities can build up unnoticed among entities where statistical

⁷ Abad, J., D'Errico, M., Killeen, N., Luz, V., Peltonen, T., Portes, R., and Urbano, T., “**Mapping the interconnectedness between EU banks and shadow banking entities**”, ESRB Working Paper, No 40, March 2017.

⁸ International Capital Market Association, “**European Repo Market Survey**”, April 2019.

⁹ ESRB Occasional Paper, “**The macroprudential use of margins and haircuts**”, February 2017.



information is not readily available or not sufficiently granular. Such gaps include missing breakdowns by types of entity, e.g. in the OFI residual of the euro area sector accounts, or among investment funds where there is still a large group of alternative funds categorised as “other” under the AIFMD. Some of the entities reported as financial institutions in the euro area accounts, such as some captive financial institutions, are in fact consolidated in the balance sheets of non-financial corporations. Current statistics do not always allow such entities to be distinguished from non-consolidated entities.

The lack of a consistent global measure of leverage for the investment funds sector is a particularly important limitation. The development of globally consistent measures of fund leverage, as devised by the FSB recommendations to IOSCO, is thus important in order to gain a system-wide view of evolving risks.¹⁰ Such consistent measures should comprise metrics based on a gross and a net notional exposure and should be supplemented by risk measures to capture potential losses stemming from leverage and potential liquidity demands from margin calls.

There is a need to integrate various data sources to better understand interconnectedness and contagion risk from a system-wide perspective. Existing risk indicators for IFs tend to be based on broad fund categories such as “bond funds” or “equity funds”. This can limit the ability to assess pockets of risk in specific business models. To improve entity-based and activity-based risk assessments, the ESRB and its member institutions work towards combining various EU-wide datasets, such as those collected under EMIR, SFTR and AIFMD, also merging them with commercial data, to get a more comprehensive view of interlinkages in the financial system.

1.3 Engagement in certain risky activities

The monitoring framework considers how non-bank financial entities are involved in certain risky activities and how these activities might have an impact on financial stability. Table 2 provides an overview of certain risky activities carried out by the entities considered in this report, including liquidity and maturity transformation, leverage, interconnectedness with the banking system and credit intermediation. The assessment of the level of engagement in Table 2 is informed by empirical evidence and market intelligence, but is ultimately judgement-based. It is reviewed and updated on an annual basis and benefits from improved data availability (e.g. under the AIFMD and the SFTR). A more detailed entity-based analysis is presented in Section 2, while activity-based monitoring is covered in Section 3 of the Monitor.

Hedge funds, financial vehicle corporations, security and derivative dealers (if not consolidated in bank balance sheets) are found to have pronounced engagement in the risky activities considered in this report. The engagement of equity funds is low on average and hence equity funds are not further discussed in Section 2. Bond funds, private debt and MMFs as well as special purpose entities (SPEs) and financial corporations engaged in lending (FCLs) are found to have medium engagement. Mixed funds, private equity funds and exchange traded funds (ETFs) have low engagement, on average, at the entity level.

¹⁰ International Organization of Securities Commissions, **Public comment letters**. The ESRB has publically commented on the report expressing support for IOSCO’s efforts to develop consistent measures of leverage.



Table 2

Mapping of activities to entity types

	Investment funds									Other financial institutions			
	MMFs	Bond funds	Mixed funds	Equity funds	Hedge funds	Real estate funds	ETFs	Private equity funds ⁴	Private debt funds	FVCs	SPES	SDDs	FCLs
Market size													
EA AuM (EUR trillion)	1.1	3.1	2.9	3.0	0.4	0.7	0.8	0.4	n.a.	1.9	n.a.	n.a.	0.4
Summary assessment													
Engagement	●	●	●	○	●	●	●	●	●	●	●	●	●
Risk transformation activities													
Credit intermediation	●	●	●	○	●	○	○	●	●	●	○	●	●
Maturity transformation	●	●	●	○	●	●	○	○	○	●	●	●	●
Liquidity transformation	●	●	●	○	●	●	○	○	○	●	●	●	●
Leverage ²	○	●	●	○	●	●	○	●	●	●	●	●	●
Market activities¹													
SFTs	●	●	●	●	●	○	●	○	○	○	○	●	○
Derivatives	●	●	●	●	●	●	●	○	●	●	●	●	○
Reuse of collateral	●	●	●	●	●	●	●	○	●	●	●	●	○
Interconnectedness													
Interconnectedness ³	●	○	○	○	●	●	●	○	○	●	●	○	●

Notes: The table summarises the assessment of engagement, where the colours of the circles reflect the intensity of the possible institutional engagement in the relevant areas of activity, according to the coding specified in the notes below. The colouring is judgement-based and informed by market intelligence and quantitative evidence.

1) Market activities through which risk transformation can be undertaken by IFs and OFIs can take various forms. The list focuses on those market activities deemed to be most susceptible to risks.

2) Leverage refers to financial leverage and not to leverage that is created synthetically through the use of derivatives.

3) Direct and indirect interconnectedness with the banking system based on asset and liability data and staff assessment.

4) While credit intermediation and leverage at the fund level may be low, private equity funds can facilitate credit and leverage in the financial system by engaging in leveraged buyout transactions. Market size data come from the Invest Europe report on 2018 European Private Equity Activity and the Investment Association annual survey on Asset Management in the UK 2017-18. FVCs stands for financial vehicle corporations (non-retained securitisations), FCLs for financial corporations engaged in lending, SDDs for security and derivative dealers, VNAV for variable net asset value and CNAV for constant net asset value. The geographical coverage of the table refers to entities domiciled in the EU. Owing to data limitations and a lack of consistent data, the assessment does not distinguish between consolidated and non-consolidated entities. Colour coding: ●= pronounced engagement; ●= medium engagement; ●= low engagement; ○= unlikely or insignificant engagement.



Regulatory Update

Recent developments in the EU policy framework

There have been a number of policy developments in 2018 related to non-bank financial intermediation. This box provides a brief summary of some of the main developments.

Several amendments to EMIR were proposed to address potential risks related to Brexit.¹¹

On 19 December 2018 the European Commission adopted temporary and conditional equivalence decisions for a fixed, limited period of 12 months to avoid any disruptions in the central clearing of derivatives and of 24 months for central depository services. Further delegated regulations, based on technical standards developed by ESMA and the ESAs and facilitating the novation of over-the-counter contracts from the UK to an EU27 counterparty, were also adopted. Counterparties in the EU may want to novate their OTC derivative contracts by replacing the UK counterparty with an EU counterparty. However, by doing this, they may trigger the clearing obligation or the bilateral margin requirements for these contracts, therefore facing costs that were not accounted for when the contract was originally entered into. The amendments would only apply in a no-deal scenario.

The COREPER¹² has endorsed the EU Council's negotiating stance on the proposed Regulation amending EMIR. This details the procedures and authorities involved for the authorisation of CCPs and requirements for the recognition of third-country CCPs (EMIR 2.2). In particular, the Council text establishes a "CCP supervisory committee" within ESMA composed of a Chair and competent authorities of Member States with an authorised CCP.

The implementation of the new MMF Regulation continues with the consultation on draft guidelines on reporting and stress testing. ESMA has issued a consultation on draft guidelines on reporting to competent authorities under Article 37 of the MMF Regulation. Following the publication of Implementing Technical Standards (ITS) in April 2018 establishing a reporting template that managers of MMFs must use to send information to the NCA, ESMA worked on guidelines and IT guidance to complement the ITS.

ESMA has issued a consultation on draft guidelines for stress test scenarios under the Money Market Funds Regulation. Under Article 28 of the MMF Regulation, ESMA must develop guidelines that establish common reference parameters of the stress test scenarios to be included in the stress tests managers of MMFs are required to conduct. The guidelines must be updated annually taking into account recent market developments. ESMA published its first set of guidelines in March 2018 and the ESRB provided the adverse stress test scenario in March 2019 to support ESMA's stress testing guidelines for managers of MMFs under Article 28.

IOSCO has issued a consultation paper on a proposed framework to help measure leverage used by investment funds. It comprises a two-step process aimed at achieving a meaningful and consistent assessment of global leverage. The first step indicates how regulators could exclude

¹¹ ESRB, "A Review of Macprudential Policy in the EU in 2018", April 2019.

¹² COREPER stands for the "Committee of the Permanent Representatives of the Governments of the Member States to the European Union". Its role and different formations are explained in Article 240(1) of the Treaty on the Functioning of the European Union.



from consideration funds that are unlikely to create stability risks to the financial system while filtering and selecting a subset of other funds for further analysis. The second step calls for regulators to conduct a risk-based analysis of the subset of investment funds identified in the first step. Each jurisdiction is expected to determine the most appropriate risk assessment. The two-step framework seeks an appropriate balance between achieving precise leverage measures and devising simple, robust metrics that can be applied in a consistent manner to a wide range of funds in different jurisdictions. It also addresses synthetic leverage by including exposure created by derivatives; considers different approaches to analysing netting and hedging and the directionality of positions; and includes approaches that limit model risk. The ESRB responded to the consultation, highlighting the importance of a globally consistent core set of leverage measures.

1.4 Fintech

Fintech innovations have the potential to transform existing business models, applications, processes or products causing a material effect on financial markets, institutions and service provision.¹³ Some prominent examples of fintech include distributed ledger technologies, crypto-assets,¹⁴ budgeting tools, mobile payments, and the use of artificial intelligence (AI) in the form of algorithm-based decision making (e.g. for mortgage granting or portfolio management) and cloud-based decision making.¹⁵ The FSB concluded in 2018 that crypto-assets do not pose a material risk to global financial stability at this time.¹⁶ However, fintech innovations have the potential to rapidly transform the financial sector, including risk transmission channels. Material financial stress and systemic risk implications may become more pertinent as the provision of fintech-based financial services increases and new forms of interconnectedness emerge.

Regulators and supervisors are addressing new fintech innovations while ensuring the integrity and resilience of the financial system.¹⁷ Besides consumer protection and market integrity concerns, regulators are focusing on material financial stress and systemic risk implications.¹⁸ The ESRB will continue to review the need to take fintech developments into account in the course of its monitoring framework.

Competent authorities in almost all EU Member States have established so-called innovation facilitators. Some of these have introduced regulatory sandboxes which allow time-limited testing of new innovations under close regulatory oversight, whereas others have introduced innovation hubs intended to provide a contact point for firms to raise queries with supervisors about the regulatory and supervisory treatment of fintech. As mandated by the European Commission, the

¹³ See FSB: “**Monitoring of FinTech**”.

¹⁴ See “**EBA reports on crypto-assets**” and “**ESMA advice on initial coin offerings and crypto-assets**”.

¹⁵ See, for example, EBA (2018), “**EBA Report on the prudential risks and opportunities arising for institutions from FinTech**”.

¹⁶ See FSB (2018): “**Crypto-asset markets – Potential channels for future financial stability implications**”, October 2018.

¹⁷ For example, in the EU, see the EU COM (2018): “**FinTech Action plan: For a more competitive and innovative European financial sector**” and EBA (2018): “**The EBA’s FinTech Roadmap**”.

¹⁸ See EBA (2017): “**Discussion Paper on the EBA’s approach to financial technology (FinTech)**”.



ESAs published a report in January 2019 setting out a comparative analysis of the innovation facilitators established in the EU and operating principles designed to support a common approach to the design and operation of innovation facilitators.¹⁹ The report also included recommendations to strengthen cross-border cooperation and coordination between innovation facilitators, including proposals for the establishment of an EU-level network. As a result of these recommendations, in April 2019 a European Forum for Innovation Facilitators was launched to provide a platform for supervisors to meet regularly to share experiences of engagement with firms through innovation facilitators, to share technological expertise and to reach common views on the regulatory treatment of innovative products, services and business models.²⁰

Following the European Commission's FinTech Action Plan, ESMA and EBA reviewed the applicability and suitability of EU law to crypto-assets. This review identified gaps and issues in the current regulatory framework concerning crypto-assets.²¹ In 2019 the European Commission will take forward work to determine the next steps to further this analysis.²² Furthermore, the EBA cryptotechnologies working group assessed cases for the use of cryptotechnology-based RegTech (regulatory technology) that financial entities can use to lower costs and increase efficiency.²³ Additionally, the International Monetary Fund (IMF) examined the use of central bank digital currency as legal tender and identified anonymity, security and transaction limits as critical features without expecting a significant effect on monetary policy transmission.²⁴

AI is still in an early phase of development, but it has the potential to significantly change the structures of markets and businesses. To date, the usage of AI by banks and insurance companies remains low compared with its application in capital markets. However, with the growing importance of AI, unregulated providers of AI-based technology could rapidly gain a systemically relevant position in financial markets directly, by providing own products, or indirectly, by delivering market infrastructure or data. Hence, it is important to assess whether upcoming AI-based developments in market infrastructure and business models are sufficiently covered by the current supervisory frameworks and whether certain entities (i.e. hedge funds) seek approval in engaging in alternative investment activities such as crypto-assets and, in turn, there may be a need to harmonise legislation across countries to avoid regulatory arbitrage.²⁵

¹⁹ See ESMA / EBA / EIOPA (2018): "**FinTech: Regulatory sandboxes and innovation hubs**".

²⁰ See EBA's "**FinTech Knowledge Hub**".

²¹ See ESMA (2019): "**Advice – Initial Coin Offerings and Crypto-Assets**" and EBA (2019): "**Report with advice for the European Commission on crypto-assets**".

²² See EC's Vice-President Dombrovskis speech at the "**Eurofi High-level Seminar 2019 – Bucharest, Romania**".

²³ See EBA (2018): "**Cryptotechnologies: improving regulatory compliance**".

²⁴ See IMF (2018): "**Casting Light on Central Bank Digital Currency**".

²⁵ See BaFin (2018): "**Big Data meets artificial intelligence**".



2 Entity-based monitoring

The ESRB entity-based monitoring approach to non-bank financial intermediation covers a broad array of non-bank financial institutions. The monitoring universe for the entity-based monitoring comprises investment funds and so-called “other financial institutions”, thus excluding, for example, banks, insurance corporations and pension funds, as well as CCPs with a banking licence.²⁶ In Section 1, Table 2 provides an overview of key entities included in the monitoring universe and summarises their engagement in certain activities that pose or potentially propagate structural financial stability risk. The subsequent section explores these assessments in more detail. In the statistical annex to the Monitor, Table 3 also provides a more detailed overview of OFIs according to the European System of National and Regional Accounts (ESA).²⁷

2.1 Developments in the EU investment fund sector

Assets under management in the EU investment fund sector decreased in 2018 as falls in valuations outweighed inflows across different types of funds (see Chart A-4.1). Equity prices fell sharply during the last quarter of 2018, which is reflected by a sharp drop in net asset values across equity funds and mixed funds (see Chart A-10). Investor inflows into investment funds continued to be positive during the last quarter of 2018 and valuations increased in early 2019.

The fund sector contracted in 2018 in some major host countries such as France, the Netherlands and Luxembourg, while expanding in others such as Ireland and Germany. However, the relative size of investment fund sectors across Member States remained largely unchanged in 2018. There is a large geographical concentration in the EU investment fund sector, with approximately 85% of total EU investment fund assets domiciled in six countries: Luxembourg, Ireland, Germany, France, the UK and the Netherlands (see Chart A-12).

The investment fund sector is linked to the rest of the financial system and the non-financial system through a number of channels. This includes linkages with the real economy, as fund managers channel investors' savings to households and non-financial corporations. Financial sector linkages are created through numerous channels, including wholesale funding of banks provided by non-bank financial entities, funding provided by banks to investment funds, or connections created through the repo and securities lending market. In addition, ownership linkages between asset managers and other financial firms can create possible contagion channels.

Asset management companies have significant ownership linkages to EU banks and, to a lesser extent, insurance corporations. Among the largest 25 asset management companies operating in the EU, 14 are owned by banks and five by insurance companies. The remaining six asset managers are independent, mainly from the US, of which two are among the three largest in

²⁶ AUM by CCPs are partially included in the monitoring universe as OFIs unless the CCPs have a banking licence, in which case they are included within MFI statistics.

²⁷ For more information see, [ESA 2010](#).



the EU. In the case of ownership ties with other financial firms, additional channels of contagion result from reputational spillovers, credit lines and contingency arrangements between banks, their asset management arms and the investment funds that they manage.

Investment funds' exposures to euro area non-financial corporations decreased, while exposures to euro area governments grew in 2018 (see Chart A-18). The share of assets issued by non-financial corporations as a percentage of investment funds' total assets fell during the final quarter of 2018 in line with the fall of equity prices during the same quarter. EU investment fund exposures to banks also fell, while exposures to euro area governments grew slightly. Notably, money market funds' share of bank debt in their overall asset allocation also fell (see Chart A-19).

2.1.1 Bond funds

Bond funds extend credit through the purchase of debt securities and can hold debt of different maturity and liquidity. Through holdings of debt securities, they are exposed to firms across different sectors, which can also result in interconnections with the banking sector. Bond funds engage in credit intermediation and, depending on their redemption policy, also typically perform maturity and liquidity transformation (see Charts A-13, A-14 and A-16). Over the past year, vulnerabilities in bond funds have remained stable or decreased on a number of metrics.

The degree of liquidity transformation performed by EU bond funds remained stable in 2018.

Liquidity transformation by open-ended bond funds, measured by the share of non-liquid assets in total assets, has increased from around 25% in 2009 to 38% at the end of 2018. Over this period, the share of non-liquid assets, such as debt securities issued by non-financial corporations and OFIs, increased. At the same time, the share of liquid assets, such as bank deposits and government debt, gradually decreased. Over the past three years, the ratio of liquidity transformation has remained stable (see Chart A-13). However, the broad sectoral data can also mask pockets of risk or potential vulnerabilities in some market segments such as high yield corporate bond funds.

The average portfolios of EU bond funds have shifted towards higher-rated debt securities, following a trend in previous years towards lower-rated holdings. A common pattern observed over the last few years in the low-yield environment is that some EU bond funds shifted their asset allocation from higher to lower-rated debt securities. Such portfolio adjustments may have been more common in some types of funds, such as high-yield bond funds. On an aggregate sector basis, this trend slowed and partly reversed in 2018, when the share of debt of higher-rated securities with a rating of at least single A went up from 40% to 44% (see Chart A-20).

Since the end of 2016 EU bond funds have also reduced the residual maturities of their portfolios after maturities had increased between 2011 and 2015 (see Chart A-21). As a result, investors invested in these funds now face less interest rate risk compared with the situation in 2016, when interest rates were already low but average maturities were longer. Should global bond yields increase, longer-dated assets are likely to suffer higher valuation losses than short-dated securities. However, the vulnerabilities arising from a larger re pricing of risk premia, for instance, as seen temporarily in the high-yield market last year, remain.



Despite a slight shift towards less risky portfolios of EU bond funds, concerns persist regarding the potential for asset repricing in debt markets to trigger rapid deleveraging and liquidity stress in certain markets. If yields in bond markets were to rise suddenly, bond funds could face large falls in value and subsequent outflows. Low portfolio liquidity may affect the redemption behaviour of investors as it strengthens the first mover advantage for investors. It also makes it more difficult for bond funds to rebalance portfolios following large redemption requests, particularly during stressed market conditions when market liquidity may be strained. Coupled with the reportedly low capacity of dealer banks to absorb such asset sales into their own portfolios, there is still concern over the potential for fund redemptions to have a negative impact on market conditions after a market-wide shock.

2.1.2 Money market funds

MMFs invest in short-term credit assets, perform some maturity and liquidity transformation and are typically highly interconnected with the banking sector (see Charts A-13, A-14 and A-19). MMFs buy short-term money market instruments issued by financial institutions, governments and corporations. Their shares can be redeemed on a daily basis and investors are typically offered redemptions at par. This promise of instantaneous liquidity and stable value means that investors consider them an attractive alternative to bank deposits. MMFs engage in some maturity and liquidity transformation, and a large portion of MMFs' assets consist of bank debt securities and deposits, thereby contributing to interconnectedness with the banking sector.

MMF assets in the euro area have remained roughly stable since 2017, after recovering from lows in 2013 (see Chart A-22). In the fourth quarter of 2018, euro area MMFs held €1,180 billion of assets which is an increase of 0.8% compared with 2017. This figure is below the March 2009 peak (€1,326 billion), but around 42% above the trough reached at the end of 2013 (€832 billion). The sector contracted in the first nine months of 2018 (-2.5%), but recovered during the final quarter of that year. Growth rates in 2018 across major fund domiciles diverged significantly, such as in France (-5.0%), Ireland (+0.3%) and Luxembourg (+5.8%).

Euro area MMFs' interconnectedness with the banking sector remains high, despite the entering into force of a new regulation in July 2018. The regulation limits the usage of a constant net asset value (CNAV) to MMFs investing in public debt securities. Similar reforms in the US led to a shift from prime MMFs, which invest in corporate debt securities, towards government MMFs. In contrast, in the euro area, MMFs remain invested mainly in debt securities issued by banks (see Chart A-19). Indeed, most CNAV prime MMFs in the euro area appear to have transformed into low volatility net asset value (LVNAV) MMFs²⁸, which allows them to continue investing in securities issued by banks.

Liquidity and maturity mismatches between MMF assets and liabilities stabilised in 2018. The low interest rate environment has resulted in pressure on the business models of MMFs and has been accompanied by a reduction in holdings of highly liquid assets over the past few years. MMFs in the EU are constrained in their risk-taking by the regulatory limits placed on the residual

²⁸ See IMMFA, "IRIS Money Fund Report", 12 April 2019.



maturity and the residual life of the securities held. In 2018 the percentage of assets with weekly liquidity and daily liquidity increased (see Chart A-24). During the final quarter of that year, the weighted average maturity (WAM) and weighted average life (WAL) of MMFs' portfolios decreased (see Chart A-23). This coincided with strong inflows into MMFs towards the end of the year. In early 2019 both the WAM and WAL of fund portfolios increased back to their mid-2018 levels.

2.1.3 Real estate funds

Real estate funds invest in real estate both directly, through holdings of physical assets, and indirectly, through holdings of real estate-related financial instruments (e.g. shares in real estate investment trusts (REITs)). Real estate is a highly illiquid asset class, requiring several months for a transaction to be completed. In contrast, open-ended real estate funds typically offer redemptions at higher frequencies. This can expose them to liquidity transformation risks. Notice periods or minimum holding periods usually mitigate liquidity transformation in most open-ended funds. Closed-ended investment funds do not tend to carry liquidity transformation risk as issued shares are not redeemable from the fund.

Assets under management in euro area real estate funds grew in 2018, causing their share of the total investment fund sector to increase to 7%. The continued increase in AUM partially reflects rising real estate prices. Total assets of euro area real estate funds amounted to €807 billion at the end of 2018, an increase of 12% over the year. The growth in assets was equally driven by new fund inflows and higher asset values. Around half of the increase in assets was due to growth in non-financial assets of 12% which largely constitutes property investments. Other assets held by real estate funds also increased, including shares held in other investment funds (13%), equity investments (10%) and debt securities (4%). Growth for all three types of securities was driven by exposures where the issuers were financial corporations other than MFIs or insurance companies and pension funds.

The liquidity composition of open-ended real estate funds' portfolios remained stable in 2018, compared with 2017 (see Chart A-13). The degree of liquidity transformation, which depends on the redeemability of fund shares and redemption frequencies, varies across countries. Some euro area-domiciled real estate funds are mainly open-ended while others have long redemption notice periods in place. Redemption gates and other liquidity management tools available to fund managers may further mitigate the risk of large and abrupt outflows.

Leverage in real estate funds decreased in 2018, but remains considerably higher than in other types of investment funds (see Chart A-14). In 2018 financial leverage of real estate funds continued its longer-term downward trend and was close to 14%, compared with around 20% in 2009. Liabilities of real estate funds primarily consist of shares issued which amount to €653 billion as well as loans and deposits which amount to €111 billion in 2018. Most of the growth in liabilities was due to shares issued which increased by 13%, while loans and deposits grew by 5%.

The real estate fund sector is highly concentrated with most funds registered in a small number of countries (see Chart A-25). Real estate funds registered in five countries (Germany, France, Italy, Luxembourg and Netherlands) account for approximately 90% of all real estate fund assets in the euro area. This concentration of the market has not significantly changed over the



past ten years. The importance of real estate investment funds (REIFs) relative to the domestic investment fund sector varies across countries. For example, in Luxembourg this share represents 3%, while in Germany it is 11% of assets under management. While the real estate fund sector is concentrated in a small number of countries in terms of fund-domicile, funds conduct cross-border investments within the EU as well as in other countries such as the US and Japan.

Compared with 2017, the risk indicators for real estate funds have largely remained unchanged. There were no significant changes in liquidity transformation, maturity transformation and credit intermediation risk metrics (Charts A-12, A-14 and A-16). Leverage in real estate funds fell, continuing a longer term downward trend in recent years (Chart A-15).

Box 1

The role of investment funds and investment trusts in EU CRE markets

Commercial real estate (CRE) markets are important from a financial stability perspective owing to their size and interconnectedness with financial markets and the real economy.

The estimated value of the EU CRE market was €2.35 trillion in 2018, on average 14% of GDP across EU countries (see Chart A).^{29,30} Transaction volumes have increased in recent years and prices are now close to their previous peak³¹ driven, in part, by investors' search for yield in the current low interest rate environment.³² Previous financial crises, including the 2007-09 experience, illustrate how disorderly adjustments in CRE markets can become a source of systemic risk. This box outlines some of the risks associated with the growing involvement of investment funds and investment trusts in EU CRE markets, and highlights differences in market structure across the EU.³³

Real estate investment funds (REIFs) and real estate investment trusts (REITs) account for a significant portion of the CRE market, with assets under management doubling over the past decade. Total assets held in EU REIFs were approximately €807 billion at the end of 2018. Total assets grew from 2% to 5% of EU GDP between 2008 and 2018, with strong year-on-year growth across countries. REIFs also account for an increasing portion of the EU CRE market, increasing from 26% in 2013 to 34% at the end of 2018 (see Chart B). Total assets of REITs also grew significantly over the same period, to stand at an estimated €302 billion in 2018. This constitutes approximately 13% of the EU CRE market, although part of this relates to equity investments by REIFs.

²⁹ This is the estimated value of the "professionally managed" EU CRE stock from Morgan Stanley Capital International (MSCI). "Professionally managed" CRE is the share of the overall CRE market which is not owner-occupied, and is thus owned by professional real estate investors for investment purposes. This estimate only considers direct holdings of physical real estate portfolios, it excludes portfolios of mortgages.

³⁰ Data referenced in this box are as at the fourth quarter of 2017, unless otherwise stated. This is mainly due to limited availability of more recent information on CRE market size and the involvement of REIFs and REITs across the referenced countries.

³¹ See ESRB, "**Report on vulnerabilities in the EU commercial real estate sector**", Frankfurt am Main, November 2018.

³² See ESRB, "**Macroprudential policy issues arising from low interest rates and structural changes in the EU financial system**", Frankfurt am Main, November 2016.

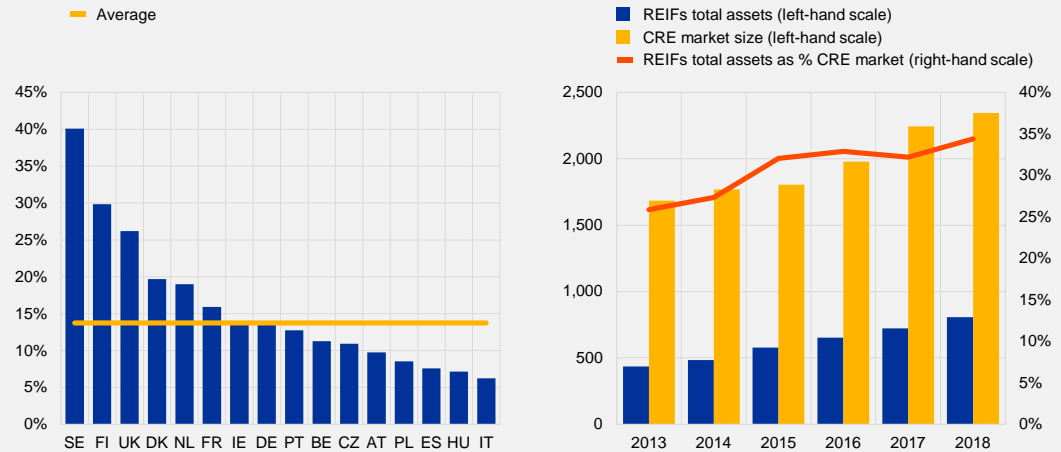
³³ REITs are "Unauthorised Alternative Investment Funds (AIFs)" under AIFMD, i.e. they are collective investment undertakings which do not require authorisation under domestic legislation based on AIFMD. REITs trade on an exchange, whereas REIFs are managed (mutual) AIFs.



Charts A and B

EU CRE market as a percentage of GDP (left-hand panel) and REIFs and CRE market size in Europe (right-hand panel)

(Chart A: percentage of GDP; Chart B: EUR billions, percentage)



Sources: Morgan Stanley Capital International (MSCI), ECB and ESRB calculations.

Notes: Chart A: MSCI estimates of CRE market size across countries for 2017 represent "professionally managed" CRE market only. Market size as % of GNI for Ireland. Chart B: Notes: MSCI estimates of CRE market size across countries for 2017. REIFs total assets refer to REIFs in the EA. The latest observations are for 2017.

The increase in investments through REIFs and REITs can result in new forms of interconnectedness and reinforce existing transmission channels.

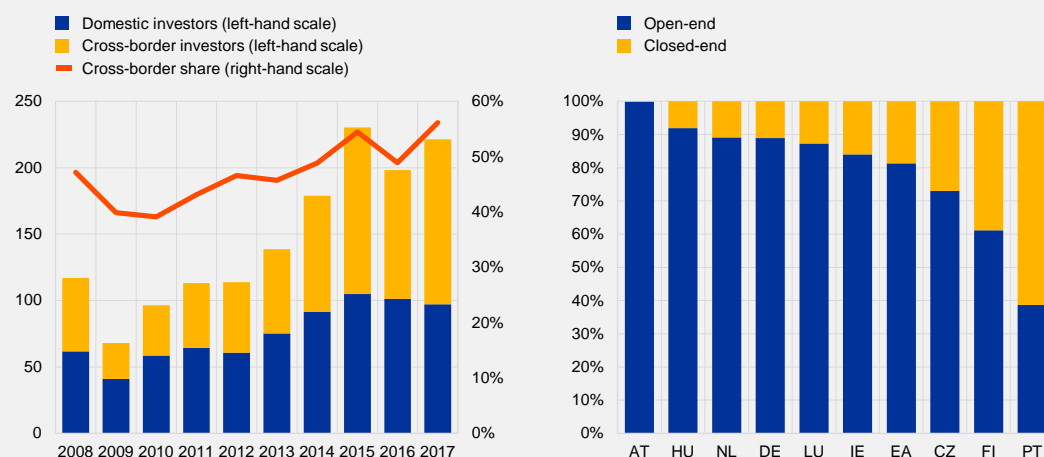
Cross-border flows have become increasingly important over the past decade and more than half of CRE transactions in Europe derived from non-domestic sources in 2017 (see Chart C). Such linkages may increase correlation across global CRE markets and could act as a channel of contagion during severe market stress. Similar to other funds investing in very illiquid assets, REIFs can engage in liquidity transformation. This applies mainly to open-ended REIFs which can face significant liquidity mismatches depending on the redemption frequencies available to investors. While many jurisdictions tend to have open-ended fund structures (see Chart D), long redemption notice periods often help to mitigate risks. Regulatory frameworks and market structures differ across jurisdictions, as illustrated by the examples below.



Charts C and D

CRE transactions in Europe by investor origin (left-hand panel) and share of open-ended and closed-ended real estate investment funds (right-hand panel) ³⁴

(Chart C: EUR millions, percentages; Chart D: percentages)



Sources: Real Capital Analytics (RCA), ECB and Central Bank of Ireland.

Notes: Chart D: SDW, Investment Funds Balance Sheet Statistics, Investment fund shares/units issued by open-ended and closed-ended real estate funds (stock). Only covers countries where both codes are available:

IVF.M.??N.4A.L30.A.1.Z5.0000.Z01.E and IVF.M.??N.4B.L30.A.1.Z5.0000.Z01.E (where ?? is a country code). Open-ended REIFs in Ireland are generally open-ended with limited liquidity. In Chart C, the latest observation is for 2017 and in Chart D it is for the fourth quarter of 2018.

Irish-domiciled REIFs held €18 billion of Irish property assets in 2018, mainly related to CRE.

On average, funding of REIFs investing in Irish property is evenly split between equity (€9.3 billion) and debt (€9 billion), with considerable funding from foreign investors (particularly euro area, UK and US). Financial leverage in REIFs relates to exposures in the form of loans from non-Irish OFIs and shareholders and loans from Irish banks. Liquidity risk associated with REIFs is generally low, as the majority of funds have infrequent redemption facilities and long notice periods are required. Irish-listed REITs held a further €3.5 billion in Irish property in 2017, mainly relating to CRE. Irish REITs are funded mainly through equity and avail of limited debt financing in the form of credit facilities from Irish banks.

Real estate funds in the Netherlands held €50 billion in real estate-related securities and €37 billion in physical assets in 2018, of which €23 billion was RRE and €14 billion was CRE.

There are also REIFs that invest in other REIFs (funds of funds), with approximately €16.9 billion in assets. Investors in these funds are mainly pension funds (89% of AUM) that invest evenly across open and closed-ended funds. Insurers represent approximately 9% of investors in Dutch REIFs and mainly invest in closed-ended funds. Banks' exposures are small and solely relate to closed-ended funds. Liquidity risk among Dutch open-ended funds is low as redemption periods of such funds is longer than the average time required to liquidate assets.

³⁴ ESRB, "Report on vulnerabilities in the EU commercial real estate sector", November 2018.



In Germany, REIFs held €289 billion in total assets in 2018, corresponding to 14% of total fund sector assets. Of these, open-ended REIFs amounted to 85% of total REIF assets. Over the year 2018 open-ended REIFs benefited from strong net inflows. Within the open-ended REIFs subsector, a significant shift has taken place in market shares (as measured by NAV) from public funds to special funds which are designed specifically for the institutional investor market. Between 2009 and 2018 the market share of special funds doubled from 24% to 51%. Most of the assets held by German open-ended REIFs are clearly CRE-related. In this portfolio of CRE assets, 59% relate to real estate assets in Germany. About half of the foreign assets are concentrated in four industrial countries. Although the legal basis for German REITs was created back in 2007, they play only a minor role in the German markets.

In Finland, investment by listed and non-listed real estate companies and real estate funds has risen sharply since 2010, together representing 30% of the property market in 2018.

Investors have recently focused especially on rental housing assets. AUMs in Finnish REIFs amount to approximately €11 billion, of which 55% is held in open-ended funds. In the case of these funds, liquidity risk is mitigated as funds usually do not offer frequent dealing and redemption requests must be made long in advance. Liquidity risks are also deemed to be diminished as open-ended funds mainly invest in RRE, which is generally more liquid than CRE. Finnish REIFs can use fund level leverage but this is usually capped by the funds' own rules. Leverage is mainly in the form of borrowing from banks, and to a lesser extent insurance corporations and pension funds.

REIFs activity in Portugal gained momentum up to the end of 2013, when total assets of these funds reached a peak of 10% of GDP. Growth in REIFs assets in Portugal has been driven mainly by closed-ended funds which accounted for 67% of AUMs of all REIFs in June 2018. In contrast with other jurisdictions there are significant links between the banking sector and the REIF sector, where, in the fourth quarter of 2017, 50% of REIFs' AUMs were managed by management companies belonging to banks. Holdings of physical CRE represent the majority of REIFs exposures, with shares in real estate companies constituting a minor percentage. Following investment trends in other EU markets, in January 2019 the Portuguese government approved the legal framework for REITs, with the expectation that, as in other EU markets, these vehicles will promote investment and dynamism in the real estate market.

2.1.4 Exchange traded funds

Exchange traded products (ETPs) are designed to track the performance of an underlying index or basket of assets which can include a broad range of investments such as shares, bonds and commodities. Most Exchange Traded Funds (ETFs) are managed passively and tend to focus on tracking equity or fixed income market indices. They combine many of the operational aspects of an open-ended investment fund with those of equities traded on an exchange. Like other ETPs, ETFs can be traded on an intra-day basis on secondary markets. Similar to equities, ETFs can be bought on margin and sold short. These features make them popular with market participants who consider them efficient and flexible instruments for trading and hedging purposes.



ETFs perform liquidity transformation if they invest in less liquid market segments while maintaining their open-ended structure and offering intraday trading of their shares. ETFs have a two-tier structure in terms of liquidity. The first layer is known as the “primary market”, where dealing takes place in large blocks of shares, directly with the issuer of the ETF. The primary market includes authorised participants (APs), such as banks and commercial investors, which are permitted by the ETF issuer to be part of the creation and redemption mechanism. APs may trade in ETFs, but they have no legal obligation to create or redeem shares.

In the current low-yield environment, ETFs may appear particularly attractive to investors as they enabled them to take positions in higher-yielding, less liquid markets while promising intraday liquidity. Liquidity mismatches are particularly high in ETFs tracking corporate debt or emerging markets. The liquidity transformation of ETFs, however, differs from liquidity transformation of traditional investment funds in the sense that there is no direct link between the liquidity of the underlying and the redemption of the investor. With ETFs, the liquidity for investors is based on the liquidity of the secondary market, where investors sell their ETF share and where it is not needed to sell the underlying for the redemption. This infrastructure therefore helps to mitigate the first-mover advantages present in redeeming investment fund shares, but entails other disadvantages. The liquidity in the secondary market, for example, depends on the willingness and ability of market participants to continuously trade ETFs in narrow bands around the value of the underlying assets.

In September 2018 total assets held in euro area ETFs reached a historic high of almost €72 billion (see Chart A-26). The growth in the euro area was broadly in line with that of the global ETF market, which more than doubled within five years.³⁵ Technological advancements have supported a market transformation towards more automated trading which helps to keep ETF share prices aligned with the value of their underlying basket of assets. This has facilitated more efficient passive investment strategies, encouraging investors to shift towards low-cost passive funds. These developments are likely to continue as the low interest rate environment causes investors to remain price sensitive, while new regulations such as MiFID II contribute to increased price transparency.

Following the all-time high in assets under management, euro area ETFs saw a decline in assets during the final quarter of 2018, falling to €16 billion. The drop in assets was driven by valuation effects amounting to €56 billion while investor transaction inflows stagnated (see Chart A-26.1). The fall in assets is in line with the downswing of international financial stock markets in the last quarter of 2018 (for example FTSE 100 or MSCI World). Euro area ETF assets account for around 6% of total euro area investment fund assets (see Chart A-26). Assets held in euro area ETFs consist of approximately 61% equities and about 25% debt securities at the end of 2018. The remaining assets relate to derivatives, deposits and loans.

The recent growth of the market warrants a closer assessment from a systemic risk perspective.³⁶ Institutional investors, including traditional investment funds are among the main users of ETFs in Europe. These investors have multiple reasons for investing in ETFs, but in many

³⁵ Statista, “Development of assets of global Exchange Traded Funds (ETFs) from 2003 to 2018”.

³⁶ ESRB, “Reports of the Advisory Scientific Committee – Can ETFs contribute to systemic risk?”, June 2019 and ECB, “Counterparty and liquidity risks in exchange-traded funds”, November 2018.



cases they are used for liquidity management purposes. As ETF shares tend to be liquid, they can be easily converted to cash, while still earning a return on investment. However, if liquidity in ETF markets were to suddenly deteriorate, this can create cascading effects. Risks may arise as investors usually expect ETFs to be liquid at all times, irrespective of the liquidity of the underlying asset and the current market conditions. It is therefore important to better understand the behavioural responses of APs, liquidity providers and arbitrageurs determining liquidity in ETF markets during different types of market shocks.

ETFs and other index-investing products may also increase co-movement and excessive volatility in the underlying securities derived from their trading activities. ETFs can contribute to stress in market segments where they have become a central factor in asset trading and price discovery. A key transmission channel for stress to the wider market is the abrupt selling into markets where liquidity is already strained. The high volatility episode in February 2018 in global equity markets demonstrated the procyclical trading behaviour of some leveraged ETPs. On that date, trading by volatility-related ETPs generated adverse price responses in the underlying markets, eventually leading to the closure of one of the ETPs – the Velocity Shares Daily Inverse VIX Short Term (XIV).³⁷

2.1.5 Hedge funds

The objective of hedge funds is to deliver positive returns using a range of investment strategies to generate returns not necessarily correlated with market trends. The investment styles of hedge funds vary widely, using different techniques and instruments. Although hedge funds can have a directional bias (long or short) or try to take advantage of corporate events (e.g. takeovers), many strategies seek to exploit arbitrage opportunities or price differentials between closely correlated assets or asset classes that differ from those observed in the past. EU hedge funds are regulated entities subject to the UCITS or AIFMD rules.³⁸ However, alternative hedge funds registered under AIFMD can invest in broader asset classes than under UCITS, can make greater use of leverage, and are typically restricted to professional investors.

The total assets of EU hedge funds amounted to €524 billion at the end of 2018, compared with €495 billion in 2017 (see Chart A-27).³⁹ Assets managed by hedge funds have increased at a slower rate than those of other fund types over the past few years. Sector-wide growth for all investment funds amounted to 16% from the end of 2015 until the end of 2018, while the NAV of hedge funds increased by 5% (see Chart A-10).

Risks to financial stability can arise when high leverage is accompanied by a high engagement in liquidity transformation. Leverage is not restricted under the AIFMD but funds are also required to align their liquidity profile and redemption policy with their investment strategy.

³⁷ Bloomberg, “Inverse Volatility Products Almost Worked”, February 2018.

³⁸ See ESMA Report on Trends, Risks and Vulnerabilities, June 2019 (forthcoming). UCITS hedge funds are subject to leverage or value-at-risk limits: in the first quarter of 2019 the financial leverage measured as the ratio between AUM and NAV was 1.27 in the EA.

³⁹ Data are taken from the ECB’s investment fund statistics, as is the definition of “hedge funds”, if not otherwise stated. The ECB statistics for the EU do not include data on hedge funds domiciled in the UK.



Otherwise, some hedge funds could be forced into fire sales in order to meet redemptions. Such asset fire sales can cause spillover effects not only within the leveraged hedge fund sector in which investment strategies can be correlated, but also within other financial sectors.

AIFMD data show that most of the alternative hedge funds sector is managed from the UK, which accounts for 82% of the assets held in the EU. Shares of alternative funds are almost exclusively owned by professional investors, with retail investors accounting for less than 5%.

EU alternative hedge funds are active users of synthetic leverage compared with other AIFs (see Chart A-11.1). While most of the leverage is due to derivatives, financial leverage is also significant for alternative hedge funds, amounting to around 105% of NAV (against 10% for all AIFs). These figures are aligned with data reported to the SEC in the US. Hedge funds have high levels of unencumbered cash (24% versus 5% for all AIFs). The highest levels of cash are held by hedge funds with strategies that have the highest exposures to derivatives, suggesting that part of the cash is held as buffers to cover margin calls.

Regarding liquidity transformation, the liquidity profile of alternative hedge funds indicates little liquidity mismatch. Only 6% of hedge funds subject to the AIFMD offer daily liquidity at the aggregate level. Over a period of one week, investors are permitted to redeem up to 33% of the sector's NAV, while 51% of the assets held can be liquidated within this time frame under normal market conditions (see Chart A-11.2). This pattern remains across all hedge fund strategies, despite different levels of portfolio and investor liquidity. For example, investors in Commodity Trading Advisors (CTA) can redeem up to 85% of the NAV within a week while average portfolios can be fully liquidated over this horizon. For macro funds, possible investors' redemptions within a week amount to 29% of the NAV, while 46% of average portfolios can be liquidated in this timeframe.

Some hedge funds are exposed to liquidity risks through their reliance on short-term borrowings. The risk would crystallise if hedge funds were to use most of their available financing and their counterparts were then to cut or reduce their funding lines. Overall, 30% of the funding is made available overnight, although there are differences depending on investment strategies used by hedge funds. Some strategies, such as credit and event-driven strategies, have most of their funding made available overnight which exposes them to rollover risk.

Box 2

Insights from new data reported under the EU Alternative Investment Fund Managers Directive (AIFMD)

In 2009 G20 leaders agreed that hedge funds or their managers should be registered and be required to disclose information on an ongoing basis to supervisors or regulators. In the EU, this commitment was translated into reporting requirements under the Alternative Investment Fund Manager Directive (AIFMD). Since July 2014 Alternative Fund Managers are required to report



detailed information to the NCAs.⁴⁰ The data collected under AIFMD help authorities in their supervision and can be used by ESMA for EU-wide risk assessments.

ESMA published a first report on the basis of those data in February 2019, providing a comprehensive market-level view of EU Alternative Investment Funds. Based on AIFMD data⁴¹, the AIF industry NAV of €4.9 trillion at the end of 2017:

- The hedge funds sector amounted to €264 billion in NAV at the end of 2017, or 5% of all AIFs. However, when measured by gross exposures, hedge funds (HFs) account for 64% of AIFs since they make substantial use of derivatives. HFs make little use of the EU passport, and they are almost exclusively held by professional investors. Leverage is high at 780% (7.8 times the NAV), particularly for some strategies reliant on derivatives. HFs are exposed to limited liquidity mismatch, typically investing in liquid instruments. HFs are exposed to financing risk, as one-third of their financing is overnight, but they tend to maintain large cash buffers.
- Private Equity (PE) funds account for 4% of NAV of all AIFs, or €204 billion. They follow a range of strategies and are almost exclusively sold to professional investors. PE make little use of synthetic and financial leverage, and invest mainly in illiquid securities (unlisted securities). Overall, liquidity risk is low, given that PE funds are overwhelmingly closed-ended.
- Real Estate Funds account for 11% of the NAV of AIFs, at €540 billion. Funds are primarily invested in CRE and the industry is concentrated in a few countries. Most RE funds are sold throughout the EU, mainly to professional investors, although RE funds have one of the highest share of retail investors (26% of NAV), which given potential liquidity risk is a concern. RE funds are mostly exposed to illiquid physical assets. RE funds make little use of synthetic leverage, but they use financial leverage, with some RE types engaged in short-term borrowing. The financing liquidity risk is amplified by the largest liquidity mismatch among AIF types: within one week, investors can redeem up to 20% of NAV while RE funds can only liquidate 8% of their assets.
- Funds of Funds (FoFs) account for 16% of the NAV of EU AIFs, at around €770 billion. Like other types of AIFs, FoFs are mainly sold to professional investors but they have the largest share of retail investors (31%) among AIFs. FoFs make little use of leverage. While most FoFs are open-ended, there is little liquidity mismatch, with investors able to redeem 83% of the NAV within one week, while 77% of assets could be liquidated within this time frame.
- “Other AIFs” account for 63% of the NAV of EU AIFs, at around €3.1 trillion. This residual category covers a range of strategies, with fixed income and equity strategies accounting for 70% of NAV.

⁴⁰ Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers (AIFMD), Article 24.

⁴¹ Further improvements to AIFMD data quality as reported to ESMA are needed. The statistics cover around 80% of the market in terms of the number of AIF managers and the NAV of AIFs.



AIFMD regulatory reporting requirements offer unprecedented reach and detail, but data collection needs to be improved. In particular, there is an ongoing effort to enhance data coverage, which currently stands at around 80%. Improving overall data quality is the other objective, for example on fund leverage as a key risk measure. In addition, the “Other AIFs” category accounts for a large portion of the total NAV and a more detailed breakdown of fund strategies is needed.

2.1.6 Private equity funds

Private equity (PE) funds are collective investment schemes making use of a wide range of investment strategies. The funds tend to invest in equity and debt issued by non-listed firms. Funding tends to be raised from institutional investors and financial institutions in the form of unfunded capital commitments when the fund is set up. The capital raised is then levied over the fund’s lifetime. PE funds encompass a broad range of fund structures among AIFs and legal structures vary widely across EU jurisdictions. Typically, PE funds are closed-ended funds with five to ten-year terms which may include annual extension options. A broad definition of private equity includes both venture capital, which provides financing for firms’ early-stage development, and leveraged buyouts, where a company is purchased using mainly debt to finance the transaction. Firms specialising in leveraged buyouts account for most of PE funds’ assets under management, while venture capital funds are numerous but smaller in size.

PE funds have assets under management amounting to €204 billion at the end of 2017 and tend to incur little liquidity or maturity transformation risk as their redemption risk is limited by their long-term funding and closed-ended structures. Most PE funds are closed-end funds (95% of NAV), and the redemption frequency for open-ended PE funds is usually longer than for other types of AIFs. The liquidity profile points to no liquidity mismatch under normal market conditions. Within 6 months, investors can redeem up to 5% of the NAV, while 11% of the assets can be liquidated within this timeframe. Given the low financing liquidity risk and very low liquidity mismatch, PE funds tend to have relatively high levels of unencumbered cash compared with other AIFs at 4.9% of NAV. These cash reserves are funds that have not yet been invested by PE funds.

The use of longer term leverage by PE funds is low compared with other fund types. They do not hold significant levels of financial leverage and are not heavy users of derivatives, while outright borrowing amounts to approximately 4% of NAV. However, temporary leverage may be used if PE funds borrow until they can call on the capital commitments from members. PE funds have also increased lending to corporates by setting up debt funds and, in the case of leveraged buyouts, this can further contribute to the leverage of PE target companies. In recent years, PE funds have increased their activities in leveraged loan markets. In the EU, the non-bank share in the primary market for leveraged loans is estimated at 70%, of which approximately 20 percentage points relate to PE funds.⁴²

⁴² FSB, “Global Monitoring Report on Non-Bank Financial Intermediation 2018”.



2.1.7 Private debt funds

Private debt funds invest in debt or debt-like instruments that are not traded and have no quoted price. Through private debt funds, investors can lend to corporations where private debt investments are typically used to support business growth, provide working capital, or fund real estate or other infrastructure projects. Private debt funds aim for equity-like returns and low volatility by focusing on borrowers that may not have access to bank financing, while offering low levels of liquidity to investors. Typical investors in private debt instruments are institutional investors, with pension funds and insurers accounting for 66% of total AUM, followed by sovereign wealth funds (5%), family offices (5%), private banks (4%) and high net worth individuals (3%).⁴³

Following the financial crisis, private debt funds became an increasingly important source of finance as banks withdrew from some segments of the lending markets. Supported by the low interest rate environment and a search for higher returns, global AUM in private debt funds increased from around USD275 billion in 2009 to USD769 billion in 2018.⁴⁴ These are split among different fund types that are active in the private debt market including funds focused on direct lending (33%), distressed debt (30%), mezzanine vehicles (21%), special situations (14%) and venture debt (2%). Lending to small and medium-sized enterprises (SMEs) and mid-market borrowers accounted for approximately half of the lending provided by private credit markets. While the growth in private debt finance reflects a diversification of funding sources for the real economy, it also causes new vulnerabilities. In particular, it can increase rollover risk for borrowers who are not able to access more traditional sources of bank finance or bond markets.

Leverage in some private debt funds has been increasing in recent years, while liquidity transformation remains low. Most private debt funds make use of some form of leverage or financing which can include borrowing against portfolio assets, short-term cash flow management facilities, or subscription line finance, which tends to have terms of less than twelve months. Private debt funds tend to be closed-ended and are mainly held by institutional investors with long term investment horizons, suggesting that they do not engage in significant liquidity transformation. However, institutional investors' exposure to private debt has grown rapidly in recent years and their behaviour in a downturn remains untested. In addition, other investors who have a lower tolerance for illiquidity, for example through the use of asset managers or fund of funds managers, may increasingly seek exposure to this asset class.

Along with the increasing issuance of private debt, leverage of borrowers has increased and loan covenants weakened. Over the past year, 44% of large private credit managers, who manage more than USD 1 billion, reported that covenants have lessened.⁴⁵ Private debt can support the growth of sub-investment grade financing and the continued growth of this market could aggravate defaults during a future economic downturn. Continued inflows from investors into private debt funds mean that borrowers are able to negotiate more flexibility on loan covenants. This encourages increased leverage among borrowers and supports the growth of the leveraged

⁴³ Alternative Credit Council (ACC), Alternative Investment Management Association (AIMA), Dechert LLP, "Financing the Economy 2018 – The role of private credit managers in supporting economic growth".

⁴⁴ Source: Preqin.

⁴⁵ Alternative Credit Council (ACC), Alternative Investment Management Association (AIMA), Dechert LLP, "Financing the Economy 2018 – The role of private credit managers in supporting economic growth".



loan market, including the rising issuance of leveraged loans that are considered to be covenant-lite (see Box 3).

Box 3 Leveraged loans

A leveraged loan is a type of loan that is typically secured and is granted to borrowers that already owe a considerable amount of debt.⁴⁶ Such loans are often sub-investment grade, meaning that the borrowers have high debt-to-EBITDA (earnings before interest, tax, depreciation and amortisation) ratios and low interest coverage ratios. While leveraged loans are not usually secured by specific collateral, as is generally the case for bank loans, they are secured against the borrowers' overall balance sheet. In case of default, they are therefore ranked above bonds and unsecured debt in the capital structure, but below secured loans made by banks and other secured debt. To compensate investors in leveraged loans for the greater risk of losses in case of a default, leveraged loans promise higher rates of return. This can make such loans a popular investment when returns on other investments are compressed. This box examines the growth in leveraged loans and highlights some of the risks and vulnerabilities associated with this asset class.

Leveraged finance, comprising high-yield bonds and leveraged loans, has grown rapidly in recent years (see Chart A). Since the global financial crisis, leveraged finance has roughly doubled in size in the US and in the EU. At the end of 2018 leveraged finance stood at €1.9 trillion in the US and €0.4 trillion in Europe. The proportion of leveraged finance that relates to leveraged loans has been on an upward trend since 2013 and accounted for just over 40% in 2018⁴⁷. These developments were partly driven by the low interest rate environment and subsequent increase in investor demand for higher returns. Leveraged loans, which are often indexed to the interbank interest rate in contrast to fixed-rate high-yield bonds, offer appealing features for medium-term expectations of interest rate increases.

The importance of non-bank investors in the EU leveraged loan market is growing as non-banks bought approximately 70% of financing issued in primary markets in 2018 (see Chart B).⁴⁸ Direct loan origination by investment funds is still a relatively new activity compared with more common primary issuance structures where banks tend to be the lead arrangers. Typical investors from the non-bank sector include private equity funds, which hold around 20% of total outstanding leveraged loans in the EU, as well as institutional investors such as insurance corporations and pension funds, and to a lesser extent retail funds. In addition, approximately 30% of the leveraged loans outstanding in the EU are indirectly held through vehicles such as collateralised loan obligations (CLOs).⁴⁹

⁴⁶ ECB, **Guidance on leveraged transactions**, May 2017.

⁴⁷ **BIS Quarterly Review**, September 2018.

⁴⁸ FSB (2019), "**Global Monitoring Report on Non-Bank Financial Intermediation 2018**".

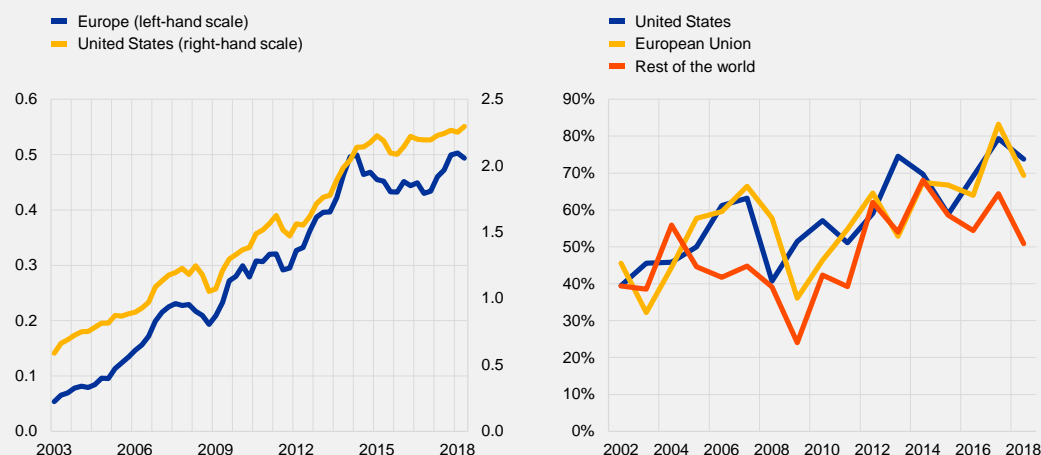
⁴⁹ FSB (2019), "**Global Monitoring Report on Non-Bank Financial Intermediation 2018**".



Charts A and B

Leveraged finance in Europe and the US (left-hand panel)⁵⁰ and non-banks' share of leveraged loan primary market issuance (right-hand panel)⁵¹

(Chart A: EUR trillions; Chart B: percentage)



Sources: BIS Quarterly Review September 2018, ESRB calculations, Bloomberg and ECB calculations.

Notes: Chart A: For institutional leveraged loans, outstanding amounts are based on S&P/LSTA leveraged loan index (LLI) for the US, and S&P European leveraged loan index for Europe; for high-yield (HY) bonds, outstanding amounts are based on the USD high-yield ICE BofAML index for the US and the EUR high-yield ICE BofAML index for Europe. Chart B: The non-bank share in the primary market has been estimated as a share of institutional loans (or institutional tranche) in the total loan issued amount in primary markets. The latest observation for Chart A is for the second quarter of 2018 and the fourth quarter of 2018 for Chart B.

CLOs have almost doubled in the last five years with their assets more concentrated in lower-rated leveraged loans.⁵² CLOs are structured finance vehicles which repackage the credit risk of assets and facilitate the securitisation of corporate loans by transforming these into tradeable securities. Given the illiquid nature of leveraged loans, CLOs provide investors access to this asset class by engaging in liquidity transformation. Most of the CLO tranches outstanding were issued within the last three years, when the underlying credit quality of the borrowers had already deteriorated through increased leverage and fewer loan covenants. Banks have mainly invested in senior tranches, suggesting they are more vulnerable to downgrades and mark-to-market losses than they are to direct credit losses (see Chart C). Asset managers largely invest in investment-grade CLO tranches, while hedge funds mainly hold the riskiest CLO tranches. The opacity about who holds the risk of many CLO tranches raises a number of financial stability concerns that require close monitoring and further investigation. Asset managers and hedge funds, who acquire the majority of the CLO tranches in the primary market, invest mainly on behalf of third parties, so that the actual risk holders of CLO tranches remain unknown.

⁵⁰ "BIS Quarterly Review", September 2018.

⁵¹ FSB (2019), "Global Monitoring Report on Non-Bank Financial Intermediation 2018", p. 76.

⁵² ECB (2019), "Financial Stability Review May 2019".



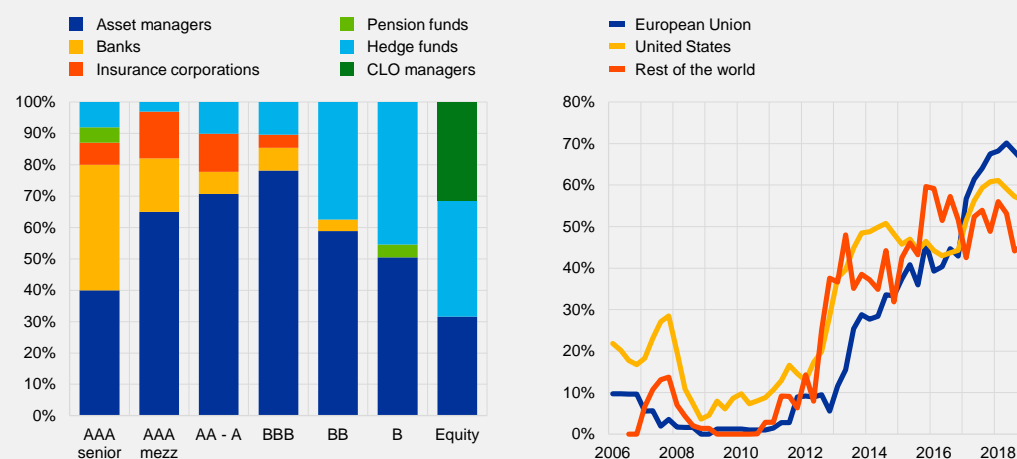
Underwriting standards for leveraged loans have significantly deteriorated, with about 70% of total issuance being categorised as covenant-lite in the euro area in 2018⁵³ (see Chart D).

Over the last three years, the share of covenant-lite loans in the euro area doubled, which also reflects developments in other countries. Leveraged loans used to be secured by contractual clauses that enabled lenders to monitor the borrowing firm's performance and provided protection to investors in case the borrower defaulted. The prevailing level of underwriting standards has decreased considerably, so the same level of creditor protection is not always available on new leveraged loan issuances. Lower underwriting standards increase expected losses, especially in the case of an economic downturn and if future earnings or the repayment capacity of companies were overestimated.

Charts C and D

Buyers of European CLO tranches in the primary market by investor type and rating (left-hand panel)⁵⁴ and share of covenant-lite leveraged loans in primary market issuance (right-hand panel)⁵⁵

(percentage)



Source: ECB Financial Stability Review (May 2019), ECB Financial Stability Review (November 2018).

Note: The latest observation is for the fourth quarter of 2018.

Deteriorating credit standards increase the risk of borrower over-indebtedness and vulnerabilities in the financial system.

The rise of covenant-lite leveraged loans increases the likelihood that some borrowers will take on excessive leverage which can lead to higher defaults in the case of an unexpected economic downturn. Given the floating rate feature of leveraged loans, they may also increase borrowers' debt servicing costs in the case of a normalisation of monetary policy. This increases the risk that highly leveraged borrowers will not be able to fulfil their repayment obligations. To help address this, the ECB issued guidelines on leveraged transactions

⁵³ ECB (2018), "Financial Stability Review November 2018".

⁵⁴ ECB (2019), "Financial Stability Review May 2019".

⁵⁵ ECB (2018), "Financial Stability Review November 2018", p. 55.



in May 2017, which apply to all significant banks supervised by the ECB under Article 6(4) of the SSM Regulation.⁵⁶ The guidance asks the banks to prepare reports and to define their risk appetite concerning leveraged transactions. However, it is important to monitor developments in this market as most financing for leveraged loans is provided by the non-bank sector where wider sell-offs could trigger rapid contagion to other high-yield markets. UCITS are typically targeted at retail investors and have some limitations on investments in leveraged loans, though restrictions are less stringent for investments in CLOs. In contrast, AIFs are typically targeted at professional investors and have no restrictions on leveraged loan exposures.⁵⁷

2.2 Other financial institutions

The following subsections of the report cover entities within the monitoring framework that are not investment funds (see Table 3). The entities included in the category “other financial institutions” pursue a variety of business models and their engagement in bank-like activities differs accordingly. While for most of the fund universe supervisory data are available for the EU or the euro area level, in the following sections data collected by national competent authorities complement the analysis. The challenges inherent in consistently defining and analysing the entities included in these sections at the supra-national level are also reflected by the “OFI residual”, which covers entities for which a more granular sectoral breakdown is not in place at either the EU or the euro area level.

2.2.1 Financial vehicle corporations engaged in securitisation

Financial vehicle corporations (FVCs) are special purpose vehicles (SPVs) engaged in securitisation activity. Securitisation allows the transformation of non-tradable, illiquid assets such as loan portfolios into tradeable securities. In some cases, securitisation is also achieved via the issuance of securitisation fund units or with the use of financial derivatives. Through securitisation, FVCs facilitate the transfer of credit risk originating in financial institutions such as banks to the buyers of the securities issued by the FVC.

Financial institutions, and especially banks, often rely on FVCs for funding and for the transfer of credit risk off their balance sheets. Securitisation lowers funding costs and can thus support the provision of credit to the real economy and facilitate the diversification of risks. However, it can contribute to the build-up of excessive leverage in the financial system and to deterioration in lending standards, as happened in the years leading to the global financial crisis. At the time, securitisation by FVCs played an important role in the increased leverage and maturity mismatches, although the regulatory framework has been substantially strengthened over the past decade.

⁵⁶ ECB (2017), “**Guidance on leveraged transactions**”.

⁵⁷ ESMA Report on Trends, Risks and Vulnerabilities, June 2019 (forthcoming).



Harmonised data for FVCs are available for the EA which allows for an examination of trends in the FVC sector and of the degree of interconnectedness with the banking sector.

Moreover, these data permit an assessment of FVCs' engagement in certain activities that may propagate financial stability risks along with a breakdown of their assets and liabilities. The FVC data also include retained securitisations, which remain on the balance sheet of banks and are therefore already taken into account in the banking system.

Total assets of euro area FVCs stood at €1.97 trillion at the end of 2018, up 5% from €1.88 trillion a year earlier. FVCs' total assets continued to grow and are up 10% from the third quarter of 2016, when they reached their lowest level since the global financial crisis. Ireland and Italy are the largest jurisdictions for FVCs, with over €400 billion in FVC assets each. The majority of the assets of FVCs consisted of securitised loans, which amounted to €1.27 trillion, or 65% of total assets. The allocation of FVC assets between securitised loans, debt securities and other assets has remained stable over the past few years (see Chart A-28). Of securitised loans, 78% were originated by euro area banks. However, this distribution of assets varied widely across countries, with securitised loans representing the vast majority of FVCs' assets in Belgium, Germany and Portugal but significantly less than half in Ireland and Luxembourg (see Chart A-29).

The majority of securitisations are structured in a traditional way whereby cash flows of underlying assets are sold to investors as securities. In contrast, synthetic securitisation, whereby FVCs employ derivatives to transfer the credit risk of assets that remain in the sponsor's balance sheet, is small compared with traditional securitisation: assets of FVCs engaged in synthetic securitisation were €81 billion at the end of 2018.

Following a sharp decline in issuance after the global financial crisis, securitisation issuance is stabilising at a level well below its pre-crisis peak. New issuances reached a low of €180 billion in 2013 from highs of €711 billion in 2008, before rising to €269 billion in 2018. In 2018 42% of new issuance consisted of residential mortgage-backed securities, compared with 82% in 2008. Conversely, the relative importance of collateralised debt obligations (CDOs) increased over the same period from 7% to 19% of new issuances (see Chart A-32). After five years of decline, net issuance of securitised loans increased in 2018. Euro area MFIs accounted for the majority of the reduction in securitised loans after the crisis and this trend continued in 2018, with a net issuance of -€14 billion during the year. Conversely, euro area non-MFIs and non-euro area originators had positive net issuances of €9 and €15 billion, respectively (see Chart A-30).

FVCs are highly connected with the banking sector, with 56% of their assets and 35% of their liabilities directly linked to euro area banks in 2018 (see Chart A-31). While close linkages between FVCs and the banking sector remain, these have continued to fall since their 2011-2012 peaks. Data are only available for the linkages with euro area institutions, but these figures already indicate the high degree of exposure of FVCs to banks. When banks buy back the loans securitised through an FVC, the credit risk remains within the banking sector. Measures of maturity transformation and leverage in FVCs remained unchanged in 2018 and do not indicate significant maturity mismatches in the sector (see Chart A-31). While FVCs are often considered to be bankruptcy-remote, in many instances during the financial crisis bank sponsors stepped in to support the assets of FVCs, thereby taking on their risks and ultimately losses. Investors may therefore underestimate this possibility and the resulting risk of contagion from FVCs to banks and the broader financial system. The new EU securitisation framework, which has been applicable



since January 2019, aims to make securitisation safer and thereby revive the EU securitisation market by standardising products and ensuring more transparency in the sector.

2.2.2 Special-purpose entities⁵⁸

Special purpose entities (SPEs) are legal entities created to fulfil narrow, specific and temporary objectives other than securitisation. SPEs are usually part of complex ownership networks within multinational groups and are linked to a range of sponsoring entities at an international level. Often, they engage in transactions on behalf of their parent companies or are set up as an instrument of intra-group financing. Like FVCs, these entities can issue debt securities and may engage in liquidity transformation.

The range of activities undertaken by SPEs is broad and varies widely across countries.

According to Central Bank of Ireland data, special purpose vehicles (SPVs) domiciled in Ireland and not engaged in securitisation had €294 billion of assets at the end of 2018 compared with €343 billion at the end of 2017. Financial auxiliaries (39% of assets) and non-financial corporations (29%) sponsored the majority of Irish-domiciled SPV assets. The interconnectedness of these vehicles with the banking sector is low. Banks were direct sponsors of vehicles with assets only amounting to around 13% of the total. In terms of location of the sponsor, around half of the vehicles were sponsored by UK and US institutions, with a significant number sponsored by Russian and Irish entities. The principal activities undertaken by Irish non-securitisation SPVs consisted of intra-group financing, external financing (together accounting for almost 37% of total SPV assets) and investment fund-linked vehicles (30%).

Special Financial Institutions (SFIs) constitute the majority of SPEs domiciled in the Netherlands. Their assets amounted to €4.4 trillion in 2018, with some entities having linkages with other financial firms, including banks. SFIs typically include holding companies, finance companies, royalty companies and invoicing companies. The extension of loans, financing activities, receipts of royalties and invoicing conducted by SFIs tends to involve cross-border flows.

The main risks to financial stability posed by SPEs relate to complex cross-border interconnectedness with the banking sector and with other parts of the financial system.

Moreover, those vehicles engaged in credit intermediation and loan origination require close monitoring to understand their business models and linkages across a range of markets. To this end, more granular cross-country balance sheet data are needed to obtain a system-wide perspective of the linkages of these entities. As the financial crisis demonstrated, the lack of granular information on cross-border linkages and potential contagion channels has inhibited regulators' abilities to identify the build-up of concentration risk within the financial system. Understanding the activities and business models of SPEs and assessing their related financial stability risks requires close cooperation at an international level.

⁵⁸ Excluding securitisation-related SPVs.



2.2.3 Security and derivative dealers

Security and derivative dealers (SDDs) are investment firms specialising in securities trading, which are authorised to provide investment services to third parties. These investment firms play an important role in facilitating savings and investment flows across the EU. They provide a range of services which give investors access to securities and derivatives markets. SDDs tend to trade in financial instruments on their own account and at their own risk, for the exclusive purpose of benefiting from the margin between the purchase and the sale price. This type of trading also forms part of their market-making activities. Other key activities of SDDs include the underwriting and placing of financial instruments on behalf of an issuer on a firm commitment or on a standby commitment basis. SDDs do not form part of the regular banking system, but are an important part of the non-bank sector from a systemic risk perspective as they may undertake liquidity and maturity transformation.⁵⁹

SDDs undertake liquidity and maturity transformation but do not form part of the regular banking system. In terms of regulatory treatment, SDDs are regulated under MiFID II and may also be regulated on a prudential basis as credit institutions under CRDIV. All SDDs are licensed and supervised by a supervisory authority, although the precise features of the applicable regimes vary. However, in 2017 the EU commission presented a proposal for a new regulatory framework which aligns capital requirements for investment firms with the size and nature of their activity, as well as with the risk they are exposed to.⁶⁰

The degree of maturity transformation, liquidity and leverage risk depend on a specific SDD's business model. Non-public data collections for the euro area suggest that SDDs' leverage increased before the financial crises, but has fallen over the past decade. This also indicated that total assets have slightly increased over the past year. SDDs engage with a variety of lenders, including banks, and can hold a wide range of asset types with different degrees of maturity. They tend to hold liquid securities which can be converted into cash through the use of repurchase agreements (repos and securities lending) or can be posted as collateral to support various trading strategies. This can result in some maturity and liquidity transformation. In particular, liquidity decreased before the financial crises and has since then begun increasing again.

SDDs may rely on banks as a source of funding and can also be consolidated into banking groups. As part of a financial institution, the consolidated banking group is then required to hold capital against the risks related to the group's SDDs. This incentivises banks to exert a degree of control over the risks borne by SDDs, and risks concerning interconnectedness with the banking sector may therefore be considered to be low.

⁵⁹ SDDs do not fall under the definition of "credit institution" as set out in the CRR. Where SDDs are in a group with a credit institution they must be consolidated pursuant to Article 18(1) of the CRR.

⁶⁰ Brussels, 20.12.2017 COM(2017) 790 final 2017/0359 (COD), "**Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the prudential requirements of investment firms and amending Regulations (EU) No 575/2013, (EU) No 600/2014 and (EU) No 1093/2010**".



2.2.4 Financial corporations engaged in lending

Financial corporations engaged in lending (FCLs) principally specialise in asset financing for households and non-financial corporations. The entities in this subsector include financial leasing, factoring, mortgage lending and consumer lending companies. When carrying out lending activities, FCLs can engage in credit intermediation outside the banking regulatory perimeter.⁶¹

The size of the FCL sector balance sheet has remained stable over the past five years.⁶²

Data published by the ECB show that total assets of FCLs were €0.45 trillion at the end of 2018, representing about 1.5% of OFI total assets. After having declined steadily since 2010, the sector's assets and liabilities started to increase again by around 2% per year in the past three years (see Chart A-33). While the balance sheet composition remained broadly stable, over the last year loans to non-MFIs and equity holdings on the asset side increased slightly. On the other hand, during the last four years, the liability side has shown an increase in FCLs' deposits and loans taken (see Chart A-34).

The extent of regulation for FCLs varies significantly across Member States. Some jurisdictions have prudential regulation in place to address liquidity and leverage risk, although the features of such regimes vary substantially.⁶³ In some countries the assets of these entities may be consolidated into banking groups and, therefore, fall within the banking regulatory perimeter, while in other jurisdictions FCLs are not subject to prudential requirements.

Systemic risks emanating from the sector appear to be small when leverage, liquidity and interconnectedness channels are considered. A simple FCL leverage measure suggests that leverage is below the median value for the banking sector.⁶⁴ Although there is large variation between countries, the liquidity risks facing FCLs are broadly similar to those for the banking sector. Finally, interconnectedness with the banking system appears to be low, as only 5% of FCL assets in 2018 had counterparty exposure to this sector.

2.2.5 Captives and OFI residual

The OFI residual refers to the difference between the total financial sector according to the financial accounts, and the subsectors for which primary statistics are available at the EU level. It continues to pose important challenges from both a statistical perspective and when conducting risk assessments of vulnerabilities in non-bank financial intermediation. Since the publication of the 2018 EU Shadow Banking Monitor, new data have been incorporated to help identify the part of the OFI residual that is related to captive firms (see Chart A-6). Captive financial

⁶¹ In November 2017 the EBA published an opinion on regulatory perimeter issues relating to CRDIV. This opinion explains that those FCLs which are in the same group as a credit institution must be consolidated pursuant to Article 18(1) of the CRR, as they are regarded as "financial institutions".

⁶² ECB's Statistical Data Warehouse, "[Euro area financial corporations engaged in lending](#)".

⁶³ The EBA has undertaken a comprehensive analysis of issues relating to the regulatory perimeter further to the 2014 EBA [Opinion and Report on the perimeter of credit institutions](#). Similar results have been obtained from an ECB survey.

⁶⁴ The leverage indicator is computed as the ratio of total assets to equity. This is in line with the method used to compute the leverage indicator for the EU banking sector, which uses consolidated banking data (CBD), and therefore allows for comparison.



companies tend to be set up by large multinational firms to channel funds between other entities of the group domiciled abroad.

There have been several initiatives at the national and global levels to help reduce the OFI residual by better understanding which entities it covers. The analysis of the OFI residual has been further enhanced by the inclusion of Eurostat data which help to identify total assets related to captive financial institutions.⁶⁵ Given the large number of captive firms domiciled in Luxembourg, the inclusion of the Eurostat data helps to describe half of the OFI residual, reducing it to approximately 26% of the investment fund and OFI sector. In 2018, the ECB carried out a survey focused on entities included in the OFI residual in order to understand better the regulatory requirements applied to them, the extent of prudential consolidation within banking groups, and data availability across EU jurisdictions. The ongoing work takes a broad approach that combines supervisory and statistical sources, including financial accounts. Results show that there is good availability of data at the national level, yet at the same time they reveal that many entities are not regulated.

Efforts to further improve data collection and risk assessments continue at national level.

For example, De Nederlandsche Bank (DNB) intends to expand its data collection on securities held by all sectors. The aim is to enhance the coverage of institutions such as finance companies in order to establish a coherent framework in which flows between all financial sectors can be effectively monitored. Similarly, the UK's Office for National Statistics is undertaking efforts to enhance the UK flow of funds statistics.⁶⁶ This initiative will develop enhanced financial accounts, aimed at improving their quality, coverage and granularity. A significant increase in detail in the financial accounts is planned for the OFI sector, and for investment funds, insurance and pension funds.

To complement the improvements in data collection, further work is required to develop the risk assessment framework for entities included in the OFI residual. For example, to help assess maturity mismatches and associated liquidity risks, remaining maturity splits for portfolios could be collected instead of original maturity split. Portfolio breakdowns by currency of denomination would also help to assess related risks, while more detailed analysis of specific markets and asset classes could be improved. For example, in the financial accounts repurchase agreements cannot be distinguished from loans and deposits. These markets tend to play an important role in liquidity and maturity transformation undertaken by non-bank financial institutions, in particular for institutions that require access to wholesale financing. Euro area micro-level data sources include the Centralised Securities Database (CSDB), Securities Holdings Statistics (SHS), analytical credit datasets (AnaCredit), and data obtained through the European Market Infrastructure Regulation (EMIR).⁶⁷

Entities included in the OFI residual may not engage in shadow banking activities, but may be interconnected with other parts of the financial system. Entities such as captive financial institutions (CFIs) do not necessarily engage in credit intermediation or in the issuance of debt

⁶⁵ Eurostat's **total assets related to captive financial institutions**.

⁶⁶ UK Office for National Statistics, "**UK Flow of Funds Project: total financial account**".

⁶⁷ See Anna Maria Agresti and Celestino Giron, ECB, "**Challenges for macro data on non-bank financial intermediaries**", 2018.



instruments. They tend not to be regulated, however, and can form part of a complex financial intermediation chain where they may engage in securities and financing transactions or make use of leverage through the use of derivatives. Owing to a lack of harmonised data on CFIs and the importance of these entities in some jurisdictions, additional analysis and data collection will need to be undertaken to better understand the business models of these entities and their legal frameworks. The potential involvement of these entities in risks that typically fall within the scope of shadow banking activities and their consolidation in banking and financial conglomerates have yet to be ascertained. The analytical framework will therefore have to continue assessing the OFI residual's relevance in the highly interconnected financial system.



3 Activity-based monitoring

Activity-based monitoring complements entity-based monitoring, thereby ensuring a more complete understanding of financial stability risks related to non-bank financial intermediation. Entity-based monitoring may not capture all aspects of systemic risks, in particular those that may arise from specific markets that cut across entities. Complementing entity-based monitoring with activity-based monitoring sheds further light on the use of certain financial instruments and the type of markets in which various types of financial institutions, including banks and entities in and outside the monitoring framework, interact.

3.1 Derivatives

Derivatives can be used for hedging or speculative purposes and their use increases interconnectedness within the financial system.⁶⁸ Derivatives can be used as a risk reduction tool, as they allow market participants to transfer unwanted risks, including market risk (e.g. movements in market variables such as exchange rates, interest rates, equity prices and commodity prices) and credit risk (e.g. the risk of late payment or the failure of a counterparty) to other market participants. This can contribute to risks being born by those market participants that are best placed to manage or bear it. However, as a risk transfer tool, derivatives can create complex financial intermediation chains that increase interconnectedness between entities and across different markets. Counterparty risk, credit risk and procyclical behaviour, in addition to risks and vulnerabilities arising from interconnectedness, can act as additional risk transmission channels in which non-bank financial institutions might play a relevant role. As a broad variety of non-bank financial institutions are involved in derivatives trading, it is important to understand why and how these institutions use derivatives.

The use of derivatives can pose risks to financial stability, e.g. through the leverage they facilitate and via procyclical behaviour. Gaining outright exposure to an asset underlying a derivative could entail borrowing an amount equal to the purchase price. By contrast, gaining the same exposure through derivatives typically incurs comparatively small up-front costs (e.g. in the form of an initial margin and – for some derivatives such as options – a premium). The use of derivatives can therefore create synthetic leverage. Furthermore, the interplay between market risk, counterparty risk and liquidity risk, and the distribution of these risks across market participants, can also be a source of systemic risk. Procyclicality in collateral requirements can lead to sudden deleveraging during the downswing phase of asset price cycles.

⁶⁸ Derivatives are usually defined as instruments with a predefined maturity, entailing an obligation or option to acquire or sell underlying assets or to effect a cash settlement determined with reference to transferable securities, currencies, interest rates or yields, commodities, or other indices or measures. Different derivative classes are used by different counterparties to address different needs. In general, interest rate swaps (IRS) are widely used as hedging instruments among banks and other intermediaries, although they may leave individual entities sensitive to interest rate changes. Credit derivatives markets, in particular the market for credit default swaps (CDSs), transfer counterparty and underlying asset credit risk at the same time. On the other hand, the market for foreign exchange (FX) derivatives allows financial and non-financial counterparties to hedge against unwanted foreign exchange risk, and constitutes a closer link between the financial system and the real economy than other forms of derivatives. See Abad, J. et al., "Shedding light on dark markets: First insights from the new EU-wide OTC derivatives dataset", Occasional Paper Series, No 11, ESRB, September 2016, for more details and an in-depth analysis.



An analysis by ESMA published in October 2018 shows that, at the end of 2017, the EU derivatives markets amounted to a gross notional amount outstanding of around €60 trillion. The analysis included both OTC and ETD derivatives, showing that EU derivatives markets are larger than previously measured and that derivatives are mostly traded OTC. In terms of gross notional amount outstanding, interest rate derivatives are the largest segment of the market, accounting for 69% (see Chart A-46). Currency derivatives follow, accounting for 12% of the total notional, while the other asset classes are all below 5% of the total notional. The overall picture is different and more diversified when the number of outstanding derivative transactions is considered. Equity derivatives and currency derivatives account for 38% and 32% respectively of the outstanding derivatives positions at the end of 2017, followed by commodity derivatives (15%) and interest rate derivatives (8%).⁶⁹ The share of exchange-traded transactions remains low, at 14% of the total number of derivatives. Currency and credit derivatives are mostly traded OTC with around 97% of the total number of trades, followed by interest rate derivatives (92%). For commodity and equity derivatives, OTC percentages are lower, although still high at 65% and 53% of the total respectively. The higher incidence of ETD trades is driven by the underlying contract type. For instance, futures are used more in cases of equity and commodity derivatives (see Chart A-47).

EMIR data confirm the central role of investment firms and banks in EU derivatives markets, while non-financial corporations are not major players and mainly make use of credit and interest rate derivatives. Investment firms and banks are the main participants, trading almost 96% of the market in notional terms (61% and 35% respectively) (see Chart A-48). Alternative investment funds represent 2% of the gross notional outstanding at the end of 2017 while UCITS funds account for less than 1%. Banks and investment firms dominate across underlying asset classes. Alternative investment funds are particularly active in credit derivatives (around 6% of the market notional amount) and interest rate derivatives markets (around 3% of the market notional amount). UCITS funds are minor players in the market and their exposure exceeds 2% of the total notional amount in only the credit derivatives and the equity derivatives segment. This result is in line with recent analysis on the use of CDS by UCITS funds.⁷⁰ However, this result has to be interpreted with care as investment firms and banks may act as intermediaries and conduct trading on behalf of end clients.

3.2 Securities financing transactions

Securities Financing Transactions (SFTs) allow investors and firms to use assets, such as the shares or bonds they own, to secure funding for their activities. A securities financing transaction can take various forms including a margin lending transaction, a buy-sell back transaction, or the lending of a security for a fee in return for a guarantee in the form of financial instruments or cash given by the borrower. One of the most common SFTs is a repurchase

⁶⁹ See “**ESMA Annual Statistical Report – EU Derivatives Markets 2018**” for a comprehensive description of EU derivatives markets.

⁷⁰ Braunsteffer, A., C. Guagliano, O. Kenny and J. Mazzacurati “The use of CDS by UCITS investment funds – Evidence from regulatory data”, ESRB working paper, forthcoming. Guagliano, C. and J. Mazzacurati “Drivers of CDS usage by EU UCITS funds”, ESMA Report on Trends, Risks and Vulnerabilities.



transaction which involves selling a security and agreeing to repurchase it in the future for the original sum of money plus a return for the use of that money.

SFTs can enhance the efficiency of the financial sector but may contribute to systemic risks.

They can enhance the efficiency of the financial sector by facilitating credit growth, maturity and liquidity transformation outside the banking system. However, during stressed market conditions, liquidity risks can materialise as the maturity of SFTs is short (often overnight), while the value of collateral can be pro cyclical. The reinvestment of cash collateral in securities may contribute to maturity and liquidity transformation, while the reuse of non-cash collateral may increase interconnectedness across sectors.

The total outstanding value of EU securities on loans increased to €23 billion at the end of 2018 compared with €9 billion at the end of 2017.

EU securities on loans include government bonds (€315 billion), corporate bonds (€42 billion) and equities (€166 billion). Government bond lending has fallen marginally by 0.3% since the end of 2017, while lending of equities has increased by 2.0% and corporate bond lending has grown strongly by 33.8% (see Charts A-39, A-40 and A-41). The growth in corporate bond loans was concentrated on euro-denominated bonds and appears mainly driven by new demand from ETF providers launching corporate bond index trackers. This includes ETFs tracking high-yield bond indices, raising potential concerns around their ability to quickly unwind contractual securities lending arrangements in order to meet investor redemptions.⁷¹ Utilisation rates – the ratio of securities borrowed over the securities that institutional investors are willing to lend – provide an indication for short-selling activities. A higher utilisation rate increases the likelihood that short sellers could face a buy-in if investors recall their loaned securities. While the utilisation rates of government bonds decreased by 3.3% from the end of 2017 to the end of 2018, utilisation rates for equities and corporate bonds increased by 21.1% and 31.4% respectively (see Chart A-38).

The gross amount of repo and reverse repo transactions reached €7.7 trillion in December 2018, up 37% from two years ago.⁷²

The increase was driven mainly by the growth in centrally-cleared repos using government bond collateral.⁷³ This reflects a combination of demand for high-quality collateral, including for regulatory purposes, and increased reliance on so-called general collateral platforms run by EU-based CCPs. Meanwhile, the downward trend of 2017 in sovereign repo rates was reversed in 2018, in line with the broader repricing in money and credit markets. Volatility spikes in repo rates also reflect an increase in demand for high-quality collateral together with the significant deleveraging taking place within EU banks around reporting periods which is compounded by typically low trading volumes around the end of each year (see Chart A-36). Central bank initiatives to address collateral scarcity issues, such as the Eurosystem's Securities Lending Programme, may alleviate such volatility, resulting in a reduction of volatility spikes. Securities lending is collateralised using either cash or other securities. Regarding the type of collateralisation in repo markets, most EU securities are collateralised with non-cash. Utilisation of cash collateral may lead to liquidity transformation when cash collateral is received at open maturity and reinvested at term maturity. The ratio of non-cash to cash collateral used for SFTs decreased

⁷¹ IHS Markit, "Securities Finance Quarterly Review", Q1 2019.

⁷² International Capital Market Association (ICMA), "ICMA repo survey", December 2018.

⁷³ ESMA "Report on Trends, Risks and Vulnerabilities, No 1", 2019.



significantly from 15.4 at the end of 2017 to 11.1 at the end of 2018 for government bonds, while it remained fairly stable for corporate bonds (2018: 5.1, 2017: 4.5) and equities (2018: 4.9, 2017: 4.3) (see Charts A-39, A-40, A-41).

The ownership of EU government bonds available for lending from non-bank financial institutions has increased.

Non-bank financial institutions owned an increasing share of government bonds available for lending at December 2018, with pension funds (28%), insurance corporations (17%) and investment funds (17%) being the major owners, while the share held by banks amounted to 17% (see Chart A-44). On the other hand, the ownership of equities available for lending changed little in 2018 compared with 2017. It is dominated by investment funds (57%), followed by pension funds (17%) and insurance corporations (6%) (see Chart A-45). During 2018, the amount of securities lending transactions that involved investment fund-owned equities fell by 7% to €27.3 billion, increased by 37% to €7.1 billion for corporate bonds, and remained fairly stable at €12.1 billion for government bonds (see Chart A-43). As significant holders of corporate bonds, investment funds may become increasingly active in securities lending markets to meet new borrower demand for corporate bonds. This can result in increased interlinkages within the non-bank financial sector.

Most of the securities lending transactions (67%) are open term and therefore have no specified end date.

Open term transactions grew during the first half of 2018, before ending the year down by 3.3% as banks increased their high-quality liquid assets that can be converted into cash for liquidity needs (see Chart A-39). The growth of term-lending transactions subsided at 0.7% during 2017 but rebounded at 6.6% at the end of 2018 owing to regulatory requirements and the adoption of certain strategies that require the availability of securities over a longer duration. The average tenure as at December 2018 was 276 days for government bonds, 150 days for corporate bonds and 74 days for equities (see Chart A-42).

Leverage and liquidity risks of the use of SFTs may emerge through the reuse of collateral.

In stressed market conditions, the fall in the value of securities used as collateral prompts lenders to demand additional collateral, possibly forcing borrowers to sell assets and post additional collateral. This may create a shock that spreads rapidly through the interconnected financial system, impacting banking and non-bank financial entities that rely on funding themselves through SFTs. Liquidity risks have emerged as bank funding shifted toward short-term and uninsured market-based sources. A shift to market funding, which is not covered by deposit insurance, often involves interlinked chains of maturity transformation, where assets used as collateral pass along multiple intermediaries, increasing fragility.

Interconnectedness between banks and non-banks has increased through the use of repo transactions.

According to the balance sheet data of euro area MFIs⁷⁴, repo liabilities with non-MFIs increased and amounted to €254.0 billion in December 2018 compared with €210.5 billion at the end of 2017, reversing their decline of 2017 (see Chart A-37). CCPs, being the largest MFI counterparty, increased to €186.4 billion in December 2018, compared with €142.8 billion at the end of 2017. As a result, their share as counterparties of MFI repo liabilities increased from 68% at

⁷⁴ Monetary Financial Institutions (MFIs) comprise national central banks and the ECB, credit institutions as defined in Article 4(1)(1) of Regulation (EU) No 575/2013 and certain OFIs that receive deposits and/or close substitutes for deposits from the public and, for their own account, grant credit and/or make investments in securities.



the end of 2017 to 73% in December 2018. By contrast, non-MMF investment funds decreased and amounted to €39.6 billion in December 2018 compared with €43.2 billion at the end of 2017. The structure of repo liabilities changed during 2018 compared with the previous year as the interconnectedness of banks with CCPs became more significant.

Open term transactions present a higher liquidity risk than term transactions. Open term transactions present a higher liquidity risk as, in periods of financial stress, lenders may recall the securities lent in open maturity transactions at any point in time, but borrowers may not be able to return them at short notice. This triggers the process of liquidating collateral and repurchasing lent securities.

Box 4

Interdependencies in central clearing in the EU derivatives markets

Central counterparties (CCPs) are by their very nature highly interconnected with other market participants. By managing the post-trade risk of financial transactions, CCPs fulfil a key function in financial markets. Regulatory initiatives, including the introduction of the clearing obligation, have led to a higher rate of central clearing, and CCPs have become key institutions in the financial system. Through the very nature of their business, they are interconnected with other market participants. This includes their clearing members (mostly banks) and their clients (e.g. insurance companies, pension funds, hedge funds and investment funds). Hence, owing to the post-crisis regulatory reforms, a larger fraction of non-bank financial intermediaries have found themselves directly and indirectly interlinked with CCPs.

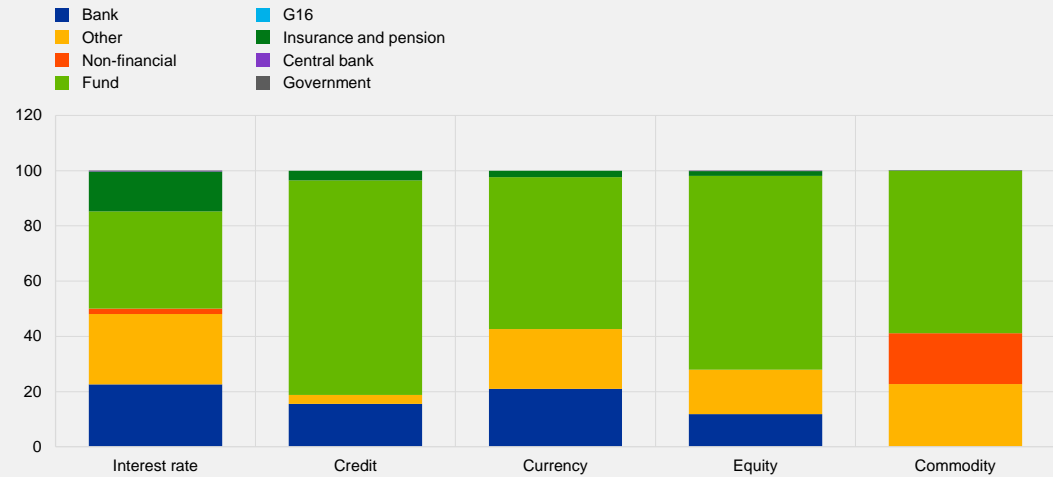
Non-bank financial institutions mostly participate in central clearing as clients of clearing members and represent a high share of client clearing. Based on EU derivatives markets data, Chart A shows the percentage of clearing members' client trades by asset class and by client sector, including banks, central banks, insurance companies and pension funds, G16 dealers, funds, non-financial companies and a residual sector ("other"). Funds, banks as well as insurance companies and pension funds represent a high share of the client clearing sector in the EU.



Chart A

Percentage of the notional value of clearing members' client trades by client type

(Q4 2018, share)



Source: Forthcoming ESRB Occasional Paper.

Notes: Owing to the confidentiality of data, the following types of institutions are not included in the chart: Credit derivatives: non-financial, government; currency derivatives: non-financial, central bank; equity derivatives: non-financial, G16; commodity derivatives: bank, G16, central bank, other.

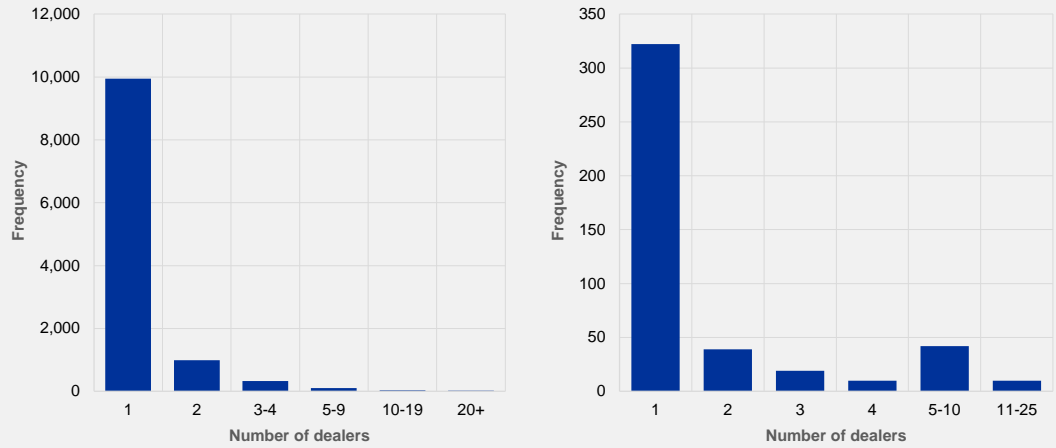
Most clients only have access to one clearing member through which they clear their derivative contracts. Chart B presents a histogram of the number of clearing members that each client uses to clear its interest rate (left-hand panel) and credit derivatives (right-hand panel). Clearly, the vast majority of clients use a single clearing member to clear their trades, while approximately ten percent of the clients use two clearing members to clear their derivative contracts. There is a small share of clients that use more than three clearing members to clear derivatives. The low number of clearing members per client may reflect the high costs for clients to use several clearing members. However, this also means that clients, including non-bank financial institutions, rely heavily on a small number of dealer banks to provide client clearing services.



Chart B

Number of clearing members by client

(Q4 2018, for interest rate (in logs) on the left-hand side and credit derivatives on the right-hand side)



Source: Forthcoming ESRB Occasional Paper.

When analysing those clients who use multiple clearing members, the portfolios cleared display a high degree of similarity. For clients using multiple clearing members to clear their single-name CDS trades, Chart C shows the similarity⁷⁵ between these clients' positions at their different clearing members. The distribution is clearly bimodal, with many observations having a cosine similarity close to zero while others are close to one. When cosine similarity is close to zero it implies that the client's position at its different dealers are uncorrelated, while a cosine similarity close to one implies that the client has very similar positions at the different dealers. Specifically, this means that these clients are either buying or selling protection on the same underlying with several dealers. This may reflect the incentive to split positions of clients across several clearing members if these positions are large and therefore prone to surcharges in the form of additional margin for large and concentrated portfolios. The effective distribution (solid black line) is compared to a hypothetical random portfolio allocation (dashed red line).

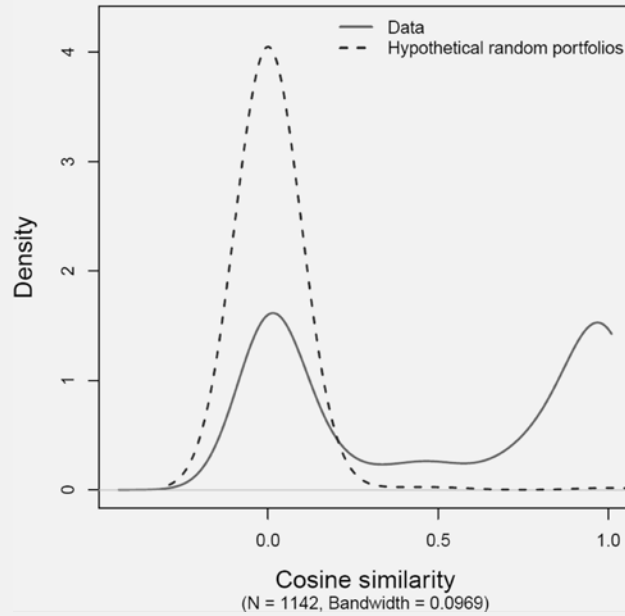
⁷⁵ For this analysis, cosine similarity, as described in Getmansky et al. (2017), is used as a measure of similarity. The cosine similarity of two vectors x and y is defined as $\frac{\langle x, y \rangle}{(\|x\| \|y\|)}$ and ranges from -1 to 1. For further details, the reader is referred to the forthcoming Occasional Paper.



Chart C

Distribution of portfolio similarity in single-name CDS

(Q4 2018: distribution of cosine similarity of client portfolios for clients that use multiple clearing members to clear their single-name CDS.)



Sources: Forthcoming ESRB Occasional Paper.



4 Statistical overview

As a reference, several charts in Section 4.2 include a vertical line at December 2017 or the fourth quarter of 2017 to better illustrate developments since the data shown in the EU Shadow Banking Monitor 2018. Charts include data as of July 2019.

4.1 Statistical classification for investment funds and OFIs

Table 3

	Entities: Sectors and subsectors		Description
Investment funds (IFs)	Money market funds (ESA S.123)		Part of the monetary financial institutions (MFI) sector
	Non-MMF investment funds (ESA S.124)	Bond funds Equity funds Mixed funds Real estate funds Hedge funds Other funds	Allocated to investment policy according to assets in which they primarily invest
		Exchange-traded funds (ETFs) Private equity funds	
Other financial institutions (OFIs)	Other financial intermediaries (ESA S.125)	Financial vehicle corporations engaged in securitisation (FVCs) Financial corporations engaged in lending (FCLs) Security and derivative dealers (SDDs) Specialised financial corporations	i.e. special purpose vehicles engaged in securitisation e.g. financial leasing, factoring, hire purchase i.e. dealers on own account e.g. venture capital, export/import financing, central counterparties (CCPs)
		Financial auxiliaries (ESA S.126) Captive financial institutions and money lenders (ESA S.127)	e.g. insurance or loan brokers, fund managers, head offices of financial groups, financial guarantors e.g. SPEs not engaged in securitisation, "brass plate" companies, holding companies

Note: Some CCPs are classified as specialised financial corporations under ESA 2010, while others have bank licences and are included in the Monetary Financial Institution statistics.

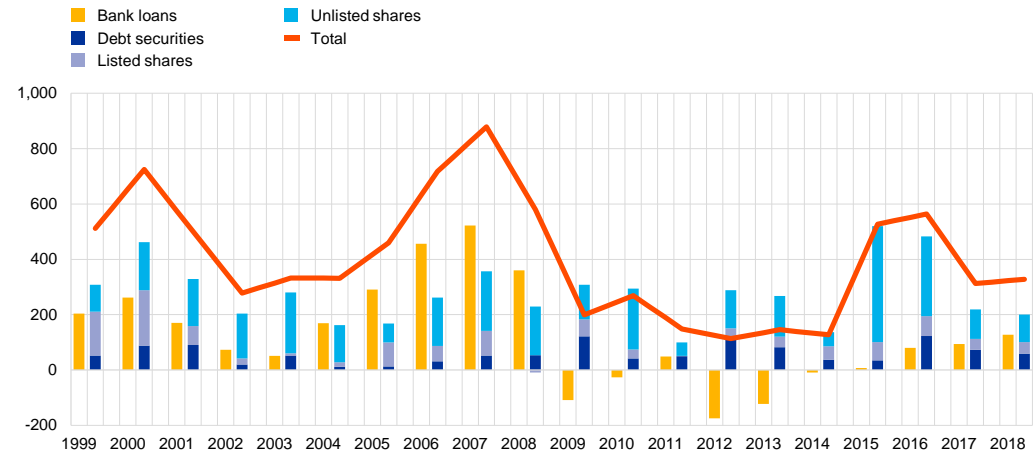


4.2 Developments in main aggregates

Chart A-1.1

Net finance raised by euro area non-financial corporations

(EUR billions)

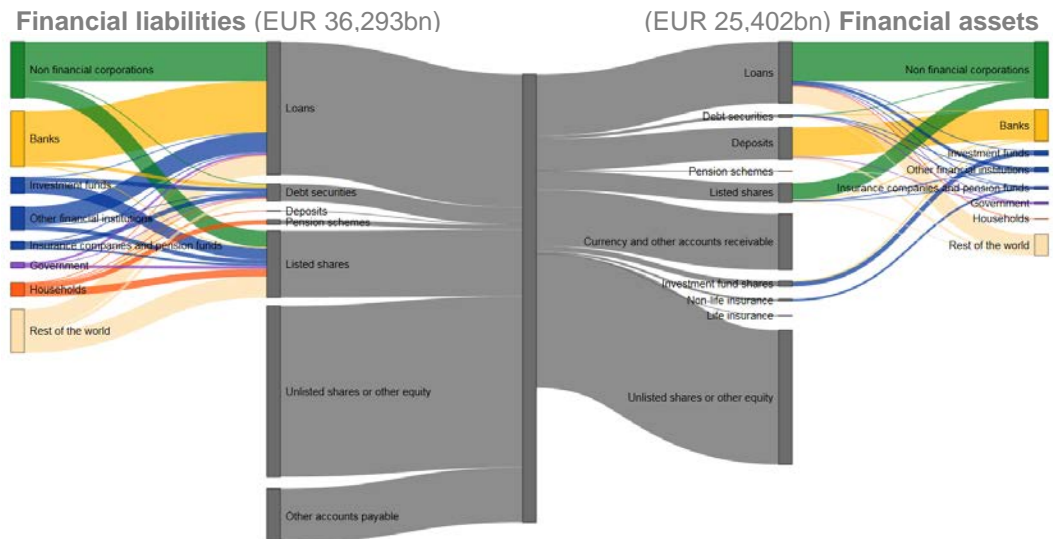


Sources: ECB Quarterly Sector Accounts (QSA) and ESRB calculations.

Chart A-1.2

Financial balance sheet of euro area non-financial corporations

(EUR billions)



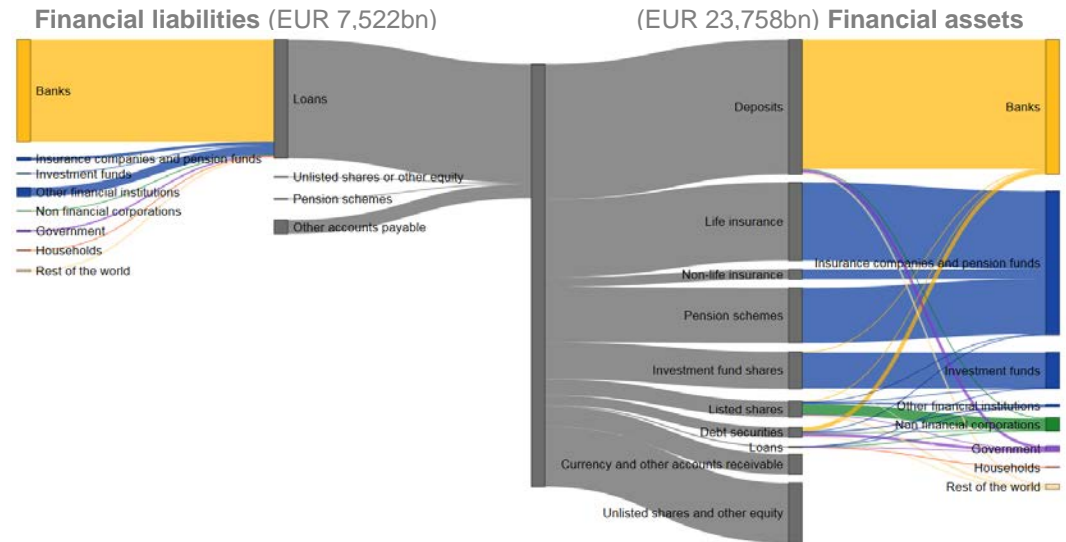
Sources: ECB and ESRB calculations.

Notes: The chart shows issuing and holding sectors of NFCs' financial assets for the EA. Outstanding amounts as of Q4 2018. The data refer to the domestic counterpart area. Financial balance sheets of households and NFCs exclude currency and financial derivatives. The latest observation is for the fourth quarter of 2018.



Chart A-1.3
Financial balance sheet of euro area households

(EUR billions)

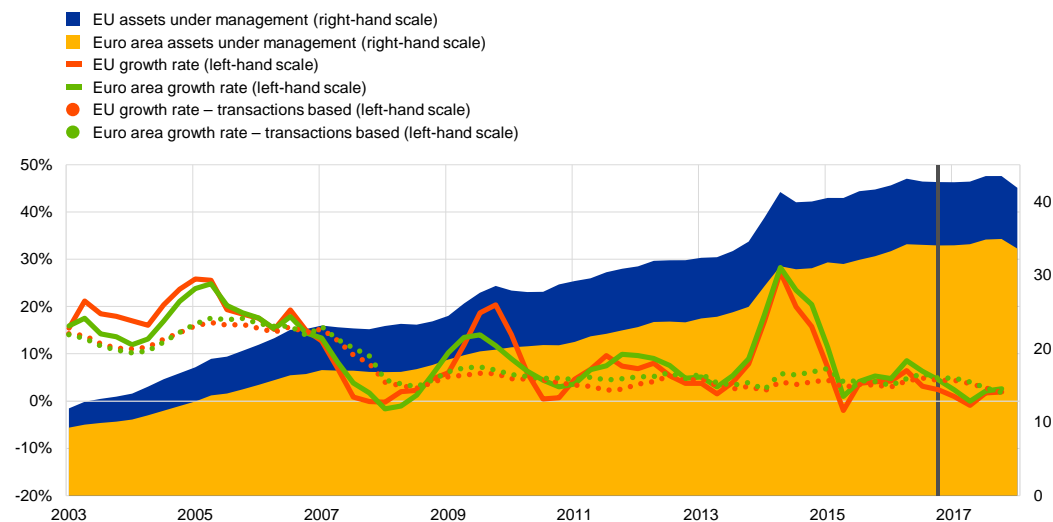


Sources: ECB and ESRB calculations.

Notes: The chart shows issuing and holding sectors of households' financial assets for the EA. Outstanding amounts as of Q4 2018. The data refer to the domestic counterpart area. Financial balance sheets of households and NFCs exclude currency and financial derivatives. The latest observation is for the fourth quarter of 2018.

Chart A-2
Assets under management in EU and EA investment funds and other financial institutions

(EUR trillions and annual growth rates)



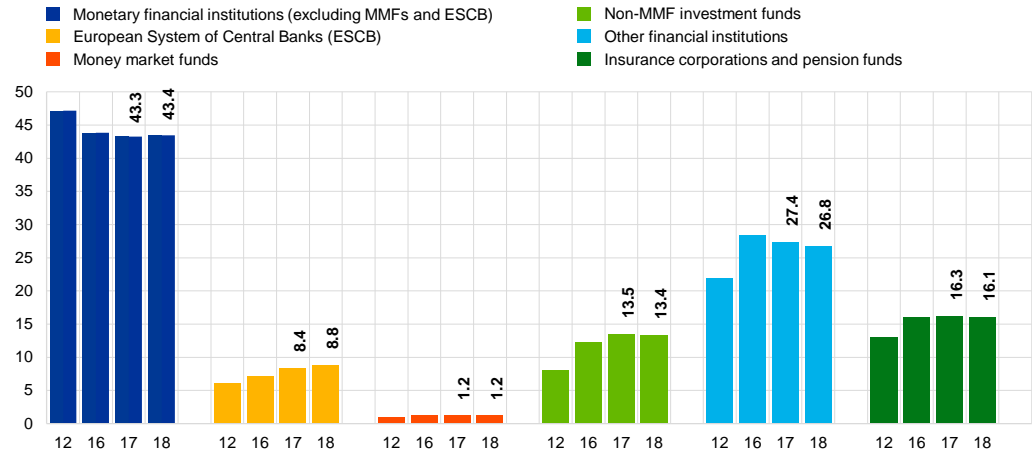
Sources: ECB and ECB calculations.

Notes: The continuous lines indicate annual growth rates based on changes in outstanding amounts. The dotted lines indicate annual growth rates based on transactions, i.e. excluding the impact of FX or other revaluations and statistical reclassifications. The latest observation is for the fourth quarter of 2018.



Chart A-3 EU financial sector

(EUR trillions; Q4 2012, Q4 2016, Q4 2017 and Q4 2018)

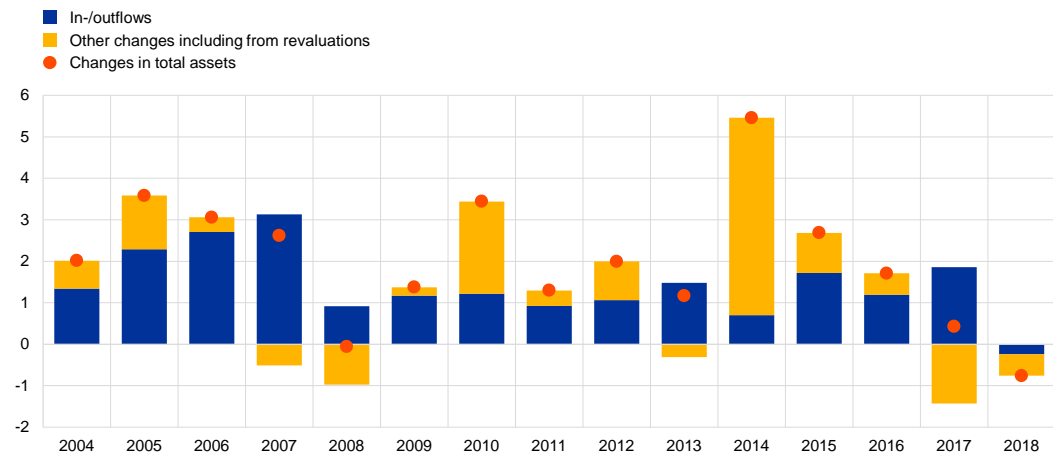


Sources: ECB and ESRB calculations.

Notes: Based on financial accounts data for the total financial assets of the financial sector of EA plus non-EA EU Member States. To exclude central banks from the MFI time series, ESCB is estimated based on BSI data for the Eurosystem and NCB data for the non-EA EU central banks.

Chart A-4 EU investment funds and other financial institutions: transactions and other changes

(EUR trillions)



Sources: ECB and ESRB calculations.

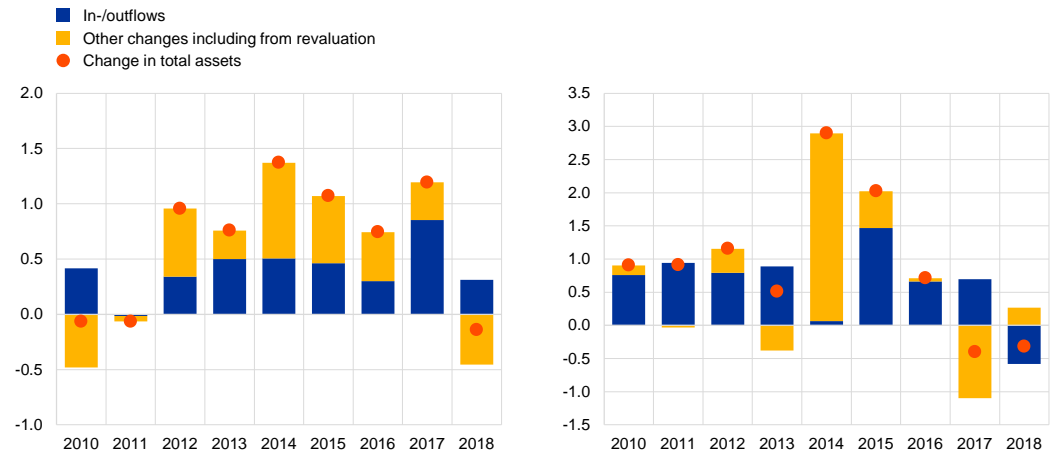
Notes: Based on financial accounts data for the total financial assets of the financial sector of the EA plus the non-EA EU Member States. Transactions are calculated from differences in outstanding amounts adjusted for revaluations, exchange rate variations, statistical reclassifications and any other changes which do not arise from transactions. The latest observation is for the fourth quarter of 2018.



Charts A-4.1 and A-4.2

Euro area investment funds (left-hand panel) and euro area other financial institutions (right-hand panel): transactions and other changes

(EUR trillions)



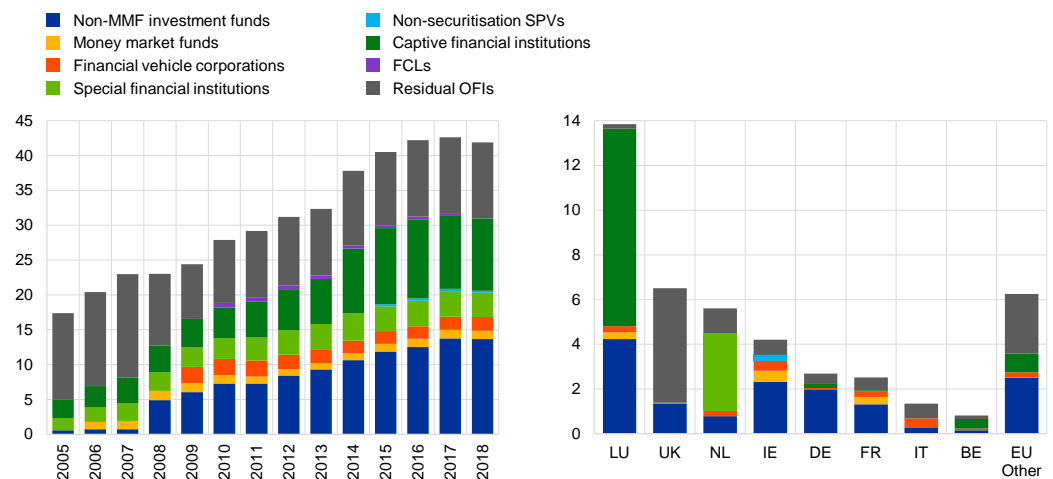
Sources: ECB and ESRB calculations.

Notes: Based on financial accounts data for total financial assets of the financial sector of the EA. Transactions are calculated from differences in outstanding amounts adjusted for revaluations, exchange rate variations, statistical reclassifications and any other changes which do not arise from transactions. The latest observation is for the fourth quarter of 2018.

Charts A-5 and A-6

Breakdown of investment funds and other financial institutions by type in the EU (left-hand panel) and by domicile (right-hand panel)

(EUR trillions)



Sources: ECB, Eurostat, Central Bank of Ireland, De Nederlandsche Bank, Nationale Bank van België/Banque Nationale de Belgique, Banque Centrale du Luxembourg and ECB calculations.

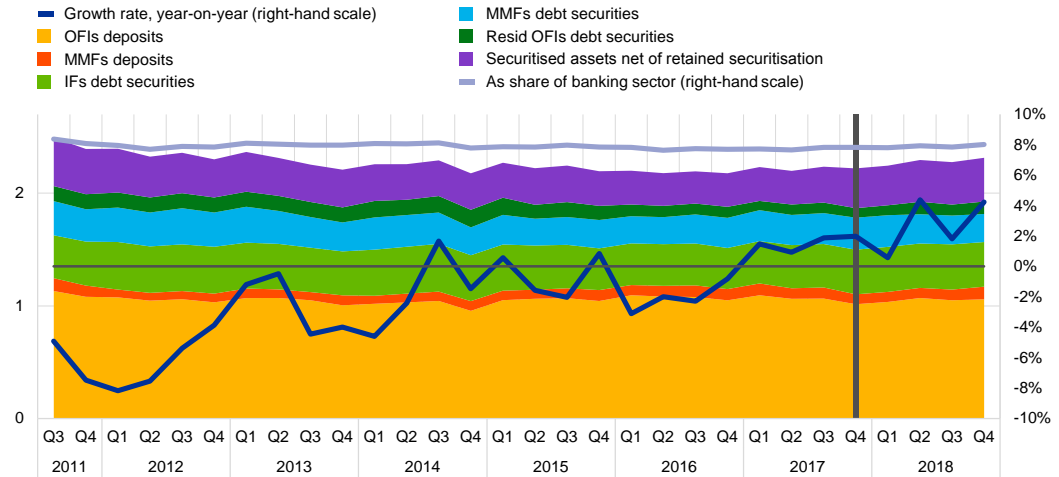
Notes: Data for the total OFI sector are sourced from financial accounts statistics; data on IFs, MMFs and FVCs are based on ECB monetary statistics. Data on FCLs is based on OFIs balance sheet items statistics. Data on SFIs, non-securitisation SPVs and captive financial institutions cover only particular countries. Captive financial institutions are sourced from Eurostat financial account statistics. In the financial accounts, SFIs, non-securitisation SPVs and captive financial institutions are included in the sector "captive financial institutions and money lenders (ESA S. 127)". The latest observation is for the fourth quarter of 2018.



Chart A-7

Wholesale funding provided by non-bank financial entities to the banking sector

(EUR trillions and annual growth rates)



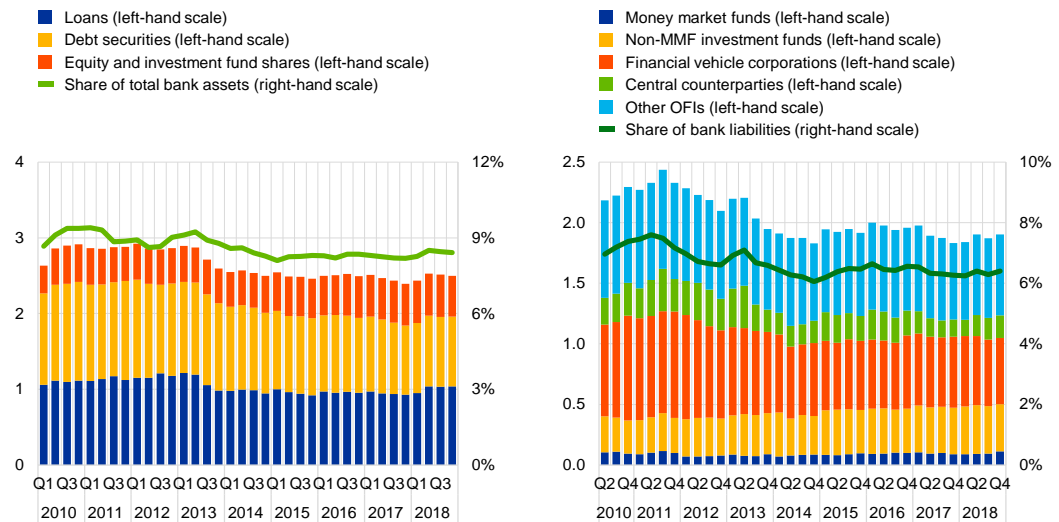
Sources: ECB and ESMA calculations.

Notes: The wholesale funding measure is the sum of: MFI funding arising from securitisation; IF, MMF and OFI deposits at EA MFIs; and IF, MMF and OFI holdings of debt securities issued by EA MFIs. "Resid OFIs" reflects the difference between the total financial sector and the known subsectors within the statistical financial accounts (i.e. assets from the banking sector, insurance companies, pension funds, FVCs, IFs and MMFs). The latest observation is for the fourth quarter of 2018.

Charts A-8 and A-9

Euro area credit institutions' assets vis-à-vis (left-hand panel) and deposits from (right-hand panel) euro area investment funds and other financial institutions

(EUR trillions and share of credit institutions' total assets)



Source: ECB.

Note: The latest observation is for the fourth quarter of 2018.

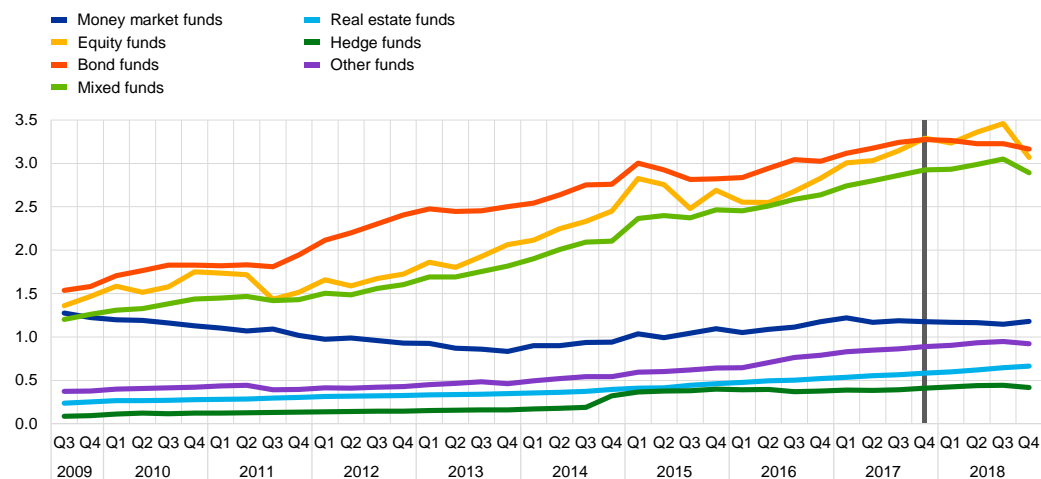


4.3 Entity-based monitoring

Chart A-10

EU investment funds: net asset values

(EUR trillions)



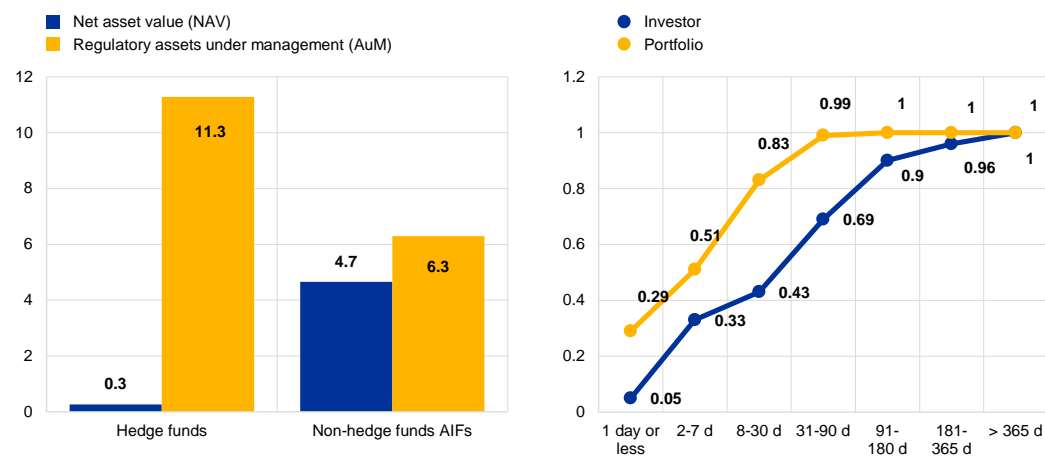
Source: ECB.

Notes: Based on data for the EU; Bulgaria, Croatia, Denmark, Sweden and the UK are not included. In 2016 some hedge funds were reclassified as "other funds", affecting the series for these funds. The latest observation is for the fourth quarter of 2018.

Charts A-11.1 and A-11.2

Hedge funds subject to AIFMD rules: net asset value (NAV) and regulatory assets under management (AUM) under AIFMD (left-hand panel) and liquidity profile (right-hand panel)

(EUR billions)



Source: AIFMD database, National Competent Authorities, ESMA.

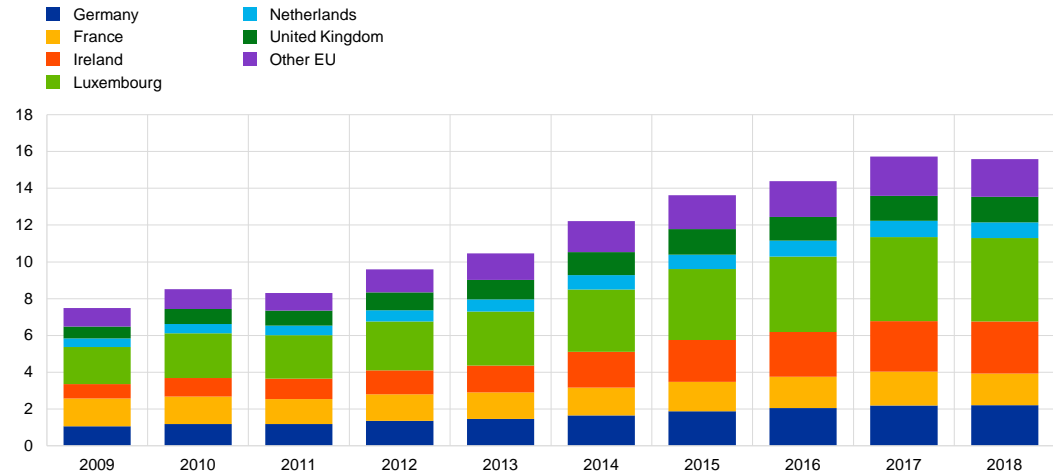
Notes: Chart A-11.1: NAV and AUM by AIF types. Regulatory AUM refers to the value of all portfolio assets, including all assets acquired through the use of leverage (borrowing of cash or securities and leverage embedded in derivative positions). Chart A-11.2: Portfolio and investor liquidity profiles of HFs managed and/or marketed by authorised EU AIFMs. Portfolio profile determined by percentage of the portfolios capable of being liquidated within each specified period, investor profiles depend on the shortest period within which redemption payments could be received. The latest observation is for the fourth quarter of 2017.



Chart A-12

EU investment funds: total assets by country of domicile

(EUR trillions)



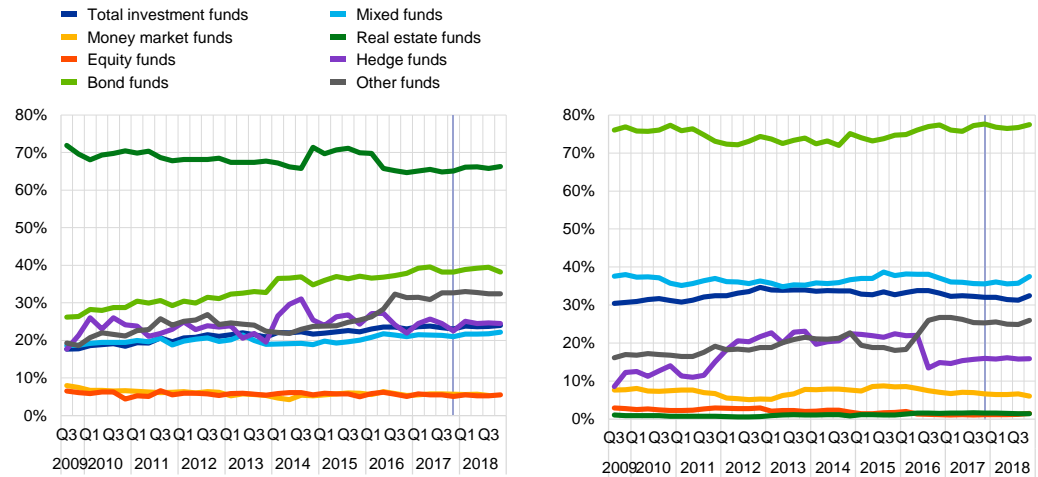
Source: ECB.

Notes: Data for non-MMF IFs are based on investment fund statistics for the EA countries and quarterly sector accounts for non-EA countries. The latest observation is for the fourth quarter of 2018.

Charts A-13 and A-14

EU investment funds: liquidity transformation (left-hand panel) and maturity transformation (right-hand panel)

(percentages)



Source: ECB.

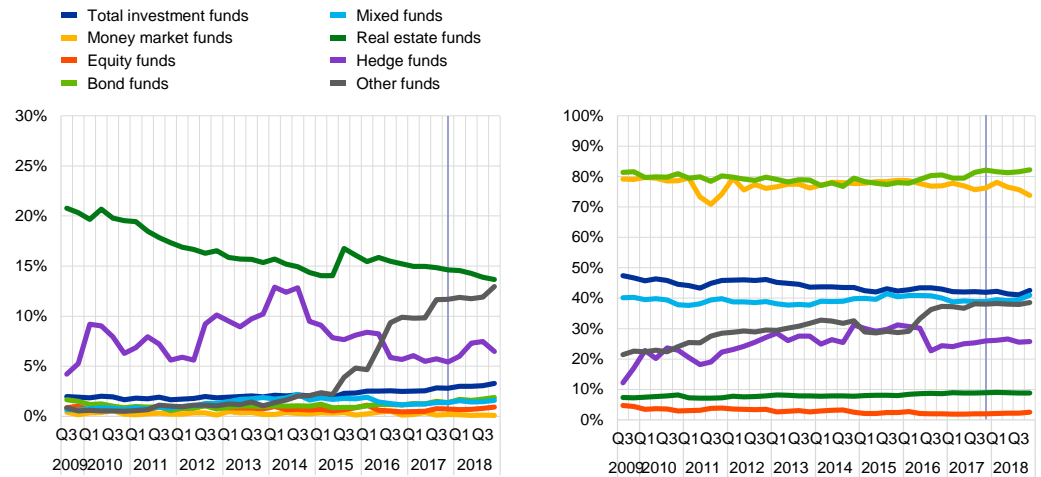
Notes: Data for the EU; Bulgaria, Croatia, Denmark, Sweden and the UK are not included. During 2016 some hedge funds were reclassified as "other funds", affecting the series for these funds. In Chart A-13, the proxy for liquidity transformation is expressed as total assets minus liquid assets (deposits, sovereign bonds, debt securities issued by MFIs and equity and investment fund shares), as a share of total assets. Closed-ended funds are not included. Estimates are made for non-MMF funds' holdings of non-EA securities and deposits not resident in the EA. In Chart A-14, the proxy for maturity transformation is expressed as the ratio of all long-term assets (with original maturities of over one year) to total assets. For MMFs, long-term assets vis-à-vis the government sector are not included. The latest observation is for the fourth quarter of 2018.



Charts A-15 and A-16

EU investment funds: financial leverage (left-hand panel) and credit intermediation (right-hand panel)

(percentages)



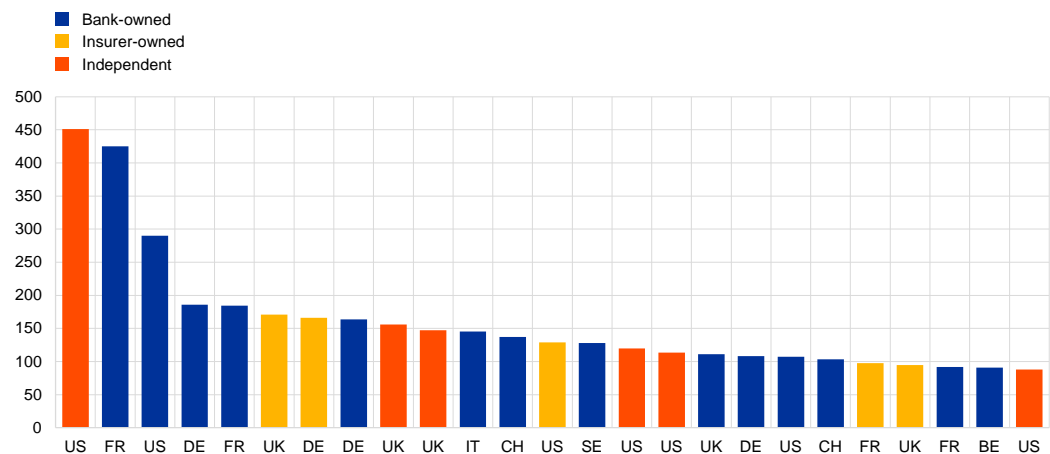
Source: ECB.

Notes: Data for the EU; Bulgaria, Croatia, Denmark, Sweden and the UK are not included. During 2016 some hedge funds were reclassified as "other funds" affecting the series for these funds. In Chart A-15, financial leverage is calculated as the ratio of loans received to total liabilities. In Chart A-16, the proxy for credit intermediation is calculated as the ratio of holdings of loans and debt securities vis-à-vis non-MMFs to total assets. An estimate is made for non-MMF funds' loans given to non-euro counterparties. The latest observation is for the fourth quarter of 2018.

Chart A-17

Aggregate net assets of the top 25 asset management companies in the EU

(EUR billions)



Sources: Thomson Reuters Lipper and ECB calculations.

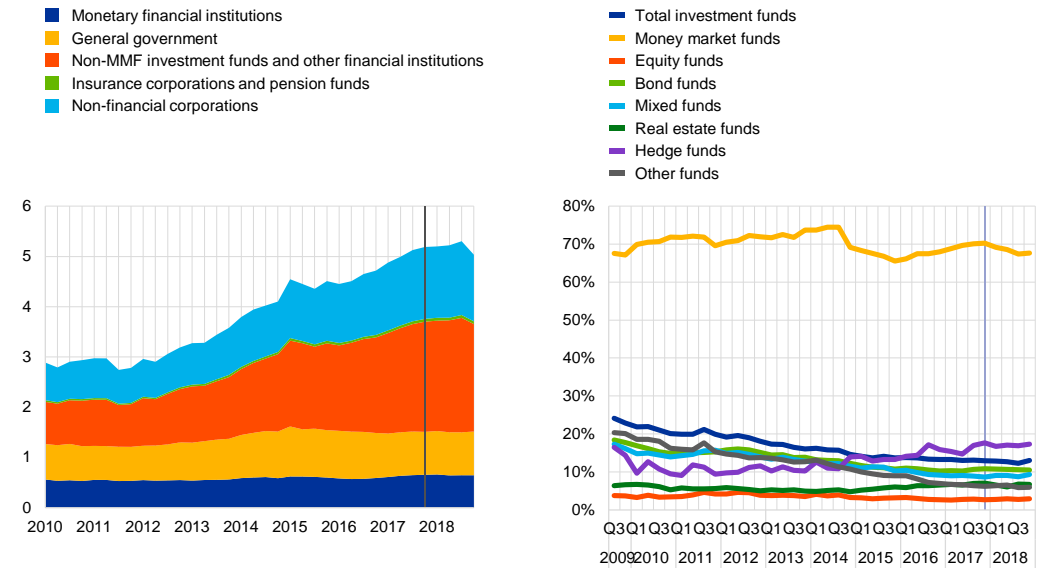
Notes: Asset managers are classified as held by banks/insurers when the asset manager is a subsidiary of the bank/insurer (this excludes cases where bank/insurance activities are a subordinate business of the group or where the holding company also holds banks/insurers) or has a bank/insurer as a majority shareholder. The horizontal axis shows the domicile of the asset manager. The latest observations are for December 2018.



Charts A-18 and A-19

EA investment funds: exposures to other financial and non-financial sectors in the euro area (left-hand panel) and holdings of MFI assets as a share of total assets (right-hand panel)

(Chart A-18: EUR trillions; Chart A-19: percentages)



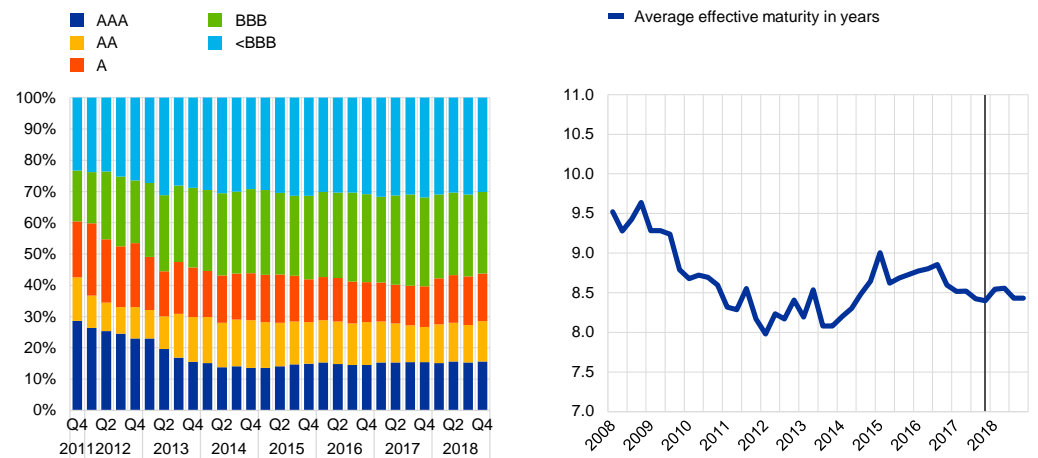
Source: ECB.

Notes: Chart A-18: EA IF holdings of debt securities, IF shares and other equity issued by EA entities. Chart A-19: Based on data for the EU; Bulgaria, Croatia, Denmark, Sweden and the UK are not included. Interconnectedness is proxied by holdings of debt securities and loans with an MFI as counterparty as a share of total assets. Estimates made for non-MMF loans to non-EA counterparties. MMF data in Q4 2014 are affected by reclassifications. The latest observation is for the fourth quarter of 2018.

Charts A-20 and A-21

EU bond funds: average rating of fund holdings (left-hand panel) and weighted average maturity of assets (right-hand panel)

(Chart 20: share of total assets)



Sources: Thomson Reuters Lipper, ESMA and Standard & Poor's.

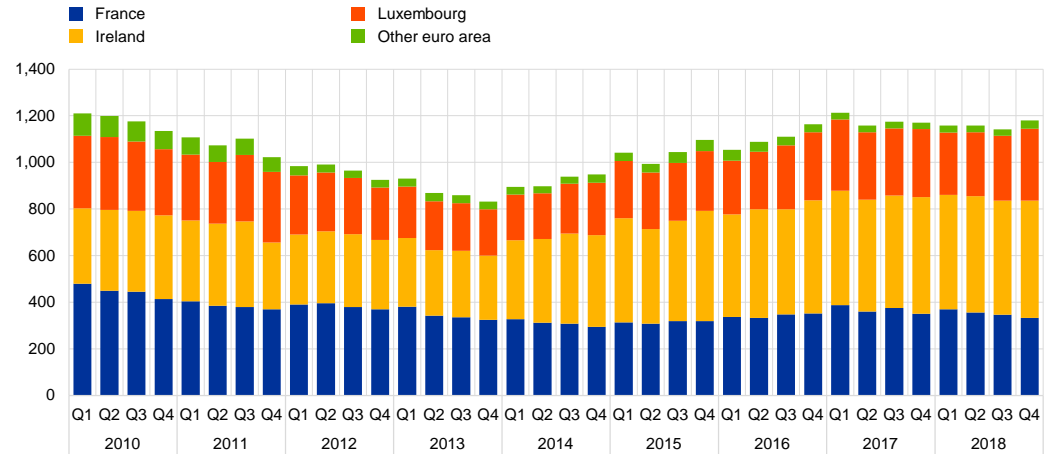
Note: The latest observation is for the fourth quarter of 2018.



Chart A-22

Euro area MMFs: total assets by country of domicile

(EUR billions)



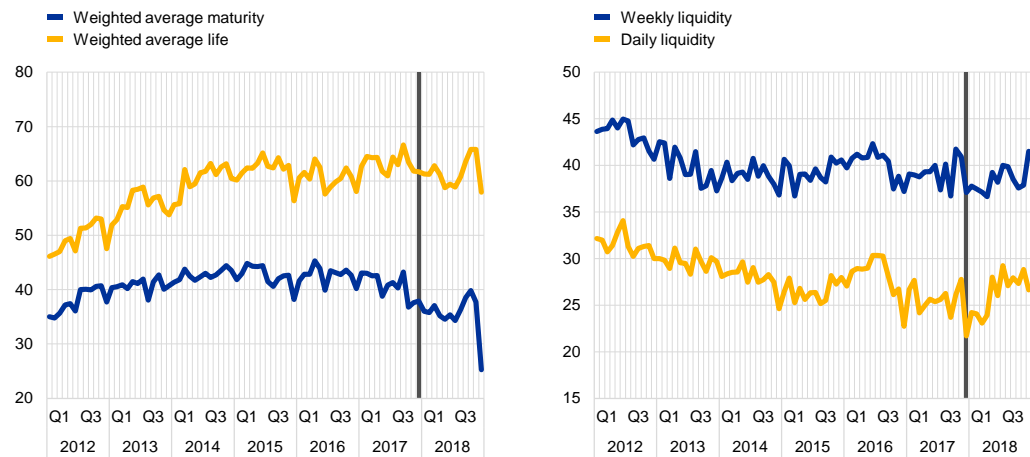
Sources: ECB and ECB calculations.

Note: The latest observation is for the fourth quarter of 2018.

Charts A-23 and A-24

EU MMFs: weighted average maturity and life (left-hand panel) and weekly and daily liquidity (right-hand panel)

(Chart A-23: days; Chart A-24: percentages)



Sources: Fitch Ratings and ESMA.

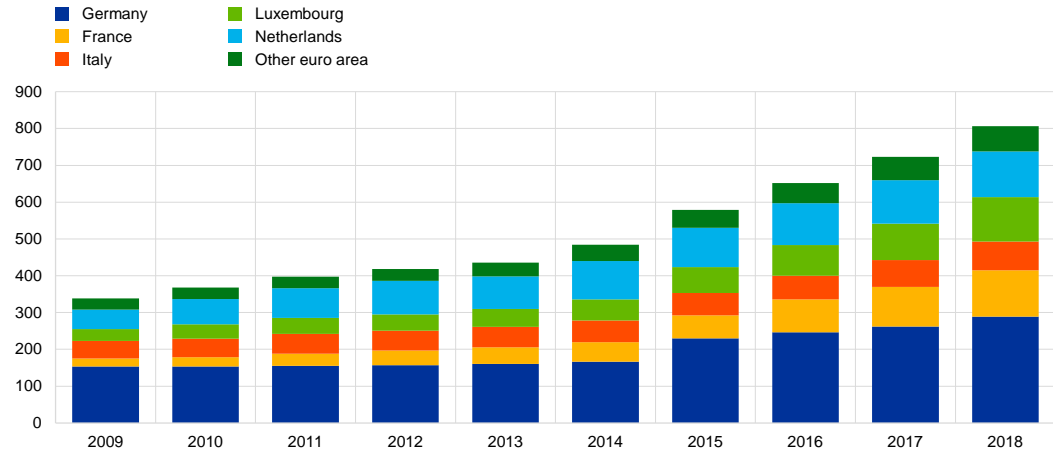
Notes: Chart A-23: Weighted average maturity (WAM) and weighted average life (WAL) of EU prime MMFs. Aggregation carried out by weighting individual MMFs' WAM and WAL by AUM. Chart A-24: Daily liquidity includes all assets maturing overnight and weekly liquidity includes shares issued by AAA-rated MMFs and securities issued by highly rated sovereigns with a maturity of less than one year. Aggregation carried out using individual MMF data weighted by AUM. The latest observation is for the fourth quarter of 2018.



Chart A-25

EU real estate funds: total assets by country of domicile

(EUR billions)



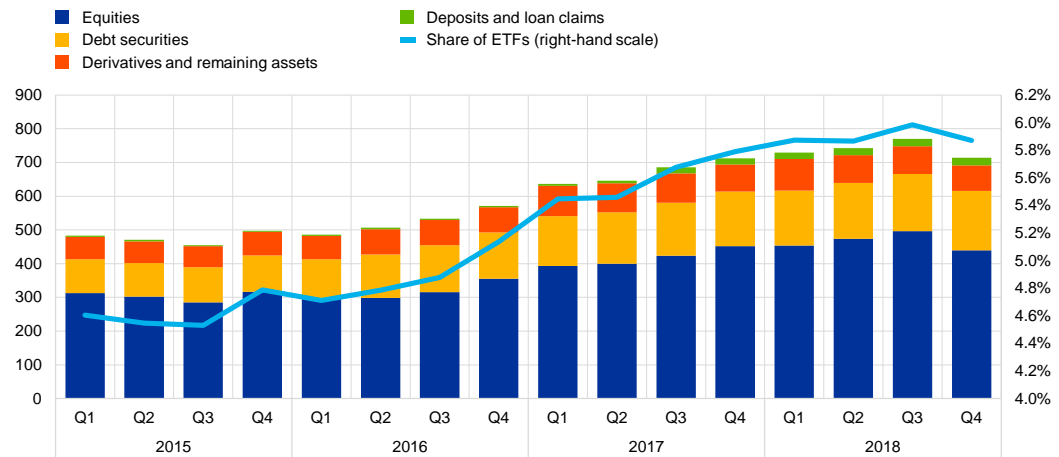
Source: ECB.

Notes: The data of German closed-ended funds have been included in the calculation of total assets since 2015. The latest observation is for 2018.

Chart A-26

Euro area ETFs: assets by type and share of total

(EUR billions (left-hand scale) and share (right-hand scale))



Source: ECB.

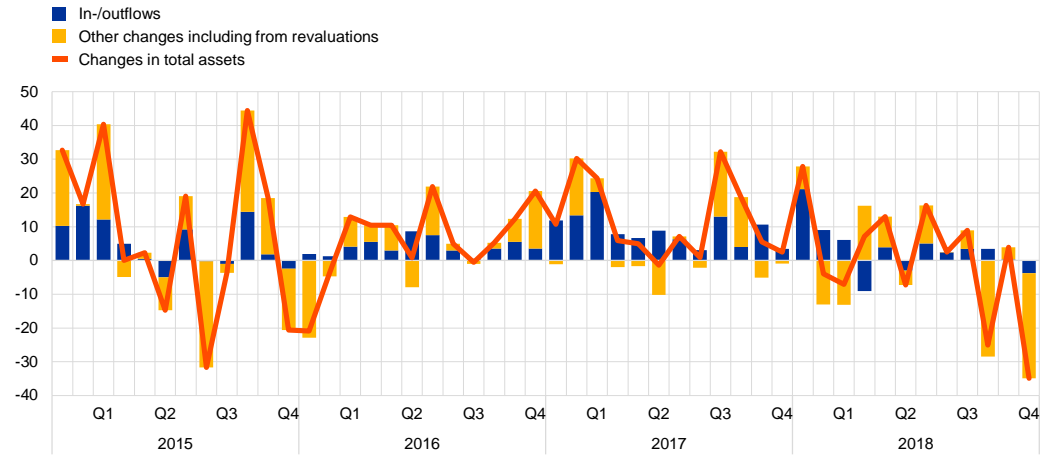
Notes: Share of ETFs is calculated relative to assets held by the EA investment fund sector. The latest observation is for the fourth quarter of 2018.



Chart A-26.1

Euro area ETFs: flows and changes in valuation

(EUR billions)



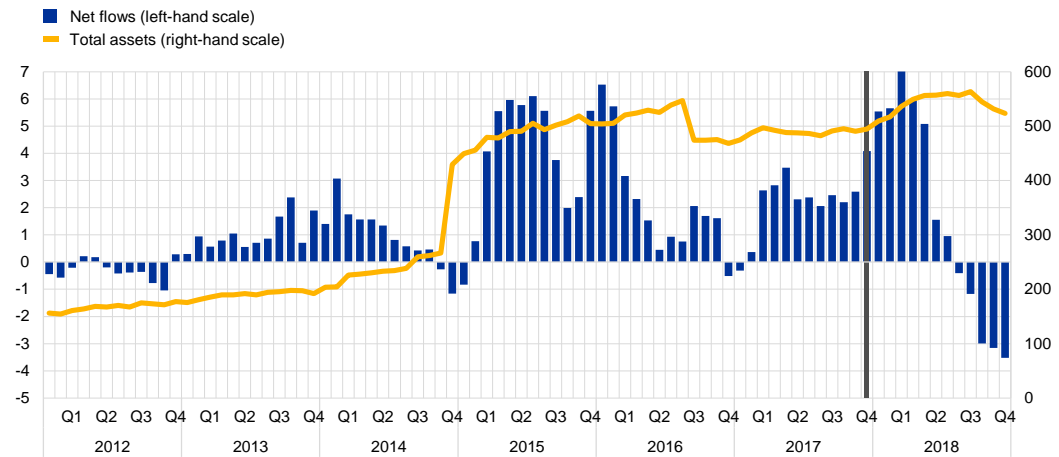
Sources: ECB and ESRB calculations.

Notes: Based on ECB Investment Funds Balance Sheet Statistics for exchange traded funds in the EA. Transactions are calculated from differences in outstanding amounts adjusted for revaluations, exchange rate variations, statistical reclassifications and any other changes which do not arise from transactions. The latest observation is for the fourth quarter of 2018.

Chart A-27

Euro area hedge funds: net flows and total assets

(EUR billions)



Source: ECB.

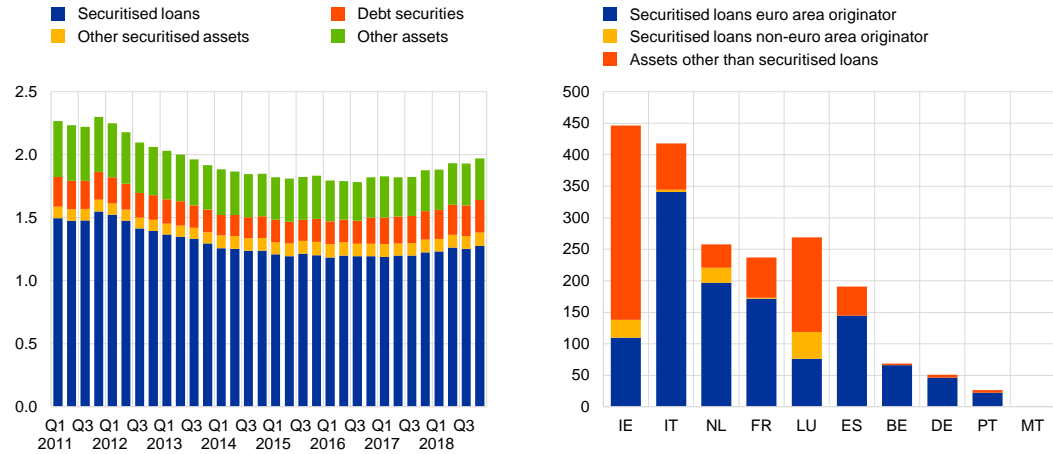
Notes: Based on available data for the EU; Bulgaria, Croatia, Denmark, Sweden and the UK are not included. Three-month moving average for net issuance of shares. Reclassifications and revisions affect the series for total assets. The latest observation is for the fourth quarter of 2018.



Charts A-28 and A-29

Euro area FVCs' total assets (left-hand panel) and total assets by domicile (right-hand panel)

(Chart A-28: EUR trillions; Chart A-29: EUR billions)



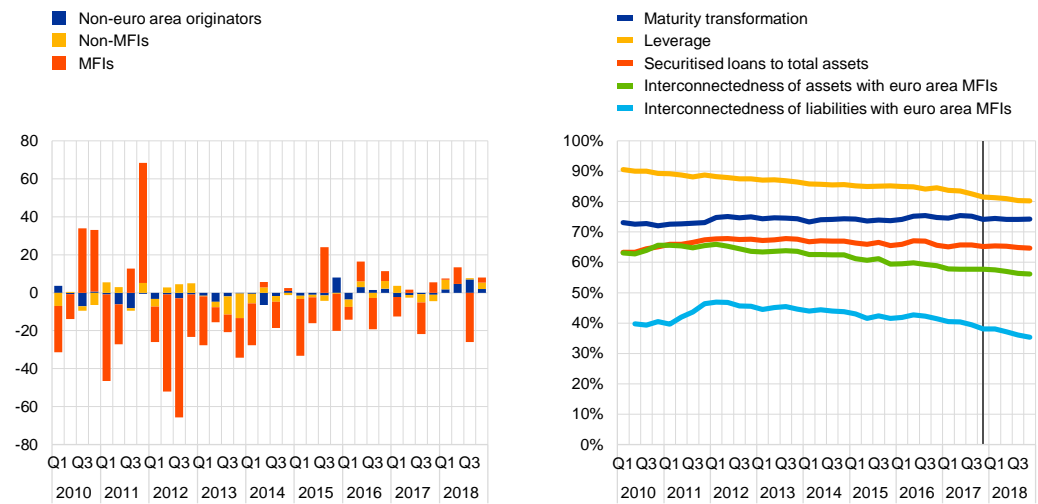
Source: ECB.

Notes: Chart A-28: "Other assets" includes shares and other equity, financial derivatives and remaining assets. The latest observation is for the fourth quarter of 2018.

Charts A-30 and A-31

Euro area FVC's net issuance of securitised loans by originator (left-hand panel) and maturity transformation, leverage, credit intermediation and interconnectedness (right-hand panel)

(Chart A-30: EUR billions; Chart A-31: percentages)



Source: ECB.

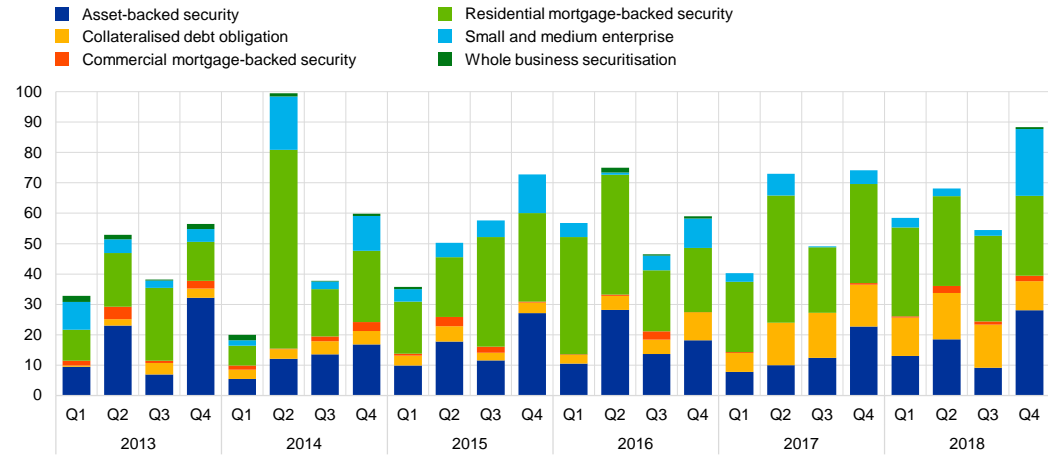
Notes: Chart A-30: EA FVCs' securitised loans by originator. Chart A-31: The proxy for maturity transformation is calculated by summing long-term securitised loans and debt securities (both >1 year initial maturity) divided by total assets. Leverage is computed as the sum of loans received and debt securities issued divided by total assets. FVC assets with a EA MFI counterparty are computed as the sum of loans and debt securities where the counterparty is a EA MFI, and securitised loans originated by a EA MFI. FVC liabilities are computed as debt securities held by EA MFIs, excluding the ESCB reporting sector, using balance sheet item statistics for MFIs. The latest observation is for the fourth quarter of 2018.



Chart A-32

European securitisation issuance by collateral

(EUR billions)



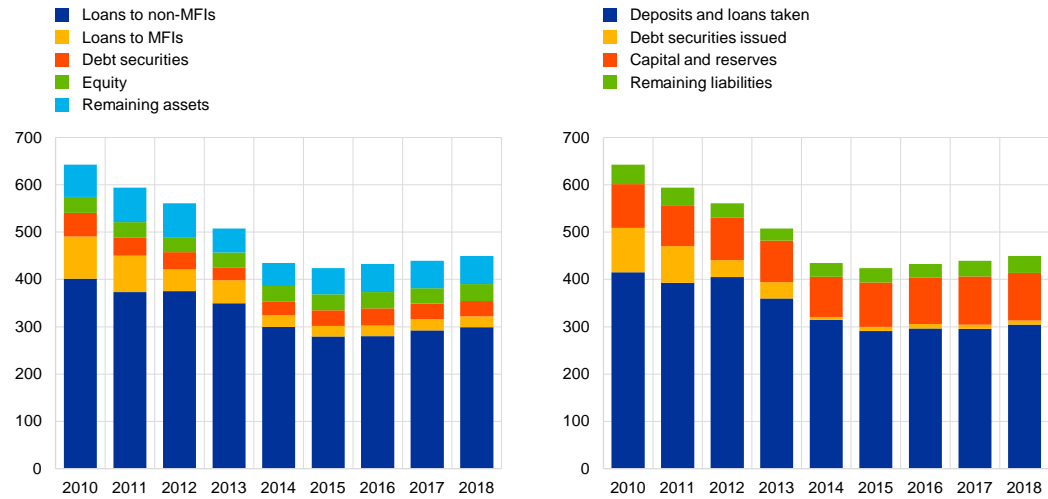
Source: AFME.

Notes: "Asset-backed security" includes auto loans, credit card receivables, leases, loans and other receivables; certain public finance initiative securitisations are included within the category "whole business securitisation" as of Q4 2013. "European" covers all EEA countries and certain non-EEA countries located on the geographical European continent. The latest observation is for the fourth quarter of 2018.

Charts A-33 and A-34

Euro area FCLs' assets (left-hand panel) and liabilities (right-hand panel)

(EUR billions)



Source: ECB.

Note: The latest observation is for the fourth quarter of 2018.

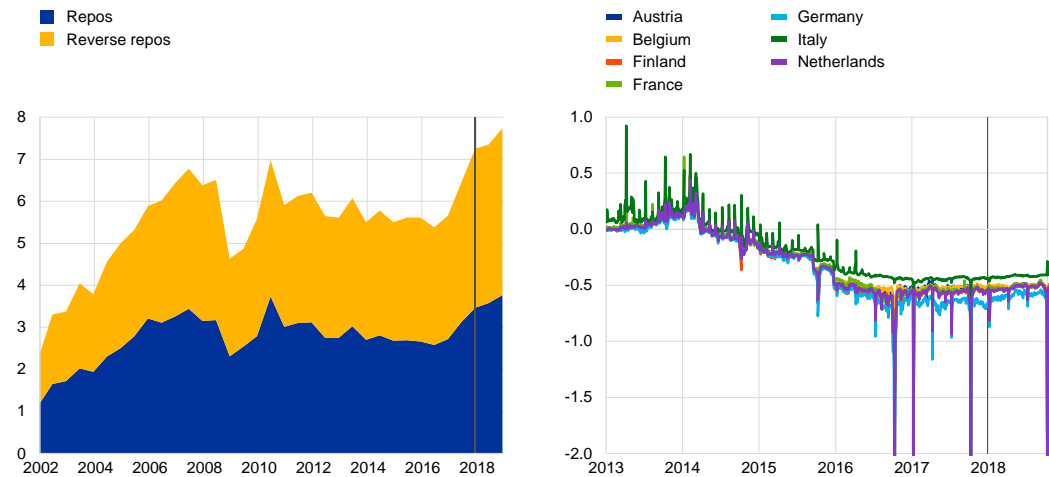


4.4 Activity-based monitoring

Chart A-35 and A-36

Size of EU repo market (left-hand panel) and repo rate on selected sovereigns (right-hand panel)

(Chart A-35: EUR trillions; Chart A-36: percentages)



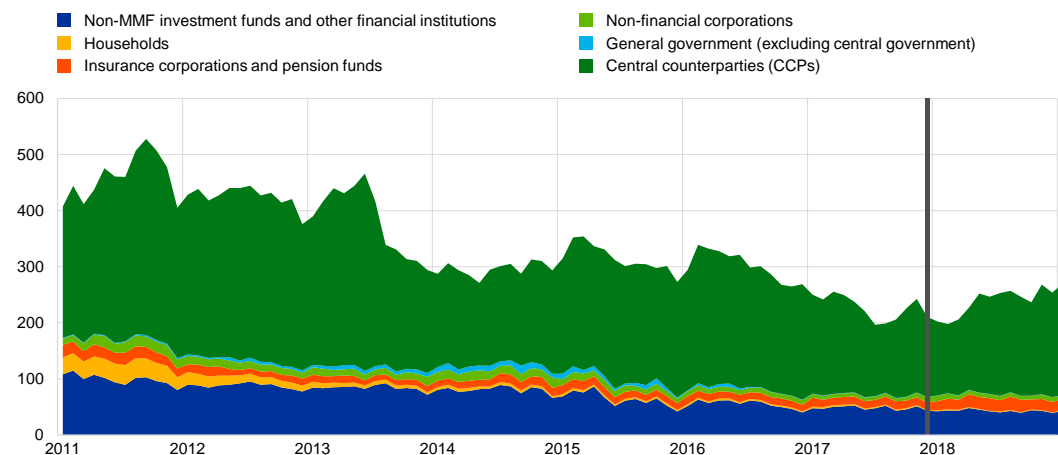
Sources: ICMA, RepoFunds Rates and ESMA.

Notes: Chart A-35: Total value of repos and reverse repos outstanding on the books of the institutions which participated in the ICMA repo surveys. Chart A-36: Volume-weighted average of fixed rate index value, by origin of the collateral. Centrally cleared sovereign repos only. The latest observation is for the fourth quarter of 2018.

Chart A-37

Euro area MFIs' repo liabilities with non-MFIs, by sector

(EUR billions)



Source: ECB.

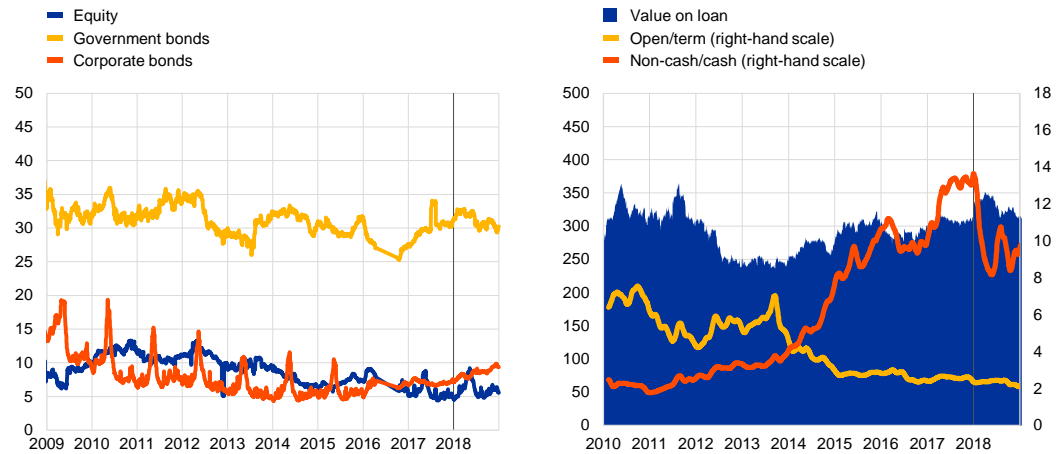
Note: EA MFIs' repo liabilities with EA non-MFI counterparts. The latest observation is for the fourth quarter of 2018.



Charts A-38 and A-39

EU securities utilisation rates (left-hand panel) and EU government bond lending (right-hand panel)

(Chart A-38: percentages; Chart A-39: EUR billions and ratios)



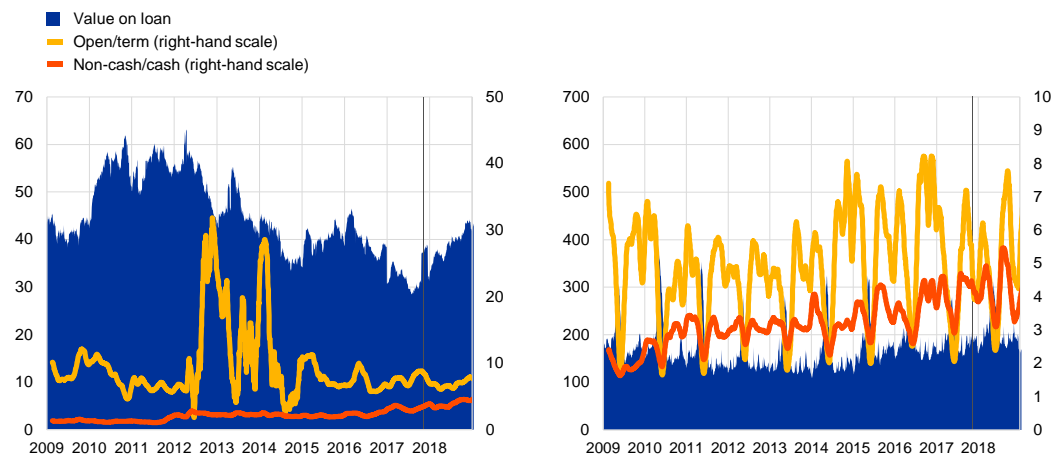
Sources: Markit and ESMA.

Notes: Chart A-38: Utilisation rate in the European securities lending market. The utilisation rate is the ratio of the value of securities on loan to the lendable value. Chart A-39: Outstanding value of European government bonds on loan in EUR billions. 30-day moving average ratios of non-cash/cash collateral and open/term transactions shown on the right-hand scale. The latest observation is for the fourth quarter of 2018.

Charts A-40 and A-41

EU corporate bond lending (left-hand panel) and EU equity lending (right-hand panel)

(EUR billions and ratios)



Sources: Markit and ESMA.

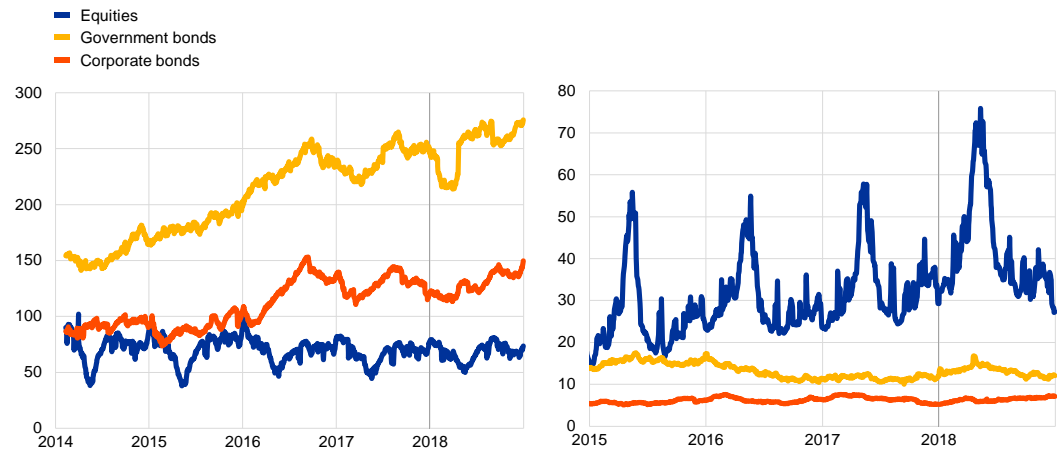
Notes: 30-day moving average ratios of non-cash/cash collateral and open/term transactions shown on the right-hand scale. Chart A-40: Outstanding value of European corporate bonds on loan in EUR billions. Chart A-41: Outstanding value of European equities on loan in EUR billions. The latest observation is for the fourth quarter of 2018.



Charts A-42 and A-43

Average tenure of EU securities on loan (left-hand panel) and outstanding value of EU securities on loan owned by investment funds (right-hand panel)

(Chart A-42: days; Chart A-43: EUR billions)



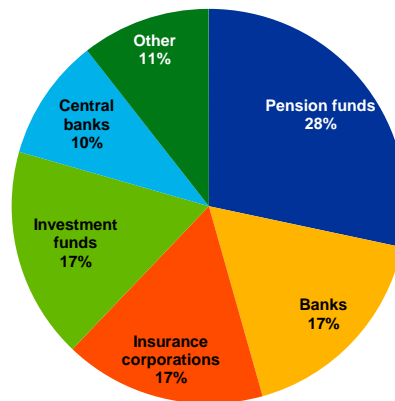
Sources: Markit and ESMA.

Note: The latest observation is for the fourth quarter of 2018.

Chart A-44

EU government bonds available for lending by beneficial owner

(percentages)



Sources: Markit and ESMA.

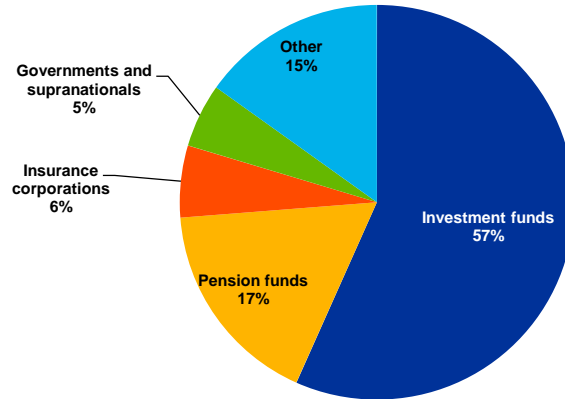
Notes: Share of EU government bonds available for lending, by sector. The latest observations are for December 2018.



Chart A-45

EU equities available for lending by beneficial owner sector

(percentages)



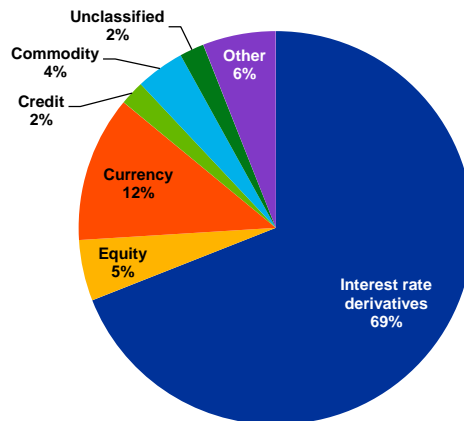
Sources: Markit and ESMA.

Notes: Share of EU equities available for lending, by sector. The latest observations are for December 2018.

Chart A-46

Gross notional amount outstanding by asset class

(percentages)



Sources: TRs and ESMA.

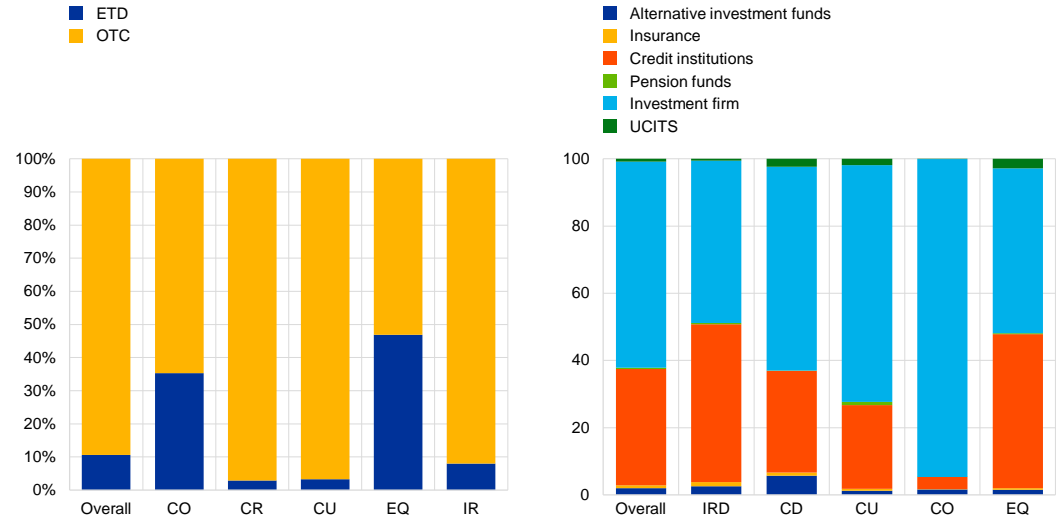
Note: Gross notional amount outstanding by asset class, in percentage of gross notional amount outstanding. The latest observations are end 2017.



Charts A-47 and A-48

ETD versus OTC notional amount (left-hand panel) and gross notional amount by sector of counterparty (right-hand panel)

(percentages)



Sources: TRs and ESMA.

Notes: Chart A-47: Share of gross notional amount outstanding, by asset class, in percentages. Chart A-48: Gross notional amount outstanding (not reconciled) by counterparty, in percentage of gross notional amount outstanding, by asset class. The latest observation is end 2017.



Table 4

Other financial institutions: acronyms, types of entities, ESA 2010 classifications and data sources

		Data sources	Geographical coverage
Other financial intermediaries (ESA S.125)¹		Financial accounts	Euro area
FVCs	Financial vehicle corporations engaged in securitisation transactions (i.e. securitisation vehicles)	Monetary and financial	Euro area
SDDs	Security and derivative dealers (e.g. broker-dealers)	–	–
FCLs	Financial corporations engaged in lending (e.g. leasing and factoring companies)	–	Euro area
SFCs	Specialised financial corporations (e.g. venture capital, export/import financing, central counterparties (CCPs))	–	–
OFI residual	Calculated as the difference between total financial sector assets and the assets held by all known subsectors; the residual is usually classified under ESA S.125	–	–
Financial auxiliaries (ESA S.126)²		–	–
Captive financial institutions and money lenders (ESA S.127)³		–	–
	Captive financial institutions and money lenders domiciled in Belgium	Nationale Bank van België/Banque Nationale de Belgique	Belgium
SPEs	Non-securitisation special-purpose entities (SPEs) domiciled in Ireland	Central Bank of Ireland	Ireland
SFIs	Special financial institutions domiciled in the Netherlands	De Nederlandsche Bank	Netherlands
	Captive financial institutions and money lenders domiciled in Denmark, Germany, Malta, France, Sweden, Hungary, Austria, Luxembourg, Finland, Greece, Latvia, Lithuania, Slovakia, Romania and Croatia.	Eurostat	Denmark, Germany, Malta, France, Sweden, Hungary, Austria, Luxembourg, Finland, Greece, Latvia, Lithuania, Slovakia, Romania and Croatia.

Special-purpose entities not engaged in securitisation

Notes: '-' denotes that data are not available. CCPs are either classified as specialised financial corporations under the European System of National and Regional Accounts (ESA 2010), or have banking license and are included under Monetary Financial Institutions statistics.

1 The "other financial intermediaries, except insurance corporations and pension funds" subsector (S.125) consists of all financial corporations and quasi-corporations which are principally engaged in financial intermediation by incurring liabilities in forms other than currency, deposits, or investment fund shares, or in relation to insurance, pension and standardised guarantee schemes from institutional units. Sub-sector S.125 includes financial intermediaries predominantly engaged in long-term financing. This is the subsector for which more statistical information is already available, including at the level of the EA. Sub-sector (S.125) is further subdivided into: (i) financial vehicle corporations engaged in securitisation transactions (FVC), i.e. undertakings carrying out securitisation transactions, (ii) security and derivative dealers, (iii) financial corporations engaged in lending, which include, for example, financial intermediaries engaged in: (a) financial leasing; (b) hire purchase and the provision of personal or commercial finance; or (c) factoring specialised financial corporations (which include for example: (i) venture and development capital companies; (ii) export/import financing companies; or (iii) financial intermediaries which acquire deposits and/or close substitutes for deposits, or incur loans vis-à-vis monetary financial institutions only; these financial intermediaries also cover central counterparty clearing houses (CCPs) carrying out inter-MFI repurchase agreement transactions).

2 The financial auxiliaries subsector (S.126) consists of all financial corporations and quasi-corporations which are principally engaged in activities closely related to financial intermediation but which are not financial intermediaries themselves. Examples



are: (a) insurance brokers, salvage and average administrators, insurance and pension consultants, etc.; (b) loan brokers, securities brokers, investment advisers, etc.; (c) flotation corporations that manage the issue of securities; (d) corporations whose principal function is to guarantee, by endorsement, bills and similar instruments; (e) corporations which arrange derivative and hedging instruments, such as swaps, options and futures (without issuing these); (f) corporations providing infrastructure for financial markets; (g) central supervisory authorities of financial intermediaries and financial markets when they are separate institutional units; (h) managers of pension funds, mutual funds, etc.; (i) corporations providing stock exchange and insurance exchange; (j) non-profit institutions recognised as independent legal entities serving financial corporations, but not engaged in financial intermediation (see point (d) of paragraph 2.46); (k) payment institutions (facilitating payments between buyer and seller); (l) head offices whose subsidiaries are all or mostly financial corporations.

3 The captive financial institutions and money lenders subsector (S.127) consists of all financial corporations and quasi-corporations which are neither engaged in financial intermediation nor in providing financial auxiliary services, and where most of either their assets or their liabilities are not transacted on open markets. Examples are: (a) units as legal entities such as trusts, estates, agency accounts or “brass plate” companies; (b) holding companies that hold controlling levels of equity of a group of subsidiary corporations and whose principal activity is owning the group without providing any other service to the businesses in which the equity is held, i.e. they do not administer or manage other units; (c) SPEs that qualify as institutional units and raise funds in open markets to be used by their parent corporation; (d) units which provide financial services exclusively with their own funds, or funds provided by a sponsor, to a range of clients and incur the financial risk of the debtor defaulting. Examples are money lenders, corporations engaged in lending to students or for foreign trade from funds received from a sponsor such as a government unit or a non-profit institution, and pawnshops that predominantly engage in lending; (e) special purpose government funds, usually called sovereign wealth funds, if classified as financial corporations.



Abbreviations

ABCP	asset-backed commercial paper	GDP	gross domestic product
ABS	asset-backed security	ICMA	International Capital Market Association
AIF	alternative investment fund	ICPFs	insurance companies/corporations and pension funds
AIFMD	Alternative Investment Fund Managers Directive	IF	investment fund
AP	authorised participant	IRS	interest rate swap
AUM	assets under management	ISIN	International Securities Identification Number
BCBS	Basel Committee on Banking Supervision	LVNAV	low-volatility net asset value
BIS	Bank for International Settlements	MFI	monetary financial institution
CCP	central counterparty	MMF	money market fund
CDS	credit default swap	MMSR	Money Market Statistical Reporting
CESR	Committee of European Securities Regulators	NAV	net asset value
CLO	collateralised loan obligation	NCA	national competent authority
CMU	capital markets union	NFC	non-financial corporation
CNAV	constant net asset value	OECD	Organisation for Economic Co-operation and Development
CRE	commercial real estate	OFI	other financial institution
CRR	Capital Requirements Regulation	OTC	over-the-counter
DTCC	Depository Trust and Clearing Corporation	PE	private equity
EA	euro area	REIFS	Real Estate Investment Funds
EBA	European Banking Authority	REITS	Real Estate Investment Trusts
ECB	European Central Bank	RMBS	residential mortgage-backed security
EEA	European Economic Area	SEC	U.S. Securities and Exchange Commission
EMIR	European Market Infrastructure Regulation	SDD	security and derivatives dealer
ESA	European System of Accounts	SFI	special financial institution
ESCB	European System of Central Banks	SFTR	Securities Financing Transactions Regulation
ESMA	European Securities and Markets Authority	SHS	Securities Holdings Statistics
ESRB	European Systemic Risk Board	SPE	special-purpose entity
ETF	exchange-traded fund	SPV	special-purpose vehicle
EU	European Union	UCITS	Undertakings for Collective Investment in Transferable Securities
FCA	Financial Conduct Authority	UK	United Kingdom
FCL	financial corporations engaged in lending	US	United States
FSB	Financial Stability Board	VNAV	variable net asset value
FVC	financial vehicle corporation	WAL	weighted average life
FX	foreign exchange	WAM	weighted average maturity



Imprint and acknowledgements

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