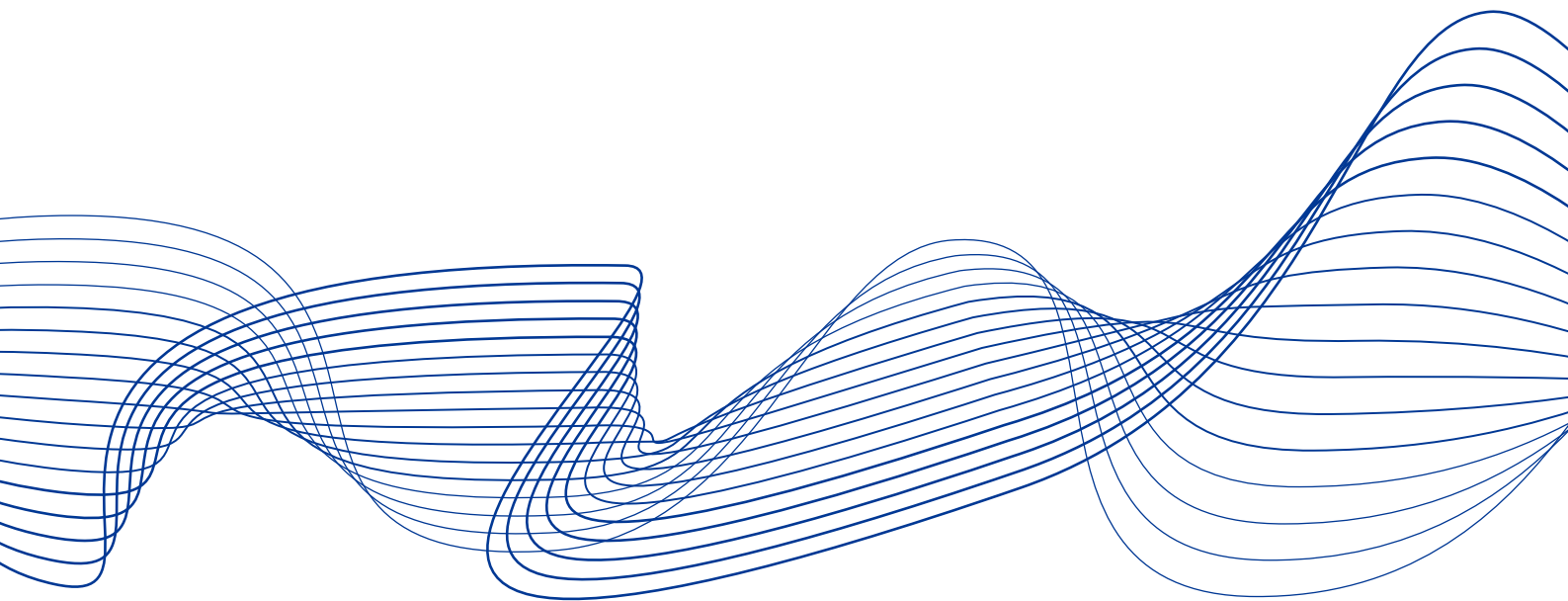


NBFI Monitor

No 6 / August 2021

EU Non-bank Financial
Intermediation Risk Monitor 2021



ESRB
European Systemic Risk Board
European System of Financial Supervision

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Executive summary

The year 2020 – the review period for this edition of the EU Non-bank Financial Intermediation (NBF) Risk Monitor – was dominated by the coronavirus (COVID-19) pandemic, which highlighted vulnerabilities in the NBF sector. The review period was characterised by an unprecedented contraction in economic output and extreme volatility in financial markets. At the height of the market turmoil in March 2020, certain types of investment funds, notably corporate bond funds and non-government money market funds (MMFs), saw a strong increase in investor redemption requests coupled with a deterioration in the liquidity of their assets. As a result of extraordinary measures taken by governments, central banks and supervisory authorities in the European Union (EU) to support the economy in the face of the pandemic, financial markets stabilised. By the end of the year, asset valuation in fixed income and equity markets had reached pre-pandemic levels and above. Corporate bond funds, equity funds and MMFs recorded high inflows, especially in the third and fourth quarters. Since then, valuations have continued to increase across asset classes, also reflecting an improved economic outlook. The developments during 2020 highlighted some of the vulnerabilities identified in previous editions of the NBF Monitor and the need to adjust the regulatory framework to address them.

This report considers a range of systemic risks and vulnerabilities related to non-bank financial intermediation, including those stemming from interconnectedness, liquidity and leverage. The monitoring universe of this report includes all investment funds and so-called other financial institutions (OFIs). The size of this monitoring universe is measured by 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 with a banking licence. In the EU (euro area), this measure stood at €39.4 trillion (€36.7 trillion) in the fourth quarter of 2020, an increase of 1.5% (0.5%) compared with the end of 2019. This growth suggests that the monitoring universe has recovered from the initial effects of the pandemic, which in the first quarter of 2020 led to a quarter-on-quarter fall in asset values held by EU investment funds and OFIs (-3.1%), as well as to outflows. This year, following the United Kingdom's withdrawal from the EU, most of the charts and statistics presented in this report do not include UK data (Box 1). 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.

The assessment of risks and vulnerabilities considers both structural and cyclical risks.

There are four key cyclical risks that emerged as a result of the impact of the COVID-19 pandemic and that will require close monitoring: (i) uncertainty about the pace of economic recovery; (ii) rising indebtedness, increased credit risk and risks from associated rating downgrades; (iii) decoupling of the real economy and financial markets; and (iv) the fragile nature of liquidity in some markets. In addition, several structural risks identified in previous editions of the NBF Monitor require ongoing monitoring, including through the development of improved risk metrics as new data become available. These include (i) excessive risk-taking, liquidity transformation, and risks associated with the use of excessive leverage among some types of investment funds and OFIs; (ii) domestic and



cross-border interconnectedness and the risk of contagion across sectors and within the non-bank financial system; and (iii) risks related to the low interest rate environment.¹

Liquidity and maturity transformations within the investment fund sector remain a source of risk going forward. While MMFs' assets have recovered and funds have substantially increased their liquid holdings, they remain exposed to the low liquidity of the private money markets they invest in, as seen in March 2020. Bond funds have further extended the duration of their portfolio, exposing them to additional interest rate risk, and their cash holdings have declined further. The credit ratings of their bond holdings have also deteriorated slightly, pointing to an increase in credit risk. Similarly, real estate funds having an asset-liability mismatch remain exposed to liquidity risk.

The NBFIM 2021 includes three special features, which cover real estate funds, the insurance sector's engagement in financial intermediation activities and three isolated events that occurred in early 2021 and showed how leverage and concentration risks can materialise.

- Analysis of Alternative Investment Fund Managers Directive (AIFMD) data shows that some real estate funds offer daily redemptions without long notification periods, while investing in illiquid assets. In addition, liquidity buffers have fallen to their lowest levels since 2017. Liquidity risk in real estate funds is further amplified by vulnerabilities in the commercial real estate (CRE) market in certain countries: long-term trends (such as the low interest rate environment) have contributed to increases in valuations, which exposes the CRE segment to the risk of a sharp price correction. In addition, valuation difficulties due to the lack of transactions make the CRE segment more vulnerable.
- With assets of €9.4 trillion as of the fourth quarter of 2020, the EU insurance sector is an important investor that contributes to non-bank financial intermediation in the EU. A special feature focuses on three aspects of insurers as non-bank financial intermediaries: (i) credit intermediation, (ii) interconnectedness with non-banks, and (iii) interconnectedness across markets via derivative positions. Overall, insurers engage moderately in the risky activities monitored in this report, but given the size of the sector and its interconnectedness with banks and other non-banks, insurers could contribute to the propagation of risks.
- Three notable but isolated events in 2021 have shown how risks around interconnectedness, liquidity and leverage can materialise even when markets are buoyant. First, in early 2021, the stock prices of a few US firms on which some investment funds made significant short positions, most importantly GameStop, increased rapidly. This increase was due to a large number of investors creating exposures to the company either by purchasing the stock or by acquiring call options on the equity, but also to procyclical effects stemming from short sellers covering their positions and dealers hedging their sales of options by purchasing the underlying stocks, which resulted in price amplification. Second, the following month, a European bank supervisor froze the assets of Greensill Bank owing to possible balance sheet manipulation. The bank belonged to a supply chain finance group that acquired trade receivables. Those purchases were funded by the bank and by repackaging the receivables into notes, with additional credit guarantees provided by insurers, which were subsequently

¹ See "[Lower for longer – macroprudential policy issues arising from the low interest rate environment](#)", ESRB, June 2021.



sold to EU investment funds. Insurers refused to renew the guarantees of the bonds due to increased concerns about the ability of clients to pay the receivables, which resulted in the suspension of redemptions for funds exposed to those notes. Third, at the end of March, the US family office management company Archegos collapsed, as the firm was unable to meet variation margin calls on highly concentrated leveraged positions on stocks acquired through derivatives. Counterparties had to liquidate the equities, resulting in large losses for some. All three of these events show how risks around leverage and liquidity can crystallise. In addition, interconnectedness between different institutions can result in an underestimation of risks by individual institutions. While these particular events did not have systemic consequences, they illustrate how a materialisation of risks can quickly propagate through the financial system.



1 Overview

The NBFi Monitor 2021 mainly focuses on developments during 2020, which were dominated by the coronavirus (COVID-19) pandemic. In the first half of 2020, growth of the European investment fund and OFI sectors was negatively affected by the effects of the pandemic, limiting temporarily their ability to provide financial intermediation to non-financial corporations (NFCs). For larger NFCs that can access capital markets, non-bank lending has become integral to the management of their liquidity and funding needs. Because of the flexibility that non-bank financial intermediation provides, these NFCs can issue new securities as the need for cash arises, at least in non-crisis times. This flexibility allows them to avoid costs linked to the holding of excess liquidity. Non-bank financial intermediaries, in particular investment funds, have increased their duration and hold an important share of lower-rated NFC debt exposures, amplifying the likelihood of losses and outflows if corporate credit risk rises materially. In a low interest rate environment in which investors search for yield, increased risk-taking is an expected outcome. However, increased risk-taking, possibly coupled with herding behaviour and mispricing of risks, can also threaten the resilience of the non-bank financial sector if risks materialise. This report examines the growth of vulnerabilities that could arise from non-bank financial intermediation, e.g. liquidity and maturity transformation, leverage and interconnectedness within the financial system.

1.1 Developments in main aggregates

The COVID-19 pandemic caused major disruptions in global and EU economic activity, which resulted in severe price and liquidity dislocation in many markets. The COVID-19 crisis posed unprecedented challenges for global economies. EU gross domestic product (GDP) fell by 3.7% and by 11.4% quarter-on-quarter in the first and second quarters of 2020, according to Eurostat. As markets tried to find equilibrium in the early stages of lockdowns across the United States and Europe, severe price and liquidity dislocation occurred in many markets. At the peak of the dislocation in March 2020, central banks in the euro area globally expanded liquidity operations and launched targeted asset purchases to ensure the transmission of their monetary policy. Although liquidity strains in financial markets subsequently eased, the measures taken by central banks were not designed to, and did not, eliminate the underlying vulnerabilities.

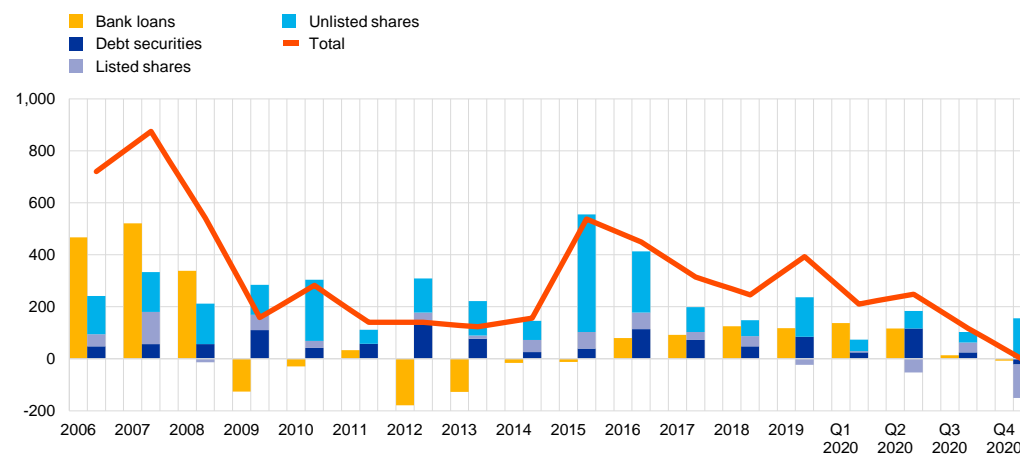
After an increase in 2019, net finance raised by euro area NFCs decreased in 2020 as a result of the pandemic. Financing obtained by NFCs in the form of direct bank loans increased in the first half of 2020, as granting of bank loans was supported through government guarantees. Both debt securities and unlisted shares recovered as a source of funding for NFCs in the second quarter of 2020, while net finance raised through the issuance of listed shares decreased, especially in the fourth quarter of 2020 (Chart 1/Chart A-1). This may reflect a preference for share buyback programmes rather than the issuing of new stock due to a lack of investment opportunities. Debt securities and listed shares issued by NFCs are mainly held by non-bank financial institutions, with a smaller share held by banks. In some EU jurisdictions, the non-bank financial sector is also an important source of funding for households. For example, in the Netherlands, 35% of new mortgages are provided by pension funds, insurers and mortgage funds.



Chart 1 (Chart A-1 in the statistical overview)

Net finance raised by euro area non-financial corporations

(EUR billions)



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

Note: The latest observation is for the fourth quarter of 2020.

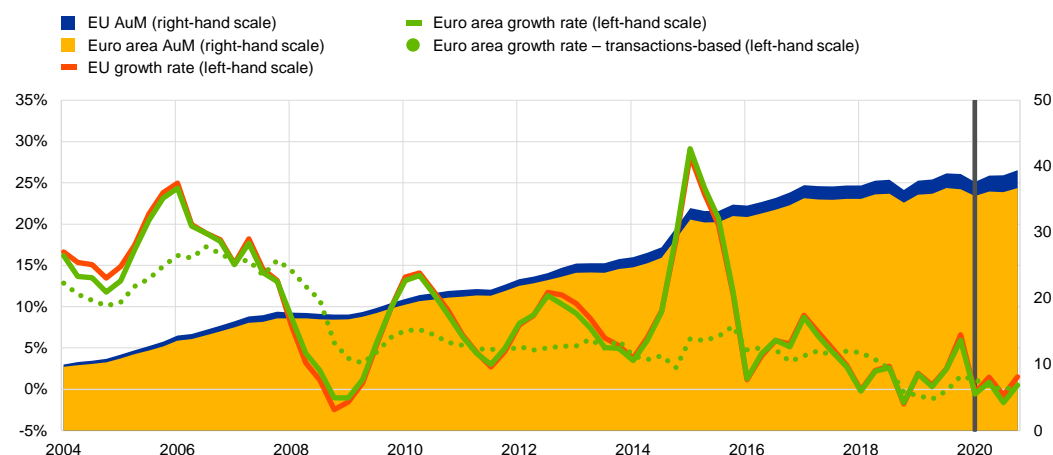
The size of the EU non-bank financial sector declined in the first quarter of 2020, reflecting price and volume effects, but recovered by the end of the year. The size of the EU (euro area) non-banking sector decreased to €37.6 trillion (€35.5 trillion) in the first quarter of 2020, compared with €38.9 trillion (€36.5 trillion) at the end of 2019 (Chart A-2). AuM in investment funds decreased significantly throughout the first half of 2020, affected by valuation losses during the first quarter (Chart A-4.1). OFIs, on the other hand, saw a much more limited decrease in total assets over the six-month period (Chart A-4.2). The assets included in the non-banking sector (including insurance corporations and pension funds (ICPFs)) make up 53% of the assets of the overall financial sector (i.e. including the European System of Central Banks (ESCB)). In 2020, the relative size of the ESCB increased from 9% to 12%, due to its exceptional monetary operations. For all sectors but the OFI sector, total assets increased overall in 2020, showing that financial markets did more than just recover from the pandemic. Despite its decrease in total assets, the OFI sector remains the largest non-bank sector with €22.3 trillion, followed by non-MMF investment funds with €14.9 trillion, ICPFs with €13.2 trillion and MMFs with €1.4 trillion (Chart A-3.1 and Chart A-3.2). The countries with the five largest non-bank financial sectors in the EU (by size: Luxembourg, the Netherlands, Ireland, Germany and France) make up 84% of the monitoring universe (Chart A-7).



Chart 2 (Chart A-2 in the statistical overview)

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.

Note: The latest observation is for the fourth quarter of 2020.

Amid the liquidity strains during the first quarter of 2020, the share of the total funding of the banking sector provided by non-bank financial entities increased significantly and was reflected by higher deposits.

Wholesale funding provided by non-bank financial entities to the banking sector increased by 8.1% year-on-year to €2.6 trillion in the first quarter of 2020 from €2.4 trillion in 2019 (Chart 3). Much of the increase in debt securities issued by banks was attributable to purchasing of certificates of deposits (+55.4%) and OFI deposits (+17.4%) by MMFs, while banks' funding through securitised assets net of retained securitisations decreased by 8.5%. Data on European securitisation issuance (including placed and retained securitisations) by collateral type showed that total issuances in 2020 were lower than those in 2019 for commercial mortgage-backed securities (-59%), collateralised debt obligations (-44%), residential mortgage-backed securities (-23%) and loans to small and medium-sized enterprises (-68%). Meanwhile, total issuances of asset-backed securities increased (+45.5%) (Chart A-33 and Section 3.3). The share of simple, transparent and standardised (STS) securitisations increased to 40% of total issuances in 2020 compared with 33% in 2019, according to the Association for Financial Markets in Europe (AFME).²

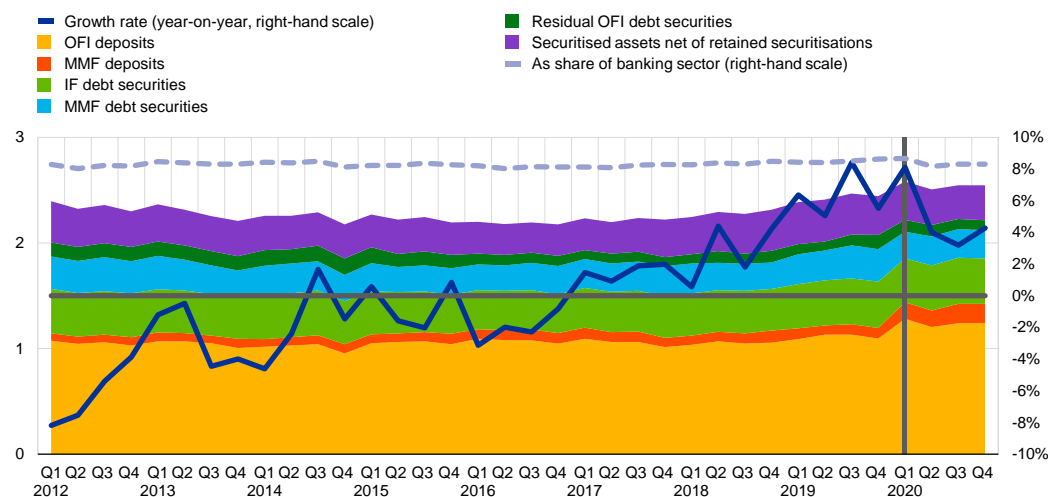
² See "Securitisation Data Report – Q4 2020", AFME.



Chart 3 (Chart A-8 in the statistical overview)

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

(EUR trillions and annual growth rates)



Sources: ECB and ESMA calculations.

Box 1

UK withdrawal from the EU and statistics in the NBFi Monitor

Most of the statistics presented in this report no longer include UK data, reflecting the withdrawal of the United Kingdom from the EU and the European Economic Area (EEA) on 31 January 2020. The United Kingdom decided to withdraw from the EU and the EEA with effect from 31 January 2020. UK data have therefore been excluded from the statistics of this report. Time series have been recalculated without the United Kingdom to ensure comparability. In some cases, however, UK data are still included or mentioned. The sections on hedge funds, private equity funds and private debt funds still refer partly to the United Kingdom because some statistics refer to 2019. The securitisation section also includes UK commercial data.

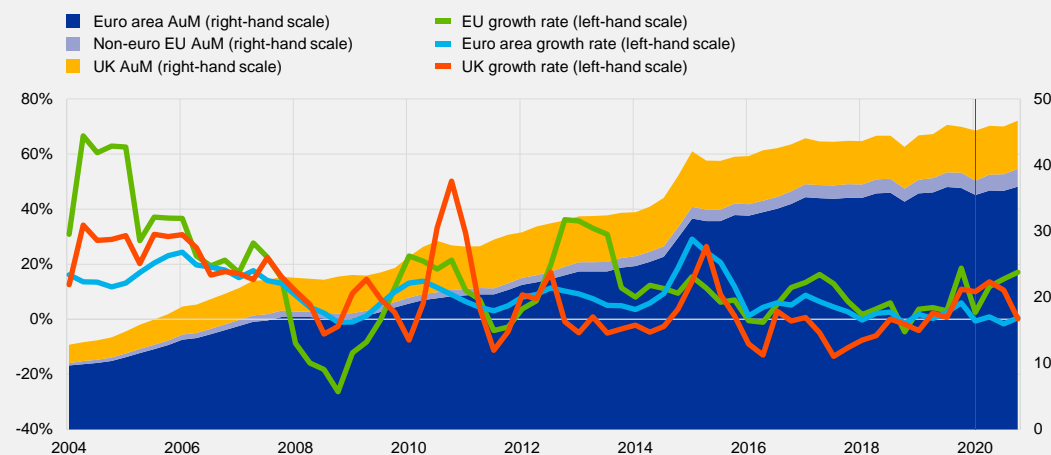
The UK non-bank sector is important, with AuM equivalent to 20% of EU 27 AuM. Chart A shows that the United Kingdom's outstanding AuM in Q4 2020 stood at €7.3 trillion. Compared with the EU 27 figure, UK AuM have not been as affected by the pandemic. The United Kingdom is the main home country of hedge funds, as well as of "residual OFIs" (Chart A-7 of the previous edition), and this is where the impact shows most, besides aggregated EU figures.



Chart A

Assets under management in investment funds and other financial institutions

(EUR trillions and annual growth rates)



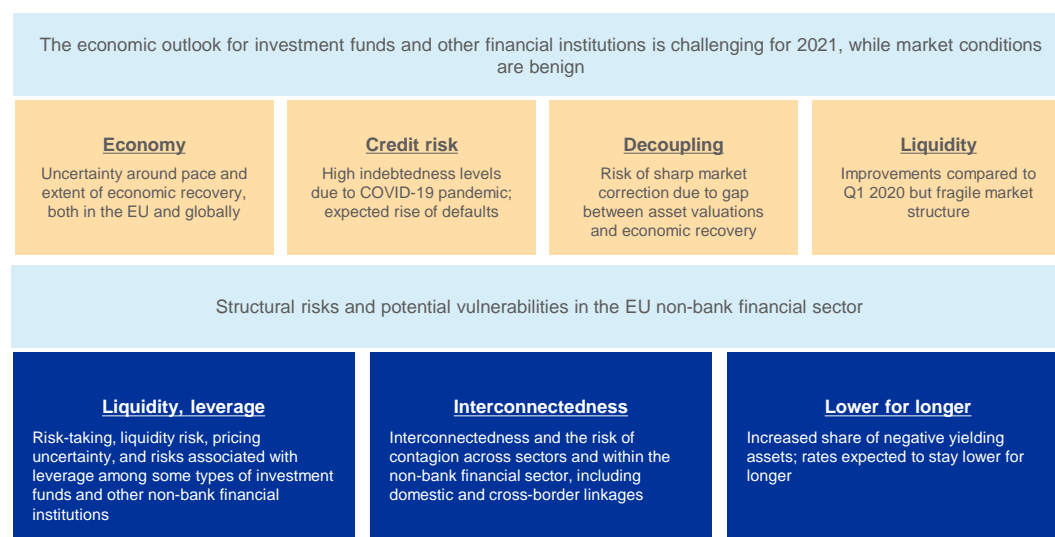
1.2 Overview of risks and vulnerabilities

From a macroprudential perspective, a growing non-bank financial sector brings benefits in terms of increased risk-sharing across the financial system, but it can also result in new risks and vulnerabilities. The expansion of the non-bank financial sector in recent years has been accompanied by an increase in liquidity transformation and maturity transformation, combined with a pick-up in leverage for some entities. Such risk-taking has created vulnerabilities which need to be monitored and assessed, taking into account interconnectedness within the financial system, as well as the role of non-bank financial institutions in funding the real economy more broadly. Figure 1 provides an overview of the potential risks and vulnerabilities arising from non-bank financial intermediation in the EU.



Figure 1

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



Source: ESRB.

Besides these vulnerabilities, data gaps still prevent an effective risk assessment in some parts of the non-bank financial sector and some markets in which it invests, such as short-term funding markets. Vulnerabilities can build up unnoticed among entities where statistical information is not readily available or not sufficiently granular. Such gaps need to be closed, existing data reporting frameworks improved, and consistent metrics developed. There are in particular gaps related to some short-term funding markets in the EU, notably in terms of the size of and activity on secondary markets. EU MMFs invest mainly in commercial paper (CP) and certificates of deposit (CDs). While the reporting requirements under the Money Market Fund Regulation (MMFR) provide information on MMF exposures, little information is available on the size of those markets, especially for CP, which tends to be fragmented across jurisdictions.³ In addition, the COVID-19 crisis has shown that the liquidity of short-term funding markets can deteriorate substantially. Data on secondary market activity for these markets are very scarce, however, including trading volumes and bid-ask spreads.

1.2.1 Cyclical risks

Economy

Medium-term uncertainty has risen after a difficult year for the EU economy. After a sharp decline at the beginning of 2020, economic activity rebounded in the second quarter as economies reopened, before falling again at the end of the year due to a second wave of infections. The beginning of 2021 brought positive news as the vaccine rollout started, but operational difficulties have prevented Europe from fully benefiting from its positive effects. The medium-term outlook

³ See "Issues note on systemic vulnerabilities and preliminary policy considerations to reform MMFs", ESRB, July 2021.



remains highly uncertain, as scarring effects could have a permanent impact on economic output and because of the risk of multiple waves of COVID-19 variants.

Credit risk

Credit risk has risen as corporate and public sector debt have ballooned. Leverage in the corporate sector has increased, with firms taking on more debt to cover their fixed costs amid a steep decline in income during the lockdown. Strong public intervention, through credit guarantees or direct purchases of corporate bonds by central banks, has helped maintain funding costs at low levels. While default rates have remained low, they may increase, especially for sectors most impacted by the pandemic. As corporate restructuring takes place, losses could materialise on financial sector balance sheets as well as for governments.⁴

Decoupling

The decoupling between a strong increase in asset prices and an uneven economic recovery raises the risk of a disorderly market correction. After a sharp decline in March 2020, asset prices have surged across markets, with end-2020 valuations above pre-pandemic levels. Such a rebound might reflect public support measures, as well as market expectations of a quick recovery in economic activity. Given the uncertainty around the medium-term outlook and the pace of the economic recovery underway across sectors and countries, markets remain subject to the risk of a disorderly correction. Sharp falls in asset prices could lead to a surge in volatility and a reduction in market liquidity, which would further amplify shocks within the financial system.

Liquidity risks

See the paragraph below that covers liquidity risks from a structural and cyclical perspective.

1.2.2 Structural risks

Risk-taking, liquidity risk and risks associated with leverage

After the market turmoil, liquidity and duration risks have increased in some parts of the European non-bank financial sector, including investment funds. During the market turmoil of March 2020, investment funds increased their liquid holdings by raising cash buffers to be able to meet redemption requests from investors. Some funds suspended redemptions, due mainly to either valuation uncertainty (real estate funds) or outflows (corporate bond funds).⁵ As market conditions normalised, bond funds resumed their credit intermediation and maturity transformation

⁴ See “**Prevention and management of a large number of corporate insolvencies**”, ESRB, April 2021.

⁵ See “**Report on the Recommendation of the ESRB on liquidity risk in investment funds**”, ESMA, November 2020.

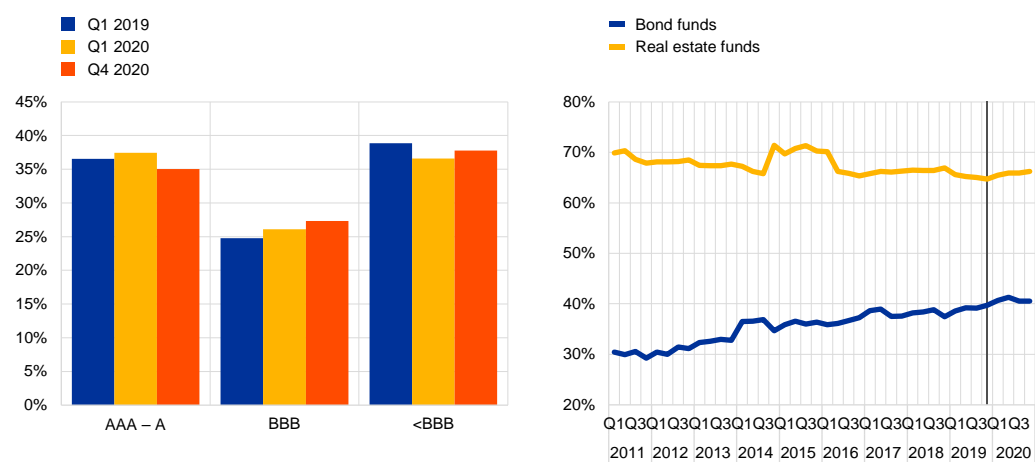


activities by investing in longer-dated bonds. Credit ratings of bonds held also decreased, potentially reflecting downgrades (Chart 4). Liquidity buffers of real estate funds fell to their lowest level since 2017. The current vulnerabilities in the CRE market of certain countries, including the risk of a sharp price correction and valuation difficulties due to the lack of transactions, may trigger liquidity risks as described in the special feature of this report on CRE.

Chart 4

Average rating of bond fund holdings (left panel) and liquidity transformation of bond and real estate funds (right panel)

(percentages of total assets)



Sources: ESMA and ESRB.

Notes: The latest observations are for the fourth quarter of 2020. The proxy for liquidity transformation is expressed as total assets minus liquid assets (deposits, sovereign bonds, debt securities issued by MFIs and equity and open-ended investment fund shares), as a share of total assets. Estimates are made for funds' holdings of non-euro area securities and deposits.

Liquidity transformation performed by MMFs has declined as they have increased their exposures to short-term liquid assets. After experiencing acute stress in March 2020, MMFs exposed to private debt (low-volatility net asset value (LVNAV) and variable net asset value (VNAV)) repositioned their portfolios towards shorter-dated liquid assets (contrary to bond funds as noted above). For USD LVNAVs, weekly liquid assets increased from around 40% of net asset value in early 2020 to more than 50% in Q4 2020 (see the entity section on MMFs).

Leverage by investment funds declined overall in 2020, but hedge fund leverage picked up towards the end of the year. Within the fund sector, leverage tends to be concentrated among hedge funds either through synthetic leverage (using derivatives), which is allowed for alternative investment funds (AIFs) and for undertakings for collective investment in transferable securities (UCITS) within the applicable defined limits (limit of 100% of net asset value (NAV) under the commitment approach, or indirect limits under the VaR approach⁶), or financial leverage (using unsecured borrowings and securities financing transactions (SFTs)), which is only possible for AIFs. During the first half of 2020, hedge fund leverage declined as funds reduced their derivatives

⁶ Under the VaR approach, leverage is indirectly limited. For a UCITs using the relative VaR approach, the one-month VaR should be up to 200% of the VaR of a reference portfolio. Under the absolute VaR approach, the one-month VaR can be up to 20% of the portfolio.



exposures during the turmoil and as direct funding decreased. Since then, synthetic leverage has contracted further but financial leverage has picked up, as hedge funds have increased repo funding.⁷

Interconnectedness and the risk of contagion

Interconnectedness of non-bank financial institutions can be significant across three dimensions. First, direct and indirect exposures within non-bank financial institutions can be important. Second, exposures between non-banks and credit institutions can be sizeable. Finally, non-bank financial institutions can also display strong cross-border interconnectedness.⁸

Non-bank financial institutions are closely connected with the banking sector through direct exposures. Investment funds, MMFs and OFIs represent an important source of wholesale funding for the banking sector. As a consequence of the liquidity stress in March 2020, deposits by OFIs and MMFs surged by 80% in 2020 (Chart A-8). Bank-issued deposits account for about half of the wholesale funding provided by these institutions. The other half consists of bank-issued debt securities held by these institutions, including securitised assets. On the other hand, financing provided to non-bank financial institutions through loans, debt securities and equities issued by non-bank financials also accounts for about 8% of banks' total assets (Chart A-9). In turn, deposits with euro area credit institutions from euro area non-bank financials account for 6.3% of bank liabilities (Chart A-10). In addition, non-bank financial institutions are exposed to banks as counterparties for non-centrally cleared derivatives and SFTs. From a counterparty risk perspective, banks may borrow a security from counterparties and post cash to counterparties as collateral, or enter into derivatives transactions with counterparties. Regarding funding risk, banks increasingly rely on non-bank financial institutions such as MMFs for short-term funding. Nevertheless, the maintenance of such funding from MMFs to banks may not be sustainable under stressed market conditions, as witnessed in March 2020 when non-banks used MMFs as a source of liquidity. An abrupt withdrawal of MMF funding to banks may lead to market disruptions that could spill over to other parts of the financial system and the non-financial corporate sector.

Non-bank financial institutions are also closely connected with each other through direct exposures, including across borders. This is the case within the fund sector and between the fund sector and the insurance and pension fund sector. In the euro area, ICPFs are the largest investors in investment funds, holding 27% of funds' shares⁹ (see the special feature on insurance corporations). Similarly, non-bank financial institutions are the largest holder of MMF shares within the euro area.

Indirect exposures can arise through ownership structures in financial conglomerates, involving banks, insurers and asset management companies. Banks and insurance companies in the EU are often connected with large asset management companies within financial conglomerates. These links can help to optimise liquidity between the parent company and

⁷ See “[Report on Trends, Risks and Vulnerabilities](#)”, ESMA, March 2021.

⁸ See Abad et al., “[Mapping exposures of EU banks to the global shadow banking system](#)”, *Journal of Banking and Finance*, May 2021.

⁹ See “[Macroeconomic and sectoral statistics – euro area, who-to-whom detail](#)”, Statistical Data Warehouse, ECB.



affiliated institutions and provide long-term benefits in terms of revenue and risk diversification. However, during stress periods, the interlinkage, e.g. through credit lines and contingency arrangements between the holding company and the affiliated institutions, can create contagion between the affiliated institutions and to the holding company. Interdependencies also exist with respect to revenue streams and confidence effects.

Indirect interlinkages between banks, insurance corporations and non-bank financial institutions can result from common asset exposures. For example, euro area banks and bond funds tend to invest in the same securities. Large common exposures between banks, investment funds and insurers increase the risk of amplifying market stress, if they have to liquidate a large or illiquid part of their portfolios simultaneously. In the asset management sector, the rise of passive investments has also resulted in more funds being exposed to the same indices. Investors holding the same assets may then suffer mark-to-market losses in their balance sheet, which can prompt further outflows and fire sales (affecting market liquidity more broadly).

Non-banks are also exposed to the rest of the world through their holdings of foreign securities. Within the euro area, investment funds account for more than half of the holdings of foreign (long-term) debt securities. Such exposures provide first and foremost diversification benefits outside of the euro area. When exposures are concentrated, they can also propagate shocks from other countries. Shocks to other countries might spill over to the EU financial sector through their impact on funds' returns. In addition, a range of financial institutions obtain funding in foreign currencies in global markets, making them exposed to vulnerabilities in short-term funding markets, as witnessed in March 2020 when USD short-term markets faced intense turmoil and central banks increased the volume of foreign exchange swaps.

Lower for longer

The low interest rate environment can increase vulnerabilities within the non-bank financial sector. Low rates can lead to business model and profitability challenges, thus encouraging further risk-taking and use of leverage.¹⁰ In addition, the low interest rate environment puts at risk the future performance of equity and bond portfolios, especially if they are exposed to corporations whose financial viability depends on a continued availability of low interest rates or on fiscal support measures.

Low rates also encourage further risk-taking, which can exacerbate risks related to liquidity and leverage. In a low interest rate environment, investors targeting absolute nominal returns have to increase their exposure to higher-yielding assets (by increasing credit risk, maturity risk or liquidity risk) and/or use leverage to amplify their returns. It is therefore key to monitor such developments and ensure that the savings vehicles chosen by investors have built-in safeguards to limit those risks and reduce the transmission of shocks to the financial system. Indeed, as investors take on more liquidity, credit and maturity risk, any abrupt change in interest rates can result in large losses on fixed income instruments. In addition, an increase in the discount rate would also

¹⁰ See "**Lower for longer – macroprudential policy issues arising from the low interest rate environment**", ESRB, June 2021.



lower equity valuations, and if it were to occur in a disorderly fashion, such changes could lead to a sharp decline in valuations across asset classes.

Low rates pose greater challenges, especially for some segments of the MMF industry. For MMFs using amortised cost (around 55% of EU MMFs), low rates and negative rates on government debt make it very challenging to maintain a stable NAV. In this context, EUR constant net asset value (CNAV) MMFs have almost disappeared as they cannot maintain a stable NAV while being invested almost exclusively in debt instruments with negative yields.

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 1 provides an overview of such 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 level of engagement in these activities does not necessarily translate into a measure of risk. The assessment of the level of engagement in Table 1 is informed by descriptive statistics and market intelligence, but is ultimately judgement-based. It is reviewed and updated on an annual basis and incorporates improved data availability (e.g. under the AIFMD and the Securities Financing Transactions Regulation (SFTR)) and regulatory developments. A more detailed entity-based analysis is presented in Section 2, while activity-based monitoring is covered in Section 3.

Hedge funds, financial vehicle corporations (FVCs), as well as security and derivative dealers (SDDs), have a 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 funds and MMFs, as well as special-purpose entities (SPEs) and financial corporations engaged in lending (FCLs), have a medium engagement. Mixed funds, private equity funds and exchange-traded funds (ETFs) have a low engagement, on average, at the entity level.



Table 1

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
	CNAV	VNAV	LVNAV	Corporate	Sovereign											
Market size																
EA AuM (EUR trillion)	0.1	0.6	0.6	3.6		3.3	3.8	0.4	0.8	0.9	0.8	n.a	2.1	n.a	n.a	0.5
Summary assessment																
Engagement	●	●	●	●	●	●	○	●	●	●	●	●	●	●	●	●
Risk transformation activities																
Credit intermediation	●	●	●	●	●	●	○	●	○	○	●	●	●	●	○	●
Maturity transformation	●	●	●	●	●	●	○	●	●	●	○	○	●	●	●	●
Liquidity transformation	●	●	●	●	●	●	○	●	●	●	○	○	●	●	●	●
Leverage²	○	○	○	●	●	●	○	●	●	○	●	●	●	●	●	●
Market activities¹																
SFTs	●	●	●	●	●	●	●	●	○	●	○	○	○	○	●	○
Derivatives	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	○
Reuse of collateral	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	○
Interconnectedness																
Interconnectedness³	●	●	●	○	○	○	○	●	●	●	○	○	●	●	○	●

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 investment funds 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 2019 European Private Equity Activity. FVCs stands for financial vehicle corporations (non-retained securitisations), FCLs for financial corporations engaged in lending, SDDs for security and derivative dealers, CNAV for constant net asset value, VNAV for variable net asset value and LVNAV for low-volatility 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.



1.4 Recent developments in the EU policy framework (regulatory update)

The European Commission adopted a Capital Markets Recovery Package on 24 July 2020.

The package contained targeted adjustments to the Prospectus Regulation, MiFID II and securitisation rules. The Prospectus Regulation was amended mainly to establish a new temporary “EU Recovery prospectus”. This shorter prospectus will make it easier for companies to raise capital to meet their funding needs, while ensuring adequate information is provided to investors. The MiFID II rules were amended to simplify information requirements in a targeted manner, while safeguarding investor protection. To facilitate the use of securitisation in the post-COVID-19 economic recovery, the existing EU framework for STS securitisations was extended to cover on-balance-sheet synthetic securitisations, and regulatory obstacles to the securitisation of non-performing exposures (NPEs) were removed. The package was adopted by co-legislators in early 2021.

On 24 July 2020, the European Commission also adopted a proposal to amend the Benchmark Regulation. The aim of the amendments (adopted by co-legislators in early 2021) was to ensure that when a benchmark is phased out, it does not significantly disrupt the functioning of financial markets in the EU, nor pose a systemic risk to the financial system. Ahead of the replacement of the euro overnight index average (EONIA) in 2022, the European Securities and Market Authority (ESMA) launched a consultation seeking feedback on the publication of the compounded euro short-term rate (€STR) by the ECB. This consultation ended in mid-September, and its results were included in the draft Regulatory Technical Standards under the Benchmark Regulation published on 29 September 2020.

On 27 October 2020, ESMA issued a public statement confirming that EU credit rating agencies would be able to endorse credit ratings elaborated in the United Kingdom after the end of the transition period.

On 6 May 2020, ESMA approved the extension of registrations of four trade repositories to include SFT reporting under the SFTR, i.e. repurchase transactions, securities or commodities lending and securities or commodities borrowing transactions, buy-sell back or sell-buy back transactions and margin lending transactions.

Several Member States (AT, BE, ES, FR, GR, IT) implemented short-selling bans during the COVID-related high volatility episode. In addition, ESMA issued a decision to enhance market monitoring that temporarily lowered the threshold under which the holders of net short positions in shares traded on an EU regulated market must notify the relevant national competent authority (NCA). This was reduced from when the position reaches or exceeds 0.2% to 0.1% of the issued share capital. The decision was renewed in June, September and December 2020.

Regulators at EU and international level are assessing vulnerabilities in the MMF sector and are considering reforms to increase resilience to future crises. In this context, ESMA published a consultation document in April 2021 on the potential need for the review of the MMF Regulation. In the meantime, ESMA published updated guidelines on stress tests for MMFs, including modifications of the risk parameters provided by the ESRB and the ECB, to take account of MMFs’ experience during the COVID-19 crisis.



In response to the ESRB’s recommendation, ESMA coordinated a supervisory exercise with a focus on investment funds exposed to corporate debt and real estate assets. Results showed that, in general, corporate debt and real estate funds were able to maintain their activities when faced with redemption pressure and valuation uncertainty. Funds were also broadly able to keep their portfolio structure constant. This was supported by the redemption shock lasting a short period of time and against the backdrop of unprecedented monetary and fiscal support measures. The supervisory exercise helped ESMA to identify five priority areas to enhance the preparedness of investment funds for future market stress: (i) continued supervision to ensure alignment between investment funds’ investment strategy, liquidity profile and redemption policy; (ii) closer supervision of investment funds’ liquidity risk assessments, including liquidity stress testing; (iii) additional specifications on how liquidity profiles should be reported under the AIFMD; (iv) the need for the availability of a common set of liquidity management tools (LMTs) for fund managers in both UCITS and AIFs; and (v) further supervisory work to ensure that management companies’ valuation procedures cover all market situations, including valuation approaches for stressed market conditions.

As a follow-up to the 2017 ESRB recommendation on liquidity and leverage in investment funds¹¹, ESMA published guidelines on setting leverage limits under Article 25 of the AIFMD.

The Commission also conducted public consultations on the renewed sustainable finance strategy (launched on 8 April), as well as reviews of the Solvency II Directive (launched on 1 July), the rules for European long-term investment funds (launched on 19 October), and the AIFMD (launched on 22 October) in 2020.

¹¹ **Recommendation of the European Systemic Risk Board of 7 December 2017 on liquidity and leverage risks in investment funds (ESRB/2017/6).**



2 Special features

This year, the NBFi Monitor includes three special features on CRE, insurance and three idiosyncratic events that took place in 2021. These special features provide a deeper dive into certain topics of relevance for the Monitor. The special feature on CRE assesses liquidity and leverage risks in investment funds on the basis of vulnerabilities in the CRE market segment due to the pandemic outbreak. As opposed to the entity-based section on real estate funds, it is forward-looking. The special feature on insurance looks at the role of insurers in non-bank financial intermediation, as those institutions were not previously covered by the Monitor. The last special feature on GameStop, Greensill and Archegos highlights the relevance of these cases for the monitoring of financial stability and how leverage, concentration and liquidity risks can materialise and spread through the financial system.

2.1 Commercial real estate – liquidity and leverage risks in investment funds

The outbreak of the coronavirus crisis in Europe saw a sharp and extended decline in CRE market activity, with market indicators pointing towards a substantial price correction. There were 50% fewer transactions in EU CRE markets in the last three quarters of 2020 than in the same period of 2019 (Chart 5, left panel). The literature shows that this type of drop in transactions typically precedes price corrections and was also seen at the start of the global financial crisis.¹² Indeed, the share of investors seeing EU markets in a downturn increased from less than 20% to more than 60% over the course of 2020.¹³ The beginning of a correction is also visible in standard CRE price indices, despite low underlying transaction numbers and the backward-looking methodologies of these metrics (Chart 5, right panel).

¹² Dorinth W. van Dijk, David M. Geltner, Alex M. van de Minne, The Dynamics of Liquidity in Commercial Property Markets: Revisiting Supply and Demand Indexes in Real Estate, *The Journal of Real Estate Finance and Economics*, July 2020.

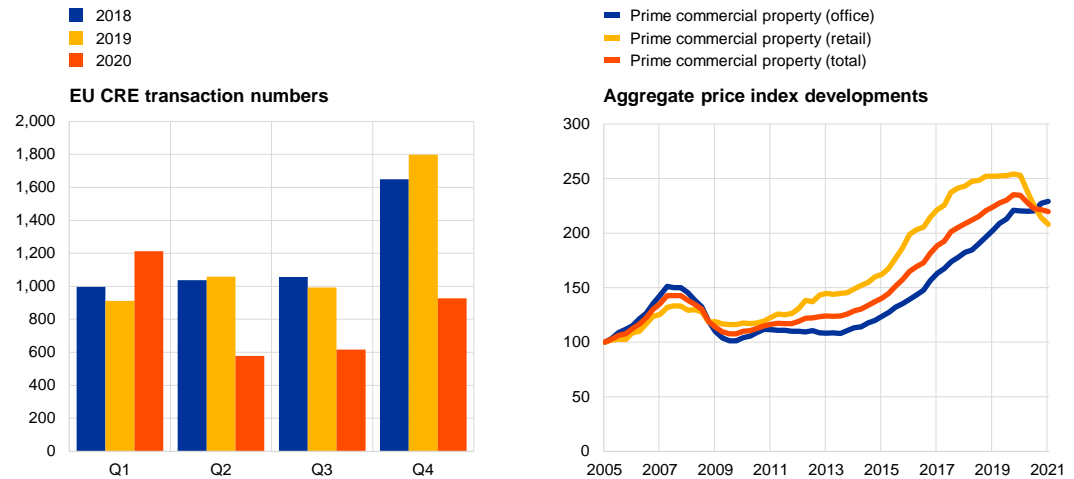
¹³ According to RICS data, which include BG, CZ, DE, IE, GR, ES, FR, HR, IT, CY, HU, NL, AT, PL, PT and RO.



Chart 5

Indicators suggest a substantial price correction may follow the current decline in CRE activity

(top left: number of transactions; top right: price index, 2005 Q1 = 100)



Sources: RCA (left panel) and JLL (right panel).

Notes: Left panel: EU sample includes full EU 27. The data for Q4 2020 are preliminary, and the overall figures may rise once up-to-date information is available. Right panel: Sample includes BE, CZ, DK, DE, IE, GR, ES, FR, IT, LU, HU, NL, AT, PL, PT, FI and SE.

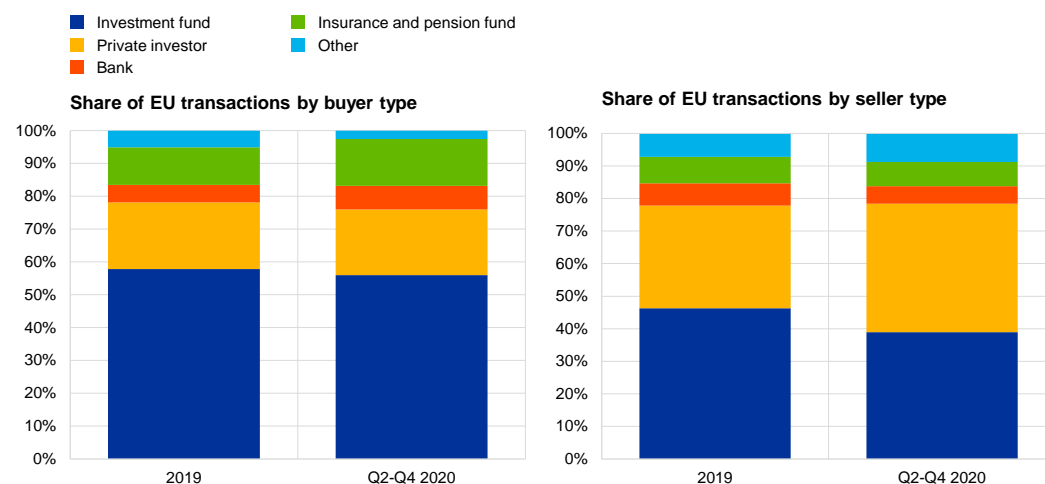
Investment funds play an important role in European CRE markets, making them highly exposed to a COVID-19 price shock and also giving them the capacity to amplify it. Chart 6 shows that, in 2019 and 2020, investment funds acted as buyers for more than 50% of the value of EU CRE transactions. A comparison with their share as sellers also shows that funds act as net buyers in this market, together with ICPFs. Funds' steady market share as buyers since the outbreak of the crisis suggests that they are currently withdrawing from the market at the same rate as other investors (Chart 6).



Chart 6

Investment funds are important players in European CRE markets: share of EU transactions by buyer and seller type

(percentage of transaction volume)



Source: RCA.

Note: Sample includes full EU 27. The “private investor” category refers to companies whose control is in private hands and whose business is primarily geared towards operating, developing or investing in CRE.

2.1.1 Vulnerabilities stemming from liquidity mismatches

Liquidity mismatches remain a key vulnerability in the open-end CRE fund sector.¹⁴ At the end of the fourth quarter of 2020, open-ended CRE funds revealed a liquidity mismatch due to offering investors shorter redemption periods than portfolio assets could be liquidated (Chart 7, left panel). The short-term portfolio liquidity (up to a month) was 10 percentage points lower than investor liquidity. Since 2017, this share has remained largely unchanged. The liquidity mismatch is more pronounced for funds permitting daily share redemptions by investors, which account for one-third of CRE funds with any liquidity mismatch. Owing to the economic significance of funds with daily redemption frequencies, the liquidity mismatch of these funds remains a key vulnerability. According to ESMA, these funds account for 50% of all CRE funds in Europe¹⁵. Instruments to mitigate risks stemming from liquidity mismatches are liquidity buffers or LMTs.

The decrease of liquidity buffers to a three-year low in 2020 may have reduced funds’ resilience to large redemptions. Liquidity buffers, consisting of cash and cash equivalents, are available to funds to meet redemption obligations or to repay existing debt. Since the beginning of 2017, liquidity buffers have steadily decreased to nearly 2.5% of NAV in the fourth quarter of 2020

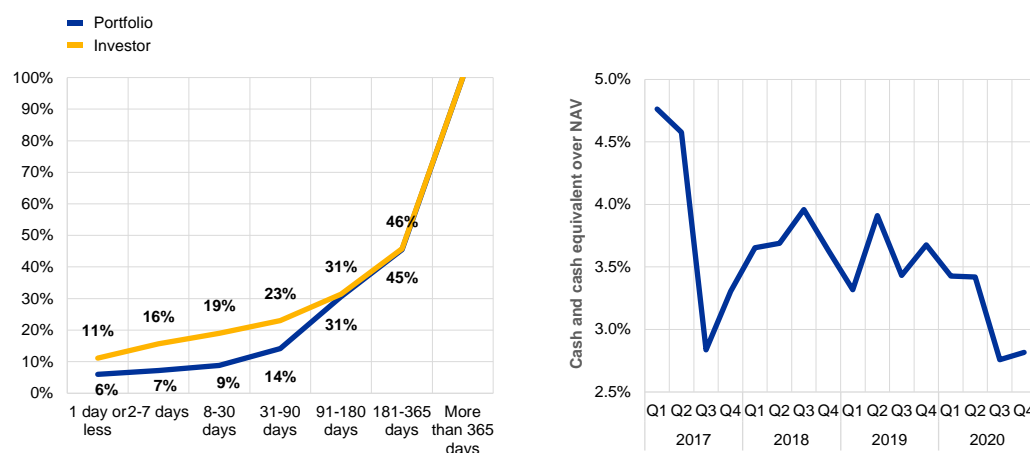
¹⁴ The ESRB defines CRE as any income-producing real estate, which means that all real estate funds fall under the ESRB definition. AIFMD data are reported under Directive 2011/61/EU on alternative investment fund managers and corresponding amendments. Charts and analyses on alternative real estate investment funds are based on data provided by NCAs to ESMA under the AIFMD and shared with the ESRB. The reporting period of the data is the fourth quarter of 2020. For French funds third quarter 2020 data are used due to data unavailability for the fourth quarter of 2020.

¹⁵ See “[Report: Recommendation of the European Systemic Risk Board \(ESRB\) on liquidity risk in investment funds](#)”, ESMA, November 2020



(Chart 7, right panel). Declining holdings of cash were observed in almost all countries. In 2020, funds' liquidity positions deteriorated, especially during the third quarter when cash was likely used to meet (the albeit limited) redemption requests. In some cases, real estate funds made use of fund suspensions and other LMTs directly at the onset of the COVID-19 pandemic, and the ESRB emphasised the widespread use of LMTs in May 2020.^{16 17} However, ESMA notes that LMTs for funds are not harmonised across Europe and their availability is still limited in some jurisdictions.¹⁸ This poses challenges for the consistent application of such tools.

Chart 7
Liquidity transformation profile (left panel) and liquidity buffers in open-ended commercial real estate funds (right panel)



Sources: AIFMD, CSDB and ESRB calculations.

Notes: Left panel: The graph shows the cumulative distributions of portfolio liquidity and investor liquidity for non-closed-ended real estate funds. Portfolio liquidity is defined as the percentage of a portfolio capable of being liquidated within the given period. Investor liquidity is defined by the breakdown of NAV depending on the shortest period within which the invested funds could be withdrawn, or investors could receive redemption payments. Right panel: The graph shows the real estate fund sector's average percentage share of liquidity buffers at the sector's cumulative NAVs. Liquidity buffers cover cash and cash equivalents, government bonds with maturity below one year, money market share investments and cash management by collective investment undertakings.

2.1.2 Vulnerabilities stemming from leverage

Owing to an overall increase in leverage, real estate funds increased their exposure to property price fluctuations. Leverage, defined as AuM/NAV¹⁹, has increased on average by 2 percentage points to 137% of NAV since the beginning of 2017.²⁰ This dynamic is mainly driven by open-ended funds (Chart 8, left panel). While closed-ended funds kept their leverage level

¹⁶ See "Report: Recommendation of the European Systemic Risk Board (ESRB) on liquidity risk in investment funds", ESMA, November 2020.

¹⁷ See "ESMA Annual Statistical Report: EU Alternative Investment Funds 2020", ESMA, January 2020.

¹⁸ See "Report: Recommendation of the European Systemic Risk Board (ESRB) on liquidity risk in investment funds", ESMA, November 2020.

¹⁹ The ratio serves as a proxy for leverage from an economic perspective. It is closely related to gross leverage, which is defined as the gross exposures excluding cash in the currency of the AIF, divided by the NAV.

²⁰ This is different than the figure reported in Section 3.1.3 due to the use of different sources of data (AIFMD and Statistical Data Warehouse).



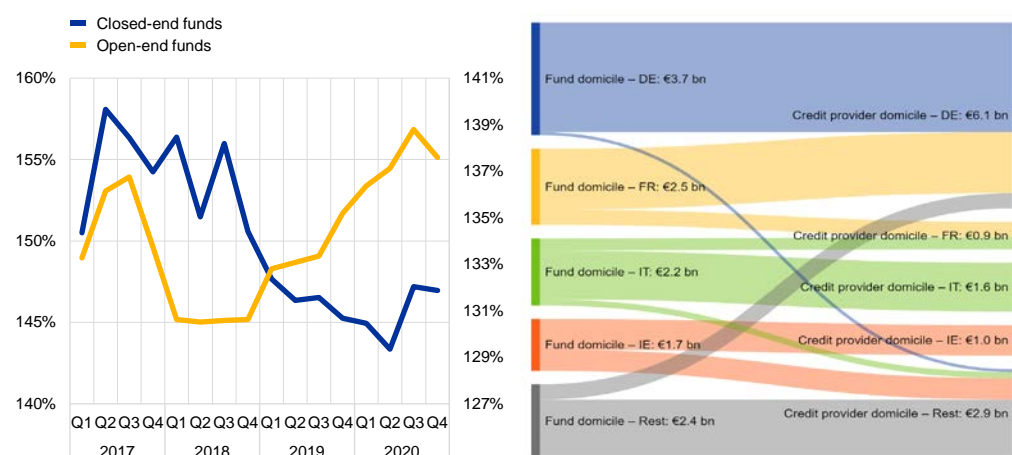
constant on average over time, open-ended funds increased leverage by 3 percentage points to 137% in the fourth quarter of 2020. Open-ended funds still apply leverage to a smaller degree than closed-ended funds. However, in contrast to closed-ended funds, these funds are additionally exposed to risks associated with liquidity transformation, which may increase their vulnerabilities.²¹

Higher leverage increases funds' interconnectedness with the rest of the financial system, as it provides an indirect contagion channel between funds and their credit providers. At the end of the fourth quarter of 2020, real estate funds borrowed €67 billion (10.2 % of NAV). Counterparty information is reported by funds for the five largest sources of borrowings, which amount to €12.5 billion (19% of all borrowings). Credit institutions are by far the largest credit providers (81%), followed by financial auxiliaries (17.5%). In most countries, credit is provided by locally domiciled intermediaries (Chart 8, right panel). This implies that parts of any spillover effects through credit provisioning during a CRE market downturn would occur between funds, banks and financial auxiliaries within the same jurisdiction. Significant cross-border linkages exist for French and Irish funds.²²

Chart 8

Leverage of open-end and closed-end funds (left panel) and credit provision by jurisdiction (right panel)

(left panel: left-hand scale: closed-end funds; right-hand scale: open-end funds; percentages)



Sources: AIFMD, CSDB and ESRB calculations.

Notes: Left panel: The blue line shows the weighted average leverage (AuM/NAV) of closed-end funds. The yellow line shows the weighted leverage of open-end funds. Leverage is weighted by funds' AuM. Right panel: Percentage of AuM for non-closed-end funds. This group includes open-end funds and funds of unspecified type. The graph shows the credit line linkages for real estate funds between the funds' domiciles (left layer) and the legal jurisdictions of credit providers (right layer). Rest subsumes all other countries to achieve data confidentiality.

²¹ Compare also the Central Bank of Ireland's Financial Stability Review 2020:1.

²² This pattern remains unchanged if one considers the parent company jurisdiction of the funds' direct credit providers.



2.1.3 National specific regulations on liquidity and leverage

Most EU jurisdictions have supplemented EU law with national regulations covering types of real estate funds, leverage and liquidity risks. There are no such regulations in Bulgaria, Denmark, Croatia, Latvia, the Netherlands, Norway and Sweden. The ESRB has undertaken a survey among its member institutions to collect information on these national specific regulations. While in many cases regulations were put in place to protect investors, they can also reduce some of the risks to financial stability identified in this special feature. The results are summarised below. Only the provisions that are not in the AIFMD are reported.

EU countries have defined limits on balance-sheet leverage for real estate funds. For example, the real estate funds are allowed to borrow but no more than a certain percentage of the value of the real estate assets. These caps may vary when funds are only open to professional or retail investors. The values of the caps differ from one country to another.

LMTs are available in several but not all jurisdictions, and their types are not harmonised. There are only closed-ended real estate funds in Belgium, Italy, the Netherlands²³ and Poland. Ex ante tools such as notice periods or liquidity buffers are available in Germany, France, Luxembourg, Hungary, Portugal and Slovakia. Ex post liquidity tools such as the suspension of redemptions, fees, or the possibility for funds to resort to short-term borrowing to pay redemptions are available in Germany, Ireland, Spain, France, Lithuania, Luxembourg, Austria, Portugal and Slovakia.

In conclusion, provisions on leverage exist in most jurisdictions but may benefit from more harmonisation, while provisions on liquidity should be introduced in several countries and harmonised to allow the availability of both ex ante and ex post measures. Beyond the availability of tools, it may also be helpful to consider whether further guidance is needed in order to determine when tools should be triggered. For instance, more harmonisation on the underlying rationale for employing regulator-led suspensions of redemptions would be beneficial.

2.2 Insurance – role in non-bank financial intermediation

With €9.4 trillion in assets as of the fourth quarter of 2020, the EU insurance sector is an important investor that contributes to non-bank financial intermediation in the EU. The primary business of insurers is to provide financial compensation to households and corporations if a predefined event occurs (for example death or accident). To this end, insurers start by collecting premiums and build reserves to cover for the promises made to policyholders at the inception of the contract. Life insurers also play an important role in facilitating long-term savings by households, for example for retirement. As a consequence of this reverse business cycle (i.e. premiums received before liabilities are paid out), insurers hold a large amount of assets that they need to invest. Typically, they invest mainly in fixed income securities of good credit quality in order to match the

²³ Except for one fund being open to retail investors.



expected duration of their liabilities.²⁴ By doing so, insurers contribute to market-based financial intermediation.

- **This special feature focuses on three aspects of insurers as non-bank financial intermediaries: (i) credit intermediation, (ii) interconnectedness with other non-banks, and (iii) interconnectedness across markets.** Several aspects of insurers' activities and balance sheets are relevant from a financial intermediation perspective. These aspects can be summarised according to the dimensions of the engagement table (Table 1) of Section 1:
- **Risk transformation activities**
 - Credit intermediation: medium engagement. As of the fourth quarter of 2020, most assets held by insurers were fixed income securities, held either directly or through investment funds (53%). These securities are usually of good credit quality: the European Insurance and Occupational Pensions Authority's (EIOPA's) risk dashboard²⁵ data shows that the median credit quality step is between AA and A ratings and that the share of assets below BBB- rating amounts to 1.5% of total assets. The section below provides more information on credit intermediation by insurers.
 - Maturity transformation: low engagement. In order for insurers to protect their balance sheets from interest rate movements that would affect their solvency positions, they tend to match the duration of their assets with that of their liabilities. The availability of long-dated securities or different strategies might lead to a so-called duration gap – typically for life insurers – which exposes insurers to the risk that interest rates may change. EIOPA's risk dashboard²⁶ shows that the median duration gap is negative and stands at around -6 years. This duration gap has widened over the past five years.²⁷ It indicates that insurers can be significantly exposed to interest rate risks.
 - Liquidity transformation: low engagement. A significant share of insurers' assets are invested in government bonds and highly rated corporate bonds and equities. These assets are generally considered liquid and would therefore allow insurers to pay unexpected claims. Some insurance policies, however, might trigger a need for liquidity that is more difficult to meet: this is the case, for example, for life insurance policies with redemption features, where a "mass lapse" event might put insurers in a difficult liquidity position.²⁸
 - Leverage: insignificant engagement. The majority of insurers' capital is composed of equity at EU level, while subordinated debt represents 7% of the capital base. Some insurers might rely more on debt, but these cases are not very frequent.

²⁴ For unit-linked products, policyholders can choose the funds in which the insurer invests on their behalf. Often, equity funds are chosen – see below.

²⁵ See https://www.eiopa.europa.eu/tools-and-data/risk-dashboard_en.

²⁶ See https://www.eiopa.europa.eu/tools-and-data/risk-dashboard_en.

²⁷ See "Lower for longer – macroprudential policy issues arising from the low interest rate environment", ESRB, May 2021.

²⁸ See Förstemann, T., "Lethal Lapses – How a Positive Interest Rate Shock Might Stress Life Insurers", October 16, 2019. Available at SSRN: <https://ssrn.com/abstract=2766999> or <http://dx.doi.org/10.2139/ssrn.2766999>.



- **Market activities**

- **SFTs:** low engagement. Few public analyses are available to assess the engagement of insurers in SFTs. A likely activity of insurers is to engage in repo transactions with banks and other non-banks: insurers hold large amounts of government bonds that can be used by banks to comply with regulatory constraints and fulfil their refinancing needs. This may apply in particular to insurers associated with a bank or a financial conglomerate.
- **Derivatives:** low engagement. Holding derivative positions is not widespread among insurers, but some insurers do hold them. These are mainly interest rate and currency derivatives. The section below provides more information on derivative positions of insurers.
- **Reuse of collateral:** insignificant engagement. Very few analyses are available to assess the reuse of collateral. The qualitative assessment is that this activity is likely to be insignificant.
- **Interconnectedness:** high engagement. EIOPA's risk dashboard using fourth quarter 2020 data shows that 14.8% of insurers' assets are invested in banks (including 7.7% in unsecured bonds), 1.6% in insurers and 20.7% in OFIs. In addition, 32% of insurers' assets are held through investment funds. These are aggregate figures and can be much higher in certain countries. The section below provides more information on the interconnectedness of insurers with investment funds.

2.2.1 Credit intermediation by insurers

Insurers contribute to a healthy and robust economy through the provision of credit – either by investing the premiums they receive in corporate bonds or by originating loans. When insurers can match their liability cash flows with asset cash flows, they are in an advantageous position to provide credit funding with fixed interest rates in comparison with banks or investment funds, as they are exposed differently to interest rate risk. When they match assets and liabilities, they do not undergo a maturity transformation that is typically the case for banks or investment funds. In addition, providing credit is not the main activity of insurers, which means they have a broader diversification of risks on their balance sheets, i.e. they have a specific risk-bearing capacity. But they may be exposed to credit risk due to borrowers defaulting or market risk in case they need to sell assets before their maturity, possibly at a distressed value.

In the fourth quarter of 2020, the insurance sector provided roughly €2.3 trillion in credit to NFCs and households (excluding exposures via investment funds).²⁹ The main asset class used by insurers to provide credit to the economy is corporate bonds. Insurers also hold, at EU level and directly, €0.4 trillion in mortgages and loans, which include credit to NFCs and credit to households, particularly in some EU countries. The insurance sector has been slightly increasing its

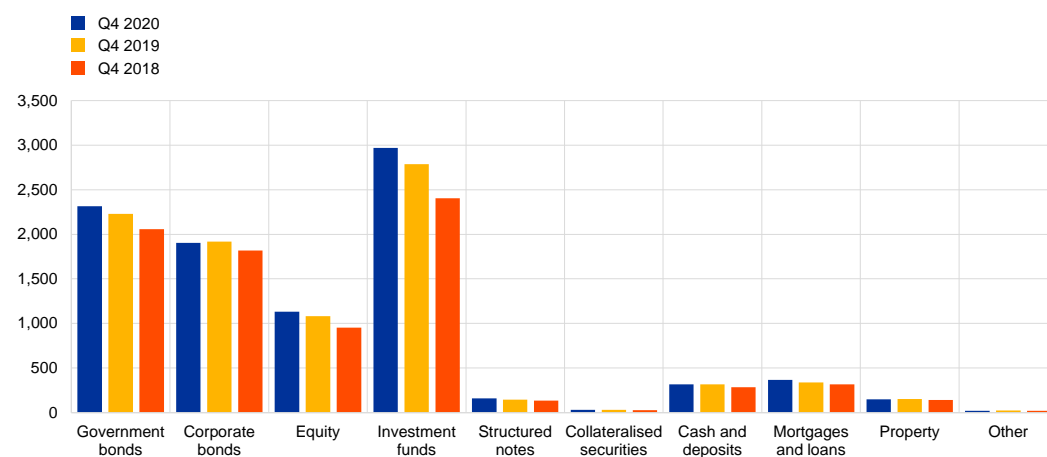
²⁹ This represents around 10% of the total stock of debt securities and loans to NFCs and households.



investment share in this asset class over the last two years, as reflected in Chart 9 below. Further credit is provided by insurers indirectly via investment funds (Section 2).

Chart 9
Investments held by insurers

(EUR billions)



Source: EIOPA Solvency II quantitative reporting template data.

Note: Figures include unit-linked and non-unit-linked portfolios.

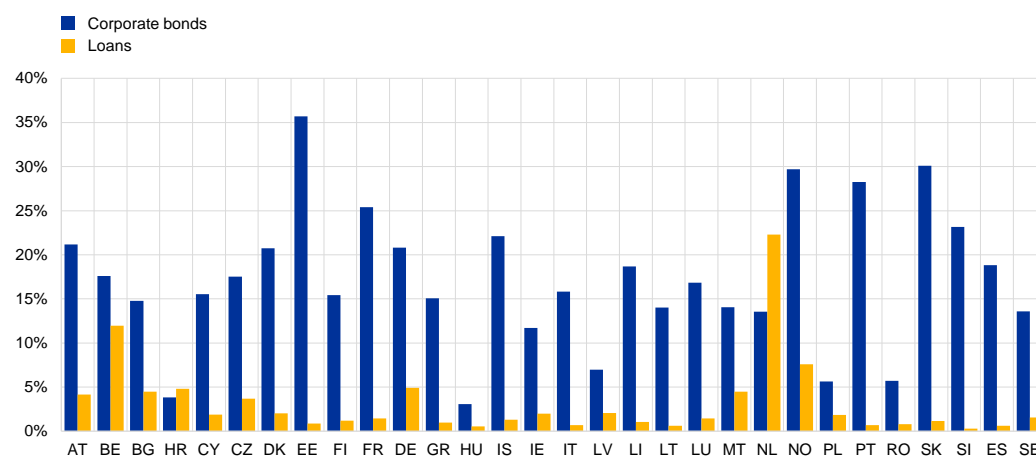
In most EU countries, insurers provide credit as a consequence of their investments in corporate bonds; credit to households is small with a few exceptions. By investing the premiums they receive in corporate bonds, insurers finance NFCs (and banks) by providing them with credit. In most EEA countries, credit is supplied via corporate bonds, meaning it is mainly directed towards NFCs and not towards households. The highest share of credit provided by EEA insurers via loans is found in the Netherlands, Belgium and Norway (Chart 10).



Chart 10

Corporate bonds and loans held by insurers per country

(percentage of total investment portfolio)



Source: EIOPA Solvency II quantitative reporting template data.

Note: The fourth quarter of 2020.

2.2.2 Interconnectedness with other non-banks: investment funds

Investment funds are an important way for insurers to manage their assets. Over the last few years, the share of assets held through investment funds has slightly increased, from 30% of total assets at the end of 2016 to 32% at the end of 2020.³⁰ In addition, insurers (and pension funds) are the largest investors in investment funds, accounting for 32% of shares.³¹ Insurers can invest in funds for several reasons, e.g. to back unit-linked savings products; to minimise costs; to have access to specific knowledge (for example of a certain market or asset class); to diversify their portfolios; or to manage their profit participation (many life insurance policies promise policyholders a share of their asset returns, but when the profit is made at the level of the fund, the insurer might not always need to share these profits with policyholders immediately)³².

The profile of investment funds held by insurers depends on the insurance product. One can distinguish insurance unit/index-linked (UL) products from others. In the case of UL products, insurers invest on behalf of policyholders, who carry the market risk. Policyholders can choose the funds in which the insurer should invest on their behalf. Around 80% of these funds are regulated under the UCITS Directive (see the EIOPA Financial Stability Report).³³ The main asset class in which policyholders invest via UL products is equity. For all other insurance products, the risk of the assets held to cover these liabilities is carried by the insurer. Around 80% of these funds are regulated under the AIFMD. The main asset class is debt (government and corporate bonds).

³⁰ This increase is mainly due to the non-unit-linked investment portfolio, the share of which is invested via investment funds has risen from 8% to 12%.

³¹ See “**Macroeconomic and sectoral statistics – euro area, who-to-whom detail**”, Statistical Data Warehouse, ECB.

³² See **Financial Stability Review**, Deutsche Bundesbank, November 2018, p.93.

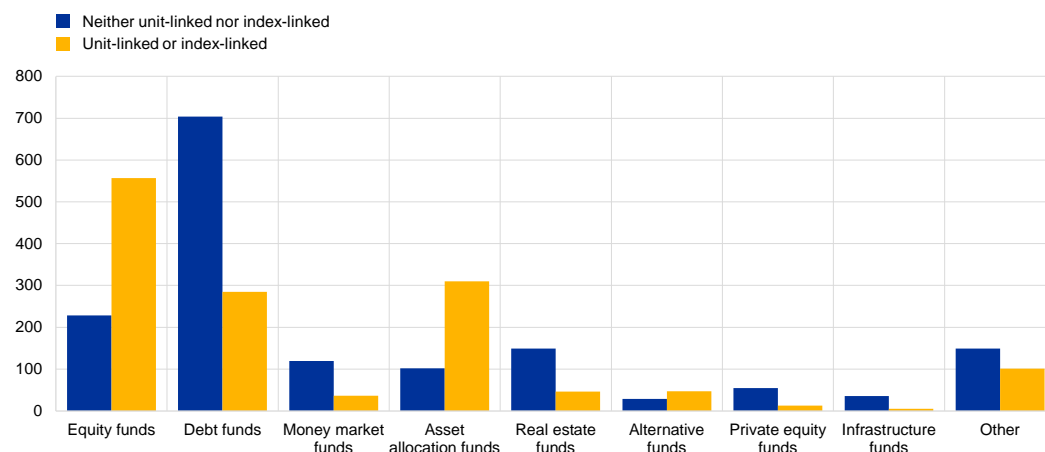
³³ See **Financial Stability Report**, EIOPA, July 2020, figure 5.30.



Chart 11

Insurers' investment in funds in the fourth quarter of 2020, by fund category

(in EUR billions and as a percentage of total assets)



Source: EIOPA Solvency II quantitative reporting template data.

Note: Funds are classified according to the Solvency II classification.

The large exposure to investment funds could generate specific risks for insurers. In UL portfolios, policyholders carry the market risk. For insurers, however, there is a step-in risk: if a fund uses LMTs that restrict the access of policyholders to their funds, the insurer might step in to compensate the policyholders and protect its reputation.³⁴ For non-UL portfolios, the imposition of fees or swing pricing would affect the return on assets of insurers. There is also a particular risk linked to MMFs: insurers use MMFs as cash management vehicles, and the imposition of gates by MMF managers might create a liquidity strain for insurers needing to pay obligations (such as margin calls on derivative positions, see below). To analyse these risks in detail, one would need to know the proportion of investment funds which are owned and controlled by one insurer only. However, this information is not available.

2.2.3 Interconnectedness across markets: derivative positions

Insurers hold derivatives in order to help mitigate interest rate risk in particular. There are good reasons for insurers to hold derivatives for hedging purposes. Studies³⁵ have found that the largest class of derivatives is interest rate derivatives (IRDs) and in particular interest rate swaps (IRSs). These allow insurers to reduce their duration gaps (where the duration of liabilities is higher than that of assets), which is particularly relevant in life insurance.

IRDs are the most prominent asset class in the derivatives portfolios of EU insurers. Based on Solvency II data as at the end of 2020, IRDs accounted for half of the total derivatives exposure of EU insurers in terms of notional amount (50%), followed by currency derivatives (42%), equity

³⁴ In some countries, insurers might not be legally allowed to compensate losses in the unit-linked portfolio with other assets – this is the case in Poland, for example.

³⁵ See **Financial Stability Report**, EIOPA, December 2018, and **Financial Stability Review**, ECB, November 2018, Box 8.

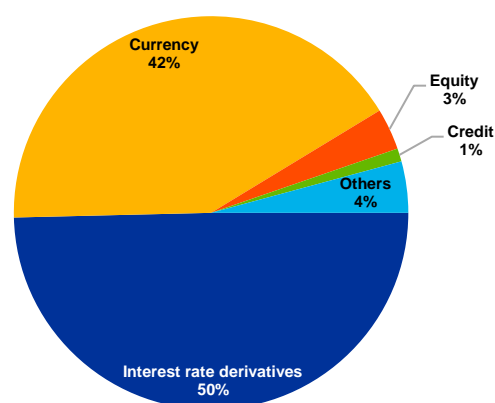


derivatives (3%) and credit derivatives (1%). Derivatives used to manage catastrophe and weather-related risk, commodity risk and mortality risk each accounted for less than 1%, while derivatives used to address other non-categorised risk types made up around 4%). See Chart 12.

Chart 12

Use of derivatives in the EU insurance industry: notional amount breakdown by risk category

(percentages)



Source: Solvency II quarterly reporting templates.

Notes: Reporting at solo level. Reporting reference date: fourth quarter of 2020.

The use of derivatives by EU insurers is concentrated in the life insurance business.

According to Solvency II data, the total notional amount of derivatives held by EU insurers stood at €5.1 trillion (€3.4 trillion in non-unit-linked portfolios and €1.7 trillion in unit-linked portfolios) as at the end of 2018.³⁶ 74% of this total was held by life insurers. Composite insurers held approximately 21% of the total, probably due to their significant life business, while the derivatives exposures of non-life insurers and reinsurers³⁷ accounted for less than 22% and 3%, respectively. Furthermore, the notional amount of derivatives equalled 75% of total investments for life insurers, 39% for reinsurers and 16% for non-life insurers, confirming that life insurers are the main users of derivatives. At the same time, the market values of derivatives are small in relation to total investments. As at the end of 2018, they accounted for just 0.44% for life insurers, 0.1% for non-life insurers and 0.11% for reinsurers.

Exposure to derivatives is concentrated in just a few countries and insurers. As at the end of December 2018, around 88% of the gross notional amount held by all EEA³⁸ insurers was concentrated in five countries: Denmark, France, Germany, the Netherlands and the United

³⁶ The figures refer to the end of 2018 as they are taken from a previous ESRB report: "Enhancing the macroprudential dimension of Solvency II," ESRB, February 2020.

³⁷ A reinsurance company provides insurance to insurance companies and other reinsurance companies (the cedant) whereby it will meet, in return for a premium, some or all of the financial risk the cedant assumes under the policies/ treaties it issues.

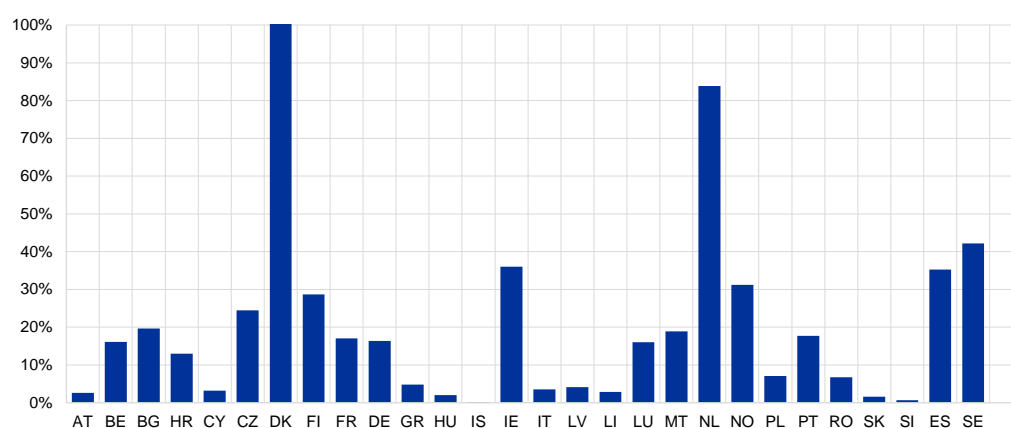
³⁸ According to the ECB's **Financial Stability Review, November 2018**, around two-thirds of the gross notional amount held by all euro area insurers as at the end of September 2018 was concentrated in just two countries, France and the Netherlands, with each holding a similar amount.



Kingdom (which at that time was still a member of the EU). The concentration is also high when looking at individual insurers. In December 2018, roughly 80% of notional amounts for derivatives was concentrated in 30 insurers. Insurers are also found to conduct transactions with a small number of counterparties, mainly banks. In the EEA, around 80% of insurers have no derivatives exposure, but the 20% who do account for approximately 85% of the total investments. See Chart 13 for an overview with figures dated as of the end of 2020. These differences in the use of derivatives may be explained by the different types of products (e.g. unit-linked products with financial guarantees or life insurance contracts with long-dated guarantees).

Chart 13
EU insurers' notional amount of derivatives relative to total investments held by insurers using derivatives, by country

(percentages)



Source: Solvency II quarterly reporting templates.

Notes: Reporting at solo level. Bars show the notional amount of derivatives as a percentage of total investments for those insurers that hold derivatives. Insurers that do not hold derivatives are excluded from the total investments per country. Data include unit-linked assets. Reporting reference date: fourth quarter of 2020.

The holding of derivatives exposes insurers to liquidity risk, as they are required to post variation margin calls on a certain share of their derivatives portfolio and usually need to post cash. A previous ESRB report³⁹ describes in detail how insurers are exposed to a liquidity risk, as they typically do not hold large amounts of cash (or securities that can be transformed into cash over one day).⁴⁰ The management of liquidity risk and appropriate tools is one of the topics under the review of Solvency II and is also part of EIOPA's opinion.⁴¹

³⁹ See "Enhancing the macroprudential dimension of Solvency II", ESRB, February 2020.

⁴⁰ See also de Jong, A., Draghiciu, A., Fache Rousová, L., Fontana, A. and Letizia, E., "Impact of variation margining on EU insurers' liquidity: an analysis of interest rate swaps positions", thematic article, EIOPA financial stability report, December 2019.

⁴¹ See "Opinion on the 2020 review of Solvency II", EIOPA, December 2020.



2.3 Archegos, Greensill and GameStop – relevance for EU financial stability

Three recent episodes show that the demise of non-bank financial entities with spillovers to the banking sector can occur in a benign liquidity environment with overall rising asset prices.

In early 2021, the stock prices of a few US companies on which investment funds took significant short positions surged without any fundamental news about the firms. This was particularly the case for GameStop, a US video game retailer. The sharp rise was related to a large number of investors obtaining exposure to the companies and discussing their investments on social media such as the reddit forum r/wallstreetbets. Exposures made by the investors were in many cases highly leveraged, due to the use of margin lending or derivatives (e.g. buying call options on the stocks). As the stocks went up, short sellers had to cover their positions, amplifying the price move. One US hedge fund faced very large losses, requiring a private capital injection of USD 2 billion. In addition, buyers of call options put further upward pressure on stock prices as a result of dealers hedging their derivative positions (the increase in the price and volatility of the underlying caused dealers to purchase the stock, as the option became more likely to be exercised in such market circumstances). As trading activity and volatility jumped, brokers had to post additional collateral to central counterparties (CCPs), also reflecting one-way trading dynamics. Some US brokers had to receive capital injections and imposed temporary trading restrictions on the stocks. Since then, the stock prices of these firms have remained very volatile, but their valuations have plummeted from the peaks reached in January.

In March 2021, Greensill Capital, a UK-authorized company specialising in supply chain finance, filed for insolvency. Promising to “democratise finance”, UK-authorized Greensill Capital started as a supply chain finance firm. Greensill paid suppliers for their invoices with a small discount when they delivered goods to their corporate clients, and the firms receiving the goods would pay Greensill some weeks later. To obtain higher returns, Greensill resorted to riskier practices by providing loans to companies secured by “prospective receivables” from “prospective buyers”.⁴² Greensill purchased credit guarantee insurance for, and securitised, its loans and sold them to investors. According to media reports, the Greensill-linked funds attracted money from investors seeking slightly higher returns than on funds investing in safe assets.⁴³ In Europe, where large bank accounts often have negative interest rates, pension funds, corporate treasurers and wealthy families were reported as significant investors in these funds.⁴⁴ The Greensill group included a bank which co-funded its activities and also securitised and sold off its exposures.⁴⁵ Greensill was seen as a highly successful company with a fast-growing business. Yet when credit insurance was withdrawn in 2020 due to concerns about the creditworthiness of creditors, Greensill's business model unravelled. Investors stopped purchasing the securitised loans, some previously financed companies declared insolvency, and Greensill's bank was closed by the German supervisor due to suspected balance sheet manipulations. Such events led to substantial valuation issues, which resulted in the suspension of redemptions for seven EU funds and one AIF domiciled in Liechtenstein. These funds were either directly invested in the supply chain notes or

⁴² See “**Bluestone-Greensill complaint**”, United States District Court for the Southern District of New York, 15 March 2021.

⁴³ “Credit Suisse's Greensill Funds Strayed From Tame Invoice Loans”, Bloomberg, 15 March 2021.

⁴⁴ “Behind Greensill's Collapse: Detour Into Risky Loans”, The Wall Street Journal, 13 March 2021.

⁴⁵ *ibid.*



were indirectly exposed to the notes (through the holding of directly exposed fund shares). The share price of the banking group owning the asset manager fell, with the bank facing potential additional losses related to legal issues.

At the end of March 2021, the US family office “Archegos”, a capital management firm, collapsed after it was unable to meet variation margins on highly concentrated leveraged positions on stocks. Archegos, a New York-domiciled investment vehicle managing personal wealth (“family office”), extracted large leverage from a half dozen major banks to buy exposure to a concentrated portfolio of tech and media stocks. The exposures were reportedly mostly achieved via over-the-counter (OTC) derivatives trades (total return swaps and contracts for difference), where its counterparty would deliver the return on the underlying stocks to the firm. The derivatives were provided by the prime brokerage desks of major international banks. The family office was able to get very high exposures on the underlying stocks by using synthetic leverage, as the margin posted by the firm was a fraction of the notional exposure obtained through the swaps. Archegos was not required to post any initial margin that could cover potential trading losses. As the firm entered into similar swap transactions with multiple prime brokers, its exposures to individual stocks were substantial. The use of derivatives allowed Archegos to conceal its significant economic exposures to publicly traded firms. Such exposures would have triggered public reporting requirements if Archegos had obtained them through outright purchases of equity securities. Owing to its highly leveraged positions, Archegos made significant gains as long as share prices rose, enabling it to build up its positions over time. By the middle of March 2021, Archegos reportedly managed between USD 30 and 100 billion in assets.⁴⁶ In fact, the hedging activities of financing banks are likely to have contributed to the rise in share prices of the targeted companies. All unravelled when the share prices started to fall by more than expected⁴⁷, as Archegos was not able to meet banks’ margin calls. Archegos’ default on its derivative positions left banks holding many of the underlying shares, which some banks sold quicker than others. Given the very high concentration of the exposures, the forced sales of prime brokers resulted in large blocks of sales of single equities, causing a sharp decline in prices (up to 50% for some stocks) and leading to large losses for those prime brokers who were slower to reduce their positions. Overall, bank losses are estimated to have surpassed USD 10 billion to date, concentrated among one Swiss and one Japanese counterparty.⁴⁸ The counterparties to the derivative transactions required only small initial margins for Archegos, allowing the firm to obtain high leverage. More generally, the Archegos episode puts a spotlight on collateralised lending (or, in the case of derivatives, large economic exposure against small amounts of collateral), as well as the regulation of family offices.

These three isolated events highlight the risks described in this report, such as the search for yield in a low interest rate environment and the use of leverage in a highly interconnected global financial system. Retail traders coordinated their actions to increase gains, including via leveraged positions. Greensill sought higher returns by venturing into more risky loan segments (those of prospective buyers). The clients of the investment funds based on supply chain finance sought higher returns on their loan exposures. Archegos worked with high

⁴⁶ “Bill Hwang Was a \$20 Billion Whale, Then Lost It All in Two Days,” Bloomberg Law, 8 April 2021; “Ex-Tiger Asia Founder Triggers \$30 billion in Large Stocks Sales,” The Wall Street Journal, 29 March 2021.

⁴⁷ The decline of the stock prices occurred following a corporate auction: Viacom decided to increase the number of stocks, and this equity dilution led to a decrease in stock prices.

⁴⁸ Estimated in April 2021.



leverage through derivatives trades to raise returns. The banks involved in these trades considered them profitable and assumed that their counterparty risk was well contained. For each of these events, the risks each entity took were only partially assessed because taking interconnectedness into account was difficult. When losses materialised, they also spread through the financial system. While these events were isolated and did not destabilise the financial system as a whole, they highlight important vulnerabilities.



3 Entity-based monitoring

The ESRB's 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 OFIs, thus excluding, for example, banks, ICPFs, as well as CCPs with a banking licence.⁴⁹ In Section 1, Table 1 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 overview of the Monitor, Table 2 also provides a more detailed overview of OFIs according to the European System of National and Regional Accounts (ESA).⁵⁰

3.1 Developments in the EU investment fund sector

AuM decreased in the first quarter of 2020 following the outbreak of the COVID-19 pandemic, but recovered by the end of 2020. Bond funds, equity funds, mixed funds and ETFs in particular observed a decrease of AuM due to the reassessment of risks and valuation effects (Chart A-5). Following the exceptional measures taken by fiscal and monetary authorities, markets recovered from the second quarter onwards and AuM reached €17.4 trillion in the fourth quarter of 2020, higher than at the end of 2019 (€16.3 trillion). The strong geographical concentration in the EU investment fund sector was broadly unchanged in 2020 (Chart A-13), although for hedge funds and private equity funds there seems to have been a small shift away from the United Kingdom and towards continental Europe, which might be the result of Brexit-related uncertainty over the future of financial regulation in that country.

Many asset management companies have ownership linkages to EU banks and, to a lesser extent, insurance corporations. Among the largest 25 asset management companies operating in the EU, 15 are owned by banks and four by insurance companies (Chart A-18). The remaining six asset managers are independent, mainly from the United States, and include the largest asset manager in 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 financial firms, their asset management arms and the investment funds that they manage.

Euro area investment funds' holdings of debt securities, investment fund shares and other equity issued by euro area NFCs and other investment funds are at 2019 levels (Chart A-19).

Exposures of euro area investment funds to other euro area non-MMF investment funds and OFIs were at €2.5 trillion in the third quarter of 2020, compared with €2.6 trillion in 2019. Exposures to NFCs were slower to recover and stood at €1.5 trillion in the third quarter of 2020 compared with €1.6 trillion in 2019. Exposures to governments (€0.9 trillion) increased slightly, while exposures to

⁴⁹ Assets under management 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.

⁵⁰ For more information, see the [ESA 2010](#).



euro area banks⁵¹ (€0.7 trillion) remained stable, and exposures to insurers and pension funds (€0.05 trillion) decreased.

3.1.1 Bond funds

Bond funds perform credit intermediation by allocating funds received from investors to borrowers that issue debt securities (Chart A-17). The debt securities held by bond funds are typically of long maturity and can vary considerably in terms of their underlying credit risk, ranging from well-rated government bonds to high-yield corporate bonds. In combination with the fact that most bond funds are open-ended, their engagement in maturity transformation is generally high, while their engagement in liquidity transformation depends on the specific bond fund types (Table 1, Charts A-14 and A-15). Through holdings of corporate debt securities, bond funds may also be exposed to the same firms as the banking sector.

In the first quarter of 2020, net assets of EU bond funds contracted by €18 billion (8.7%), mainly due to valuation effects and, to a lesser extent, investor outflows. In the euro area, net outflows from bond funds in the first quarter of 2020 amounted to €82 billion (2.3% of their net assets), which was slightly more than net outflows from equity funds (€54 billion or 1.4% of their net assets) and from mixed funds (€15 billion or 0.5% of their net assets) (Chart A-5). Corporate and emerging market bond funds suffered particularly large outflows. This may have reflected an increase in credit risk in their portfolios due to the shock to the real economy, but also a dry-up in liquidity within certain debt markets that provided an incentive for investors to redeem their fund shares ahead of others.

In the last three quarters of 2020, net assets of EU bond funds recovered to reach their end-2019 level (Chart A-11). Following the swift rebound in financial markets after the March market turmoil, bond funds benefited both from valuation gains and renewed investor inflows (Chart A-5). Valuation gains were more concentrated in the second quarter of 2020, while inflows were spread over the remaining three quarters.

Credit intermediation and maturity transformation by EU bond funds declined temporarily in the first quarter of 2020 as they increased the share of cash holdings in their portfolios. The shares of credit assets and of long-term assets in relation to total assets each dropped by 4 percentage points in the first quarter of 2020 (Charts A-15 and Chart A-17). At the same time, liquidity transformation remained broadly unchanged in the first quarter of 2020, as a lower share of other liquid asset holdings cancelled out the increasing share of cash (Chart A-14). In the subsequent quarters, credit intermediation and maturity transformation by EU bond funds bounced back to their pre-crisis levels.

Bond funds' exposure to interest rate risk has risen continuously since 2019, whereas their exposure to credit risk has slightly deteriorated. Over the past two years, the average effective maturity of bond funds' assets has increased to 8.5 years (Chart A-22). At the same time, credit ratings of the debt securities held by EU bond funds have remained relatively stable, though a slight

⁵¹ "Banks" refers to EU monetary financial institutions (MFIs), which 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.



deterioration was observable in 2020 (Chart A-21). The share of debt securities rated A decreased from 15% in the fourth quarter of 2019 to 13% in the fourth quarter of 2020, while at the same time, the share of securities rated BBB rose from 25% to 27%. This slight deterioration was primarily observable for corporate bond funds and may correspond to downgrades of NFCs during the pandemic.

The rise in credit risk associated with the COVID-19 pandemic is likely to pose the biggest risk to EU bond funds. The protracted impact of the pandemic on the real economy may lead to a rise in corporate defaults. As more than half of the debt securities held by EU bond funds comprise securities that are either rated at the lower end of the investment grade scale (BBB+ to BBB-) or in the high-yield domain (below BBB-), the impact of corporate defaults could be pronounced for some of these funds. In line with their investment strategies, corporate bond funds and high-yield bond funds are most at risk, as 61% and 84% of their debt securities holdings have a credit rating of BBB+ or lower, respectively.

3.1.2 Money market funds

MMFs buy short-term money market instruments issued by financial institutions, governments and corporations, and are used as cash management vehicles by investors.

MMFs play a key role in providing short-term funding to financial institutions (especially banks) and corporates. MMFs are also important for the liquidity management of non-banks. Their shares can be redeemed on a daily basis and, depending on the type of MMF, investors are offered redemptions at either a constant price (CNAV and LVNAV) or a variable price (VNAV). LVNAVs account for 48% of EU MMFs (€648 billion), followed by VNAVs (42% at €574 billion) and CNAVs (10% at €139 billion), which are smaller due to the impact of the low interest rate environment. Overall, as of the fourth quarter of 2020, around 58% of EU MMFs offer a stable NAV. In addition, a large portion of MMFs are in foreign currency (32% for USD, 22% for GBP), although EUR MMFs continue to represent the largest share (46%).⁵²

MMFs are subject to risks related to liquidity and maturity transformation. The promise of daily dealings and the prospect of instantaneous liquidity and stable value, as well as their portfolio holdings with diversified credit risk, mean that investors consider them an attractive alternative to bank deposits. MMFs engage in some maturity and liquidity transformation (Charts A-14 and A-15).

In 2020, MMFs experienced abrupt changes in asset valuations and investor flows across MMF types. In the first quarter of 2020, non-public debt MMFs recorded sharp outflows due to the dash for cash (Chart A-23), while USD CNAVs saw a surge in assets as a result of substitution effects between LVNAVs and CNAVs. As markets normalised, inflows returned to LVNAVs and VNAVs. From March 2020 onwards, MMFs increased their liquidity buffers and reduced the weighted average life of their holdings in order to be able to meet potential additional redemption requests. (Charts A-24 and A-25). However, they kept their exposure to interest rate risk, measured by the weighted average maturity, relatively stable (Chart A-24). In the second half of 2020, MMFs

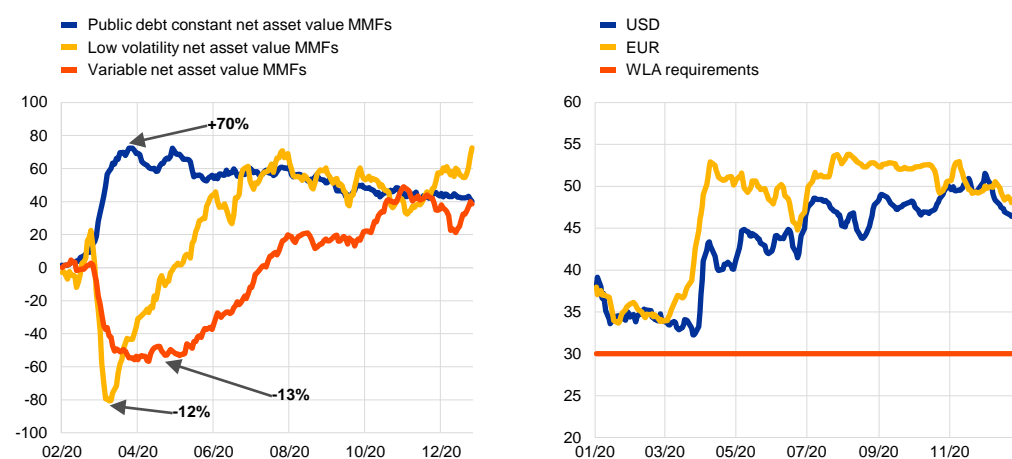
⁵² These figures are based on data provided by the Autorité des Marchés Financiers, the Central Bank of Ireland and the Banque centrale du Luxembourg.



continued maintaining high liquidity buffers at around 50% of NAV for LVNAVs, 20 percentage points above the regulatory requirements (Chart 14).

Chart 14
MMF cumulated daily flows by type (left panel) and MMF liquidity buffers (right panel)

(EUR millions and percentage of NAV)



Sources: Refinitiv Lipper, Crane and ESMA.
Note: The latest observation is for the fourth quarter of 2020.

Further details on systemic vulnerabilities of MMFs, as well as policy considerations to reform MMFs, have been published in an ESRB issues note.⁵³

3.1.3 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 or REITs). Real estate is a highly illiquid asset class, often requiring several months for a transaction to be completed. Open-ended real estate funds may offer redemptions at higher frequencies which can expose them to liquidity transformation risks. Notice periods or minimum holding periods usually mitigate liquidity transformation risks in most open-ended funds. Closed-ended investment funds typically do not carry liquidity transformation risk, as issued shares are not redeemable from the fund. There are significant differences in the share of open-ended and closed-ended real estate funds and in regulatory frameworks across jurisdictions.⁵⁴

AuM in euro area real estate funds grew in 2020, and their share of the total investment fund sector increased slightly by 0.2 percentage points to reach 6.6% at the end of the year.

⁵³ "Issues note on systemic vulnerabilities of and preliminary policy considerations to reform money market funds," ESRB, July 2021.

⁵⁴ See "The role of investment funds and investment trusts in EU CRE markets", EU Non-bank Financial Intermediation Risk Monitor 2019, ESRB, July 2019.



Assets have increased continuously for the past seven years, driven by new fund inflows and supported by increasing real estate prices. Despite the period of market stress triggered by the COVID-19 shock, flows into euro area real estate funds remained positive and stable in 2020, and they did not suffer from valuation losses (chart A-5). Total assets of euro area real estate funds amounted to €1,001 billion at the end of 2020, an increase of 9% relative to the end of 2019 (Chart A-26). This growth was felt across all asset types. Holdings of non-financial assets increased by 10% (€478.1 billion in the fourth quarter of 2020), equities increased by 6.7% (€169 billion in the fourth quarter of 2020), deposits and loan claims increased by 0.5% (€130.1 billion in the fourth quarter of 2020), debt securities increased by 10.3% (€16.9 billion in the fourth quarter of 2020), shares of other investment funds increased by 10.4% (€88 billion in the fourth quarter of 2020), and remaining assets including financial derivatives increased by 15.3% (€118.9 billion).⁵⁵

Open-ended real estate funds' engagement in liquidity transformation remained stable in 2020 (Chart A-14). This measure is derived from the share of illiquid assets over total assets, and, due to the nature of their investments, real estate funds have higher levels for this indicator than other fund types. The degree of liquidity transformation also depends on the redeemability of fund shares and redemption frequencies, which vary across countries. Most euro area-domiciled real estate funds are open-ended, while others have long redemption notice periods in place (see also the special feature). Redemption gates and other LMTs available to fund managers may further mitigate the risk of large and abrupt outflows or risks stemming from valuation uncertainties.

According to analysis carried out by ESMA in coordination with NCAs, real estate funds did not experience substantial outflows at the height of the market stress in March 2020, but a significant number of funds were affected by valuation uncertainty. This analysis followed the ESRB recommendation on the supervisory engagement with investment funds exposed to corporate debt and real estate in order to assess their reaction since the onset of the COVID-19 crisis as well as their preparedness for potential future shocks.⁵⁶ From mid-February to the end of June, redemption requests accounted for 1.8% of the NAV of the sample used to assess exposures to real estate, which consisted of 92 real estate AIFs covering €294 billion in February 2020 (31% of EU real estate funds). Owing to the low level of redemptions, few LMTs were used during this period, and the only two suspensions in the sample took place in June. On the other hand, 38% of funds reported having been affected by valuation uncertainties in the same period, and 42% by material distortions in incoming cash flows from their real estate assets.

Financial leverage in real estate funds remained stable throughout 2020 and above the levels employed by other fund types (Chart A-16). The financial leverage of real estate funds has gradually decreased over the past decade but remained unchanged during the year (13% in all quarters of 2020). Liabilities of real estate funds primarily consist of shares issued, which amounted to €817 billion in the fourth quarter of 2020 (up 8.6% from the end of 2019), as well as loans and deposits received, which amounted to €128.4 billion in the fourth quarter of 2020 (up 5.4% from the end of 2019). Remaining liabilities and financial derivatives amounted to €55.8 billion in the fourth quarter of 2020 (up 20.9% from the end of 2019).⁵⁷

⁵⁵ IVF: Investment Funds Balance Sheet Statistics, ECB.

⁵⁶ See [Recommendation of the European Systemic Risk Board on liquidity risks in investment funds \(ESRB/2020/4\)](#).

⁵⁷ See IVF: Investment Funds Balance Sheet Statistics, ECB.



The real estate fund sector is highly concentrated in terms of domicile, with most funds being registered in a small number of countries (Chart A-26). Real estate funds registered in five countries (France, Germany, Italy, Luxembourg and the 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 decade. The importance of real estate funds relative to the domestic investment fund sector varies across countries. For example, in Luxembourg this share represents 3%, while in Italy it is 20% of total AuM.

The special feature on commercial real estate provides more analysis on the vulnerabilities of commercial real estate funds based on AIFMD data.

3.1.4 Exchange-traded funds

ETFs are generally 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 ETFs are managed passively and tend to focus on tracking equity or fixed income market indices. Like equities, ETFs can be traded intraday on secondary markets and 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.

The dual market structure of ETFs allows liquidity transformation between the primary and secondary market, particularly in less liquid or fixed income markets. ETFs combine many of the operational aspects of an open-ended investment fund with those of equities traded on an exchange. Their dealing arrangements have a creation and redemption mechanism in primary markets like in open-ended investment funds, with arrangements which allow trading in secondary markets. The primary market includes authorised participants (APs), such as banks and proprietary trading firms, which are designated 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. They regulate the supply of ETF shares in the secondary market when there is an imbalance of orders to buy or sell ETF shares that cannot be met through the secondary market. Secondary markets consist of the trading activity of buyers and sellers taking place on an exchange. Trading activity and market depth on stock exchanges contribute to an ETF's secondary market liquidity.

After a sharp decline in the first quarter of 2020, ETFs' AuM resumed their growth trajectory in the following quarters, reaching €1,028 billion in the fourth quarter of 2020, 10% above end-2019 amounts (Chart A-27). The drop in AuM during the first quarter of 2020 was driven by both falling asset values throughout the quarter and substantial investor outflows in March, amid the market stress triggered by the COVID-19 shock. Conversely, increasing asset values and investor inflows allowed for the recovery in the remaining three quarters (Chart A-27.1). In a similar vein, the share of ETFs as a percentage of total euro area investment fund assets decreased in the first quarter but increased again over the rest of the year, reaching an all-time high of 6.9% as of the end of 2020. While the drop in assets during the first quarter was widespread across the most significant ETF asset classes, equity ETFs were particularly affected, with AuM decreasing by 21.8% in the first quarter of 2020. The subsequent market recovery led to an increase in AuM for all ETFs: compared with the end of 2019, AuM increased by 12.5% for equity ETFs and by 13.5% for



ETFs investing in debt securities. Equity ETFs remained the largest ETF type, accounting for around 66% of AuM in 2020, followed by debt security ETFs, which held approximately 27% of total ETF assets (Chart A-27).

High deviations in shares of fixed income ETFs from the prices of the underlying bonds emerged during the peak of the market turbulence experienced in March 2020.⁵⁸ These discounts to NAV were particularly pronounced for corporate bond ETFs. By virtue of their sole access to primary markets, APs tend to step in when such gaps arise and regulate the supply of ETF shares. In this case, APs could have bought large amounts of ETF shares at discount values and redeemed them at NAV, thus capturing the spread as profit. However, liquidity in the markets for the underlying securities dried up at the peak of market stress, and the NAV and price discounts no longer reflected current information. Moreover, APs' internal pricing models suggested that prices for the underlying bonds should be lower, which meant that actual deviations in NAV were smaller. For this reason, APs focused on market-making activities in the secondary market, which further sustained liquidity on ETF shares and contributed to the unusually high deviations in NAV. Once liquidity improved on the underlying bonds, the gaps to NAV eventually closed and returned to pre-crisis levels.

Fixed income ETFs may have played a price discovery role during the period of market stress, but potential disruptions in the arbitrage mechanism may have also contributed to the observed deviations in NAV. The divergent levels of liquidity and market depth in the ETFs and underlying portfolio markets may substantially account for these NAV discounts. This friction in the arbitrage mechanism is best illustrated by the fact that deviations in NAV were greater the less liquid the underlying bonds were. Therefore, ETFs may have played a price discovery role and allowed for continued exposures to the underlying fixed income securities during this period. At the same time, notwithstanding the role of illiquidity in the underlying markets, defects in the arbitrage mechanism may have also contributed to NAV discounts at the peak of market stress. Hence, additional analyses and assessments of the factors that relate to this episode are warranted.⁵⁹

3.1.5 Hedge funds

Hedge funds aim to generate returns not correlated with market trends by using a wide range of investment strategies. 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, which are mostly subject to

⁵⁸ See "Discounts to net asset values on corporate bond exchange-traded funds induced by COVID-19", **EU Non-Bank Financial Intermediation Risk Monitor 2020**, ESRB, October 2020.

⁵⁹ See, for example, Todorov, K., "The anatomy of bond ETF arbitrage", *BIS Quarterly Review*, Bank for International Settlements, March 2021.



AIFMD rules but also, in some cases, to UCITS rules.⁶⁰ They usually make greater use of leverage compared with other fund types and are typically restricted to professional investors.

AuM of EU hedge funds as published by the ECB experienced substantial volatility in 2020 and stood at €12 billion at the end of the year, with a decrease of 5% relative to end-2019 figures (Chart A-28). The EU hedge fund market is small, with AuM accounting for around 3% of the overall European fund industry. In terms of volumes, the decrease in AuM in 2020 follows annualised growth rates of 3% and 10% in 2019 and 2018, respectively. In line with this, EU hedge funds' NAV also decreased in 2020, from €435 billion in the fourth quarter of 2019 to €404 billion in the fourth quarter of 2020. Over the past few years, NAV growth in hedge funds has been slower than in other fund types such as equity or bond funds (Chart A-11).

AIFMD data reported to ESMA show that hedge funds domiciled in EU 27 countries and registered as AIFs represent €6 billion in terms of NAV but are highly leveraged (Chart A-12.1). This figure refers to 2019 due to a significant time lag in processing AIFMD data. The exclusion of UK data leads to substantial year-on-year differences in the indicators, since this represented 76% of total EU 28 NAV. Hedge funds accounted for 1.5% of AIFs' total NAV in the EU 27, down from 6% in the EU 28 in 2018, but are substantially more leveraged than other fund types. Considering all EU countries including the United Kingdom, the gross leverage of hedge funds, given by the ratio of total assets to NAV, increased from 5,514% to 6,450% in 2019, while adjusted gross leverage, which excludes exposures arising from IRDs, decreased from 1,052% to 991%. It should be noted, however, that these figures are caused by large outliers, as three-quarters of hedge funds have adjusted leverages below 330%. AIFMD data suggest that many of these outliers may have been based in the United Kingdom, as the gross leverage for hedge funds domiciled in EU 27 countries stood at 588% only. The use of financial leverage grew in 2019, as direct borrowing by hedge funds rose by 13% in 2019 and is estimated to have amounted to €610 billion at the end of the year.⁶¹

The high levels of leverage used by hedge funds may contribute to the build-up of financial stability risks. Since leverage involves the use of borrowed money and derivatives, which require a smaller initial investment than buying cash equities or bonds, the exposure of funds to market movements is amplified. In times of stress, funds that are strongly engaged in liquidity transformation and have high levels of leverage may be forced to sell their assets at fire-sale prices in order to meet redemption requests.

The liquidity profile of hedge funds subject to AIFMD rules indicates little liquidity mismatch at the aggregate level compared with other fund types. Although hedge funds are mainly open-ended (78% in 2019), AIFMD data show little liquidity transformation, in line with previous years. Within one week, investors can only redeem up to 27% of NAV (16% in 2018), while 53% of the

⁶⁰ For statistical purposes, the ECB defines hedge funds as funds "which apply relatively unconstrained investment strategies to achieve positive absolute returns and whose managers, in addition to management fees, are remunerated in relation to the fund's performance" (Guideline ECB/2014/15).

⁶⁰ UCITS funds that qualify themselves as "hedge funds" managed €185 billion in the euro area at the end of 2020, compared with €512 billion managed by all hedge funds domiciled in the euro area. UCITS are subject to strict limitations on balance sheet leverage, but they can use derivatives to obtain synthetic leverage. For UCITS using the commitment approach, leverage (including through derivatives) is limited to 200% of NAV; UCITS can use a VaR approach, which can allow them to obtain substantial levels of leverage as long as their VaR are within the regulatory limit (their one-month VaR should be less than 20% of NAV).

⁶¹ See "ESMA Annual Statistical Report on EU Alternative Investment Funds 2021", ESMA, April 2021.



assets can be liquidated within this time frame (35% in 2018) (Chart A-12.2). The significant differences between years are due to the exclusion of data on UK hedge funds from the statistical overview of the Monitor.

Hedge funds are exposed to financing risk, as on average 18% of their financing is overnight (compared with over 70% for commodity trading advisers (CTAs) and equity strategies), but also tend to maintain large cash buffers which help to meet future margin calls relating to derivative positions.⁶² Hedge funds have high levels of unencumbered cash compared with other AIFs (31% for hedge funds versus 5% for all AIFs). The highest levels of cash are for strategies that have the highest exposures to IRDs, such as relative value, macro, credit and CTAs (funds using future contracts). This suggests that part of the cash buffers is used to cover future margin calls.

Hedge funds are mostly managed from the United Kingdom, but this concentration became less pronounced in 2019. The United Kingdom accounted for 76% of hedge funds' NAV in 2019, down from 80% in 2018, followed by Ireland and France, which accounted for 8% and 6% (5% and 1% in 2018), respectively. This shift away from the United Kingdom may be the result of Brexit-related uncertainty. Hedge funds are also concentrated in a number of big funds, as the top ten hedge funds hold approximately 20% of the total NAV. There is concentration in terms of strategies as well: equity hedge funds hold roughly half of the total NAV of hedge funds (48% in 2019, compared with 42% in 2018). Other strategies such as macro or CTA are each around 10% or below.

3.1.6 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 is often 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 encompasses: (i) venture capital, which provides financing for firms' early-stage development; (ii) growth capital, which provides funding for mature firms in need of capital to restructure operations, expand into new markets or finance an acquisition; and (iii) mezzanine capital, which provides debt financing with an embedded option to convert the stakes into equity instruments. The universe of PE funds also includes leveraged buyouts, whereby a company is purchased using a combination of equity and debt to finance the transaction. The investors in PE funds are predominantly professional investors. The proportion of retail investors stood at 5% in 2019, the lowest among AIF types after hedge funds.

The NAV of PE funds increased by 28% year-on-year in 2019 and reached €456 billion.

Available regulatory data for PE funds are less up to date than those for other fund types and

⁶² See "ESMA Annual Statistical Report on EU Alternative Investment Funds 2021", ESMA, April 2021.



therefore this subsection outlines developments over 2019 rather than 2020.⁶³ Strong growth resulted in PE funds increasing their share of the total NAV of AIFs to 7% in 2019, up from 6% in 2018 and 4% the year before. Growth in NAV was a common feature of PE funds across the whole spectrum of investment strategies, with venture capital funds appearing to grow at the quickest pace year-on-year. The two largest PE strategies in 2019 were growth capital and the residual category, which includes leveraged buyouts. Collectively, these strategies accounted for 80% of NAV.

Growth in NAV was visible across the EU, resulting in the increased importance of the EU 27, but the PE fund industry continues to be concentrated in a few countries. Managers domiciled in five Member States – Luxembourg, France, the Netherlands, Germany and Spain – manage funds accounting for 85% of NAV when the United Kingdom is excluded. The NAV of PE funds managed by an authorised or registered asset manager domiciled in Luxembourg grew by 71% and reached €106 billion, the highest among EU 27 countries, while managers domiciled in Germany (40%), France and the Netherlands (>20%) also experienced dynamic growth. While the United Kingdom remained the most important domicile for PE fund managers in Europe in 2019, accounting for €184 billion of NAV, its share in the EU 28 decreased by 7 percentage points to 40% compared with 2018. The increase in the relative importance of EU 27 jurisdictions at the expense of the United Kingdom may reflect relocations of alternative investment fund managers in anticipation of Brexit.

PE funds 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 remain closed-ended (93% of NAV in 2019), and the redemption frequency for open-ended PE funds is usually longer than for other types of AIFs. Unlike the previous two years, the level of unencumbered cash that PE funds held in 2019 was relatively low compared with other AIFs. It accounted for 2% of NAV, a sharp drop of 24 percentage points from 2018, and below the 2017 value of 4.9% in 2017. However, given the low financing liquidity risk and very low liquidity mismatch mentioned before, this apparent weakening of the funds' liquidity position is not necessarily a cause for concern. A possible explanation could be that PE funds accumulated large amounts of "dry powder" (committed capital not yet invested) above their liquidity needs in 2018, which was subsequently invested in the following year.

The use of longer-term leverage remains low compared with other fund types, although current reporting does not necessarily capture the full usage of leverage. PE funds do not directly hold significant levels of financial leverage and are not heavy users of derivatives. The AuM-to-NAV ratio, which stood at 111% on aggregate in 2019 (113% in 2018), is the lowest among AIFs. Moreover, outright borrowing further decreased from approximately 3% of NAV in 2018 to less than 2% in 2019, continuing the trend from the year before, and there is no significant dispersion across different fund types. Mezzanine funds are an exception, as they rely on a hybrid of equity and debt financing, but outright borrowing for this type still amounted to around 7% of NAV in 2019, 3 percentage points lower than it had been in 2018. However, the low level of leverage for PE funds must be interpreted with caution, as leverage may be incurred through special-purpose vehicles (SPVs) or by the firm the fund invests in. This is particularly the case for leveraged buyout

⁶³ See "ESMA Annual Statistical Report on EU Alternative Investment Funds 2021", ESMA, April 2021.



funds.⁶⁴ Temporary leverage may also be used, whereby PE funds borrow until they can call on the capital commitments of members.

Industry data on the performance of Europe-oriented PE funds in the first half of 2020 suggest that the uncertain economic environment caused by the COVID-19 pandemic led to a slowdown in deals, but fundraising remained stable.⁶⁵ Funding raised in the first half of 2020 by Europe-focused funds amounted to 53% of the 2019 figure, and the 2020 figure appears likely to match it. Investment activity, in turn, slowed from 2019. The aggregate value of buyout deals in Europe in the first two quarters of 2020 was at 38% and 40%, respectively, compared with 2019 as a whole. Venture capital deals were relatively more dynamic, with the aggregate value of deals closed in the first half of 2020 amounting to 49% of the 2019 total. The first half of 2020 also saw a change in the leading investment strategy in terms of capital raised, with secondaries replacing buyouts.⁶⁶

Overall, the risks in 2019 appear to have been stable compared with the previous year, and it is too early to pass judgement on the effects of the COVID-19 pandemic on PE funds. In 2019, PE funds experienced strong growth across all strategies and EU jurisdictions, while their use of leverage decreased slightly. In 2020, the high prevalence of PE-backed companies with very low credit ratings or outright defaulting suggests that risks stemming from the use of indirect leverage may have increased. However, due to the one-year lag in the availability of detailed regulatory data on PE funds, a more complete assessment of the effects of the COVID-19 pandemic on these entities will have to be made in the next edition of the NBFIRisk Monitor.

3.1.7 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 funds are institutional investors, with pension funds and insurers accounting for around two-thirds of total AuM. Other investors include sovereign wealth funds (5%), family offices (5%), private banks (4%) and high net worth individuals (3%).⁶⁷ Most of the investors in private debt are located in the United States (55%), followed by Europe (24%) and Asia (13%). Out of 504 private debt fund managers based in Europe, the vast majority are located in the United Kingdom (257) and the Nordic countries (190).⁶⁸

Following their continuous growth in the aftermath of the financial crisis, the COVID-19 pandemic is the first major test for private debt funds. Total AuM of private debt funds globally are, for the first time since 2000, expected to decrease from USD 854 billion at the end of 2019 to

⁶⁴ See “**Financial stability implications of private equity**”, *Financial Stability Review*, ECB, May 2020.

⁶⁵ See “**Preqin Markets in Focus: Alternative Assets in Europe**”, Preqin, September 2020.

⁶⁶ See also “**Post-COVID private equity: thriving in a bifurcated world of opportunity**”, Deloitte, September 2020.

⁶⁷ See “**Financing the Economy 2018**”, Alternative Credit Council.

⁶⁸ See “**2021 Preqin Global Private Debt Report**”, Preqin, February 2021.



USD 848 billion at the end of 2020, based on annualised data until October.⁶⁹ Fundraising by private debt funds initially fell by 41% in the first quarter of 2020 as valuation uncertainties increased. By the end of the year, total capital raised stood at USD 118 billion, which represents a fall of 10.6% on 2019 and is the lowest amount raised by private debt funds since 2015. Deal activity also experienced a slowdown in 2020 with the number of deals and their aggregate value decreasing by 20% and 4%, respectively, translating into 780 deals with a total value of USD 66 billion.

The economic downturn caused by the pandemic led to a shift in lending strategies.

Although direct lending remained the most important approach in terms of fundraising, accounting for 43% of capital raised globally, the importance of this strategy fell at the expense of possibly riskier alternatives such as mezzanine funding, distressed debt and special situation lending. In particular, around 35% of capital raised in 2020 went to private debt funds specialising in distressed debt and special situation lending.⁷⁰ These strategies can involve buying portfolios of non-performing loans from banks or providing capital to struggling companies with sound business models, and can offer attractive returns in times of economic downturn to investors interested in more risky opportunities. Over 80% of managers, collectively representing half of the assets managed by private debt funds, believe that investment in debt of struggling firms will increase over the next year.⁷¹

Credit risk increased considerably in 2020 amid substantial uncertainty, a legacy of “covenant-lite” leveraged loans and worsening conditions of borrowers.

Over the past few years, covenant-lite leveraged loans have become the new standard for private debt funds. The continued fundraising meant that a large amount of capital was available for a relatively small number of deals, which allowed borrowers to be more selective in their choice of capital provider. This motivated private debt managers to offer more attractive covenant-lite leveraged loans, where certain investor protections are no longer available and the downside risk is larger. Portfolio companies of private debt funds now face worsening economic conditions and may struggle with liquidity, especially considering the relatively low uptake of government-backed liquidity assistance among them. A large segment of funds thus decided to offer adjustments to loan terms, such as payment holidays. 69% of managers believe that an additional injection of finance will be necessary to allow their borrowers to mitigate the impact of the recession, but uncertainty regarding the long-term viability of the business and difficulties in reaching agreements with owners and other lenders, perhaps related to the weaker covenants mentioned earlier, remain the primary hurdle to obtaining it.⁷² The remedial measures implemented in the private debt sector may have had a mitigating effect on the default rate of borrowers, which reached its peak of 8.1% in the second quarter of 2020 before declining to 3.6% in the fourth quarter, the lowest level of the year.⁷³

Leverage in some private debt funds has been modestly increasing in recent years, while liquidity transformation remains low.⁷⁴ Private debt funds can make use of leverage or

⁶⁹ See “[Future of Alternatives 2025: Private Debt’s Spectacular Rise Will Continue](#)”, Preqin, 4 November 2020.

⁷⁰ Source: Preqin.

⁷¹ See “[Financing the Economy 2020](#)”, Alternative Credit Council.

⁷² *ibid.*

⁷³ See “[Proskauer Releases Q4 Private Credit Default Index](#)”, Proskauer, February 2021.

⁷⁴ See “[Financing the Economy 2018](#)”, Alternative Credit Council.



financing, including borrowing against portfolio assets, short-term cash flow management facilities, or subscription line finance, which tends to have terms of less than 12 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.

To conclude, private debt funds continued to provide significant funding to the real economy in 2020, but the risks appeared to have increased. While the full extent and longevity of the effects of the COVID-19 pandemic remain to be seen, risks in private debt appeared to increase in 2020. This was due to a combination of increased risk appetite from investors, who increasingly targeted distressed debt, and worsening financial conditions of borrowers.

3.2 Other financial institutions

3.2.1 Financial vehicle corporations engaged in securitisation

FVCs are special-purpose vehicles engaged in securitisation activity. Securitisation is the transformation of non-tradable, illiquid assets such as loan portfolios into tradable, and more liquid, debt securities. It can also be achieved through the issuance of securitisation fund units or with the use of financial derivatives. Through securitisation, FVCs facilitate the transfer of credit risk from financial institutions, such as banks, that originate the credit to the buyers of the securities issued by the FVC. Other types of assets held by FVCs include deposits and loan claims, debt securities as well as equity and investment fund shares.

Assets of euro area FVCs grew by 0.6% in 2020, increasing from €2.08 trillion to €2.1 trillion (Chart A-29). The increase in assets took place despite the deregistration of a large state-sponsored resolution vehicle in Ireland.⁷⁵ While holdings of securitised assets decreased, this was offset by an increase in debt securities held by FVCs of 17% in 2020 compared with 2019, reaching 19% of total assets. The percentage of total assets related to securitised loans fell from 61.8% to 60.6%. Euro area FVC assets are concentrated in a few jurisdictions, with Ireland and Italy having the largest sectors at over €450 billion each in terms of assets (Chart A-30). While securitised loans (mostly originated within the euro area) represent the majority of FVC assets in most jurisdictions, assets other than securitised loans constitute more than half of the holdings of FVCs domiciled in Ireland and Luxembourg. Net purchases of securitised loans by euro area FVCs were positive in 2020, increasing by €24 billion (Chart A-31).

The main risks posed by FVCs stem from their interconnectedness with other parts of the financial system, and some of the implications of the COVID-19 crisis may only be observable after a delay. Banks often use securitisations by FVCs to transfer assets, along with their related risks, from their balance sheets to the investors in the FVC securities. In past years, however, they have bought back a substantial portion of FVC securities, thus retaining the risks associated with the securitised loans underlying these securities. Given the unprecedented monetary and fiscal policy response to the COVID-19 crisis, losses on some loans included in

⁷⁵ See “**Special Purpose Entities Statistics Q2 2020**”, Central Bank of Ireland, September 2020.



securitised assets may materialise only with some delay when economic support measures are withdrawn. Banks and OFIs are also faced with potential “step-in” risk if they sponsor an FVC and they decide to provide support during times of stress. During the global financial crisis, there was evidence that some banks provided liquidity support and assumed the losses of a defaulting securitisation vehicle that they sponsored. Maturity mismatches generated by FVC securities remain low. Given the way these vehicles are structured (they transfer the losses to investors according to the tranching and waterfall structure), they hold only a small amount of equity and therefore their business model is characterised by high leverage.

Vulnerabilities arising from the FVC sector have increased over the course of the last year.

As shown in Chart A-32, measures of maturity transformation and leverage have increased, while securitised loans to total assets and the interconnectedness of liabilities with euro area banks decreased. The rise in maturity transformation reflects a larger portion of total assets in the form of long-term securitised loans and debt securities. Despite the gradual decline in recent years of interconnectedness with the financial system, particularly with banks, levels remain elevated and a potential source of vulnerability. Moreover, the rapid growth of some segments of the market – notably collateralised loan obligations (CLOs) – deserves continued close monitoring to identify risks arising from this part of the sector.

3.2.2 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 intragroup financing. Like FVCs, these entities can issue debt securities and may engage in liquidity transformation.

SPEs engage in a broad range of activities, and the cross-border nature of many of their transactions make them an important contributor to international financial flows. These entities have little or no connection to the domestic economy of their country of domicile, and their general purpose is to channel financial flows from one country or corporation to another, frequently within a corporate group structure and often for corporate tax structuring purposes. The main activities of non-securitisation special financial institutions (SFIs), which are a type of SPE domiciled in the Netherlands, can be broadly divided into financing companies and holding companies set up to provide debt or equity funding to foreign subsidiaries, or royalty and licencing companies set up for the payment of fees related to intellectual property rights. These vehicles had assets of about €2.45 trillion at the end of 2020, down from €3.49 trillion a year earlier.⁷⁶ Part of the decrease in assets is due to SPEs launching non-financial activities, such as sales and marketing activities, causing them to be classified as “normal” companies.⁷⁷ This is partly the result of efforts to reduce tax avoidance structures. Meanwhile, Irish-domiciled non-securitisation SPEs’ assets stood at €416.2 billion in the fourth quarter of 2020, a small drop from €416.3 billion at the end of

⁷⁶ See “**Balance sheet of SFIs**”, DNB statistics, De Nederlandsche Bank, July 2021.

⁷⁷ See “**Decreased activity among mostly smaller special purpose entities**”, DNBulletin, De Nederlandsche Bank, May 2020.



2019.⁷⁸ Irish-domiciled SPEs' activities include a number of different business models, such as investment fund-linked activities, external and intragroup financing, and operational leasing, among others. Investment fund-linked vehicles saw the largest increase in assets (€2.4 billion), while bank-linked investments saw the largest decrease (€2.3 billion).

The main financial stability-related vulnerabilities posed by SPEs relate to their complex cross-border linkages. The lack of data on SPEs at an EU level inhibits systemic risk monitoring of the activities of SPEs and their linkages. As experienced during the financial crisis, the lack of detailed knowledge of the activities of a sector reduces the ability of regulators to properly identify sources of contagion within the financial system. For instance, in times of stress, the complexity of SPEs' cross-border linkages might lead to an amplification and spread of shocks through the financial system.

3.2.3 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 saving and investment flows across the EU. They provide a range of services which focus on providing investors with 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. In doing so, SDDs give investors access to securities and derivatives markets through investment advice, portfolio management, brokerage, the execution of orders, proprietary trading, underwriting, and the placing of financial instruments on behalf of an issuer on a firm commitment or on a standby commitment basis in line with MIFID II⁷⁹. Their services concern tradable financial instruments, which unlike deposits are not payable at face value but fluctuate according to market movements. Up to now, SDDs have not formed 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.⁸⁰ However, a new regulatory regime in the EU will change the classification of these entities to credit institutions. This Regulation shall apply from June 2021 and therefore has no effect on the 2020 data.

Country-level data show that total assets held by SDDs remained stable in 2020. Non-public data collections for the euro area suggest that SDDs' leverage increased before the financial crisis, but has fallen again over the past decade, a trend which seems to have continued throughout 2020. These data also suggest that total assets have remained stable over the past year. Continued monitoring of the sector remains important as the recent changes in EU regulation may result in changes in the business models of and total assets held by SDDs.

⁷⁸ See "Special Purpose Entities Statistics Q2 2020", Central Bank of Ireland, September 2020.

⁷⁹ Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU (recast). The Directive 2014/65/EU is a legal act of the European Union. Together with Regulation (EU) No 600/2014 it provides a legal framework for securities markets, investment intermediaries and trading venues.

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



An important regulatory change that will apply from July 2021 is the revision of the Capital Requirements Regulation (CRR).⁸¹ This new regulation, approved by the European Parliament and the Council in November 2019, governs the prudential requirements of investment firms and their prudential supervision. This includes the introduction of a new categorisation of investment firms, i.e. (i) systemic and “bank-like” investment firms to which the full CRR/CRD IV requirements should be applied, (ii) other (“non-systemic”) investment firms with a more limited set of prudential requirements, and (iii) smaller firms with “non-interconnected” services.

Previous regulatory regimes for investment firms have been fragmented and were applied inconsistently across member jurisdictions. Currently, all SDDs in the EU are licensed and supervised by a supervisory authority, although the exact features of the applicable regimes vary across countries. The 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, may affect the future risk assessment of these entities. In addition, for the systemic and “bank-like” investment firms to which the full CRR/CRD IV requirements will be applied, less fragmentation and inconsistencies across member jurisdictions may be expected.

The degree of maturity transformation, liquidity and leverage risk depends on the specific business model of the SDD. SDDs engage with a variety of lenders, including banks, and can hold a wide range of asset types with different maturities. They tend to hold liquid securities which can be converted into cash through repos and securities lending or can be posted as collateral to support various trading strategies. This can result in some maturity and liquidity transformation.

SDDs may rely on banks as a funding source, especially when they are 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, which implies that risks stemming from interconnections with the banking sector may be considered low. However, this may not be the case across all jurisdictions as SDDs may not always be consolidated into banking groups.

Overall, risks in SDDs appear to have remained largely unchanged in 2020 compared with the previous year. The revisions to the CRR may result in structural shifts in the SDD market, which will need to be monitored.

3.2.4 Financial corporations engaged in lending

FCLs are non-bank credit grantors that principally specialise in asset financing for households and NFCs. The entities in this sub-sector include financial leasing, factoring, mortgage lending and consumer lending companies. When carrying out lending activities, FCLs

⁸¹ Regulation (EU) 2019/2033 of the European Parliament and of the Council of 27 November 2019 on the prudential requirements of investment firms (OJ L 314, 5.12.2019, p. 1).



engage in credit intermediation outside the banking regulatory perimeter.⁸² At European level there are no current legal initiatives to create a harmonised regulatory framework for these entities.

Assets of FCLs increased by 8% in 2020 compared with lower increases of around 3.3% on average per annum in the previous three years. Annual data published by the ECB show that total assets of FCLs were around €577 billion at the end of 2020, up from €534 billion at the end of 2019. This represented about 2.6% of OFIs' total assets. Having declined steadily between 2010 and 2014, the sector's balance sheets have grown slightly every year since 2015 (Chart A-34). The balance sheet composition has remained broadly stable in recent years, with loans to non-monetary financial institutions (MFIs) continuing to represent around 94% of total loans provided by FCLs. The liabilities side of the balance sheet shows a gradual increase in FCLs' capital and reserves over the last five years and a sharp reduction of debt securities issued compared with the beginning of the decade (Chart A-35).

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.⁸³ In some countries the assets of FCLs are partly consolidated into banking groups and therefore fall within the banking regulatory perimeter, while in other jurisdictions FCLs are not subject to any prudential requirements.

Systemic risks emanating from the sector appear to be low when leverage, liquidity and interconnectedness channels are considered. A simple FCL leverage measure suggests that leverage has been decreasing over the past six years and is below the median value for the banking sector.⁸⁴ Although there is large variation across countries, the liquidity risks facing FCLs are broadly similar to those for the banking sector, and the liquidity conditions of the sectors have been increasing over the years. Finally, interconnectedness with the banking system appears to be low, as only 4% of FCL assets in 2020 had direct counterparty exposure to the banking sector. Overall, risks appear to have remained unchanged compared with the previous year.

Despite extraordinary support measures by public authorities, loan loss provisions are expected to increase. This has included various economic support measures for entrepreneurs, sole traders, other small, medium-sized and large companies, as well as credit institutions. However, the severe economic shock has been reflected in escalating loan loss provisions⁸⁵, and a reduction in business investments is likely to subdue growth in 2020.

⁸² In November 2017, the EBA published an opinion on regulatory perimeter issues relating to the Capital Requirements Directive IV (CRD IV). 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".

⁸³ 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 in an ECB survey. The ECB has also undertaken a survey analysis of these entities, and further work is expected in this direction.

⁸⁴ 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.

⁸⁵ See "Leaseurope Index Q2 2020", September 2020.



3.2.5 Captives and OFI residuals

Data gaps remain a relevant issue for the assessment of non-bank financial intermediation by captives and OFI residuals. And in this respect, data gaps for OFI residuals are the most important. OFI residuals refer to sub-sectors of non-bank financial institutions for which primary statistics are not currently available at the EU level. They continue to pose important challenges both from a statistical and policy perspective when conducting assessments of vulnerabilities. While some new data collections have been launched at national level in recent years, data for captive financial institutions (CFIs) – the largest OFI sub-sector in many jurisdictions – are not available at the EU level. There remains a strong interest at the EU and global levels in better understanding the activities undertaken by CFIs. Ongoing efforts in international fora⁸⁶ are working towards a better comprehension of the business models and legal regimes of these entities. This will help to assess vulnerabilities in the sector and to assess whether additional policy actions should be considered.

CFIs and money lenders form an economic sector comprised of institutional units, usually as part of a larger corporate structure, that provide financial services to the corporate group. These include a wide range of entities that undertake different activities with diverse business models. The entities are not subject to a uniform European legal framework, but to different national legal systems (i.e. in terms of authorisation, regulation and tax systems). Consequently, it is important to define the perimeter of the sector that is relevant for systemic risk analysis due to its potential interconnectedness with other parts of the financial system.

According to the ESA 2010 classification, entities included in CFIs can be grouped into five broad types. These are: (i) units which are legal entities such as trusts, estates, agency accounts or “brass plate” companies; (ii) 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; (iii) SPEs that qualify as institutional units and raise funds in open markets to be used by their parent corporation; (iv) units which typically provide financial services exclusively with own funds; and (v) sovereign wealth funds classified as financial corporations.

CFIs and other entities included in the OFI residual segment do not necessarily engage in activities that give rise to risks from a financial stability perspective, but may be interconnected with other parts of the financial system. Such entities do not necessarily engage in credit intermediation. They also tend not to be regulated and can form part of a complex financial intermediation chain where they may engage in securities and financing transactions or maintain high levels 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.

It is therefore not yet possible to make a clear assessment of the risks generated by these entities. However, work is ongoing to better understand the detailed characteristics of CFIs. A survey conducted by the ECB found that most CFIs can be categorised as holding companies of

⁸⁶ The IMF, ESRB and OECD.



larger groups or as SPEs. The interconnectedness with banking groups does not appear to be a significant source of risk, although credit intermediation undertaken by some entities will require further assessment.



4 Activity-based monitoring

Activity-based monitoring complements entity-based monitoring, thereby ensuring a more holistic 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 in 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 different kinds of financial institutions, including banks and entities within and outside the monitoring framework, interact.

4.1 Derivatives

Derivatives can be used for hedging or speculating, and their use increases interconnectedness within the financial system.⁸⁷ Derivatives can be used as a risk-reduction or risk-adoption tool, as they allow market participants to transfer risks between market participants, including market risk (e.g. movements in market variables such as exchange rates, interest rates, equity prices and commodity prices), credit risk (e.g. the risk of late payment by a borrower) and counterparty risk (i.e. the failure of a counterparty to fulfil its obligations). This can contribute to risks being borne by those market participants that are better placed to manage or bear them. However, as a risk-transfer tool, derivatives can also 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 can play a relevant role, as witnessed by the losses related to the collapse of Archegos in March 2021. As many types of non-bank financial institutions are involved in derivatives trading, it is important to understand why and how these institutions use derivatives.

The trading and execution of derivatives contracts play a central role in market integrity, efficiency and transparency. Derivatives executed in a regulated market and on an OTC basis have distinctive characteristics in terms of the levels of standardisation, liquidity and post-trading processes such as central clearing. Exchange-traded derivatives (ETDs) are standardised and transparent; they are traded on regulated markets and have become more widely used in response to regulatory requirements, as the standardisation of contracts, liquidity, the reduction of default risk and transparency have become determining factors in investment strategies. In most assets and overall, ETDs are still less common than OTC derivatives, though they account for about half of the total outstanding notional amount in equity and commodity derivatives. Nonetheless, there has

⁸⁷ Derivatives are usually defined as instruments whose value is derived from the value of an underlying entity. They can have a predefined maturity and may entail 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, IRSs 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 FX 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.



been an increase in OTC derivatives traded on multilateral and organised trading facilities in recent years for interest rate, currency and credit derivatives. These are considered as OTC under the European Market Infrastructure Regulation (EMIR) as they are not traded on regulated markets, but in other respects are more similar to ETDs. Following MIFID there has been growth in the trading of OTC derivatives on trading venues.

EMIR data show that the EU derivatives market had a total notional outstanding amount of €47 trillion and 24 million open trades at the end of 2020.⁸⁸

The market continued to be dominated by IRDs, with 79% of the total notional amount. About 13% of the total notional amount was in currency derivatives, with the remaining 8% in equity, credit and commodity derivatives (Chart A-39). OTC contracts accounted for 92% of the total notional amount in the fourth quarter of 2020, with the remainder in ETDs. However, 15% of the total notional amount was in OTC contracts executed on trading venues with characteristics comparable to ETDs, growing strongly from the 10% of a year earlier.⁸⁹

Commodities and equities account for a large proportion of ETDs since instruments in these asset classes are mostly traded on regulated markets.

In the fourth quarter of 2020, the share of ETDs in the gross notional amount outstanding was the largest for equities (50%) and commodities (49%) (Chart A-40), compared with 50% and 48% in the fourth quarter of 2019. In other classes, OTC derivatives continued to account for most of the gross notional amount outstanding. OTC trades accounted for 93% of the gross notional amount outstanding for IRDs, 99% for currency and 95% for credit derivatives in the fourth quarter of 2020, compared with 92%, 99% and 92% respectively in the fourth quarter of 2019.

Banks and investment firms continue to dominate the EU derivatives market.

Banks and other credit institutions hold the largest exposures in most asset classes. They account for the largest outstanding notional amounts in IRDs (58%), currency derivatives (53%) and credit derivatives (36%) (Chart A-41). Investment firms also have significant notional exposures across all derivative classes, ranging from 15% of currency derivatives to 40% of equity derivatives, the largest among all actors. They also account for a large share of the notional amount in credit derivatives (16%), IRDs (19%) and commodity derivatives (30%). However, such exposure measures for investment firms and credit institutions are liable to overstate these firms' exposures to some extent because these firms can conduct trading on behalf of end-clients that are not captured under EMIR reporting. Further distortions occur as notional amounts can be a poor proxy when assessing exposures, as derivatives with underlyings having a low volatility can have large notional amounts, while derivatives with highly volatile underlyings can have a small notional amount.

Following the rapid fall in asset prices and increased volatility as a result of the COVID-19 outbreak in early 2020, initial margins collected by EU 27 CCPs slowly decreased throughout the remainder of 2020, and variation margins returned to pre-crisis levels. During the COVID-19 related market movements, increases in derivatives margins were related to spot market movements on stock or commodity markets while margin increases for IRDs and credit

⁸⁸ These market size metrics are significantly lower than a year earlier because the United Kingdom is no longer included in the statistics given its withdrawal from the European Union on 31 January 2020.

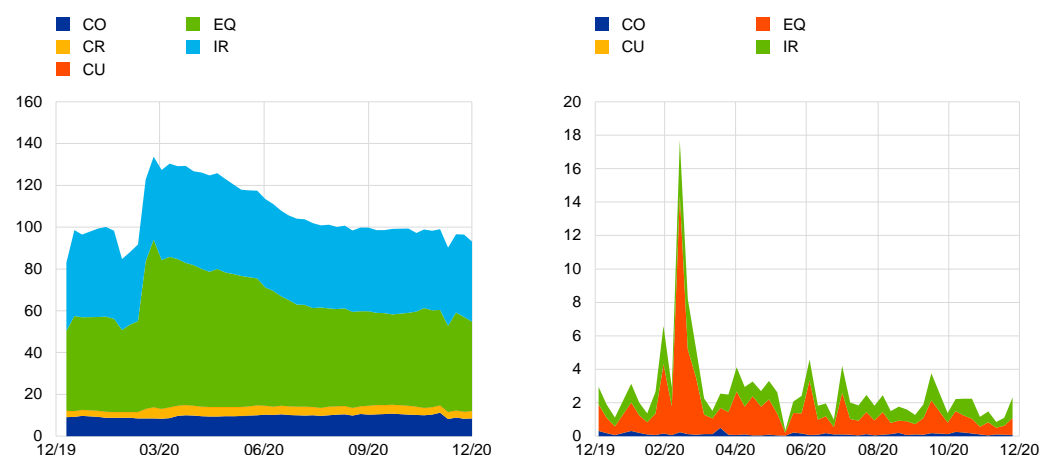
⁸⁹ In this section, where comparisons are made with 2019 data, the 2019 data apply to the EU 27 (i.e. EU Member States excluding the United Kingdom) to ensure comparability with 2020 figures.



derivatives were related more to liquidity and credit risk concerns. These significant margin calls may be one factor behind the dash for cash observed during the first quarter of 2020, which led to considerable outflows from MMFs.⁹⁰

Chart 15
Outstanding amounts of initial margins (left panel) and variation margins (right panel)

(EUR billions)



Sources: Trade repositories and ESMA.

Notes: CO stands for commodity, EQ for equity, CR for credit, IR for interest rate and CU for currency. Outstanding amounts of (LHS) initial margins required and excess collateral and of (RHS) variation margins received by EU 27 and UK CCPs for derivatives (CCP.A, CC&G, European Central Counterparty N.V and KDPW data missing). Data points for 29 May, 12 June and 16 October incomplete.

Clearing rates rose to 73% on average in the second quarter of 2020 for credit default swap indices, up from 54% in the first quarter of 2020. The rise in cleared rates may be related to the liquidity and volatility crisis. However, it does not appear to reflect only a flight-to-liquidity episode because volumes in cleared single names (less liquid than indices, and usually left out in such episodes) followed a similar trend as cleared CDS indices. Activity subsequently declined in the third and fourth quarters as market conditions improved, with clearing rates coming back towards their medium-term average. High activity during the market turmoil points to central clearing being perceived as safer by investors than non-centrally cleared trades.

4.2 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. SFTs include four types of instrument: securities lending, repurchase agreements, buy-sell back transactions and margin lending transactions. They can enhance the efficiency of the financial sector by facilitating credit growth, maturity transformation and liquidity transformation outside the banking system.

⁹⁰ See "Issues note on systemic vulnerabilities of and preliminary policy considerations to reform money market funds", ESRB, July 2021.



SFTs contribute to the efficient functioning of the financial sector but can also be a source of systemic risks.

During stressed market conditions, liquidity risks can emerge as SFTs have short maturities, while collateral values, haircuts and eligibility can behave in a procyclical manner. At the same time, SFTs contribute to the reliance on overnight or short-term leverage. Additionally, the reinvestment of cash collateral in securities creates maturity and liquidity transformation, while the reuse of non-cash collateral creates opaque interconnectedness across sectors.

Securities lending activity retained its resilience in the first half of 2020.⁹¹ EU securities on loan include government bonds, corporate bonds and equities. Securities lending transactions involving European government bonds declined slightly by 2% year on year in the first half of 2020 to €284 billion, while the amount of lendable assets increased (by 8% to €926 billion) and the average utilisation remained elevated at 26%. All in all, the securities finance market retained its resilience in the first half of the year. Given that uncertainty around future investment returns is elevated due to the pandemic, an appropriate environment is provided for securities lending market participation, leading to relative stability in European government bond lending. Securities lending activity involving European equities declined, with lending revenues of €619 million (35% contraction year-on-year) and its lowest return in the first half of 2020 since at least 2006. However, there were significant differences between Germany and other European markets. German equities on loan increased by 24% year-on-year to €30 billion, while French shares on loan decreased by 11% to €35.2 billion. Lending of equity securities picked up in the second half of the year, with revenues growing by 16% year-on-year and exceeding those from the first six months for the first time on record. France and the Netherlands, in particular, recorded strong increases in the average value of these lending types of 46% and 74%, respectively.

The total value of the European repo market amounted to approximately €8.3 trillion in December 2020, the same as its 2019 level (Chart A-36). During the acute crisis of March 2020, there was a widening of collateral haircuts and spreads in the repo market, but this subsequently reversed after the support measures were employed. Consequently, the European repo market appears to have largely returned to its pre-stress levels. During the March episode, there were sharp increases witnessed in variation margin collections by CCPs, reflecting large changes in mark-to-market values on derivatives positions. During the episode, a collateral transformation took place with the aim of raising cash to meet investors' redemptions or margin calls. The ECB announced a package of temporary collateral-easing measures, which helped to relieve conditions in the repo markets.⁹² Eventually, the Federal Reserve System and the ECB expanded swap lines and created repo facilities for international monetary authorities. These measures were largely successful in maintaining the functioning of financial markets.⁹³ All in all, volatility spikes decreased during the last nine months of 2020. Volatility spikes reflect an increase in deleveraging by EU banks around quarterly reporting periods. This is compounded by typically low trading volumes at the end of each year (Chart A-37).

Liquidity risks in SFTs may increase in the event of a sudden repricing of the securities used as collateral. While SFTs provide funding to the real economy that allows corporates to

⁹¹ See "Securities Finance mid-year review – H1 2020" and "Securities Finance 2020 review", IHS Markit.

⁹² See "Lessons from COVID-19: The Experience of European MMFs in Short-Term Markets", BlackRock, July 2020.

⁹³ See Haas, J., Neely, C. and Emmons, W., "Responses of International Central Banks to the COVID-19 Crisis", *Federal Reserve Bank of St. Louis Review*, Fourth Quarter 2020, Federal Reserve Bank of St. Louis, pp. 339-384.



mitigate the consequences of a stress episode, this source of funding could at the same time increase liquidity risks if there is insufficient collateralisation. Such funding strains result in a more widespread spillover to unsecured funding markets. The profile of the collateral pool has evolved, and different collateral haircuts are being imposed across different jurisdictions. To the extent that COVID-19 pressures persist, the increased haircuts on euro area securities might lead to a fall in collateral valuations in the event of corporate downgrades.

The credit conditions on euro-denominated SFTs improved in the second half of the year after two quarters of tightening. According to a survey on credit terms and conditions for euro-denominated SFTs⁹⁴, overall credit terms and conditions on euro-denominated SFTs in the third quarter of 2020 represented a partial reversal of the widespread tightening of credit terms and conditions observed both in the first and second quarters of 2020. Nevertheless, whereas price terms eased significantly, non-price terms on balance tightened for all counterparty types except banks. The easing of price terms is attributed to an improvement in general liquidity and market functioning, but increased risk-taking was an additional reason for offering more favourable conditions to counterparties. This trend continued in the fourth quarter of 2020, and while price terms tightened slightly for counterparties most except banks and hedge funds, non-price terms broadly improved. Overall, the credit terms are considered to have eased for all counterparty types.⁹⁵

While policy support from central banks has eased the impact from the March episode, interconnectedness between banks and non-banks through the use of repo transactions increased. According to balance sheet data of euro area banks, banks' repo liabilities to non-banks increased to €297 billion at the beginning of May 2020, compared with €248 billion at the end of 2019 (Chart A-38). Since around 70% of repo transactions are centrally cleared⁹⁶, CCPs are the largest counterparty to banks: banks' repo liabilities to CCPs increased to €196 billion at the beginning of May 2020 from €179 billion at the end of 2019 but then decreased to €131 billion by the beginning of December 2020, possibly due to year-end effects. Their share as counterparties of bank repo liabilities decreased to 60% in July 2020 and rose back to 2019 levels at the end of 2020 (73% compared with 72% at the end of 2019). Bilateral trades between banks and non-bank financial institutions increased markedly in 2020: bank repo liabilities to non-MMFs and other OFIs spiked in March 2020 to €80.6 billion from €44 billion at the end of 2019. As a result, the share of banks as counterparties to non-MMFs and other OFIs increased to 28% in March 2020 from 18% in December 2019 and stood at 31% in December 2020. This shows that non-MMFs became much more interconnected with banks during this period.

While the unprecedented set of collateral measures has mitigated the tightening of financial conditions and widened the pool of collateral availability, shortages of collateral may re-emerge in the event of corporate debt downgrades, especially if there is a prolongation of a COVID-19 induced crisis. The expansionary collateral policy had an immediate effect on repo rates, resulting in a decline following the announcement of the pandemic emergency purchase programme (PEPP) in mid-March. Volatility spikes in repo rates remained low as euro area

⁹⁴ See "Survey on credit terms and conditions in euro-denominated securities financing and OTC derivatives markets (SESFOD)", ECB, September 2020.

⁹⁵ See "Survey on credit terms and conditions in euro-denominated securities financing and OTC derivatives markets (SESFOD)", ECB, December 2020.

⁹⁶ See "Euro money market study 2020", ECB.



investment funds engaged in repo transactions to raise cash, either through selling assets or drawing on credit lines. While the collateral-easing measures from the first PEPP purchases restored liquidity in the markets, rates subsequently increased in late March and April 2020 as investors became concerned over potential collateral shortages in the event of rating downgrades. Nevertheless, following the additional measures undertaken to mitigate the impact of possible rating downgrades on collateral availability, repo rates declined between May and October 2020, signalling that most of the concerns over shortages have been alleviated.⁹⁷ Price terms offered to NFCs, insurance corporations and hedge funds eased significantly in the third quarter of 2020 after tightening in the first half of the year.

4.3 Securitisation

Securitisation allows non-tradable, illiquid assets such as individual loans to be pooled and tranced into tradable securities. A securitisation is a financial instrument that bundles the cash flows of underlying assets such as residential mortgages, auto loans, credit card debt or derivatives, and splits these into different tranches that are issued as debt instruments of varying credit risk. Usually the securitisation process involves the transfer of assets (e.g. mortgages) via a true sale from the originator (e.g. the bank) to an FVC, i.e. a different entity. The FVC, which is bankruptcy remote from the originator, then “securitises” these assets into different tranches that are issued as bonds to investors. When the cash flows from a derivative rather than from loans or physical assets are securitised, the securitisation is called a “synthetic” securitisation.

When implemented properly, securitisations bring important economic and financial benefits; however, they also require close supervision and monitoring in order to ensure that risks are adequately mitigated. Examples of economic or financial benefits arising from securitisations are that (i) they enable investors to gain exposure to new, previously unavailable asset classes and thus support portfolio diversification (e.g. pension funds can gain exposure to residential real estate markets); (ii) they transform illiquid assets that are difficult to trade, such as mortgages and credit card debt, into tradable and liquid securities, thereby contributing to a more diverse funding mix for banks and better credit pricing for customers; and (iii) they allow banks to transfer risks to other investors, thus freeing up balance sheet capacity and enabling them to increase lending to the real economy.

While in 2020 the number of securitisations issued fell to its lowest level since 2013, the EU introduced a new regulation in April 2021 to use the advantages of securitisation to aid the economic recovery from COVID-19. According to AFME, the number of securitisations issued in the EU in 2020 fell to €195 billion, a decrease of 12% from 2019 and the lowest level since 2013. 2020 also saw more rating downgrades than upgrades, especially in the second and third quarters. On 9 April 2021, the EU introduced Regulation 2021/557, amending Regulation 2017/2024 (the STS Regulation), with two main goals. First, with a focus on aiding the economic recovery from COVID-19, a regulatory framework enabling the securitisation of NPEs under the STS Regulation was created. As NPEs are expected to increase due to COVID, this allows financial institutions to better deal with and manage these. Second, more flexibility was introduced into the STS framework

⁹⁷ See De Guindos, L. and Schnabel, I., “Improving funding conditions for the real economy during the COVID-19 crisis: the ECB’s collateral easing measures”, The ECB Blog, ECB, April 2020.



by including on-balance-sheet synthetic securitisations. In an on-balance-sheet synthetic securitisation, credit risk arising from assets (e.g. residential mortgages) is also transferred from the originator to investors. However, in contrast to a “traditional” securitisation, the underlying asset is not sold to a special-purpose entity, but remains on the balance sheet (hence the name), and the credit risk is transferred to investors by means of credit derivatives or guarantees.

As of the fourth quarter of 2020, securitisations accounted for around 5% of euro area debt securities and around 9% of the EU mortgage market. In the fourth quarter of 2020, around €1 trillion of securitisations were outstanding in Europe, of which €605 billion were residential mortgage-backed securities (RMBSs). Securitised auto loans, consumer credit and SME loans accounted for €91 billion, €78 billion and €92 billion, respectively. Covered bonds, which are different from securitisations in several aspects (in particular by providing recourse to other assets of the originating institution if the mortgages in the cover pool become insufficient to cover investor claims (“double recourse”), also play an important role in the EU mortgage market, accounting for €2.7 trillion. According to data from AFME, STS securitisations amounted to €77 billion and accounted for 40% of new issuances in 2020.

Box 2

Upcoming ESRB report on securitisations

Under the Securitisation Regulation, the ESRB is responsible for the macroprudential oversight of the EU securitisation market. As illustrated by the US subprime mortgage crisis, which eventually spiralled into the global financial crisis, moral hazard and inappropriate risk management by transaction parties as well as the complexity and opaqueness of securitised products can have devastating effects for the real economy and the financial system. To contribute to both a vibrant and safe EU securitisation market, the ESRB is therefore tasked with macroprudential oversight.

The ESRB’s macroprudential monitoring focuses on maintaining an overview of the market and identifying systemic risks caused by high leverage and strong interconnectedness. In line with its mandate under the Securitisation Regulation, the ESRB is preparing a first report to be published towards the end of 2021. At the outset, the report aims to provide an overview of the composition of and developments in the EU securitisation market and to examine its importance and linkages. To this end, the ESRB is currently developing an analytical toolbox to monitor systemic risks from the perspective of underlying assets in securitisations, but also in terms of how securitisations transfer risks in the financial markets and whether there are for instance concentrated exposures among certain groups of investors or sectors. A particular emphasis is placed on RMBSs as they are the predominant form of securitisation in Europe.



5 Statistical overview

5.1 Statistical classification for investment funds and other financial institutions

Table 2

	Entities: Sectors and sub-sectors		Description
Investment funds (IFs)	Money market funds (ESA S.123)		Part of the monetary financial institution (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	ETFs and private equity funds are included in the above fund types, depending on the strategy of the fund
Other financial institutions (OFIs)	Other financial intermediaries (ESA S.125)	Financial vehicle corporations engaged in securitisation (FVCs)	i.e. special-purpose vehicles engaged in securitisation
		Financial corporations engaged in lending (FCLs)	e.g. financial leasing, factoring, hire-purchase
		Security and derivative dealers (SDDs) Specialised financial corporations	i.e. dealers on own account e.g. venture capital, export/import financing, central counterparties (CCPs)
	Financial auxiliaries (ESA S.126)	e.g. insurance or loan brokers, fund managers, head offices of financial groups, financial guarantors	
	Captive financial institutions and money lenders (ESA S.127)	e.g. special-purpose entities not engaged in securitisation, "brass plate" companies, holding companies	

Source: ECB

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

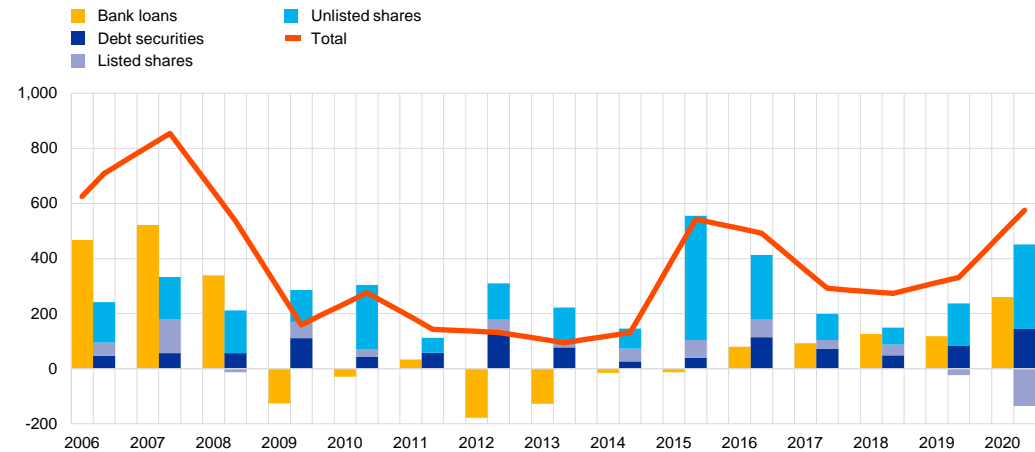


5.2 Developments in main aggregates

Chart A-1

Net finance raised by euro area non-financial corporations

(EUR billions)



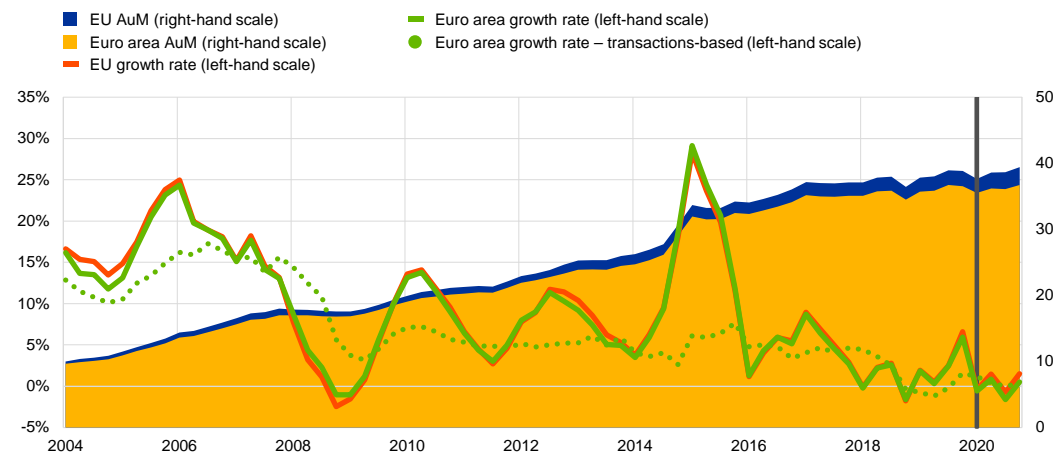
Sources: ECB QSA and ESRB calculations.

Note: The latest observation is for the fourth quarter of 2020.

Chart A-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.

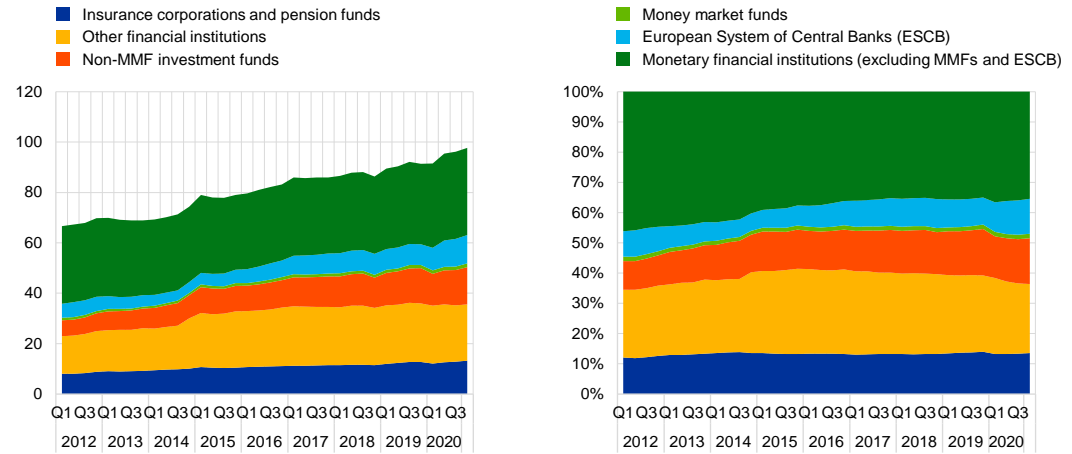
Notes: The continuous lines indicate annual growth rates based on changes in outstanding amounts. The dotted line indicates the annual growth rate based on transactions – i.e. excluding the impact of exchange rate variations or other revaluations and statistical reclassifications. The latest observation is for the fourth quarter of 2020.



Charts A-3.1 and A-3.2

EU financial sector

(Chart A-3.1: EUR trillions; Chart A-3.2: percentages)



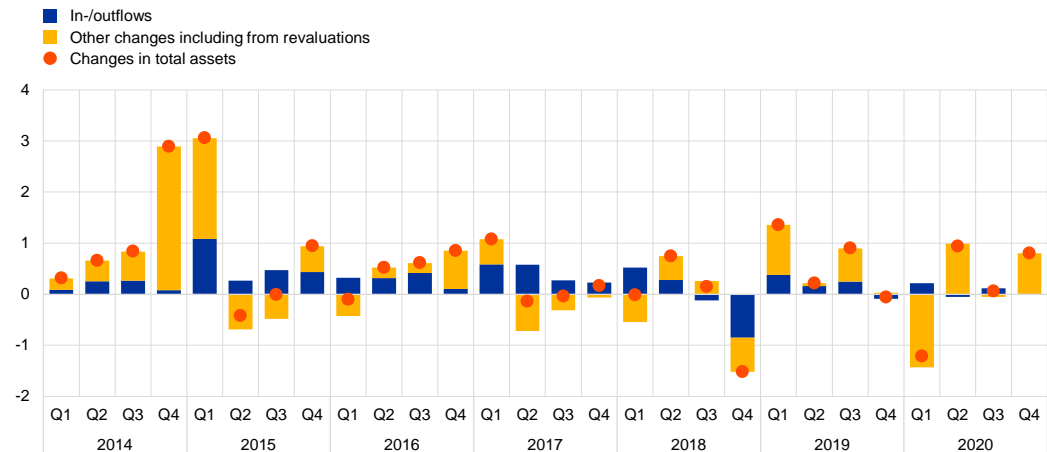
Sources: ECB and ESRB calculations.

Notes: Based on financial accounts data for the total financial assets of the financial sector of euro area plus non-euro area EU Member States. To exclude central banks from the MFI time series, ESCB is estimated based on BSI data for the Eurosystem and national central bank data for the non-euro area EU central banks. The latest observation is for the fourth quarter of 2020.

Chart A-4

EU investment funds and other financial institutions: financial transactions and other changes

(EUR trillions)



Sources: ECB and ESRB calculations.

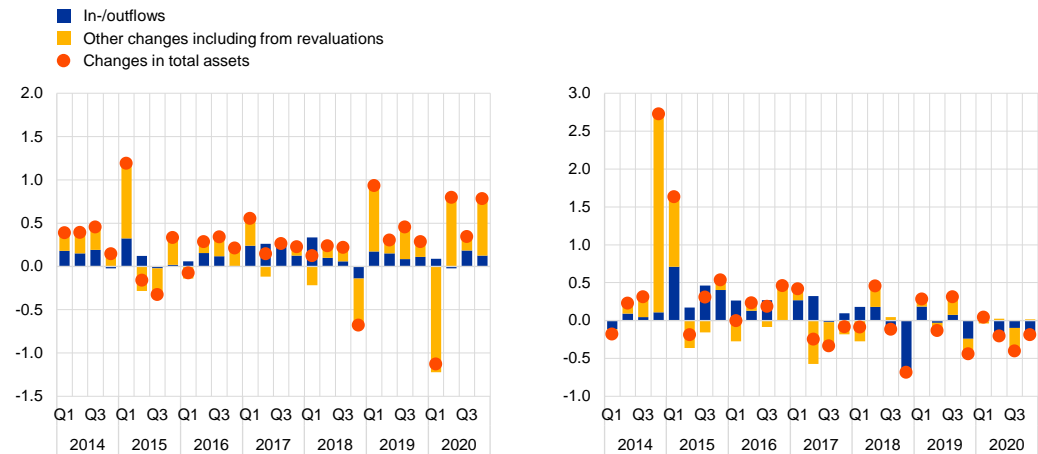
Notes: Based on financial accounts data for the total financial assets of the financial sector of euro area plus non-euro area EU Member States. In/outflows are calculated from differences in outstanding amounts adjusted for revaluations, exchange rate variations, statistical reclassifications and any other changes which do not arise from transactions. The latest observation is for the fourth quarter of 2020.



Charts A-4.1 and A-4.2

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

(EUR trillions)



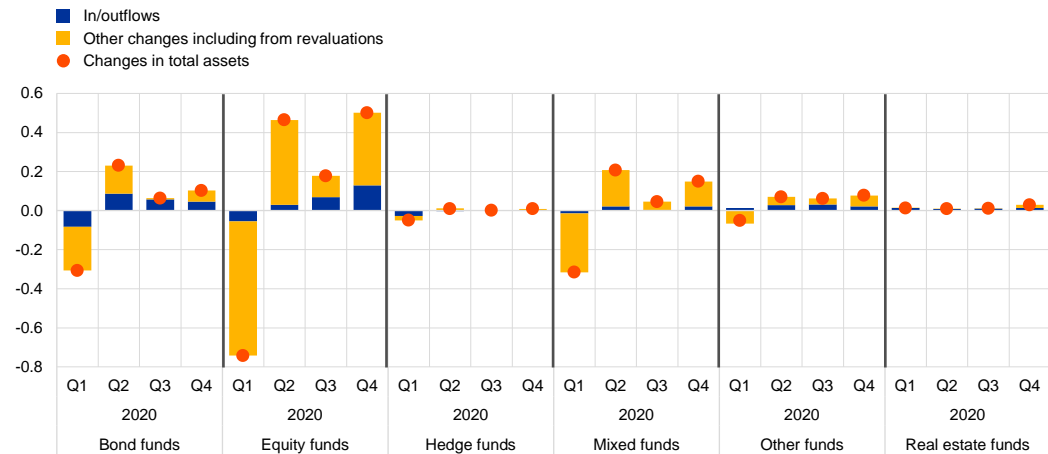
Sources: ECB and ESRB calculations.

Notes: Based on financial accounts data for the total financial assets of the financial sector of the euro area. In/outflows are calculated from differences in outstanding amounts adjusted for revaluations, exchange rate variations, statistical reclassifications and any other changes not arising from transactions. The latest observations are for the fourth quarter of 2020.

Chart A-5

Euro area investment fund types: in/outflows and other changes (EUR trillions)

(EUR trillions)



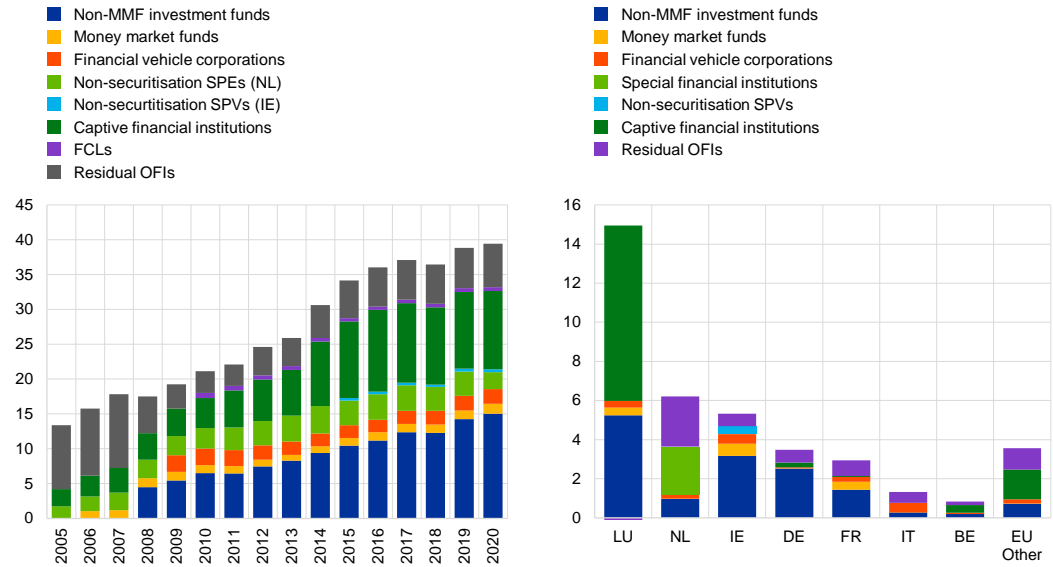
Sources: ECB and ESRB calculations.

Notes: Based on financial accounts data for the total financial assets of the financial sector of the euro area. "In/outflows" are given by the net issuance of fund shares. The latest observation is for the fourth quarter of 2020.



Charts A-6 and A-7

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

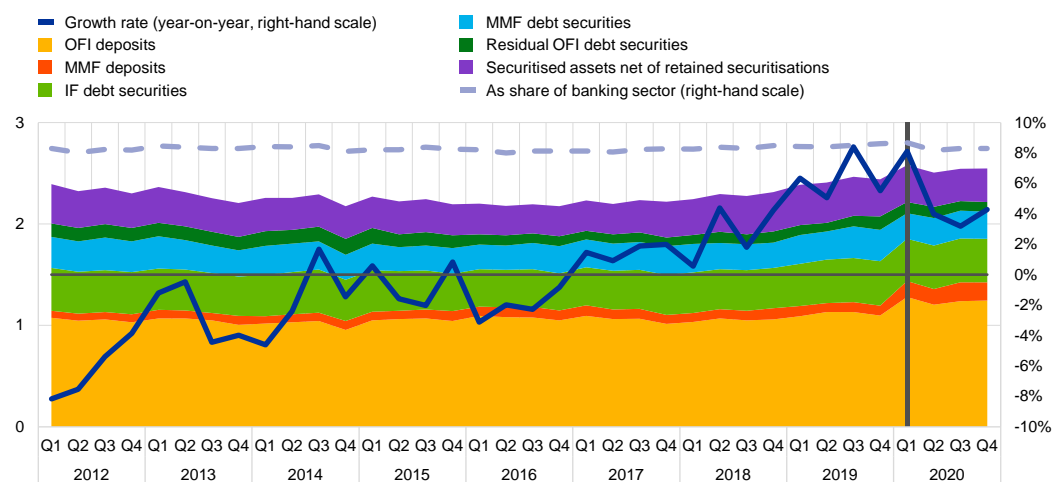


Sources: ECB, Eurostat, Central Bank of Ireland, De Nederlandsche Bank, Nationale Bank of Belgium and ECB calculations.
 Notes: Data for the total OFI sector are sourced from financial account statistics; data on IFs, MMFs and FVCs are based on ECB monetary statistics. Data on FCLs are based on OFI BSI 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 observations are for 2019 for captive financial institutions and for the fourth quarter of 2020 for all other categories.

Chart A-8

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 euro area MFIs; and IF, MMF and OFI holdings of debt securities issued by euro area MFIs. "Residual OFIs" reflects the difference

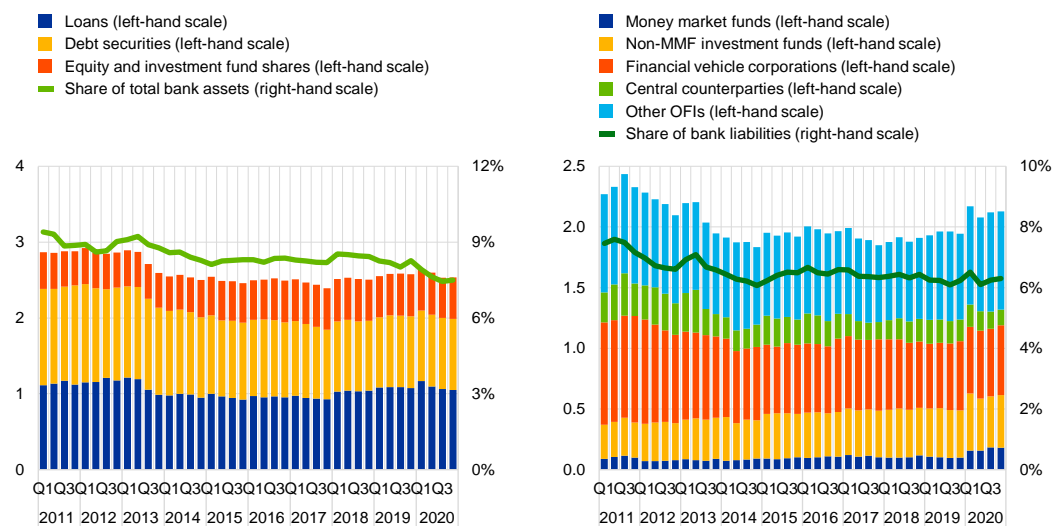


between the total financial sector and the known sub-sectors in the statistical financial accounts (i.e. assets from the banking sector, insurance companies, pension funds, FVCs, IFs and MMFs). The latest observation is for the fourth quarter of 2020.

Charts A-9 and A-10

Euro area credit institutions' assets vis-à-vis (left panel) and deposits from (right 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 2020.

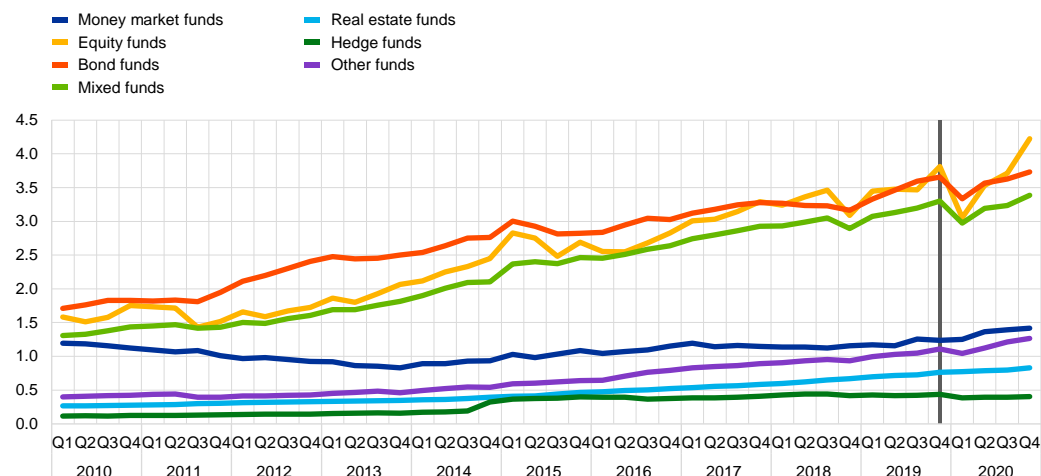


5.3 Entity-based monitoring

Chart A-11

EU investment funds: net asset values

(EUR trillions)



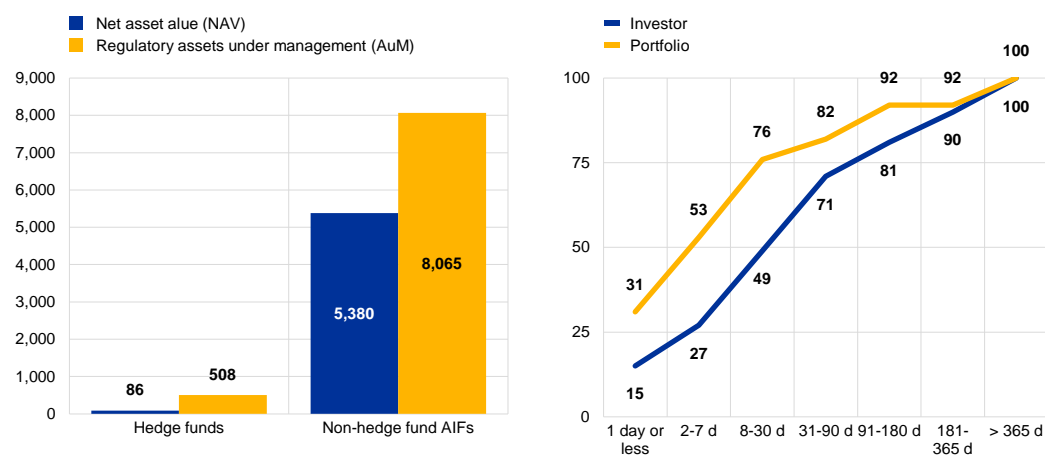
Source: ECB.

Notes: Based on data for the EU; Bulgaria, Denmark, Croatia, Sweden and the United Kingdom 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 2020.

Charts A-12.1 and A-12.2

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

(EUR trillions)



Sources: AIFMD database, NCAs and ESMA.

Notes: Chart A-12.1: NAV and AuM by AIF type. "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-12.2: portfolio and investor liquidity profiles of hedge funds managed and/or marketed by authorised EEA AIFMs. Portfolio profile determined by percentage of the portfolios capable of being liquidated within each specified period; investor profiles

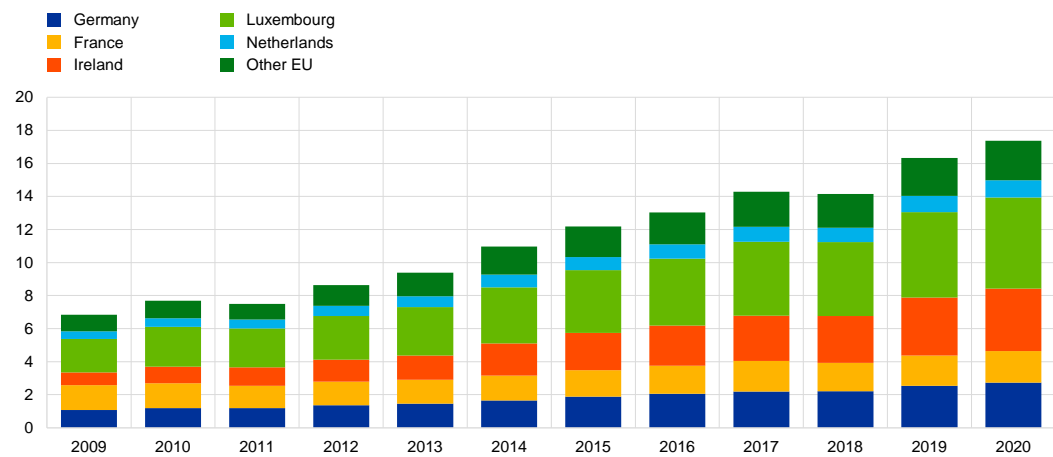


depend on the shortest period within which redemption payments could be received. The latest observation is for the fourth quarter of 2019.

Chart A-13

EU investment funds: total assets by country of domicile

(EUR trillions)



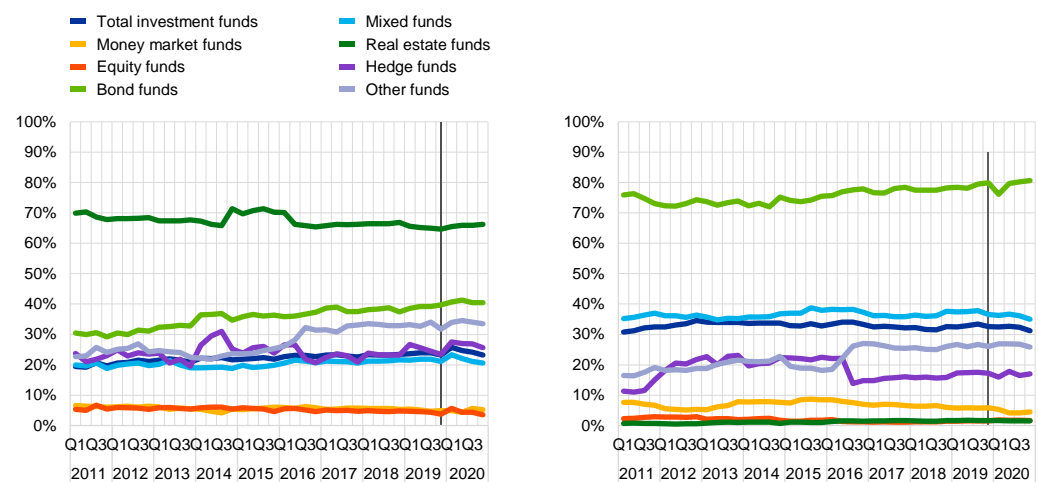
Source: ECB.

Notes: Data for non-MMF IFs are based on investment fund statistics for the euro area countries and QSA for non-euro area countries. The latest observation is for the fourth quarter of 2020.

Charts A-14 and A-15

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

(percentages)



Source: ECB.

Notes: Data for the EU; Bulgaria, Denmark, Croatia, Sweden and the United Kingdom are not included. During 2016, some hedge funds were reclassified as "other funds". In Chart A-14, the proxy for liquidity transformation is expressed as total assets minus liquid assets (deposits, sovereign bonds, debt securities issued by MFIs and equity and open-ended investment fund shares), as a share of total assets. Estimates are made for non-MMF funds' holdings of non-euro area securities and deposits.

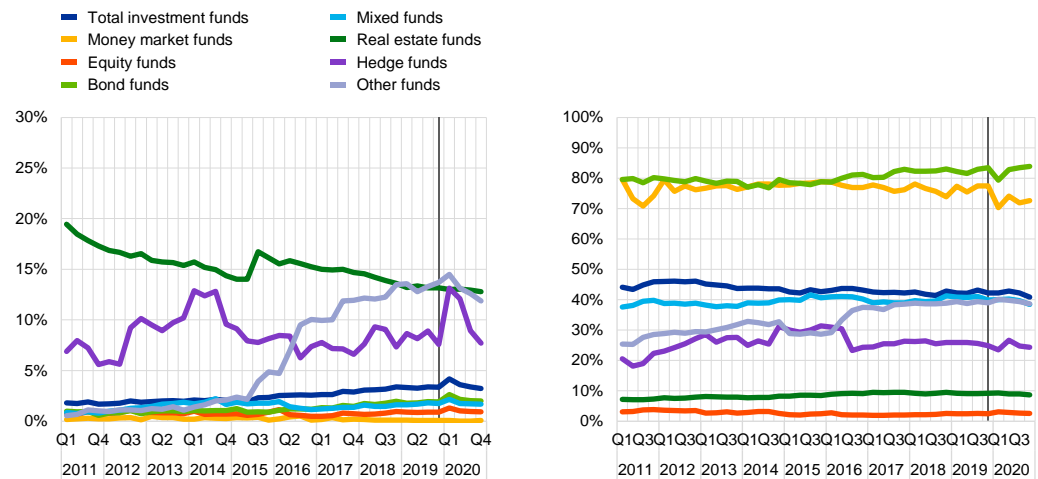


In Chart A-15, maturity transformation is shown as the ratio of all long-term assets (original maturities of over one year) to total assets. By this measure, maturity transformation is low for equity funds and real estate funds (which invest in non-financial assets). For MMFs, long-term assets vis-à-vis the government sector are not included. The latest observation is for the fourth quarter of 2020.

Charts A-16 and A-17

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

(percentages)



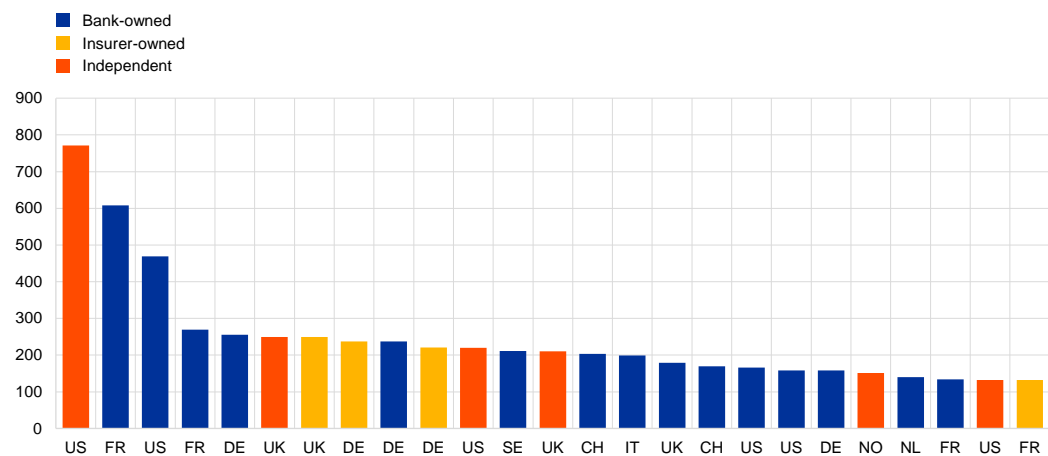
Source: ECB.

Notes: Data for the EU; Bulgaria, Denmark, Croatia, Sweden and the United Kingdom are not included. During 2016, some hedge funds were reclassified as "other funds". In Chart A-16, financial leverage is calculated as the ratio of loans received to total liabilities. In Chart A-17, 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 to non-euro area counterparties. The latest observation is for the fourth quarter of 2020.

Chart A-18

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

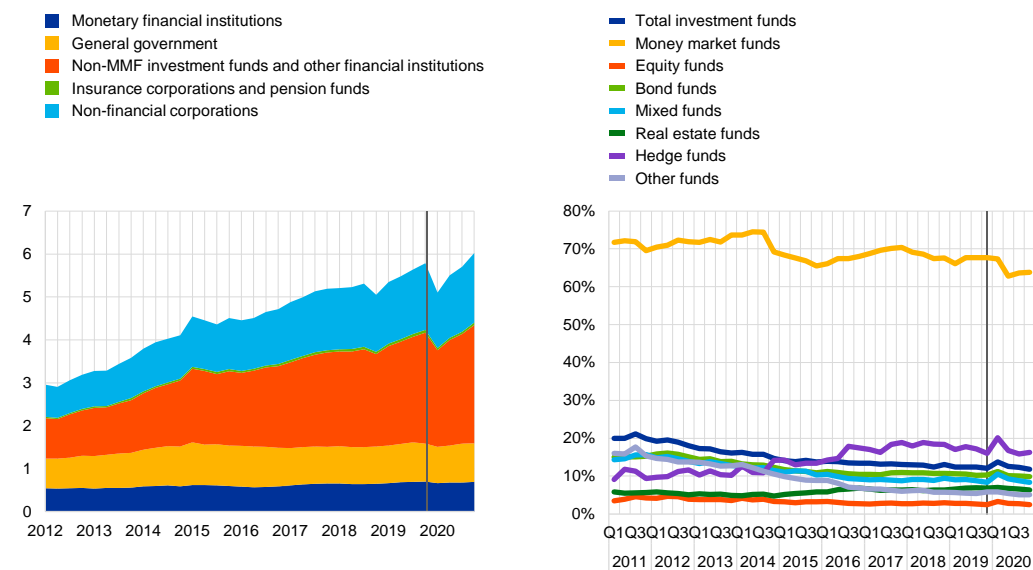


(this excludes cases where bank/insurance activities are a subordinate business of the group or where the holding company also holds banks/insurers) or has a bank/insurer as a majority shareholder. The horizontal axis shows the domicile of the asset manager. The latest observation is for December 2020.

Charts A-19 and A-20

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

(Chart A-19: EUR trillions; Chart A-20: percentages)



Source: ECB.

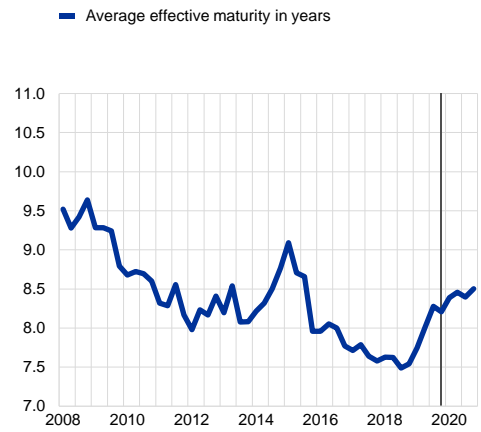
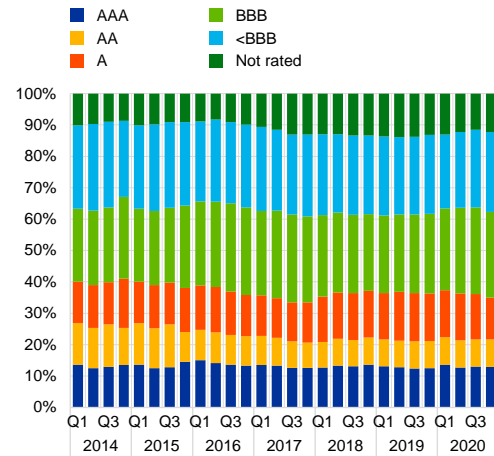
Notes: Chart A-19: euro area IF holdings of debt securities, IF shares and other equity issued by euro area entities. Chart A-20: based on data for the EU; Bulgaria, Denmark, Croatia, Sweden and the United Kingdom are not included. Interconnectedness is proxied by holdings of debt securities and loans with an MFI as a counterparty as a share of total assets. Estimates made for non-MMFs' loans to non-euro area counterparties. MMF data in the fourth quarter of 2014 are affected by reclassifications. The latest observation is for the fourth quarter of 2020.



Charts A-21 and A-22

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

(Chart A-21: share of total assets)

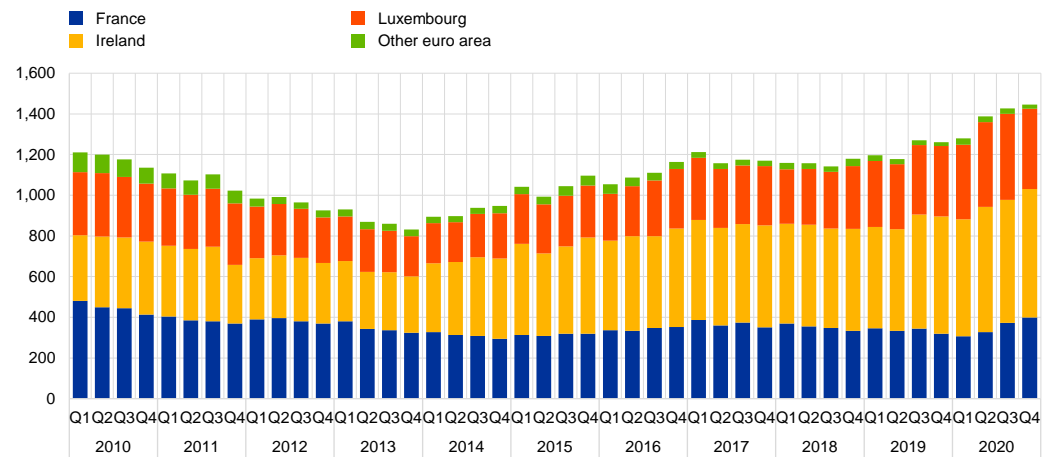


Sources: Thomson Reuters Lipper, ESMA and Standard & Poor's.
 Note: The latest observation is for the fourth quarter of 2020.

Chart A-23

Euro area MMFs: total assets by country of domicile

(EUR billions)



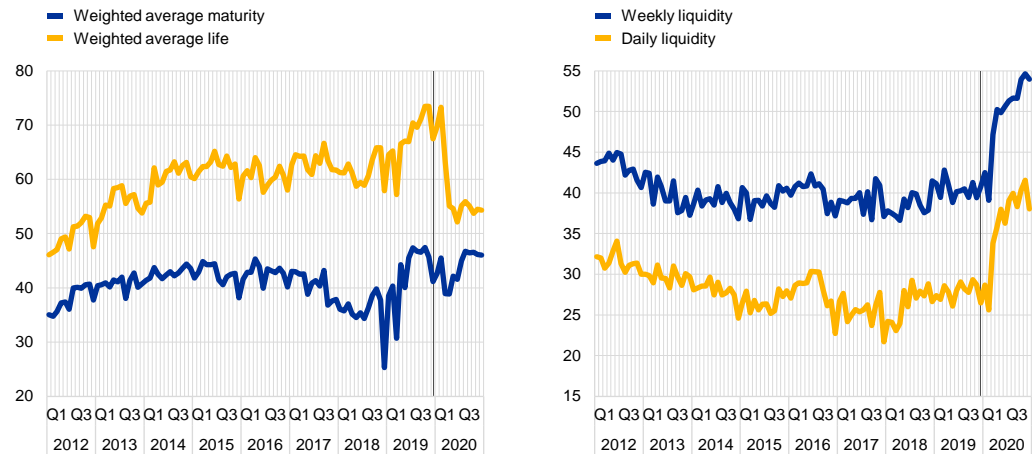
Sources: ECB and ECB calculations.
 Note: The latest observation is for the fourth quarter of 2020.



Charts A-24 and A-25

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

(Chart A-24: days; Chart A-25: percentages)



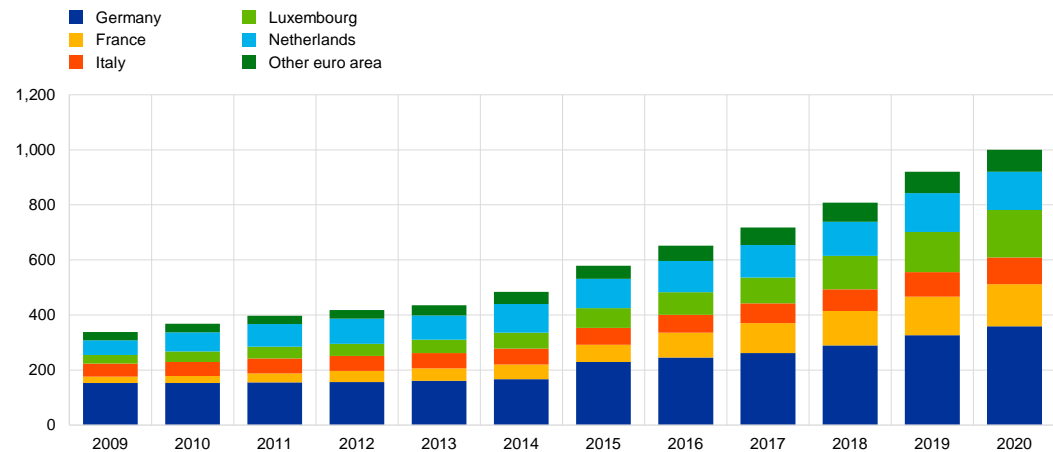
Sources: Fitch Ratings and ESMA.

Notes: Chart A-24: weighted average maturity (WAM) and weighted average life (WAL) of EU and UK prime MMFs. Aggregation carried out by weighting individual MMFs' WAM and WAL by AuM. Chart A-25: 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 December 2020.

Chart A-26

Euro area real estate funds: total assets by country of domicile

(EUR billions)



Source: ECB.

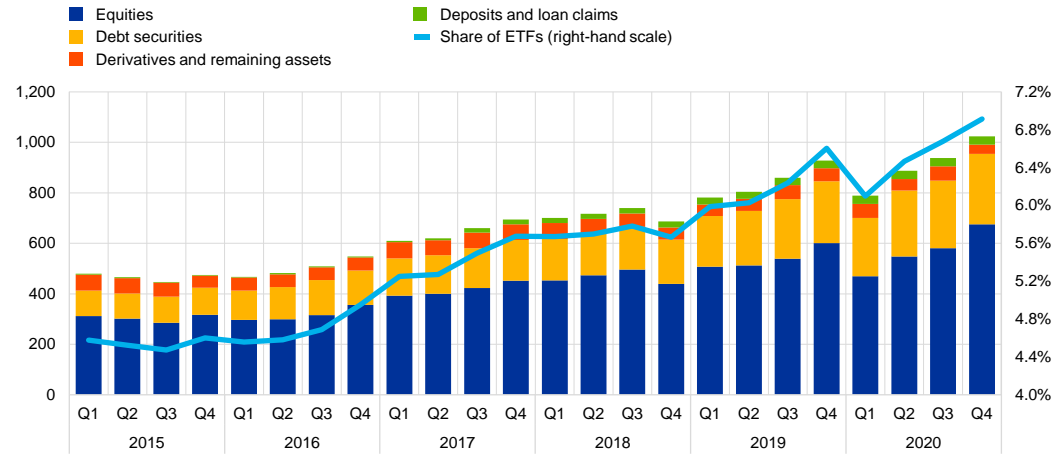
Notes: The data of German closed-ended funds have been included in the calculation of total assets since 2015. The latest observation is for the fourth quarter of 2020.



Chart A-27

Euro area ETFs: assets by type and share of total

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



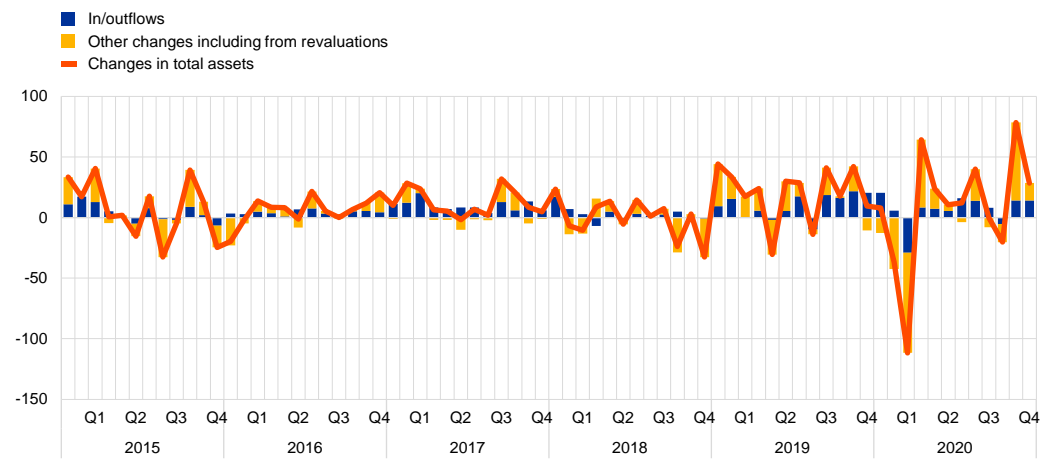
Source: ECB.

Notes: "Share of ETFs" is calculated relative to assets held by the euro area investment fund sector. The latest observation is for the fourth quarter of 2020.

Chart A-27.1

Euro area ETFs: flows and changes in valuation

(EUR billions)



Sources: ECB and ESRB calculations.

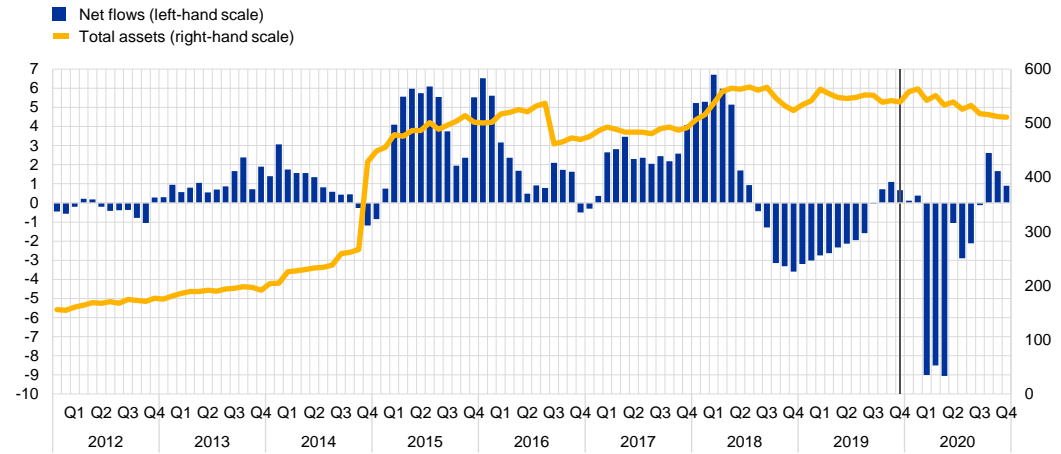
Notes: Based on ECB investment fund balance sheet statistics for exchange-traded funds in the euro area. Transactions are calculated from differences in outstanding amounts adjusted for revaluations, exchange rate variations, statistical reclassifications and any other changes which do not arise from transactions. The latest observation is for December 2020.



Chart A-28

EU hedge funds: net flows and total assets

(EUR billions)



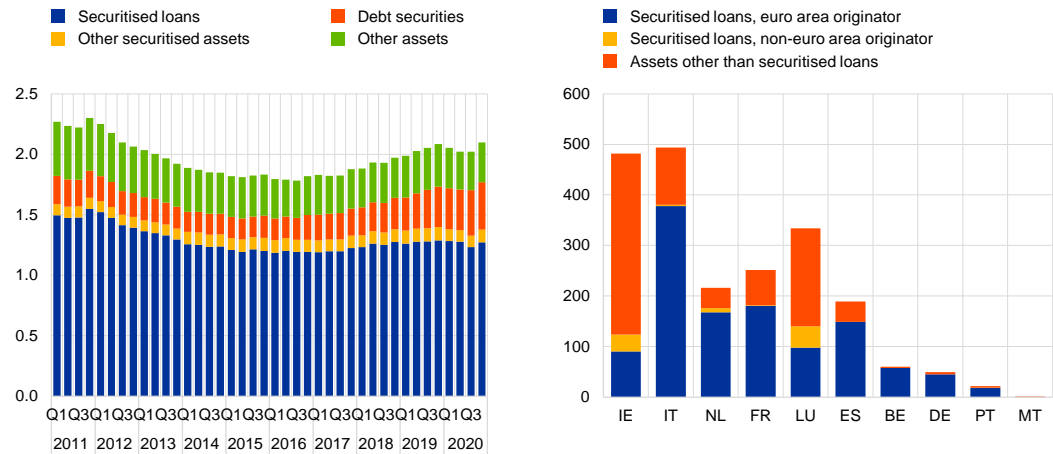
Source: ECB.

Notes: Based on available data for the EU; Bulgaria, Denmark, Croatia, Sweden and the United Kingdom 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 December 2020.

Charts A-29 and A-30

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

(Chart A-29: EUR trillions; Chart A-30: EUR billions)



Source: ECB.

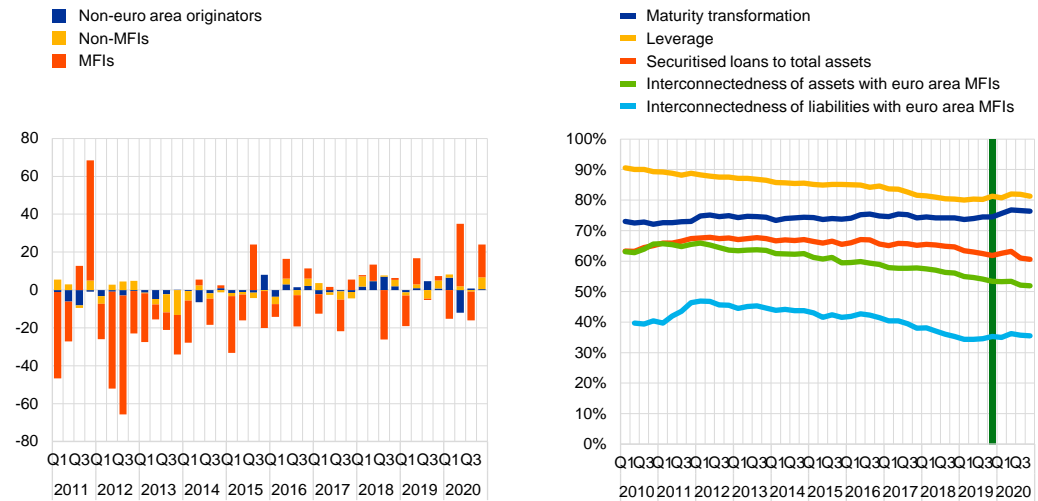
Notes: Chart A-29: "Other assets" includes shares and other equity, financial derivatives and remaining assets. The latest observation is for the fourth quarter of 2020.



Charts A-31 and A-32

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

(Chart A-31: EUR billions; Chart A-32: percentages)



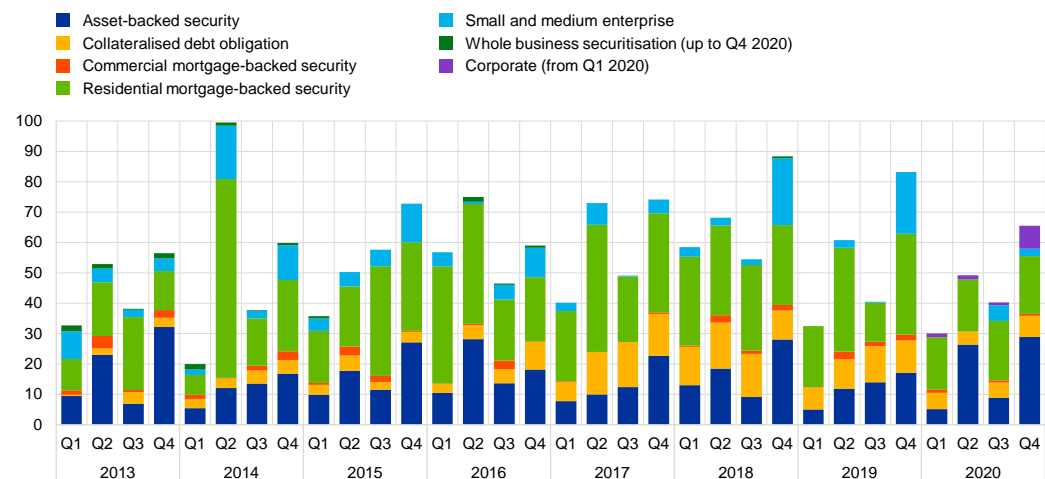
Source: ECB.

Notes: Chart A-31: euro area FVCs' securitised loans by originator. Chart A-32: the proxy for maturity transformation is calculated by summing long-term securitised loans and debt securities (both with an initial maturity of more than one year) 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 euro area MFI counterparty are computed as the sum of loans and debt securities where the counterparty is a euro area MFI, and securitised loans originated by a euro area MFI. FVC liabilities are computed as debt securities held by euro area MFIs, excluding the ESCB reporting sector, using BSI statistics for MFIs. The latest observation is for the fourth quarter of 2020.

Chart A-33

European securitisation issuance by collateral type

(EUR billions)



Source: Association for Financial Markets in Europe (AFME).

Notes: "Asset-backed security" includes auto loans, credit card receivables, leases, loans and other receivables; certain public

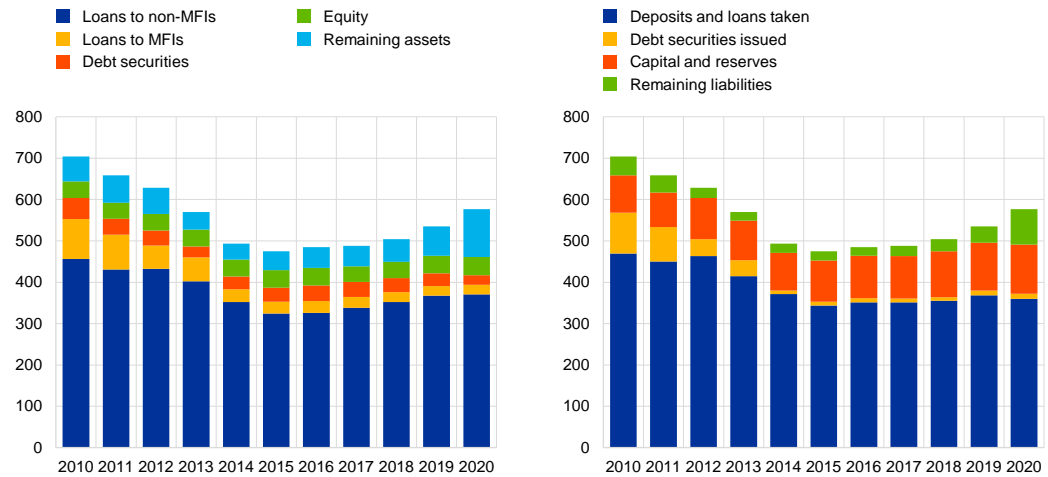


finance initiative securitisations are included within the category “whole business securitisation” as of the fourth quarter of 2013. Owing to a change in sources of securitisation issuance data, collateral types include a “corporate” category from the first quarter of 2020 onwards, while data for “whole business securitisation” are no longer published. “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 2020.

Charts A-34 and A-35

Euro area FCLs’ assets (left panel) and liabilities (right panel)

(EUR billions)



Source: ECB.

Note: The latest observation is for the fourth quarter of 2020.

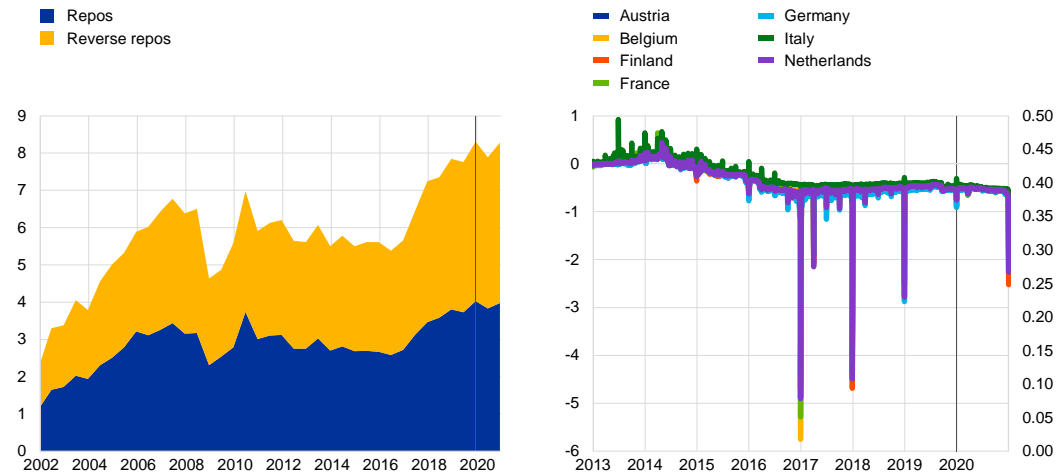


5.4 Activity-based monitoring

Charts A-36 and A-37

Size of EU repo market (left panel) and repo rate for selected sovereigns (right panel)

(Chart A-36: EUR trillions; Chart A-37: percentages)



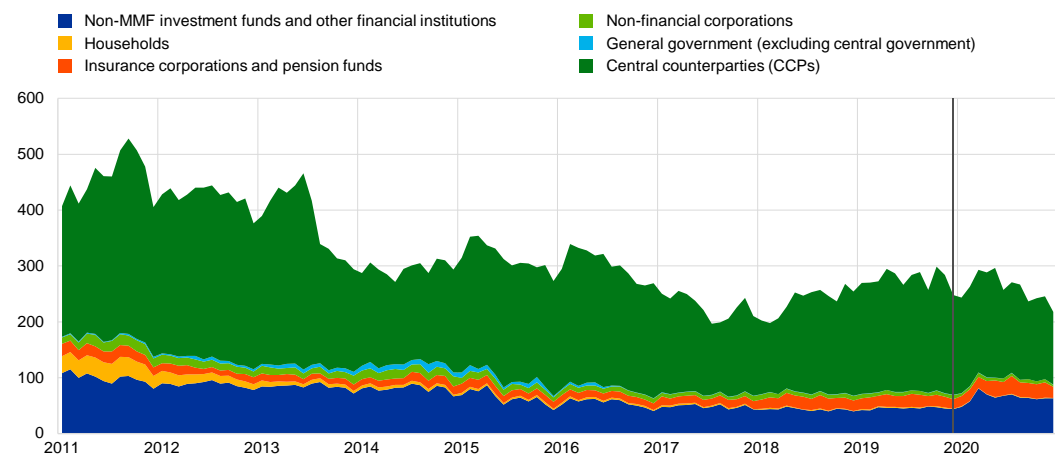
Sources: ICMA, RepoFunds Rate and ESMA.

Notes: Chart A-36: total value of repos and reverse repos outstanding on the books of the institutions which participated in the ICMA repo surveys. Chart A-37: volume-weighted average of fixed rate index value, by origin of the collateral. Centrally cleared sovereign repos only. The latest observation is for December 2020 for Chart A-36 and A-37.

Chart A-38

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

(EUR billions)



Source: ECB.

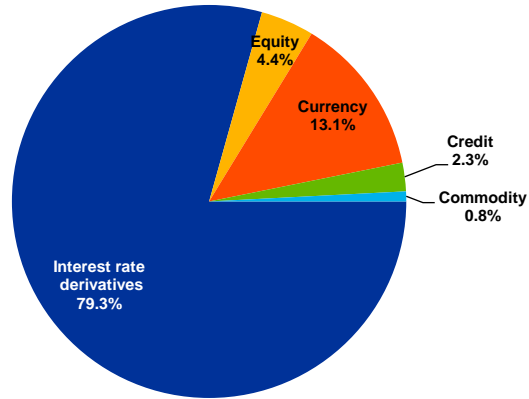
Notes: Euro area MFIs' repo liabilities with euro area non-MFI counterparties. The latest observation is for December 2020.



Chart A-39

Gross notional amount outstanding by asset class

(percentages)



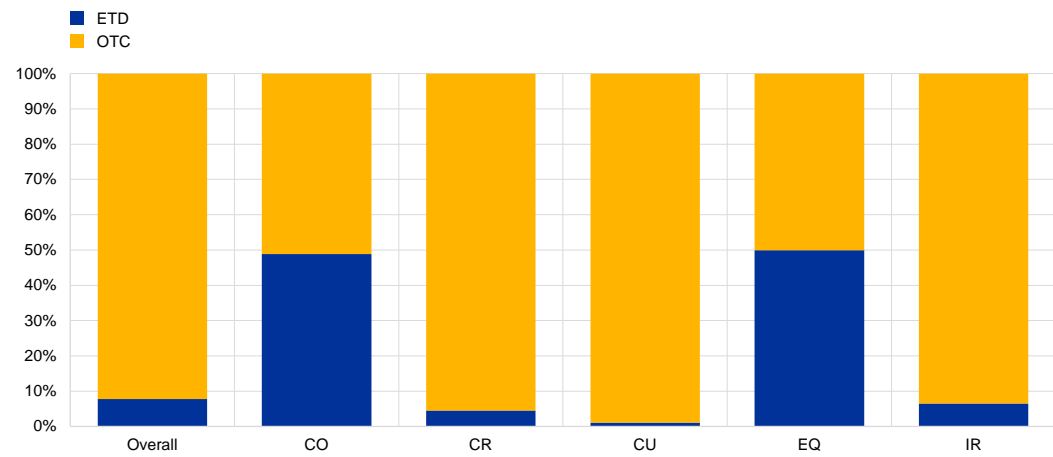
Sources: Trade repositories and ESMA.

Notes: Gross notional amount outstanding by asset class as a percentage of gross notional amount outstanding. The latest observation is for the end of 2020.

Chart A-40

ETD versus OTC notional amount

(percentages)



Sources: Trade repositories and ESMA.

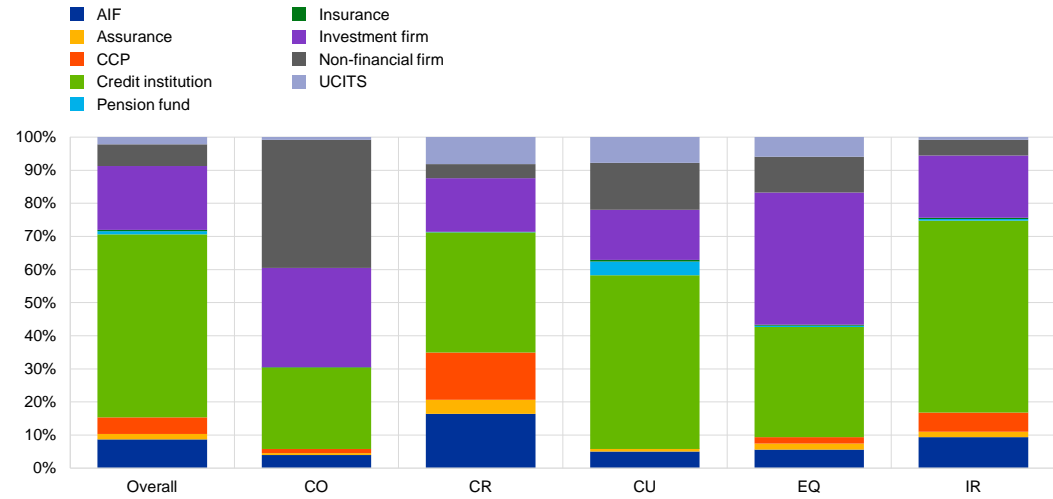
Notes: Percentage share of gross notional amount outstanding by asset class. The latest observation is for the end of 2020.



Chart A-41

Gross notional amount by sector of counterparty

(percentages)



Sources: Trade repositories and ESMA.

Notes: Gross notional amount outstanding (not reconciled) by counterparty as a percentage of gross notional amount outstanding by asset class. The latest observation is for the end of 2020.



Abbreviations

ABS	asset-backed security	GBP	pound sterling
AI	artificial intelligence	GDP	gross domestic product
AIF	alternative investment fund	GNE	gross notional exposure
AIFMD	Alternative Investment Fund Managers Directive	HQLA	high-quality liquid assets
AP	authorised participant	HY	high-yield
AuM	assets under management	ICMA	International Capital Market Association
BCBS	Basel Committee on Banking Supervision	ICO	initial coin offering
BIS	Bank for International Settlements	IF	investment fund
BSI	balance sheet item	IG	investment-grade
CBD	consolidated banking data	IMF	International Monetary Fund
CCP	central counterparty	IRD	interest rate derivative
CDO	collateralised debt obligation	IRS	interest rate swap
CDS	credit default swap	IOSCO	International Organization of Securities Commissions
CFI	captive financial institution	LTV	loan-to-value
CLO	collateralised loan obligation	LVNAV	low-volatility net asset value
CMBS	commercial mortgage-backed security	M&A	mergers and acquisitions
CMO	collateralised mortgage obligation	MIFID	Markets in Financial Instruments Directive
CNAV	constant net asset value	MFI	monetary financial institution
CPMI	Committee on Payments and Market Infrastructures	MMF	money market fund
CRD	Capital Requirements Directive	NAV	net asset value
CRE	commercial real estate	NCA	national competent authority
CRR	Capital Requirements Regulation	NCB	national central bank
DLT	distributed ledger technology	NFC	non-financial corporation
DTI	debt-to-income	OECD	Organisation for Economic Co-operation and Development
EA	euro area	OFI	other financial institution
EBA	European Banking Authority	OTC	over-the-counter
ECB	European Central Bank	PE	private equity
EDW	European Data Warehouse	PEPP	pandemic emergency purchase programme
EEA	European Economic Area	REIF	real estate investment fund
EFIF	European Forum for Innovation Facilitators	REIT	real estate investment trust
EIOPA	European Insurance and Occupational Pensions Authority	repo	repurchase agreement
EMIR	European Market Infrastructure Regulation	RMBS	residential mortgage-backed security
ESA	European Supervisory Authority, European System of Accounts	SDD	security and derivative dealer
ESCB	European System of Central Banks	SFI	special financial institution



ESMA	European Securities and Markets Authority	SFTR	Securities Financing Transactions Regulation
ESRB	European Systemic Risk Board	SHS	Securities Holdings Statistics
ETD	exchange-traded derivative	SPE	special-purpose entity
ETF	exchange-traded fund	SPV	special-purpose vehicle
ETP	exchange-traded product	STS	simple, transparent and standardised
EU	European Union	UCITS	undertakings for collective investment in transferable securities
EUR	euro	UK	United Kingdom
FCL	financial corporation engaged in lending	US	United States
FSB	Financial Stability Board	USD	US dollar
FATF	Financial Action Task Force	VNAV	variable net asset value
FVC	financial vehicle corporation	WAL	weighted average life
FX	foreign exchange	WAM	weighted average maturity



Imprint and acknowledgements

The EU Non-bank Financial Intermediation Risk Monitor No 6 (2021) was approved by the ESRB General Board on 9 July 2021. It was prepared by the ESRB Expert Group on Non-bank Financial Intermediation (NBEG) co-chaired by Steffen Kern and Richard Portes (Advisory Scientific Committee) under the auspices of the ESRB Advisory Technical Committee and the ESRB Advisory Scientific Committee. Substantial contributions were provided by:

Anna Maria Agresti
ECB

Antoine Bouveret
ESMA and Chair of the Risk Metrics Taskforce

Manuel Cruz
Previously ESRB Secretariat

Max Gehrend
Banque centrale du Luxembourg

Camille Graciani
ESRB Secretariat and Secretary to the NBEG

Jakub Gruszczynski
ESRB Secretariat

Jean-Baptiste Haquin
ESMA

Alexander Harris
ESMA

Anton Jevcak
European Commission

Konstantinos Kanellopoulos
Bank of Greece

Ellen Ryan
ECB

Eiko Sievert
Previously ESRB Secretariat and Secretary to the NBEG

Christoph Walkner
European Commission

In addition, useful input and comments were also received from members of the ESRB Expert Group on Non-bank Financial Intermediation.

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Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.esrb.europa.eu

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The cut-off date for the data included in this report was 31 December 2020.

For specific terminology please refer to the [ESRB glossary](#) (available in English only).

PDF ISBN 978-92-9472-229-4, ISSN 2600-2434, doi:10.2849/85397, DT-AK-21-001-EN-N