EUROPEAN CENTRAL BANK

EUROSYSTEM

Financial Integration and Structure in the Euro Area

March 2020

become important drivers in the financial services area. For all these reasons, the ECB monitors and assesses financial integration, structure and development and expresses its views on relevant policy options.

In general, each issue of the report will contain a first chapter reviewing the main trends in financial integration, structure and development, and a set of special feature articles and boxes, which will provide deeper analyses of specific issues or policies. This first issue of the new report includes special features and boxes on:

- the implications of Brexit for the EU/euro area financial system;
- the need to take the CMU project further;
- the implications of a common sovereign safe asset for the functioning of the banking and capital markets unions;
- euro area cross-border bank mergers and acquisitions in an international context;
- the role of equity markets in “greening” the economy; and
- the euro area fintech scene and how to improve the related statistics.

The ECB has since September 2005 released biannual updates of a set of indicators of financial integration. Similarly, since November 2004 it has also published a selection of EU structural financial indicators in the “Report on financial structures” (previously the “Report on EU banking structure”). Going forward, the ECB will continue these practices with a biannual release of a streamlined set of indicators covering both financial integration and financial structure.

Key messages

1 Overall assessment of financial structure and integration

The size of the euro area financial system has been broadly stable in the last few years at a level around six to seven times GDP, roughly in line with the relative sizes of financial systems in other major countries. The overall size of a financial system can be estimated, among other ways, from the assets of financial intermediaries or from the liabilities of all economic sectors. In June 2019 the total stock of assets held by euro area financial intermediaries amounted to €82 trillion (including assets held by the Eurosystem). This is more than seven times euro area GDP (see Chart 1.1, left panel). This figure has changed little since 2015. At the end of 2018 total financing of euro area sectors stood at €67 trillion, which is almost six times euro area GDP and has changed little since about 2014. Such proxies of total financial system size also constitute one way of assessing the development of a financial system in an economy. They are indicative of the capacity that a financial system has to channel funds of agents with surpluses to agents in need of financing for consumption or productive investment purposes. At the same time, the financial crisis that started in 2007 illustrated that too large a financial system could indicate widespread imbalances and therefore pose a serious threat to financial stability and, ultimately, economic welfare. Moreover, there are other dimensions of financial development that may not be reflected well in total assets or liabilities, such as financial innovations, as well as institutional and organisational improvements in the financial system.

In terms of the roles of different financial intermediaries, the euro area financial structure shows a medium-term movement from strong bank dominance towards a more balanced composition, in which different types of non-bank financial intermediaries are becoming increasingly important. Another dimension that characterises a financial system is its structure, which refers to the mixture of financial intermediaries and financial markets that operate in the economy. For example, the right panel of Chart 1.1 shows that – by assets – the largest financial sub-sector remains banks (credit institutions), although their share has consistently declined since the early 2000s. At the same time, the importance of non-money market investment funds, of a residual category of “remaining” other financial institutions[6] (comprising a wide set of different intermediaries and other entities, including security and derivatives dealers or brokers, insurance brokers, asset management companies, venture capital companies, investment advisers, financial holding companies, specialised lending companies, funding vehicles of non-financial corporations – e.g. supporting their debt securities issuance – and other entities that channel financial flows within non-financial corporations), and of the Eurosystem increased. In other words, in terms of the asset shares of different types of financial

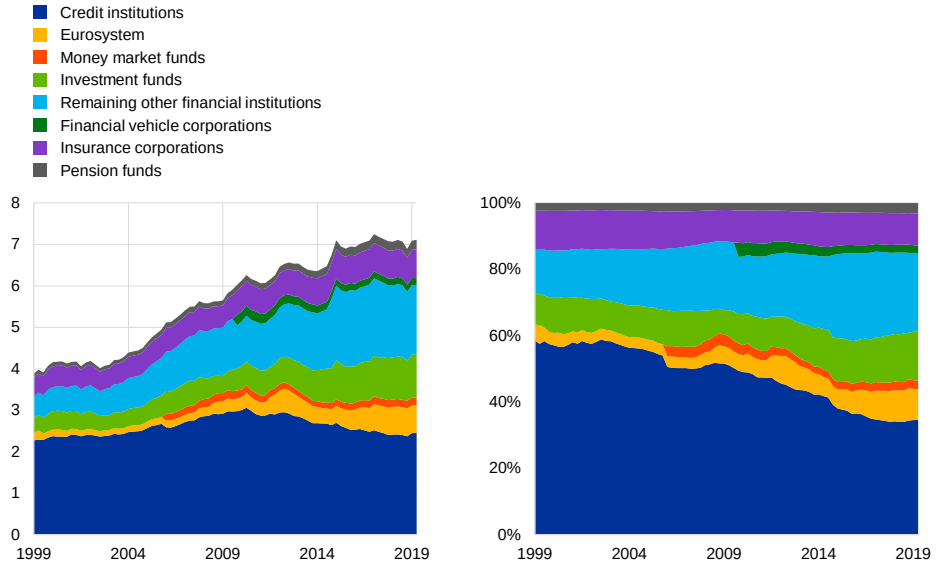
[6] In Chart 1.1 the total set of other financial institutions (OFIs) is the sum of financial vehicle corporations (dark green area), which deal with securitisations, and of remaining other financial institutions (light blue area).

intermediaries, bank dominance in the euro area financial system has weakened, notably after the financial and sovereign debt crises.

Chart 1.1

Total assets of the euro area financial sector and shares of different types of financial intermediaries

(ratio of assets to nominal GDP (left panel); percentages (right panel); March 1999 -June 2019)



Source: ECB.
Notes: The aggregated (non-consolidated) assets of sub-sectors include financial assets and exclude non-financial assets. Remaining other financial institutions include security and derivative dealers, financial corporations engaged in lending (such as leasing or factoring companies), specialised financial corporations (including venture capital companies, export/import financing companies or some central clearing counterparties), financial auxiliaries (including for example asset management companies, securities brokers, investment advisers, insurance brokers or exchanges) as well as captive financial institutions and money lenders (including for example financial holding companies, funding vehicles of non-financial corporations – e.g. supporting their debt securities issuance – and other entities that channel financial flows within non-financial corporations). Data on money market funds are reported separately from credit institutions only as of Q1 2006. Data on financial vehicle corporations, which are undertakings carrying out securitisation transactions, are reported separately from remaining other financial institutions as of Q4 2009.

Investment and pension funds have been the fastest-growing types of non-bank financial intermediaries in the euro area over the last few years.

Non-bank financial intermediaries (all areas in Chart 1.1, except the dark blue one for credit institutions and the yellow one for the Eurosystem), which accounted in June 2019 for almost 60% of total euro area financial sector assets, deserve particular attention. This is not only because their growth may represent financial development and a more diversified financial system, but also because it may reflect – in part – the migration of risks from the banking sector, which was re-regulated significantly after the crisis, to less regulated financial sub-sectors. A first observation in this regard is that the remaining other financial institutions (OFIs), which cannot be broken down with the currently available statistics and therefore remains relatively opaque, constitutes a substantial share of non-bank financial intermediaries by assets. A second observation is that investment funds and pension funds have been the fastest-growing categories in recent years and investment funds had already earlier become the second largest non-bank financial intermediary group in the euro area behind the residual remaining OFIs. The third and fourth largest types of non-bank intermediaries are insurance corporations and pension funds, respectively.

While non-bank financial intermediary growth has a number of benefits reflecting financial development, it also calls for prudential policy attention to how to contain transforming and potential newly emerging or even increasing financial stability risks. Investment fund growth is important for a variety of reasons. First, European households still hold a relatively large share of their savings in bank deposits, but in the current low interest rate environment various types of investment funds (based on past experience) offer more attractive returns on well-diversified portfolios. Second, many types of investment funds offer cross-country diversification for equities, bonds or other (less tradable) assets, which makes them natural conduits for private financial risk sharing in the euro area. The recent adoption of an EU directive and regulation to promote the cross-border distribution of investment funds may be helpful in this regard.[7] Third, the growing financial flows into investment funds, combined with increasing liquidity mismatches on their balance sheets (see, for example, sub-section 4.2 of the November 2019 ECB Financial Stability Review), may lead to greater financial stability risks and therefore require prudential policy attention. The recommendations published by the Financial Stability Board in 2017 and the European Systemic Risk Board in 2018 aim to address structural vulnerabilities of asset managers arising, in particular, from liquidity mismatches.[8] Progress in implementing these recommendations in Europe can be achieved in the context of a review of EU legislation, such as the ongoing review of the Alternative Investment Fund Managers Directive, for which a public consultation is expected in the second half of 2020.

In terms of the roles of different financial markets, the euro area financial structure is characterised by a continuing dominance of non-marketable financing instruments, such as loans and unlisted shares. The second way of describing financial structure through the mixture of markets is via the relative importance of different financing instruments employed by the main economic sectors. Chart 1.2 details the relative shares of the main (on-balance-sheet) financial instruments in the aggregate financing of all economic sectors (households, firms and government, but excluding the external sector) for the euro area, the United States (US) and Japan. The three panels reveal some tangible differences, in line with the widespread view that Europe and Japan have more bank-based financial systems and the United States has a more capital market-based system. The euro area economy has particularly large shares of financing through loans and unlisted shares and the Japanese economy through loans and government debt securities. The US economy has a larger part of financing through listed shares and non-financial corporation (NFC) debt securities than the euro area or Japan (although the shares of loans and other equity are not small).

Only some marketable instruments, notably NFC debt securities, show a small medium-term upward trend in the euro area, while the amount of public equity

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7 Regulation (EU) 2019/1156 of the European Parliament and of the Council of 20 June 2019 on facilitating cross-border distribution of collective investment undertakings and amending Regulations (EU) No 345/2013, (EU) No 346/2013 and (EU) No 1286/2014 and Directive (EU) 2019/1160 of the European Parliament and of the Council of 20 June 2019 amending Directives 2009/65/EC and 2011/61/EU with regard to cross-border distribution of collective investment undertakings.

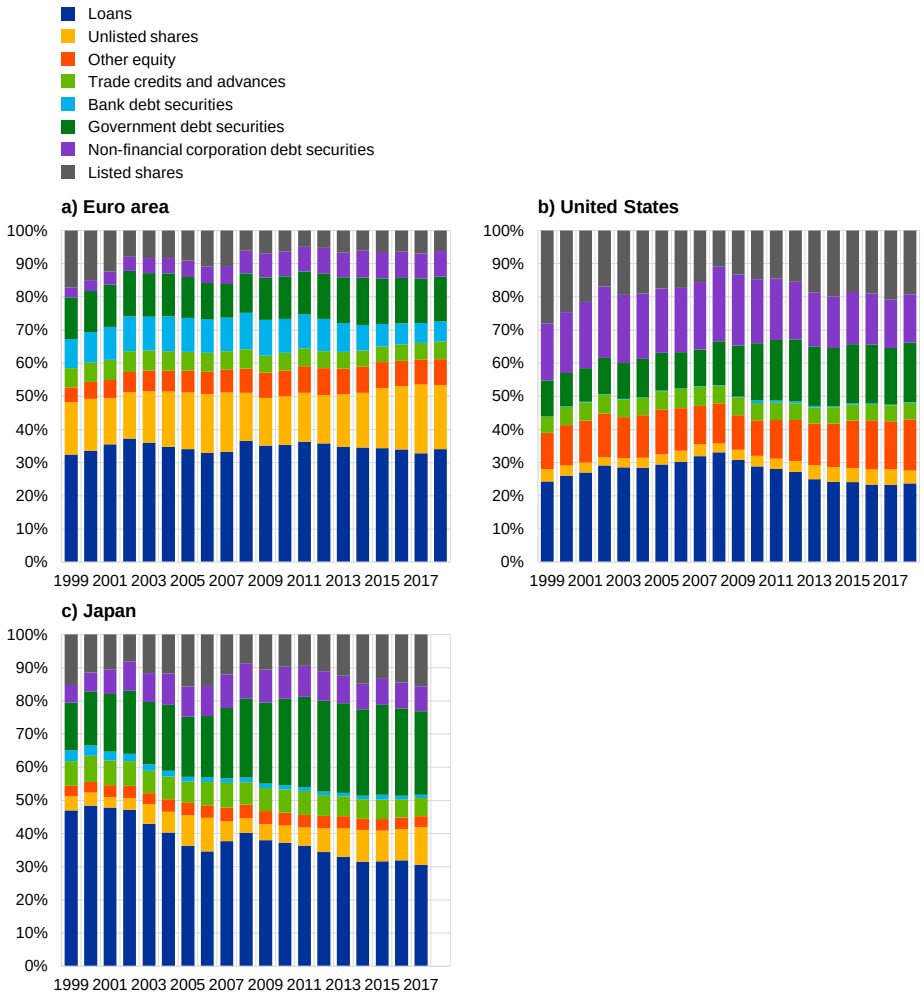
8 Financial Stability Board (2017), "Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities", January, and European Systemic Risk Board (2018), "Recommendation on leverage and liquidity in investment funds", 14 February.

remains relatively small. While the share of all equity instruments in total financing in the euro area is comparable to that in other countries, the proportions of different equity instruments are not. Financing through equity traded on public markets (listed shares) is relatively small, while financing through private equity (unlisted shares) is relatively large. In line with its bank-based system, the share of bank bonds – effectively financing loans (and leading to some double-counting in Chart 1.2) – is relatively large for the euro area compared with the US or Japan. At the same time, bank bond financing has somewhat declined after the financial crisis and direct corporate bond financing has increased, meaning that the latter has become larger than the former in the euro area. However, the slowly moving aggregate stocks displayed in Chart 1.2 do not suggest a generalised trend towards greater market-based financing, as financing through unlisted shares has broadly increased in tandem. They also mask significant cross-country heterogeneity in the relative importance of market-based instruments. If anything, Chart 2 in the first chapter of this report shows a mild decline for all sectors together over the last two decades. This may, however, have bottomed out recently, as the market-based financing of NFCs recovered after the crisis (probably because NFCs needed to compensate for bank deleveraging).

Chart 1.2

Financing structures of the euro area, US and Japanese economies by type of instrument

(percentages; annual data: 1999 -2018)



Sources: ECB for euro area and OECD for United States and Japan.
Notes: The chart is constructed from the liabilities of all economic sectors, excluding liabilities to the rest of the world, loans from NFCs (to net out intra-company loans in this non-consolidated data), currency and deposits, investment fund shares or units, entitlements from pension, insurance and standardised guarantee schemes, financial derivatives and employee stock options as well as other accounts payable. Other equity refers to equity claims that are not securities listed on an exchange and not unlisted securities, such as equity in incorporated partnerships, equity in limited liability companies whose owners are partners, capital invested in cooperative societies or investment by the government in the capital of public corporations whose capital is not divided into shares. Data for the United States and Japan are based on the global System of National Accounts (SNA) 2008. The European System of Accounts (ESA) 2010 underlying the euro area data is broadly consistent with the SNA 2008, although in some cases it may be more detailed.

The post-crisis bank restructuring process in the euro area is continuing at a gradual pace, but the limited domestic and cross-border consolidation seems to also be a global phenomenon. Since the financial crisis, the euro area banking sector has been going through a gradual restructuring process, which involves the search for new business models, the adjustment to the revised regulatory regime, consolidation and the resolution of non-performing assets. The number of euro area banks continues to decline slowly, as consolidation has remained rather muted since the crisis, whereas the number of foreign branches has been broadly stable. Interestingly, Box 3 in the first chapter finds that subdued post-crisis consolidation dynamics are not specific to the euro area or the EU. Similarly, low domestic and

cross-border bank merger and acquisition (M&A) activity since 2010 has also been observed in the other main free-trade areas around the globe, including the United States-Mexico-Canada Agreement (USMCA, the successor to the North American Free Trade Agreement or NAFTA) area and the Association of Southeast Asian Nations (ASEAN) area.

One specific obstacle to bank consolidation in the euro area could be persistently low valuations and their underlying causes, in addition to other economic, business and regulatory factors. The single currency and the banking union could have been expected to result in a greater cross-border component of the bank consolidation process than in other regions of the world. But this is not the case. In addition to a series of economic, business and regulatory factors (including the still incomplete banking union) discussed in the 2018 ECB report on "Financial integration in Europe", the box in this report points to declining valuations of euro area banks in the last few years as another important factor that may explain the lack of consolidation. The factors that might be behind the declining valuations include low profitability, problematic business models, high costs, unresolved non-performing exposures, and/or market misperceptions or mispricing. Such declining valuations have not been observed in the USMCA region or the rest of the world and seem to be specific to the euro area.

Following the dynamic creation of fintech entities over the last decade, the euro area now hosts about a fifth of all such entities worldwide – quite a number of which are located in smaller, "tech-savvy" euro area countries. One of the most dynamic developments in the financial structure of major economies has been the growth of fintech companies – companies that use technological innovation, in particular information technology, to support or provide financial services. Given the absence of a specific statistical reporting framework for fintechs so far, information about them is relatively limited and unsystematic. Based on a new but still experimental dataset collected by the ECB, the report indicates that – following a sharp acceleration in the creation of fintechs in the euro area since the middle of the first decade of the millennium – the 2,800 fintech entities domiciled in the euro area in 2018 constituted more than a fifth of all fintech entities worldwide. While large euro area countries host most fintech entities, there are some small and "tech-savvy" countries with significant fintech representation relative to their population (e.g. Estonia, Finland, Ireland, Lithuania and Luxembourg).

Understanding the economic benefits and potential risks of fintechs would be facilitated by integrating them as a separate class into the international and European statistical classification systems for economic activities. Following the typology of the European Banking Authority, the experimental dataset reveals that most entities are involved in payment, clearing and settlement services or in credit, deposit-taking and capital-raising services. But there are also significant numbers of entities involved in investment services and management or in credit scoring, compliance services and other (not further classified) financial technology. In terms of ownership structure, the largest shareholder group tends to be from the financial and insurance sector and the second largest group from the information and communication sector. In terms of the location of shareholders, most of the fintech

entities are domestically owned. In order to provide a sound basis for monitoring fintech developments, for assessing their benefits and risks and for analysing their implications for the main central bank functions, it is important that they are properly integrated into the international and European statistical classification systems for economic activities. Monitoring and assessment would be facilitated if fintech activities were to become a separate class.

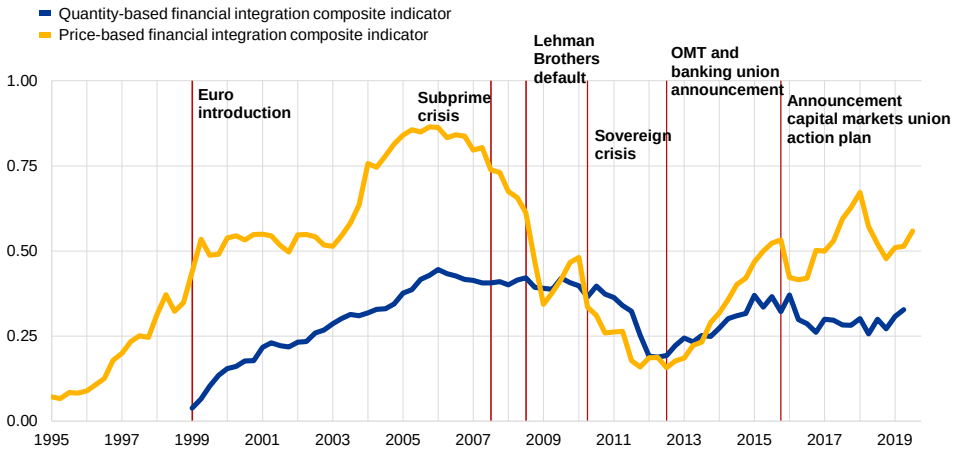
Following the strong post-crisis reintegration trend in the euro area until 2015, mixed developments in overall financial integration since then have been characterised by substantial volatility in price convergence and the stalling of growth in cross-border investment. The more advanced financial integration across euro area countries is, the more one can talk about a single market for financial services and the more adequate it is to look at financial structure and development in the euro area as a whole. The two composite indicators of financial integration displayed in Chart 1.3, which are designed to approximate the overall picture of euro area financial integration by combining information from the most important financial markets, still suggest discrepancies between integration as reflected in cross-border price differentials (the price-based indicator in yellow) and integration as reflected in cross-border investment (the quantity-based indicator in blue). Following the financial and sovereign debt crises both strongly recovered until 2015. Thereafter, however, the price-based indicator showed sizeable fluctuations, with the latest reading being only slightly above the 2015 peak. This volatility resulted in particular from changing cross-border bond yield differentials, related to emerging and dissipating political uncertainties in various euro area countries among other factors. Despite the generally supportive effects on financial integration from the ECB's expansionary monetary policy, the quantity-based composite indicator was held down since 2015 particularly by modest cross-border interbank lending, as the injection of excess reserves implied by unconventional monetary policy measures – as expected – reduced counterparties' need for cash. The slight pick-up of the quantity-based indicator for the latest observation, bringing it to similar levels as seen in 2004 and 2015, was driven by recoveries in cross-border interbank lending and bond holdings. A related indicator on cross-border finance in the euro area published by the Association for Financial Markets in Europe, which is based on a broader set of market segments and thereby less influenced by a single component, shows, however, a more continuous post-crisis recovery also in terms of quantities.[9]

[9] Association for Financial Markets in Europe (2019), "Capital Markets Union: Key Performance Indicators", October, chart 7.3.

Chart 1.3

Price-based and quantity-based composite indicators of financial integration

(quarterly data; price-based indicator: Q1 1995 – Q3 2019; quantity-based indicator: Q1 1999 – Q2 2019)



Source: ECB and ECB calculations.
Notes: The price-based composite indicator aggregates ten indicators for money, bond, equity and retail banking markets, while the quantity-based composite indicator aggregates five indicators for the same market segments except retail banking. The indicators are bounded between zero (full fragmentation) and one (full integration). Increases in the indicators signal greater financial integration. From January 2018 onwards the behaviour of the price-based indicator may have changed due to the transition from EONIA to €STR interest rates in the money market component. OMT stands for Outright Monetary Transactions. For a detailed description of the indicators and their input data, see the Statistical Web Annex to this report and Hoffmann, P., Kremer, M. and Zaharia, S. (2019), "Financial integration in Europe through the lens of composite indicators", *Working Paper Series*, No 2319, ECB, September.

Favourable financial integration developments have been observed in the last few years, particularly, in large-value payment relationships, specific collateral repo market rates and, very gradually, bank retail lending volumes, but have mostly not been seen in equity markets. This report also identifies some specific integration developments in different financial markets. New research applying network methodologies to TARGET2 data indicates that the number of payment relationships that banks in Europe maintain with other TARGET2 banks of the same national community has steadily decreased in the course of the last decade, while new payment relationships with TARGET2 banks of other national communities have increased. This suggests increasing cross-border integration in the large-value payments area. In the secured euro money market, the specialness of repo rates for specific types of government bond collateral has diminished over the last two years, as indicated by the narrowing of their yield spreads below the ECB's deposit facility rate for countries like France, Germany, Italy, the Netherlands and Spain. At the same time, euro area cross-border bank retail lending increased, albeit rather gradually and from a relatively low level (see the blue line in panel (d) of Chart 1.4). Euro area equity returns and holdings across countries (see the blue line in panel (a) of Chart 1.4) no longer point to further increases in stock market integration and, by some measures, suggest incipient signs of re-fragmentation. This is in line with the slowing and less uniform economic recovery, as well as political uncertainties in some euro area countries.

When considering measures of home bias in euro area equity and bond fund holdings that do not distinguish between investor and fund domiciles, it is necessary to be careful not to underestimate quantity-based financial integration. Special Feature C directly links fund investors' countries of origin with the

origins of their fund-specific equity and bond holdings. The corresponding home bias measure is considerably lower than measures taking the fund's domicile as the investment origin. This finding can be explained by the sizeable share of fund investments that euro area investors hold in financial centres (e.g. Ireland or Luxembourg). The funds in these centres tend to have more diversified portfolios than funds domiciled outside financial centres. Therefore, when considering home bias measures that do not fully account for investor origin, one has to be careful not to underestimate quantity-based integration.

The significant post-crisis improvements in the resilience of euro area financial integration may have levelled out and it should be monitored that increasing cross-border short-term debt investments and decreasing cross-border foreign direct investment (FDI), if they continue, do not lead over time to pockets of vulnerability to shocks. Chart 1.4 shows the four indicators that the ECB monitors to assess the resilience of euro area financial integration (i.e. that the improvements in financial integration since the financial and sovereign debt crises do not unravel should severe shocks strike). For example, one type of vulnerability could emerge from over-proportionate shares of "runnable" instruments, such as interbank loans or short-term debt securities. First, panel (a) of Chart 1.4 may suggest that the ratio of cross-border equity investments to cross-border bond investments in the euro area peaked in 2017 and 2018. Second, panel (b) shows that FDI within the euro area as a share of cross-border direct investment and portfolio equity investment hovered around similar levels since 2011 and started to decline towards the end of 2018.[10] Third, panel (c) shows that since 2014 cross-border short-term debt investments have grown at a faster rate than cross-border long-term debt investments in the euro area. Fourth, panel (d) shows that during 2019 the rather gradual increase in cross-border retail bank lending in the euro area was more than offset by the recovery in cross-border interbank lending. While the reversals still tend to be rather small and, perhaps with the exception of short-term debt, not particularly protracted as yet, it seems advisable to continue monitoring developments in these resilience indicators.

[10] However, part of this movement may have been caused by US multinationals repatriating foreign earnings, a phenomenon that took place at around the same time and could also have affected measures of intra-euro area FDI flows.

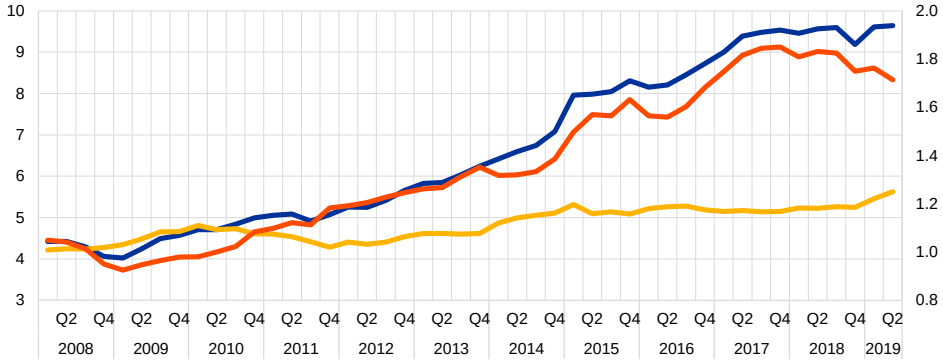
Chart 1.4

Indicators of the resilience of financial integration in the euro area

(left-hand scale: EUR trillions; right-hand scale: ratio)

- Intra-euro area cross-border equity holdings
- Intra-euro area cross-border debt securities holdings
- Ratio of equity holdings to debt securities holdings (right-hand scale)

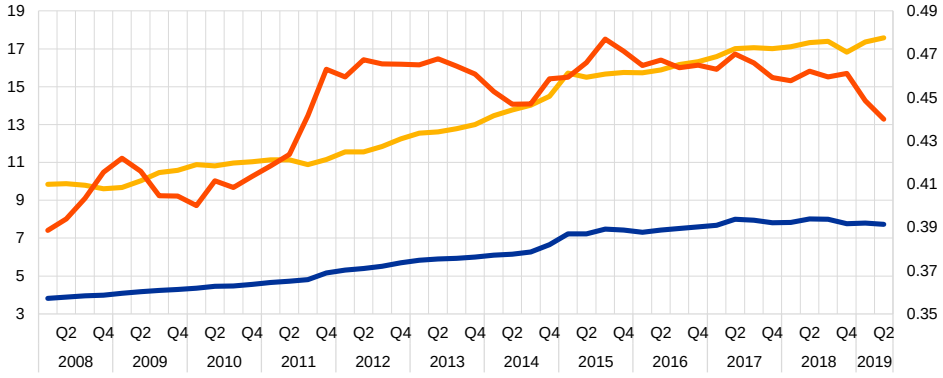
a) Intra-euro area cross-border equity investments relative to intra-euro area cross-border debt investments



(left-hand scale: EUR trillions; right-hand scale: ratio)

- Intra-euro area foreign direct investment
- Intra-euro area foreign direct investment and cross-border portfolio investment
- Ratio of foreign direct investment to foreign direct investment and portfolio investment (right-hand scale)

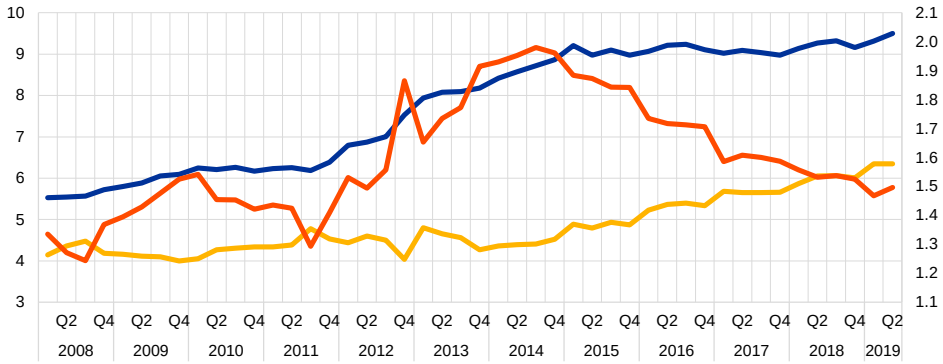
b) Intra-euro area foreign direct investment



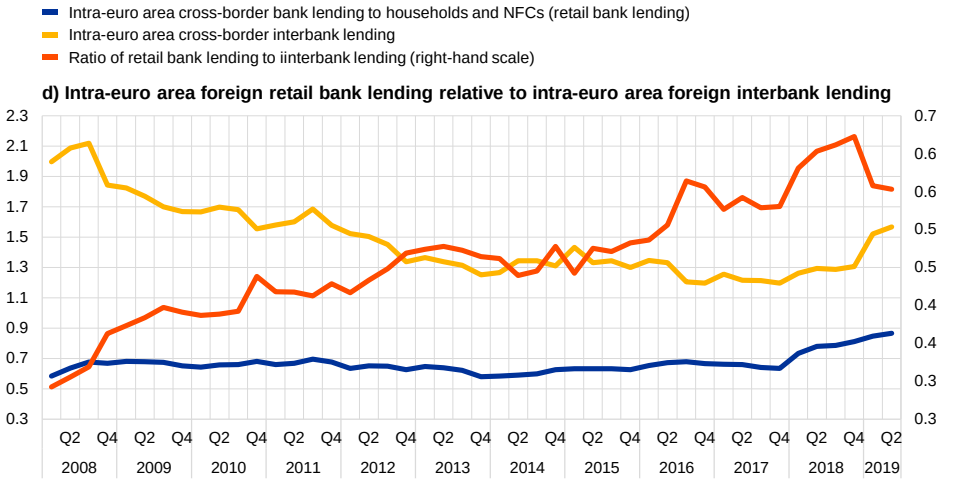
(left-hand scale: EUR trillions; right-hand scale: ratio)

- Intra-euro area cross-border long-term debt securities holdings
- Intra-euro area cross-border short-term debt securities holdings
- Ratio of long-term to short-term debt securities holdings (right-hand scale)

c) Intra-euro area cross-border long-term debt investments relative to intra-euro area cross-border short-term debt investments



(left-hand scale: EUR trillions; right-hand scale: ratio)



Sources: (a) ECB and ECB calculations; (b) ECB; (c) ECB, ECB calculation based on balance of payments data and Eurostat; (d) ECB.
Notes: (a) The blue line shows the total amount of equity holdings by euro area investors (all sectors) issued by residents of other euro area countries. The yellow line shows the total amount of debt securities holdings by euro area investors (all sectors) issued by residents of other euro area countries. The orange line shows the ratio of the two. For both equity and debt investments, the total refers to the sum of intra-euro area cross-border and domestic asset holdings. (b) The blue line shows the total amount of intra-euro area foreign direct investment. The yellow line shows the sum of intra-euro area foreign direct investment and intra-euro area cross-border portfolio investment. The orange line shows the ratio of the two. (c) The blue line shows the total amount of long-term debt (with a maturity of more than one year) issued by euro area countries and held by residents of other euro area countries. The yellow line shows the total amount of short-term debt (with a maturity of less than one year) issued by euro area countries and held by residents of other euro area countries. The orange line shows the ratio of the two. (d) The blue line shows the total amount of intra-euro area cross-border bank lending to households and NFCs, i.e. retail bank lending. The yellow line shows the total amount of intra-euro area cross-border lending between MFIs, i.e. interbank lending. The orange line shows the ratio of the two. For more discussion on the interpretation of these indicators, see Special Feature A "Financial integration and risk sharing in a monetary union" in the 2016 ECB report on "Financial integration in Europe".

2 Selected policy issues for financial structure and integration

A number of the features of and developments in euro area financial structure, development and integration mentioned above underline the importance of completing the European banking union and making further progress with the European capital markets union. Concerning CMU, the share of marketable financing instruments has not increased since the introduction of the euro. In particular, compared with other countries, there is scope to raise the share of public equity in total corporate financing. Furthermore, the euro area private equity markets should become a more dynamic source of risk capital, which would give rise to better growth opportunities for young and innovative companies. At the same time, the relatively strong growth of non-bank financial intermediaries suggests the need to contain transformed or new financial stability risks that may emerge and ensure a level playing field with banks. In order to maintain the resilience to shocks of the capital market integration achieved so far, it seems desirable that the slight declines in cross-border equity holdings and in FDI (to the extent that the latter was not a temporary effect of US multinationals repatriating foreign earnings) do not continue and that cross-border long-term debt investments resume to grow faster than short-term debt investments. Overall, the level of financial integration reached in the euro area is not satisfactory. For the effective functioning of the banking union, it would be good if the only very gradual increases of cross-border bank retail lending in the euro area continued and strengthened, enhancing the resilience of banking integration and increasing private credit risk sharing among euro area countries. These effects

are much more likely to materialise with further cross

- *the ratio of financial sector assets to GDP has been contracting at the euro area level since 2015, masking heterogeneity in national developments.*

When looking at overall financial integration, both dimensions – i.e. price convergence across the euro area and quantity-based integration via cross-border activities – were hit by the global financial crisis and the subsequent "double dip" in the economy. They have recovered some ground since, thanks to non-standard monetary policy measures (NSMs), reforms of Economic and Monetary Union (EMU), and macroeconomic adjustment programmes. Yet this process has stalled in since 2015, while the two dimensions exhibit some discrepancies. On balance, progress in financial integration within the euro area – based on combining a broad range of price-based and quantity-based indicators – has not been very satisfactory in recent years.

Concerning risk sharing, which should reflect both financial integration and resilience, it has risen slightly in recent years, but is modest overall across the various channels in the euro area. Not all risk-sharing channels are operating at their capacity, and some are not even contributing at all due to a reversal of cross-border banking flows. Thus, there may be potential for improved risk sharing through better integrated capital markets.

Concerning integration across market segments, a mixed picture emerges. The unsecured and secured segments of the money markets have not responded in quite the same way to an environment characterised by excess liquidity. The integration of retail banking markets is characterised by contrasting developments. Bank retail lending volumes grew across all countries and the share of cross-border intra-euro area loans rose somewhat over the review period. The dispersion of MFI interest on new loans to households is more nuanced. Euro area equity market returns across countries no longer point to a further increase in stock market integration. Meanwhile, cross-border holdings point to a slight increase in fragmentation – also due to political uncertainties in some euro area countries.

This section proceeds by first analysing the euro area financing requirements by size and type of financing instrument (Section 1.1) to understand the demand that the euro area financial sector is expected to meet. Subsequently the section illustrates in more detail how those financing requirements developed over time for the household, NFC and general government sectors (Section 1.2). This analysis provides insights into the evolving liabilities in euro area financial markets. The composition of markets in debt and equity instruments where those seeking and providing financing meet and trade is then presented (Section 2). These markets provide the link to the different types of financial intermediary that channel savings to sectors with borrowing needs. Section 3 reviews structural developments in key sub-groups of these three types of financial intermediaries. The section then turns to the analysis of the recent developments in financial integration (Section 4) by first looking at the price, quantity and quality of integration at the aggregate euro area level (Section 4.1) before looking in more detail at developments in credit markets (Section 4.2) and securities markets (Section 4.3).

1 Liabilities of euro area economic agents

This section characterises the type of instruments used to meet euro area resident economic agents' financing needs and compares them to their equivalents in the United States and Japan. Economic agents incur different types of liabilities depending on the institutional sector[13] they belong to. The aggregate liabilities determine the demand that the euro area financial system should cater for and that is analysed in Section 2.

At the end of 2018, the euro area economy required total financing amounting to EUR 66.6 trillion or 5.8 times nominal GDP (Chart 1 – Section a). Such aggregate financing represented 66% of total[14] (unconsolidated) euro area domestic financial liabilities.[15] Euro area economic agents sourced this financing in the form of debt instruments – loans and trade credits as well as debt securities – and equity instruments – including listed and unlisted shares as well as other types of equity.[16]

The financing of the euro area economy has increased by EUR 1.1 trillion from 2016 to 2018[17]

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13 The five mutually exclusive domestic institutional sectors that make up the total domestic economy are: (i) non-financial corporations (NFCs); (ii) financial corporations; (iii) general government; (iv) households; and (v) non-profit institutions serving households.

14 Total liabilities and loans are adjusted for loans by NFCs as these are interpreted as intra-company loans. A representation of "pure" external financing requirements would build on consolidated economic sector balance sheets as well as net out financing requirements intermediated through banks and securitisation activities.

15 Financial accounts in national accounts are unconsolidated. The analysis in this chapter excludes financial liabilities by the rest of the world economic sector. In addition to the positions considered in this analysis – i.e. loans and trade credits, debt securities and equity – total financial liabilities include monetary gold and special drawing rights (SDRs), currency and deposits, investment fund shares/units insurance, pension and standardised guarantee schemes, financial derivatives and employee stock options, and other accounts payable.

16 The European system of accounts – ESA 2010 defines the instruments included in Chart 1 as follows:

- Equity is a financial asset that is a claim on the residual value of a corporation, after all other claims have been met.
- Listed shares are equity securities listed on an exchange. Such an exchange may be a recognised stock exchange or any other form of secondary market. Listed shares are also referred to as quoted shares. The existence of quoted prices of shares listed on an exchange means that current market prices are usually readily available.
- Unlisted shares are equity securities not listed on an exchange.
- Other equity comprises all forms of equity other than those classified in the sub-categories listed shares and unlisted shares. In particular, it includes all forms of equity in corporations which are not shares, including the following:

  (1) the equity in incorporated partnerships subscribed by unlimited partners;

  (2) the equity in limited liability companies whose owners are partners and not shareholders;

  (3) the capital invested in ordinary or limited partnerships recognised as independent legal entities;

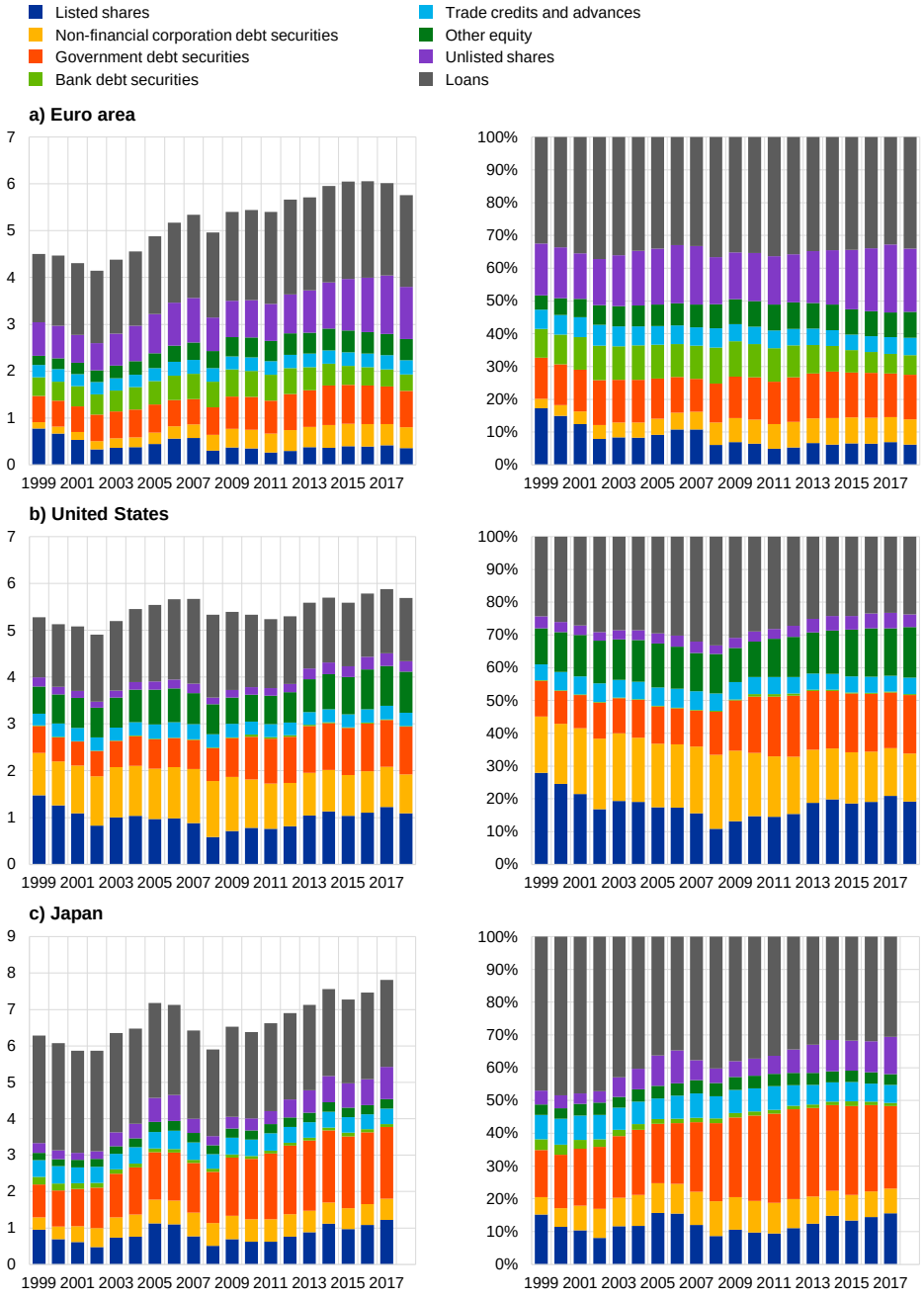
  (4) the capital invested in cooperative societies recognised as independent legal entities.

17 As shown in Chart 10 and discussed in Section 2, by mid-2019 the increase amounted to EUR 3.7 trillion, as the negative valuation effects observed in 2018 reversed in early 2019, in particular for listed shares. The trend was not uniform in 2019Q1 and 2019Q2. Non-bank financial intermediaries mainly hold listed shares issued by NFCs. For investment funds, the increase in assets in 2019H1 reflected both increased inflows and valuation gains from falling yields. As for other financial intermediaries and financial vehicle corporations (FVCs), the valuation losses depicted in 2019Q2 were lower than the valuation gains in 2019Q1. As a result, assets in this category increased in 2019H1.

Chart 1

Financing of the euro area, US and Japanese economies

(ratio to nominal GDP (left-panels); percentages (right-panels); annual data: 1999-2018)



Sources: ECB for euro area and OECD for United States and Japan.
Notes: The chart is constructed from the liabilities of all economic sectors, excluding liabilities to the rest of the world, loans from NFCs (to net out intra-company loans in this non-consolidated data), currency and deposits, investment fund shares or units, entitlements from pension, insurance and standardised guarantee schemes, financial derivatives and employee stock options as well as other accounts payable. Other equity refers to equity claims that are not securities listed on an exchange and not unlisted securities, such as equity in incorporated partnerships, equity in limited liability companies whose owners are partners, capital invested in cooperative societies or investment by the government in the capital of public corporations whose capital is not divided into shares. Data for the US and Japan are based on the global System of National Accounts (SNA) 2008. The ESA 2010 underlying the euro area data are broadly consistent with the SNA 2008, although in some cases it may be more detailed.

1.1 By type of financial instrument

The financing of the euro area economy is still predominantly debt-based, despite a steady decline in the share of debt securities instruments. The share of debt financing declined from a peak of 73.6% in 2011 to 68.4% in 2018. Nearly 55% of debt financing consists in loans, 38% in debt securities and 7% in trade credits.

General government has issued the largest stock of debt securities outstanding, representing half of the debt securities in the euro area economy. Credit institution liabilities in the form of debt securities represented 6% of total external financing. This share has nearly halved since its peak in 2008 reflecting an advancing but slow process of euro area banking sector consolidation and concentration (see Section 3.1). It also reflects robust deposit growth and notable financing through the Eurosystem, thus reducing the need for debt securities issuance as well as dependency on interbank lending.

Despite gradually increasing from 27% in 2008 to 32% in 2018, equity financing is still well below the 36% share in external financing it had at the start of EMU. Looking ahead, a more significant role of equity financing of the euro area economy would have beneficial implications including diversifying funding sources, increasing financial resilience (see Section 4), and supporting a faster reduction in the carbon footprint of the economy (see Box 1).

Listed shares – a marketable and hence more easily tradable financial instrument – have seen their role in the mix of equity instruments diminish strongly since 1999 as they are increasingly supplanted by unlisted shares (i.e. equity securities not listed on an exchange). The proportion of listed shares has fallen from 46% to 19% whereas that of unlisted shares has increased from 42% to 58%.

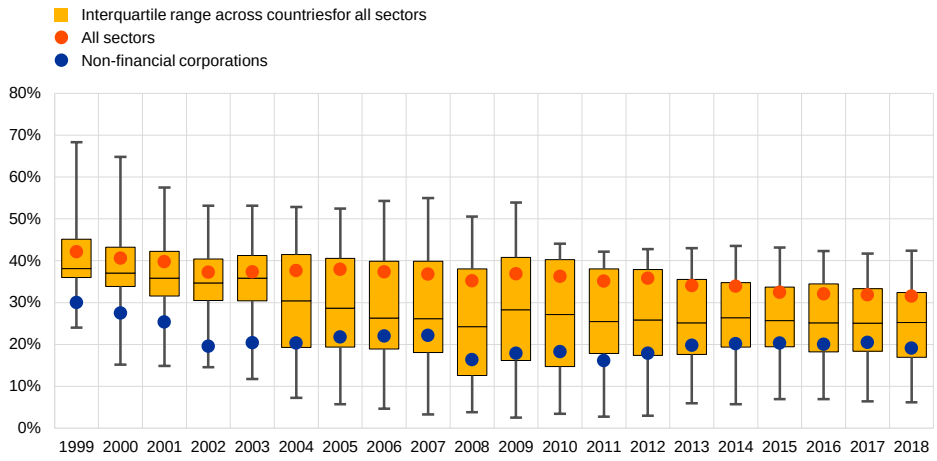
The significant decline in the share of marketable instrument-based financing since the start of EMU has stabilised recently (at 32%). However, this masks significant heterogeneity in developments across Member States (Chart 2). Marketable financial instruments benefit from a broader investor base and – subject to an adequate prudential framework – provide economic agents with a more diverse and resilient funding pool. Therefore, from a financial stability perspective, it is desirable for these instruments to play a larger role in the external financing of euro area Member States. Unfortunately, the share of these instruments remains markedly low, especially the share in the NFC financing mix (19%). Furthermore, we note a downward trend for the overall share of these instruments since 1999, echoing the increasing role of unlisted shares, as indicated in Chart 1. Finally, the downward trend comes with a time-varying distribution across the euro area countries. The current width of the distribution – narrower than during the recent crisis, but broader than at the start of the period – translates into a heterogeneous situation across the various Member States.

The major role of loans in external financing, and the dominance of unlisted shares in equity financing (58%), reflect the high share of small and medium-sized enterprises (SMEs) in the euro area economy.

Chart 2

Marketable proportion of external funding among euro area countries

(ratio; annual data: 1999-2018)



Source: ECB.
Notes: The marketable part of a euro area country's capital market is defined as the total debt securities and listed shares over total loans (adjusted for intra-company loans), trade credits, debt securities and equity (including listed and unlisted shares as well as other equity). For the years 1999-2003, the plot is based on only 12 countries (specifically, it excludes Cyprus, Estonia, Malta, Lithuania, Latvia, Slovakia and Slovenia).

A comparison with the financing structures of the US and Japanese economies highlights the following differences:

- **At a comparable level in terms of ratio to GDP (5.7), the US economy's external financing was more equity-based (39%) and marketable instrument-based (52%) (Chart 1 – Section b).** It relied less on loans (24%) and featured a larger stock of public sector debt securities (18%). Equity financing was based 51% on listed shares, 8% on unlisted shares and notably 41% on other equity financing instruments.[18] [19]

- **While significantly larger in size (7.8 times GDP), Japanese external financing needs featured a stronger debt basis as a consequence of the high public sector indebtedness (Chart 1 – Section c).** Moreover, it relied almost equally on marketable financial instruments in general with a significant share of listed share equity financing (16%).

- The marginal role of debt issuances by US and Japanese credit institutions – commonly operating as subsidiaries of larger bank holding companies or financial groups – masks the fact that parent entities – classified as other

[18] The System of National Accounts 2008 provides the following definitions of unlisted shares and other equity respectively:
- Listed shares are equity securities listed on an exchange. They are also referred to as quoted shares.
- Unlisted shares are equity securities not listed on an exchange. Unlisted shares can also be called private equity; venture capital usually takes this form. Unlisted shares tend to be issued by subsidiaries and smaller scale enterprises and typically have different regulatory requirements.
- Other equity is equity that is not in the form of securities. It can include equity in quasi-corporations (such as branches, trusts, limited liability and other partnerships), unincorporated funds and notional units for ownership of real estate and other natural resources. (…)

[19] Financing in the US economy through other equity instruments is particularly relevant for NFCs (representing 77% of the outstanding other equity instruments) and to a lesser extent for MFIs (12%) and OFIs (9%).

financial intermediaries (OFIs) – issue debt securities to meet financing requirements and subsequently channel the funding received to the credit institutions via intra-company loans.

Box 1

Does financial structure affect the carbon footprint of the economy? [20]

Prepared by Alexander Popov

The recent interest in the ability of green-finance initiatives to fund the decarbonisation of the global economy has laid bare our limited understanding of the link between traditional finance and environmental degradation. Are expanding financial markets detrimental to the environment because they fuel economic growth and the concomitant emission of pollutants, or do they steer economies towards sustainable growth by favouring "green" sectors over "brown" ones? And do credit markets and equity markets have a similar impact on the environment, or does it make economic sense to stimulate one segment of the financial system at the expense of the other in order to contribute to meeting high-level commitments on limiting global warming?[21] These important issues seem to be missing in the current policy discussion about how to de-carbonise advanced economies.[22]

Analysis of data on aggregate carbon emissions and financial structure reveals that the carbon footprint of the economy shrinks faster in economies that receive relatively more of their funding from equity investors than from banks. Chart A illustrates this result: during the quarter-century after 1990, per capita carbon emissions declined more in countries where stock markets were relatively larger in 1990. The statistical relationship between financial structure and carbon emissions is observed while holding the level of economic development, financial development, and environmental regulation constant, and when using policies promoting financial market deregulation and liberalisation as instruments for financial development and improving financial structure. It is also economically meaningful: lifting all countries to a ratio of total stock market capitalisation to the sum of total private credit and total stock market capitalisation of one-half (from a global mean of one-third) would result in an 11.5% reduction in global per capita carbon emissions.[23]

The aggregate effect is explained by two separate mechanisms at the sector level: relatively faster output growth in "green" sectors, and relatively faster declines in emissions per output in carbon-intensive sectors, in countries with deeper equity markets. The former mechanism is similar to one in which financial markets speed up the reallocation of productive resources towards sectors with better growth opportunities.[24] The latter mechanism is related to the ability of financial markets to finance the development and adoption of new technologies which increase within-sector

[20] This Box is based on De Haas, R., and Popov, A. (2019), "Finance and carbon emissions," Working Paper Series, No 2318, ECB, Frankfurt am Main.

[21] See for example the 2015 Paris Climate Conference Agreement, and the European Commission's long-term vision for a climate-neutral economy by 2050, COM (2018) 773.

[22] Krogstrup, S., and Oman, W. (2019), "Macroeconomic and Financial Policies for Climate Change Mitigation: A Review of the Literature", *IMF Working Papers*, No 185, September.

[23] The evidence presented in this chart is supported by parametric analysis. See De Haas and Popov (2019) as referenced in footnote 10 for more details.

[24] Wurgler, J. (2000), "Financial Markets and the Allocation of Capital", Journal of Financial Economics, Vol. 58, pp. 187-214; Fisman, R. and Love, I. (2007), "Financial Dependence and Growth Revisited", Journal of the European Economic Association, Vol. 5, pp. 470-479; Hartmann, P., Heider, F., Papaioannou, E., and Lo Duca, M. (2007), "The Role of Financial Markets and Innovation in Productivity and Growth in Europe", *ECB Occasional Papers*, No 72.

productivity. Unlike most previous research, however, the evidence here suggests that one type of investment (equity) is superior to another (credit) in achieving both goals, i.e. growth in "green" sectors and technological progress in "brown" sectors, at least in the context of the economy's carbon footprint.

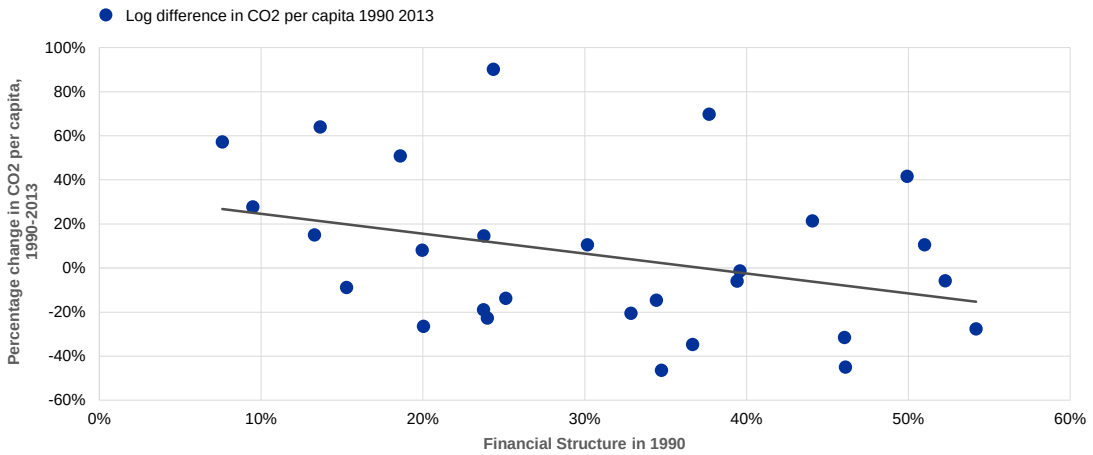
Also strengthening the link between equity markets and green innovation is the fact that deeper stock markets are associated with more green patenting in traditionally carbon-intensive sectors. This is especially the case for patented inventions whose goal is to increase the energy efficiency of the production process. This mechanism is further strengthened when the analysis takes into consideration private equity investments, such as venture capital and angel investments, which are particularly effective in financing early-stage innovation.[25] Importantly, while some of the reduction in domestic carbon emissions is offset by those embedded in the production of imported goods, the "domestic-greening" effect dominates the "carbon-import" effect by a factor of ten.[26]

Firm-level evidence also supports the idea that higher equity investment is associated with faster decarbonisation. In 2006 Belgium introduced a notional interest deduction for corporate equity, in order to reduce the tax advantage of issuing debt. This policy shock provides an arguably exogenous source of variation in the cost of equity financing. Matched data from Orbis and from the European Emissions Trading System suggest that the reform caused Belgian non-financial firms to increase their equity ratio by about 5%, an adjustment similar to that of Belgian banks.[27] Subsequently, these same firms reduced the carbon intensity of their production, also in comparison to similar firms in the same sector in neighbouring countries (such as the Netherlands).

Chart A

Financial structure and carbon emissions

(y-axis: percentage change in country-specific carbon emissions per capita between 1990 and 2013; x-axis: total stock market capitalisation divided by the sum of total private credit and total stock market capitalisation, for each country, in 1990)



25 Kortum, S., and Lerner, J. (2000), "Assessing the Contribution of Venture Capital to Innovation", RAND Journal of Economics, Vol. 31, pp. 674-692. In contrast, the effects of corporate bond financing seem to be more like bank loan financing than like equity financing, when it comes to their overall impact on carbon emissions.

26 This result is related to the work of Levinson, A. (2009), "Technology, International Trade, and Pollution from US Manufacturing." American Economic Review, 99 (5): 2177-92, who shows that the clean-up of US manufacturing since the late 1980s mainly reflects technological progress and only to a limited extent the shifting of polluting industries overseas.

27 See Schepens, G. (2016), "Taxes and Bank Capital Structure", Journal of Financial Economics, Vol. 120, pp. 585-600.

Notes: "Financial structure in 1990" is defined as total stock market capitalisation divided by the sum of total private credit and total stock market capitalisation, for each country, in 1990. Data on carbon emissions (kilotons of CO2 per capita) from the International Energy Agency. Data on private credit and stock market capitalisation from the Financial Structure Database.

The superiority of equity financing to debt financing in decarbonising the economy appears to stem largely from equity investors' propensity to fund intangible projects and their higher aversion to litigation risk. Relative to carbon-intensive sectors, energy-efficient sectors tend to be more innovative and less rich in tangible assets. Innovative, R&D intensive sectors typically grow faster in countries with deeper stock markets. In contrast, sectors rich in tangible assets (which also happen to be more carbon-intensive) expand faster in economies that rely more on bank financing, for example because banks often take less risk and therefore tend to lend against tangible collateral.[28] Second, equity investors see green firms as less likely to suffer environmental disasters, and therefore less likely to be involved in litigation.[29] Thus, the technological "greening" of carbon-intensive sectors as stock markets develop is, to a large degree, explained by equity investors pushing such sectors to develop and adopt greener technologies in an attempt to reduce future litigation costs.

The evidence provided in this box illustrates the challenges implied in limiting the financing of the carbon transition in Europe to bank or debt-based initiatives, and instead suggests a strong emphasis on equity-based initiatives. A number of such initiatives can be embedded in a push to give a stronger equity dimension to the European Capital Markets Union (CMU) project, tapping the European capital markets' potential to fund innovative, sustainable growth. One specific measure that is crucial in this regard is reducing or eliminating any tax benefits that favour debt over equity. The European Commission has already adopted a proposal on a common corporate tax base which will address the current debt-bias in corporate taxation by introducing an "Allowance for Growth and Investment" that will give companies tax benefits for equity equivalent to those they receive for debt.[30] Other initiatives already on the table that will arguably stimulate equity investment include measures to support the development of venture capital markets, and improving and harmonising insolvency regimes, among others.[31]

In parallel, countries should take measures to counterbalance the tendency of credit markets to finance relatively carbon-intensive sectors and firms. For example, banks can be asked to release information about the environmental performance of the firms they fund. Furthermore, countries can adopt green credit guidelines to encourage banks to improve their environmental performance and to lend more to firms that are part of the low-carbon economy.

Finally, a number of initiatives can be implemented to support the budding market for green bonds, such as improving risk-return profiles, boosting demand, introducing tax incentives, and enabling strategic issuance.[32] Practically non-existent a decade ago, green bonds (i.e. bonds issued by private or public entities and earmarked to be used for climate and environmental projects)

28 Kim, W. and Weisbach, M. (2008), "Motivations for Public Equity Offers: An International Perspective", Journal of Financial Economics, Vol. 87, pp. 281-307; Hsu, P.-H., Tian, X., and Xu, Y. (2014), "Financial Development and Innovation: Cross-Country Evidence", Journal of Financial Economics, Vol. 112, pp. 116-135; Brown, J., Martinsson, G., and Petersen, B. (2017), "Stock Markets, Credit Markets, and Technology-led Growth", Journal of Financial Intermediation, Vol. 32, pp. 45-59.

29 See Klassen, R., and McLaughlin, C. (1996), "The Impact of Environmental Management on Firm Performance", Management Science, Vol. 8, pp. 1199-1214.

30 See Capital Markets Union. Arguably, this proposal is not driven by environmental considerations, but is part of an overall plan to create a more neutral and investment-friendly tax environment.

31 See for example "Capital markets Union: Commission reports on progress achieved ahead of Europe Council", and "Report Next Capital Markets Union High-Level Group: The next CMU".

32 See Policy areas supporting the growth of a green bond market.

have rapidly emerged as a popular way to finance the greening of the economy. Their global issuance stood at $255 bn in 2019, with the EU being the biggest issuer of green bonds in the world ($107 bn), ahead of the United States ($51 bn) and China ($30 bn). While the analysis of their effectiveness is constrained by the short historical window of their existence, recent evidence suggests that green bond issuance does not just improve companies' value and performance, but also weakly stimulates patented innovation.[33] At the same time, green bonds are typically issued by large listed companies which tend to be much less constrained than smaller companies in their ability to invest in R&D, a fact that puts their usefulness in funding green innovation in question. In contrast, equity investors such as venture capitalists typically fund financially constrained young innovative companies seeking to place a radically new technology in the market. For this reason, measures aimed at stimulating equity investment in Europe are plausibly associated with higher benefits for climate mitigating technologies than measures supporting the market for green bonds.

1.2 By economic sector

The three main euro area economic sectors – households, non-financial corporations (NFCs) and the general government – have distinct funding structures. The following sections examine the evolution of the use of financial instruments by each sector as well as the main funding sources.

1.2.1 Euro area households

Euro area households finance themselves principally through loans from MFIs, (Chart 3). The presence of the non-banking sector is still limited in this segment of the market. OFI loans consist mainly of securitised loans originated by MFIs. The shares of bank and OFI loans in total loans to euro area households have remained practically unchanged over the past ten years.

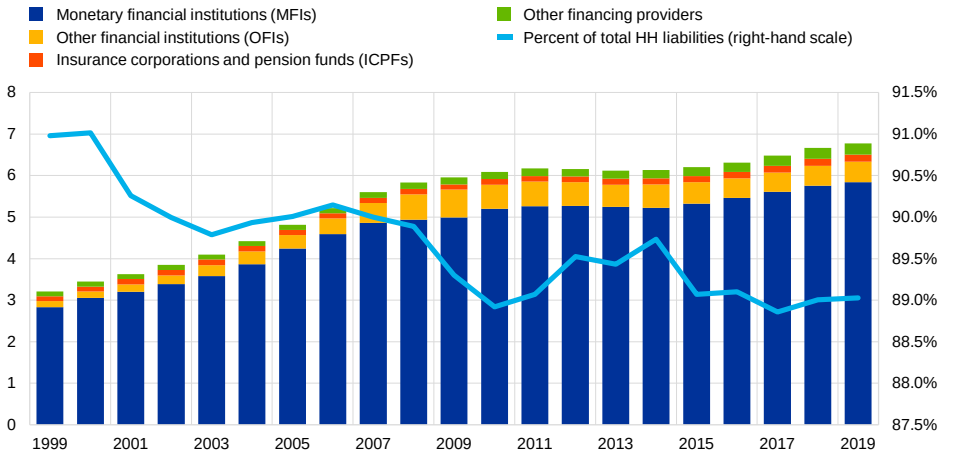
The main reason households have recourse to MFI loans for financing is to purchase houses (75% of MFI loans) with the remaining share being equally distributed between consumer credit and loans for other purposes (Chart 4).

[33] See Flammer, C. (2018), "Corporate Green Bonds", *Global Economic Governance Initiative Working Papers*, No Paper 23.

Chart 3

Loans to households and the economic sector providing the financing

(EUR trillions (left-hand scale); percentages (right-hand scale); annual data; 1999-2019)

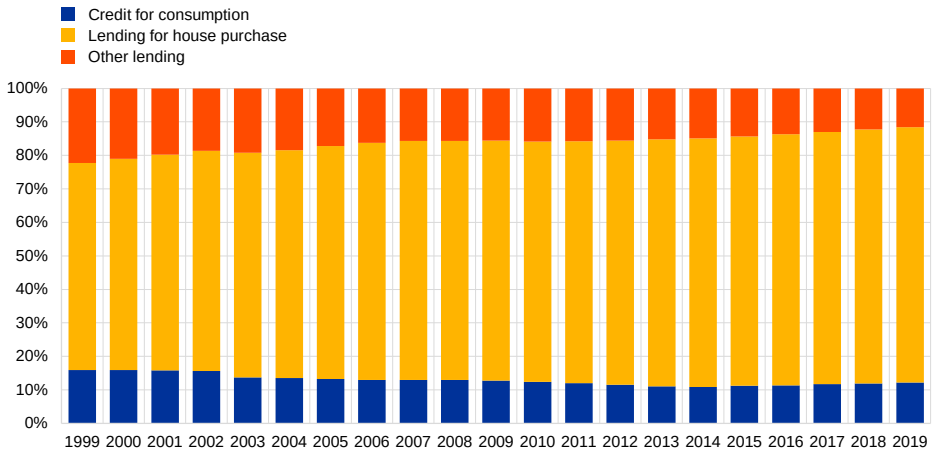


Source: ECB.
Notes: OFIs include other financial intermediaries (except insurance corporations and pension funds), financial auxiliaries as well as captive financial institutions and money lenders. OFI loans consist mainly in securitised loans originated by MFIs. 2019 data refer to end Q3 2019 data.

Chart 4

Composition of outstanding MFI loans to households by lending purpose

(percentages; annual data; 1999-2019)



Source: ECB.
Notes: Loans consist of: (1) loans granted to households in the form of credit for consumption, i.e. loans granted primarily for the purpose of personal use in the consumption of goods and services; (2) lending for house purchase, i.e. credit extended for the purpose of investing in houses for own use or rental, including building and refurbishments; and (3) other, i.e. loans granted for purposes other than consumption and house purchase, such as business, debt consolidation, education, etc. (see Guideline ECB/2014/15).

1.2.2 Euro area NFCs

Euro area NFCs have relied principally on loans and unlisted shares for their financing over the last 20 years (Chart 5). These two funding sources currently represent around 60% of NFCs' total non-consolidated liabilities. The observed low NFC reliance on market-based finance relative to other major international economies

is partly due to the larger share of small and medium enterprises (SMEs) in the euro area.

Equity financing has provided the backbone of euro area NFC financing since 1999. In terms of stocks, equity financing (i.e. listed and unlisted shares and other equity issued by NFCs) represented 53.9% of NFC external financing in 2007, which was 4.5 percentage points higher than in 2003. At that time, this increase was supported by substantial positive valuation effects on the equity issued, reflecting the marked stock price increases, and by the high level of mergers and acquisitions (M&A) witnessed during that boom period. Thereafter, between 2007 and 2011, the share of equity in external financing declined significantly, following the global financial crisis and the euro area crisis as well as the ensuing marked drop in stock prices. Thereafter, it recovered and increased to stand at 55.3% in mid-2019, mirroring the gradual recovery of the economy and a considerable increase in stock prices.[34]

A notable phenomenon is that since 2007 NFCs have gradually diversified their funding structure towards a combination of loan and market-based debt and equity financing (Chart 6). From a stock perspective, bank loans formed 63% of NFC debt financing in 2007, which was 5.7 percentage points higher than in 2003. Borrowing from banks was buttressed over this period by robust economic growth, construction and real estate booms and very favourable bank lending conditions in a number of euro area countries. Post-2007 the share of bank loans in NFC debt financing has followed a declining trend. In mid-2019, bank loans accounted for 46.3% of debt financing, while the share of financing through debt securities, loans from OFIs and from the rest of the world increased to 50.5%. Changes in the financing structure of large enterprises drove the decline in the share of bank loans, as these large enterprises increasingly reverted to capital markets for direct debt securities financing and to other financial institutions (OFIs) for indirect debt securities and loan financing. By contrast, small and medium-sized enterprises (SMEs), the backbone of the euro area economy, also reduced their reliance on bank credit.

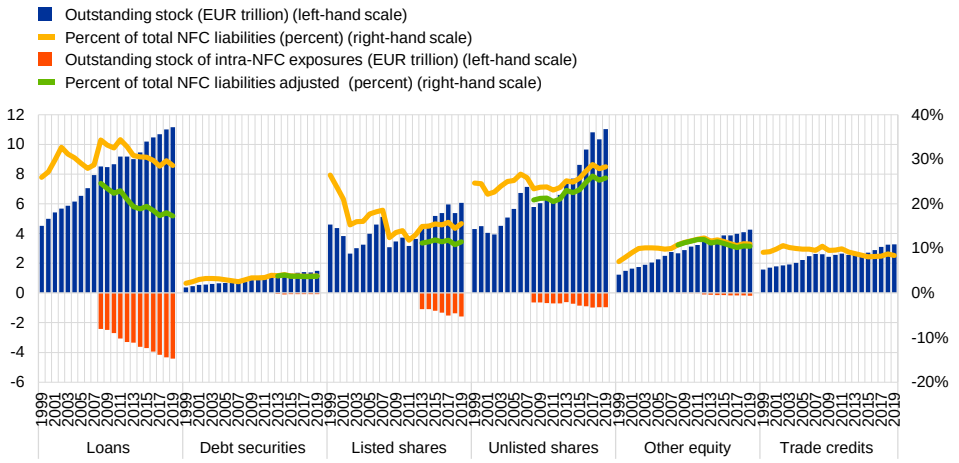
Trade credits have traditionally played an important role in the financing structure of euro area NFCs and now represent close to 10% of euro area NFC liabilities.

[34] Improvements in data collection also contributed to the increase in the recorded share of equity financing in total outstanding liabilities since 2015. Earlier data in the series have not been corrected backwards.

Chart 5

Composition of NFC liabilities by type of financial instrument

(EUR trillions (left-hand scale); percentages (right-hand scale); annual data; 1999-2019)

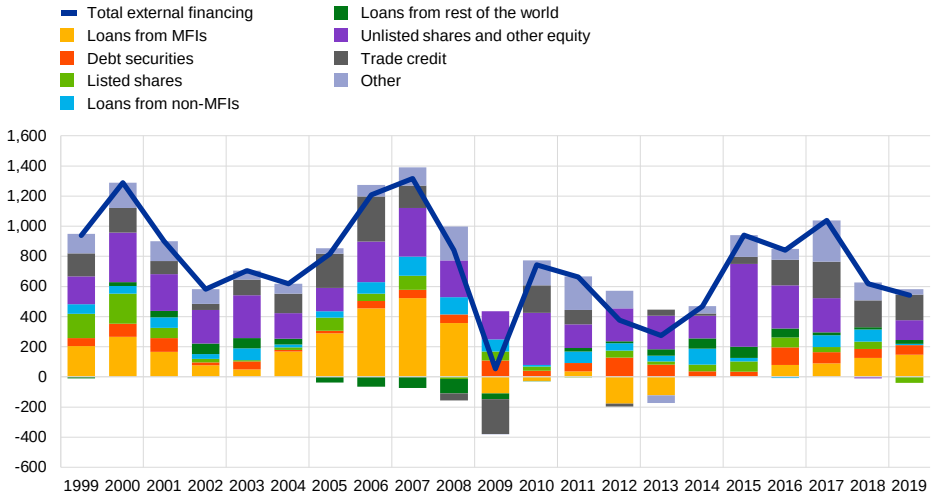


Sources: ECB and ECB calculations.
Notes: The outstanding stock of intra-NFC exposures is estimated based on financial accounts and balance of payments data. This explains the fact that a significant part of non-investment fund and non-FVC OFI loans are related to debt securities issued indirectly via NFC financing conduits. 2019 data refer to end Q3 2019 data.

Chart 6

External financing of euro area NFCs by instrument

(annual flows; EUR billions; 1999-2019)



Sources: ECB (euro area accounts) and ECB calculations.
Notes: Non-MFIs include other financial institutions (OFIs) as well as insurance corporations and pension funds (ICPFs). "Other" is the difference between the total and the instruments included in the chart, and includes inter-company loans and the rebalancing between non-financial and financial accounts data. 2019 data refer to end Q3 2019 data.

NFCs have sourced their financing from different financial intermediaries or economic sectors. The role of the different financing providers via loans, debt securities and listed shares is characterised as follows (Chart 7):

- **Intra-NFC financing is substantial.** NFCs rely for approximately 13% of financing on other NFCs. One-quarter of euro area NFC listed shares are owned by other euro area NFCs and 32% of loans are inter-company (often

intra-company) loans. The outstanding stock of intra-NFC exposures in Chart 5 provides an estimate for the broader relevance of inter-company exposures.

- **MFIs remain an essential provider of debt financing to euro area NFCs.** Since 2013 the role of MFIs in the stock of debt financing has declined by 5 percentage points to 36% and the composition of debt financing has shifted towards marketable instruments.

- **The ICPF and investment fund (IF) sectors each finance around 27% of NFC debt issuance.** IFs moreover provide around 17% of equity financing through listed shares. The ICPF sector has increased its portfolio allocation to IFs over recent years (see Section 3.2.1) and hence also contributes to NFC equity financing indirectly.

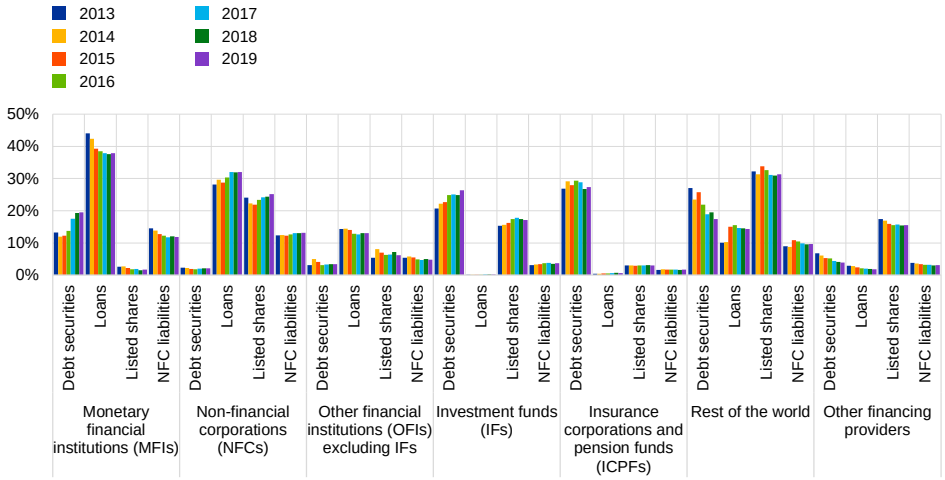
- **The rest of the world holds close to 10% of NFC liabilities.**

This characterisation is incomplete as suppliers of financing in the form of unlisted shares – the biggest component in euro area NFC funding structures – cannot currently be identified due to the limitations of the statistical data. This is an area in which further work is ongoing.

Chart 7

Role of financing-providing sectors in the stock of euro area NFC external financing

(percentages; annual data; 2013-2019)



Sources: ECB (euro area accounts) and ECB calculations.

Box 2

The need to take the European Capital Markets Union (CMU) further

Prepared by Kalina Tylko-Tylczynska and Wieger Kastelein

Well developed and integrated capital markets can make important contributions to economic growth and financial stability, in particular by improving funding access for firms and households and increasing private cross-border financial risk sharing (Section 4). Since the implementation of the CMU Action Plan in 2015 progress has been achieved on the legislative front, albeit to a varying

extent across initiatives. While acknowledging that the actual impact on the real economy may take time to materialise, further and timely action is indispensable to drive this project forward.

Benefits of CMU

The Commission has been pursuing the CMU Action Plan in order to unlock more EU and global investment, better connect financing to investment projects, enhance financial stability and deepen financial integration and competition. A deeper and more harmonised CMU complements Europe's strong reliance on bank financing and strengthens the link between savings and growth.

State of play of CMU

After announcing its CMU Action Plan in September 2015, the European Commission launched a series of initiatives to stimulate the development and integration of EU capital markets. These initiatives resulted in many pieces of legislation that addressed shortcomings in the area of securitisation, investment firms, covered bonds, pension products and restructuring legislation.[35] There were also measures related to fintech and sustainable finance. By the end of 2019, 11 out of 13 proposals included in the action plan had been adopted. While the adoption rate is relatively high, it has to be acknowledged that for some of the CMU-related legislative proposals the initial ambitions had to be scaled back significantly in order to reach an agreement among the co-legislators.[36]

So far, there is limited evidence that patterns in financial structures and markets have shifted so as to ultimately benefit the real economy. Retail participants have not yet embraced directly investing in capital market products and although the balance between banks and non-bank institutions has evolved in recent years, EU financing remains predominantly bank-based.[37] The report of the CEPS-ECMI Task Force[38] on Rebranding CMU indicates that even though the amount of assets held by households in the EU has increased by 70% since 2003, the portion of retail investments channelled through equity markets amounts to only 21%, as compared to 41% in the United States.[39]

With regard to financial integration, volatile developments in the convergence of asset prices across the euro area during the last few years can be observed while post-crisis reintegration of cross-border asset holdings has broadly stalled.[40] This is also illustrated by the relatively small contribution by capital markets to smoothing a country-specific shock to GDP growth in the euro area.[41]

New geopolitical and economic challenges – such as Brexit, cyber risks and climate change – provide a fresh impetus for CMU. The relevance of CMU in the context of the broader Brexit

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35 See for instance, Regulation (EU) 2019/1238 of the European Parliament and of the Council of 20 June 2019 on a pan-European Personal Pension Product (PEPP) and the 2019 Directive on preventive restructuring frameworks, on discharge of debt and disqualifications, and on measures to increase the efficiency of procedures concerning restructuring, insolvency and discharge of debt, and amending Directive (EU) 2017/1132 (Directive on restructuring and insolvency).

36 This was namely the case for the review by the European Supervisory Authorities (ESAs).

37 See Capital Markets Union – Key Performance Indicators (Second Edition), report by AFME dated October 2019.

38 This is a joint task force of the Centre for European Policy Studies and the European Capital Markets Institute, two European think-tanks.

39 See Rebranding Capital Markets Union – A market finance action plan, report by the CEPS-ECMI Task Force of June 2019. See the World Bank's Financial Structure Database. See the ECB's Household Finance and Consumption Survey. Hsu, P., Tian, X., and Y. Xu (2014), "Financial development and innovation: Cross-country evidence," *Journal of Financial Economics*, Vol. 112, pp. 116-135. See 2016 Financial Integration in Europe Report, Special Feature A "Financial integration and risk sharing in a monetary union."

40 See section 4.1.

41 See Box 5 in this section

discussions is highlighted in a dedicated special feature on the implications of Brexit for the EU financial landscape.[42] Furthermore, there are important synergies between the CMU agenda and other key European initiatives, such as the completion of the banking union, the Single Market agenda and initiatives to boost funding opportunities for the real economy.

Various parties' recommendations for the next stage of developing CMU

In 2019, the CMU agenda continued to draw broad support from EU policymakers and market participants. A High Level Working group established by Germany, the Netherlands and France composed of different representatives of the private sector published proposals for relaunching CMU. These include recommendations for generating long-term savings opportunities, developing equity markets, enhancing cross-border financial flows, and developing debt, credit and forex financing tools with a view to increasing the international role of the euro.[43] The IMF had also recently published a Staff Note that identified three concrete priorities where further progress could be achieved: enhancing transparency by centralising and standardising reporting by all issuers, sharpening regulation and supervision, and improving solvency procedures.

Industry-led initiatives also produced recommendations on the future of CMU. For instance, the CEPS-ECMI Task Force on Rebranding CMU put forward a Market Finance Action Plan in which it pleads for action on the core bond and equity markets, and on advancing the participation of individuals in capital markets.[44] In its report on Key Performance Indicators, the Association for Financial Markets in Europe (AFME) recommends renewing the ambition on CMU and unleashing the benefits of sustainable finance as well as digitalisation. Furthermore, work towards expanding the volume of and capacity for liquidity provision in EU markets and increased retail participation in public markets should continue. Finally, AFME is of the opinion that possible solutions for a European safe asset should be studied extensively in consultation with market participants.[45]

Way forward

The Commission intends to make CMU a centrepiece of the forthcoming legislative agenda, and has set up a High Level Forum composed of experts from different industry sectors, which has started work on proposals for the next CMU action plan.[46] The Finance Ministers of the Council of the European Union also indicated their interest in putting CMU high on the political agenda.[47] The main goals formulated for bringing CMU forward in this regard are: creating an ecosystem that enables more cross-border capital raising, developing European capital market architecture, greater retail investor participation, and the transition to sustainable and digital economies. The ECB strongly supports taking CMU to the next level with a second set of policy measures following the 2015 action plan.

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42 [See the dedicated special feature on the implication of Brexit for the EU financial landscape – specific reference to be added later]

43 See Savings and Sustainable Investment Union The Next CMU High-Level Group, Report to Ministers and presented to the Finnish Presidency October 2019.

44 See Rebranding Capital Markets Union – A market finance action plan, [TBD]

45 See Capital Markets Union – Key Performance Indicators (Second Edition).

46 See Press release on High-Level Forum on capital markets union, European Commission. The ECB is participating in the High-Level Forum on Capital Markets Union (HLF) as an observer.

47 See Council conclusions on the deepening of the capital markets union, Outcome of Proceedings, adopted at the Council of the European Union on 5 December 2019.

1.2.3 Euro area general government

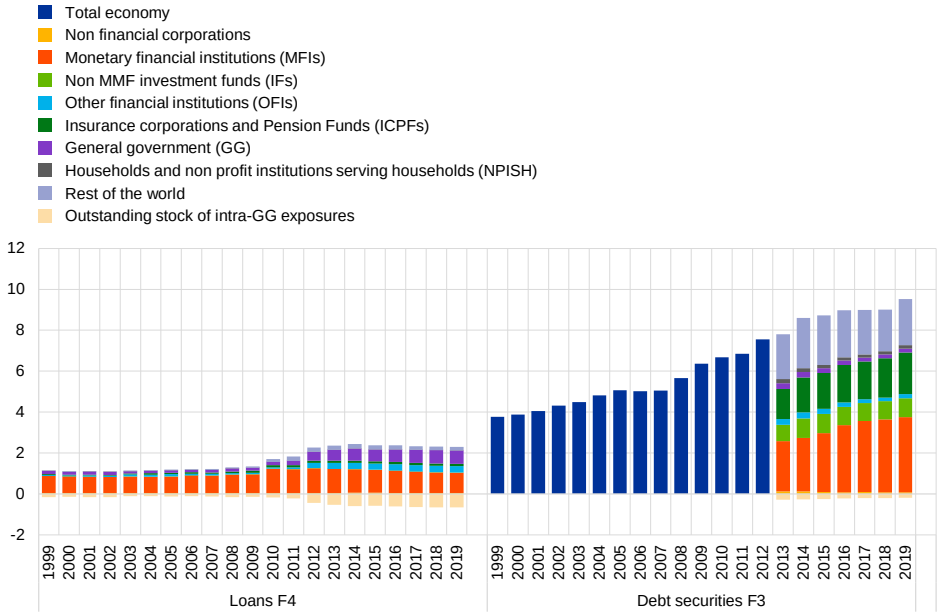
The euro area general government sector largely relies on debt financing instruments (Chart 8). Debt securities and loans represent 81% and 16% of total debt outstanding respectively. The relative composition of holders of general government debt has changed, certainly since 2013:

- the share held by residents has been growing, driven primarily by demand from resident financial corporations[48];
- the share held by non-residents remains generally significant, though it has been declining in relative terms; and
- the rest of the world holds around one-quarter of general government debt[49] [50].

Chart 8

Composition of general government liabilities by type of financial instrument and financing-providing economic sector

(EUR trillions; annual data; 1999-2019)



Sources: ECB and ECB calculations.
Notes: Information on the financing-providing economic sector for debt securities and for intra-government exposure in the form of debt securities is only available since 2013.

48 As regards the non-MMF investment funds sector, the "home bias" is discussed in a special feature in this report.

49 The share ranges from 13% of general government debt in Malta to above 50% in Germany, Spain, Italy, Luxembourg, France and the Netherlands.

50 "Under ESA 2010, the ESM will be classified, in the accounts of all EU countries, as a non-domestic euro area resident, within the sector rest of the world S.2, under the sub-sector S.21 (the European Union) and among the institutions of the EU (S.212). In the accounts of the European Institutions (seen as a separate "Member State"), the ESM is classified as other financial intermediary (S.125 in ESA 2010)." (see: Manual on Government Deficit and Debt – Implementation of ESA 2010)

2 Assets of financial intermediaries

The financial structure of a financial system can be understood as the mixture of financial markets and intermediaries operating within the economy of that system.[51]

Compared to the US and Japan, the euro area financial markets feature a smaller scale involvement of other financial intermediaries except insurance corporations and pension funds (OFIs) in the provision of loans (Chart 9). In spite of its increasingly large financial weight, the OFI sector has not yet managed to compete significantly against the MFI sector in the core business of issuing loans. The smaller role the OFI sector plays in loan supply contrasts with its large role in providing trade credit, which is much larger in volume in the euro area than in the United States or Japan. Trade credit being an instrument where the MFI sector is largely absent, the large use of this instrument by the OFI sector illustrates the fact that the MFI and OFI sectors do not necessarily compete in the same financial instruments. Other noteworthy differences between the three economic areas include the strong role of non- money market funds (MMFs) investment funds (IFs) in the United States in providing financing through listed shares, as well as the large demand from the government for debt securities in Japan.

The euro area financial system relies on three types of financial intermediaries (i.e. agents that channel funds between providers and recipients):

1. **Monetary financial institutions (MFIs) (excluding central banks):** Credit institutions and money market funds had, until the end of 2014, represented the largest part of the financial system, financing households and NFCs principally through loans. While the MFI sector grew by roughly EUR 2 trillion over the period and is therefore the largest contributor to the overall short-term trend (closely followed by the OFI sector and the Eurosystem), the relative weight of this sector experienced a long-term decline. Specifically, its weight fell from nearly 50% of the size of the total financial sector in Q4 2009, to 35% in Q4 2016, and stabilised thereafter.

2. **Financial corporations except MFIs and ICPFs:** non-MMFs investment funds, other financial intermediaries except ICPFs (including financial vehicle corporations (FVCs), financial auxiliaries and captive finance institutions and money lenders – experienced a steady long-term increase in their share of financing and have been the largest intermediaries of the total financial sector since the second half of 2014.

3. **Insurance corporations and pension funds (ICPFs):** ICPFs have grown by approximately EUR 1.1 trillion since the end of 2016 with pension funds (PFs) – predominantly relevant in the Netherlands and Ireland – representing one-quarter of total ICPF assets.

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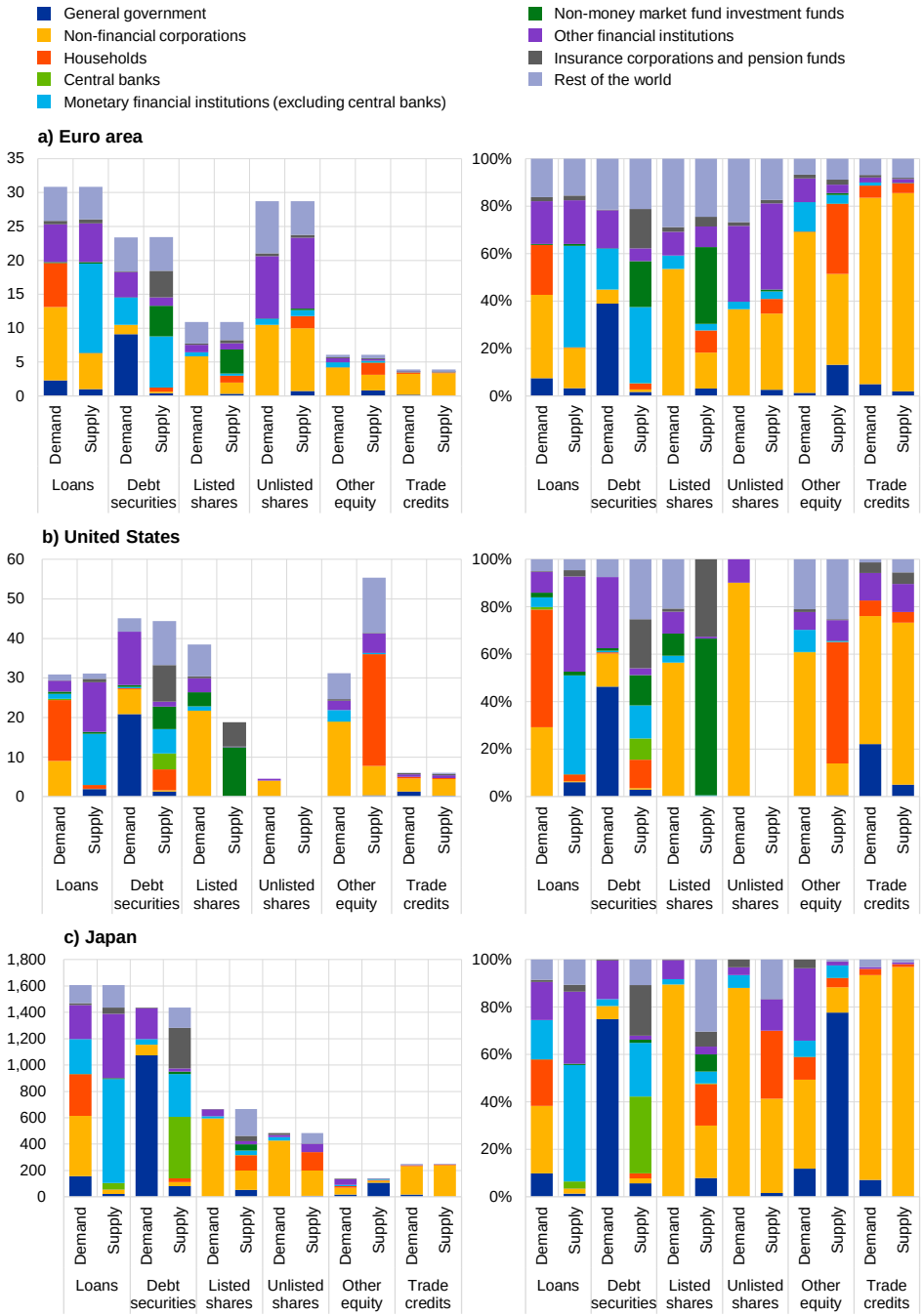
[51] See Hartmann, Maddaloni and Manganelli (2003), "The euro-area financial system: Structure, integration, and policy initiatives", *Oxford Review of Economic Policy*, 19(1), pp. 280-313. For related discussions see also Allen and Gale (2000), "Comparing Financial Systems", Cambridge, MA: MIT Press, Demirguc-Kunt and Levine (2001), "Financial Structure and Economic Growth", Cambridge, MA: MIT Press, and the ECB Report on Financial Structure (2002).

Structural developments in key constituents of these three types of financial intermediary are presented in more detail in Section 3.

Chart 9

Composition of demand and supply in markets for financial instruments: an international comparison

(trillions of national currency; 2018 (for the euro area and United States) and 2017 (for Japan))



Sources: ECB for the euro area and OECD for the United States and Japan.
Notes: (1) Demand refers to liabilities of economic entities domiciled in the jurisdiction and to assets of those domiciled in the rest of the world. Supply refers to assets of economic entities domiciled in the jurisdiction and to liabilities of those domiciled in the rest of the world.
(2) Data for loans and debt securities markets include the participation of central banks in these markets.
(3) The charts aggregate for both the demand and the supply side the financial instrument position by economic sector. They show the relevance of the different financial instrument markets for the various economic sectors. It is a market view though, not a from-who-to-whom analysis.
(4) Other financial institutions (OFIs) include other financial intermediaries (except insurance corporations and pension funds), financial auxiliaries as well as captive financial institutions and money lenders
(5) Looking at listed shares, unlisted shares and other equity combined, the demand and supply match in US financial accounts data. Discrepancies at the instrument level are due to statistical reporting issues.

Aggregate assets of all financial intermediaries point to the following major developments over the over the period from the end of 2016 to mid-2019 (Chart 10):

- **Total euro area financial sector assets grew by EUR 6.5 trillion, recording an annual growth rate of slightly below 3.5%.**[52] There was a dip in financial sector assets in 2018, and a rebound as from early 2019, associated with equity value changes predominantly affecting the non-money market fund investment funds sector (Chart 11). The lower equity market valuations were caused by geopolitical uncertainties, trade tensions, Brexit uncertainty (see the special feature on Brexit), as well as a short-lived tightening in the Federal Reserve's monetary policy stance.

- **The ratio of financial sector assets to GDP has contracted at the euro area level since 2015. Importantly, the aggregate picture given in Chart 10 masks some heterogeneity in national developments.**

- **Assets of non-banks (i.e. ICPFs, IFs and OFIs) have surpassed in size the euro area banking sector's assets since mid-2013.**[53] Drivers of this development are a relatively slower growth of bank assets, further consolidation and concentration in the banking sector, the strong Eurosystem balance sheet expansion and increased reliance market-based intermediation.

- **The euro area Financial Corporations except MFIs and ICPFs (FCs) sector has constituted the largest financial sub-sector since the second half of 2015.** The euro area OFI sector is larger than the FCs sector of Japan, though smaller than that of the United States.[54]

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52 Over the period from the end of 2016 to mid-2019, the MFI sector grew by EUR 2.3 trillion or 3.4%, while the OFI sector grew by EUR 1.9 trillion or 2.4%.

53 Non-bank financial intermediaries comprise insurance corporations and pension funds (ICPFs), non-MMF investment funds (IFs), financial auxiliaries, captive financial institutions and money lenders, and other financial intermediaries (except ICPFs).

54 FSB Global Monitoring Report on Non-Bank Financial Intermediation 2018.

Chart 10

Total assets of the euro area financial sector

(ratio to nominal GDP (left panel); percentages (right panel); March 1999-June 2019)

Source: ECB.
Notes: The aggregated (non-consolidated) assets of sub-sectors include financial assets and exclude non-financial assets Remaining other financial institutions include security and derivative dealers, financial corporations engaged in lending (such as leasing or factoring companies), specialised financial corporations (including venture capital companies, export/import financing companies or some central clearing counterparties), financial auxiliaries (including for example asset management companies, securities brokers, investment advisers, insurance brokers or exchanges) as well as captive financial institutions and money lenders (including for example financial holding companies, funding vehicles of non-financial corporations – e.g. supporting their debt securities issuance – and other entities that channel financial flows within non-financial corporations). Data on money market funds are reported separately from credit institutions only as of Q1 2006. Data on financial vehicle corporations, which are undertakings carrying out securitisation transactions, are reported separately from remaining other financial institutions as of Q4 2009.

Chart 11

Change in the total financial asset holdings of euro area financial corporations

(annual growth rates; percentage point contributions; quarterly; March 2000 – June 2019)

Source: ECB.

The strong growth of the euro area financial sector over the past two decades has affected the euro area financial structure and development.

The financial structure – defined as the ratio of stock market capitalisation to private credit through loans and debt securities (Chart 12) – reflects the predominant role of credit lTc 0 Tw (t)- (c)-32.6 (f03 (s)]T)0.7 (a)22.5 5.2 (i29 l)-24.7 ()-38.7 (a)2

undertakings. The average length of operation of analysed entities stands now at somewhat longer than seven years.

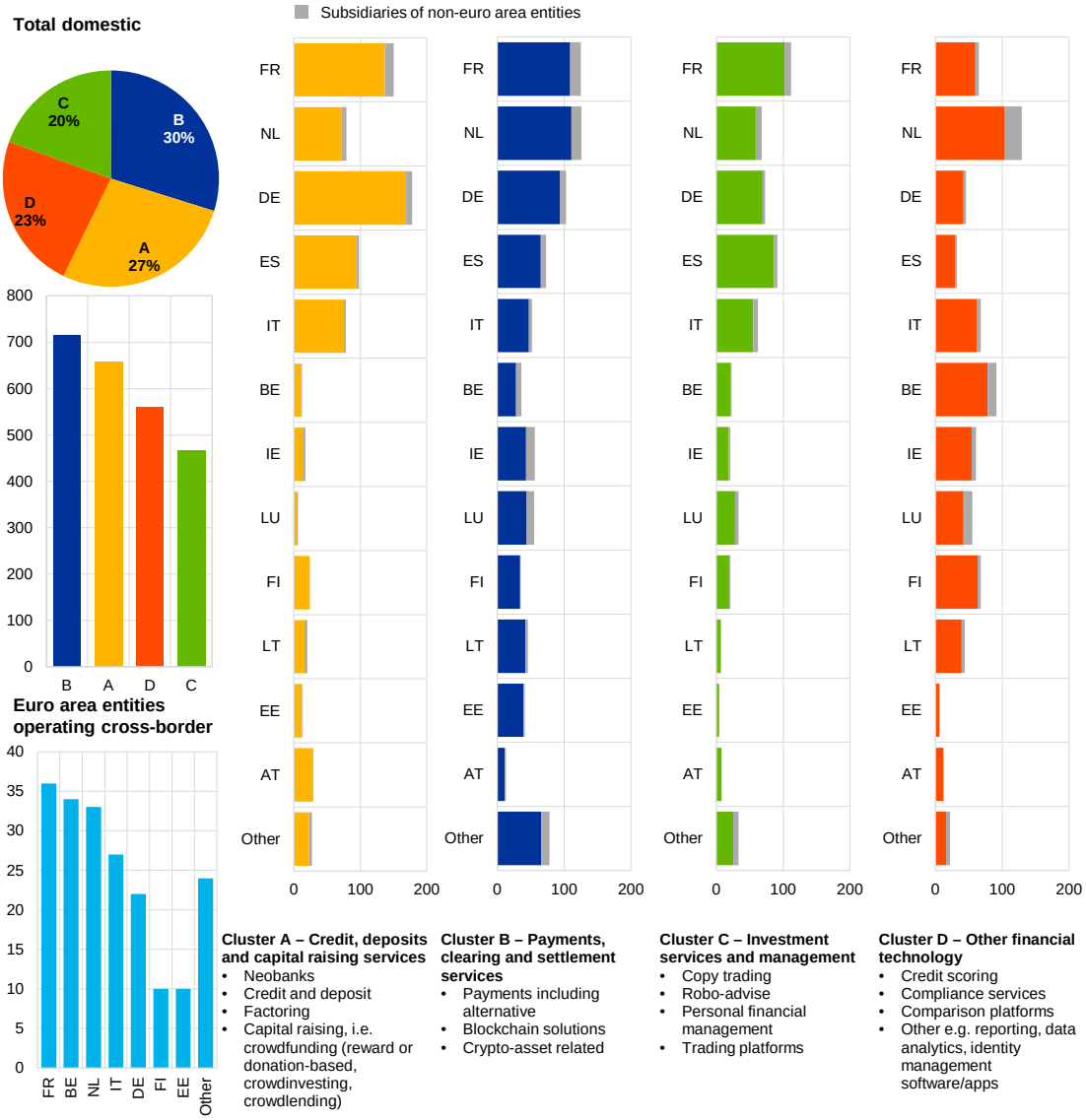
Fintech entities can be divided into four clusters[63] in line with their distinctive business models and by analogy to the traditional value-adding areas of a universal bank (see Chart B). Fintech entities operating within clusters B (payments, clearing and settlement services) and A (credit, deposit and capital raising services) are the most numerous in the euro area. From a country perspective, large countries such as France, the Netherlands and Germany host the largest number of fintech entities. With the high number of entities, also in relation to population size, Luxembourg, Estonia, Lithuania, Ireland and Finland can be identified as the most densely covered – or "tech savvy" – countries. Initially fintech entities tended to first enter the sphere of activities in cluster B, which might explains the dominant position of this cluster with its high number of entities in many euro area countries. However, in many countries already other clusters are the most populated by fintech entities. In terms of cross-country heterogeneity and national specialisations, cluster A is the most populated in Germany, Spain and Italy. Cluster D covering technological services not classified elsewhere is the most populated in the Netherlands, Belgium, Ireland and Finland. Cluster C (Investment services and management) is well populated across the euro area however it is not dominant in any of particular countries. In general, the 10 euro area countries with the highest number of fintech entities account for 90% of the total number. A certain share of fintech entities operates cross-border, consistent with some contribution to euro area financial integration (see the lower left panel in Chart B). Based on the collected data, 8% of the euro area entities have a solid presence[64] in at least one other euro area country and many entities also offer services and products across euro area borders.

63 Discussion paper on the EBA's approach to fintech.

64 Based on a rather conservative measure which identifies such entities if they feature on the lists of fintech entities in countries other than the location of headquarters.

Chart B

Number of fintech entities by cluster of financial activity and by country



Source: ECB calculations based on experimental data collection.
Notes: Clusters of activities as in the discussion paper on the European Banking Authority's (EBA's) approach to fintech. One entity is allocated to one cluster only. Entities operating cross-border are entities with headquarters in one euro area country that feature also on the lists of fintech entities in other countries than the headquarter location.

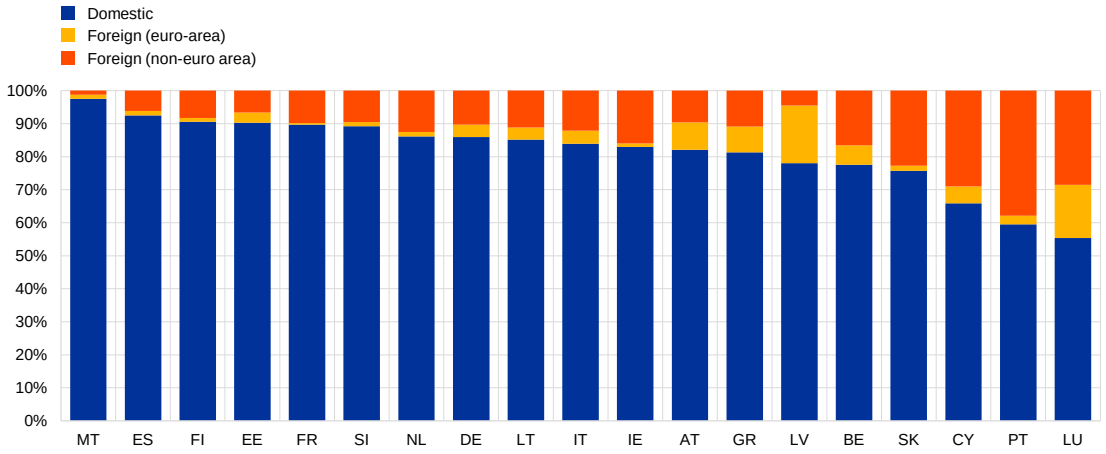
In terms of ownership structure, the links between fintech entities and the traditional financial sector are close. The analysis of shareholders[65] points to strong euro area entities supporting the fintech entities as well as to close links between fintech and the traditional financial sector (see Charts C and D). Looking at the of shareholders' countries of incorporation, the majority of fintech entities are domestic, with the lowest share of domestic shareholders recorded in Luxembourg and accounting to 55%. The vast majority of foreign shareholders are from the non-euro area countries; however, the part of the non-domestic euro area shareholders is significant. The analysis of shareholders by sector of economic activity points to strong links with the financial sector (K NACE Financial and insurance activities sector of economic activity). Unsurprisingly a quite

[65] Based on Bureau van Dijk (BvD) links data and ECB estimates and calculations.

significant proportion of shareholders were also registered as active in the J NACE information and communication sector of economic activity. The shareholders from the financial sector are dominant within activity clusters A, B and C, with on average 60%, 46% and 40% respectively. Shareholders from the information and communication sector constitute 24% and 34% of total shareholders in Clusters C and D respectively.

Chart C

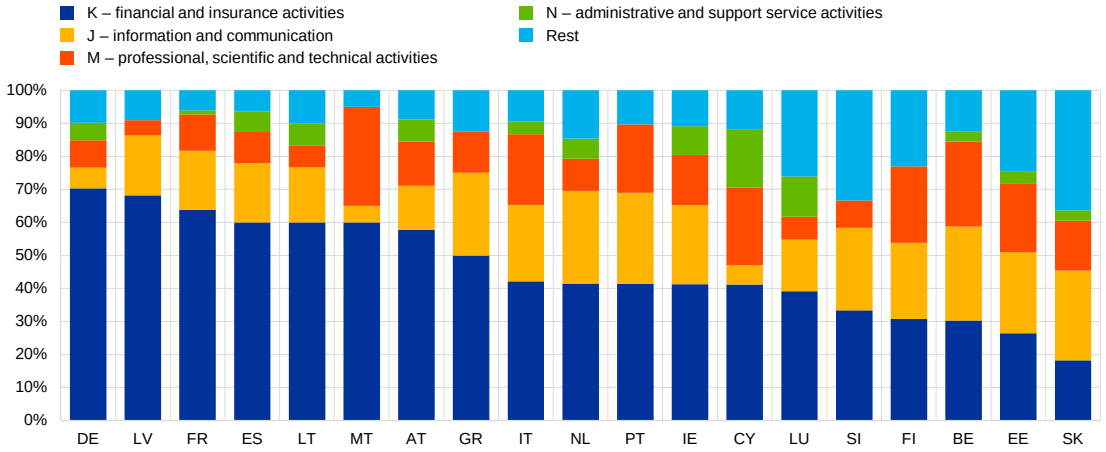
Shareholders of fintech entities by geographical location



Source: ECB calculations based on experimental data collection and Bureau van Dijk (BvD) links information.

Chart D

Shareholders of fintech entities by sector of economic activity



Source: ECB calculations based on experimental data collection and Bureau van Dijk (BvD) links information.
Note: Sectors of economic activity follow the NACE classification.

Well developed and reliable statistics on fintech undertakings are crucial for monitoring and assessing the benefits that fintech entities bring to the euro area financial system, for guarding against potential risks and for analysing their implications for the main central bank functions. With a view to gaining an insight into Fintech related transformation and risks, central bank statistical initiatives aimed at increased availability of information provide valuable input. In this context the ECB and national initiatives are to be highlighted, for example those associated with the

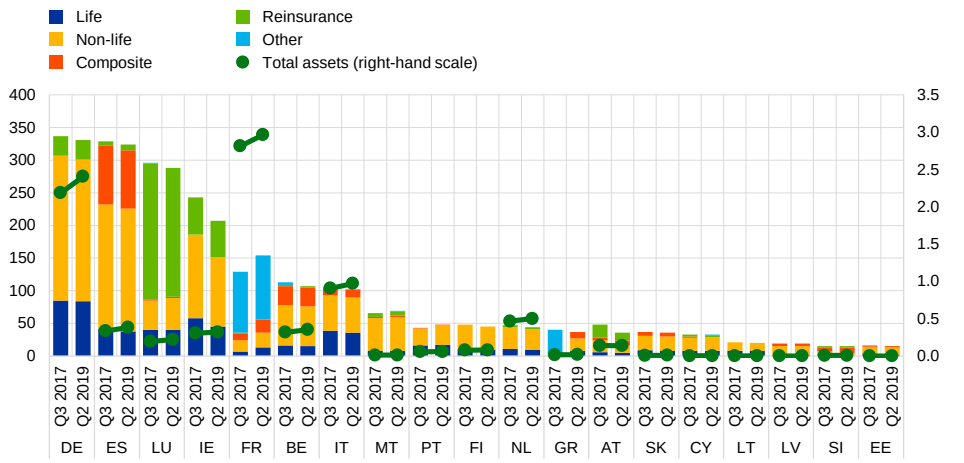
Irving Fisher Committee (IFC) on Central Banking Statistics[66]. Specifically, the IFC Working Group on fintech data has analysed and made recommendations on central bank fintech statistics[67]. Finally, prospective fintech-related adaptation of the International Standard Classification of All Economic Activities[68] (ISIC) as well of the statistical classification of economic activities in the European Community (NACE[69]) would facilitate adequate monitoring of fintech developments by requiring the identification of fintech activities as a separate class or set of classes.

3.2.1 Insurance corporations and pension funds

The total assets of euro area insurance corporations (ICs) are concentrated in a small number of countries (Chart 16). ICs' assets in France, Germany, Italy, and the Netherlands make up 81% of the sector's total assets in the euro area. The total number of ICs was stable between Q3 2017 and Q2 2019 (1,985 versus 1,930 corporations), with the highest number of institutions in Germany, Spain, Luxembourg, and Ireland. This concentration points to a relatively high integration of insurance markets across the euro area, with corporations domiciled in a small set of countries also offering insurance services for the remaining euro area countries.

Chart 16

Total number and total assets of insurance corporations by country



Source: ECB (insurance corporation balance sheet data).

Insurance corporations and pension funds have continuously shifted their portfolio towards higher-yielding, but more diversified assets in recent years (Chart 17). The portfolio share of investment fund shares in total financial assets increased from 18% in 2008 to 32% at the end of 2018, while the proportion of direct

66 See the BIS website.

67 See "2018 IFC Annual report", Irving Fisher Committee on Central Bank Statistics (IFC), Bank for International Settlements (BIS), March 2019 and "Central banks and fintech data issues", IFC, BIS, February 2020. The final report of the IFC WG on Fintech data is to be published in the first half of 2020.

68 See the UN website.

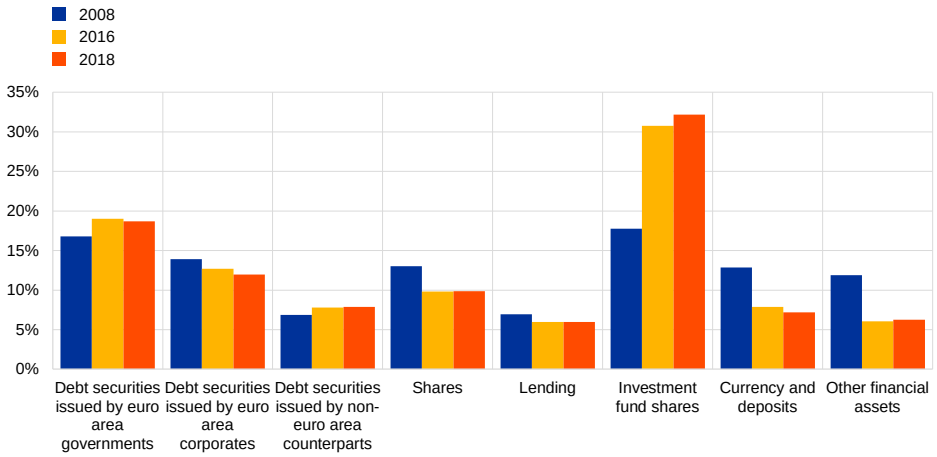
69 See the Eurostat website.

investments in equity shares, debt securities, and lending either remained stable or decreased.[70] This shift towards indirect asset holdings via investment fund shares was mainly for accounting reasons. According to some sources, it also led to a better geographical portfolio diversification, which is fostering financial integration in the euro area.[71] Holdings of highly liquid assets, such as currency and deposits decreased from 13% in 2008 to 6.8% in 2018.

Chart 17

Breakdown of financial assets – euro area ICPFs

(2008, 2016, 2018; percentage of financial assets)



Source: ECB (euro area accounts).
Note: Investment fund shares exclude MMF shares.

3.2.2 Investment funds

The investment fund sector grew continuously in recent years with total assets standing at almost EUR 14 trillion in June 2019. Investment funds are primarily domiciled in Luxembourg, Ireland, Germany, and France, from where they offer services to the whole euro area (Chart 18). In total, there are about 60,000 funds registered in the euro area, of which about one-quarter are located in Luxembourg.

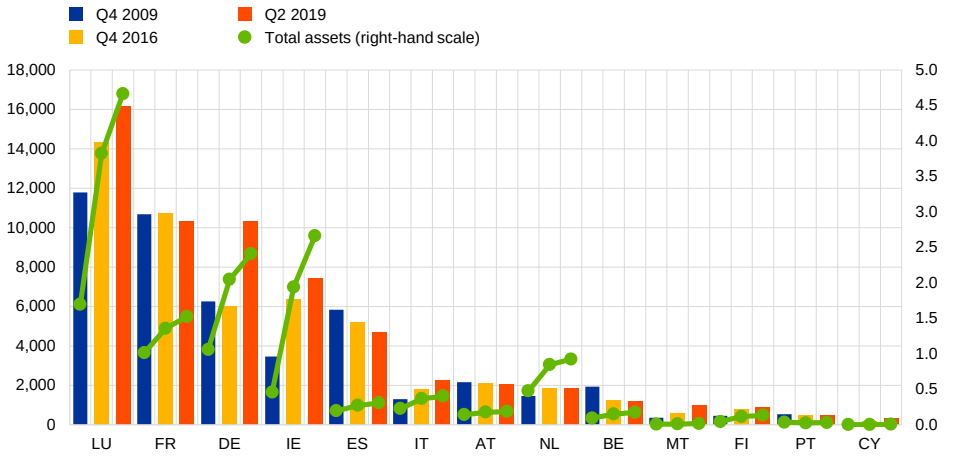
70 See *Financial Stability Review*, ECB, November 2019, Chapter 4.

71 See, for example, *Financial Stability Review*, Deutsche Bundesbank, November 2018.

Chart 18

Total number and total assets of investment funds

(left-hand scale: number of funds; right-hand scale EUR trillions)

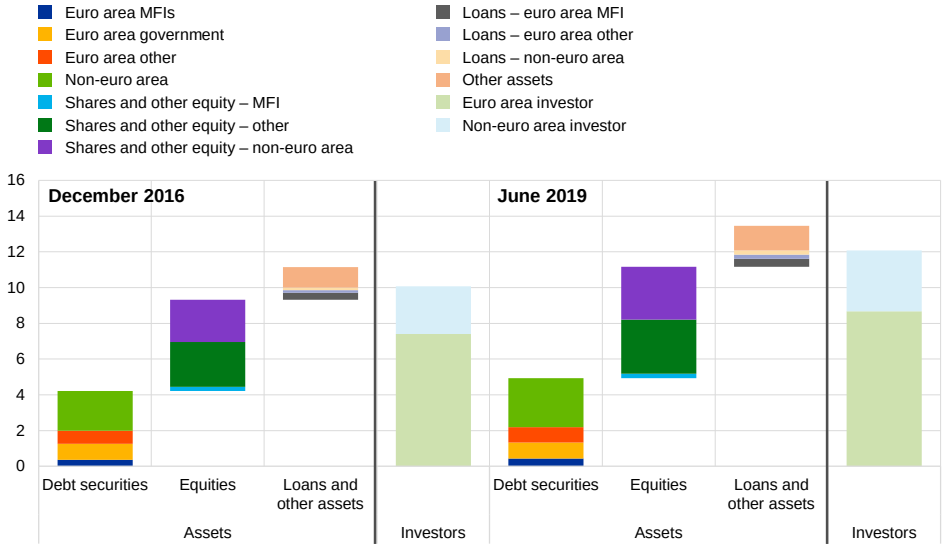


Sources: ECB investment statistics and ECB calculations.
Note: Number of funds includes sub-funds.

Chart 19

Euro area investment funds' balance sheets

(December 2016; June 2019; EUR trillions)



Sources: ECB (investment fund balance sheet statistics) and ECB calculations.

The asset class composition of euro area investment funds remained broadly constant in recent years. The proportions of assets invested in bonds and equity stood at 37% and 46% respectively in June 2019, almost unchanged compared to December 2016 (Chart 19). Within their debt securities portfolios, investment funds partially rebalanced towards non-euro area securities and away from euro area government debt. The investor base of the investment fund sector consisted 71% (73%) of investors from within the euro area in June 2019 (December 2016).

4 Financial integration

This section presents empirical evidence on financial integration and resilience and then analyses the state of integration in specific financial market segments, such as the money market, retail banking market, securities markets, bond markets and equity markets. This section is structured so as to take three perspectives on integration. First it looks at the quantified degree of aggregate financial integration based on a rich set of composite indicators. This makes it possible to synthesise a vast array/range of empirical evidence on various strands of financial integration. Second, the section looks at several indicators of overall financial resilience in order to check that financial progress is less prone to unravel – and the financial system become a source of instability – in the face of large shocks to the financial system. Box 5 discusses the current state of cross-country risk sharing in the euro area. This is an important economic benefit of genuine financial integration in a monetary union. Better integrated asset markets should help smooth income and consumption growth, and hedge against country-specific sources of risk through the contribution of the capital, fiscal and credit channels. Together these indicators make it possible to gauge changes in the quality of financial integration in the euro area. Third, the section analyses the specific financial market segments.[72]

4.1 Aggregate developments

4.1.1 Quantified degree of integration through the lenses of composite indicators

According to the ECB's composite financial integration indicators, the state of intra-euro area financial integration has been rather volatile in recent years. Two composite indicators of financial integration underlying the analysis combine information from the most important financial markets (Chart 20). They capture cross-border price differentials (the price-based indicator in yellow) and cross-border investment (the quantity-based indicator in blue) respectively. Following the financial and sovereign debt crises both composite indicators recovered until 2015. Instead, in recent years these two financial integration indicators displayed some discrepancies.

In recent years, the price-based indicator showed sizeable fluctuations, with the latest reading being only slightly above the 2015 peak. This volatility resulted in particular from changing cross-border bond yield differentials, related to emerging and dissipating political uncertainties in various euro area countries among other factors. Underlying these dynamics in the price-based composite indicator were heterogeneous developments in its four market-specific subcomponents[73]. While cross-country interest rate dispersion in the retail banking loan and deposit markets

[72] As from January 2018 MiFID II strengthens investor protection and improves the functioning of financial markets, making them more efficient, resilient and transparent. This recent reform is not addressed in this section. New reporting requirements and tests are also increasing the amount of public information available.

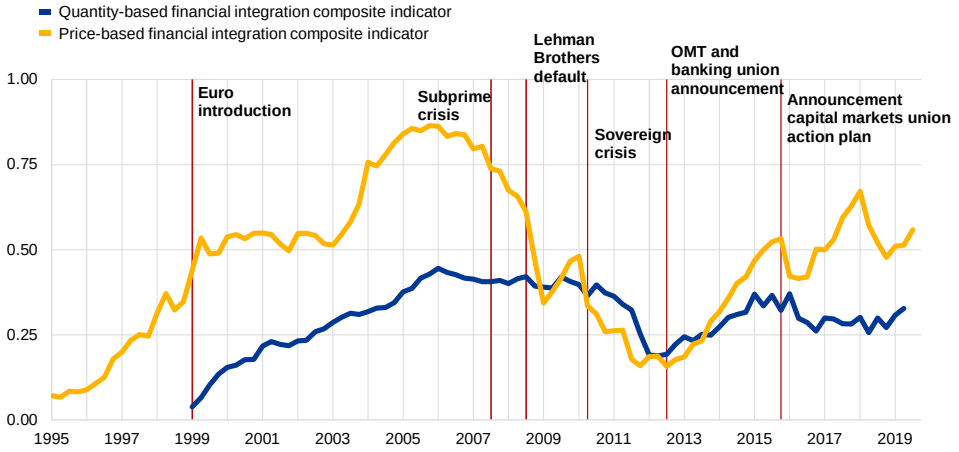
[73] For details see the Statistical Web Annex to this report.

was broadly stable, the price-based measures of the state of equity market integration deteriorated sharply between the end of 2017 and September 2019. The dispersion in price-based equity market integration could be related to differences in the business cycle, country-specific shocks to certain industries or other factors not investigated here. At the same time, the large drop in price-based equity market integration over recent quarters was accompanied by diverging trends in the three other markets. The interest rate convergence slightly declined in the unsecured money market[74], it stagnated in the banking markets and it increased in government and corporate bond markets.

Chart 20

Price-based and quantity-based composite indicators of financial integration

(quarterly data; price-based indicator: Q1 1995 – Q3 2019; quantity-based indicator: Q1 1999 – Q2 2019)



Source: ECB and ECB calculations.
Notes: The price-based composite indicator aggregates ten indicators for money, bond, equity and retail banking markets, while the quantity-based composite indicator aggregates five indicators for the same market segments except retail banking. The indicators are bounded between zero (full fragmentation) and one (full integration). Increases in the indicators signal greater financial integration. From January 2018 onwards the behaviour of the price-based indicator may have changed due to the transition from EONIA to €STR interest rates in the money market component. OMT stands for Outright Monetary Transactions. For a detailed description of the indicators and their input data, see the Statistical Web Annex to this report and Hoffmann, P., Kremer, M. and Zaharia, S. (2019), "Financial integration in Europe through the lens of composite indicators", *Working Paper Series*, No 2319, ECB, September.

The quantity-based composite indicator – which aggregates various measures of relative portfolio shares of intra-euro area cross-border asset holdings – also recorded a minor overall increase during the same period (Chart 20). However, the broad stability in this second composite indicator of financial integration masked rather heterogeneous developments across the different market segments. In particular, a rather strong decline in the measured degree of equity market integration (also picked up by the price-based indicator) was overcompensated for by increasing cross-border holdings in money and bond markets.

74 The price-based money market indicator reflects developments in the unsecured segment using (pre-€STR data as of March 2017. The dispersion of €STR is less volatile than the one of EONIA in the last 2 years. First, unlike for EONIA, the calculation of €STR involves significant trimming (-50% in total, 25% extremes at each tail of the rates distribution are excluded), implying that operations at most dispersed rates end up being trimmed. Second, €STR has a much broader coverage than EONIA (around EUR 30 bn total underlying volume versus just EUR 2 bn for EONIA), diluting the impact of outliers. Third, €STR does not just encompass the interbank market (like EONIA does) but also non-bank financial institutions which makes it more representative of the bulk of money market transactions. Non-bank financial institutions do not have an allowance from the two-tier system assigned to them and do not have access to the deposit facility. Therefore, they cannot exploit the arbitrage in the same way as euro area banks and are still willing to lend/deposit at rates below the deposit facility rate.

On balance, financial integration within the euro area – based on combining a broad range of price-based and quantity-based indicators – exhibits discrepancies and its progress has not been very satisfactory in recent years. We see relatively uneven developments across the market segments considered in this report. We also find notable discrepancies between price-based and quantity-based indicators.[75]

4.1.2 Quality of integration

From the point of view of a monetary union, it is important to look not only at the above-mentioned price-based and quantity-based indicators of financial integration, but also at the "quality" of financial integration. As discussed in the Financial Integration Report 2016, the economic literature has come to the conclusion that that financial integration through equity instruments (either foreign direct investment (FDI) or portfolio equity holdings) is more resilient (e.g. to idiosyncratic shocks) than financial integration through debt instruments.[76] In a similar vein, financial integration based on debt instruments of longer maturities is more stable (e.g. less prone to sudden reversals/outflows), especially during financial tensions or crises, than financial integration based on debt instruments of shorter maturities. Moreover, it is believed that liquidity crises have often been triggered by sudden halts in short-term debt investment.

Against this background, we turn to several indicators of the resilience of financial integration in the euro area. Charts 21, 22 and 23 illustrate the quality of equity, long-term debt and FDI, respectively. Chart 21 presents the first indicator of the resilience of financial integration in the euro area by looking at intra-euro area foreign equity holdings versus foreign debt holdings. Equity integration has experienced stagnation and exhibited a subsequent decline since Q4 2017; thus echoing the negative evolution in the composite indicators reviewed above. In the long run though, equity investments are increasingly becoming more relevant debt investments (representing around 70% of intra-euro area debt holdings), but their level remains low. This evolution has been driven by two concurrent phenomena: a gradual increase and subsequent levelling-off in intra-euro area equity holdings and a gradual decline and subsequent levelling-off of intra-euro area debt securities holdings. While the long-term trend of equity integration is encouraging, the adverse current trend and the low level of equity integration leave room for further improvement.

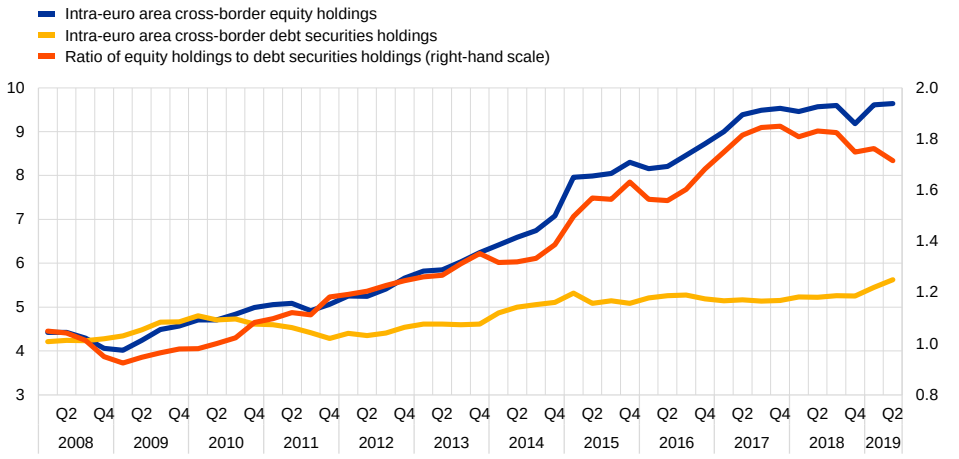
[75] See also AFME Capital Markets Union – Key Performance Indicators (Second Edition), October 2019, which provides a set of complementary indicators.

[76] See Financial integration in Europe, April 2016.

Chart 21

Equity integration, though stagnant, is increasingly becoming more than debt investments

(left-hand scale: EUR trillions; right-hand scale: ratio; Q1 2008 – Q2 2019)

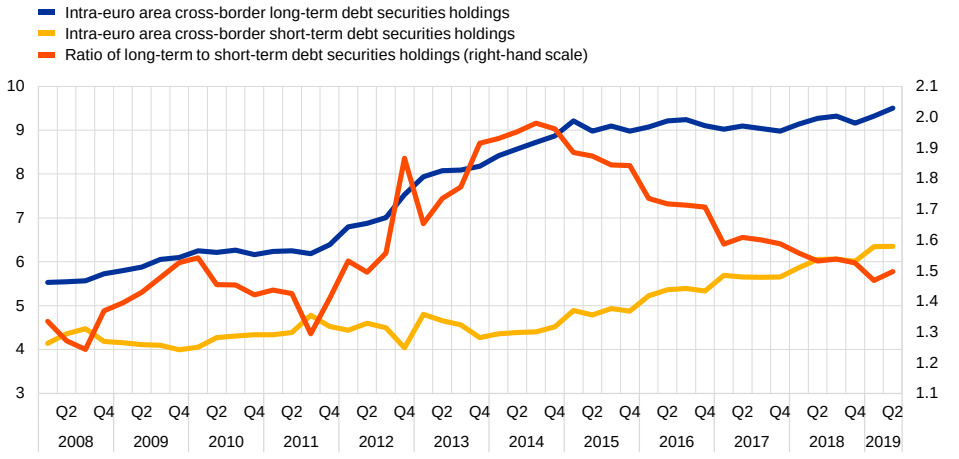


Source: ECB and ECB calculations.
Notes: The blue line shows the total amount of equity holdings by euro area investors (all sectors) issued by residents of other euro area countries. The yellow line shows the total amount of debt securities holdings by euro area investors (all sectors) issued by residents of other euro area countries. The orange line shows the ratio of the two. For both equity and debt investments, the total refers to the sum of intra-euro area cross-border and domestic asset holdings

Chart 22

Cross-border holding of short-term debt is on the rise and is coupled with a broadly stable trend in long-term debt integration

(left-hand scale: EUR trillions; right-hand scale: ratio; Q1 2008 – Q2 2019)



Sources: ECB, ECB calculations based in particular on balance of payments data, and Eurostat.
Notes: The blue line shows the total amount of long-term debt (with a maturity of more than one year) issued by euro area countries and held by residents of other euro area countries. The yellow line shows the total amount of short-term debt (with a maturity of less than one year) issued by euro area countries and held by residents of other euro area countries. The orange line shows the ratio of the two.

Since late 2014, we note an increase in cross-border holdings of short-term debt, which is reminiscent of the recent increase in money market integration picked up by the composite indicators. This is shown in Chart 22 which looks at intra-euro area foreign long-term debt holdings versus foreign short-term debt holdings. This trend combined with a broadly stable trend in long-term debt resulted in a decrease in the ratio of intra-euro area exposures to long-term debt relative to

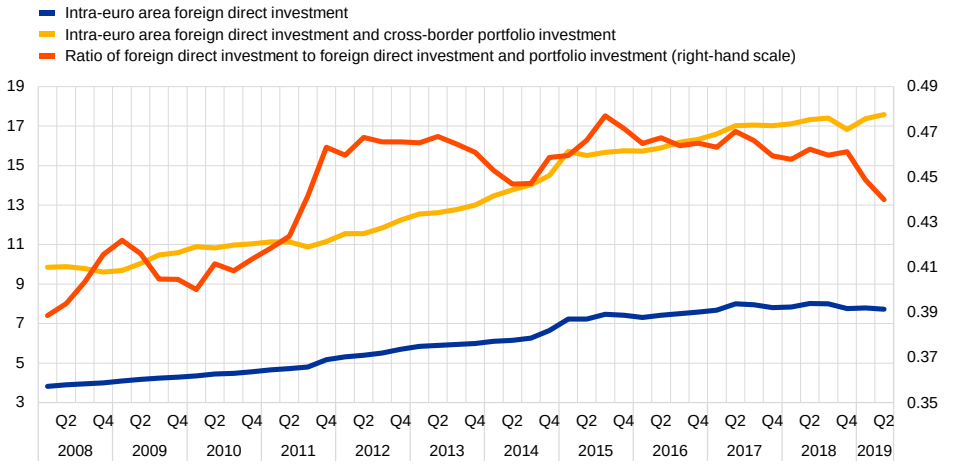
short-term debt, currently standing at roughly 1.5. The trend may be affected somewhat by the asset purchase programme (APP) implemented in a decentralised fashion by the Eurosystem. Since the recent trend in short-term debt integration has eroded part of the positive trend witnessed since 2008, further developments should be monitored.

As short-term flows are thought to be more volatile, it is important to look at the maturity of the intra-euro area capital flows. Chart 23 presents the share of FDI in total foreign investment, given its long-term and relatively fixed nature. One stark observation is the falling role of FDI since Q2 2017, to a level close to that of Q3 2011. At the same time, it should be noted that the repatriation of foreign earnings by US multinationals affected FDI flows over this period.[77] Against this background, the share of intra-euro area FDI in total foreign investment increased only modestly over the entire period considered in Chart 17; thus contrasting with the substantial increase between 2008 and Q2 2017. Overall, the evolution of FDI integration should be monitored, considering the sharp decline over the past three years.

Chart 23

The share of FDI in total foreign investment has been declining in recent years

(left hand scale: EUR trillions; right-hand scale: ratio; Q1 2008 – Q2 2019)



Source: ECB.
Notes: The blue line shows the total amount of intra-euro area foreign direct investment. The yellow line shows the evolution of the sum of intra-euro area foreign direct investment and intra-euro area cross-border portfolio investment. The red line shows the ratio of the two.

Finally, the composition of intra-euro area foreign bank lending remains skewed towards wholesale lending. As shown in Chart 24, cross-border direct lending to households and NFCs (excluding lending by local branches and subsidiaries of foreign banks) still accounts for a small share of total foreign bank

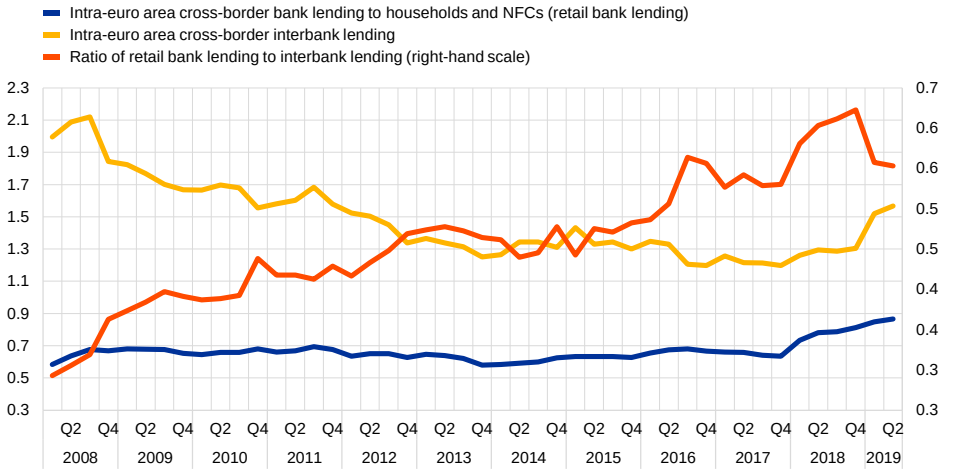
[77] See European Central Bank (2019), "Euro area foreign direct investment since 2018: the role of special purpose entities", *Economic Bulletin*, Issue 5. The Bureau of Economic Analysis (BEA) reported around USD 300 billion of repatriated earnings in the first quarter of 2018 and about USD 170 billion in the second quarter. See Bureau of Economic Analysis (2018). See "Effects of the 2017 Tax Cuts and Jobs Act on Components of the International Transactions Accounts" *US International Transactions Third Quarter 2018*, December. According to the United Nations Conference on Trade and Development (UNCTAD), these amounts largely correspond to the contraction in Europe-United States liabilities. See United Nations Conference on Trade and Development (2019), "Global foreign investment flows dip to lowest levels in a decade", *Global Investment Trends Monitor*, No 31, January.

lending in the euro area. Although foreign bank lending has been rising overall, it is still below 1% and a decrease is visible over the past few quarters.

Chart 24

Direct foreign bank lending to households and NFCs still plays a very limited role

(left-hand scale: EUR trillions; right-hand scale: ratio; Q1 1999 – Q2 2019)



Source: ECB.
Notes: The blue line shows the total amount of intra-euro area cross-border bank lending to households and NFCs, i.e. retail bank lending. The yellow line shows the total amount of intra-euro area cross-border lending between MFIs, i.e. interbank lending. The orange line shows the ratio of the two. For more discussion on the interpretation of these indicators, see Special Feature A "Financial integration and risk sharing in a monetary union" in the 2016 ECB report on "Financial integration in Europe".

Ultimately, a high "enough" degree of financial integration and financial resilience, in terms of both quantity and quality, will be required to pursue more genuine finance-based risk sharing in the euro area (see next Box 5).

Box 5

On the measurement of risk-sharing in the euro area

Prepared by Alessandro Giovannini, Carl-Wolfram Horn, Francesco Paolo Mongelli, and Alexander Popov

There is a rich literature investigating the benefits of developed and integrated financial markets for, among other things, insulating private consumption from shocks to domestic income, referred to as "risk sharing". In an international context, this is denoted as cross-country risk sharing, although this stabilisation property is also relevant for federations and monetary unions. Starting from the two seminal papers by Lewis (1996)[78] and Asdrubali et al. (1996)[79], the literature has over time crystallised two distinct but complementary approaches for assessing the extent of risk sharing, i.e. the extent to which private consumption is decoupled from aggregate output dynamics. The first approach by Lewis (1996) is operationalised by Sorensen et al. (2006) who estimate the degree of risk sharing by regressing changes in consumption on changes in GDP and test whether a country's consumption growth is uncorrelated with its GDP growth. The second approach by Asdrubali et al. (1996) – later refined in Sorensen and Yosha (1998)[80] – relies instead on a

[78] Lewis, K. (1996), "What Can Explain the Apparent Lack of International Consumption Risk-sharing?" *Journal of Political Economy*, Vol. 104 (2), pp. 267-297.

[79] Asdrubali, P., Sorensen, B. and Yosha, O. (1996), "Channels of interstate risk sharing: United States 1963-1990", *Quarterly Journal of Economics*, Vol. 111(4), pp. 1081-1110.

[80] Sorensen, B. and O. Yosha (1998), "International risk sharing and European monetary unification", *Journal of International Economics*, Vol. 45(2), pp.: 211-238.

decomposition of the cross-sectional variance of shocks to GDP that closely follows the structure of national accounts. This approach makes it possible to investigate the various channels through which consumption can be smoothed inter-temporally, i.e. via capital markets, credit markets, and international transfers.

Enhancing risk-sharing is particularly important for the European EMU. As EMU is still incomplete, though advancing in terms of governance, it suffers from distinct frictions and fragilities. Early papers on risk sharing in the euro area have shown that risk sharing increased considerably following the launch of the euro (see Demyanyk et al., 2008).[81] After the recent financial crisis, many authors have re-investigated the matter with rather mixed results. Cimadomo et al. (2018)[82] find that following the launch of the euro only about 40% of country-specific output shocks were smoothed, while in the aftermath of the euro area crisis this share increased to about 65%. According to the authors, the main drivers of such higher shock-absorption capacity were higher overall financial integration, but also the financial support provided by new European tools like the European Stability Mechanism (ESM) to countries undertaking an adjustment programme, which allowed these countries to achieve a higher degree of public risk sharing. Based on a similar set of countries, Milano (2017)[83] also finds that lending by European tools like the ESM has a positive effect on consumption risk sharing in the euro area. Contrary to these studies, Kalemli-Ozcan et al. (2014)[84] show that risk sharing turned negative during the crisis because (conditional on world consumption growth) the decline in GDP in 2010 was accompanied by a more than proportional decline in consumption in euro area countries. Similarly, Alcidi et al. (2017)[85] also find only very limited cross-country risk-sharing capacity in the euro area (due to a high and heterogeneous persistence of shocks, combined with systematic under-performance and over-performance of certain euro area countries).

Against the background of such differential results about the extent of risk sharing in the euro area, this box provides an initial investigation of several factors at play. The preliminary nature of the findings warrants further investigations as to whether differences in country samples, time windows, and methodological approaches affect these estimates. Overall, the initial findings presented in this box suggest that the risk sharing in the euro area is currently rather limited, as pointed out in previous editions of the ECB Financial Integration Report.

As a start, we consider a quarter-by-quarter cross-sectional regression of consumption growth on output growth. Using a similar methodology to that followed in the Financial Integration Reports for 2016 and 2018, based on the Lewis (1996) approach, Chart A (left-hand side) plots the contemporaneous correlation between domestic GDP growth and domestic consumption growth for a panel of EA12 countries, over rolling 12-quarter windows.[86] Based on this analysis, we fail to reject

81 Demyanyk, Y., Ostergaard, C. and Sorensen, B.E. (2008),) "Risk Sharing an Portfolio Allocation in EMU," *Economic Papers*, No 334, European Commission Directorate General Economic and Financial Affairs.

82 Cimadomo, J., Fortuna, O. and Giulidori, M. (2018), "Private and public risk sharing in the euro area", *Working Paper Series*, No. 2148, ECB.

83 Milano (2017),) "Risk sharing in the euro zone: the role of European institutions", *CeLEG Working Paper Series*, No. 01/17.

84 Kalemli-Ozcan S., Luttini, E. and Sørensen, B. (2014) "Debt Crises and Risk-Sharing: The Role of Markets versus Sovereigns," Scandinavian Journal of Economics, Wiley Blackwell, Vol. 116(1), pp. 253-276.

85 Alcidi, C., D'Imperio, P. and Thiron, G. (2017), "Risk-sharing and consumption-smoothing patterns in the US and the euro area: a comprehensive comparison", *CEPS Working Document*, No. 2017/04.

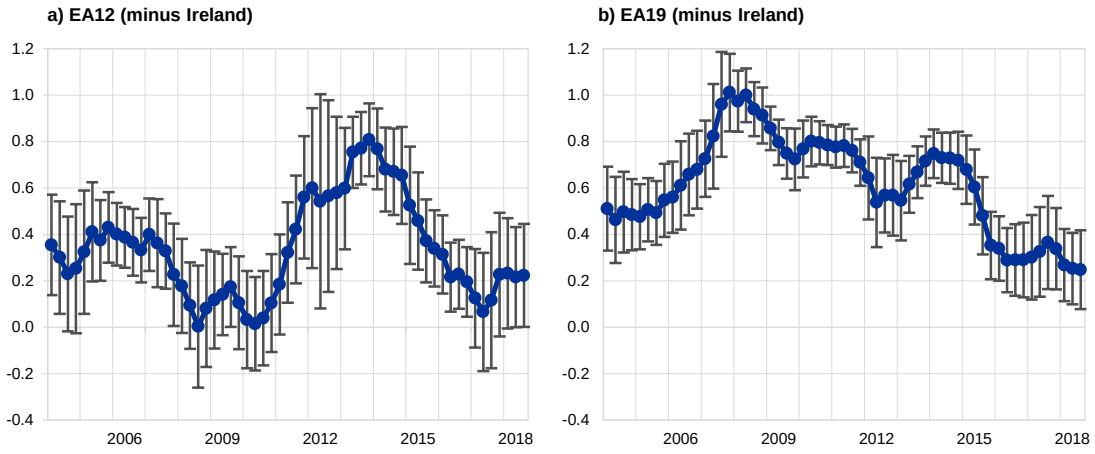
86 For simplicity the control for changes in relative prices (the ratio of the respective country consumer price index to the euro area consumer price index) is excluded in this analysis. The overall results are only partially affected by this decision, i.e. the inclusion/exclusion has no impact on the statistical relevance of the correlation.

the hypothesis of perfect risk sharing in the euro area in the most recent period: even though the correlation between domestic consumption and GDP growth is slightly above zero for the most recent period, it is statistically indistinguishable from zero at the 95% confidence level. This is a visible reversal of the trend during the period of the global financial crisis and the sovereign debt crisis: i.e. when the data soundly rejected the null hypothesis of perfect risk sharing in the euro area. Arguably, the data sample used is limited (also due to the exclusion of Ireland, given the large GDP revisions in 2016 and large impact on GDP developments of a limited number of big economic operators)[87], but it still makes it possible to measure the extent of risk sharing in the EMU consistently, without being influenced by new countries joining the monetary union. When considering all current countries in the EMU (18, still excluding Ireland) over the same period, the correlation is still slightly above zero but appears to be statistically distinguishable from zero at the 95% confidence level for most of the time period in question (see Chart A, right-hand side). While further analysis is needed to understand the drivers of these differences, the conflicting results are not so surprising considering the impact that adopting the euro had on countries' financial and trade flows.

Chart A

Correlation of consumption and output in euro area countries

(quarterly data; Q3 2004 – Q1 2019)



Sources: ECB and ECB calculations.
Notes: The chart plots point estimates (dots) and confidence intervals (whiskers) from a panel regression of changes in country per capita consumption on changes in country per capita GDP. Each dot and whisker is estimated for data from the twelve quarters preceding the time indicated on the horizontal axis (rolling window).

Against this background, it is important to analyse which factors support or hinder risk sharing when looking at the cumulative effect of the various underlying channels. Given the transformations and shocks in the euro area economy and financial system, and the paucity of observations, it is essential to proceed with caution. Following the approach developed in previous Financial Integration Reports, we first provide updated results using the framework by Asdrubali and Kim (2004) enhanced for relative price adjustments and applied to a panel of EA12 countries (again, excluding Ireland), over rolling 10-year windows. The results are reported in Chart B and suggest that the contribution of each channel to the risk sharing in the euro area has remained broadly stable over the past several years. The capital channel – primarily via the cross-border ownership of productive assets and labour income from abroad (cross-border wage payments) – cumulatively smooths around 15% of a shock to country-specific GDP (see dark blue bar). The contribution of the fiscal channel – via cross-border transfers to both individuals and governments, such as remittances and

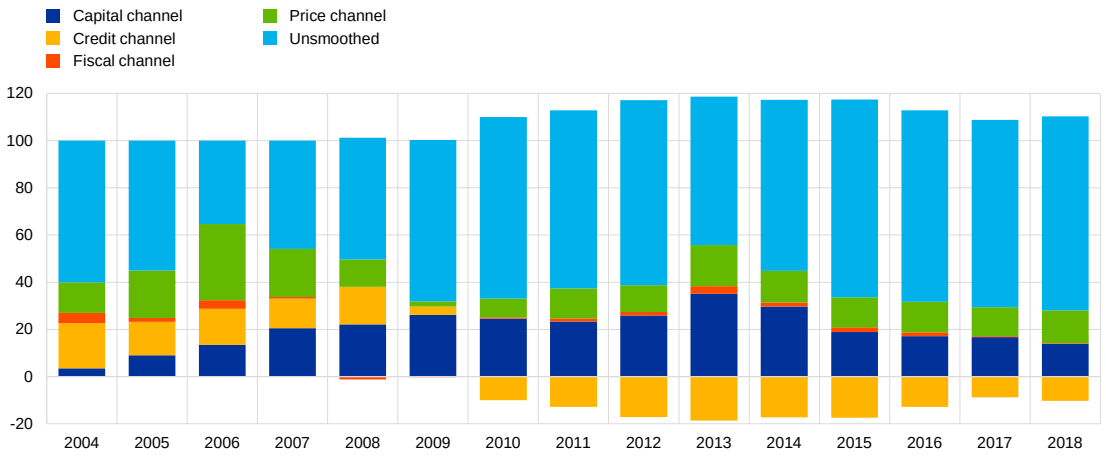
[87] See Irish GDP revision – European Commission, 12 December 2016.

EU structural funds – is negligible (red bar). As for the contribution of the credit channel – via cross-border borrowing and lending by both individuals and governments – it is negative, albeit less so than during the period of the financial crisis (yellow bar).[88] Last, a price channel (green bar) is also at work to support the smoothing of idiosyncratic shocks (as discussed in the Financial Integration Reports 2016 and 2018, and in Asdrubali et al., 2018). This channel also smooths around 15% of a country-specific shock to GDP. At the same time, a separate analysis shows complex interactions between the price channel and the other risk-sharing channels, suggesting the need for further investigation.

Chart B

Consumption risk-sharing in the EA12 (minus Ireland) and its channels

(percentages)



Source: ECB calculations.
Notes: The chart displays, by year, the contribution of capital markets (via cross-border ownership of productive assets), credit markets (via cross-border borrowing and lending), fiscal tools (via public cross-border transfers), and relative prices (via changes in the domestic consumer price index relative to the euro area average index) to the smoothing of country-specific shocks to real GDP growth. The respective contributions are calculated using a vector-autoregression (VAR) model whose parameters are estimated over a ten-year rolling window of annual data, applying the Asdrubali and Kim (2004) approach enhanced for relative price adjustments. The bars display the share of a one-standard-deviation shock to domestic GDP growth that is absorbed by each respective risk-sharing channel. The shares are computed on the basis of the cumulative impact of the shock on the variables capturing each risk-sharing channel over a five-year horizon. Year-to-year variations in the shares reflect changes in the re-estimated model parameters. The remaining portion represents the portion of the shock to country-specific real GDP growth that remains unsmoothed and is fully reflected in country-specific consumption growth. The individual bars may fall below 0% if one or more of the channels involved has a dis-smoothing effect on country-specific consumption growth. All bars together total 100%.

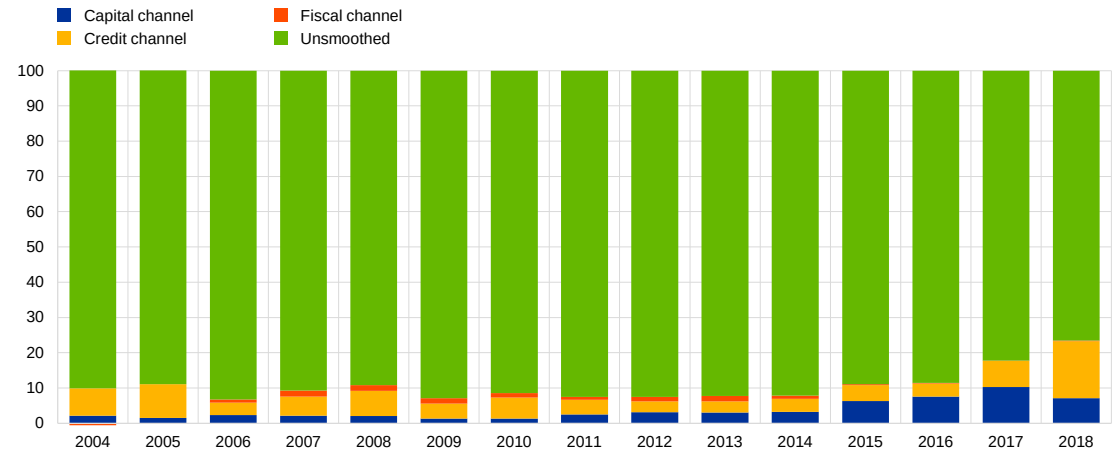
Slightly changing the specification of the above approach and enlarging the set of countries in the sample affects the results. When the sample is enlarged to include all current euro area countries, while still excluding Ireland, and the price channel is removed, a slightly different picture emerges. While this specification benefits from an increased sample size, it considers euro area countries and countries jointly before their actual adoption of the euro. Chart C shows that a large part of the shocks still remains unsmoothed, although the unsmoothed component is higher than in the previous chart. The capital channel smooths around 8-10% of a shock to country-specific GDP cumulatively over the five years following the shock. The contribution of the fiscal channel remains negligible. The contribution of the credit channel is above 12% and rises in the most recent sub-period.

[88] An important caveat is that credit channel captures both cross-border and domestic saving and dissaving (both private and public).

Chart C

Consumption risk-sharing in the EA19 (excluding IE) and its channels

(percentages)



Sources: ECB and ECB calculations.
Notes: The chart displays, by year, the contribution of capital markets (via cross-border ownership of productive assets), credit markets (via cross-border borrowing and lending), and fiscal tools (via public cross-border transfers) to the smoothing of country-specific shocks to real GDP growth. The respective contributions are calculated using a vector-autoregression (VAR) model whose parameters are estimated over a ten-year rolling window of annual data, applying the Asdrubali and Kim (2004) approach enhanced for relative price adjustments. The bars display the share of a one-standard-deviation shock to domestic GDP growth that is absorbed by each respective risk-sharing channel. The shares are computed on the basis of the cumulative impact of the shock on the variables capturing each risk-sharing channel over a five-year horizon. Year-to-year variations in the shares reflect changes in the re-estimated model parameters. The remaining portion represents the portion of the shock to country-specific real GDP growth that remains unsmoothed and is fully reflected in country-specific consumption growth. The individual bars may fall below 0% if one or more of the channels involved has a dis-smoothing effect on country-specific consumption growth. All bars together always total 100%.

Given the important differences in the findings presented, some caution is needed in interpreting them and in distilling the messages from the risk-sharing literature. A better understanding of the underlying set of data and the nuances of the two approaches is required. Despite the fact that the above approaches constitute the state of the art in the academic literature, they still have various shortcomings. The approach by Lewis (1996), for instance, ignores many interfering factors and the approach by Asdrubali et al. (1996) is rather inflexible given its strong reliance on the structure of national accounts. These problems seem to lead to robustness issues in the measurement of risk sharing. Moreover, the last ten years have been momentous for the euro area and the role of exceptional policies also needs to be better understood. Therefore, care should be taken in interpreting the diverse risk-sharing channels and further robustness analyses are needed.

All in all, risk sharing in the euro area remains at relatively low levels and is unstable over time. Most studies assessing the current extent of risk sharing among euro area countries conclude that it is rather low – at least compared with the risk sharing typically observed across regions or states within a single country or federation. As documented in this section, intra-euro area cross-border lending is modest and cross-country asset ownership is rising – but slowly. Moreover, discussions on establishing a genuine fiscal capacity for the euro area have stalled and the limited size of the EU budget does not allow scope for playing a meaningful stabilisation role. All this poses challenges for macroeconomic stabilisation in the euro area. While further work is needed to develop and refine the methodologies for estimating risk sharing, the evidence gathered in this section and the overall low and unstable level of risk sharing in the euro area clearly indicates the need to complete the banking union as well as to advance the European CMU.

4.2 Credit markets

4.2.1 Money markets

The increased supply of reserves by the Eurosystem had mixed effects on the integration of money markets. On the one hand, the asset purchase programme (APP) contributed to the contraction of interbank trading activity between euro area banks as the injection of excess reserves reduced counterparties' need for cash. On the other hand, the targeted longer-term refinancing operations (TLTROs) and the securities lending programme helped to ease funding conditions and support repo market activity. Hence, while unsecured trading volumes decreased, funding rates converged. This means that although banks are less connected, they face more analogous conditions across the euro area.[89]

The unsecured and secured segments of money markets have not uniformly responded to an environment characterised by excess liquidity and regulatory changes. The decline in turnover in the unsecured segment was driven by the ample liquidity injection, reducing the need for interbank cash funding, as well as aversion to counterparty credit risk and regulation, further disincentivising risk-taking. A new development over the review period is that the share of non-banks lending cash to euro area banks has increased, which does not indicate a recovery of money market activity or a sign of financial integration, but rather the joint effect of a mechanical redistribution of liquidity caused by the APP and the fact that these non-banks are not allowed to deposit cash at the Eurosystem (Chart 25). With regard to prices observed in the unsecured segment, downward pressure on rates and spread compression continue to be observed. The spread between the three-month EURIBOR and overnight index swap (OIS) rates is a particularly relevant parameter for financial integration, as it is an indicator of how credit and liquidity risks are perceived and therefore of tensions in money markets[90]. Since 2017 it has returned in pre-crisis levels, illustrating how the provision of long-term central bank funding may have strengthened the confidence of investors and depositors and helped banks to regain access to financing (Chart 26). The favourable rate for TLTROs supported mostly the non-core banks with higher take-ups, thus favouring a convergence in funding costs for all banks in the euro area.

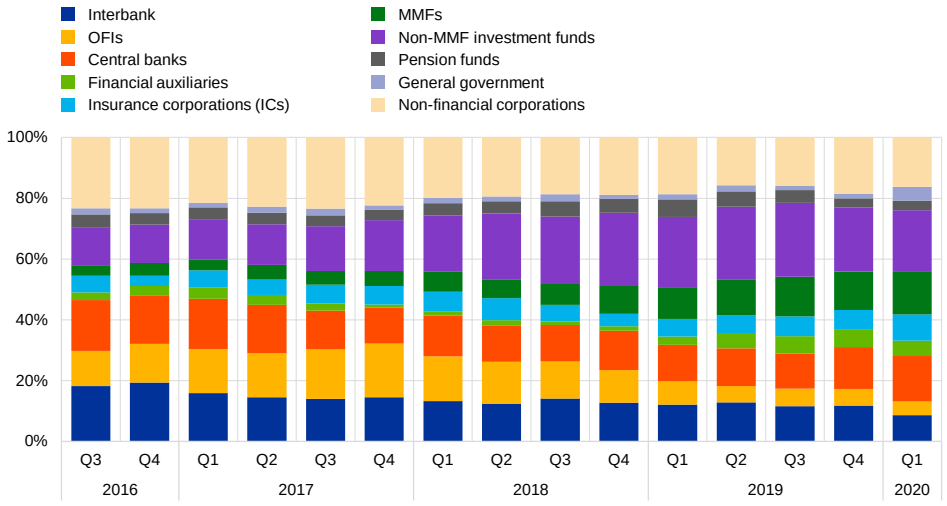
89 This is, however, not a necessarily an indication of increased integration of money markets. TLTRO rates do not take the risk profile of banks into account. Therefore banks with higher credit risk might get a lower TLTRO rate than they would get in a well-integrated market, in which risk differentiation is applied.

90 Such a spread provides an implicit comparison between two alternative strategies available to any bank willing to lend funds on the interbank market: a one-shot strategy (OS) versus a roll-over strategy (RO). In an OS strategy, funds are lent for three months to one bank at the three-month EURIBOR rate. In a RO strategy, over three months, funds are lent each day until the next day at the overnight rate. The borrower bank is not necessarily the same on each day. In the OS strategy, the lender is more exposed to credit risk, as the RO strategy can only generate a credit loss if the borrower bank defaults overnight. The lender is also more exposed to liquidity risk as the contract is illiquid for three months while the RO strategy can be interrupted on any given day and the released funds be diverted to other uses.

Chart 25

Other sources of funding in the euro area

(sources of unsecured borrowing; in percentages)

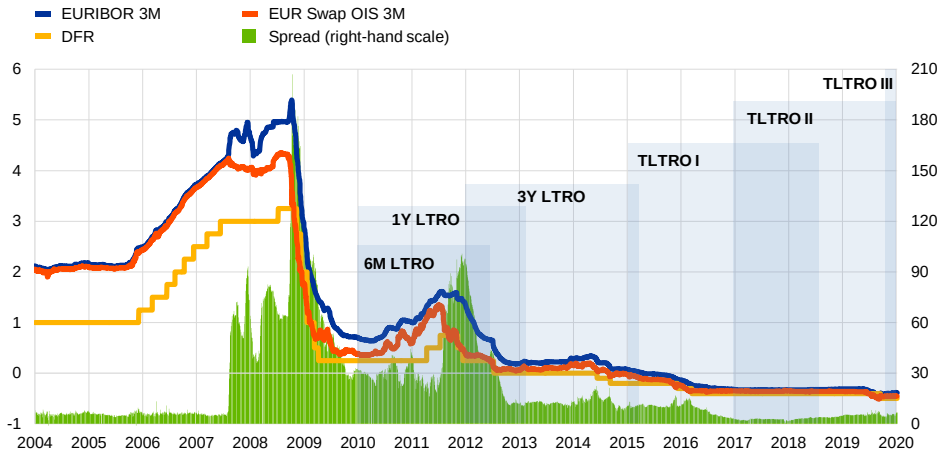


Sources: MMSR, ECB calculations.

Chart 26

3-month EURIBOR and three-month OIS rates

(three-month EURIBOR, three-month OIS rates and their spread)



Sources: Bloomberg, ECB calculations.

In the secured segment, the ample liquidity situation has also reduced the need for cash funding, while regulation has increased demand for high quality liquid assets (HQLA). This has transformed the repo market from a platform for cash exchange to one for collateral exchange. Chart 27 illustrates how the reduced need for short-term funding in an environment of excess liquidity implies that banks have fewer incentives to conduct general collateral (GC) repo transactions, which are frequently used for cash management.[91] Simultaneously, due to regulatory

[91] However, due to higher liquidity demands and increased fragmentation of the money markets funding stress can emerge even in an environment of excess liquidity. This was the case during the September 2019 funding stress in the United States, which however did not affect euro area money market functioning.

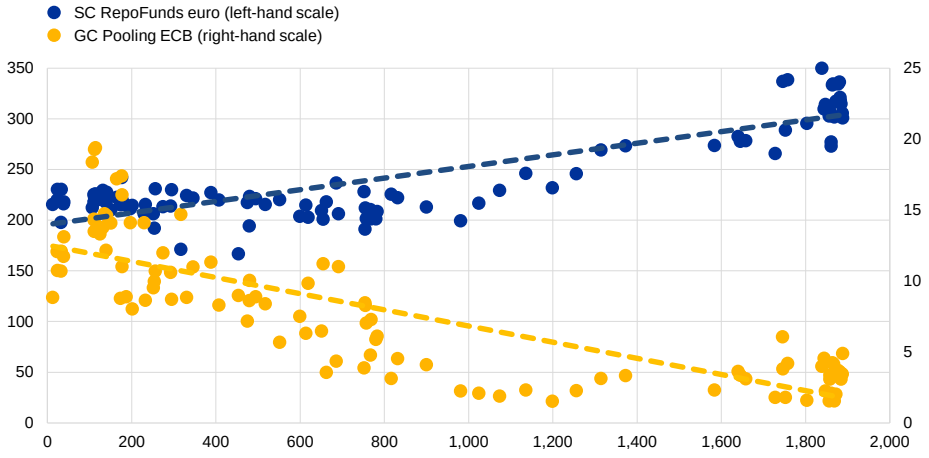
requirements, the demand for HQLA government bonds has grown significantly, amid lower availability of marketable HQLA due to the APP. As a result, counterparties seeking a specific security (special collateral – SC) agree on a repo rate that is well below the deposit facility rate (DFR), pricing in its scarcity.

Prices in the secured segment exhibit differentiation depending on the collateral issuer, especially for the highest quality and most liquid assets, which should not, however, be attributed to fragmentation. For the ECB, the interbank market would continue to be considered fragmented if potential participating banks were not treated equally when active in the market, despite having similar risk profiles. Chart 28 shows that the overnight borrowing costs for repo transactions backed by collateral issued in core countries with better ratings and macroeconomic outlooks (like Germany, the Netherlands and France) are lower than for non-core countries (such as Italy or Spain). As a result, the ongoing dispersion in rates should be seen as reflecting different pricing for risk differentiation based on collateral parameters, such as ratings or macroeconomic outlook. Moreover, in the period under review, a modest narrowing of the spread between repo rates and the ECB's DFR, in particular for core country collateral, was observed in a stable rating outlook environment. By increasing the effective supply of securities that are in high demand, the securities lending programme helped to address potential collateral shortages in the system.

Chart 27

Excess liquidity and the transformation of the secured market

(y-axis: GC secured volumes (left-hand scale); SC secured volumes (right-hand scale); x-axis: excess liquidity; EUR billions)

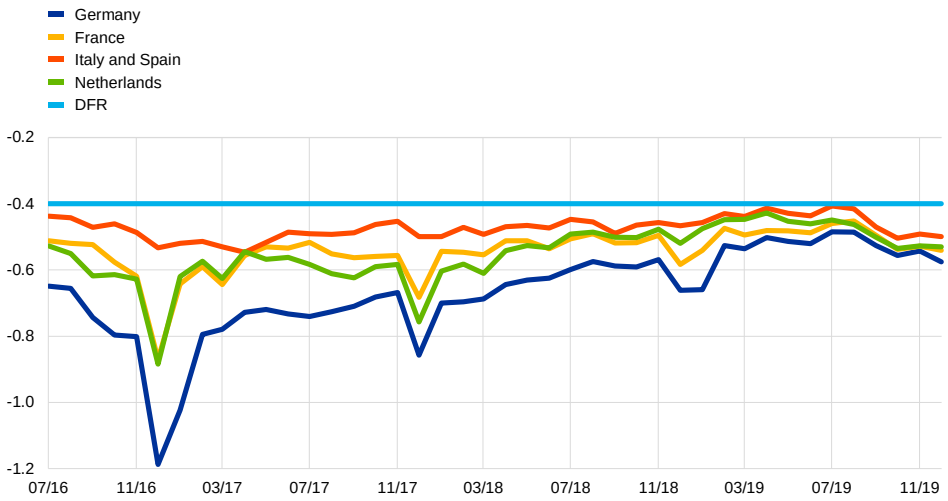


Sources: Bloomberg, ECB calculations.

Chart 28

Weighted average borrowing rates by location of collateral issuer

(cash borrowing against collateral in percentages)



Sources: MMSR, ECB calculations.
Notes: One-day rates (overnight, spot/next, tomorrow/next). Spain and Italy are depicted jointly to comply with confidentiality rules.

The introduction of the two-tier system for the remuneration of excess reserve holdings had so far not had a material impact on money market rates, despite a redistribution of excess reserves between euro area banks aimed at exploiting their exemption allowances. When the two-tier system became effective on 30 October 2019[92], it triggered some swift cross-border liquidity flows in the repo segment, especially towards Italy, but no material impact was observed on rates except on isolated dates. In the unsecured segment, additional lending was predominantly provided by domestic counterparties. This might suggest a lack of willingness to lend cross-border and therefore money market integration still being imperfect. All in all, the upward pressure on the overnight rates remained small.

Box 6

What payment systems reveal about financial integration[93]

Prepared by Paola Donati and Francesco Vacirca

The intertemporal analysis of payment networks in Europe provides an interesting perspective for monitoring financial integration. Payment networks arise when financial institutions, and in particular banks, make payments to each other.

The core of the euro-denominated payment networks is the TARGET2 system,[94] which went live in 2007 with the stated objective of enhancing European financial integration. By creating

92 The two-tier system remunerates part of banks' excess holdings with the Eurosystem at zero: the so-called exempt tier for reserve remuneration applies for the maintenance period starting on 30 October 2019 and exempts part of credit institutions' excess liquidity holdings (i.e. reserve holdings in excess of minimum reserve requirements) from negative remuneration at the rate applicable on the deposit facility. This provides new incentives for cross-border trading as some banks need inflows from other jurisdictions to fully utilise their exempt tier.

93 This Box is based on Vacirca, F., Kahros, A. and Rosati, S. (2019), "Detecting community critical participants in payment networks: an application to TARGET2," *Proceedings of the 17th Simulator Seminar*, Suomen Pankki.

seamless and direct links among all of the main European banks, TARGET2 has made it possible to settle payments with the same ease, whether they are among domestic entities or between domestic and cross-border entities.

Payment system networks are characterised by nodes and links. In TARGET2, the nodes are the banks participating in the system. A link exists between two nodes if the two banks exchange payments. In any network, groups of nodes labelled "communities" may be identified according to various criteria. One criterion consists in clustering the nodes (i.e. the banks) by their nationality, and then focusing on "national communities." For example, groups of German banks or groups of French banks. Another criterion consists in identifying communities that maximise "modularity" which measures how intensely the nodes of the community interact with one another (i.e. exchange payments) as opposed to the rest of the network. In "modularity communities" the density of the links (i.e. the number of links) among the nodes of the same community is greatest. Financial integration may be monitored by contrasting developments in modularity communities with developments in national communities.

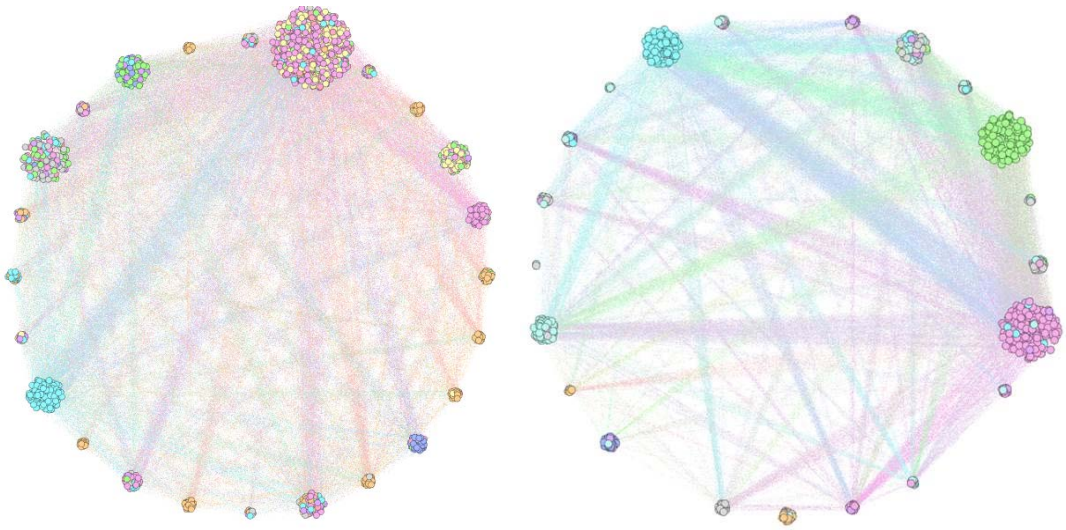
The analysis of the developments observed from 2008 to 2018 in the structure of such networks confirms that financial integration across TARGET2 banks has materially increased over the past ten years. Chart A depicts TARGET2 payment networks in 2008 (left panel) and in 2018 (right panel). The nodes are represented by the coloured dots, the national communities are represented by the groups of coloured dots, and the modularity communities are made of dots of the same colour. If all the dots in a group have the same colour, e.g. a group of green dots, and there are no dots of that colour outside that network, e.g. all green dots are in that group, it means that the national community and the modularity community coincide, so that the banks of that green national community exchange payments primarily with each other. From the visual comparison of the left and right panels it can be seen that in 2008 national communities largely overlapped with modularity communities. By contrast, in 2018 the mix of colours within most national communities – stemming from a higher density of links among the nodes of different nationalities – reflected increased financial integration. This is formally confirmed by the results shown in Chart B.

[94] TARGET2 is the real-time gross settlement system provided and operated by the Eurosystem for the settlement of euro-denominated payments in central bank money. TARGET2 replaced the TARGET system that went live in 1999, a few days after the launch of the euro, to support monetary policy operations and to settle euro payments across national borders in the EU.

Chart A

TARGET2 bank network in 2008 and 2018

(left panel: 2008; right panel: 2018)



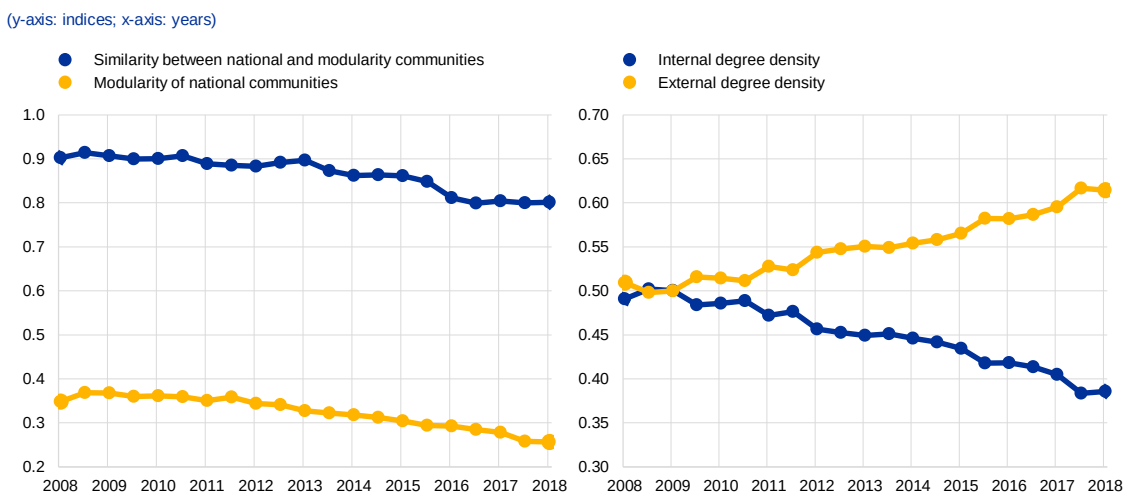
Sources: TARGET2 and ECB calculations.

Chart B, in the left panel, shows two measures characterising the networks among TARGET2 bank communities. The dotted yellow line depicts the intertemporal evolution of national communities' modularity (reflecting the density of interactions among banks within the same national community) compared with the density of the interactions the same banks have with the rest of the network. The fact that it trends downwards means that the relevance of the interactions within the same national community has been diluted over time to the benefit of increased interactions across national communities. The dotted blue line depicts the intertemporal evolution of an index gauging the similarity between national communities and modularity communities. The fact that it too trends downwards indicates that these two types of communities have become increasingly dissimilar over time. Whereas in 2008 the modularity communities characterising the structure of TARGET2 were primarily nationally anchored, in 2018 those modularity communities included banks of different nationalities as a result of the progressive integration of banks located across borders.

Over the past ten years, the number of relationships that TARGET2 banks maintain with banks within the same national community has steadily decreased, while the number of relationships they have with banks of other national communities has increased. This is shown in the right panel of Chart B by the blue dotted line – reflecting the degree of link density within communities – which declines as a result of the progressive decline in the density of relationships within national communities. Instead, the yellow dotted line – reflecting the degree of link density across communities – trends upwards as a result of the expansion in the density of relationships across national communities.

Chart B

Measures of TARGET2 bank networks (left panel) and density of national versus cross-border relationships among TARGET2 banks (right panel)



Sources: TARGET2 and ECB calculations.

Notably, the rise in the number of payment relationships across European banks occurred independently of national consolidation processes, which may have reduced the number of relationships within the affected national communities. It is also independent of new subsidiaries that banking groups may have in different countries. In fact, banking groups have progressively consolidated the management of their payments so that the TARGET2 accounts originally opened by subsidiaries abroad have been closed in favour of directly using the TARGET2 account of the parent company.

An open question for future research is how the robustness of today's TARGET2 payment networks to adverse shocks and contagion compares with pre-crisis network structures. At this stage, the decline in the modularity of today's bank communities can already be considered a sign of increased resilience.

4.2.2 Retail banking markets

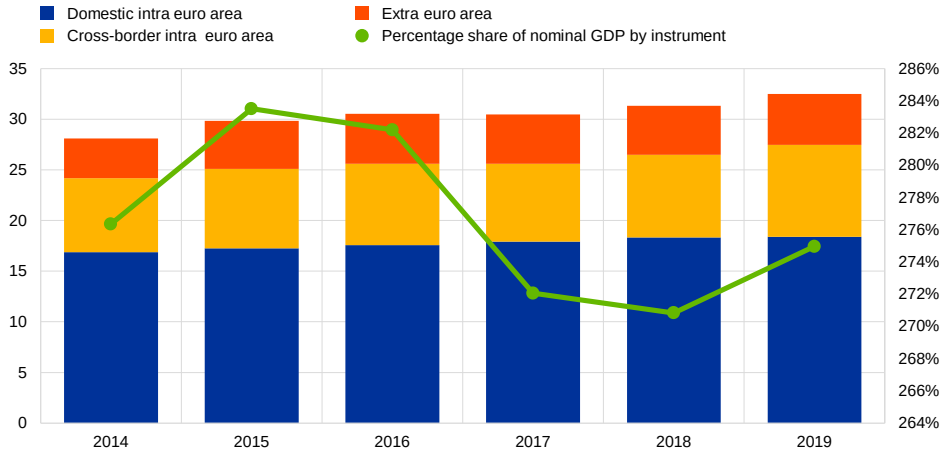
The integration of retail banking markets is characterised by three contrasting developments. First, while domestic intra-euro area loans still represent the bulk of loans granted, the share of cross-border intra-euro area loans has risen over the review period (Chart 29). Second, the stock of total loans, as a share of nominal GDP, has somewhat declined since 2014, though posting a small rebound in 2019. Third, the dispersion of MFI interest charged on new loans, where a two different pictures emerge for NFCs and for households. The dispersion of MFI interest on new loans to NFCs has declined to pre-crisis levels since 2013 and has wavered at low levels over the review period. No doubt this pricing is benefiting from accommodative non-standard monetary policy measures (especially TLTROs and especially for banks in non-core countries). The dispersion of MFI interest on new loans to households is

more nuanced however (Chart 31). While dispersion of mortgage loans has been declining, that of consumer credit has not and remains at high levels.

Chart 29

Stock of loans in the euro area and domicile of financing provider

(left-hand scale: EUR trillions; right-hand scale: %; 1999 to 2019)

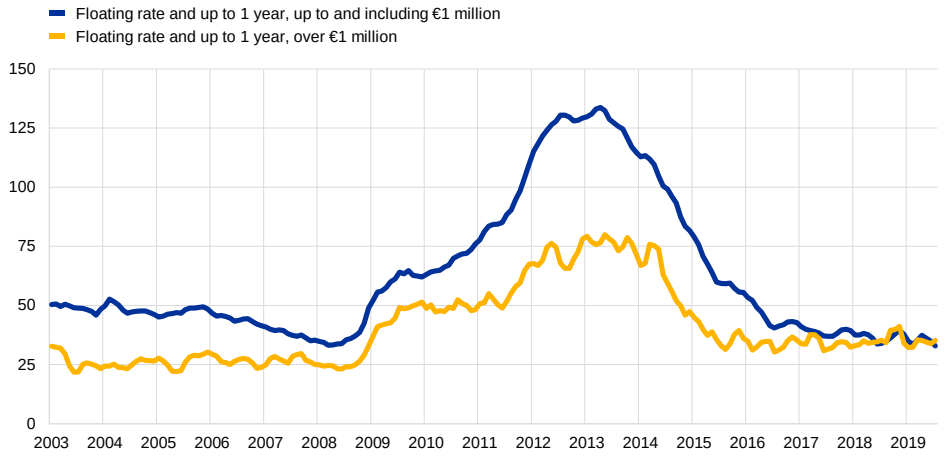


Source: ECB.
Note: The stock of loans for year 2019 refers to Q3 2019 values. Annual GDP for the year 2019 is calculated as the sum of quarterly nominal GDPs from Q4 2018 – Q3 2019.

Chart 30

Cross-country standard deviation of MFI interest rates on new loans to NFCs

(basis points, monthly data, January 2003 – November 2019)

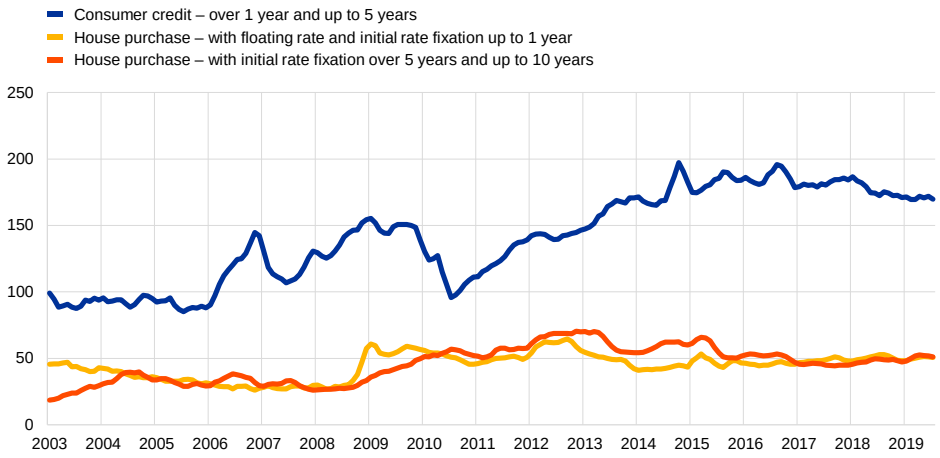


Source: ECB.

Chart 31

Cross-country standard deviation of MFI interest rates on loans to households

(basis points, monthly data, January 2003 – November 2019)



Source: ECB.

The latter may be the result of loans for consumer credit, which are less secure than mortgages, reflecting differences in domestic credit standards of both lenders and recipients. Hence, low integration in this segment might reflect some heterogeneous developments across countries. On the household side, the balance sheet strength of households remains dispersed and substantial cross-country differences in unemployment rates exist. On the banking side, since mid-2017 banks in most countries have witnessed a moderation in the balance sheet repair process that started in 2014. This was due to a slowdown in improvements in asset quality, largely attributable to remaining legacy issues regarding NPLs. Differences across countries can also be partly explained by the uneven phasing-in of regulatory requirements, as well as a slowdown in the balance sheet repair process.[95]

Another development is that banks themselves use direct market financing: conditions in euro area bank bond markets have continued to improve significantly since the beginning of 2019, making debt security issuance a viable funding alternative to central bank financing in several jurisdictions. Structural challenges related to low profitability and weak market valuations are likely to constrain banks' intermediation capacity should economic conditions deteriorate. Yet normative and regulatory pressures are biting, and profitability is still low. Clear signs of deleveraging, with a rise in direct financing, are also a noteworthy development. Banks are among the intermediaries of this process. Finally, considerable heterogeneity remains across euro area countries, also in the ability of their banks to pass on negative rates to NFC depositors.

95 As of 2019, capital requirements increased due to the completion of the phase-in of the capital conservation buffer and of the globally systemically important institution (G-SII) buffer. Also, an increase in the countercyclical capital buffer will be implemented in various euro area countries, while further and larger adjustments will be required for the finalisation of Basel III.

4.3 Securities markets

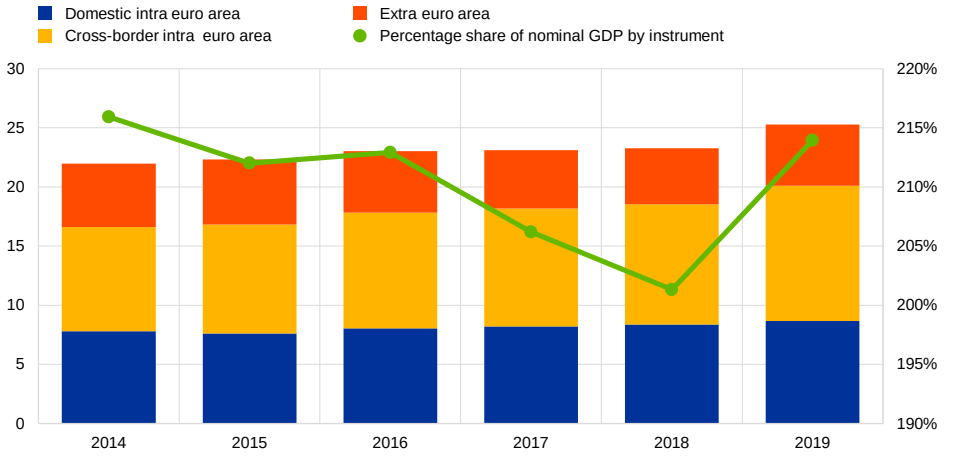
4.3.1 Bond markets

The stock of debt securities in the euro area, as a percentage of GDP, continued on its declining trend in 2017 and 2018, but rebounded over the course of 2019 (see Chart 32).

Chart 32

Stock of debt securities in the euro area and domicile of financing provider

(left-hand scale: EUR trillions; right-hand scale: percentages; 2014-2019)



Source: ECB.
Notes: The stock of debt securities for year 2019 refers to Q3 2019 values. Annual GDP for the year 2019 is calculated as the sum of quarterly nominal GDPs from Q4 2018 – Q3 2019.

In terms of remuneration, euro area government bond markets showed a continued convergence of yields for most countries over the reference period. The dispersion of government bond yields also declined in 2019 (Chart 33) as the spread between the sovereign bond yields of most non-core euro area countries and German government bond yields narrowed substantially, in particular for Portuguese government bonds. Greece increasingly regained market access, which was reflected in more issuances and the continued narrowing of its sovereign spreads. Spreads between Italian and German government bond yields widened in May 2018 and showed heightened volatility over the following months, leading to a temporary increase in the dispersion of euro area government bond yields (see Chart 33). Spillovers to other euro area countries' bond spreads were limited. Subsequently, Italian spreads retrenched somewhat.

Euro area sovereign bond yields fell between Q3 2018 and Q3 2019 in the context of a weakening economic outlook. This decrease has been a generalised global phenomenon and not limited to Europe. Protracted weakness of the euro area economy and persistence of low inflation as well as downside risks justified further monetary easing, including a re-activation of net asset purchases by the ECB as from 1 November 2019. Concerns about a possible hard Brexit and

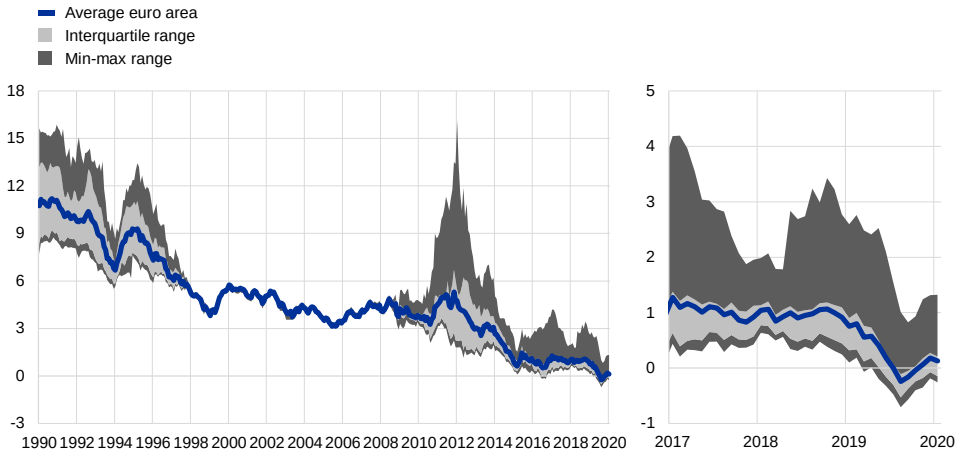
increased global trade tensions, in particular between the United States and China, also contributed to the uncertainty and the decline in yields.

The fiscal outlook for several euro area countries improved and was followed by rating upgrades. The upgrade of credit ratings generally went along with a decrease in risk premia. Rating upgrades for Spain, Portugal and Greece were reflected in the narrowing of yield spreads with German government bonds. For example, Standard & Poor's upgraded the ratings of Spain (to A from A- with a stable outlook) and of Portugal (to BBB from BBB- with a positive outlook) in 2019. Portugal was also upgraded by Moody's in 2018 and by Fitch in 2017.

Chart 33

Dispersion of euro area ten-year sovereign bond yields

(percentages; monthly data, January 1990 – January 2020; left panel: 1990-2020; right panel: 2017-2020)



Source: ECB.
Notes: The stock of debt securities for year 2019 refers to Q3 2019 values. Annual GDP for the year 2019 is calculated as the sum of quarterly nominal GDPs from Q4 2018 – Q3 2019.

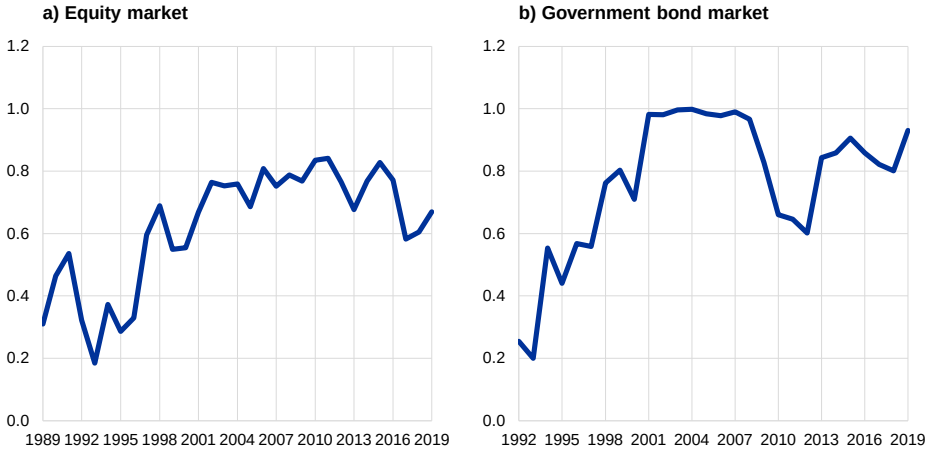
Within a monetary union, financial market integration is generally associated with resilience to country-specific idiosyncratic shocks. Resilience to idiosyncratic shocks reduces risk for investors, and therefore generally leads to lower risk premia. Instead, the continued dispersion of euro area government bond yields (see Chart 33) points to heterogeneity between countries, and possibly also to some degree of market fragmentation remaining.

The indicator depicted in Chart 34 provides a measure of integration in the euro area government bond markets, harnessing the explanatory power of common factor portfolios. For each calendar year, these portfolios are formed on the basis of a principal component analysis and used in a simple regression framework to explain bond market returns for each country. The measure is then computed as an average (median) R-squared across countries. In general, a higher figure indicates a more integrated market, where 1 implies perfect integration and 0 implies no integration. As shown in Chart 34, the indicator increased for both groups of countries in 2019 compared to its 2018 value. However, its value is still below the level observed during 2002-07 (although these two periods are not directly comparable).

Chart 34

Equity and government bond market integration based on common factor portfolios

(annual data, 1989-2017, as at September 2019)



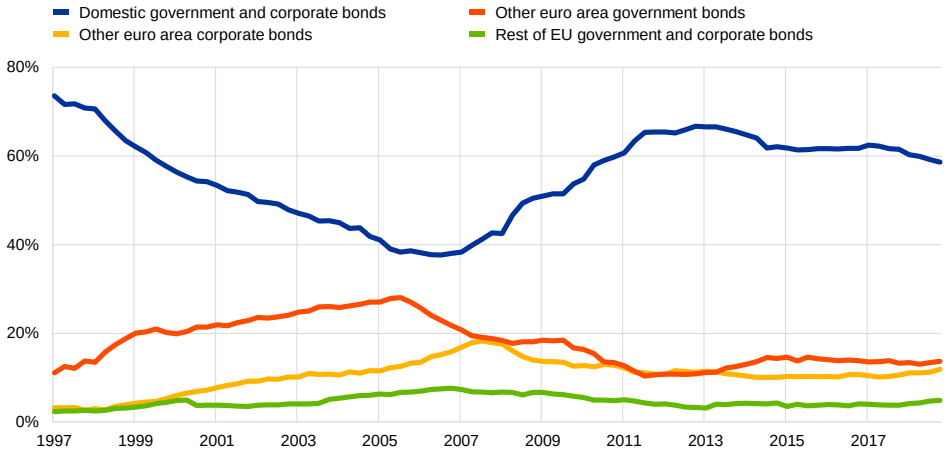
Sources: Thomson Reuters and ECB calculations.
Note: The indicators are based on "Global market integration: An alternative measure and its application" by Kuntara Pukthuanthong and Richard Roll (Journal of Financial Economics, Volume 94, Issue 2, November 2009). The indicator measures integration in the euro area equity and government bond markets, harnessing the explanatory power of common factor portfolios. For each calendar year, these portfolios are formed on the basis of a principal component analysis and are used in a simple regression framework to explain equity and bond market returns for each country. The measure is then computed as an average (median) R-squared across countries. In general, a higher R-square figure indicates a more integrated market as the same factors are indeed able to explain returns across countries, where 1 implies perfect integration and 0 implies no integration or fragmentation.

MFIs' holdings of debt securities are predominantly invested in domestic government and corporate bonds, at around 60% of total debt securities held by the MFIs in the euro area. The share of domestic government and corporate bonds has declined from its peak in 2013 (at 67%), as depicted in Chart 35, but remains high, indicating a continued strong preference for holding domestic assets. The shares of other euro area corporate bonds and other euro area government bonds remained broadly unchanged at 12% and 14%, respectively, while the share of debt securities from non-euro area EU countries was also stable at around 5%.

Chart 35

Share of MFI holdings of debt securities issued by euro area and EU corporates and sovereigns

(percentages of total holdings, excluding the Eurosystem, quarterly data, Q3 1997 – Q3 2019)



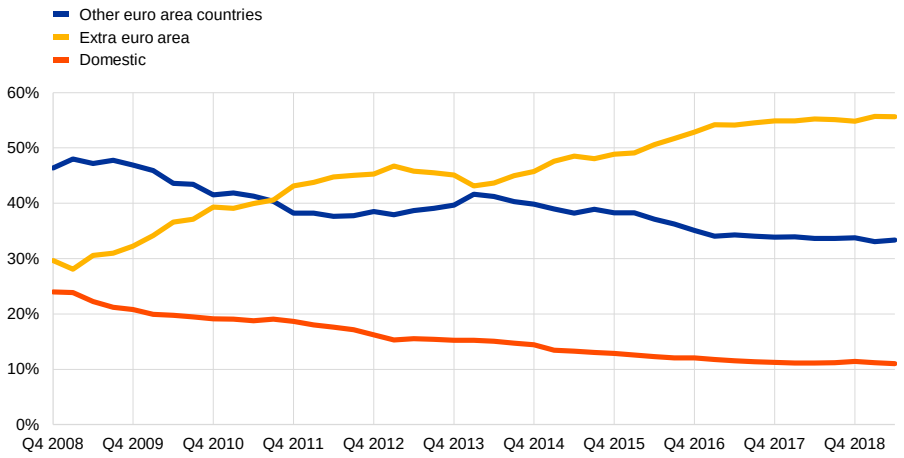
Source: ECB.

Over the past decade, investment funds located in the euro area have increasingly allocated funds to extra euro area debt securities, as shown in Chart 36. The increase in the share of investment funds' portfolios allocated to extra euro area debt securities took place in the context of the low-yield environment in the euro area. Investment funds gradually reduced the share of euro area debt securities holdings from about 24% in Q1 2009 to about 11% in Q4 2017; this may be also seen in the context of the euro area sovereign debt crisis. Since Q4 2017, the share of domestically issued debt securities in investment fund portfolios has remained broadly unchanged at 11%. Similarly, the share of debt securities issued in other euro area countries declined from 48% in Q1 2009 to 33% in Q2 2019. The share of debt securities issued outside the euro area increased from 28% in Q1 2009 to 56% in Q2 2019. The changes in relative allocations in the last three years have been negligible.

Chart 36

Investment funds holdings of debt securities

(percentages of total holdings of debt securities, quarterly data, Q4 2008 – Q3 2019)



Source: ECB.
Notes Debt securities exclude shares and include money market paper held by investment funds located in the euro area. A complete list of investment funds is available from the ECB website.

Newly adopted European legislation aims to remove remaining cross-border barriers for investment funds. In April 2019, the European Parliament formally adopted the trilogue agreement on the European Commission's initiative to remove cross-border barriers to the residence of investment funds. In particular, the European Commission adopted two legislative proposals in early 2019; the first one on regulation aimed to align national requirements for the marketing of funds, regulatory fees, and the harmonisation of the requirements for the verification of marketing material by national competent authorities. The second legislative proposal was a directive aimed at harmonising the conditions under which investment funds may exit a national market and allowing European asset managers to engage in pre-marketing activities.

4.3.2 Equity markets

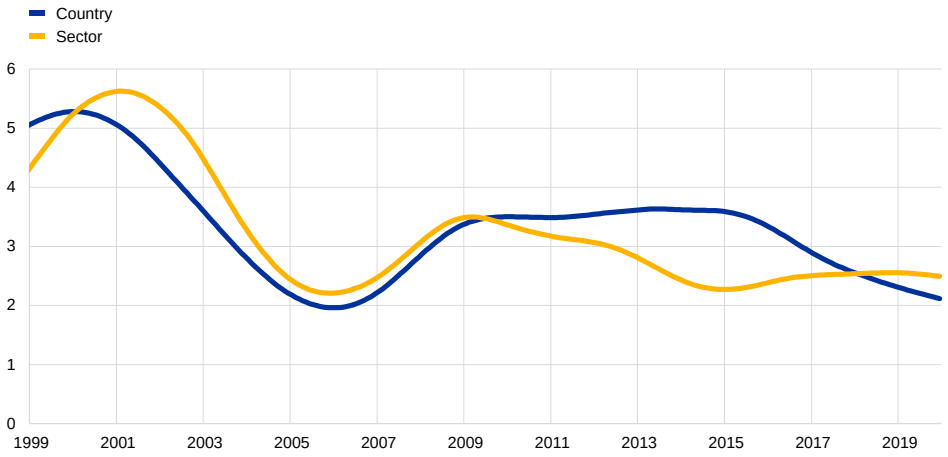
In terms of prices, euro area equity market returns appear to have become less dispersed across countries, also reflecting the prominent role of international drivers over the last years (Chart 37). Equity market dispersion, as measured by the absolute deviation of returns across national indices, has continued to decline on a country level and now stands close to pre-crisis readings. The reason for the decline in cross-country equity market dispersion – which is a sign of integration – may partly lie in the prominent role of international drivers that have impacted euro area equity markets across the board over the past two years. In particular, this period of time coincided with large and relatively significant fluctuations in economic and policy uncertainty, mainly driven by the ongoing US-China trade negotiations and Brexit. The second indicator, pictured in yellow, is a sectoral indicator. It does not look at sector level equity price returns by country, but only at sector returns for the euro area overall index (e.g. it looks at euro area industrials as compared with all other euro area sectors, and it does not compare prices changes for Italian industrials to those for

German industrials). This sectoral-level, euro area equity market dispersion remained rather flat, but also close to its pre-crisis lows. While a comparison of the absolute levels of both indicators is difficult, both should be tracked over time in comparison to each other.

Chart 37

Dispersion of returns in euro area Country and Sector equity price indices

(percentages, monthly data, January 1999 – August 2019)



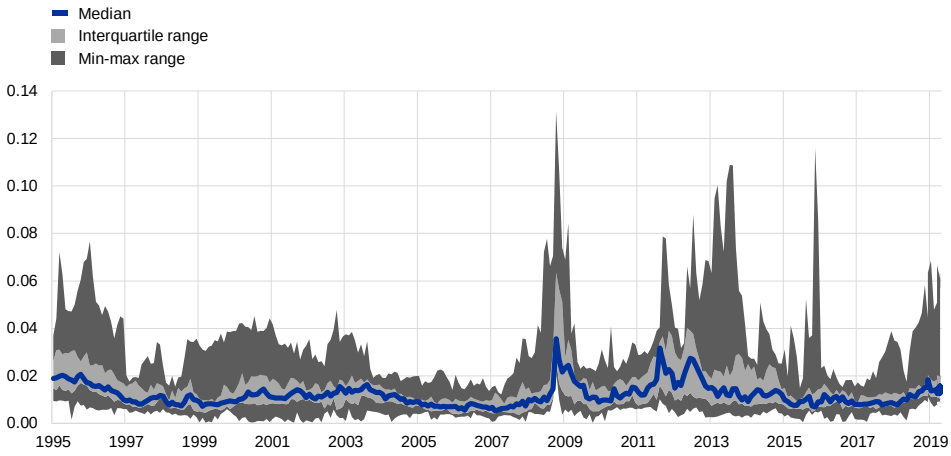
Sources: Thomson Reuters and ECB calculations.
Note: Euro-denominated (reinvested) dividends are included.

However, from a valuation perspective, euro area segmentation has increased (Chart 38). Equity market segmentation, as measured by the dispersion between the inverse of price-to-earnings ratios (rather than returns) across euro area countries, remained relatively low and stable during 2017, but increased thereafter. Much of the increase in segmentation reflects a deterioration of equity prices relative to earnings in Italy, i.e. an increase in the risk premia required by investors for holding Italian equity rather than equity listed in other euro area countries.

Chart 38

Segmentation in euro area equity market valuations

(monthly data, January 1995 – December 2019)



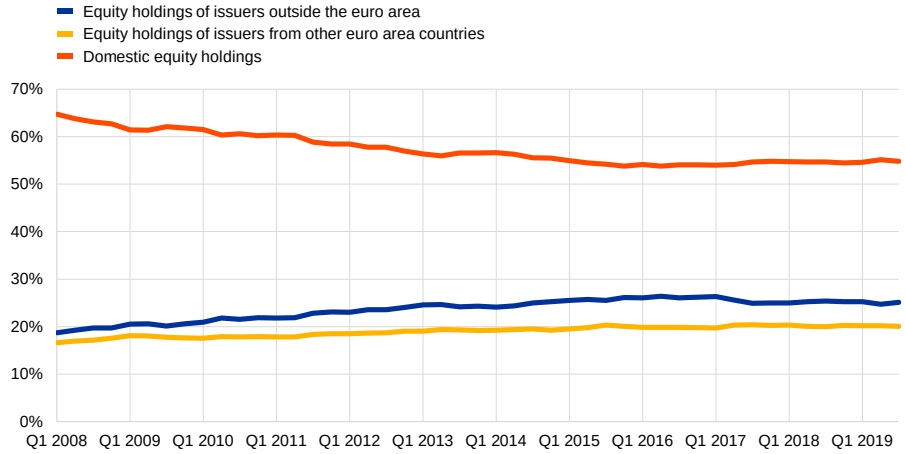
Sources: Thomson Reuters and ECB calculations.

In terms of cross-border holdings of equities, which are at the core of integration, a slight trend towards fragmentation started to emerge in 2019. Euro area holdings of equity were characterised by a rising share in domestic equity holdings (Chart 39). The split between domestic and non-domestic holdings (both inside euro area and outside the euro area) remained stable from 2016 to 2018, after the prolonged and slow integration that had taken place since 2008. However, at the beginning of 2019 signs started to emerge that integration was going backwards. This was most likely linked to uncertainty surrounding trade wars and Brexit.

Chart 39

Euro area holdings of equity (including investment fund shares and other equity) by geographical issuer

(percentages of total euro area holdings of equities, quarterly data, Q1 2008 – Q3 2019)



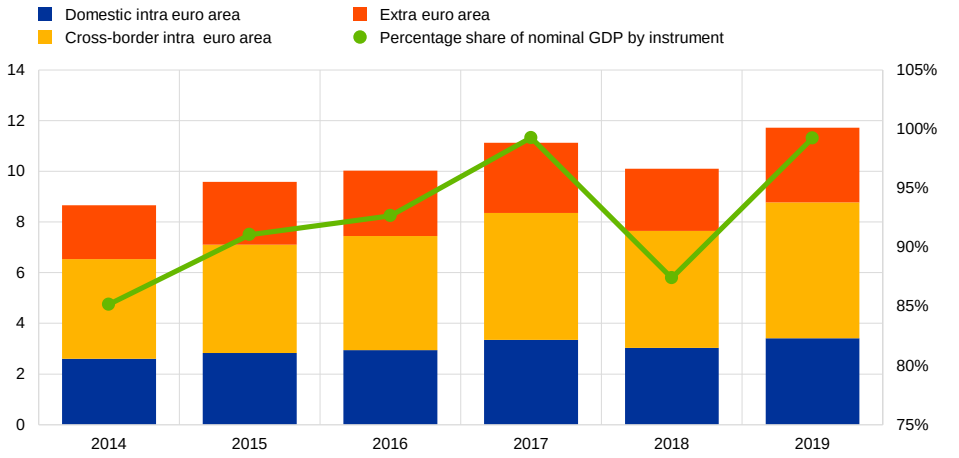
Source: ECB.
Note: Equity holdings include listed and unlisted shares, investment fund shares (of any type of investment fund) and other equities including, among other things, participations in international organisations (e.g. the ECB or the European Stability Mechanism) and holdings of real estate outside the domestic economy.

In terms of publicly listed equities, more recent developments regarding euro area listed shares were marked by the 2018 contraction and subsequent recovery in 2019. From a somewhat longer perspective, since 2014 we have observed a significant increase in total issuance supported by strong equity markets. Issuance grew at the domestic level, as well as at the cross-border intra-euro area and extra-euro area. Despite these developments, in relative terms, the share of domestic financing over the total remained the same between 2014 and 2019, which can be seen as a sign of stagnation in the level of market integration. However, these numbers have been strongly influenced by a relatively large increase in domestic issuance in France. For most euro area countries, cross-border intra-euro area and extra-euro area flows have become relatively more significant since 2014.

Chart 40

Euro area issued listed shares by domicile of financing provider

(EUR trillions (left-hand scale); percent (right-hand scale); end-of-year data; 2014 – 2019)



Source: ECB.
Note: Total financing received includes listed shares. The stock of shares in year 2019 refers to Q3 2019 values. Annual GDP for the year 2019 is calculated as the sum of quarterly nominal GDPs from Q4 2018 – Q3 2019.

Special Features

A Implications of Brexit for the EU financial landscape

Prepared by Stephanie Bergbauer, Matteo Cominetta, Mirko De Giovanni, Giovanni di Iasio, Massimo Libertucci, Pierre Marmara, Clément Rouveyrol, Ellen Ryan and Esther Wehmeier

Brexit will result in a substantial structural change to the EU's financial architecture over the coming years. It could be particularly significant for derivatives clearing, investment banking activities and securities and derivatives trading as the reliance on service provision by UK financial firms is more pronounced in these areas and the provision of such services is currently linked to the EU passporting regime. At the same time, the precise overall impact of Brexit on the EU's future financial architecture in general – and on these specific areas in particular – is difficult to predict at this stage, and may change over time.

This special feature makes a first attempt at analysing some of the factors that may affect the EU's financial architecture post-Brexit. It focuses on areas which currently show strong reliance on the UK and are of particular relevance for the ECB under its various mandates.

One factor which may affect the future architecture is the extent to which regulatory and supervisory frameworks in the UK may diverge from EU ones, as alignment is a precondition for recognising the UK as an equivalent jurisdiction under the EU's existing third-country regimes. If the provision of services out of London continues to be allowed, regulatory and supervisory consistency is paramount to limit the scope for regulatory arbitrage. Financial stability considerations will be a key factor in the forthcoming decisions around equivalence. The EU is prepared for all scenarios, including regulatory and supervisory divergence. In the light of the current uncertainty regarding the equivalence of the UK's framework in the future, the private sector must also continue to prepare for all possible outcomes beyond 31 December 2020.

Economic incentives faced by market participants are another factor likely to affect the EU's financial architecture. For activities subject to economies of scale, splitting EU and non-EU service provision may entail efficiency costs. This is particularly significant for the central clearing of derivatives, where restrictions on access to central counterparties (CCPs) based in the UK could reduce market depth and increase costs for clients, at least in the near-to-medium term. For activities subject to economies of scope or currently benefiting from agglomeration effects in London, the implications are less clear. Furthermore, current advantages in terms of efficiency need to be balanced against systemic risks that could arise from significant reliance on a third-country jurisdiction for key financial services.

For a number of banking activities, such as deposit-taking and lending, an EU equivalence regime does not exist and continued cross-border provision of services is not possible. Many UK-based banks are in the process of setting up or expanding their

presence in the euro area. When their target operating models are achieved, these banks plan to move more than €1,200 billion of assets to their euro area entities.

Based on initial data on bank relocations, it would seem that relocations could concentrate in a few centres in the euro area, possibly reinforcing the multi-centricity of the EU financial system. Such a multi-centric financial system would reduce concentration risks. At the same time, without a high level of fluidity between the different financial centres, financial fragmentation may arise, at least temporarily.

In order to address this concern, fostering the integration of EU capital markets is a key priority for the capital markets union. To this purpose, EU financial hubs will need to build capacity and interact efficiently to ensure market functioning. This will require an increased level of supervisory convergence within the EU.

Brexit thus reinforces the rationale for policies aimed at better mobilising domestic savings into capital market activities, in particular in areas such as equity financing, private equity and venture capital, with a view to diversifying funding sources, supporting investment and enhancing private risk sharing. Overall, this would contribute to developing domestic capacity in areas where the EU currently relies heavily on the UK. In this regard, delivering on the capital markets union agenda will be key to renewing the EU's ambition to develop genuine capital markets and cross-border financing of debt and equity instruments.

1.1 Introduction

Currently, the financial systems of the EU27 and UK are intertwined and deeply integrated. A number of key activities which serve EU27 clients are provided out of London, one of the most developed financial centres in the world. For some EU27 financial and non-financial firms, the City of London also represents a gateway to global financial markets.

Brexit will change the legal framework in which financial firms will operate in the future. The degree of integration between the EU27 and the UK will probably evolve over the coming years and will be driven by both regulatory and economic considerations. From a regulatory perspective, details of the future EU -UK relationship in financial services are still highly uncertain and remain subject to, in particular, the extent of regulatory alignment between the two jurisdictions going forward. This, in turn, will determine the manner in which the EU equivalence framework will be applied to the UK. Depending on these factors, some activities and sectors are likely to be affected more than others. As for other major third countries, the relationship with the UK in the area of financial services will depend on regulatory developments in both jurisdictions as well as the development of domestic EU capital markets (Section 4).

The future economic and financial relationship between the UK and the EU27 may also affect the structure, development and integration of the EU27 financial system. The EU27 will have to foster domestic capacity and develop markets in areas where it currently relies on the UK. Eventually, this would likely change the financial

structure – understood as the mix of different financial markets and intermediaries – in the EU27 in a more fundamental way. Brexit could also affect the way in which the EU27 accesses global financial markets, i.e. its integration in the global financial system. Large-scale relocation from London could, over time, result in the emergence of a centralised landscape or multiple financial centres. To increase the effectiveness of financial markets in both scenarios, financial integration within the EU27 would need to be strengthened. These potential changes would also affect a number of the ECB's key policy tasks, including the transmission of its monetary policy and its tasks in the area of financial stability.

This special feature assesses these implications of Brexit for the EU financial system in three parts. First, it makes a preliminary attempt to identify areas of the financial system most reliant on the UK, and links these with third-country regimes which will shape the provision of services from the UK after Brexit, provided the legal preconditions are met (Section 2). Section 3 examines possible drivers and implications of changes in cross-border conduct of activities, including a relocation of financial activities. Possible policy responses, particularly in the context of the European Capital Markets Union (CMU), are discussed in Section 4.

1.2 Euro area reliance on the UK for financial services and relevant regulatory frameworks

1.2.1 Euro area reliance on the UK for financial services

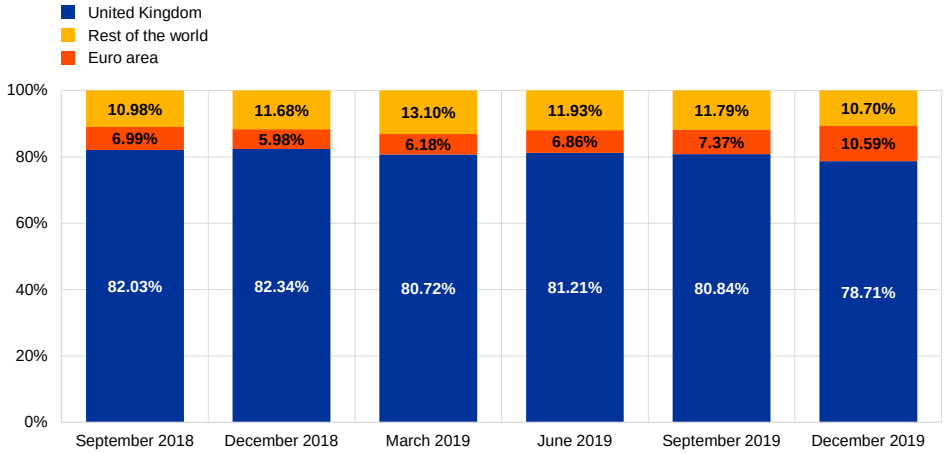
Changes to the euro area financial landscape following Brexit are likely to be concentrated on activities where the euro area currently relies on the UK the most. The importance of London to the euro area financial system varies substantially across financial activities. For example, derivatives clearing and investment banking activities are reliant on the UK to a significant extent, while UK-domiciled banks have a generally limited role in direct lending to the euro area real economy.

Reliance is very pronounced in derivatives clearing. As at December 2019, almost 80 per cent of all euro area clearing members' OTC derivatives positions were cleared through UK CCPs (Chart A.1). Large investment banks operating out of London also play a significant role in euro area bilateral OTC derivatives markets. As at August 2019, over a quarter of uncleared OTC derivatives held by euro area counterparties were sourced from the UK (Chart A.2). While issues related to uncleared OTC derivatives are unlikely to create financial stability risks in a no-deal scenario, the activities of some of these institutions are still relevant to the provision of liquidity to euro area markets over the longer term.[96] Large investment banks are in the process of implementing contingency plans with a view to continuing to service EU clients.

[96] For financial stability assessment of risks arising from a no-deal Brexit, see ECB (2019a).

Chart A.1

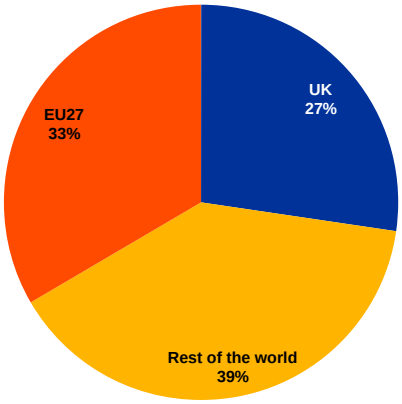
Outstanding cleared OTC derivatives transactions of euro area clearing members



Source: ECB EMIR data.
Note: Data from two trade repositories have been excluded owing to limited availability and quality.

Chart A.2

Geographic breakdown of counterparties to euro area uncleared OTC derivative contracts



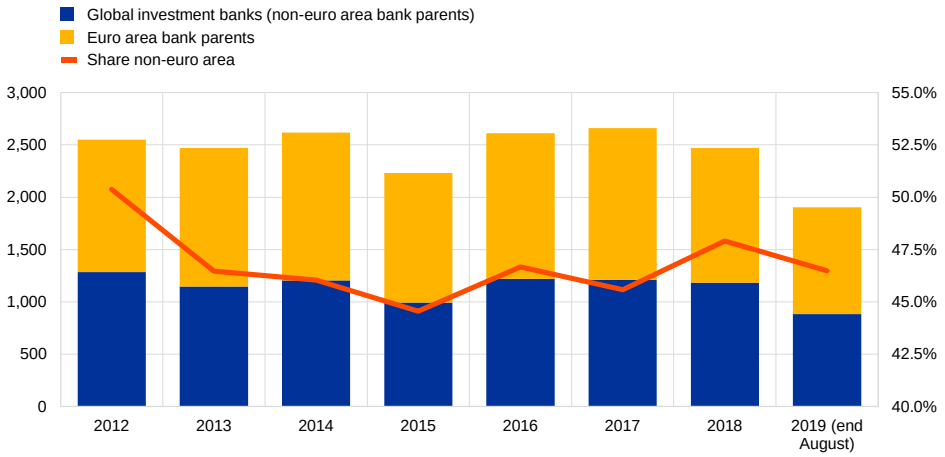
Source: ECB estimates on EMIR data.
Notes: Shares based on mid-point of upper and lower bound estimates. Under the EMIR reporting regime, there is an obligation for both counterparties to a derivative contract to report the trade ("double-sided reporting"). Due to misreporting and underreporting, not all trades can be matched, i.e. there are unpaired trades. The assumption that all unpaired trades are the result of underreporting leads to an "upper bound" estimate of the uncleared derivatives exposures. Conversely, the assumption that all unpaired trades are the result of misreporting leads to a "lower bound" estimate. Data as at 29 August 2019.

Global investment banks operating out of the UK are also key providers of financial services to euro area non-financial firms. Many global investment banks currently access the euro area market from London. They support access of euro area non-financial corporations to capital markets and provide a number of services. For instance, global banks play a very active role in debt and equity issuance (Charts A.3 and A.4), as well as mergers and acquisitions (M&As) and syndicated loans (Charts A.5 and A.6).

Chart A.3

Euro area non-financial corporations' debt issuance via non-euro area-owned banks

(left-hand scale: number of deals; right-hand scale: percentage shares)

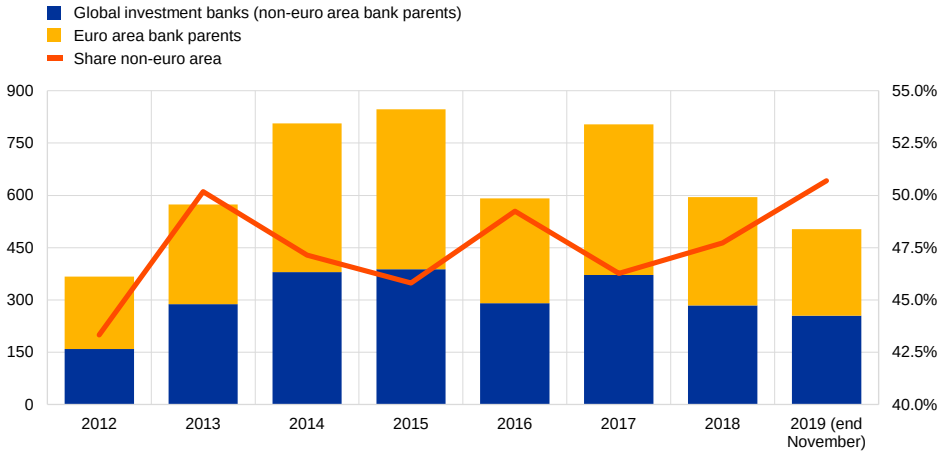


Source: Dealogic.
Notes: Banks involved in deals as manager, co-manager, bookrunner, participant or underwriter are categorised as "euro area" or "global", depending on the location of the parent. Prior to Brexit, global banks typically accessed the market from London. Bars reflect the total number of deals individual banks participated in. As many banks typically participate in a single deal, this may entail double-counting of deals in total left-hand side axis figures. The red line is the ratio between the blue and yellow bars and can be taken as a proxy for the relevance of global banks to the euro area market.

Chart A.4

Euro area non-financial corporations' equity issuance via non-euro area-owned banks

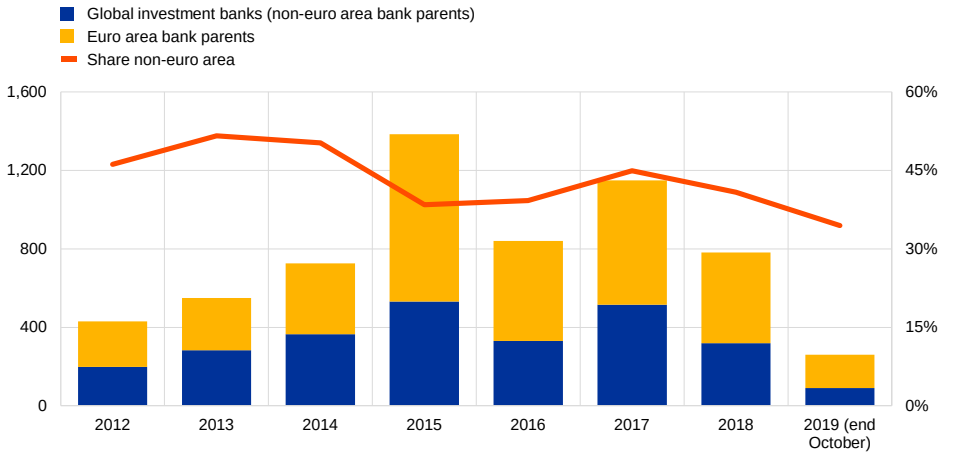
(left-hand scale: number of deals; right-hand scale: percentage shares)



Source: Dealogic.
Notes: Banks involved in deals as manager, co-manager, bookrunner, participant or underwriter are categorised as "euro area" or "global", depending on the location of the parent. Prior to Brexit, global banks typically accessed the market from London. Bars reflect the total number of deals individual banks participated in. As many banks typically participate in a single deal, this may entail double-counting of deals in total left-hand side axis figures. The red line is the ratio between the blue and yellow bars and can be taken as a proxy for the relevance of global banks to the euro area market.

Chart A.5

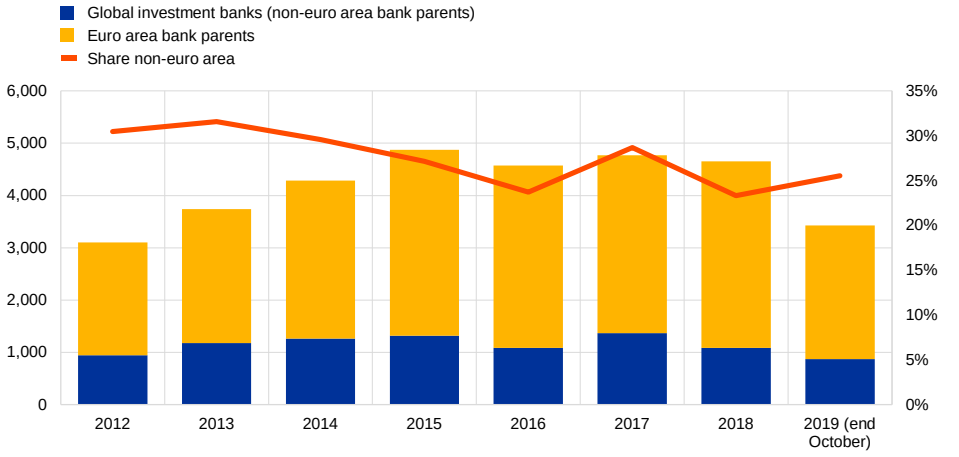
M&A deals involving euro area non-financial corporations financed by non-euro area-owned banks



Source: Dealogic.
Notes: Banks involved in deals as lead bank are categorised as "euro area" or "global", depending on the location of the parent. Prior to Brexit, global banks typically accessed the market from London. Bars reflect the total number of deals individual banks participated in. As many banks typically participate in a single deal, this may entail double-counting of deals in total left-hand side axis figures. The red line is the ratio between the blue and yellow bars and can be taken as a proxy for the relevance of global banks to the euro area market. The sample includes transactions in which the acquirer, the target or both are firms based in the euro area and pertain to any non-financial and non-government sector.

Chart A.6

Syndicated loans to euro area non-financial corporations led by non-euro area-owned banks



Source: Dealogic.
Notes: Banks involved in deals as lead bank are categorised as "euro area" or "global", depending on the location of the parent. Prior to Brexit, global banks typically accessed the market from London. Bars reflect the total number of deals individual banks participated in. As many banks typically participate in a single deal, this may entail double-counting of deals in total left-hand side axis figures. The red line is the ratio between the blue and yellow bars can be taken as a proxy for the relevance of global banks to the euro area market.

So far, evidence of relocation has been mixed across sectors. While some uptake can be seen in Chart A.1, overall relocation of derivatives clearing has been limited (see Box 1). Global banks currently serving the euro area out of London have completed authorisation procedures to establish or expand their presence within the EU27, ensuring that they can continue to serve this market after the UK has left the EU. Plans agreed with supervisors indicate that these banks aim to transfer over €1 trillion in assets in a scenario where the UK would not be granted market access under

EU equivalence regimes and cross-border provision of services would be limited to existing national third-country regimes (Section 2.2 and Box 2).

1.2.2 Third-country frameworks for market access

While the parameters of the future EU -UK financial services regime are likely to evolve over time, some services might continue being provided directly from the UK via third-country regimes after Brexit. UK-based financial firms currently rely on passporting rights to provide services across the EU Single Market based on a single authorisation in their home Member State. UK-based firms will be subject to third-country regimes in EU financial services legislation following Brexit (Table A.1). Member States may further grant access to domestic markets for specific activities under national legislation. The EU has the option to recognise that the regulatory or supervisory regime of a third country is equivalent to the corresponding EU regime. For example, Markets in Financial Instruments Regulation[97] and Markets in Financial Instruments Directive II[98] (MiFIR/MiFID II), European Market Infrastructure Regulation[99] (EMIR) and Central Securities Depositories Regulation[100] (CSDR) allow investment firms, recognised central counterparties and central securities depositories from equivalent third countries to provide services to EU counterparties and markets, subject to a positive equivalence decision by the European Commission. But, while equivalence regimes exist in a number of areas[101], they do not replicate the passporting regime in the EU Single Market which allows EU-wide free movement of products and services based on a single rulebook and a common supervisory architecture.

The degree to which the UK will be able to benefit from market access under EU equivalence regimes will be decided unilaterally by the EU and it will be conditional on future regulatory choices in both jurisdictions. Indeed, the decision to grant the UK market access under different EU equivalence regimes will crucially depend on the degree of future regulatory alignment between EU and UK frameworks. It will also depend on risk management considerations associated with cross-border activity in terms of impact on EU financial stability, market integrity, investor protection and the level playing field in the EU internal market. Although the UK applied the EU's regulatory framework prior to its departure, decisions on equivalence take into account potential risks to the EU on a forward-looking basis, as

97 Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012 (OJ L 173, 12.6.2014, p. 84).

98 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 (OJ L 173, 12.6.2014, p. 349).

99 Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories (OJ L 201, 27.7.2012, p. 1).

100 Regulation (EU) No 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories and amending Directives 98/26/EC and 2014/65/EU and Regulation (EU) No 236/2012 (OJ L 257, 28.8.2014, p. 1 -72.).

101 EU financial services law currently includes around 40 provisions that allow the European Commission to adopt equivalence decisions. On this basis, the Commission has taken over 280 equivalence decisions for more than 30 countries, across various types of financial services, products and activities. See Equivalence/adequacy decisions taken by the European Commission for an overview.

explained in the European Commission's 2019 communication on equivalence.[102] The modalities of equivalence assessments and decisions are within the remit of the European Commission. From a risk perspective, both current regulatory and supervisory frameworks and intentions as to future changes appear relevant. And in the light of the current uncertainty regarding the equivalence of the UK's framework in the future, the private sector must continue to prepare for all possible outcomes beyond 31 December 2020 – indeed, EU authorities have been calling for adequate preparations by the private sector throughout the Brexit process. The EU is prepared for all scenarios, with the previous considerations on Brexit-related risks continuing to apply.[103]

Even if equivalence is granted to the UK in some areas, the dynamic nature of regulatory and supervisory frameworks will require regular monitoring of these decisions. Initial equivalence determinations may become outdated as UK regulation evolves and diverges from EU regulation, potentially bringing risk to the EU's financial system. In particular, the Commission will monitor whether equivalence decisions continue to fulfil the EU objectives for which they were taken. In doing so, it will also take into account changes in the regulatory framework of the third country, and whether the services and activities covered by the decision continue to respect the integrity of the EU internal market and preserve the level playing field vis-à-vis the UK and within the EU. Withdrawing an equivalence decision is a unilateral prerogative of the European Commission.

Table A.1

Mapping UK-reliant activities onto relevant third-country frameworks

Main areas of financial activities currently provided from UK	Current reliance on UK	Relevant regulatory framework	EU equivalence regime?	Option for national regime?
Central clearing	High	EMIR	Yes	N/A
Trading venues	High	MiFIR/MiFID and EMIR	Yes	N/A
Investment services regulated under MiFID/R Dealing on own account Underwriting Execution of orders	Medium	MiFIR/MiFID	Yes, but not activated so far	Yes Substantial differences between Member States in terms of treatment of cross-border services and branches
Banking services Lending Deposit taking	Low	CRR/CRD IV	No	N/A

Where provision of financial services directly from the UK is prohibited for regulatory reasons, these services would need to be provided by entities within the EU. The provision of services to EU clients by financial firms currently established in London will be determined by the extent of relocation and changes in the provision

[102] See Communication from the Commission to the European Parliament, the Council, the European Central Bank, the European Economic and Social Committee and the Committee of the Regions on equivalence in the area of financial services (2019).

[103] For further details see ECB (2019a).

of services by existing EU-domiciled peers. A number of factors which may drive relocation of activities are discussed in the next section. Where UK entities are allowed to continue providing services under the EU's third-country frameworks, there might be limited change to the current situation. Furthermore, in a number of areas, the City of London acts as a hub for global financial flows, rather than as an intermediary for intra-EU activities.

1.3 The structure of the post-Brexit euro area financial system

The nature of required changes and the post-Brexit structure of the euro area financial system will be affected dynamically by regulatory and economic factors. The different drivers are likely to vary substantially across business models as illustrated below for selected market segments such as central clearing and investment banking. Brexit is therefore likely to have heterogeneous effects on different types of financial firms, activities and sectors over time. Individual choices of firms will also matter, depending, for instance, on market opportunities. Over the medium term, policies fostering the attractiveness of EU capital markets globally could enhance incentives for providing services from within the EU (see Section 4). This section seeks to provide an assessment of the dynamics potentially affecting certain key sectors – although an exhaustive picture cannot be provided at this stage.

Economies of scale and market efficiencies from concentration dominate the central clearing business. At least in the near-to-medium term, restricting market access to UK CCPs could lead to lower market depth and increase costs in EU OTC derivatives markets, especially for end users (see Box A.1). If UK CCPs were not recognised, EU clients would in most cases need to switch to EU27 or recognised third-country CCPs, which may need to scale up their activity in some markets. UK CCPs would likely remain global clearing hubs for most services and have so far given no indication of further plans to relocate activities to the EU. The lack of access to global liquidity pools could negatively affect the competitiveness of EU dealer banks and increase costs for clients in certain products. However, given the EU's significant reliance on UK systemic clearing activities, the EU will need to prioritise mitigation of any associated financial stability risks by ensuring ongoing regulatory alignment and effective EU supervisory oversight of these activities, as laid down in EMIR 2.

Box A.1

Central clearing: market concentration or fragmentation?

Prepared by Clément Rouveyrol

UK CCPs are leading global clearing hubs for a number of markets, including major OTC derivatives segments, including interest rate swaps (IRS) and credit default swaps, as well as other important markets such as futures on benchmark rates, commodities and repo markets. While there are many CCPs of different sizes and activities, a given market segment is typically cleared mostly in one or a very small number of CCPs. The drivers of market concentration include efficiencies gained through higher market liquidity and netting benefits[104], the existence of silos between trading venues and

[104] See Duffie et al. (2015).

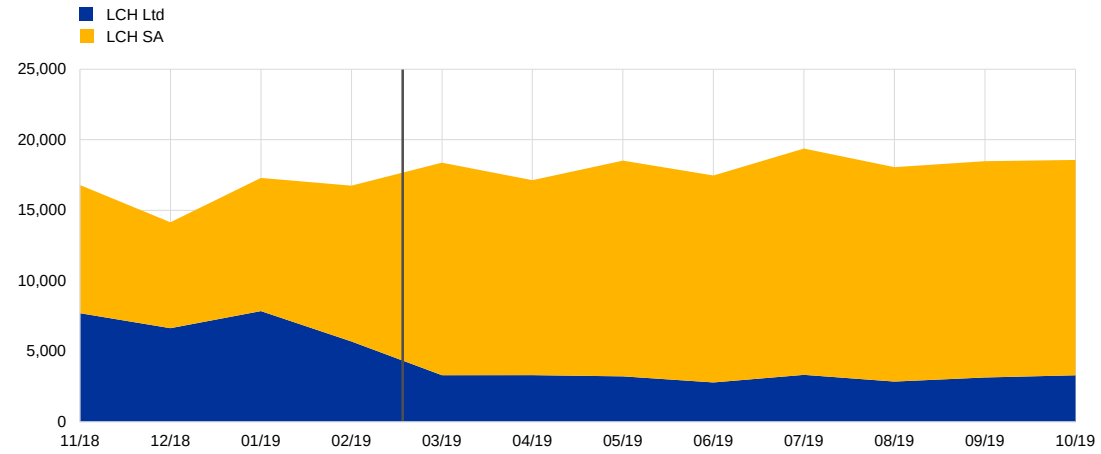
clearing houses, and the high sunk cost of developing new clearing services. As a result, although small CCPs may have a local footprint, cleared markets are structured around global hubs with broad cross-border access. For instance, LCH Ltd in London clears nearly 90% of all IRS cleared globally (in 26 different currencies).[105] The EU27's reliance on these London clearing hubs is part of a global pattern.

So far, the main relocation operation from the UK to the euro area in terms of clearing has fostered further market efficiencies. In February 2019, a concerted effort between repo dealers and the two LCH CCPs in London and Paris (both owned by the London Stock Exchange Group) led to the relocation of the near-totality of euro-denominated repo clearing from the UK to France. In the eight months following this relocation, the average monthly value of cleared repo trades at LCH SA (Paris) increased to €15.1 trillion from €8.3 trillion in 2018, while at LCH Ltd it dropped from €8.1 trillion to €3.2 trillion (see Chart A), around 90% of which being repos on sterling-denominated gilts.[106] Euro-denominated repos are now cleared almost exclusively at euro area CCPs (largely at LCH SA)[107], enabling additional market efficiencies including balance sheet netting and access to TARGET2 -Securities.

Chart A

Repos cleared at LCH Ltd and LCH SA (monthly nominal amount)

(EUR billions, 2018 -2019)



Source: LCH.

Depending on market conditions which evolve over time, restrictions on cross-border access can create an economically inefficient discrepancy in swap pricing due to imperfect arbitrage between CCPs clearing the same instrument (CCP basis). Supply-demand imbalances and higher balance sheet costs of clearing eventually increase costs for banks that cannot use arbitrage between CCPs.

However, competition can also have positive effects, such as fostering innovation and exerting downward pressure on fees. Market concentration does not prevent competition in central clearing, provided that it is supported by dealer banks. The growth of euro IRS clearing at Eurex Clearing (Frankfurt), which has reached €14.1 trillion in notional outstanding (compared with €84.1 trillion at

[105] Based on public data published by CCPs clearing OTC interest rate derivatives.

[106] Data from LCH Ltd.

[107] Euro-denominated repos on sovereign bonds are also cleared by BME Clearing (ES), Eurex Clearing (DE) and CC&G (IT). CC&G and LCH SA have an interoperability arrangement for the clearing of Italian sovereign bonds.

LCH Ltd), is a recent example. Competition between CCPs may also reduce concentration risk and a market with multiple CCPs can bring positive effects to financial stability by reducing systemic risk.

The breadth of cross-border activity and reliance on global markets are reflected in regulatory frameworks, which largely allow cross-border access. Under EMIR (the European Market Infrastructure Regulation, which established the EU regulatory framework for CCPs), the EU has granted recognition to 32 CCPs in 15 jurisdictions designated as equivalent, and other jurisdictions similarly allow the cross-border provision of clearing services: LCH Ltd is registered under the regulatory framework of eight jurisdictions in addition to the EU.

UK CCPs clear key markets in EU currencies, in particular the euro. Given the systemic importance of these activities for the EU, it is essential from an EU perspective to ensure that financial stability risks are adequately managed and to protect the rights and the stability of EU financial institutions which participate in UK CCPs. This means that the risks of regulatory divergence and a loss of EU supervisory oversight would be particularly pronounced in this area. UK CCPs must continue to comply with the EU's high prudential, governance and operational standards and EU authorities must have the same degree of oversight over systemically important UK CCPs as over EU CCPs. EU legislators have pre-emptively addressed this issue with the adoption of EMIR 2, which amends EMIR to enhance the EU framework for the supervision of third-country CCPs. Under the new regulation, third-country CCPs which are systemically important for the EU will need to meet additional conditions for recognition. The potential for regulatory arbitrage can be mitigated by the direct application of EMIR standards to systemically important CCPs and the lack of oversight by EU authorities can be addressed with the involvement of ESMA and EU central banks. The new framework should therefore be expected to address the main regulatory issues raised by reliance on critical third-country infrastructures. EMIR 2 also addresses the case of third-country CCPs (or clearing services) having such substantially systemic importance to the EU that these mitigants prove insufficient to ensure regulatory alignment and supervisory cooperation. In this case, EMIR 2 envisages that these clearing services may be denied recognition to address outstanding risks.

Some UK-based banks are planning to transfer some activities from the UK to continue servicing the euro area (see Box A.2). These are largely global banks that act as intermediaries in capital and derivatives markets (see Box A.3) and provide financial services to euro area non-financial companies and governments. Banks may continue providing these services by establishing or expanding their presence in the euro area. These institutions are expected to be capable of managing all material risks potentially affecting them independently and at the local level. Their governance and risk management mechanisms will need to be commensurate with the nature, scale and complexity of the business, including adequate staffing of their euro area entities.

Box A.2
Bank relocation plans

Prepared by Massimo Libertucci and Esther Wehmeier

This box provides an overview of the relocation of activities so far and banks' stated intentions regarding relocation. The information currently available indicates that activities could move to a number of countries within the EU27, as opposed to concentrating in a single location. However, this may change over time in response to banks' choices and incentives.

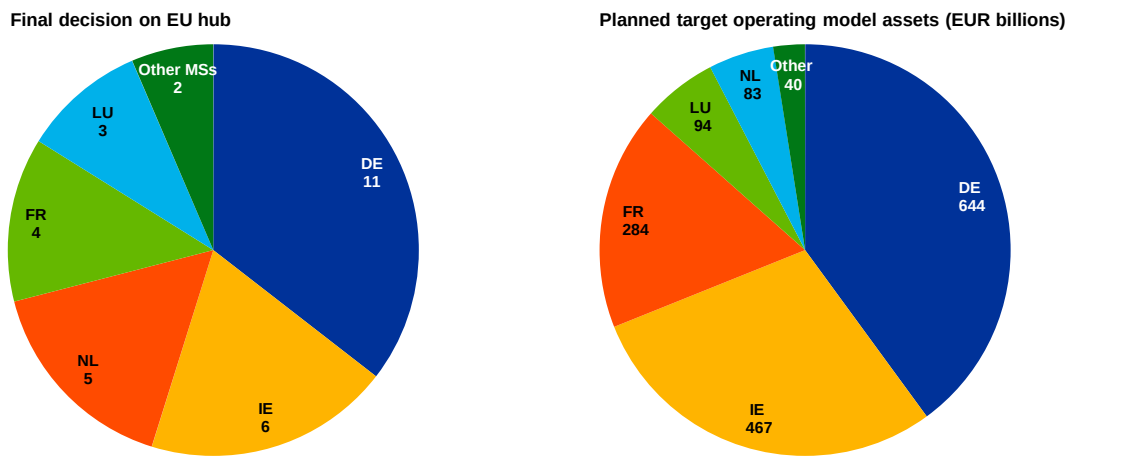
Driven by the loss of passporting rights and the need to operate inside the EU to keep servicing EU clients, incoming institutions can pursue three main different relocation options: (i) setting up a new subsidiary/subsidiaries; (ii) setting up new branches; (iii) expanding existing subsidiaries/branches. As part of their Brexit strategy, large globally active banks are, in many cases, using a combination of these three options. A number of groups are also reorganising their network of European Economic Area branches, for example by re-attaching current branches of UK entities to their new EU hub. Some incoming banks are also planning to rely on national legislation in some EU Member States that allows the direct provision of certain services on a cross-border basis by third-country firms. Investment firms currently headquartered in the UK are also relocating parts of their activities to the EU27.

In their adverse Brexit-related scenarios, incoming credit institutions are planning to operate with more than €1,600 billion[108] in assets on the balance sheet of the group entities established in the euro area once they reach their target operating model. This would constitute an increase of more than €1,200 billion (or more than 300%) as compared with the end of 2017. This planned relocation of assets supports the expectation that incoming credit institutions will substantially increase their footprint in the euro area, with a view to avoiding disruptions in servicing their euro area clients after Brexit.

Around 25 Brexit-related formal authorisation procedures related to the establishment of new credit institutions or the restructuring of existing ones have been launched in the euro area. In addition, ten existing credit institutions are substantially increasing their activities due to Brexit. Most incoming institutions have indicated that their new main location in the EU will be Germany, Ireland, the Netherlands and France (Chart A).

Chart A

Most incoming banks have indicated that their new main location in the EU will be Germany, Ireland, the Netherlands and France



Sources: ECB supervisory information, ECB calculation.

Incoming banks with material capital market activities are planning to operate with a total of €837billion in capital market assets. Capital market business refers to sales, trading and treasury activities, excluding advisory or pure lending components. Interest rate products make up the largest asset class, accounting for 58.4% of the total, followed by equity (10.3%), credit (4.7%) and FX

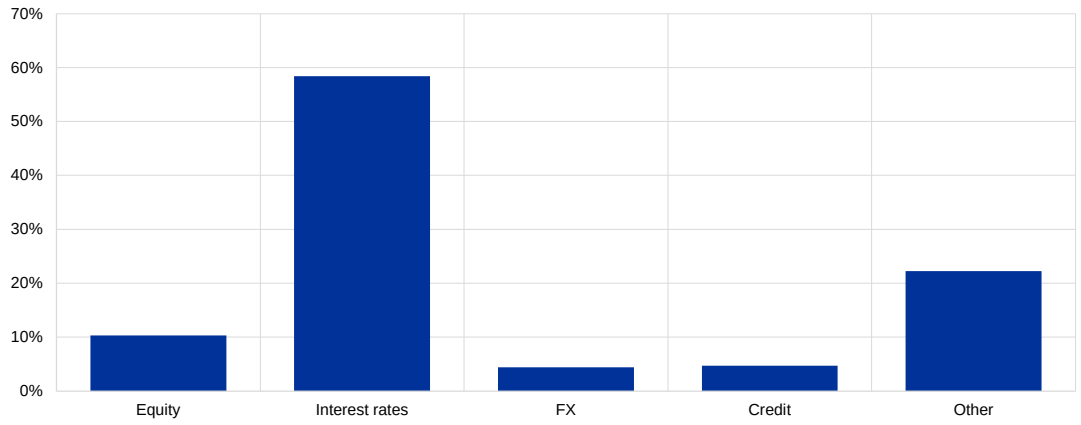
[108] Total assets at the highest level of consolidation in the euro area.

products (4.4%).[109] Other capital markets business (for example commodities) accounts for the remaining 22.2% (Chart B).

Chart B

Incoming banks with material capital markets activities

(percentages)



Sources: ECB supervisory information, ECB calculation.

Economies of scale and scope may create complex incentives regarding the relocation of various activities. Economies of scale seem to be present in banks that are more involved in investment banking activities, such as market-making. In this sense, splitting the provision of services to EU and non-EU clients may increase costs. Much of the literature on economies of scope in banking focuses on synergies between the provision of investment banking activities and more traditional activities. It includes spreading fixed costs, information economies, risk reduction and customer cost economies.[110] Benefits of scope could also exist in investment banking activities. For example, there may be synergies between providing brokerage and investment services or spot and derivatives trading for the same asset class. Incentives to relocate may be affected by the degree and scope of these synergies.

Economies of scale are present in euro area derivatives markets, while economies of scope across business lines seem more limited. According to granular information on euro derivatives, the list of most active dealers varies substantially across different asset classes and contract types. More specifically, different dealers are dominant in different asset classes. Even within asset classes, dealers tend to specialise in specific contract types, e.g. swaps, options and futures. In September 2019, the Herfindahl concentration index within asset classes and across contract types was below 15 per cent, a relatively low level. This evidence suggests that economies of scope in making derivatives markets are quite limited.

109 Interest rate products, such as interest rate derivatives, are instruments whose value depends on increases and decreases in interest rates. Equity products are products with equities or equivalents as underlying (e.g. equity options, single-stock options or index return swaps). Credit products include debt securities in the trading book, securitisations and credit derivatives (e.g. credit default swaps and total return swaps). FX products are derivatives including all deals involving exposure to more than one currency, for example currency swaps or options.

110 See, for instance, Berger (1987).

Box A.3

The role of UK-based dealers in the euro area derivatives market

Prepared by Francesca D. Lenoci and Ellen Ryan

Global dealers are pivotal players in trading euro area derivatives. Dealers provide liquidity and enhance price discovery in typically less transparent markets, such as OTC derivatives markets. This role is usually served by G16 dealers.[111] This box uses EMIR data to examine the role of G16 dealers in the euro area OTC markets. As at September 2019, the gross notional share of outstanding positions where at least one G16 dealer was involved ranged between 42% and 70% of the total across different asset classes (see Chart A, panel (a)). G16 dealers provide liquidity to other sectors, as captured by the yellow bars in the same chart. The role of G16 dealers is more pronounced in less liquid markets such as credit derivatives, where the share of derivatives traded OTC is larger (see the dots in Chart A, panel (a)).

Many G16 dealers currently serve the euro area market out of London. In this context, the liquidity provision of UK-based dealers is quite heterogeneous across asset classes (Chart A, panel (b)).[112] In gross notional terms, UK-based dealers are prominent in credit derivatives, which is a smaller market, while their role in interest rate derivatives is more limited. Compared with euro area dealers, they tend to take larger net exposures, especially for commodity, credit and equity derivatives (net notional, see dots in Chart A, panel (b)).[113] Since dealers typically do not take substantial and persistent net exposures, this could indicate that UK dealers may be offsetting the large net exposures they hold vis-à-vis euro area counterparties with other global dealers. This may reflect the role of UK-based dealers as intermediaries between the euro area and the rest of the world.

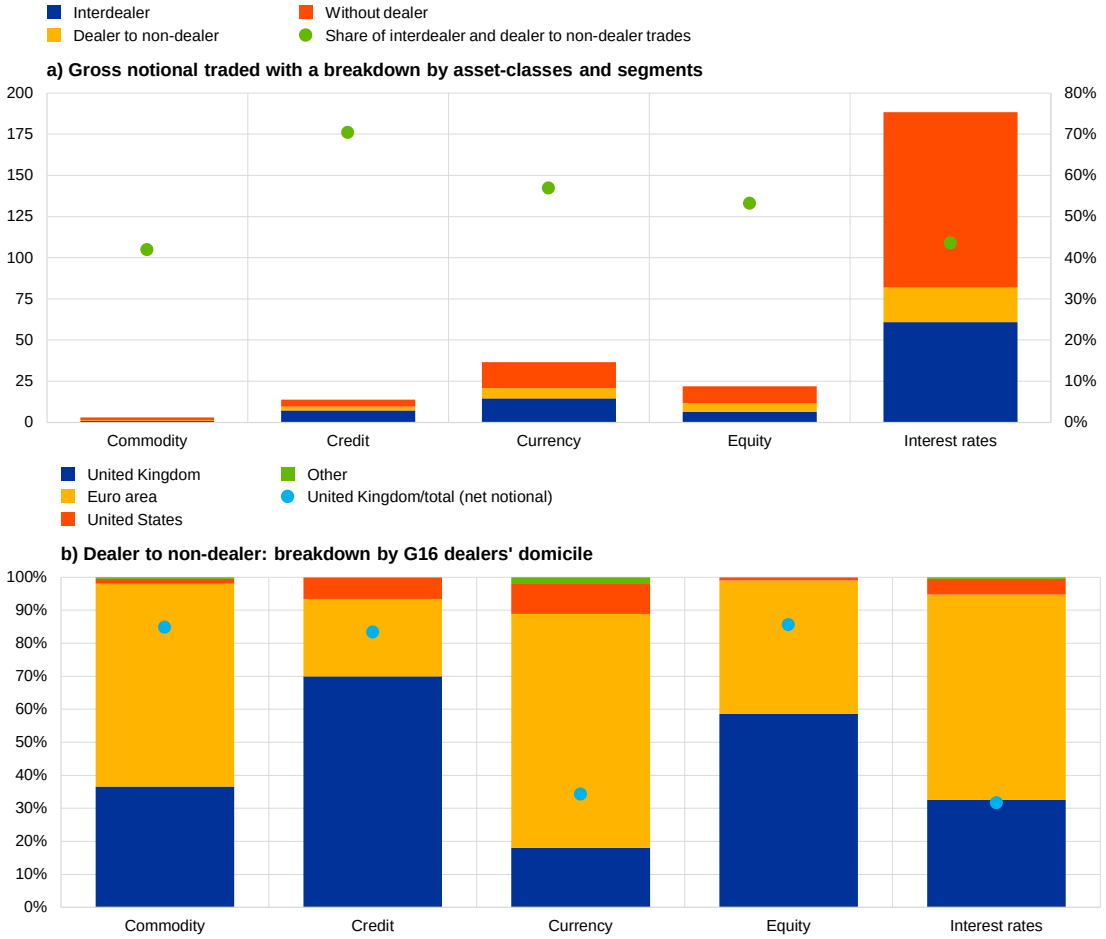
[111] G16 dealers are defined by the NY Fed as the group of banks which originally acted as primary dealers in the US Treasury bond market but nowadays happen also to be the group of largest derivatives dealers. The sample, which has world coverage, has changed over time and, currently comprises: Amherst Pierpont Securities, Bank of Nova Scotia, BMO Capital Markets Corp., BNP Paribas, Barclays, Bank of America, Cantor Fitzgerald, Citigroup, Crédit Agricole, Credit Suisse, Daiwa Capital Markets, Deutsche Bank, Goldman Sachs, HSBC, Jefferies, J.P. Morgan, Mizuho Securities, Morgan Stanley, NatWest, Nomura, RBC Capital Markets, Société Générale, TD Securities, UBS and Wells Fargo. See the list here. All G16 dealers are usually members of one or more CCPs with the role of clearing members.

[112] "UK-based" in this case refers to the domicile of the trade's counterparties and is identified via LEI codes. For example, it includes subsidiaries of US G16 dealers operating in the UK.

[113] The analysis is performed without controlling for dealers' securities portfolio. Net positions in derivative portfolios may also reflect hedging of other exposures such as loans, bonds or deposits. If UK banks had substantially larger directional exposures on the balance sheets, this could explain some part of their more directional derivatives positions vis-à-vis the euro area.

Chart A

Market breakdown by cluster of trades



Sources: EMIR data and ECB calculations. The analysis is carried out based on outstanding positions as at Q3 2019 and includes trades cleared to CCP via clearing members. According to Commission Delegated Regulation 151/2013, European (euro area or national) authorities have access to trades where at least one counterparty is resident in the EU (euro area or specific country), to trades where the reference entity is resident in the EU (euro area or specific country) and to trades where the underlying instrument is sovereign debt of a European (euro area or specific) country.
Notes: Panel (a): the chart reports the gross notional traded as at September 2019 with a breakdown by asset class and segments (y-axis: left-hand side in trillion, right-hand side in percentages; x-axis: breakdown by asset classes). We distinguish three segments: "Interdealer" refers to trades where both counterparties are G16 dealers, "Dealers to non-dealers" refers to trades where one of the two counterparties of the trade is a G16 dealer and the other belongs to other sectors, "W/o dealers" refers to trades occurring between non-G16 dealer counterparties (e.g. CCP, investment funds, insurance companies, non-G16 banks, pension funds, non-financial corporations and other financial institutions). Panel (b): the chart reports the breakdown by asset class and G16 dealers' domicile as share of gross notional traded as at September 2019, dots indicate UK-domiciled dealers as share of net notional (y-axis: in percentages; x-axis: breakdown by asset classes).

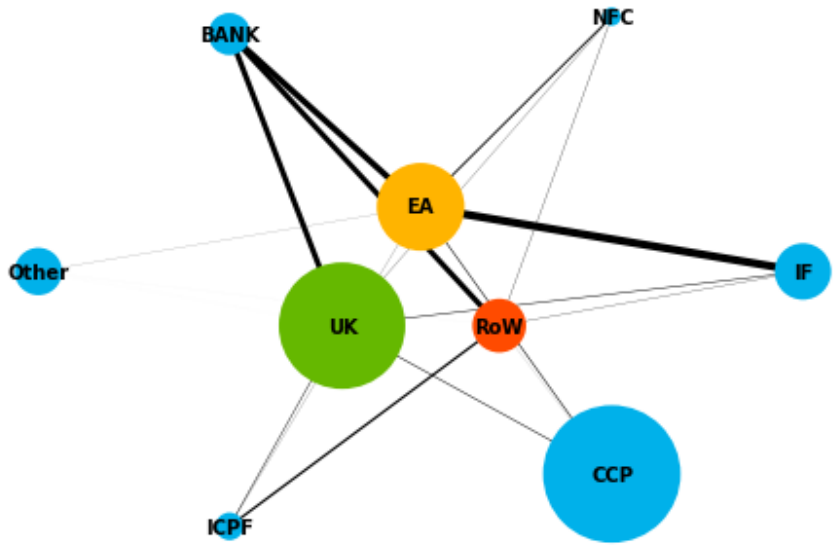
UK-based dealers are important in the euro area credit default swap (CDS) market. UK dealers play a prominent role in providing liquidity in the CDS market to a number of euro area sectors, most notably banks. This is captured by the ratio of net over gross exposures and expressed by the thickness of the edges in panel (a) of Chart B.[114] Meanwhile euro area G16 dealers dominate the euro interest rate swap (IRS) market, with strong directional exposures towards non-financial firms and investment funds. In both markets, UK-based and euro area dealers are highly interconnected.

[114] Gross exposures include a dealer's matched book, which is commonly very large. If clients are able to buy or sell quickly and in volume, it is because a dealer is willing to take the other side of the trade without waiting for an offsetting customer trade. As a consequence, the dealer accumulates net exposures, sometimes long and sometimes short, depending on the direction of the imbalance. The ratio between net over gross exposures then represents the role of the dealer in making the market and providing immediacy to clients.

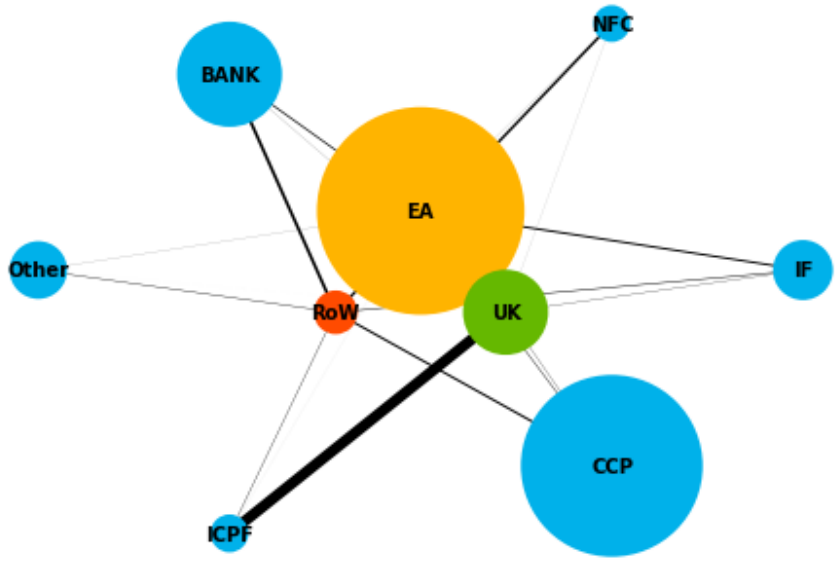
Chart B

Market breakdown by cluster of trades

a) Credit default swap



b) Interest rate swap



Sources: EMIR data and ECB calculations. The analysis is carried out based on outstanding positions as at Q3 2019 and includes trades cleared to CCP via clearing members. According to Commission Delegated Regulation 151/2013, European (euro area or national) authorities have access to trades where at least one counterparty is resident in the EU (euro area or specific country), to trades where the reference entity is resident in the EU (euro area or specific country) and to trades where the underlying instrument is sovereign debt of a European (euro area or specific) country.
Notes: The size of each node reflects the gross notional traded by each sector. Light blue nodes represent euro area non-dealer sectors. G16 dealers are aggregated by country of domicile in euro area (EA), UK and other countries (RoW). The thickness of each link reflects net/gross notional traded between the two groups of counterparties. In the centre of both networks, dealers interact with each other in the interdealer market, while the outer circle shows their liquidity provisioning role towards other sectors. NFC stands for non-financial corporations, CCP for central clearing counterparties, ICPF for insurance companies and pension funds, BANK for commercial and investment banks other than G16, IF for investment funds and Other is a residual category including GOVT (governments), OFI (other financial institutions), NCB (national central banks) and MMMF (money market mutual funds).

Brexit could affect the geography of financial centres in Europe more broadly.

The literature on financial centres often cites “ecosystem effects”, whereby financial

firms benefit from close geographic proximity to other institutions providing similar and complementary services. Such benefits may arise, for example, due to access to specialised labour pools, with the availability of outside employment opportunities also encouraging a further concentration of human capital in one location. On the other hand, benefits arising from proximity to the client base could incentivise a more even spread of activity across the euro area. Kindleberger (1973 and 1974) argues that financial centres develop through a combination of market efficiency – arising from scale, market depth, access to information and proximity to economic activity – and institutional or socio-political factors. Subsequent work has highlighted the benefits of placing international market infrastructure and banking in a single location but also the role of information sensitivity in driving geographic distribution.[115]

This complex mix of incentives will eventually be reflected in the emerging structure of the euro area financial system. According to preliminary evidence on the relocation plans of banks, a small number of "hubs" and some degree of activity concentration could emerge (see also Box A.2). Based on market intelligence, this pattern also seems to be confirmed for relocation activities beyond banking. A sizeable fraction of asset management firms and insurance companies affected by Brexit are planning to move to Ireland and Luxemburg or have already done so. The Netherlands, meanwhile, is mainly attracting firms such as trading platforms, exchanges and fintechs. If these dynamics are confirmed, and the multi-centric structure of the euro area financial system becomes more pronounced, it will be crucial to implement policies that foster an efficient interaction between different hubs (see Section 4). Such a multi-centric financial system would reduce concentration risks.

1.4 Implications for the capital markets union

Brexit reinforces the need to complete the capital markets union (CMU).[116] The CMU aims to develop new sources of funding for companies, remove barriers between EU capital markets and broaden the role of the non-bank sector. The CMU would improve the capital channel for cross-border risk sharing and complement the credit channel of the banking union (BU).[117] Fostering equity financing is one of the objectives of the CMU. It could support investment and private risk sharing, and appears better suited for financing young innovative companies at an early stage and funding the transition to a low-carbon economy (see Box A.1 in the first chapter). The CMU therefore provides a policy agenda to tackle challenges related to market fragmentation and the potential reduction in market depth and efficiency resulting from Brexit. It can also enhance the attractiveness of EU's capital markets more broadly on the global stage.

Measures aimed at developing capital markets in the EU would help to ensure strengthened domestic capacity in areas where the EU financial system currently strongly relies on London. For instance, after Brexit, the EU could lose

[115] See Lysandrou, Nesvetailova and Palan (2017) for discussion.

[116] See de Guindos (2020).

[117] See ECB (2016).

access to a significant market for equity capital. The CMU provides a policy agenda for developing domestic capacity in the area of equity financing, private equity and venture capital. Redoubling efforts to foster CMU initiatives aimed at developing genuine capital markets and cross-border financing of both debt and equity instruments (as has been undertaken with the securitisation and venture capital regulations) seems all the more warranted in a post-Brexit world.

Policies fostering the integration of EU capital markets would help ensure efficient interaction of EU financial hubs. If the multi-centricity of the EU financial system were to become more pronounced post-Brexit, the efficient interaction of different EU financial hubs would become even more important to supporting effective market functioning. Currently, barriers to the cross-border provision of services, such as differences in national insolvency and taxation regimes, prevent integration in the euro area. While legislation passed in the aftermath of the crisis provided a first step towards a single rulebook for capital markets in the EU, such markets remain subject to national rules and supervision.[118] This may also open the door to regulatory arbitrage. A large-scale increase in euro area capital market activities would reinforce the case for more centralised oversight and supervision of markets.[119] In this context, it is also important to strengthen the risk identification and surveillance framework and the macroprudential toolkit for the non-bank financial sector.[120]

For services that could continue to be provided out of London based on third-country access regimes, regulatory and supervisory consistency is paramount to limit the scope for regulatory arbitrage and risks to financial stability. In the absence of a unified EU-level framework, a patchwork of national frameworks for the cross-border provision of services could give rise to regulatory arbitrage, as firms could circumvent host supervision and EU regulatory requirements. The details of the future cooperation between the EU and the UK and the degree of regulatory alignment over time will determine the level of interaction between the two financial systems. This, in turn, will frame the scope for the continued cross-border provision of services by UK financial entities. Appropriate oversight and toolkits available to EU regulators and supervisors will therefore be necessary to contain risks to financial stability in the euro area, especially considering that existing third-country regimes were not developed to manage a substantial degree of cross-border provision of services to EU entities. Building a unified EU-level framework or increasing harmonisation of national third-country regimes will be necessary to enhance the EU's supervisory framework within the banking union. For instance, the authorisation and supervision of third-country branches should be further harmonised at the EU level.

While Brexit could strengthen the rationale for developing and integrating EU capital markets, the relevance of the CMU agenda goes beyond Brexit. Progress on the CMU project is crucial to enabling EU capital markets to meet the financing needs of European companies which at the moment are mostly met in London. At the same time, the preliminary insights highlighted in this special feature suggest that

118 See ECB (2019b), de Guindos (2019).

119 See ECB contribution to the European Commission's consultation on the operations of the European Supervisory Authorities (June 2017) and Building a Capital Markets Union – Eurosystem contribution to the European Commission's Green Paper (2015).

120 See Pires (2019).

post-Brexit relocation dynamics are difficult to predict and depend on complex drivers and incentives. Therefore, a policy agenda seeking to increase the depth and efficiency of EU financial markets will need to look beyond Brexit and enhance the attractiveness of the EU's capital markets on the global stage.

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B How could a common safe asset contribute to financial stability and financial integration in the banking union?

Prepared by Spyridon Alogoskoufis, Margherita Giuzio, Thomas Kostka, Anouk Levels, Luis Molestina Vivar and Michael Wedow

This special feature discusses how a common sovereign safe asset in the euro area could benefit financial stability by fostering financial integration and development, and by changing the structure of asset markets. The discussion focuses on the potential benefits of a well-designed common safe asset that has certain desirable characteristics, while it does not provide an assessment of specific design options. This special feature should be viewed as part of a broader discussion on how to complete the banking union, which also includes considerations regarding a European deposit insurance scheme and changing the regulatory treatment of sovereign exposures.

A well-designed common safe asset could benefit financial stability by mitigating the negative feedback loops between sovereigns and their domestic banking sector. First, a common safe asset may foster financial integration in the euro area by facilitating both diversification and de-risking of banks' sovereign portfolios. In this context, a common safe asset and changes in the regulatory treatment of sovereign exposures (RTSE) could be two mutually supportive elements of the banking and capital markets union. Second, a common safe asset could foster financial development by introducing an additional financial instrument with a different risk-return profile. This instrument could also allow markets to develop a proper euro area term structure. Third, a common safe asset has the potential to benefit the financial structure by supporting the development of a single securities market in the EU. In addition, a common safe asset could foster the international role of the euro, and would have fundamental implications for the design and implementation of monetary policy in the euro area.

To achieve its intended benefits, a common safe asset should combine several features. It should have a very high credit quality and be resilient to idiosyncratic as well as more widespread sovereign shocks. It should also be compatible with both regulatory and market standards and meet the collateral eligibility criteria for the Eurosystem's liquidity operations. Furthermore, a common safe asset should not undermine the incentives for sound national fiscal policies, while at the same time ensuring well-functioning national debt markets. A common safe asset should also be of sufficient size and liquidity in order to have a meaningful impact on financial integration and stability. This special feature concludes that a well-designed, common safe asset could be a supportive element of the banking and capital markets union.

Motivation

The financial and sovereign debt crises showed that the close link between the resilience of sovereigns and their domestic banking sector in the euro area poses a risk to financial stability. Risk-sharing mechanisms can reduce the impact

of country-specific shocks, thus contributing to macroeconomic stability. In a monetary union, risk-sharing mechanisms are particularly important in addressing asymmetric shocks.[121] Enhanced private financial risk sharing can therefore significantly improve the macroeconomic stabilisation of the euro area and thereby the functioning of the Economic and Monetary Union (EMU). The financial and sovereign debt crises showed that this private risk-sharing mechanism did not function properly.[122] Retail lending of banks focused on financing domestic markets, whereas cross-border lending grew ever larger in interbank markets. When stress hit the financial system, this interbank lending was subject to a "sudden stop" and banks' wholesale activities retrenched into their domestic market.[123] This reinforced fragmentation in financial intermediation and created major feedback loops that tied together the resilience of sovereigns and their domestic banking sector. For example, Andreeva and Vlasopoulos (2016) show that following the onset of the financial crisis, euro area banks started buying sizeable amounts of euro area government debt in a "flight to safety". Initially they did not discriminate between domestic and non-domestic sovereign debt. This changed during the sovereign crisis, when banks started to only acquire domestic government bonds, shedding those issued by other euro area sovereigns.

A common safe asset could foster financial integration, help mitigate risks spilling over from sovereigns to their domestic banking sector and complement the banking and capital markets union. The achievements under the banking union already limit the extent to which stress in the banking system can spill over from banks to sovereigns, as the framework for single supervision and resolution makes banking sectors more resilient and less dependent on support from national sovereigns. Further progress with the capital markets union will continue to facilitate structural financial integration and – if stepped up – private risk sharing in the EU, making economies less vulnerable to domestic shocks.[124] While these institutional developments contribute substantially to financial stability and reduce the interconnectedness between sovereigns and their domestic banks, there is still the domestic focus of financial markets and banks that may need to be further addressed. As a result, banks remain vulnerable to domestic sovereign risk. If well designed, a common safe asset could facilitate diversification and de-risking of banks' sovereign portfolios. In addition, a common safe asset may make banks' funding conditions less dependent on those of the sovereign.

Several proposals for a common safe asset have been put forward and are currently being discussed at the European level. In the aftermath of the financial and sovereign debt crises, several ideas were proposed for the development of a common euro area safe asset. Leandro and Zettelmeyer (2018, 2019) provide a

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121 See European Commission (2015), ECB (2016), Constâncio (2018).

122 In its 2017 reflection paper on the deepening of the EMU, the European Commission points out that the convergence trends observed in the initial years of the EMU were partly illusionary and driven by a mispricing of risk. The financial crisis led to a strong market correction and fragmentation of euro area financial markets.

123 See ECB (2016) for an assessment of how and under what conditions financial integration benefits social welfare. The authors argue that cross-border equity holdings, foreign direct investment and cross-border retail lending in particular are resilient forms of financial integration which enable income and consumption smoothing by making countries less dependent on domestic financing.

124 See European Commission (2015, 2017), and Next CMU High-Level Group (2019).

comprehensive overview[125] and evaluation of these proposals. In summary, the authors argue that early suggestions were aimed at creating a large liquid euro area bond market to support financial integration and open up funding possibilities for distressed economies. Later proposals focused more on developing a large and liquid supply of euro-denominated safe assets which could substitute some of banks' holdings of national sovereign debt, thereby mitigating risk spillovers from sovereigns to their respective national banking system.[126] The European Commission has taken an open stance towards exploring the development of a common safe asset, with a view that the development of a common safe asset as well as a revision of the regulatory treatment of sovereign exposures could facilitate financial integration in the context of the banking and capital markets union.[127] [128] However, there is no consensus on the desirability and design of a common safe asset.

With a view to contributing to the ongoing discussions at the European level, this special feature discusses how a common safe asset could benefit financial stability in the banking union. Section 2 elaborates on how a well-designed common safe asset could facilitate financial integration and help mitigate the negative feedback loops between sovereigns and the domestic banking sector, and how it could support the banking and capital markets union. In this context, Box 1 discusses how a common safe asset might interact with potential changes in the regulatory treatment of sovereign exposures – another possible measure to reduce the interconnectedness between banks and their domestic sovereign. Section 3 then discusses what conditions need to be met for the common safe asset to achieve the intended benefits. The analysis in Box 1 and Section 3 draws heavily on the work by Leandro and Zettelmeyer (2018, 2019). Box B.2 discusses how a common safe asset may extend the benefits of an internationally accepted reserve asset to all members of the banking union. Section 4 concludes. This special feature does not consider the impact of specific safe asset design options, but rather discusses the potential benefits of a theoretical safe asset that has all the desired characteristics. Whether or not all of these characteristics would be feasible is outside the scope of the analysis. The impact of specific safe asset designs on fiscal incentives and the functioning of national debt markets is therefore also outside the scope of this special feature. However, whether a common safe asset ultimately contributes to financial stability strongly depends on its design and regulation. Therefore, further assessment of the potential benefits and drawbacks of specific safe asset proposals by policymakers and academics would benefit the policy discussion going forward.

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125 Leandro and Zettelmeyer (2018) provide an overview of several proposals, including proposals by De Grauwe and Moesen (2009), Monti (2010), Delpla and von Weizsäcker (2010), Beck, Wagner and Uhlig (2011), Hellwig and Philippon (2011), Brunnermeier et al. (2017).

126 This categorisation was made by Leandro and Zettelmeyer (2019), p. 2.

127 In President's Junker's letter of intent at the State of the Union in September 2017 and the Banking Union Communication of October 2017, the European Commission highlighted the potential for a common safe asset and made a commitment to take action in this area. In May 2018, the Commission presented a legislative proposal to enable the development of a market for sovereign bond-backed securities (SBBS). The proposal draws on the findings of an ESRB report on SBBS which was published in 2018. In April 2019, the European Parliament endorsed the proposed reforms to facilitate SBBS.

128 In its 2017 reflection paper on the deepening of the EMU, the Commission states that changing the regulatory treatment of sovereign bonds on banks' balance sheets could also be discussed as an option to reduce the sovereign-bank nexus.

Transmission channels for a common safe asset to benefit financial stability in the banking union

Several transmission channels tie together the resilience of sovereigns and their banking sector. Figure B.1 in this special feature illustrates these channels.[129] Sovereign stress can spill over to the banking sector in various ways. Variations in sovereign credit risk assessments as well as concerns about sovereign debt sustainability could directly lead to increased risk premia and market losses on sovereign debt held by banks (channel 1). In addition, sovereigns with unsustainable debt levels would ultimately need to cut spending, which could lead to lower economic growth and have an adverse impact on the corporates and households to which banks have extended finance (channel 2). Moreover, bank funding costs are closely related to the funding costs of their sovereign, as sovereign funding rates are often used as relevant benchmarks. Also, banks use sovereign bonds as collateral in wholesale transactions, and valuation losses could limit banks' funding possibilities and increase costs (channel 3). Similarly, problems in the banking sector can spill over to the sovereign. In the absence of credible mechanisms to resolve unviable banks, sovereigns may be compelled to bail out banks that are of systemic importance to their economy (channel 4). This may put a strain on the sovereigns' finances. Banks in distress are furthermore likely to curb lending to the real economy, which may slow down growth and have a negative impact on government revenues (channel 5). When the market deems it likely that a sovereign may bail out its banking system, this will be reflected by an increase in sovereign funding costs (channel 6).

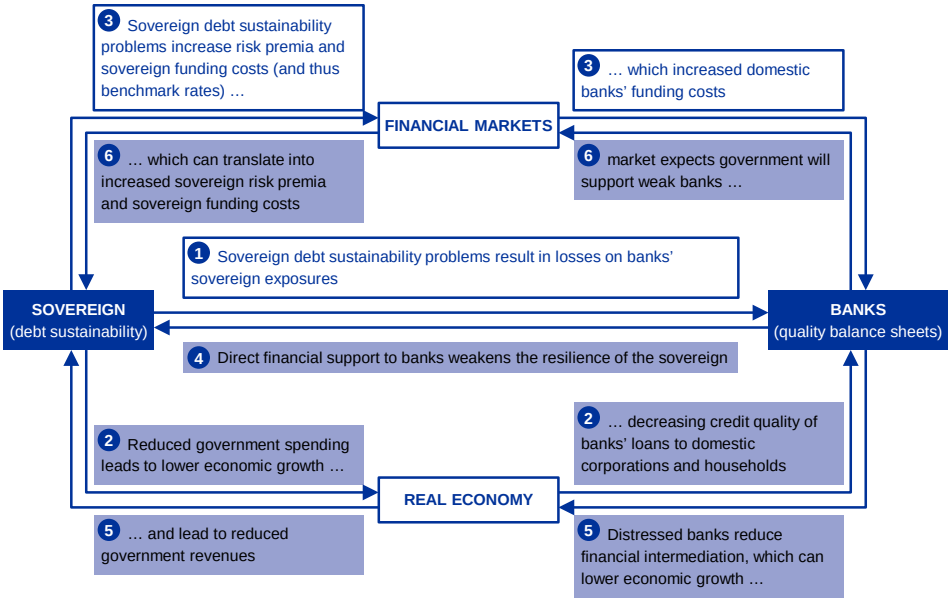
The development of the banking and capital markets union helps to mitigate the transmission channels between banks and their sovereign, and to improve structural financial integration. Regulators have made significant progress in reducing the bank-to-sovereign contagion channel. The banking union provides the euro area with a harmonised framework for banking supervision at a centralised level, as well as a crisis management and a single resolution mechanism. By increasing the resilience of the banking sector and making it less dependent on national support from the sovereign, the banking union limits the extent to which stress in the banking system can spill over to sovereigns (thereby addressing channels 4 and 6 in Figure B.1). Nevertheless, discussions on a European deposit insurance scheme – a key missing element required to complete the banking union – are still ongoing. Turning to the capital markets union, ongoing initiatives aim to facilitate structural financial integration. The removal of cross-border barriers to investments, diversification of funding (i.e. reducing the overreliance on bank funding) and reducing funding costs will all facilitate risk sharing across the euro area, making economies less vulnerable to domestic shocks. For example, problems in the domestic banking sector will be less detrimental to the domestic economy if a larger share of funding comes from cross-border investors (channel 5).

[129] The description of transmission channels draws strongly on the work by Véron (2017) and Bekooij et al. (2016).

Figure B.1

Sovereign-banks nexus channels and interactions with a common safe asset

Overview of how problems at the sovereign can spill over to the domestic banking sector and vice versa



Sources: Based on Véron (2017), and Bekooij et al. (2016).
Notes: The figure provides a schematic overview of the channels linking the resilience of a sovereign with its domestic banking sector (channels 1 to 6 in the blue and white boxes). An arrow running from the sovereign to the banking sector indicates a channel through which problems at the sovereign can be transmitted to the banking sector. An arrow running from the banking sector to the sovereign indicates a channel through which problems in the domestic banking sector can spill over to the sovereign. The overview presents direct linkages between the sovereign and the domestic banking sector as well as indirect linkages where the transmission of risks runs via the real economy or financial markets. The transmission channels highlighted in white represent the channels which could be (partially) mitigated by a well-designed common safe asset. The channels in the blue boxes are not affected by a well-designed common safe asset.

However, tackling the sovereign-to-bank channel has proven difficult. A common safe asset could help mitigate this vulnerability. There has been little progress in reducing the sovereign-to-bank contagion channel, as banks are linked to sovereigns both (i) directly through their holdings of sovereign debt and (ii) indirectly via real economy and macroeconomic linkages.[130] However, if well designed, a common safe asset could benefit financial stability by mitigating the negative feedback loops between sovereigns and their domestic banking sector. First, a common safe asset may foster financial integration in the euro area by facilitating both diversification and de-risking of banks' sovereign exposures. This will make banks less vulnerable to domestic sovereign risk (thereby addressing channel 1 in Figure B.1). Second, a common safe asset could make banks' funding conditions less dependent on those of the domestic sovereign (channel 3). The euro area financial structure currently lacks a common safe asset. Such a security would develop the financial system by introducing an additional financial instrument with risk-return characteristics different from existing assets, notably with low risk that is not directly related to a single sovereign. A common safe asset could also be used as high-quality liquid collateral and facilitate secured wholesale funding. This would make banks' funding conditions in the secured interbank market less dependent on the value and credit quality of (national) sovereign bonds. As such, a common safe asset could facilitate financial

130 Bellia et al. (2019).

development and integration, and efficient capital allocation within the euro area. Because diversifying into a common safe asset would make banks less sensitive to idiosyncratic country risk, the risk of flights to safety by banks – as observed during the crisis – may be reduced.

A common safe asset may also facilitate potential risk-mitigating measures aimed at reducing the nexus between sovereigns and banks in the banking union. Recently, several ideas for revising the regulatory treatment of sovereign exposures on banks' balance sheets have been put forward at the global and European level.[131] These ideas have been motivated by the notion that such adjustments could help reduce the interconnectedness between sovereigns and banks. It has been argued[132] that banks cannot create from existing securities a portfolio that has both low concentration and low credit risk by means of diversification alone. Changing the regulatory treatment of sovereign exposures may incentivise banks to diversify their sovereign holdings, but this may increase the overall riskiness. A common safe asset could facilitate both diversification and lower credit risk simultaneously.[133] At the same time, a change in the regulatory treatment of sovereign exposure may be needed to induce banks to hold a common safe asset. In this regard, a common safe asset and changes in the regulatory treatment of sovereign exposures could be two mutually supportive measures aimed at reducing the nexus between sovereigns and banks. Box B.1 discusses their possible interaction further.

Finally, a common safe asset has the potential to benefit the financial structure by supporting the development of a single securities market in the EU. Unlike other currency areas, there is currently no pan-European, neutral and harmonised channel for the issuance and initial distribution of debt securities that would cover the European Union as a single domestic market. The fragmentation of debt markets along national lines complicates financial integration and risk sharing among euro area market participants. The potential development of a common safe asset may propel the development of a pan-European service[134] within the EUR liquidity framework of the TARGET Services.[135] At the same time, such an infrastructure would be needed to ensure that investors across the euro area could trade the common safe asset safely and efficiently on a level playing field, independently of their location.

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131 See Basel Committee on Banking Supervision (2017) and Véron (2017).

132 See Alogoskoufis and Langfield (2019).

133 The ways to achieve low credit risk in a common safe asset vary between different safe asset design proposals. In all of them, however, some other entity will have to bear the sovereign credit risk.

134 In May 2019, the ECB issued a market consultation to investigate why there is currently no pan-European channel for the issuance and distribution of debt securities. In October 2019, the ECB published the responses it had received from the market. The Eurosystem will keep market participants informed regarding the progress of its work with a view to determining any follow-up actions leading to a potential Eurosystem initiative in this area. In doing so, the Eurosystem will take into account all relevant legal, regulatory and statutory considerations.

135 By November 2022, TARGET Services will comprise a single liquidity pool in central bank money, i.e. a cash account with the Eurosystem, which would enable financial market actors to manage transactions in payments (retail and large value), securities and collateral. Within this context, an issuance and initial distribution service could potentially be explored in order to issue and distribute common safe assets, among other debt instruments, in an efficient way across the euro area.

Box B.1

Possible interaction between a common safe asset and the regulatory treatment of sovereign exposures

Prepared by Margherita Giuzio, Anouk Levels and Luis Molestina Vivar

Sovereign exposures currently receive a risk-free treatment in the EU banks' capital requirements framework. Under Basel standards, jurisdictions may exempt banks from capital requirements for sovereign exposures denominated and funded in the domestic currency.[136] The EU Capital Requirements Regulation[137] (CRR) assigns a zero risk weight to such exposures under the standardised approach.[138] Sovereign exposures are also exempted from large exposure limits, which constrain exposures to a single counterparty to be no greater than 25% of a bank's own funds. Furthermore, sovereign bonds are treated as high quality liquid bonds under the liquidity requirements.[139]

Several proposals for the revision of the regulatory treatment of sovereign exposures (RTSE) have been put forward to mitigate the sovereign-bank nexus (see, for example, BCBS (2017) and Véron (2017)).[140] However, no consensus has been reached so far. For our analysis, we focus on the proposals for concentration charges for euro area sovereign exposures.[141] Under these proposals, banks would be incentivised to diversify their sovereign exposures, which may mitigate the sovereign-bank nexus.

As a reaction to concentration charges, banks may diversify their sovereign portfolios by substituting sovereign holdings that are above the concentration threshold with other banks' sovereign exposures above the threshold. This may reduce banks' exposures to their domestic sovereign (i.e. "home bias"), thereby mitigating the sovereign-bank nexus. However, it is possible that banks cannot fully diversify their sovereign holdings by trading with each other. In this sense, some sovereign exposures may remain above the concentration threshold.

Concentration charges may also increase the overall riskiness of banks' sovereign portfolios. Craig et al. (2019) find that the introduction of concentration charges would increase the risk of most banks' sovereign portfolios after they reallocate their holdings, compared with their current sovereign portfolio. This is also in line with Alogoskoufis and Langfield (2019), who find that reforms focused on concentration would result in banks increasing their overall exposure to sovereign credit risk. While a simultaneous introduction of adequate risk weights could mitigate this risk, their paper finds that

136 See Basel Committee on Banking Supervision (2017).

137 Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 (OJ L 176, 27.6.2013, p. 1).

138 See Article 114(4) of the CRR (Regulation (EU) No 575/2013). In addition, the CRR grants authorities the discretion to allow internal ratings-based (IRB) banks to use the standardised approach for their sovereign exposures.

139 See Article 400(1a) of the CRR.

140 The Basel Committee on Banking Supervision (2017) mentions the removal of the IRB approach for sovereign exposures, positive standardised risk weights for most sovereign exposures, the introduction of marginal risk weight add-ons to mitigate concentration risk, and the removal of the national discretion to apply a haircut of zero for sovereign repo-style transactions.

141 The proposal considered here does not take into account differences in credit risk. German Council of Economic Experts (2018) analysed the effects of risk-based concentration charges.

banks cannot create from existing securities a sovereign portfolio that has both low concentration and low credit risk by means of diversification only.[142]

A well-designed common safe asset could mitigate some of the unintended consequences of regulatory concentration charges. In a scenario where both concentration charges for sovereign exposures and a common safe asset are in place, banks could substitute parts of their sovereign bond holdings with the common safe asset. As a result, the amount above possible concentration thresholds would be lower and they would only need to redistribute a smaller portion of their sovereign portfolio to avoid concentration charges. Furthermore, due to its low envisaged risk, a common safe asset may lower the overall volatility of banks' sovereign portfolios following their diversification in response to concentration charges.

This box assesses the extent to which a common safe asset could interact with regulatory concentration charges. We take a two-step approach. In the first step we model the safe asset and banks' holdings of the safe asset. We consider two different sizes for a European safe asset and compute how much of each euro area country's government debt would be needed for its creation based on the ECB's capital key. The total amount of sovereign bonds purchased to reach 30% of GDP would be around €3.5 trillion, while it would be €1.8 trillion to reach 15% of GDP (see Leandro and Zettelmeyer (2019) and Guidice et al. (2019)). [143] With regard to banks' holdings of the safe asset, we make a number of simplifying assumptions. First, all banks would contribute proportionally to the creation of the safe asset and would replace parts of their sovereign portfolio with a European safe asset.[144] In doing so, we assume that there are no obstacles to banks absorbing the safe asset, and that banks have sufficient incentives to hold it.[145] Second, throughout the analysis, the common safe asset would be exempted from regulatory concentration charges, which largely determines the results of the simulations. In this context, we do not consider any potentially riskier by-product of the common safe asset that could be subject to stricter regulatory treatment. Third, the overall amount of sovereign debt in the aggregate banking system remains constant throughout the analysis.

In the second step, we compare the impact of concentration charges for a scenario with and without a common safe asset. In line with the Basel Committee calibration, we assume concentration charges above 100% of Tier 1 capital.[146] We then simulate how banks would reallocate sovereign bonds above this threshold with other euro area banks.[147] In this reallocation exercise, banks maintain their overall volume of sovereign holdings but aim to reduce holdings above 100% of Tier 1 capital by

[142] The focus of this box is on safe assets, not the design of the regulatory treatment of sovereign exposures. The design and calibration of the RTSE would need to be assessed in a different context.

[143] We assume that this volume represents the safe part of the common safe asset. We do not consider any potential riskier by-product that could result from creating a common safe asset. In other words, we assume that banks do not hold any subordinated or junior sovereign debt.

[144] By way of example, if the creation of the common safe asset requires x% of country X's government debt to be included in the safe asset creation pool, we assume that banks would contribute proportionally to their holdings of country X's debt. A bank holding y% of country X's government debt would sell x%*y% government bonds to the entity that creates the safe asset.

[145] For instance, it has been suggested that a change in the regulatory treatment of sovereign exposure may be needed to induce banks to hold a common safe asset.

[146] Given that exposures below the 100% threshold would be exempted from capital charges in this scenario, we assume that banks would not aim to diversify these exposures. Therefore, the reshuffling exercise only takes into account the sovereign bonds that are above the concentration threshold.

[147] The algorithm starts with a random bank's sovereign exposure that is above the concentration threshold. It then chooses a sovereign bond above the threshold from another bank. Starting from the sovereign with the most similar rating, exchanges are pursued until the concentration threshold is reached for this sovereign. The holdings offloaded are allocated to the set of banks offering their holdings above the threshold, ensuring that receiving banks do not breach the concentration threshold. After the maximum reallocation possible is completed for this bank-sovereign bond pair, the algorithm moves to the next pair in random order.

exchanging these bonds against other euro area banks' bonds that exceed the threshold.[148] We assume that a bank would only exchange sovereign bonds against bonds that have a similar risk profile. For example, a bank with German sovereign bonds above 100% of its Tier 1 could only trade with a bank that has exposures above this threshold from Austria, Belgium, Estonia, Finland, France, Luxembourg or the Netherlands.[149]

Table A

Potential impact of a common safe asset on banks' sovereign bond holdings in the event of a regulatory concentration charge (concentration threshold: 100% of T1 capital)

	Impact of regulatory concentration charges – considering banks' risk preferences		Impact of regulatory concentration charges – without considering banks' risk preferences	
	Reduction in holdings above the threshold	Share of domestic bonds	Reduction in holdings above the threshold	Share of domestic bonds
Reallocation without safe asset	18.9%	52.6%	53.2%	50.0%
Reallocation with safe asset (15% of euro area GDP)	61.8%	39.4%	71.9%	38.7%
Reallocation with safe asset (30% of euro area GDP)	80.3%	26.5%	82.4%	26.4%

Sources: FINREP and ECB calculations.
Notes: "Reduction in holdings above the threshold" refers to the amount of excess holdings above 100% of T1 capital that could be reduced through banks' reallocation under three different scenarios: (i) reallocation without a safe asset; (ii) reallocation with a large safe asset (30% of GDP); (iii) reallocation with a smaller safe asset (15% of GDP). "Share of domestic bonds" is the amount invested in domestic sovereign bonds as a percentage of the total amount of euro area sovereign bonds held by banks. Columns 2 and 3 consider banks' risk preferences meaning that banks only trade sovereign holdings that have a similar credit rating. Columns 4 and 5 do not consider banks' risk preferences, meaning that banks can trade their sovereign holdings with other sovereign bonds that are above the threshold irrespective of the credit rating.

Table A shows that a common safe asset, which is exempt from regulatory requirements, could reduce euro area banks' holdings above a concentration threshold of 100% of T1 capital.[150] In the absence of a safe asset, banks could diversify away around 19% of holdings above the threshold in the euro area banking sector, under the assumption that banks only trade in similarly rated bonds (column 2, row 1). If banks could trade their bonds irrespective of the bonds' credit rating, the banking sectors' holdings above the threshold could be reduced by around 53% (column 4, row 1). Under the scenario where the safe asset reaches 15% of euro area GDP, banks could diversify around 62% (or 72% without considering banks' risk preferences) of their bond holdings above the threshold. If the size of the safe asset was 30% of euro area GDP, holdings above the threshold could be reduced to 80% (or 82% without considering banks' risk preferences). The introduction of a common safe asset would also reduce the share of domestic bonds in banks' sovereign portfolios (columns 3 and 5). Without a safe asset, banks' domestic sovereign exposures would amount to around 53% (50% without considering banks' risk appetite) of total euro area sovereign exposures after banks reallocate

[148] This analysis takes into account the (limited) outstanding amounts of general government debt securities held by banks.

[149] The other buckets include ES, IE, LT, LV, MT, SI, SK (A+ to A-), CY, IT, PT (BBB+ to BBB-), and GR (BB+ to B-), based on Q4 2018 S&P credit ratings. We assume that banks only exchange bonds against bonds that are in the same credit bucket.

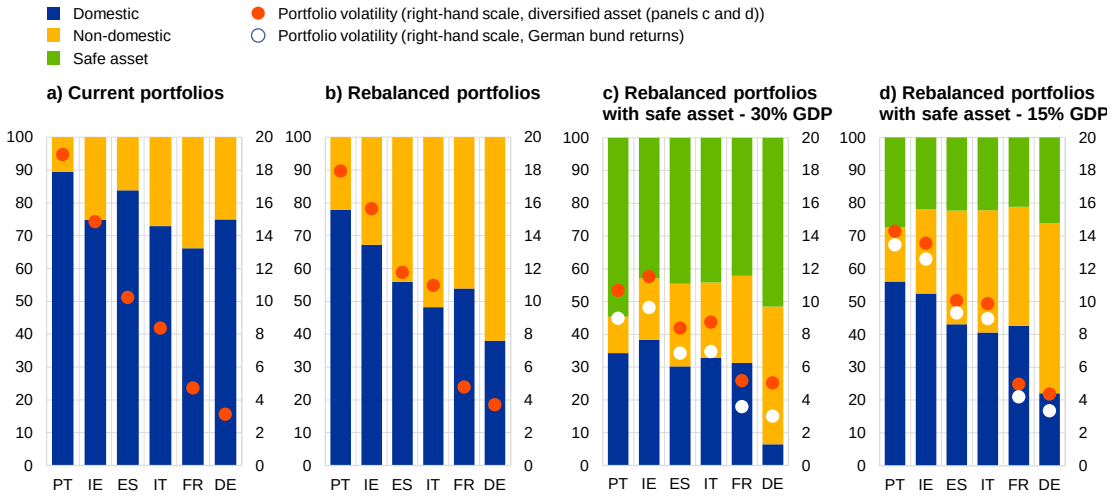
[150] In our model, stricter concentration charges would lead to more sovereign holdings above the threshold and the need to further reduce domestic sovereign bond holdings. Since the size of the safe asset and the absorption by banks is fixed and independent of the concentration threshold, the relative impact of a safe asset under a stricter concentration charge is slightly lower.

their holdings above the regulatory threshold.[151] In the presence of a safe asset, the home bias could be reduced to around 39% or 26%, depending on the scenario for the size of the safe asset.

Chart A

Potential impact of a common safe asset on sovereign portfolio risk in the event of regulatory concentration charges (concentration threshold: 100% of T1 capital)

(sovereign holdings; portfolio variance)



Sources: EBA and ECB calculations.
Notes: Domestic holdings represent banks' exposure to domestic sovereign bonds, while non-domestic holdings represent exposures to other euro area sovereigns. Portfolio variance is the variance of portfolio returns. In the right panel, white dots indicate portfolio volatility when the returns of the safe assets are the same as the German Bund. Red dots indicate portfolio volatility when the returns of the asset are modelled as a linear combination of the returns of euro area sovereign bonds.

A common safe asset could also reduce banks' sovereign portfolio variances, thereby mitigating some unintended effects from concentration charges. In line with Craig et al. (2019), the first two panels on the left in Chart A show that concentration charges could increase banks' sovereign portfolio variance.[152] To see how a safe asset could mitigate this unintended effect, we introduce a safe asset with the same returns as the German Bund (white dots).[153] We find that the resulting reallocations are less volatile than the rebalanced ones across all countries. The effect is larger for the safe asset with a size of 30% of euro area GDP compared with the smaller safe asset.[154] We also assess the impact of a fully diversified asset, assuming that its returns are a linear combination of the returns of euro area sovereign bonds (weighted by each country's capital key).[155] We find that the resulting sovereign bond portfolio variances would be smaller than the rebalanced ones for most countries except for German and French banks, which in this case would be exposed to countries with lower credit quality.

151 Since we assume that banks only reshuffle those sovereign holdings that are above the regulatory threshold, a large share of sovereign bonds are not redistributed. Therefore, the aggregate home bias in euro area banking system still stays relatively high based on the simulation exercise.

152 Portfolio variance is interpreted as the "average riskiness" of banks' portfolios (Craig et al., 2019).

153 This assumption derives from the literature which suggests that the safe asset should have lower returns than any euro area sovereign bond.

154 This finding is in line with those of the ESRB (2018, p. 15), who find that banks would de-risk their sovereign bond portfolios (without reducing the size of those portfolios) if they reinvested (some fraction of) current holdings into senior SBBS.

155 Under these assumptions, the safe asset would be equal to a diversified euro area sovereign bond portfolio.

While a common safe asset could facilitate regulatory concentration charges, the results presented should be interpreted with caution. The findings suggest that a common safe asset could (i) reduce banks' sovereign holdings above the concentration threshold while keeping the overall amount of sovereign debt in the banking system constant, (ii) reduce banks' home bias and (iii) lower banks' portfolio variance, compared with introducing concentration charges without a safe asset. The magnitude of the results depends to a large extent on the calibrations used for the safe asset and on our assumptions of how banks would substitute national sovereign bonds for the common safe asset on their balance sheet. Furthermore, banks' behaviour is difficult to predict. While we assume that banks try to reallocate holdings to holdings of a similar risk profile, it may also be the case that the presence of a safe asset would incentivise banks to invest their remaining sovereign bond portfolios in riskier bonds. Finally, our results depend on the possible calibration of the RTSE and the assumption that a common safe asset would be exempted from regulatory capital requirements. In this regard, preferential treatment of a common safe asset under the RTSE may incentivise banks to invest in such an asset.[156]

Desirable features of a common safe asset

While a common safe asset could foster financial integration and stability in the banking and capital markets union, there is no consensus on how such a common asset should be designed in order for it to have the intended benefits. A wide range of proposals have been put forward. Leandro and Zettelmeyer (2018, 2019) provide an overview and comparison of these proposals. This sections draws heavily on their work. Leandro and Zettelmeyer (2018, 2019) group the proposals into three broad categories. The first set of proposals envisions the creation of a common safe asset through collective public guarantees. The second requires the creation of an area-wide fiscal authority. In contrast, the third would not rely on fiscal integration but instead suggests the establishment of financial intermediaries to issue a common safe asset backed by a diversified portfolio of euro area sovereign debt. Current discussions at the European level focus on the third group of proposals.

Yet, it seems that there is some common ground as regards the desirable features a common asset should have. A common safe asset should have a very high credit quality and be resilient to idiosyncratic and more widespread sovereign shocks. A common safe asset should have a credit quality comparable to sovereign bonds with the highest credit rating. The safety of a common asset that relies on collective public guarantees or a euro area fiscal authority would be difficult to quantify. Conceptually, however, the robustness of these options to systemic events where the resilience of several sovereigns decreases simultaneously would need to be assessed. In such scenarios, problems may easily spread to sovereigns that have to provide financial support in already unfavourable fiscal conditions. This risk of direct spillovers across sovereigns would not be present for proposals that rely on private

[156] The preferential treatment should only extended to safe part of the common asset and not to any subordinated elements.

risk sharing through diversification and seniority.[157] Studies on the safety of these design options show that there may be a trade-off between safety in severe but plausible events versus extreme crisis scenarios (tail events).[158] For a common safe asset to have a beneficial impact on financial stability in the long term, it would also need to be robust in extreme crisis scenarios since these would be the times that the financial system would need safe assets the most. It should be noted, however, that even a common safe asset resilient to extreme shocks would never be entirely risk free.

A common safe asset should also ensure fiscal discipline without impairing the functioning of national debt markets. Common safe asset designs that depend on loss mutualisation among sovereigns could provide the wrong fiscal incentives, which would run against EU legislation.[159] Some design options which rely on private risk sharing may have a positive impact on fiscal discipline, because they would lead to higher marginal funding costs on remaining national sovereign debt. While this could be a desirable feature of a common safe asset, it may lead to an impairment of the functioning of national debt markets, both in normal times and during future crises. The national debt markets should remain resilient and liquid, and funding costs should not rise prohibitively as a result of the introduction of a common safe asset.[160] [161] In this regard, it has been argued that a rise in funding costs for national sovereign debt might (in part) be offset by lower funding costs for the share of sovereign debt that will enter into the safe asset pool, especially when the common safe asset has an international reserve status (see Box B.2 in this special feature). Finally, cliff-edge effects – for instance due to safe asset design rules that would exclude sovereign debt – should be avoided as this could further hamper sovereigns in regaining market access.[162]

A common asset should be of sufficient size and liquidity in order to have a meaningful impact on financial stability and integration. It has been estimated that a common safe asset based on private risk sharing could – depending on its design – achieve a volume of between 13% and 30% of euro area GDP, while ensuring a very high credit quality.[163] At these levels, a common safe asset would already have

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157 As mentioned in Section 2 and Box 1, a common safe asset that relies on diversification as well as seniority may outperform pure diversification only, as pure diversification could reduce banks' home bias but may not result in overall lower credit risk in banks' sovereign portfolio. See also Alogoskoufis and Langfield (2019) and Craig et al. (2019).

158 Leandro and Zettelmeyer (2019), pp. 25 -28, compare different design options for European Safe Bonds (ESBies) and e-bonds, and show that while ESBies might be slightly safer in severe events (>1.7% VAR threshold), they would be substantially less safe in extreme tail events (<1.7% VAR threshold).

159 Loss mutualisation among sovereigns would not be in line with the Treaty, as Article 125 TFEU states that "A Member State shall not be liable for or assume the commitments of central governments, regional, local, or other public authorities […] or public undertakings of another Member State […]".

160 Markets should also remain stable during future shocks and crises, as turbulence of national bond markets may increase rather than decrease financial stability risk. See ESRB (2018).

161 See Giudice et al. (2019) for an assessment of the e-bond proposal on marginal and average funding costs. They conclude that marginal funding costs would rise only moderately for e-bond volumes up to 20% of GDP. Average funding costs would remain broadly unchanged up to 45% of GDP. This is because of the assumption that higher funding costs of remaining national debt would be offset by more favourable funding conditions for the e-bond debt. The ESRB (2018) concludes that the impact on national sovereign bond market liquidity is limited to a senior SBBS volume of up to 13% of GDP.

162 Under some proposals for a common safe asset, only bonds from sovereigns that have primary market access can be included in the safe asset.

163 See Leandro and Zettelmeyer (2019), Giudice et al. (2019).

a volume larger than the current outstanding German Bund volume (which is about €1.1 trillion) and may have a beneficial impact on financial stability. While the benefits for financial stability may be greater for larger volumes of the common safe asset, there is a clear trade-off between volume and safety. Since common safe asset designs based on private risk sharing rely on subordination to attain high credit quality, a lower subordination level will increase the volume of the safe asset, but also its risk. Besides being of sufficiently large volume and credit quality, the common safe asset should be liquid enough to be used as reference asset for pricing financial assets. In this regard, the common safe asset would need to be issued with various (short-, medium-, and long-term) maturities so that a euro area-wide, risk-free term structure could be constructed.

The creation of a safe asset may pose several challenges to national sovereign debt markets. First, depending on the design, the creation of a common safe asset could have a negative impact on national bond markets should these be perceived to become subordinated to the common safe asset. Second, there could be a trade-off between liquidity of the common safe asset and the remaining national sovereign bond markets. It is possible that the issuance sizes of free-floating national government bond markets will become smaller. This could have a negative impact on market liquidity, potentially reducing the investor base and hampering the price discovery process. These potential challenges to national sovereign debt markets deserve careful consideration.

A common safe asset should also be compatible with both regulatory and market standards. A change in the RTSE may induce the creation of a common safe asset. A common safe asset would then need to have a preferential treatment compared to remaining sovereign debt, in order to incentivise banks to invest in it. Moreover, a common asset should meet the criteria for high-quality liquid assets in line with the applicable regulatory framework. Furthermore, the common safe asset should meet market standards for highly liquid assets in order to be fungible as collateral in, for instance, repo or derivative transactions.

In addition to meeting the above criteria, any common safe asset must be eligible for central bank operations to be universally acknowledged as a euro-area safe asset. The eligibility of a common safe asset as collateral for the Eurosystem's monetary policy operations would incentivise banks to hold such an asset, and would moreover be key for the reputation of the European institutions. Whether a common safe asset would be eligible under the current collateral framework depends on its design. Currently, the collateral framework of the Eurosystem would only accept common safe assets in the form of unsecured debt instruments issued by a group of states or an agency such that they can be classified as supranational or sovereign debt securities. However, if the safe asset is created as a contractual innovation, for instance in the form of a securitisation, it would not be eligible. Although some types of secured debt instruments are eligible (see ECB

Guideline (EU) 2015/510[164]), the Eurosystem currently does not accept secured debt instruments that are backed by sovereign bonds.

Box B.2

International demand for a common safe asset

Prepared by Spyridon Alogoskoufis and Thomas Kostka

An often-cited feature of the euro bond market is that ample domestic and international demand for safe sovereign assets is barely met by a decelerating supply. Owing to downgrades of significant euro area sovereign issuers to lower investment grade and high-yield ratings as well as fiscal consolidation of highly rated issuers, the supply of sovereign assets deemed safe by investors has not kept up with the growing demand. Domestic and international central bank purchases add to the scarcity of highly rated sovereign assets, putting further upward pressure on their prices. As a result, bond yields across euro area sovereigns have become more dispersed over the recent decade, with issuers of safe sovereign assets benefiting from a scarcity premium.

This box provides evidence on demand for a common safe asset and explains the benefits of a broader supply of the common safe assets from the perspective of the issuer. It argues that a larger supply of highly rated sovereign assets would likely be absorbed by domestic and international demand mainly because its typical investors, the official sector in particular, are relatively less price-sensitive. As such, the benefits of lower borrowing rates can be transmitted to a larger set of issuers and strengthen the international role of the euro at the same time. However, whether this will translate into lower average sovereign funding costs also depends on adjustments in the supply of lower-rated sovereign assets which, in turn, is determined by the specific safe asset design as well as developments in fiscal consolidation of single euro area sovereigns.

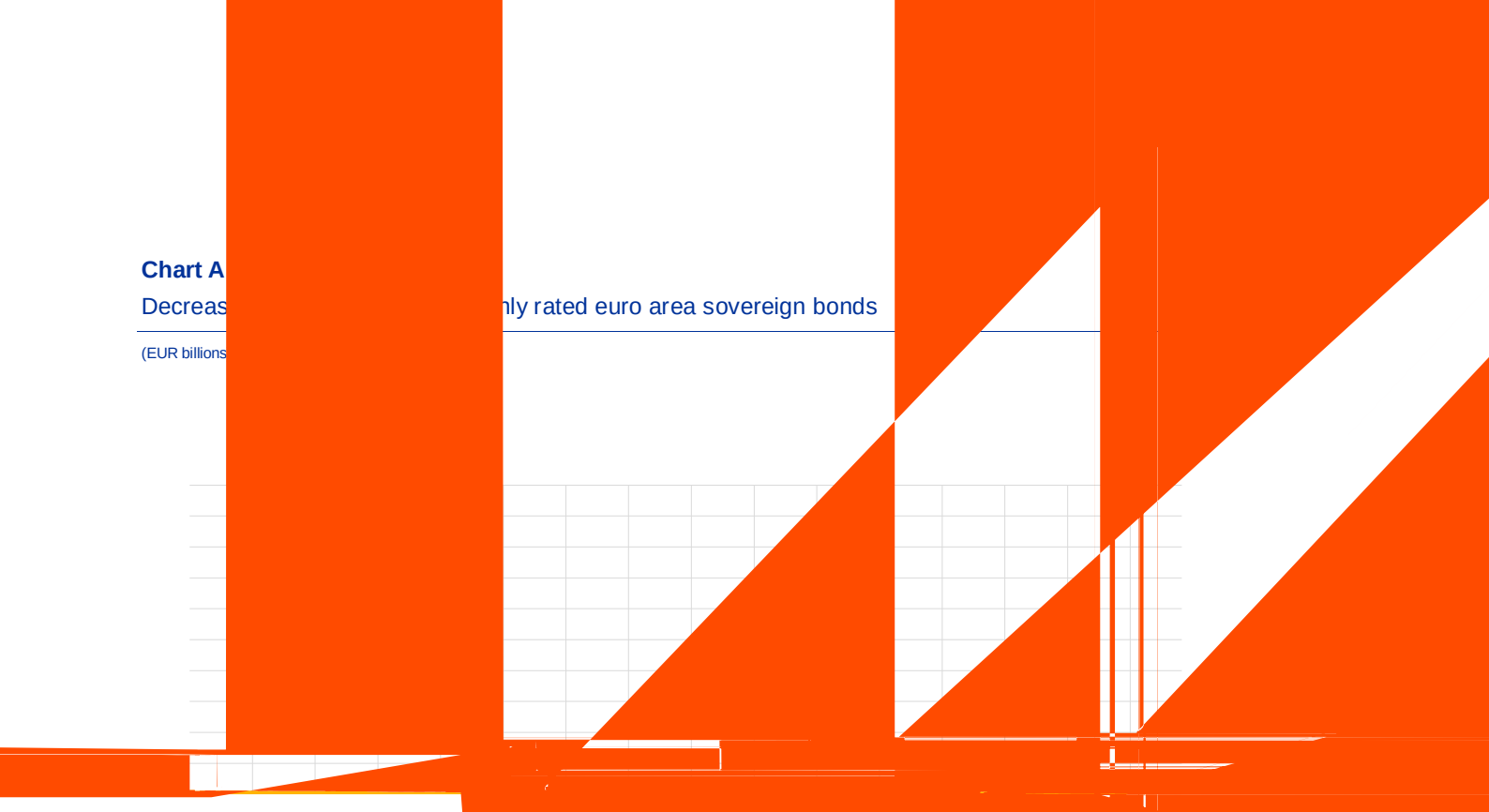
The supply of highly rated sovereign bonds grows only gradually. From a regulatory viewpoint, all sovereign bonds are regarded as high quality and liquid assets (HQLA). However, market participants do not share this perception of safety, as evidenced by the flight-to-quality dynamics during the sovereign crisis. Instead, they focus on assets that are relatively very low-risk (e.g. AAA or AA rating) and have a deep and liquid secondary market. Furthermore, investors tend to consider securities issued by governments or large public institutions safer than those issued by private sector institutions, all other things being equal. According to this classification, only a very narrow set of sovereign assets can be considered safe. In the euro area, the nominal stock of (sub-sovereign debt securities rated AAA and AA stands at roughly €4.5 trillion, which is still slightly below the peak in 2011 before the onset of the euro area sovereign debt crisis (Chart A). In comparison, US general government debt has increased by nearly a third in nominal terms over the same time span.

[164] Guideline (EU) 2015/510 of the European Central Bank of 19 December 2014 on the implementation of the Eurosystem monetary policy framework (ECB/2014/60) (OJ L 91, 2.4.2015, p. 3).

Chart A

Decreas nly rated euro area sovereign bonds

(EUR billions



Sources: Iboxx.
Note: Sovereign and sub-sovereign debt rated AA
upgrades.

Data on holdings of euro area s
securities issued by countries th
illustrates the strong preferences
Indeed, German and French sov
sovereigns, followed by the Neth
countries (Austria and Belgium) is
in lower-rated bonds that are rela
Evidence from the IMF's Coordina
these portfolio inflows originate fr
rated debt. The demand from this
considerations, which makes it mo
targeting a certain absolute portfoli

Table A

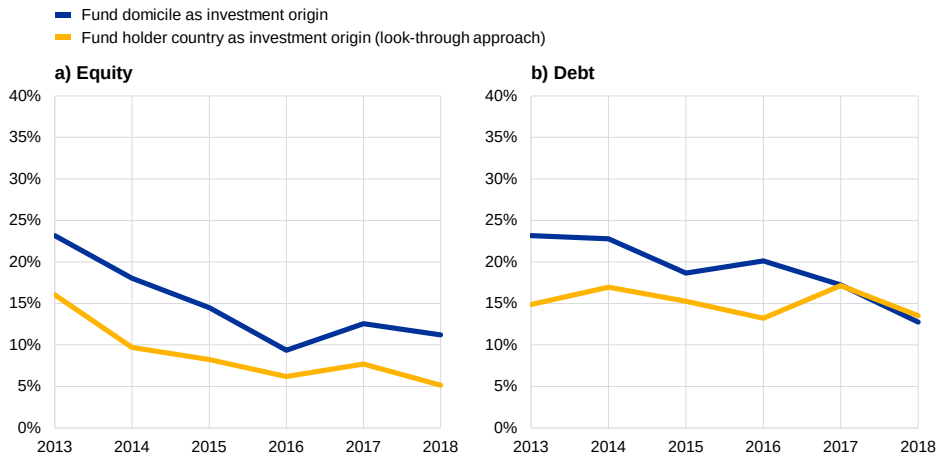
Foreign official investors make up a
sovereign debt market

Country (credit rating)
Germany (AAA)
Netherlands (AAA)
France (AA)
Belgium (AA)
Austria (AA)
Spain (A)
Italy (BBB)
Portugal (BBB)

outside the euro area, the look-through approach includes a number of funds that would not be captured when taking the fund domicile as investment origin.[173] In Q4 2018, our dataset covers €1.7 trillion of euro area investor equity holdings and €0.7 trillion of euro area debt holdings via investment funds.

Chart C.1

Euro area investor fund holdings of domestic equity (left panel) and domestic debt securities (right panel)



Sources: SHS and Lipper IM.
Notes: The blue line uses fund domicile as investment origin, following ECB (2018). The yellow line uses investor domicile as investment origin, following the look-through approach. The sample of reporting countries includes Austria, Belgium, Germany, Spain, France, Greece, Ireland, Italy, Lithuania, Luxembourg, Latvia and the Netherlands.

Applying the look-through approach, the relative share invested in domestic assets is lower for most periods compared with taking the fund domicile as investment origin. Following ECB (2018), Chart C.1 shows investments in domestic equity (left panel) and domestic debt investments (right panel) relative to total investments through investment funds. We show domestic investments using both the fund domicile as investment origin (blue lines) and the investors' country of origin (yellow lines). When taking into account investors' country of origin, we find that, except for debt securities in Q4 2018, the share invested in domestic securities is lower compared with the use of the fund domicile as investment origin. For equity securities, the share of investments in domestic securities has declined over the past five years. In Q4 2018, domestic equity securities were only 5.2% of total assets when using the look-through approach and 11.2% when taking the fund domicile as investment origin.

To investigate the extent to which euro area investors overweight domestic holdings, we compare fund holdings with a benchmark following standard practice in the literature. Chan et al. (2005) assess the deviation of the share of a

[173] In 2018, around 7% of euro area investors' assets were held in funds domiciled outside the euro area, with Japan and the United States as the most important fund domiciles in this regard. Since we do not have data on non-euro area investors, these investments are linked with the available euro area investors. To avoid the risk of overestimating international exposures, we also conduct our analyses excluding investments in non-euro area-domiciled funds. While this would decrease aggregate non-euro area exposures relative to total exposures, the home bias measures remain robust, both in direction and magnitude, across euro area countries.

country in its mutual fund holdings from the world market capitalisation weight of the country. Following this approach, we use the market capitalisation of total equity and debt holdings by country as the benchmark based on the full fund holdings available. We first apply the home bias measure by Chan et al. (2005) using the investment fund domicile as investment origin. We then adjust these home bias measures by taking fund holder countries as investment origin based on the look-through approach. Box C.1 describes the differences between the two methodologies in more detail.

Table C.2

Home bias by euro area country: fund domicile vs. fund holder country as investment origin

(home bias measures)

	Fund domicile as investment origin (Chan et al. (2005))	Fund holder country as investment origin (look-through approach)
Austria	3.4	1.8
Belgium	2.6	0.7
Finland	3.3	1.0
France	1.7	0.9
Germany	1.2	1.0
Greece	7.3	1.4
Ireland	0.2	-0.2
Italy	2.6	1.7
Latvia	4.6	1.3
Lithuania	6.4	1.6
Luxembourg	0.6	-0.0
Netherlands	1.2	0.2
Spain	2.9	2.2
Euro area (average)	2.9	1.0

Sources: SHS and Lipper IM.
Notes: The table shows the average home bias across euro area countries between 2013 and 2018, based on total equity and bond holdings. The home bias for country j reflects the deviation of the share of country j in its mutual fund holdings from the world market capitalisation weight of country j. Column 2 shows country j's home bias using fund domicile as investment origin, closely following Chan et al. (2005). Column 3 shows country j's home bias using fund holders' country as investment origin, following the "look-through approach". The two methodologies are explained in more detail in Box C.1.

When taking into account investors' countries of origin we find a lower home bias throughout the euro area, compared with home bias measures that use the fund domicile as investment origin. Column 2 of Table C.2 shows the results using fund domicile as investment origin, while column 3 shows the results using the look-through approach. Similar to Chan et al. (2005), we find evidence for home bias in all 13 euro area countries in our dataset when using the fund domicile as investment origin. When applying the look-through approach, however, we find a substantially lower home bias. While there still is a positive home bias for most countries (except for Ireland and Luxembourg), the euro area average is only one-third of the home bias measure that uses the fund domicile as investment origin.[174]

[174] The effect is robust for equity and bond securities: when restricting the sample to bond and equity securities separately, the home bias is still lower across all euro area countries when taking the fund holder country as investment origin, relative to taking the fund domicile as investment origin.

The lower home bias is particularly pronounced for countries with small fund sectors whose investors are to a large extent active in euro area financial centres. Austria, Belgium, Finland, Greece, Italy, Latvia, Lithuania and Spain show a relatively high home bias when taking the fund domicile as investment origin (see Table C.2, column 2). These countries have small investment fund sectors, each holding less than 4% of total euro area assets. Investors domiciled in these countries invest a considerable share of their assets in funds domiciled outside of their jurisdiction, in particular in euro area financial centres. For instance, in 2018, Italian investors put only 37% of their assets in funds domiciled in Italy, with 57% of Italian investments held by funds domiciled in Ireland and Luxembourg.[175] For these countries, investments in funds domiciled in financial centres would not be accounted for when taking the fund domicile as investment origin. Therefore, the home bias measure changes considerably for countries whose investors put a large share of their assets outside their own country's fund sector.

Table C.3

Home bias in funds domiciled in euro area financial centres

	Investment in foreign securities (percentages)	Herfindahl-Hirschman Index	Home bias (look-through approach)
Funds domiciled in euro area financial centres	89.0	0.14	0.3
Funds domiciled in the euro area but outside financial centres	67.7	0.19	1.3

Sources: SHS and Lipper IM.
Notes: The first column shows investment in foreign securities for funds domiciled in financial centres (i.e. Ireland and Luxembourg) and funds domiciled outside financial centres. The second column shows the average Herfindahl-Hirschman Index for funds domiciled in financial centres and funds domiciled outside financial centres. The third column shows the average home bias across euro area countries between 2013 and 2018, using the "look-through approach" (see Box C.1 for explanation). The reported home bias measure provides the average across all 13 euro area holder countries for the two different samples (i.e. funds domiciled in euro area financial centres and funds domiciled in other euro area countries), respectively.

The lower home bias can be explained by investments in funds domiciled in financial centres, which invest in more diversified portfolios relative to funds domiciled in other euro area countries. According to column 2 of Table C.3, funds domiciled in financial centres invest 89% of assets in non-domestic securities, while other euro area funds only invest 68% of their assets in non-domestic securities. Furthermore, funds domiciled in financial centres tend to hold less concentrated portfolios than funds domiciled outside financial centres. The Herfindahl-Hirschman Index, which proxies for portfolio concentration, is 0.14 for funds domiciled in financial centres and 0.19 for funds domiciled in the euro area but outside financial centres (column 3). Because funds in financial centres tend to have more diversified portfolios than funds outside financial centres, the home bias across euro area countries is lower when using the look-through approach. The rationale is that this approach also considers investments in funds domiciled outside their own jurisdiction, which are not considered for that country when taking the fund domicile as investment origin. Column 3 shows that, using the look-through approach, the average home bias across euro area holder countries is only 0.3 for the subsample of funds domiciled in Ireland or Luxembourg. This is less than four times the home bias observed when excluding funds domiciled in financial centres (column 4). Funds in financial centres thus

[175] See also Coletta and Santioni (2019) for a comprehensive description of foreign funds held by Italian households.

contribute to a lower home bias across euro area countries through a more diversified portfolio compared with funds domiciled in other euro area countries.

Box C.1

Methodology: home bias and the "look-through approach"

This box describes the look-through approach and how our methodology differs from home bias measures which take the fund domicile as investment origin, in particular referring to the approach taken by Chan et al. (2005). In a first step, we replicate Chan et al. (2005) by linking a fund's domicile with the fund's investments, based on our dataset. To do so, we calculate the percentage allocation of fund holdings for each of the fund domiciles (i.e. host countries):

1. $w_{ij} = {MV_{ij}}/{\sum MV_{ij}}$

where w_{ij} is the share of country j in the fund holdings for domicile country i and MV_{ij} is the market value of fund holdings of country j for host country i. We then compute the weight of country j in the world market portfolio as follows:

2. $w_j^* = {MV^*_j}/{\sum MV_i^*}$

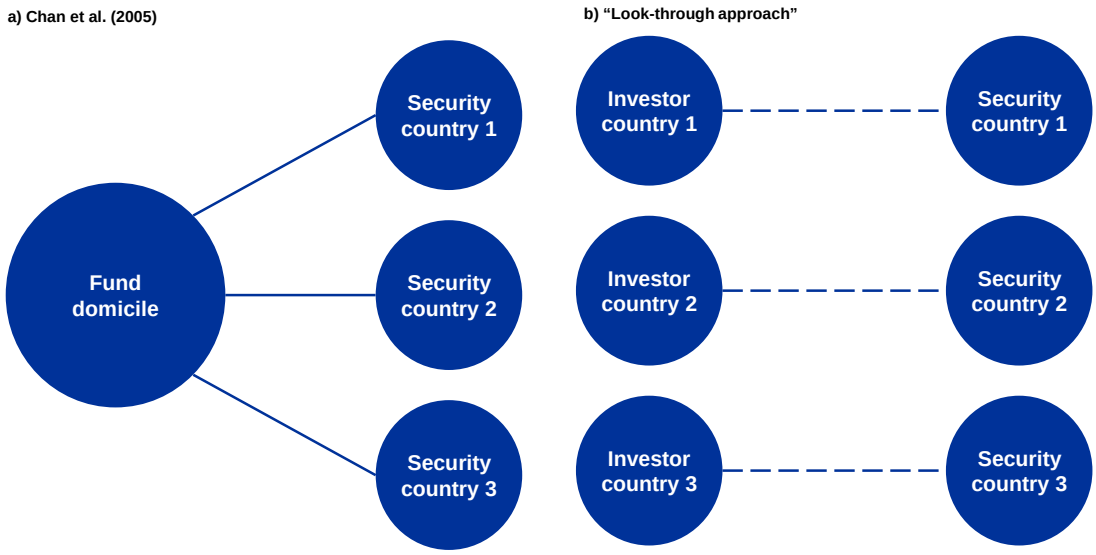
where w_j^* is the share of country j in the world market portfolio and MV^*_j is the market capitalisation of country j, based on our dataset. The value of the home bias is defined as the log ratio of the share of country j's fund holdings in the domestic market (w_{jj}) to the world market capitalisation weight of country j (w_j^*).[176] If country j has a domestic bias, the value is positive. This would suggest that funds overweight home markets in their fund holdings, relative to the country's holdings in the world market portfolio.

Using the look-through approach, we adjust Chan et al.'s measure by taking into account investors' actual country of origin. To do so, we re-estimate (i). But instead of taking the fund domicile as investment origin, we use the fund holders' country of origin. We link the investor origin country directly with the country of the securities held by a particular fund. Figure A illustrates the differences in methodology. By applying the look-through approach, we may also consider investments through non-euro area domiciled funds, if euro area investors invest directly in these funds. Because the entire universe of holdings through funds by euro area investors is taken into account, this approach allows for a more representative assessment of home bias. For the analysis, investments in funds are taken from the Securities Holdings Statistics (SHS) at the country-sector level, while funds' security-level holdings are taken from Lipper IM.

[176] Following (i), w_{jj} only considers the share of country j in the fund holdings for domicile country j.

Figure A

Home bias methodology



Notes: This stylised chart shows how fund investor domiciles, fund domiciles and security issuance countries interact in the home bias methodologies. Chan et al. (2005, left panel) take the fund domicile as investment origin and link the fund domicile with the countries of the securities. The look-through approach (right panel) directly links the investor countries with the security countries, "looking through" the respective funds.

From home bias to euro area bias?

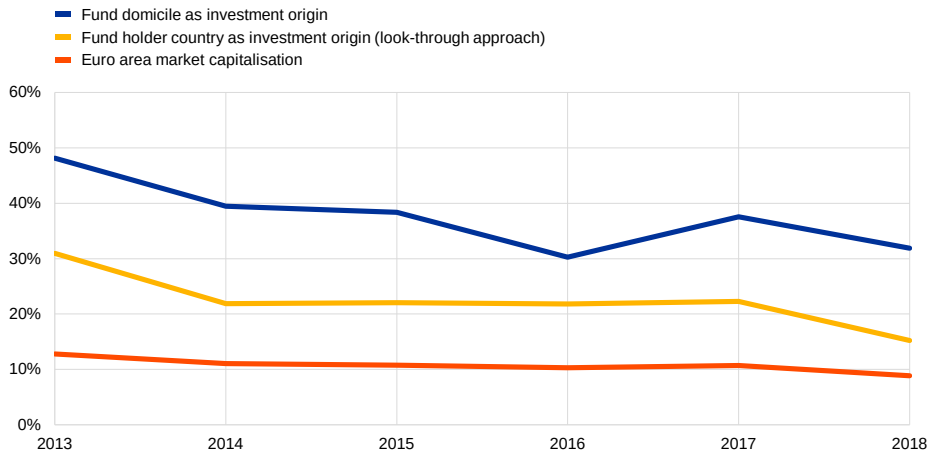
Lower investments in domestic equities coincide with higher equity investments in countries outside the euro area.[177] As shown in the previous section, investments in domestic equities have declined over the past five years. Similarly, there is a downward trend of aggregate investments in euro area equities, relative to total equity investments (Chart C.2, blue and yellow lines). In 2018, around two-thirds of equity investments were in securities issued outside the euro area, while the remaining investment was in equities issued in the euro area. The share of equity investments outside the euro area is larger when taking into account investors' country of origin relative to taking the fund domicile as investment origin, resulting in a smaller share of euro area equity investments. This can be explained by the fact that the look-through approach also considers some funds that are domiciled outside the euro area, given that a number of euro area investors invest directly in funds domiciled outside the euro area. These investments would not be captured when considering euro area fund domiciles as investment origin.

[177] This section focuses on equity investments, because we use the market capitalisation of listed domestic companies (World Bank (2019)), which applies to equities. Note that the correction using the look-through approach for debt securities provides a similar picture with relatively lower euro area investments and higher investments outside the euro area.

Chart C.2

Euro area investor fund holdings of euro area equities

(y-axis: percentages; x-axis: year)



Sources: SHS, Lipper IM and World Bank.
Notes: Investments in equity securities by euro area holders. The blue line is based on domicile as incorporation of the fund; the yellow line shows the correction based on fund holder country of origin (look-through approach). The red line shows the market capitalisation of listed domestic companies as a percentage of total world market capitalisation, based on World Bank (2019).

Euro area investors still tend to overweight euro area equities relative to their market capitalisation, providing some evidence for an equity "euro area bias". Chart C.2 shows that, relative to the market capitalisation of listed companies (red line), euro area investors still overweight investments in euro area equities. In 2018, the market capitalisation of listed companies in the euro area was 8% of the world market capitalisation, while euro area investors put around 15% of their equities in the euro area. This is in line with findings suggesting that euro area investors invest more in euro area countries than underlying fundamentals would suggest (see, for instance, Lane and Milesi-Ferretti (2005)).

Conclusion

Our main finding shows that, when correcting for investors' country of origin, the home bias in the euro area fund sector is lower than the literature often suggests. We link fund investors' countries of origin directly with their fund-specific holdings. We find that the home bias is nearly three times smaller than what is found using methodologies that take the fund domicile as investment origin. This finding can be explained by the high share of investment in funds domiciled in euro area financial centres and the more diversified portfolios of these funds relative to funds domiciled in other euro area countries. We provide corroborating evidence suggesting a lower equity "euro area bias" when taking into account the fund holders' countries of origin, relative to using the fund's domicile as investment origin.

This finding is in line with the objectives of the capital markets union (CMU) where the cross-border distribution of investment funds is a key priority. Investment funds play an important role in financial integration of the euro area since they tend to hold diversified portfolios. The lower estimated home bias across euro

area countries is a positive signal for cross-border distribution of capital flows via investment funds. In the context of the CMU agenda, there are a number of initiatives aimed at further promoting cross-border investments in the EU. For instance, the recent adoption of EU Directive 2019/1160[178] and Regulation 2019/1156[179] aims to promote the cross-border distribution of investment funds. Furthermore, the final report of the Next CMU High-Level Working Group highlights the importance of private equity funds and stresses the need to develop an efficient equity market.[180] Further action may still be needed to increase cross-border equity financing and to expand retail access to capital markets. Such measures could promote increased risk sharing in the EU and help stabilise households' consumption over time.

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[178] Directive (EU) 2019/1160 of the European Parliament and of the Council of 20 June 2019 amending Directives 2009/65/EC and 2011/61/EU with regard to cross-border distribution of collective investment undertakings (OJ L 188, 12.7.2019, p. 106).

[179] Regulation (EU) 2019/1156 of the European Parliament and of the Council of 20 June 2019 on facilitating cross-border distribution of collective investment undertakings and amending Regulations (EU) No 345/2013, (EU) No 346/2013 and (EU) No 1286/2014 (*OJ L 188, 12.7.2019, p. 55).*

[180] See Savings and Sustainable Investment Union.

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Statistics

Statistical annex

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