



EUROPEAN CENTRAL BANK

EUROSYSTEM

Financial integration and structure in the euro area

Statistical annex

April 2022



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1 Preface

This publication, launched in parallel with the ECB's report on financial integration and structure in the euro area, brings together two sets of statistical indicators which were previously presented in separate ECB reports.

The first part of the publication shows the indicators of financial integration in the euro area. These indicators allow an overall assessment of the degree of financial integration in the main financial market segments of the euro area, covering the money market, bond markets, equity markets and banking markets, including indicators related to market infrastructures.

The second part of the publication is devoted to statistical indicators and measures that were previously included in the ECB's annual report on financial structures.

The indicators disclosed in this publication will be updated on a biannual basis. The cut-off date of the indicators included in the Annex is 11 February 2022.

2 Financial integration indicators

2.1 Composite indicators of financial integration in Europe

The price- and quantity-based financial integration composite indicators aggregate data from a selection of market-specific indicators, thereby offering a comprehensive overview of financial integration in the euro area.

2.1.1 How the price-based financial integration composite indicator is constructed

The price-based financial integration composite indicator is constructed from a selection of price-based indicators that cover the four main segments, i.e. the money, bond, equity and banking markets.

As a first step the indicators to be aggregated are homogenised by the application of a transformation based on an indicator's empirical cumulative distribution function (CDF), which involves the computation of order statistics. For a time series of T observations of an indicator $x = (x_1, x_2, \dots, x_T)$, the data are ranked in ascending order, i.e. $x_{[1]} \leq x_{[2]} \leq \dots \leq x_{[T]}$, where $x_{[1]}$ represents the sample minimum ($\min(x)$) and $x_{[T]}$ the sample maximum ($\max(x)$). The transformation of the series requires the calculation of the empirical CDF, $F(x)$, which is equal to the number r of observations not exceeding a particular value x , divided by the total number T of observations in the sample:

$$F(x) := \begin{cases} \frac{r}{T} & \text{for } x_{[r]} \leq x < x_{[r+1]}, \quad r = 1, 2, \dots, T-1 \\ 1 & \text{for } x \geq x_{[T]} \end{cases}$$

If a value for x occurs more than once, the ranking number assigned to each of the observations is set to the average for the ranks covered.

All the input series used for the price-based financial integration composite indicator measure price dispersion, with higher values of price dispersion tending to indicate a lower degree of financial integration. The transformation of $1 - F(x)$ is also applied in order to ensure that higher values of the indicator indicate a higher level of financial integration. After transformation, all input series are unit-free and are, approximately, uniformly distributed within a range of zero to one.

The problem still remains as to how to relate the transformed input series to a theoretical state of perfect integration – each indicator can only provide information concerning the relative degree of financial integration achieved over its specific period of observation. For instance, a (transformed) indicator might display an increasing trend for its data sample, signalling that financial integration has improved. However, despite this trend, the actual state of integration might still be low in comparison with other market segments or with a state of perfect integration.

Next, a theoretical (ideal) benchmark value of zero is defined for all dispersion measures of financial integration and a sample-dependent scaling factor is constructed:¹

$$\theta^P(x) := \frac{\max(x) - \min(x)}{\max(x) - 0},$$

where the superscript p differentiates the price-based scaling factor from that applied to the quantity-based financial integration composite indicator.

The above factor scales down each transformed series by the percentage representing the realised range of dispersion (the historical maximum minus the minimum dispersion) over the ideal dispersion range (the historical maximum minus the theoretical benchmark of zero). Since there is no theoretical upper bound for price dispersion, its highest observed value is set as the benchmark for the lowest degree of financial integration. The series $1 - F(x)$ is multiplied by $\theta^P(x)$ to produce the final indicator z^P , which is used as an input series in the computation of the price-based financial integration composite indicator:

$$z_t^P = [1 - F(x_t)]\theta^P(x).$$

All available indicators z^P are aggregated into sub-indices s_i^P for the four markets. The sub-index for each market segment is computed as the arithmetic average of its N_i constituent integration indicators after transformation:

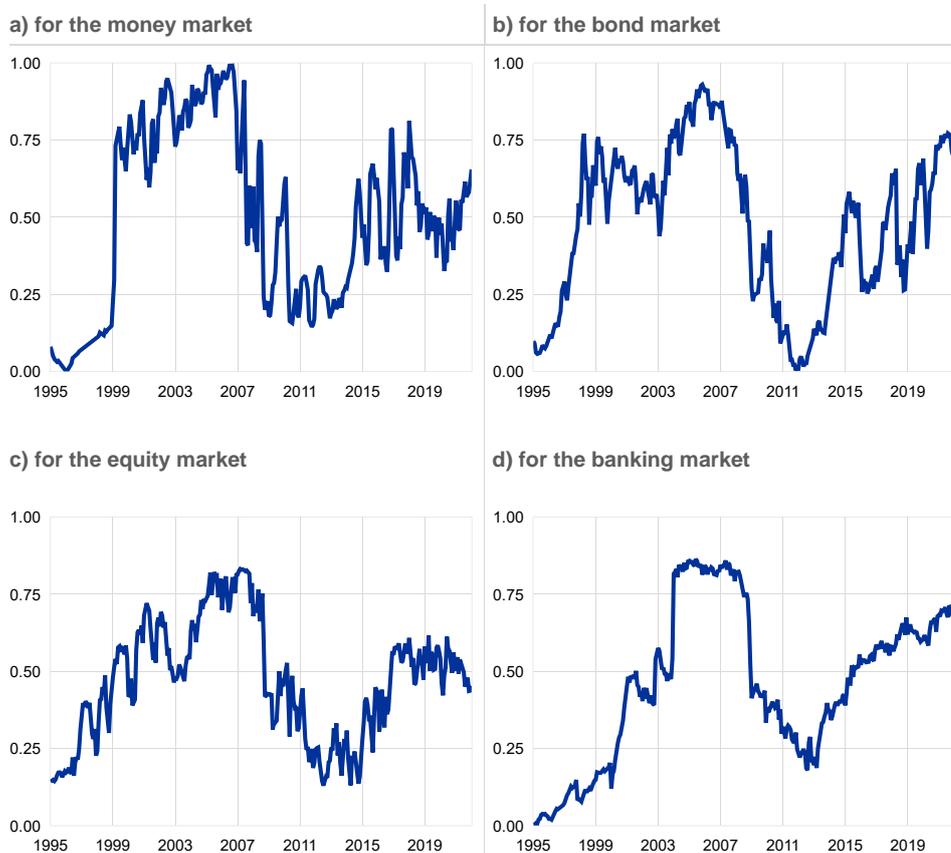
$$s_{i,t}^P = \frac{1}{N_i} \sum_{n=1}^{N_i} z_{n,t}^P, \quad \text{for } i = 1, \dots, 4.$$

¹ A theoretical benchmark of zero price dispersion is an extreme case that can only hold true under ideal conditions. For instance, a zero dispersion benchmark implicitly assumes cross-country convergence in all fundamental factors driving equilibrium risk premia embedded in asset prices. However, cleaning asset prices from risk premia is a notoriously difficult exercise. In addition, the rank-based transformation of raw dispersion measures provides some robustness to risk-related price differentials as demonstrated in Hoffmann, P., Kremer, M. and Zaharia, S. (2019), "Financial integration in Europe through the lens of composite indicators", ECB Working Paper No. 2319, September.

Chart 1

Sub-indices for each market segment

(monthly data, January 1995 – January 2022)



Sources: ECB and ECB calculations.

Notes:

a) The indicator aggregated into the sub-index is the cross-country standard deviation of unsecured interbank overnight lending rates. From January 2018 onwards the behaviour of the subcomponent may have changed due to the transition from EONIA to €STER interest rates. Data for Greece are excluded to preserve the information content of the indicator.

b) The indicators aggregated into the sub-index are the cross-country standard deviations of two- and ten-year sovereign bond yields (Greece excluded), and the cross-country standard deviation of the bond yields of uncovered corporate bonds issued by non-financial corporations (data are aggregated at country level).

c) The indicators aggregated into the sub-index are the segmentation index and the absolute value of the difference between the cross-sectional dispersions in sector and country index returns. Data for Greece are included.

d) The indicators aggregated into the sub-index are the cross-country dispersions of interest rates on new loans to households (for consumer credit and total loans) and non-financial corporations, and the cross-country dispersions of deposit rates for households and non-financial corporations on deposits with agreed maturity. Data for Greece are included.

The sub-indices are further aggregated into the price-based financial integration composite indicator by computing weighted averages using size weights that reflect the relative size of the underlying financial market segment:

$$I_t^P = \sum_{i=1}^4 w_i^P s_{i,t}^P$$

Chart 2

Price-based financial integration composite indicator

(monthly data, January 1995 – December 2021)



Sources: ECB and ECB calculations.

The size weights are computed as the relative average amounts outstanding (taken from the aggregated euro area financial accounts) for the base period 1997-2014, producing the following constant weights w_t^P : money markets 17%, bond markets 36%, equity markets 15% and banking markets 32%.

2.1.2 How the quantity-based financial integration composite indicator is constructed

The quantity-based financial integration composite indicator is constructed in a manner similar to that used for the price-based composite indicator described above – the main differences are the definition of the input indicators and the scaling factor. The indicators used are intra-euro area cross-border holdings expressed as a percentage of total holdings for the euro area.² A simple portfolio perspective is adopted to derive the scaling factor, which is based on the theoretical benchmark for the share of cross-border securities holdings. To this end it is assumed that in a perfectly integrated market all agents invest in the market portfolio, which implies that all investors should hold a portfolio whose assets are proportional to the total supply of assets in the economy. Accordingly, each country's share of the total amount outstanding is computed for the relevant market segment. If a country k represents a share $\omega_{k,t}$ of the total amount outstanding of a given asset class at a time t , the portfolio of domestic investors should have a cross-border share of $1 - \omega_{k,t}$. Therefore, a time-varying benchmark can be computed for a given market segment with K countries as:

$$BM_t = \sum_{k=1}^K \omega_{k,t}(1 - \omega_{k,t}) \text{ for } t = 1, \dots, T.$$

² The total is calculated as the sum of intra-euro area cross-border and domestic amounts.

This yields the following sample-dependent, time-varying scaling factor:

$$\theta^Q(x_t) := \frac{\max(x)}{BM_t},$$

where $\max(x)$ represents the sample maximum for the time series of an indicator $x = (x_1, x_2, \dots, x_T)$.

The transformed and scaled indicators z^Q are defined as:³

$$z_t^Q = F(x_t)\theta^Q(x_t).$$

These are further aggregated into three sub-indices: interbank markets (which include the money and banking markets), bond markets and equity markets:

$$s_{i,t}^Q = \frac{1}{N_i} \sum_{n=1}^{N_i} z_{n,t}^Q, \quad \text{for } i = 1, \dots, 3.$$

Finally, the quantity-based financial integration composite indicator is calculated as the weighted average⁴ of the sub-indices:

$$I_t^Q = \sum_{i=1}^3 w_i^Q s_{i,t}^Q$$

Chart 3

Quantity-based financial integration composite indicator

(quarterly data, Q1 1999 – Q4 2021)



Sources: ECB and ECB calculations.

Notes: The raw indicators are the share of cross-border lending among MFIs of the euro area, MFIs' and investment funds' shares of cross-border holdings of debt securities of all maturities issued by euro area governments and non-financial corporations, and MFIs' and investment funds' cross-border holdings of equity issued by euro area residents. The raw indicator on the share of cross-border lending among MFIs has been adjusted to exclude loans and deposits to the Eurosystem. Holdings of debt securities and equities by investment funds from Luxembourg are excluded.

³ For the quantity-based indicators, higher values of $F(x)$ indicate higher levels of integration.

⁴ As is the case for price-based indicators, the weights are determined using aggregated euro area financial accounts. Given that they represent the largest share of interbank markets, only money markets are considered in the weighting. It is, therefore, the initial shares of the money, bond and equity markets that are used to recalculate weights that add up to 100%. This produces the following weights w_i^Q : interbank markets 23%, bond markets 54% and equity markets 23%.

2.1.3 References

The analysis is based on Hollo, D., Kremer, M. and Lo Duca, M. (2012), “CISS – A composite indicator of systemic stress in the financial system”, *Working Paper Series*, No 1426, ECB, March; and Hoffmann, P., Kremer, M. and Zaharia, S. (2015), *Financial integration in Europe through the lens of composite indicators*, mimeo.

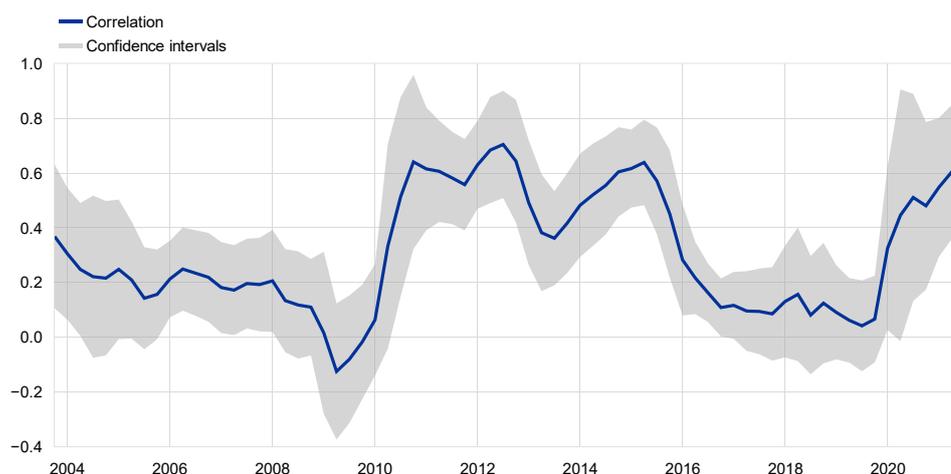
2.2 Indicator of risk sharing

This indicator measures the extent to which changes in domestic consumption co-move with changes in domestic GDP, thus gauging the level of risk sharing. Under a hypothesis of perfect risk sharing, domestic consumption would not correlate with domestic output; the indicator controls for changes in relative prices.

Chart 4

Correlation between consumption and output across euro area countries

(quarterly data, Q4 2003 – Q3 2021)



Sources: ECB and ECB calculations.

Notes: The chart plots point estimates (line) and confidence intervals (areas in grey) from a panel regression of changes in country per capita consumption on changes in country per capita GDP, controlling for changes in relative prices (the ratio of the respective country consumer price index to the euro area consumer price index), and using a twelve-quarter rolling window. The data sample comprises the euro area EA-12 countries excluding Ireland. Each point and interval is estimated for data from the twelve quarters preceding the time indicated on the horizontal axis (rolling window). Ireland is excluded from the calculation of the indicator owing to the unusually large revisions to the country's GDP growth figure for 2015 that were made in July 2016.

2.2.1 How the indicator of risk sharing is constructed

The indicator is estimated using the following regression:

$$\Delta \log C_{it} = \beta_y \Delta \log Y_{it} + \beta_{rer} \Delta RER_{it} + \varphi_i + \eta_t + \varepsilon_{it}$$

where $\Delta \log C_{it}$ is the percentage change in domestic consumption for each country i and each quarter t , $\Delta \log Y_{it}$ is the percentage change in domestic GDP for each country i and each quarter t , ΔRER_{it} is the percentage change in relative prices for each country i and each quarter t , expressed as the ratio of the relevant country

consumer price index to the euro area consumer price index, while φ_i and η_t are country- and time-fixed effects, respectively

Under a hypothesis of perfect risk sharing, domestic consumption does not co-move with domestic output, and the coefficient for the change in domestic output should be equal to zero: $\beta_y = 0$.

2.2.2 References

The approach is based on Lewis, K. (1996), "What can explain the apparent lack of international risk-sharing?", *Journal of Political Economy* 104, pp. 267-297, and has been augmented to account for the role of relative price adjustments across countries.

2.3 Standard indicators

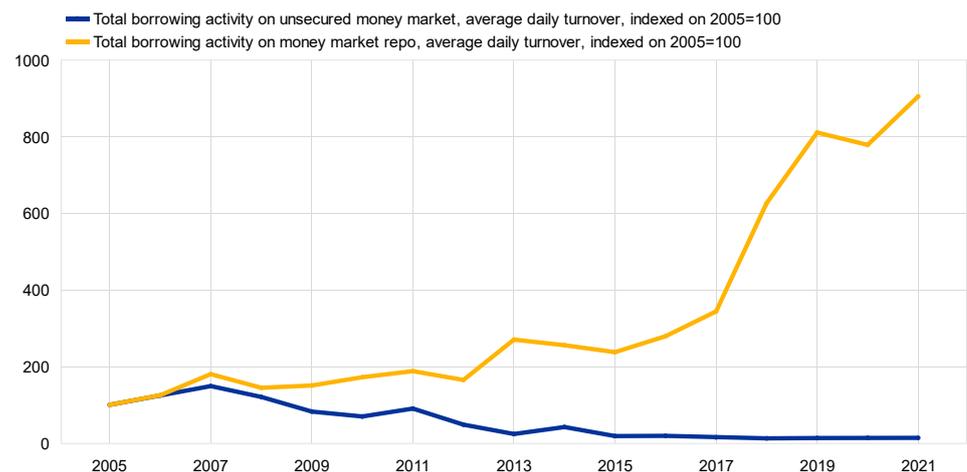
2.3.1 Money market indicators

2.3.1.1 Quantity-based indicators

Chart 5

Borrowing activity in euro area secured and unsecured markets

(average daily turnover, 2005 = 100, annual data, 2005 – 2021)



Sources: ECB's Euro Money Market Survey (EMMS) until end-2015 and ECB money market statistical reporting (MMSR) subsequently.

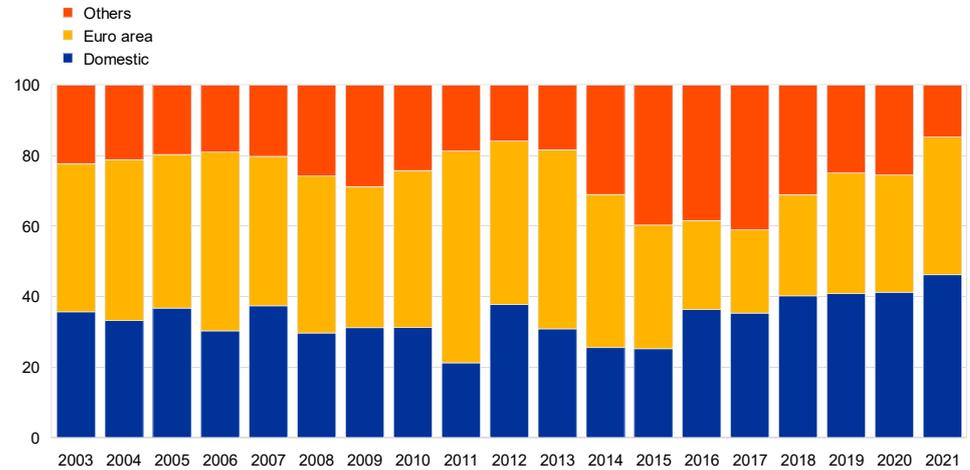
Notes: Data from 2016 are taken from the ECB MMSR⁵ for those reporting banks that were also part of the ECB Money Market Survey panel.

⁵ More information is available on the [ECB website](#).

Chart 6

Geographical counterparty breakdown for secured and unsecured borrowing transactions

(percentages of total transactions, annual data, 2003 – 2021)



Sources: ECB's EMMS (until end-2016) and MMSR (subsequently).

Notes: Data from 2016 are taken from the MMSR for those reporting banks that were also part of the Money Market Survey panel. They are shown as a percentage of total transactions for the second quarter for each year, except for 2016 when third quarter data were taken following the transition to MMSR data.

Economic rationale

The indicator reflects the degree of financial integration in money markets by considering the geographical location of the counterparties (domestic, euro area and other). The higher the share of transactions with non-domestic counterparties, the higher the level of financial integration. Transactions representing secured and unsecured borrowing are combined, although the trend is mainly driven by secured transactions, given that this market segment is larger than the unsecured market segment.

Chart 7

Use of cross-border collateral in Eurosystem monetary policy operations

(percentages of total collateral use, daily data, December 2007 – January 2022)



Source: ECB.

Economic rationale

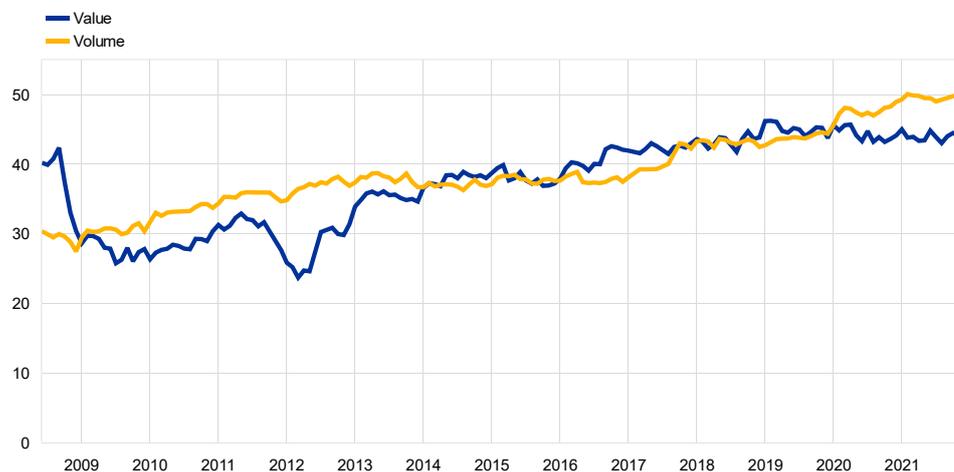
The trend towards greater use of domestic rather than cross-border collateral in Eurosystem liquidity-providing operations, which started with the financial crisis and has intensified since the onset of the euro area sovereign debt crisis, may be a sign that financial integration has regressed. In particular, greater use of domestic collateral until 2013 may have been the result of an increasing home bias among investors as well as an elevated use of self-originated marketable assets as collateral.

2.3.1.2 Other indicators

Chart 8

Share of cross-border activity in TARGET2

(percentages of total payments (values and volumes), monthly data, June 2008 – December 2021)



Sources: TARGET2 data and ECB calculations.

Notes: T2S and technical transactions are excluded. Cross-border activity is defined as a payment made between institutions holding accounts at different national central banks (NCBs). Data for euro-denominated cross-border transactions are aggregated on a monthly basis.

Economic rationale

TARGET2⁶ is the real-time gross settlement system for the euro, operating on a single shared platform. Since its launch in May 2008, TARGET2 has offered banks further opportunities to centralise their euro-denominated payments in central bank money, thereby contributing to financial integration in Europe.

⁶ More information is available on the [ECB website](#).

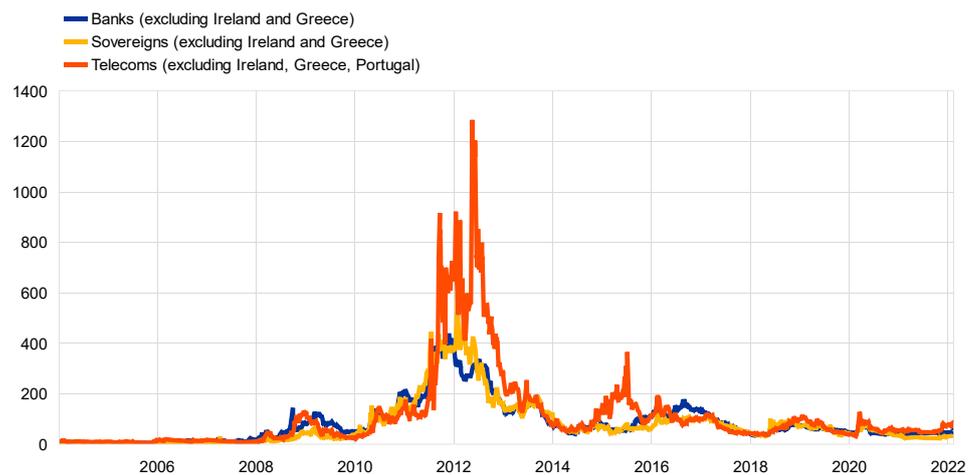
2.3.2 Securities market indicators

2.3.2.1 Price-based indicators

Chart 9

Five-year CDS premia dispersion across the euro area

(basis points, daily data, January 2004 – February 2022)



Sources: Refinitiv and ECB calculations.

Notes: The indicators are simple standard deviations of the country averages. The sovereign and bank CDS premia data do not include Ireland and Greece, given the very high premia for these countries. Ireland and Portugal are excluded from the telecommunications data owing to the very high CDS premia of their telecommunications companies.

"Sovereigns" include Germany, Spain, France, Italy, the Netherlands, Austria and Portugal.

"Banks" include ABN AMRO (NL), Banca Monte dei Paschi di Siena (IT), Banca Popolare di Milano (IT), Banco Comercial Português (PT), Banco Sabadell (ES), Novo Banco SA (PT), Banco Santander Central Hispano (ES), Erste Bank der österreichischen Sparkassen (AT), Bayerische HypoVereinbank (DE), BNP Paribas (FR), Deutsche Bank (DE), Commerzbank (DE), Crédit Agricole (FR), Dexia Group (BE), Fortis NL (NL), Intesa Sanpaolo SPA (IT), Mediobanca (IT), Natixis (FR), Nordea Bank (FI), Société Générale (FR) and UniCredito Italiano (IT).

"Telecoms" include Deutsche Telekom (DE), Orange (FR), Hellenic Telecommunications Organization (GR), KPN (NL), Telecom Italia (IT), Telefónica (ES) and Telekom Austria (AT).

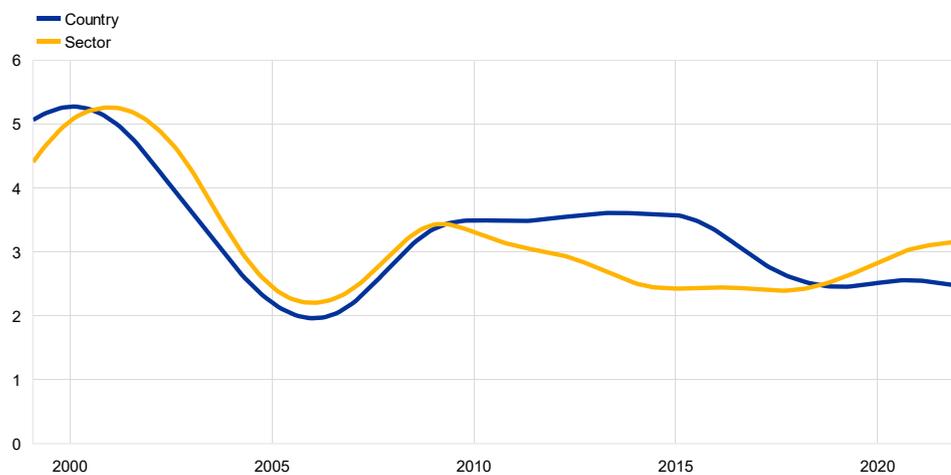
Economic rationale

The dispersion of credit default swap (CDS) premia for different sectors is considered to indicate the degree of dispersion of the cost of funding. Although a CDS premium primarily reflects the cost of insuring debt against default, it may also be regarded as a proxy for the cost of funding. Lower industry-level dispersion across the euro area (after excluding possible country-specific factors that could skew the dispersion) correlates with a higher level of integration in the financing of these entities (sovereigns, banks and telecommunications companies).

Chart 10

Country and sector dispersion in euro area equity returns

(percentages, monthly data, January 1999 – February 2022)



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

Economic rationale

The chart shows the dispersion in equity returns, across sectors and across countries, in the euro area, which reflects structural changes in the aggregate euro area equity market. Under conditions of full financial segmentation, the limited diversification opportunities lead to investors demanding high returns for holding shares in undiversified firms, so cross-country dispersion (which reflects not only cross-border fragmentation, but also the different sectoral composition of each country's economy) should be higher than cross-sectoral dispersion (which also reflects the differing performance of the underlying sectors). In contrast, in an integrated financial market there is no financial premium on sectoral or geographical diversification, so greater specialisation is affordable. This should reduce the gap between cross-country and cross-sectoral dispersion.

Technical description

The cross-sectoral dispersions are filtered using the Hodrick-Prescott smoothing technique, which provides a smooth estimate of the long-term trend component of the series. The smoothing parameter λ is equal to 14,400.

References

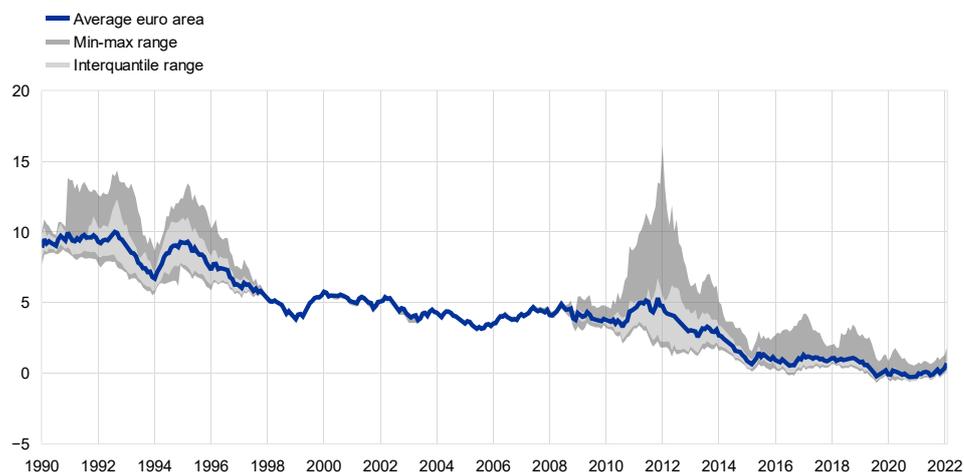
The indicator is based on an approach first presented by Adjaouté and Danthine; see Adjaouté, K. and Danthine, J.P. (2003), "European Financial Integration and Equity Returns: A Theory-based Assessment", in Gaspar, V. et al. (eds.), *Second ECB*

Central Banking Conference: The transformation of the European financial system, ECB, May.

Chart 11

Dispersion of euro area ten-year sovereign bond yields

(percentages, daily data, January 1990 – February 2022)



Sources: Bloomberg and ECB calculations.

Notes: The shaded areas represent the minimum-maximum range and the interquartile range of benchmark bond yields for the euro area countries. The yields for Estonia, Greece, Cyprus, Latvia, Lithuania, Malta, Slovenia and Slovakia are excluded owing to infrequent or even non-existent observations.

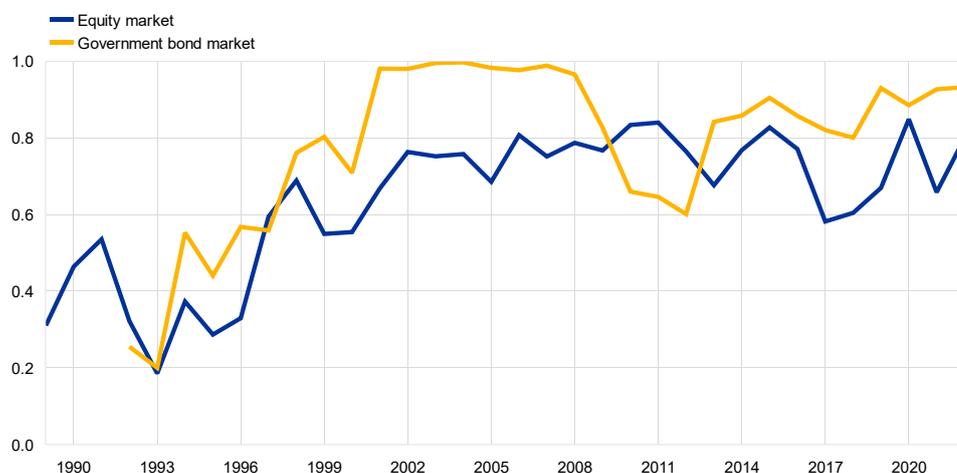
Economic rationale

Dispersion should be lower in a well-integrated market, as investors will not demand as high a premium to compensate for the risk of idiosyncratic shocks. Dispersion should be higher in a fragmented market.

Chart 12

Equity and government bond market integration based on common factor portfolios

(annual data, 1989 – 2022)



Sources: Refinitiv and ECB calculations.

Economic rationale

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 figure indicates a more integrated market, where 1 implies perfect integration and 0 implies no integration.

Technical description

This measure of financial market integration for calendar year t is computed as the cross-sectional mean (median) R² that is obtained by estimating the following regression separately for each country i:

$$R_{i,t,\tau} = \alpha_{i,t} + \sum_{k=1}^K \beta_{i,t}^k \theta_{i,t}^k + \varepsilon_{i,t,\tau}$$

where $R_{i,t,\tau}$ is the market return in country i on trading day τ in year t, and $\theta_{i,t}^k$ is the return on the kth common factor portfolio on the same day. The K common factor portfolios are obtained via principal component analysis, and it is assumed throughout that K=3. The weights (eigenvectors) for the factor portfolios in year t are calculated using data from year t-1.

In order to obtain a measure that is comparable across years, daily return data (on broad equity market indices and ten-year benchmark bonds) must be available from the beginning of the sample.

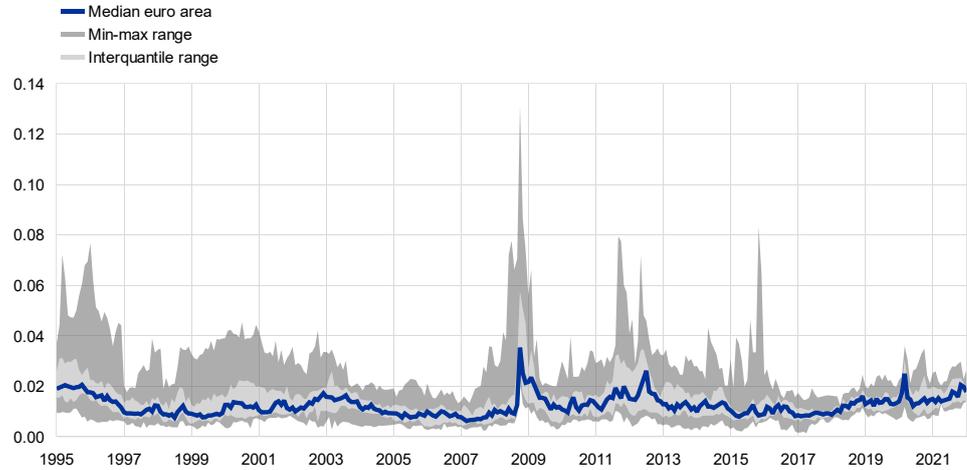
References

The analysis is based on Pukthuanthong, K. and Roll, R. (2009), "Global market integration: An alternative measure and its application", *Journal of Financial Economics*, Vol. 94, No 2, November, pp. 214-232.

Chart 13

Equity market segmentation

(monthly data, January 1995 – January 2022)



Sources: Refinitiv and ECB calculations.

Economic rationale

This indicator measures the segmentation (the opposite of integration) of euro area equity markets via industry-level valuation differentials across countries.

Technical description

For each calendar month and industry sector, the absolute difference is calculated between the stock market valuation (based on analyst forecasts) of a specific sector for a given country, and the euro area average for that sector. The first step is to aggregate these absolute differences by calculating, for each country, the average of absolute differences, weighted by the share of each industry in the country's total stock market capitalisation. A higher value indicates a higher level of market segmentation (i.e. a lower level of market integration), because industries in different countries in an integrated market may be expected to have similar business prospects and, therefore, similar valuations. A measure of zero implies perfect integration.

The segmentation measure for country i is computed as:

$$Seg^i = \sum_{k \in K} \omega_k^i |EY_k^i - \overline{EY}_k|$$

where EY_k^i is the average earnings yield (the inverse of the price/earnings ratio) based on analyst forecasts for industry sector k in country i , \overline{EY}_k is the respective euro area average, and ω_k^i is the share of sector k in the stock market capitalisation of country i .

References

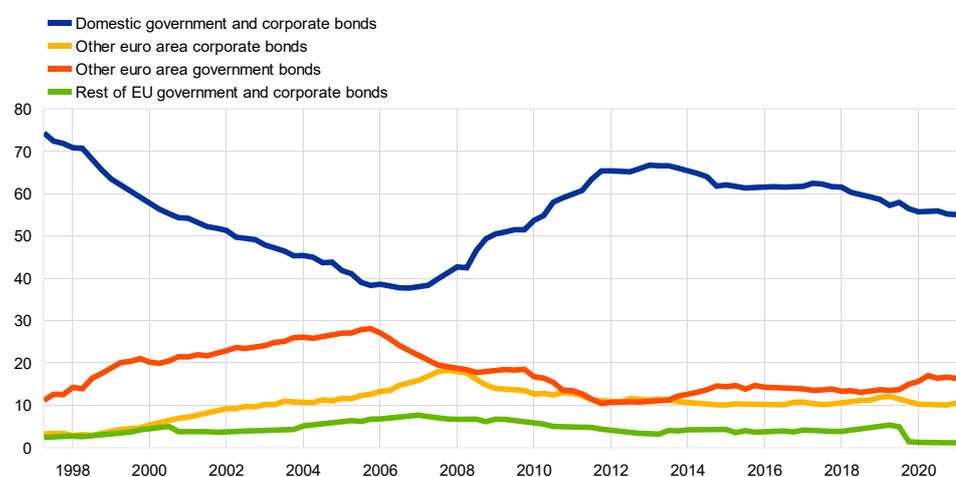
The analysis is based on Bekaert, G., Harvey, C.R., Lundblad, C.T. and Siegel, S. (2011), "What segments equity markets?", *Review of Financial Studies*, Vol. 24, No 12, October.

2.3.2.2 Quantity-based indicators

Chart 14

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 2021)



Source: ECB.

Economic rationale

Cross-border holdings by euro area MFIs of debt securities issued by non-financial borrowers (sovereign and corporate) of other euro area countries are a relevant quantity-based indicator of financial integration. The indicator is constructed on the basis of the MFI balance sheet statistics⁷.

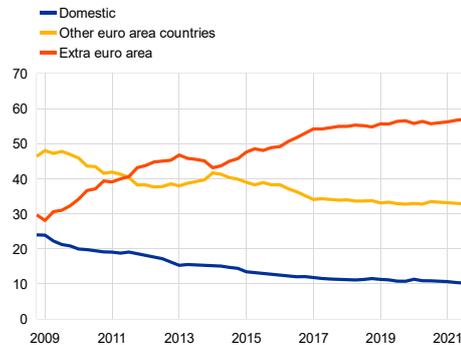
⁷ More information is available on the [ECB website](#).

Chart 15

Investment funds' holdings

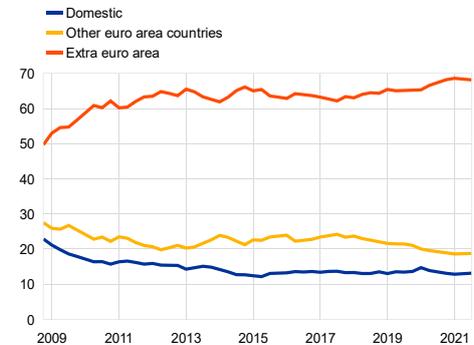
a) of debt securities

(percentages of total holdings of debt securities, quarterly data, Q4 2008 – Q3 2021)



b) of equity

(percentages of total holdings of equity, quarterly data, Q4 2008 – Q3 2021)



Source: ECB.

Notes:

a) 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.

b) The equity category includes shares and other equity (but excludes investment fund shares/units).

Economic rationale

These two indicators are used to assess the contribution of institutional investors to financial integration in the euro area.

Technical description

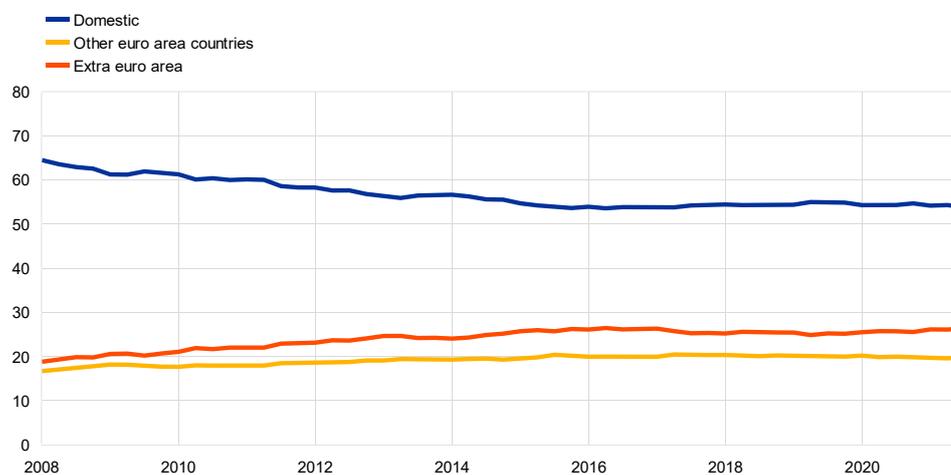
The indicators are constructed based on the balance sheets of euro area investment funds (excluding money market funds, which are included in the MFI balance sheet statistics)⁸.

⁸ A complete list of euro area investment funds, as well as further information on investment fund statistics, is available on the [ECB website](#).

Chart 16

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

(percentages of total euro area holdings of equities, quarterly data, Q1 2008 – Q3 2021)



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.

Technical description

The financial integration indicator for cross-border equity holdings is calculated using balance of payments (b.o.p.) and international investment position⁹ (i.i.p.) statistics and euro area accounts data for the entire euro area economy. Equity holdings in b.o.p. and i.i.p. statistics data are broken down by functional category (type of investment): foreign direct investment (FDI), portfolio investment (PI), other investment (OI) and reserve assets (RA). The equities included under RA are all issued by countries outside the euro area and the relevant amounts are not particularly significant in comparison with those included in the other three types of investment.

Balance of payments statistics provide a geographical breakdown for extra- and intra-euro area issuers. The total for equities held by the euro area (including domestic issuers) is obtained from the euro area accounts. B.o.p. and i.i.p. statistics and euro area accounts definitions and coverage are consistent, enabling the euro area holdings for domestic issuers to be derived as the residual.

⁹ More information is available on the [ECB website](#).

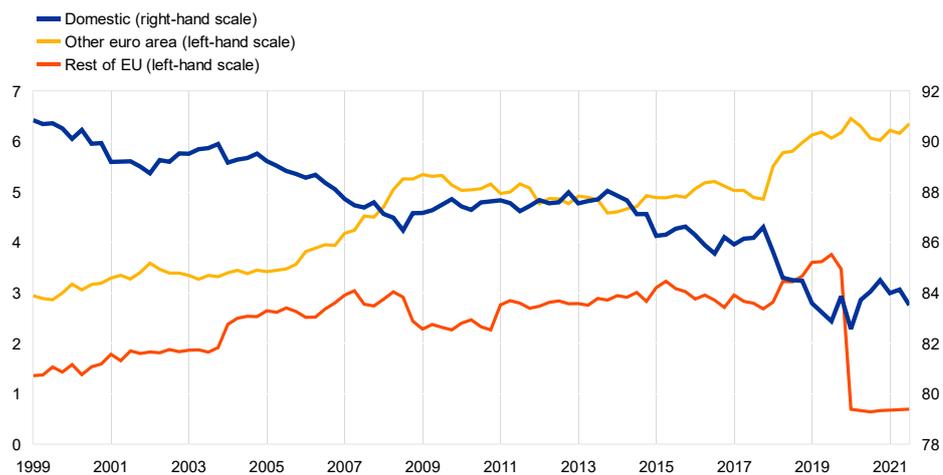
2.3.3 Banking market indicators

2.3.3.1 Quantity-based indicators

Chart 17

MFI loans to non-MFIs: outstanding amounts by residency of counterparty

(percentages of total lending excluding the Eurosystem, quarterly data, Q1 1999 – Q3 2021)



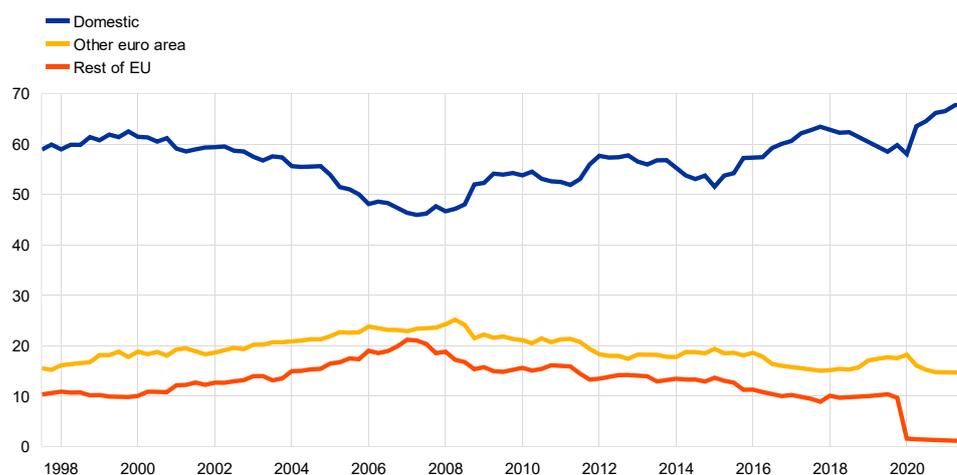
Source: ECB.

Notes: Underlying data refer to the national aggregated MFI balance sheet data reported on a non-consolidated basis to the ECB at monthly and quarterly frequencies. These data cover the MFI sector excluding the Eurosystem, and include data on money market funds (MMFs). Consequently, as MMFs typically invest in inter-MFI deposits and short-term securities, the indicators providing data for these assets are, to some extent, affected by the MMFs' balance sheet items. Balance sheet positions with foreign counterparties include those with foreign branches and subsidiaries. Underlying data include the UK figures until 31/12/2020.

Chart 18

MFI loans to MFIs: outstanding amounts by residency of counterparty

(percentages of total lending excluding the Eurosystem, quarterly data, Q3 1997 – Q3 2021)



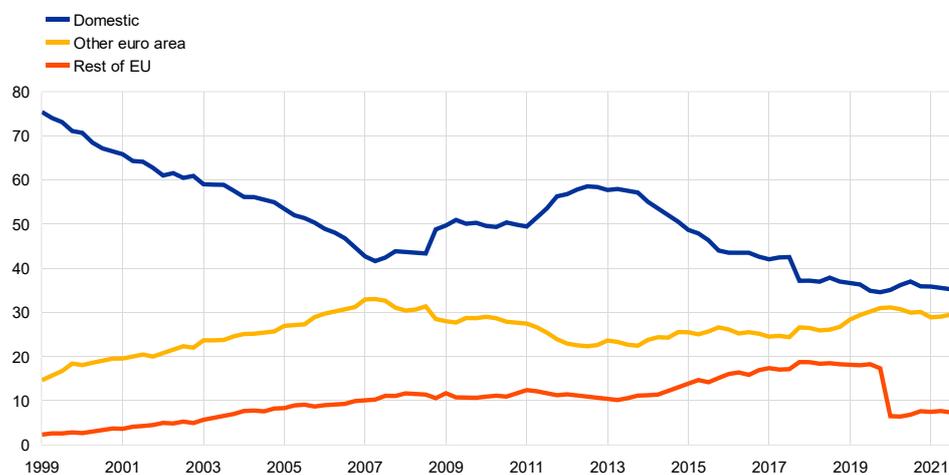
Source: ECB.

Note: See Chart 17.

Chart 19

MFI holdings of securities issued by MFIs: outstanding amounts by residency of counterparty

(percentages of total holdings, quarterly data, Q1 1999 – Q3 2021)



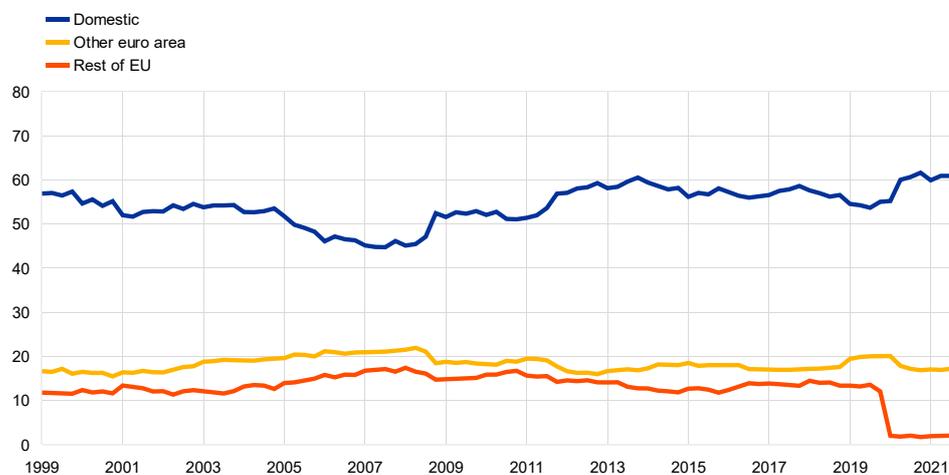
Source: ECB.

Notes: Underlying data include the UK figures until 31/12/2020.

Chart 20

MFI deposits from MFIs: outstanding amounts by residency of counterparty

(percentages of total deposits excluding the Eurosystem, quarterly data, Q1 1999 – Q3 2021)



Source: ECB.

Notes: Underlying data include the UK figures until 31/12/2020.

Economic rationale

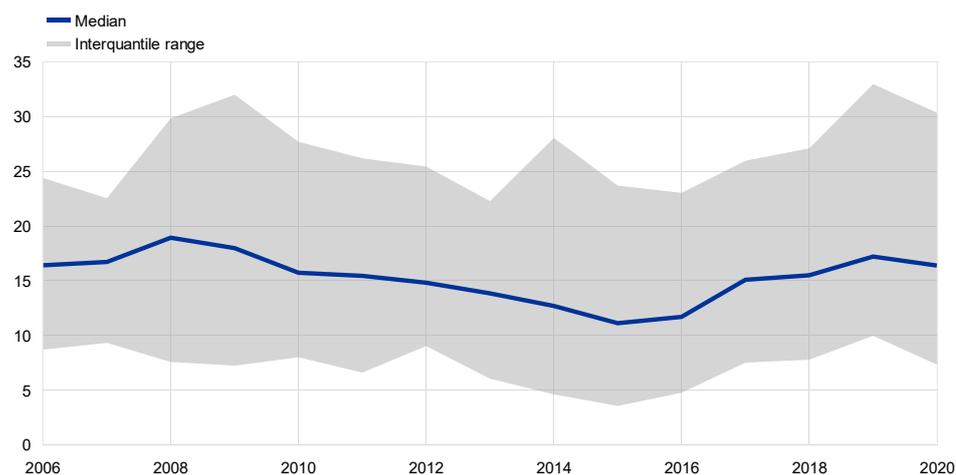
This set of indicators demonstrates the significance of cross-border balance sheet connections for euro area MFIs. The indicators are based on MFI balance sheet

statistics¹⁰ and show that euro area wholesale banking markets are far more integrated than retail markets.

Chart 21

Dispersion of the total assets of foreign branches and subsidiaries of euro area banks across euro area countries

(percentages of the total assets of the euro area banking sector, yearly data, 2000 – 2020)



Sources: ECB and ECB calculations.

Note: Dispersion across countries for which shares are calculated.

Economic rationale

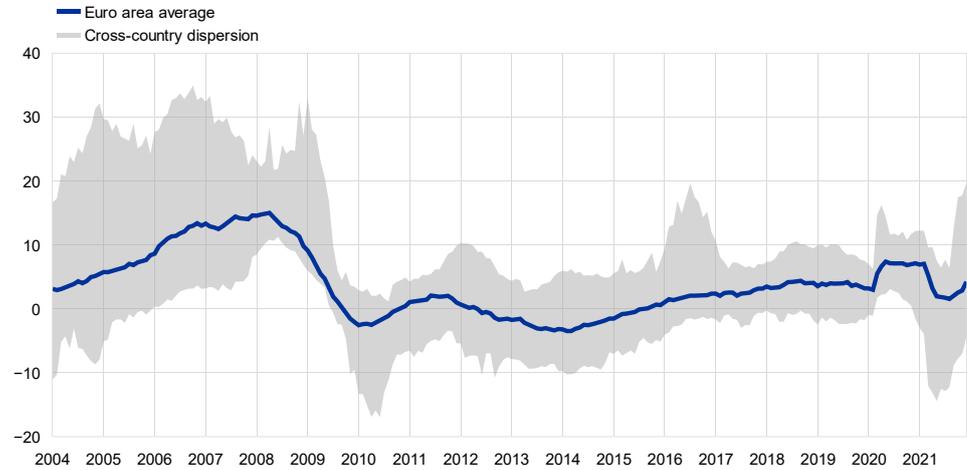
The indicator shows the level of financial integration measured by the total assets of foreign branches and subsidiaries.

¹⁰ Further information is available on the [ECB website](#).

Chart 22

MFI loans to non-financial corporations

(annual loan growth; percentages, monthly data, January 2004 – December 2021)



Sources: ECB and ECB calculations.

Notes: The cross-country dispersion shown in the chart is the difference between the maximum and minimum calculated for a fixed sample of 12 euro area countries (Belgium, Germany, Ireland, Greece, Spain, France, Italy, Luxemburg, the Netherlands, Austria, Portugal and Finland). Underlying data are adjusted for loan sales, securitisation and cash pooling activities. Annual growth rates are calculated based on an index of notional stocks.

Economic rationale

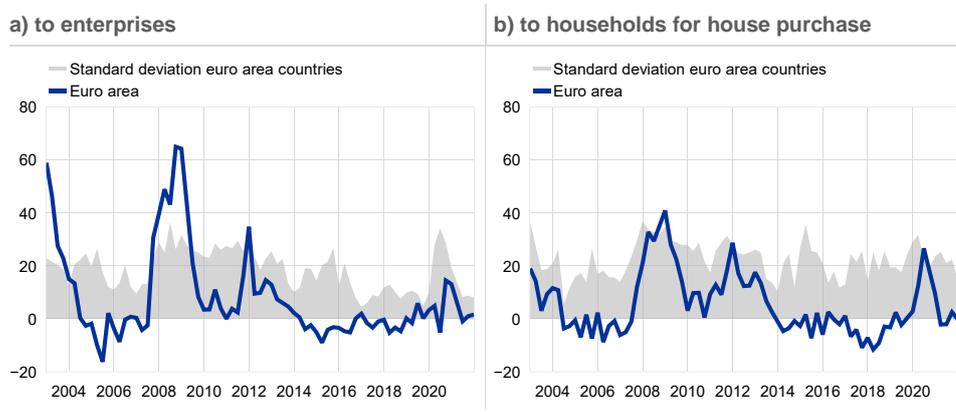
The indicator of annual loan growth shows that developments in retail loan markets are heterogeneous.

2.3.3.2 Survey-based indicators

Chart 23

Changes in credit standards

(net percentages of banks indicating a tightening of standards, quarterly data, Q4 2002 – Q4 2021)



Sources: Euro area bank lending survey and ECB calculations.

Notes: Changes in credit standards are given as net percentages of replies, i.e. the percentage of banks indicating a tightening of credit standards minus the percentage of banks indicating an easing of credit standards. From the January 2022 BLS onwards, the aggregation of banks' replies to the euro area results is based on unweighted national results for almost all euro area countries (AT, BE, CY, DE, EE, ES, FI, FR, GR, IE, IT, LT, LU, LV, NL, PT, SI, including historical revisions). For MT and SK instead, the reported national series continue to be the weighted series. The last observation refers to the quarter in which the most recent BLS was published.

Economic rationale

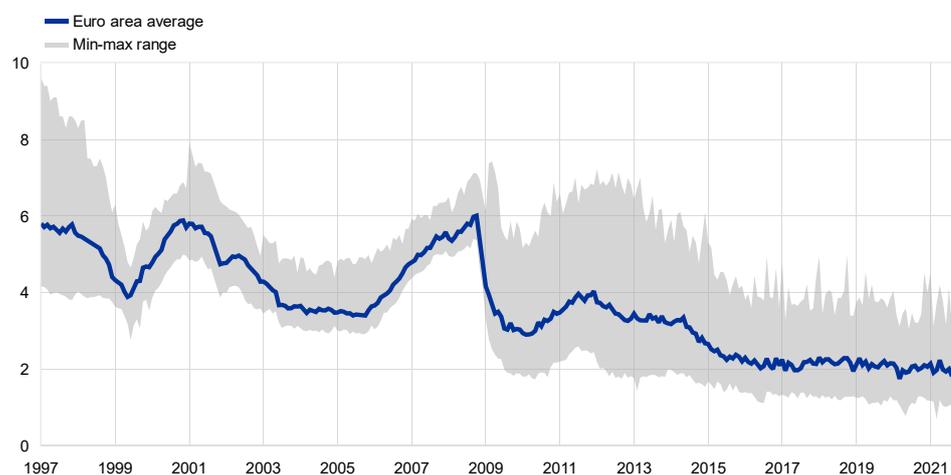
A divergence in the level of credit standards between countries would suggest disparities in borrowers' access to loans across euro area countries.

2.3.3.3 Price-based indicators

Chart 24

Interest rates on new loans to euro area non-financial corporations

(average of MFI interest rates (MIRs), percentages, monthly data, January 1997 – December 2021)



Sources: ECB and ECB calculations.

Notes: All euro area countries, changing composition. MFI interest rates (MIRs) refer to new business.

Economic rationale

The convergence of retail interest rates charged/paid by banks on loans and deposits to/from non-financial corporations and households may be seen as demonstrating the degree of integration in the retail banking market. Bank interest rate dispersion should be lower when instruments are more homogeneous across countries. Nevertheless, note that differences in bank interest rates may be due to other factors, including differing conditions in national economies (credit and interest rate risk, firm size, industrial structure, degree of capital market development), institutional factors (taxation, regulation, supervision) and financial structures (degree of bank/capital market financing, competitiveness, etc.).

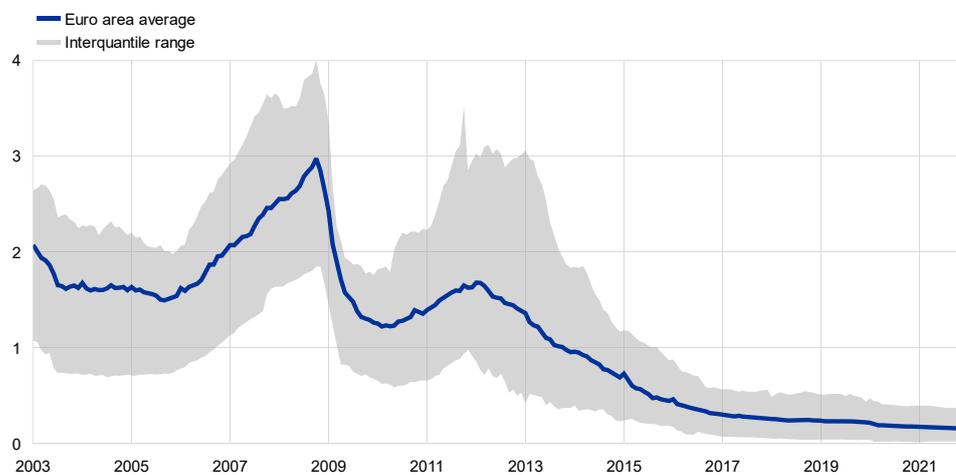
The indicator is based on euro area bank interest rate statistics¹¹.

¹¹ More information is available on the [ECB website](#).

Chart 25

Interest rates on MFI deposits from households in the euro area

(percentages, monthly data, January 2003 – December 2021)



Sources: ECB and ECB calculations.

Notes: The deposit rates are aggregated using outstanding amounts. The cross-country dispersion displayed in the chart is the difference between the maximum and minimum calculated for a fixed sample of 12 euro area countries (Belgium, Germany, Ireland, Greece, Spain, France, Italy, Luxemburg, the Netherlands, Austria, Portugal and Finland), excluding extreme values.

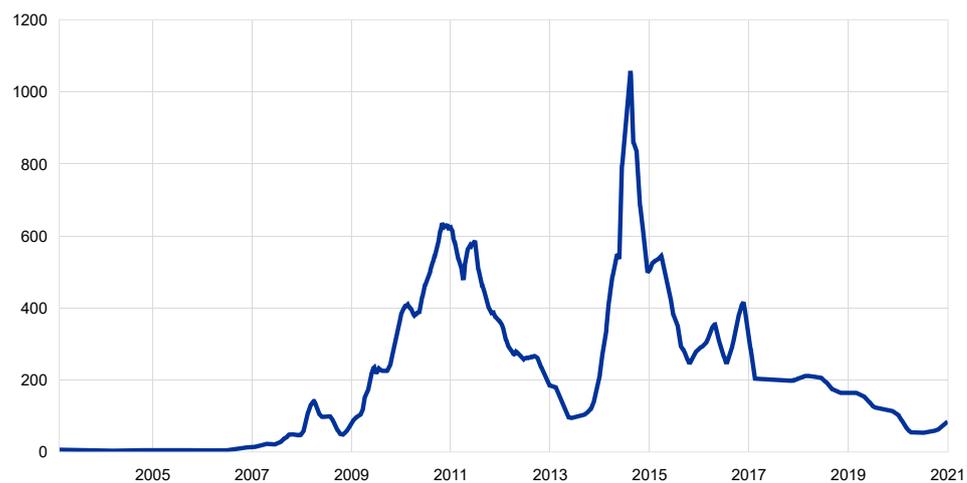
Economic rationale

See Chart 24.

Chart 26

Standard deviation of banks' CDS premia

(basis points, daily data, February 2004 – January 2021)



Sources: Bloomberg, Refinitiv, Credit Market Analysis Ltd (CMA) and ECB calculations.

Note: Based on CDS data available for banks in the EONIA panel. Rolling window of 60 days is applied in calculating standard deviation.

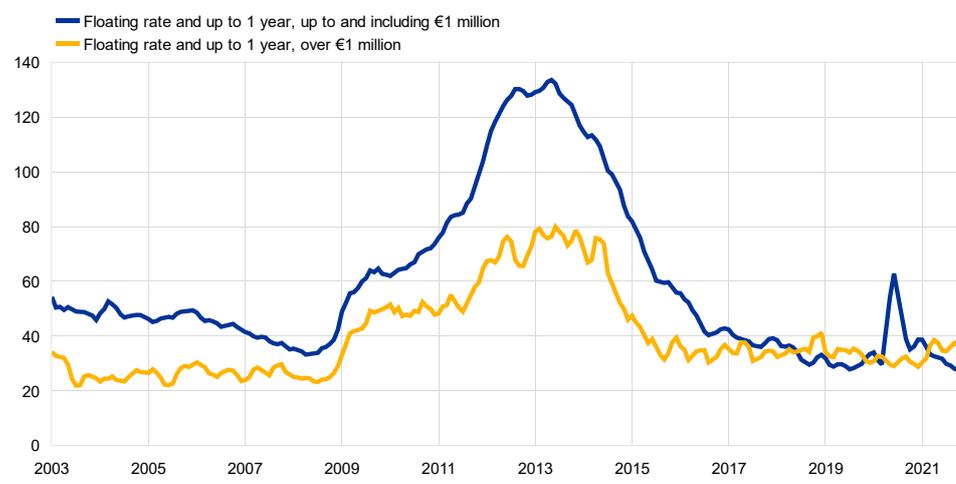
Economic rationale

Lower cross-country variance of CDS premia charged by investors for bank debt indicates increased financial integration. It must, however, be borne in mind that CDS premia also depend on a range of other factors including credit risk, liquidity and the correlation between CDS premia for banks and sovereigns.

Chart 27

Cross-country standard deviation of MFI interest rates on new loans to non-financial corporations

(basis points, monthly data, January 2003 – December 2021)



Sources: ECB and ECB calculations.

Economic rationale

See Chart 24.

Technical description

The following general notation is used for each of the above loan categories:

$r_{c,t}$ = the interest rate prevailing in country c in month t

$b_{c,t}$ = the business volume in country c in month t

$w_{c,t} = \frac{b_{c,t}}{B_t}$ is the weight of country c in the total euro area business volume B in month t where:

$$B_t = \sum_c b_{c,t}$$

MFI interest rates in the euro area are computed as the weighted average of country interest rates $r_{c,t}$, using the country weights $w_{c,t}$:

$$r_t = \sum_c w_{c,t} r_{c,t}$$

The euro area weighted standard deviation is expressed as:

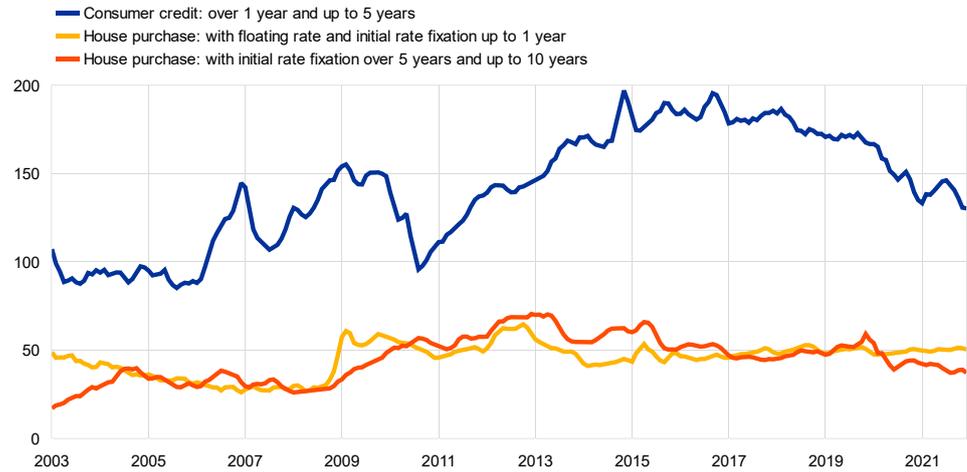
$$M_t = \sqrt{\sum_c (r_{c,t} - r_t)^2 w_{c,t}}$$

The monthly data are smoothed by calculating a three-month centred moving average of the standard deviation.

Chart 28

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

(basis points, monthly data, January 2003 – December 2021)



Sources: ECB and ECB calculations.

Economic rationale

See Chart 24.

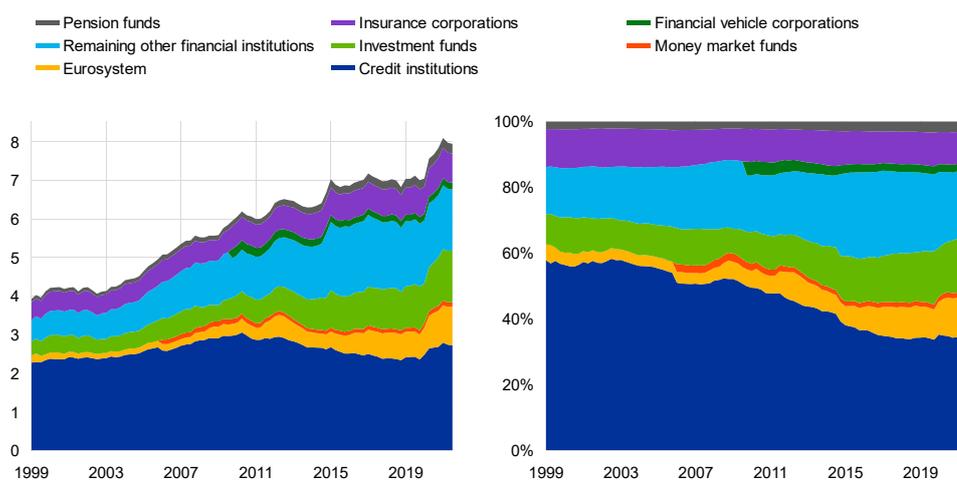
3 Financial structure indicators

3.1 The euro area financial sector

Chart 1

Total assets of the euro area financial sector

(ratio to nominal GDP (left panel); percentages (right panel), quarterly data, March 1999 – September 2021)



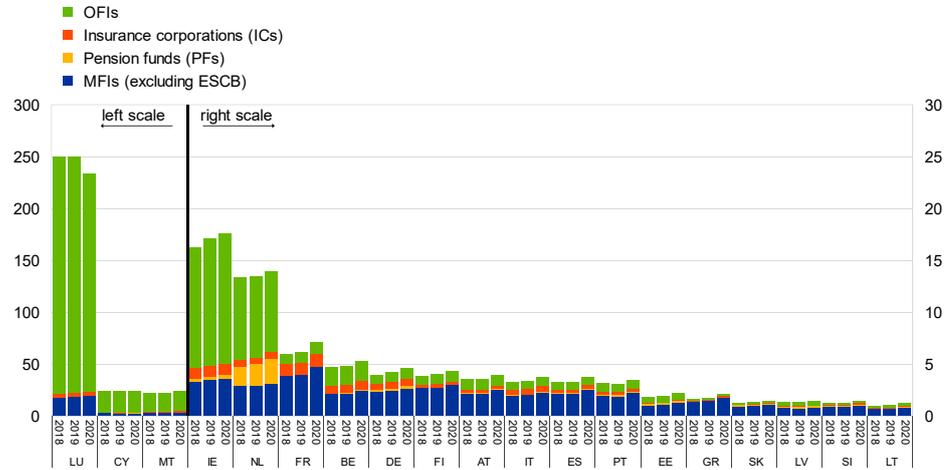
Sources: ECB.

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 2

Size of the euro area financial sector

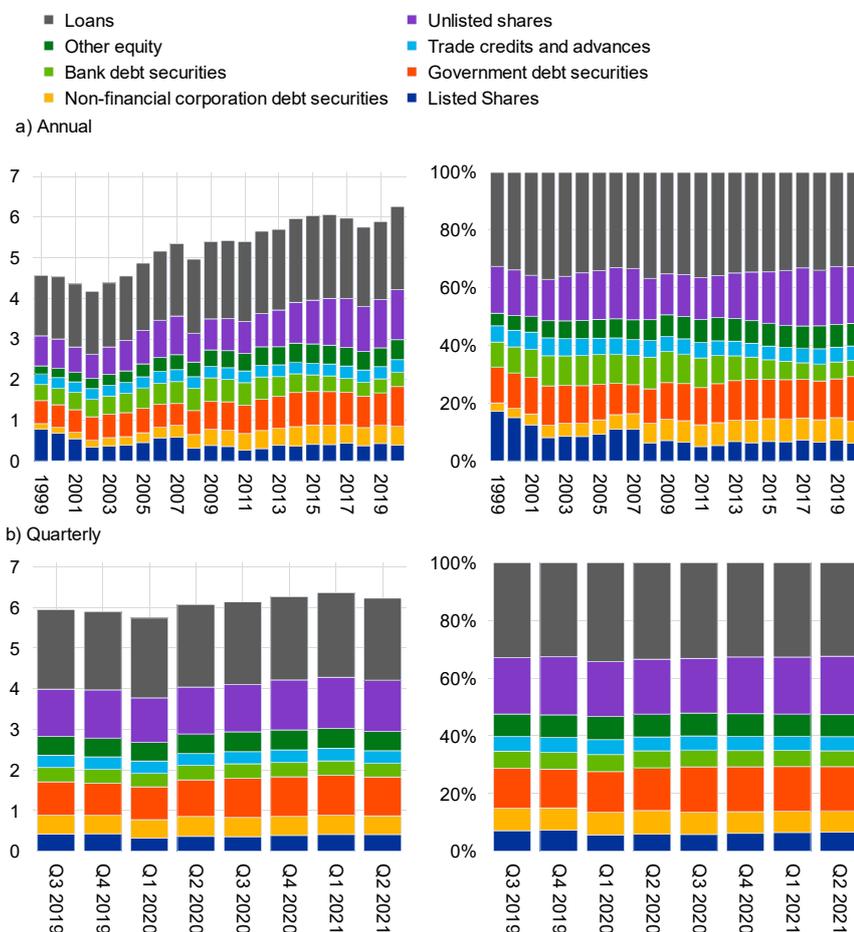
(ratio of assets to GDP, annual data, 2018 – 2020)



Sources: ECB (euro area accounts, monetary financial institutions balance sheet items statistics), Eurostat and ECB calculations.
 Notes: "MFIs (excluding ESCB)" refers to the difference between MFI total assets (including NCBs) from the EAA and NCB assets from the MFI BSI statistics. OFIs refer to non-monetary financial corporations excluding ICPFs (i.e. non-MMF investment funds, FVCs and the remaining OFIs are included).

Chart 3 Financing of the euro area economy

(ratio to nominal GDP (left-panels); percentages (right-panels); top row = annual data: 1999-2020, bottom row = quarterly data: Q3 2019 – Q2 2021)



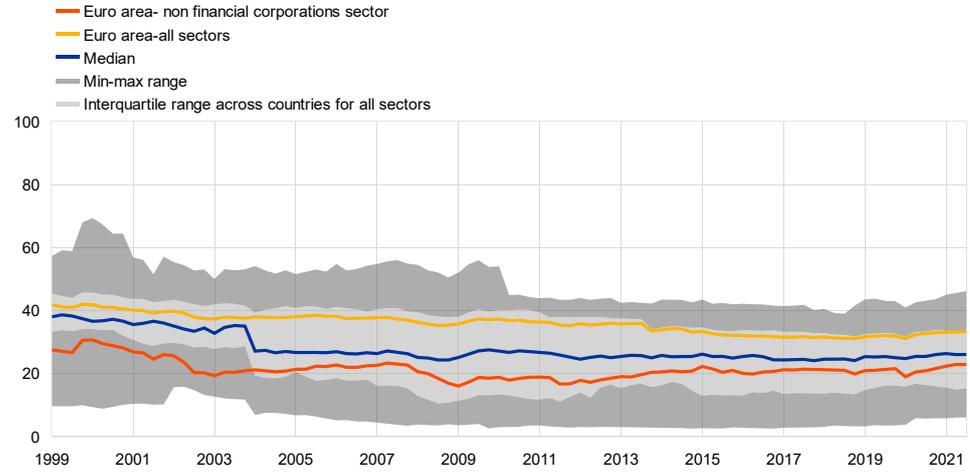
Sources: ECB

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.

Chart 4

Marketable proportion of external funding among euro area countries

(ratio; quarterly data: Q1 1999 – Q3 2021)



Source: ECB.

Notes: (i) The upper whisker denotes the country with the highest share of marketable instruments in the sample (maximum) and the lower whisker the country with the lowest share of marketable instruments (minimum). The two intermediate boxes highlighted in yellow indicate the dispersion between the first and the second quartiles, as well as between the second and the third quartiles, respectively. The line separating the two boxes represents the median among countries.

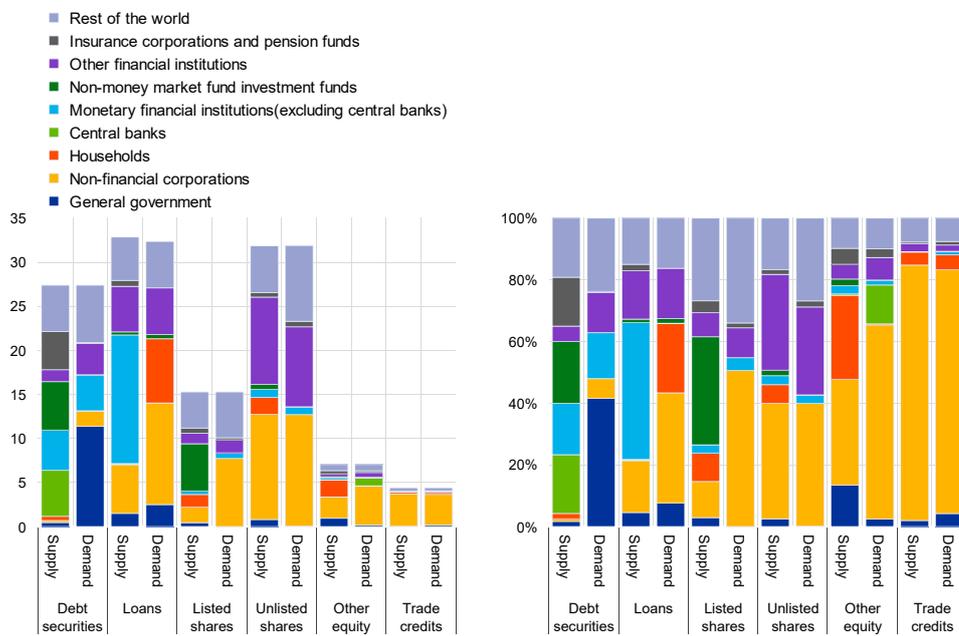
(ii) The marketable part of a euro area country's capital market is defined as the total debt securities and listed shares over total loans (adjusted for intra-company loans), trade credits, debt securities and equity (including listed and unlisted shares as well as other equity).

(iii) For the years 1999-2003, the plot is based on only 12 countries (specifically, it excludes Cyprus, Estonia, Malta, Lithuania, Latvia, Slovakia and Slovenia).

Chart 5

Composition of demand and supply in markets for financial instruments

(trillions of national currency; Q3 2021)



Sources: ECB.

Notes: (i) 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.

(ii) Data for loans and debt securities markets include the participation of central banks in these markets.

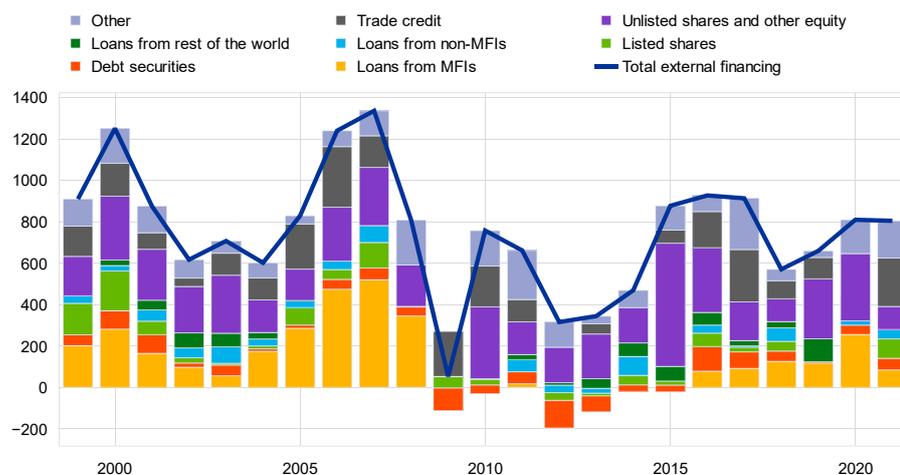
(iii) The charts aggregate for both the demand and the supply side the financial instrument position by economic sector. They show the relevance of the different financial instrument markets for the various economic sectors. It is a market view though, not a from-who-to-whom analysis.

(iv) 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

Chart 6

External financing of euro area NFCs by instrument

(annual flows; EUR billions; 1999 to 2021)



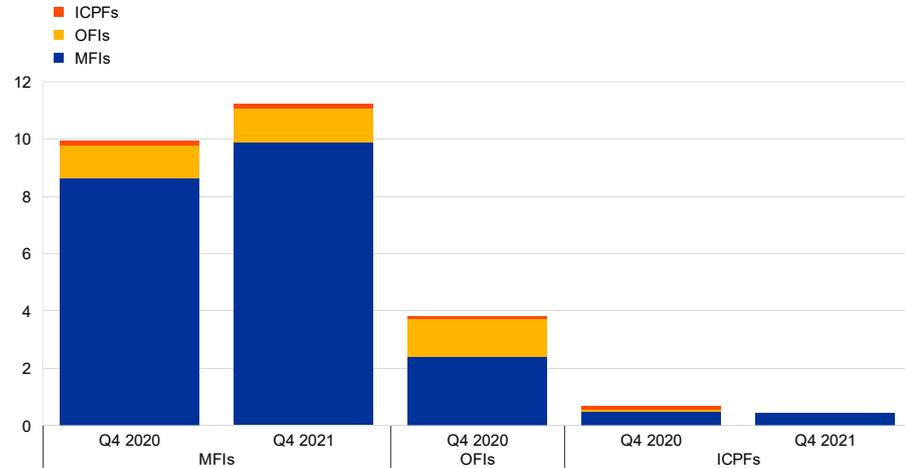
Sources: ECB (euro area accounts) and ECB calculations.

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.

Chart 7

Cross-exposures among sectors of the euro area financial system: loans

(EUR trillions, Q4 2020, Q4 2021, quarterly data, x-axis: lender; y-axis: exposure to counterparty sector)



Sources: ECB (EAA, MFI BSI statistics) and ECB calculations.

Notes: Loans by MFIs include both interbank lending and longer-term loans and exclude ESCB lending. OFIs refer to non-monetary financial corporations and include the non-MMF IFs and FVCs components. The data also include intra-group positions.

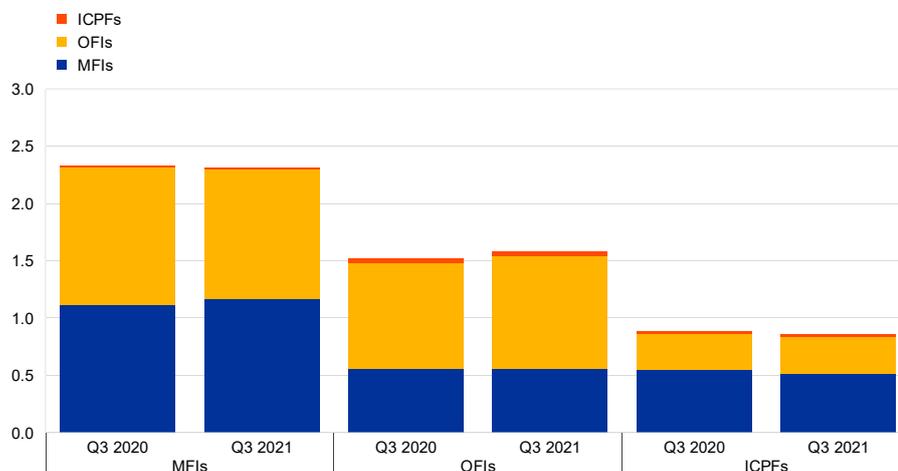
Technical description

Charts 7 to 10 show the direct exposures across different sectors of the wider euro area financial system by instrument type. The lender (in the case of loans) or the holding sector (for securities, listed shares and investment fund shares) is reported on the horizontal axis, while the borrower or the issuing sector, as the case may be, is reported on the vertical axis. The size of the exposures differs significantly according to the type of instrument.

Chart 8

Cross-exposures among sectors of the euro area financial system: debt securities

(EUR trillions; quarterly data; Q3 2020, Q3 2021; x-axis: holding sector; y-axis: exposure to counterparty sector)

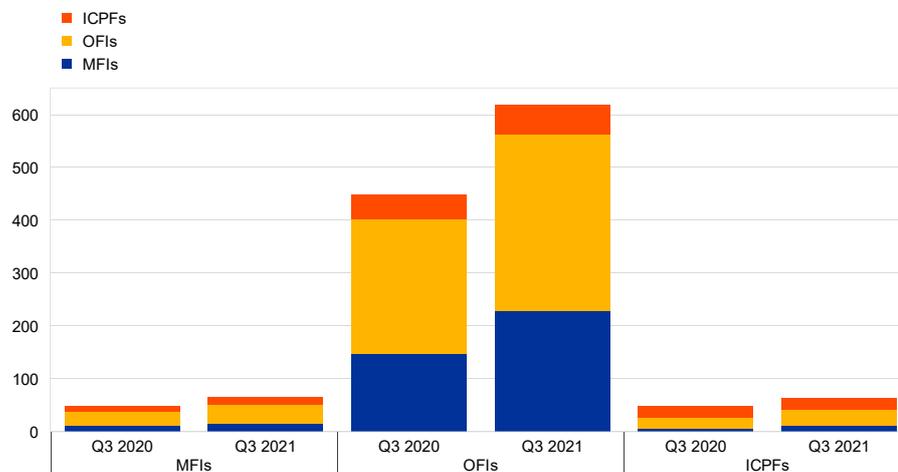


Sources: ECB (EAA) and ECB calculations.
 Notes: Holdings of debt securities by MFIs exclude debt securities held by the ESCB in the context of the asset purchase programmes. OFIs refer to non-monetary financial corporations and include the non-MMF IFs and FVCs components. The data also include intra-group positions.

Chart 9

Cross-exposures among sectors of the euro area financial system: listed shares

(EUR billions, quarterly data, Q3 2020, Q3 2021, x-axis: holding sector; y-axis: exposure to counterparty sector)

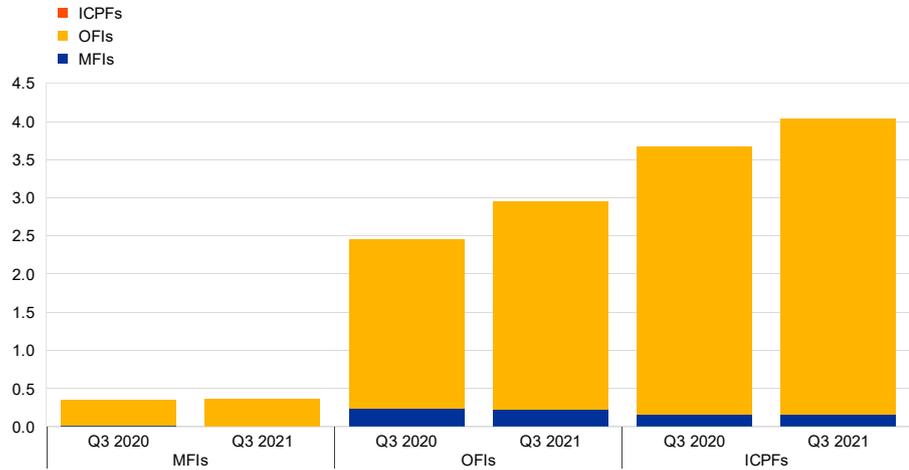


Sources: ECB (EAA) and ECB calculations.
 Notes: The data include intra-group positions. OFIs refer to non-monetary financial corporations and include the non-MMF IFs and FVCs components.

Chart 10

Cross-exposures among sectors of the euro area financial system: investment fund shares

(EUR trillions, quarterly data, Q3 2020, Q3 2021, x-axis: holding sector; y-axis: exposure to counterparty sector)



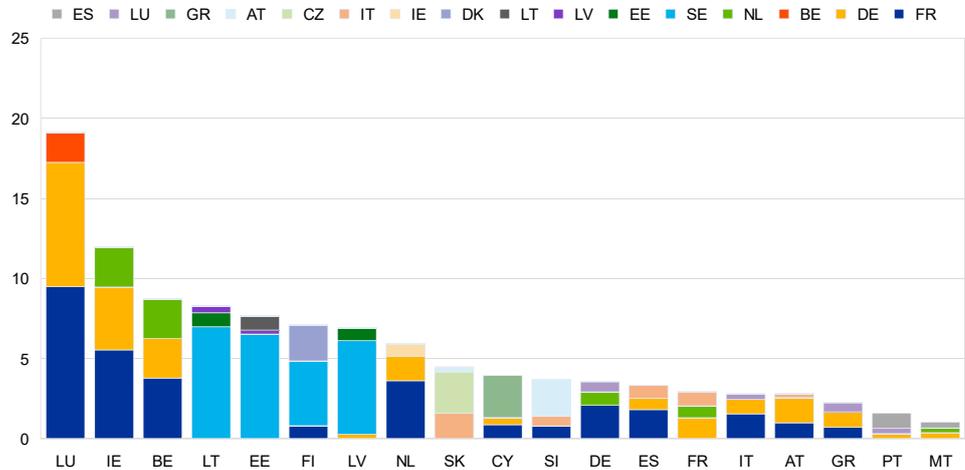
Sources: ECB (EAA) and ECB calculations.

Notes: The data include intra-group positions. OFIs refer to non-monetary financial corporations and include the non-MMF IFs and FVCs components.

Chart 11

Three largest exposures of MFIs to foreign MFIs

(percentage of total assets, Q3 2021)



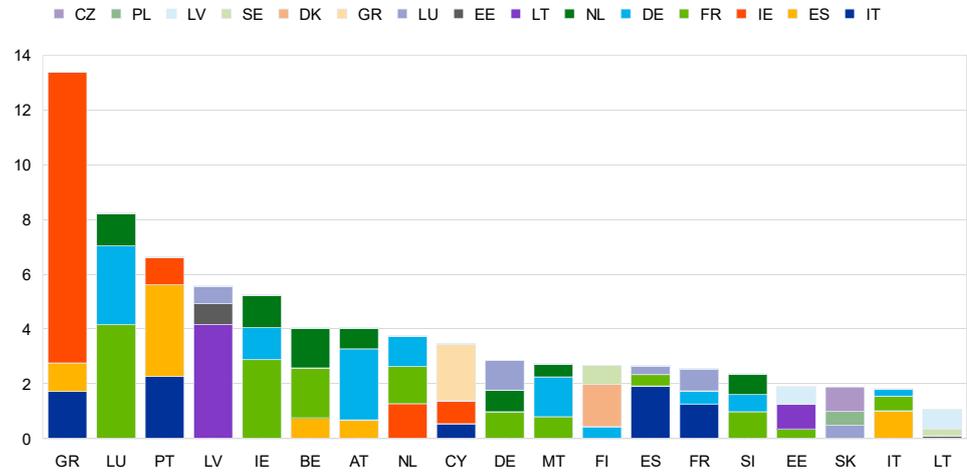
Sources: ECB (MFI BSI statistics).

Notes: Exposures of each sector are computed combining MFI loans, holdings of debt securities and holdings of MMF shares. The series on loans used in this chart are not adjusted for loan sales and securitisations.

Chart 12

Three largest exposures of MFIs to foreign non-MFIs

(percentage of total assets, Q3 2021)



Sources: ECB (MFI BSI statistics).

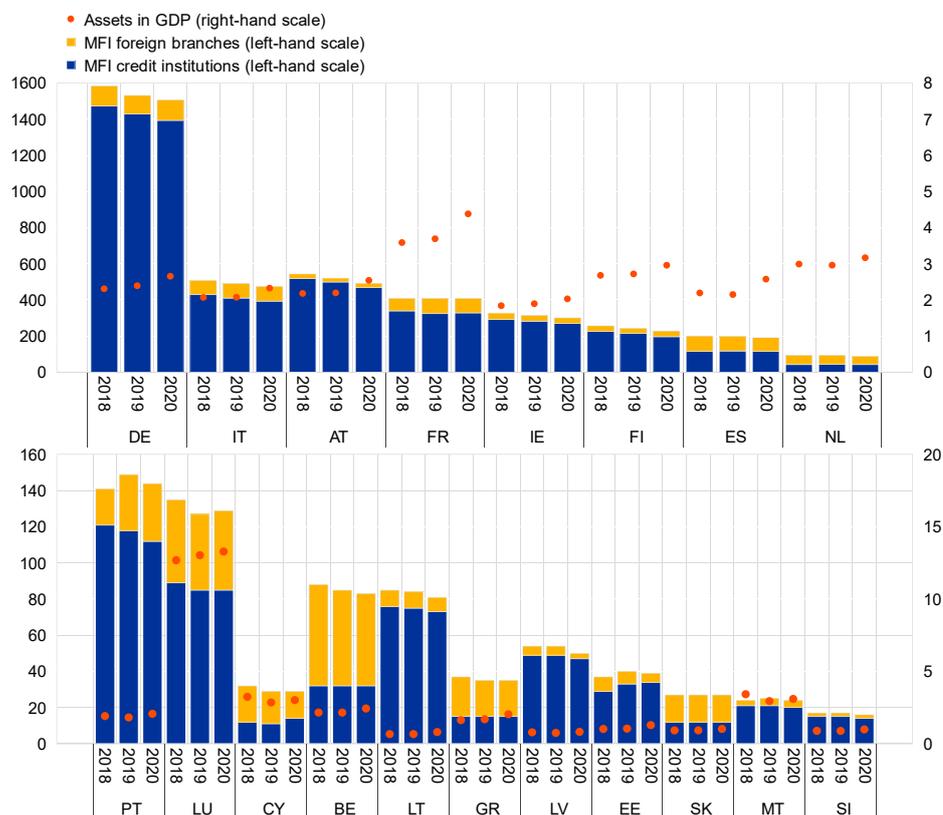
Notes: Exposures of each sector are computed combining MFI loans and holdings of debt securities. The non-MFI sector includes general government, financial corporations except MFIs, non-financial corporations, households and non-profit institutions serving households. Exposures of Greek banks to foreign non-banks, in particular to Irish non-bank counterparties, include exposures to SPVs set up for securitisation operations. Removing those exposures would substantially reduce the total exposures of Greek banks to foreign non-banks.

3.2 The euro area banking system

Chart 13

Number of credit institutions and foreign branches and bank assets in GDP

(2018, 2019 and 2020)



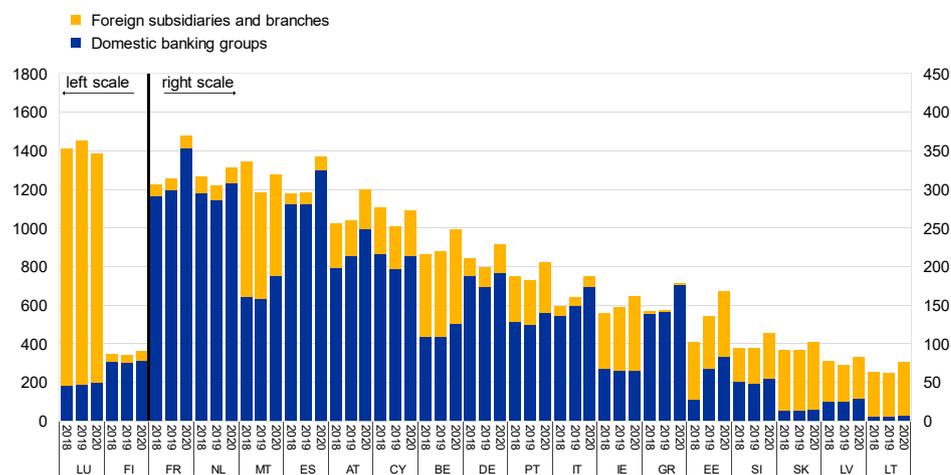
Sources: Eurostat, ECB and ECB calculations.

Notes: Branches refer to the local units of credit institutions. In the case of Ireland, the ratio may be underestimated given the large impact of foreign-owned multinational enterprises in its GDP. The use alternative metrics, other than GDP, that are more related to the domestic economy, such as the Modified Gross National Income (GNI*), would yield considerably higher ratios for bank assets.

Chart 14

Total assets of domestic banking groups and foreign-controlled subsidiaries and branches in relation to GDP in euro area countries

(percentage, total assets for banking groups and foreign-controlled subsidiaries and branches, annual data, 2018 – 2020)



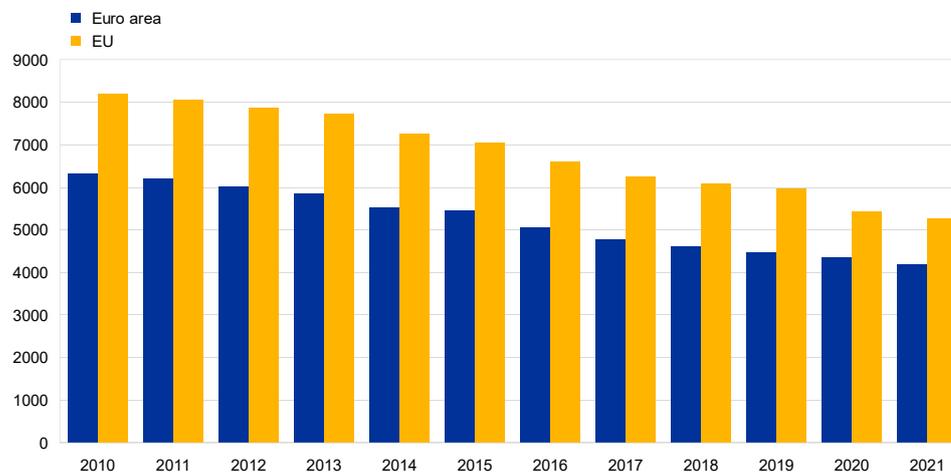
Sources: ECB Consolidated Banking Data (CBD) and ECB calculations.

Notes: Data for domestic banking groups and foreign subsidiaries and branches are consolidated and, hence, include branches and subsidiaries that can be classified as OFIs, except insurance companies.

Chart 15

Number of credit institutions

(annual data, 2010 – 2021)

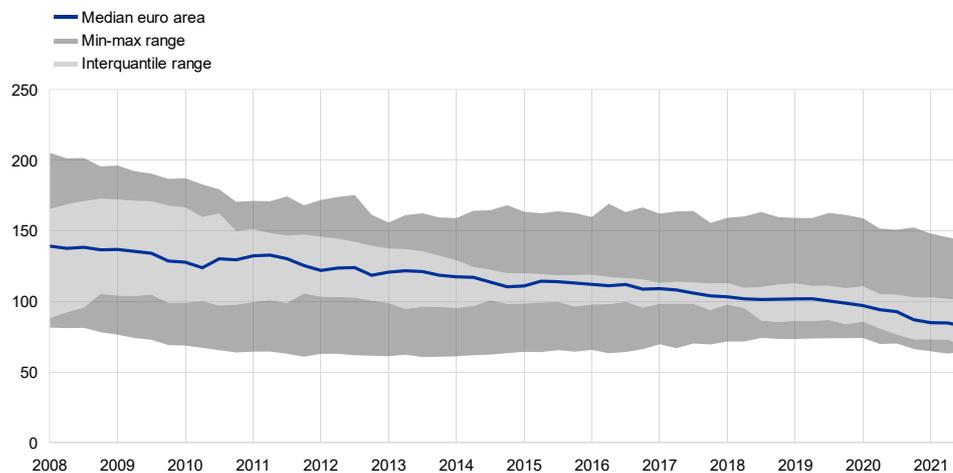


Sources: ECB (MFI statistics).

Chart 16

Loan-to-deposit ratios of euro area banking sectors

(all banks; percentages; maximum, minimum, interquartile range and median across national banking sectors; quarterly data, Q1 2008 – Q3 2021)

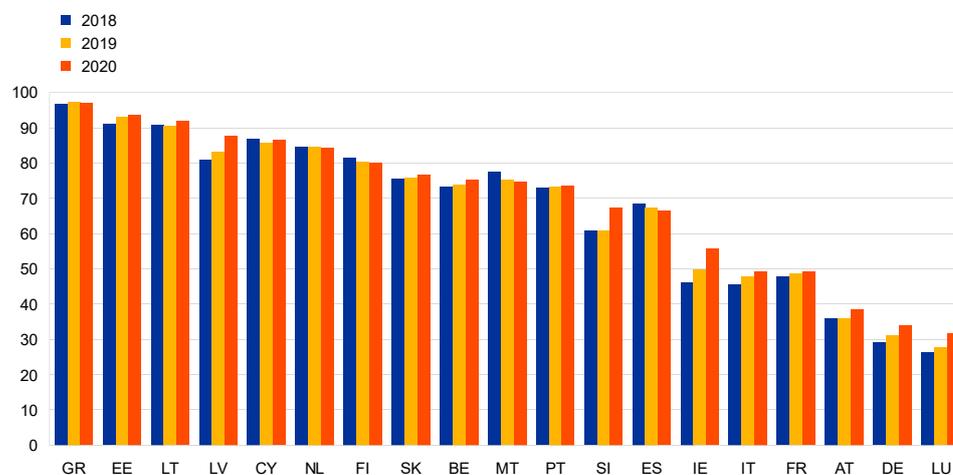


Sources: ECB (BSI statistics) and ECB calculations.

Chart 17

Share of the five largest credit institutions in total assets

(percentages, annual data, 2018 – 2020)



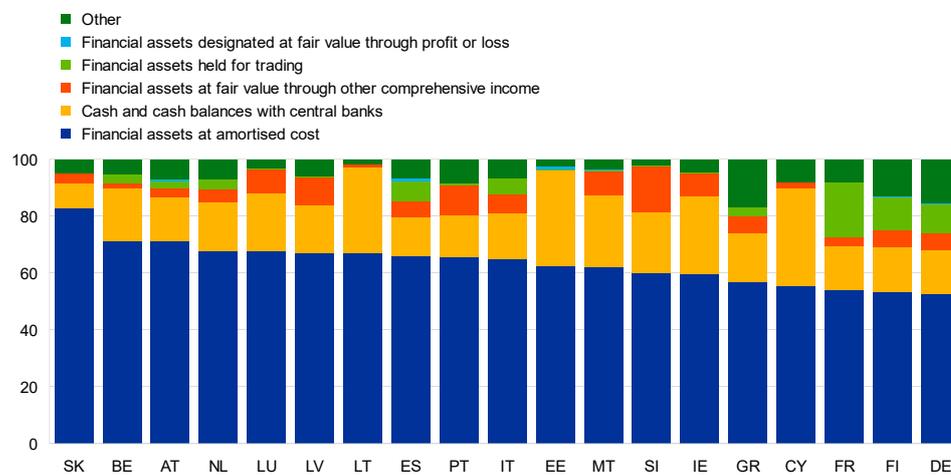
Sources: ECB (SFI statistics).

Note: Figures are reported on an unconsolidated basis.

Chart 18

Bank assets by category in the euro area countries

(percentage of total assets, quarterly data, Q3 2021; all domestic banks)

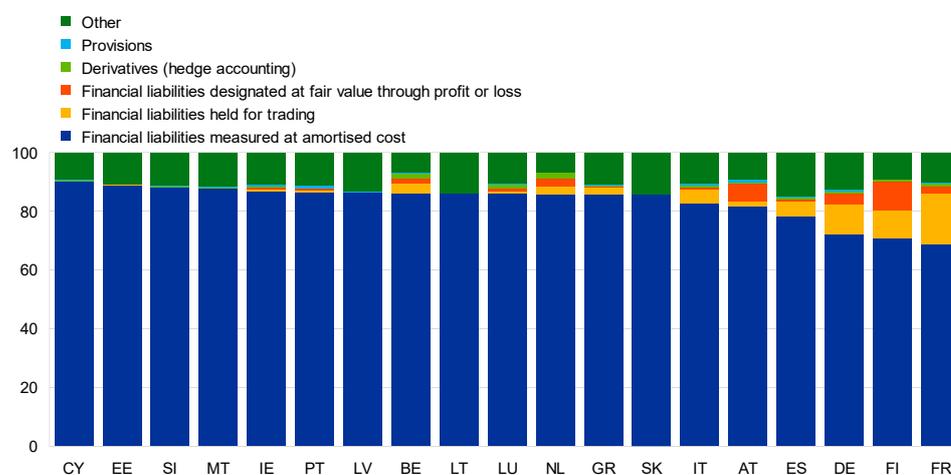


Sources: ECB (CBD) and ECB calculations.

Chart 19

Bank liabilities in the euro area countries

(percentage of total assets, annual data, 2020; all domestic banks)



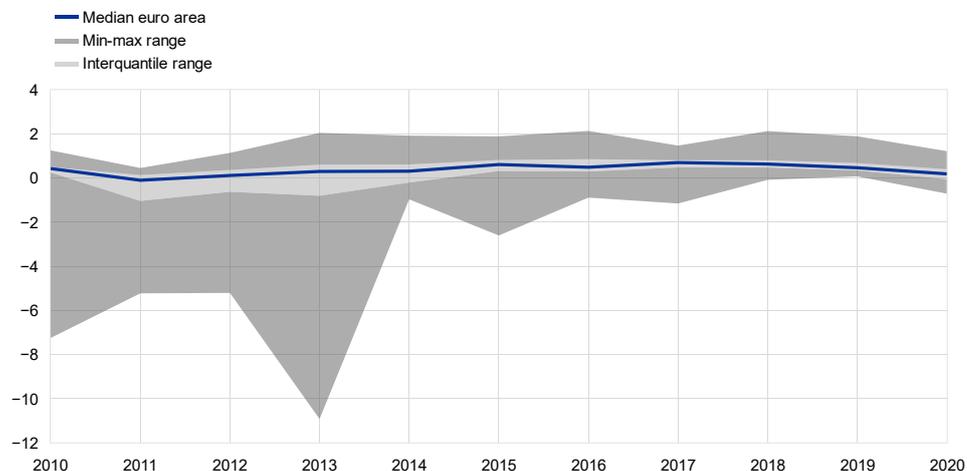
Sources: ECB (CBD) and ECB calculations.

Notes: IFRS reporting banks only. Other liabilities include, for instance, deposits from central banks, financial liabilities associated with transferred financial assets, and tax liabilities. Owing to non-availability of data, the following positions are also included in other liabilities: derivatives and financial liabilities at fair value for Estonia, for Lithuania and Latvia.

Chart 20

Return on assets of euro area banking sectors

(percentages, annual data, 2010 – 2020; all domestic banks; maximum, minimum, interquartile range and median across national banking sectors)

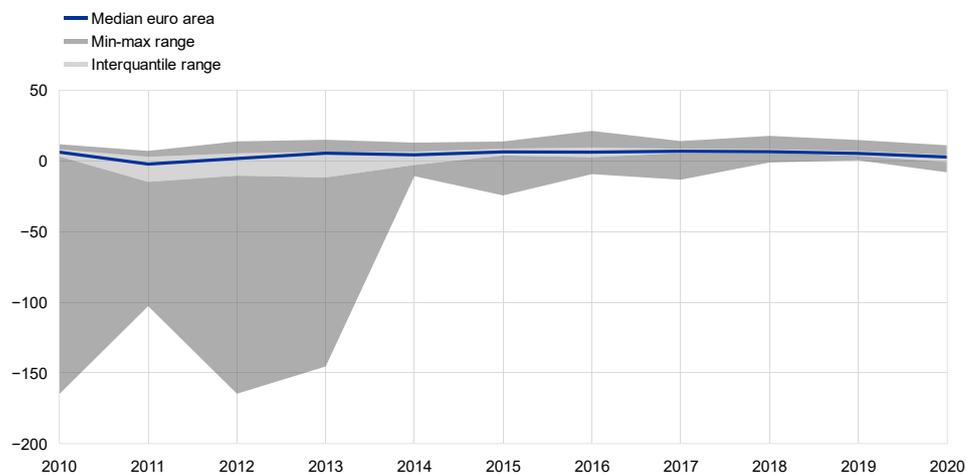


Sources: ECB (CBD) and ECB calculations.

Chart 21

Return on equity of euro area banking sectors

(percentages, annual data, 2010 – 2020; all domestic banks; maximum, minimum, interquartile range and median across national banking sectors)

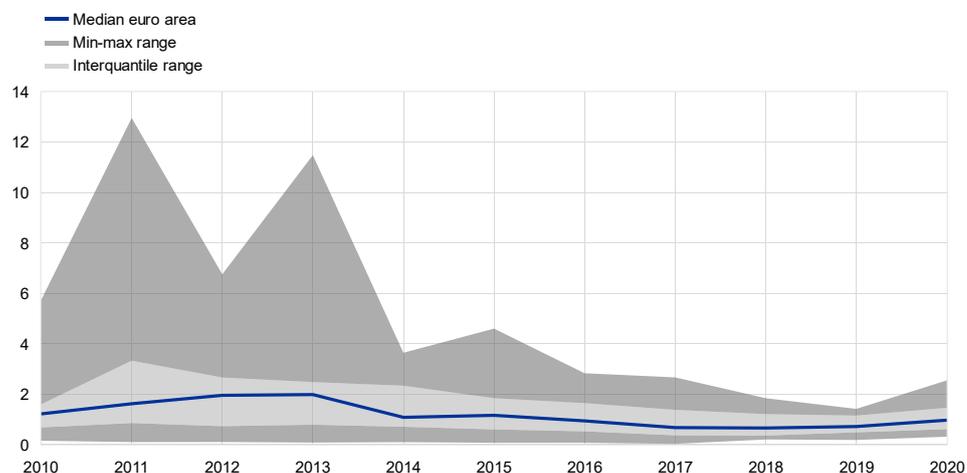


Sources: ECB (CBD) and ECB calculations.

Chart 22

Provisions and impairments of euro area banking sectors

(percentage of total assets, annual data, 2010-2020; all domestic banks; maximum, minimum, interquartile range and median across national banking sectors)



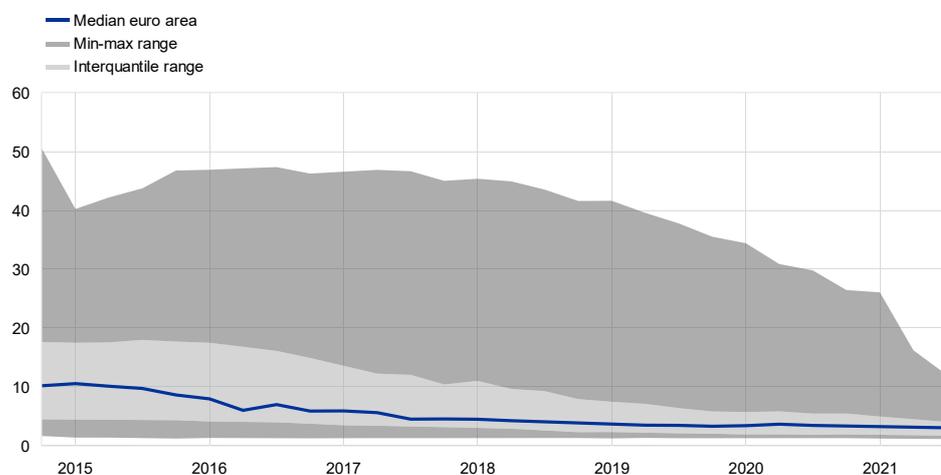
Sources: ECB (CBD) and ECB calculations.

Notes: For confidentiality reasons, data may not be available for all euro area countries for all the years.

Chart 23

Banks' non-performing loan ratio in the euro area countries

(gross non-performing loans and advances as a percentage of gross non-performing loans and advances, quarterly data, Q4 2014 – Q3 2021; all domestic banks, maximum, minimum, interquartile range and median across national banking sectors)



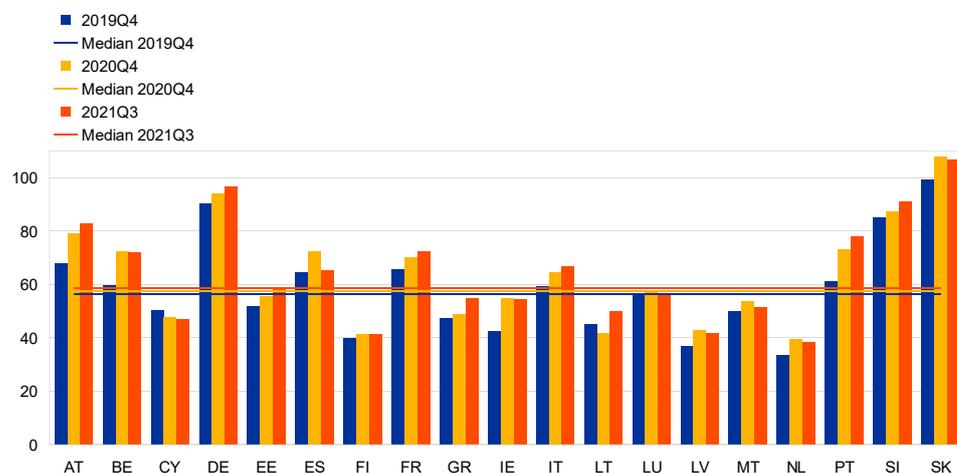
Sources: ECB (CBD) and ECB calculations.

Notes: Non-performing loan ratio is defined as the ratio of non-performing loans to total loans.

Chart 24

Coverage ratios of euro area banking sectors

(percentages, quarterly data, 2019Q4, 2020Q4, 2021Q3; all domestic banks; total loan loss reserves as a percentage of total gross doubtful and non-performing loans)



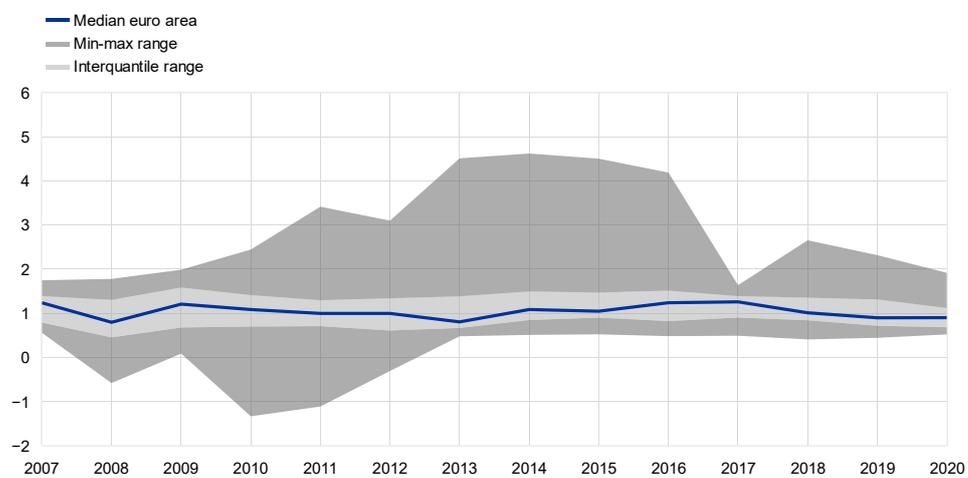
Sources: ECB (CBD) and ECB calculations.

Notes: Data are not fully comparable across countries owing to different definitions of non-performing loans across countries.

Chart 25

Operating profits of euro area banking sectors

(percentage of total assets, annual data, 2007 – 2020; all domestic banks; maximum, minimum, interquartile range and median across national banking sectors)

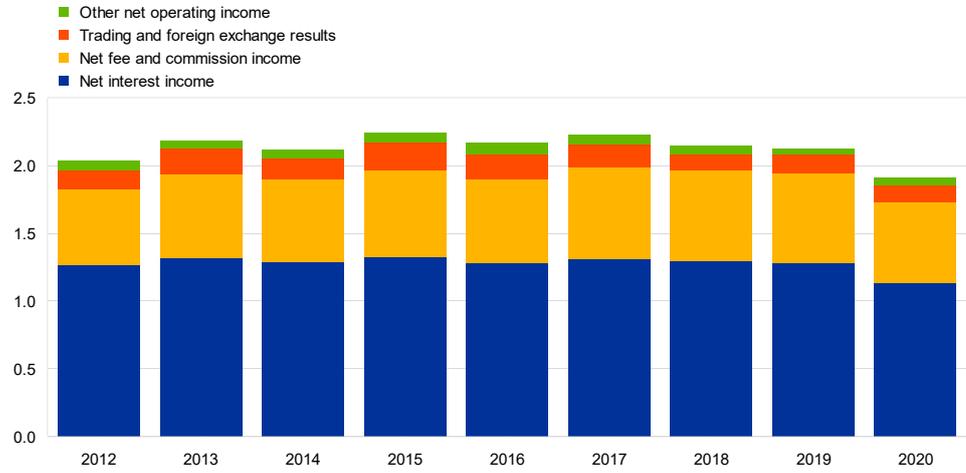


Sources: ECB (CBD) and ECB calculations.

Chart 26

Operating income structure of the euro area banking sector

(percentage of total assets, annual data, 2012 – 2020; all domestic banks)

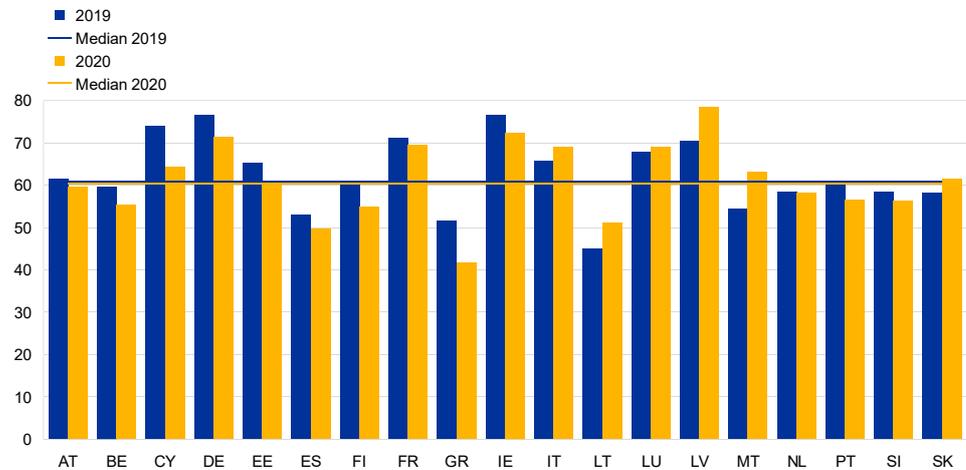


Sources: ECB (CBD).

Chart 27

Cost/income ratio of euro area banking sectors

(percentages, annual data, 2019 – 2020; all domestic banks)

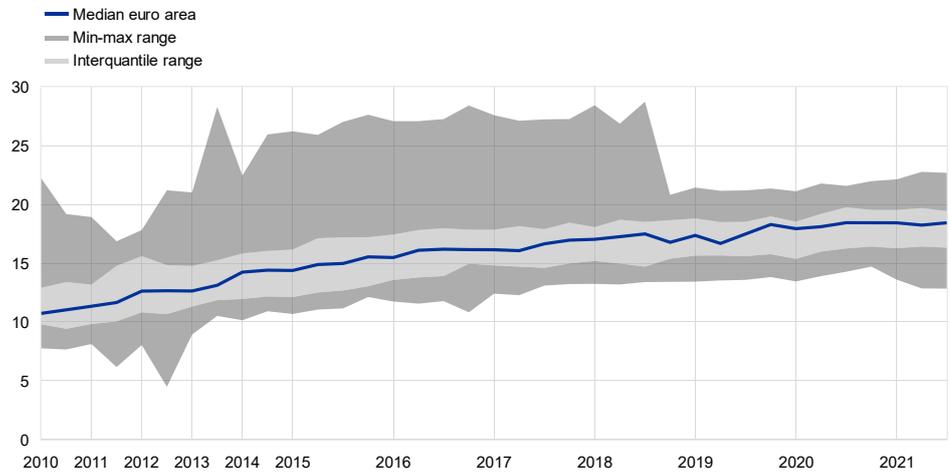


Sources: ECB (CBD) and ECB calculations.

Chart 28

Dispersion of Tier 1 ratios across national banking sectors in the euro area

(percentages, semi-annual data, 2010Q2 – 2014Q4, quarterly data, 2015Q1 – 2021Q3; all domestic banks; maximum, minimum, interquartile range and median across national banking sectors)

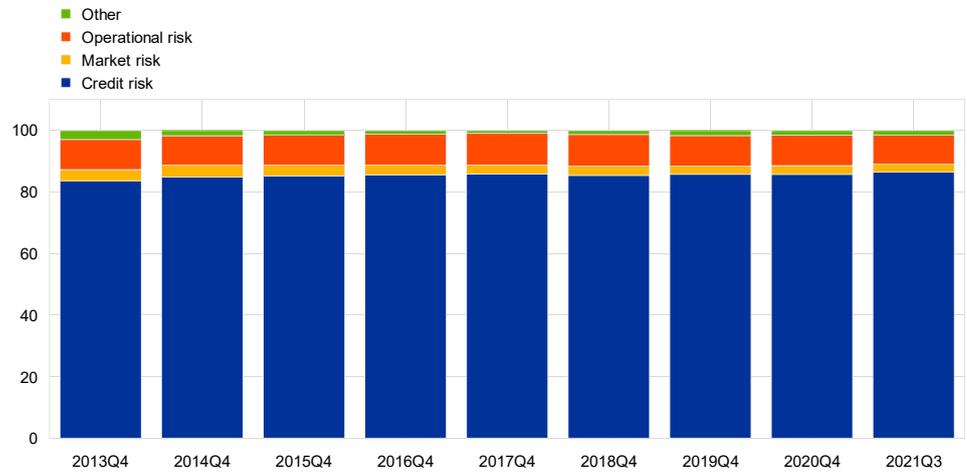


Sources: ECB (CBD) and ECB calculations.

Chart 29

Breakdown of RWAs of euro area banks

(percentage of total RWAs, quarterly data, 2013Q4 – 2021Q3; all domestic banks)

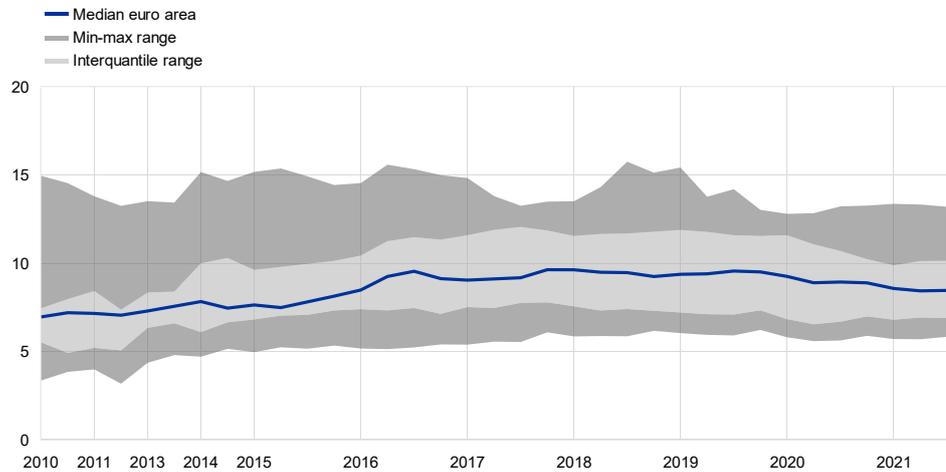


Sources: ECB (CBD) and ECB calculations.

Chart 30

Equity-to-total assets ratios of euro area banking sectors

(percentages, semi-annual data, 2010Q2 – 2014Q4, quarterly data, 2015Q1 – 2021Q3; all domestic banks; maximum, minimum, interquartile range and median across national banking sectors)



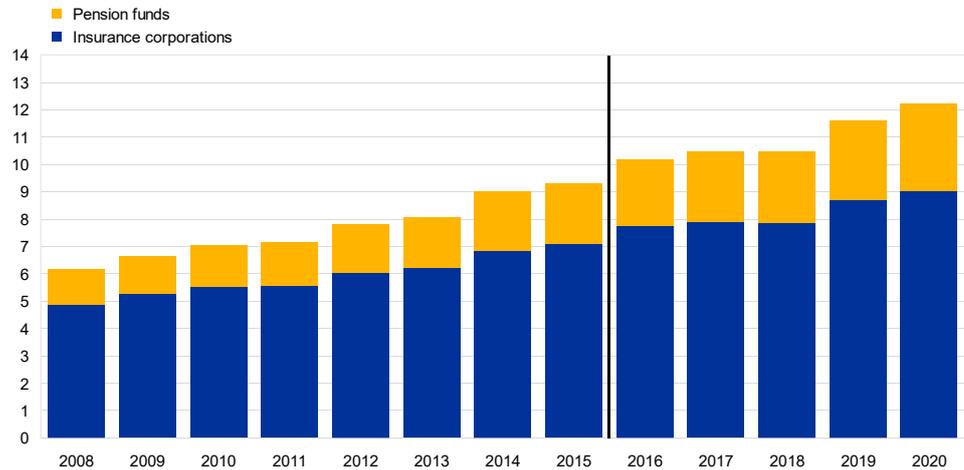
Sources: ECB (CBD) and ECB calculations.

3.3 Insurance corporations and pension funds

Chart 31

Total assets of euro area ICPFs

(EUR trillions, 2008 – 2020)



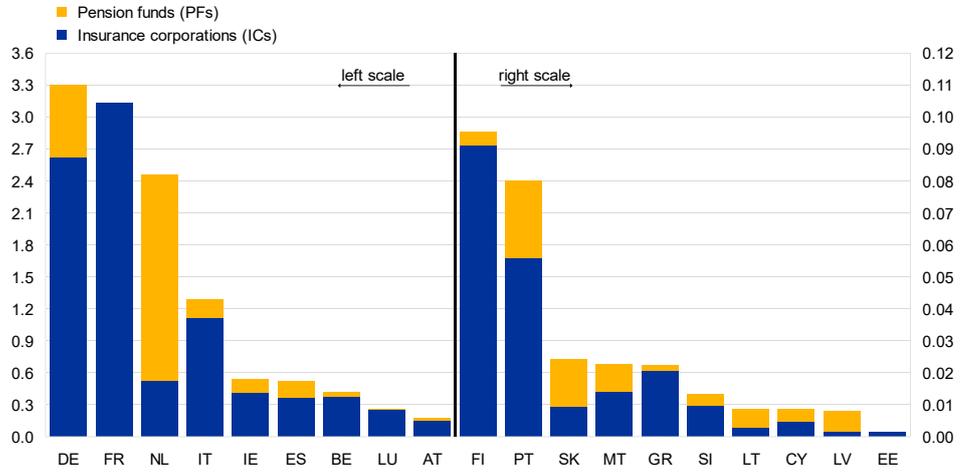
Sources: ECB (IC and PF balance sheet data).

Notes: The solid vertical line indicates the structural break in the data due to the changes in ECB's IC and PF balance sheet data.

Chart 32

Assets of ICPFs in euro area countries

(EUR trillions, quarterly data, Q3 2021)



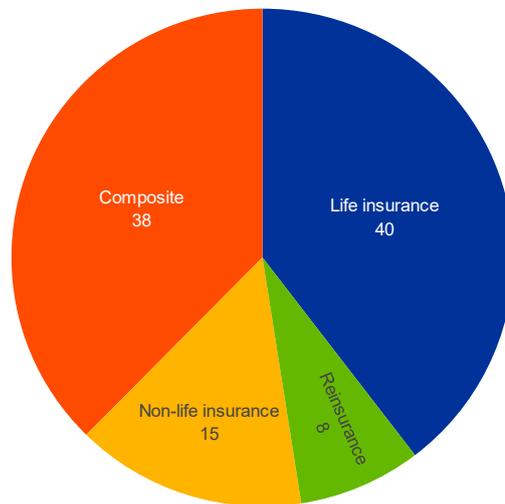
Sources: ECB (IC and PF balance sheet data).

Notes: SI and CY pension funds' total assets are retrieved from the Quarterly Statistical Account (QSA) dataset.

Chart 33

Total assets of euro area insurance firms – by type

(percentages of total assets, quarterly data, Q3 2021)

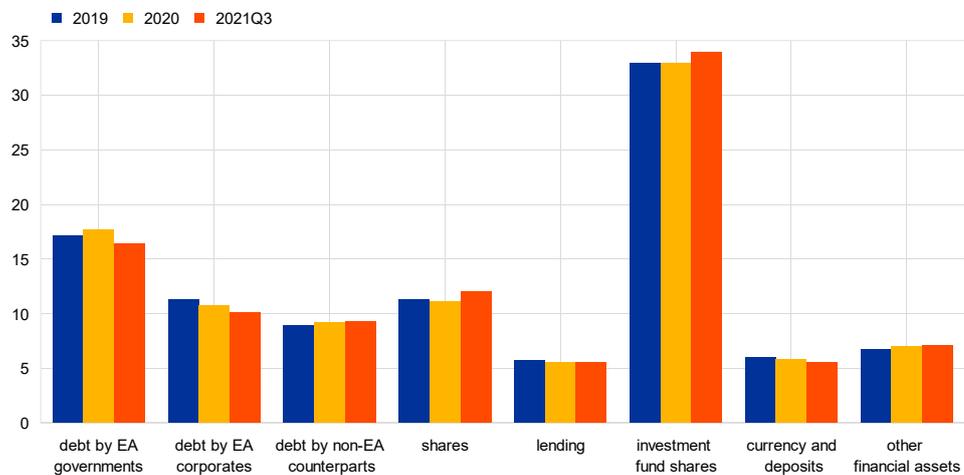


Source: ECB (IC balance sheet data).

Chart 34

Breakdown of financial assets – euro area ICPFs

(2019 – 2021Q3; percentage of financial assets)



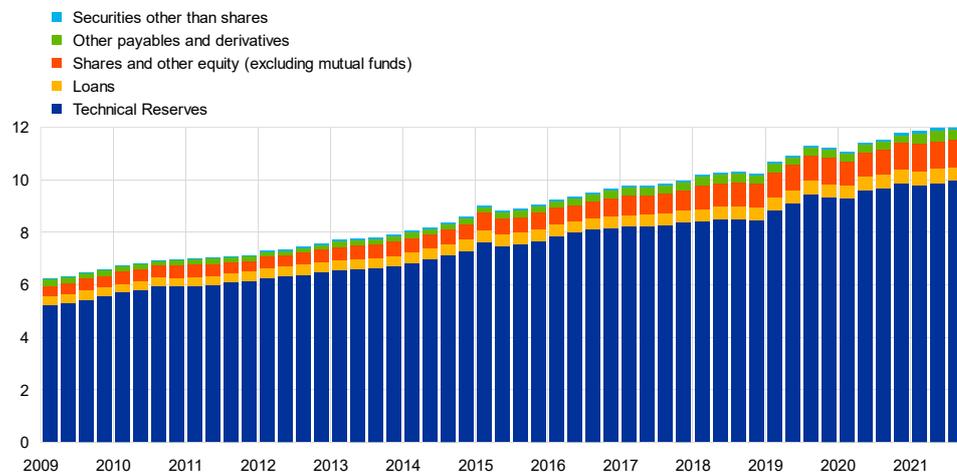
Source: ECB (euro area accounts).

Note: Investment fund shares exclude MMF shares.

Chart 35

Liabilities of euro area ICPFs

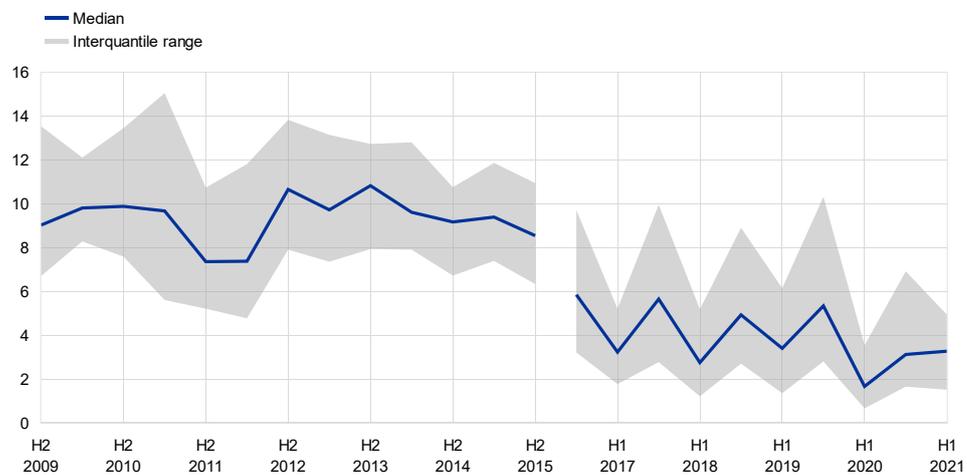
(EUR trillions, quarterly data, Q1 2009 – Q3 2021)



Sources: ECB (EAA) and ECB calculations.

Chart 36 Return on equity

(percentages, semi-annual data, H2 2009 – H1 2021, interquartile range and median)



Source: EIOPA.

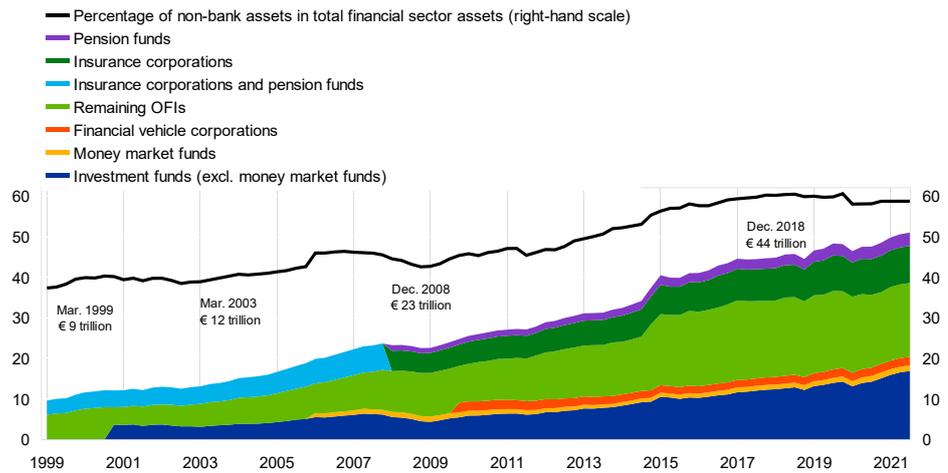
Notes: The empty space indicates the structural break in the data used for this chart owing to the changes in the EIOPA collection. The data for the first semester 2016 are not available. The return on equity before end-2015 is defined as the cumulated profit (loss) after tax and before dividends over the last four quarters, divided by the average solvency capital over the last four quarters. The return on equity after end-2015 is defined as the cumulated profit (loss) after tax and before dividends, divided by the excess of assets over the liabilities for the current quarter. The data before end-2015 covered a sample of a maximum of 27 EU-headquartered insurance groups. The data after end-2015 cover a sample of 93 European insurance groups and are based on the Solvency II reporting.

4 Other euro area non-bank financial entities

Chart 37

Total assets of the non-bank financial sector

(EUR trillions, quarterly data, Q1 1999 – Q3 2021)

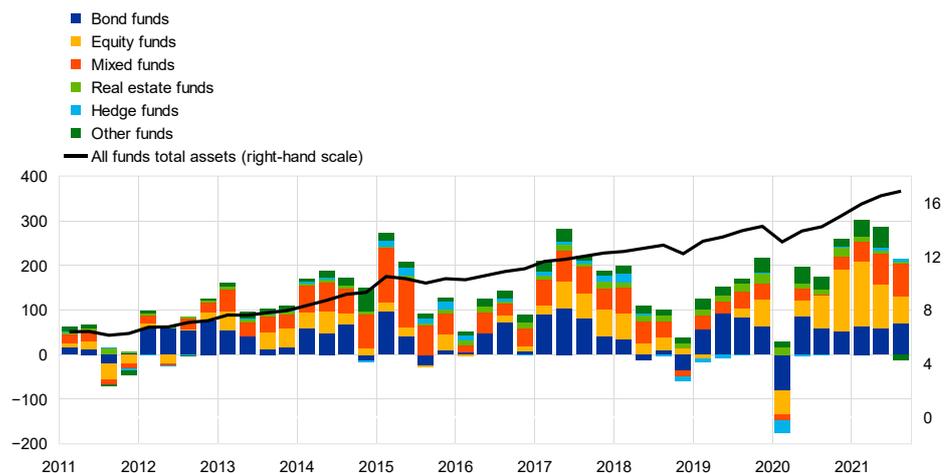


Sources: ECB (EAA, MFI BSI statistics, investment fund balance sheet statistics, IC and PF balance sheet data, FVC asset and liability statistics) and ECB calculations.
Notes: A breakdown of statistical data for MMFs, other funds, IC and PF, and FVCs is available only from the indicated dates onwards. Total financial sector before 2006 included the CBs.

Chart 38

Euro area investment funds – quarterly net flows and total assets

(EUR billions (left-hand scale); EUR trillions (right-hand scale), quarterly data, Q1 2011 – Q3 2021)

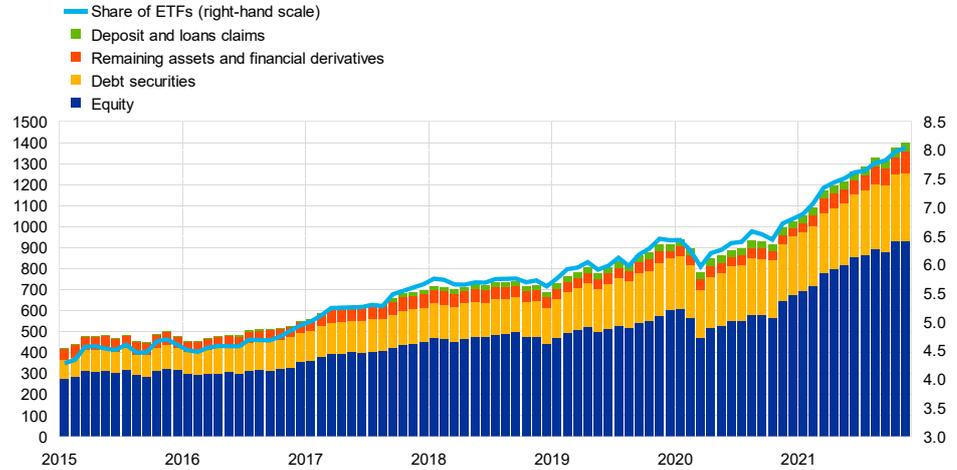


Sources: ECB (investment fund balance sheet statistics).
Note: Net flows reflect net issuance of shares.

Chart 39

Euro area investment funds – asset composition and relative size of ETFs

(monthly data, Jan 2015 – Nov 2021; EUR billions; percentages)



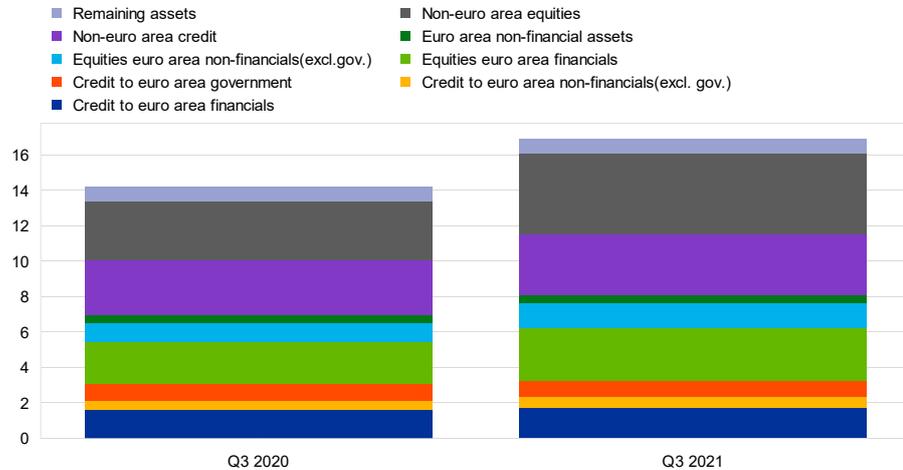
Sources: ECB (investment fund balance sheet statistics) and ECB calculations.

Note: The share of ETFs is expressed as a percentage of total assets held by non-MMF investment funds.

Chart 40

Euro area (EA) investment funds – assets by type

(quarterly data, Q3 2020; Q3 2021; EUR trillions)



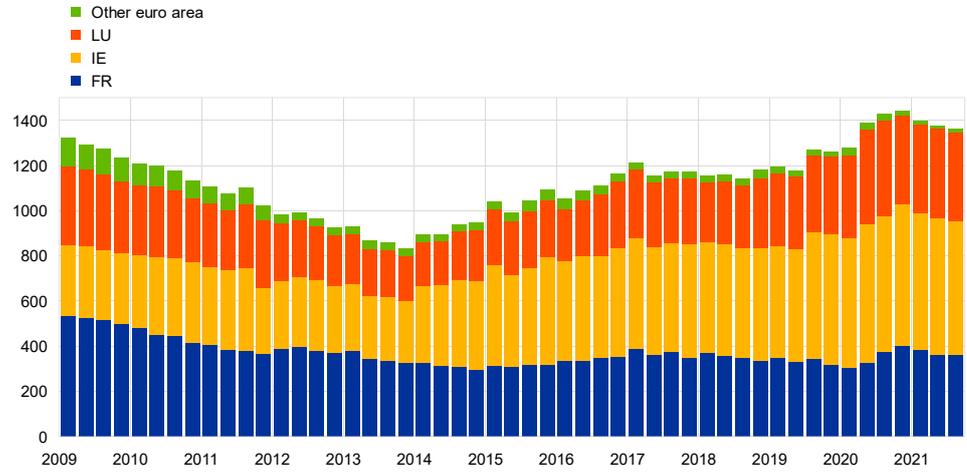
Sources: ECB (investment fund balance sheet statistics) and ECB calculations.

Note: Credit includes loans and debt securities; non-financial assets include real estate and other non-financial assets.

Chart 41

Euro area money market funds – total assets by country of fund domicile

(quarterly data, Q1 2009 – Q3 2021; EUR billions)

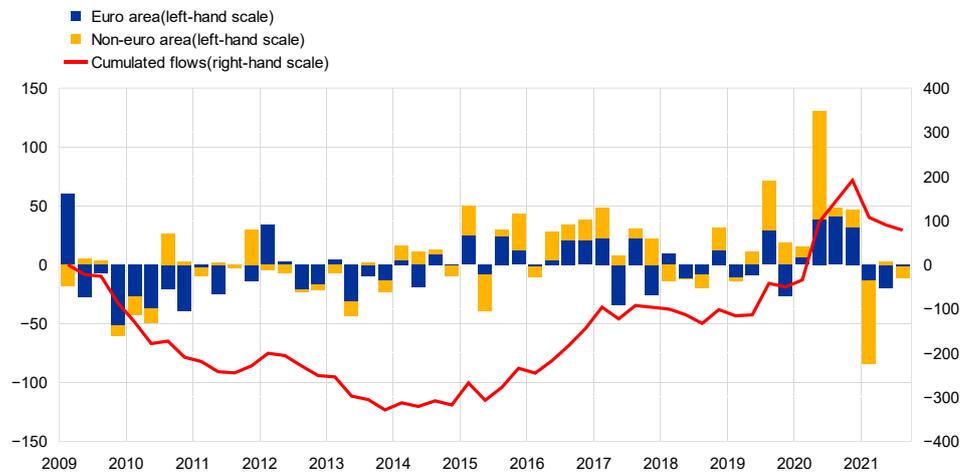


Sources: ECB (MFI BSI statistics) and ECB calculations.

Chart 42

Euro area money market funds – quarterly and cumulated net flows

(quarterly data, Q1 2009 – Q3 2021; EUR billions)

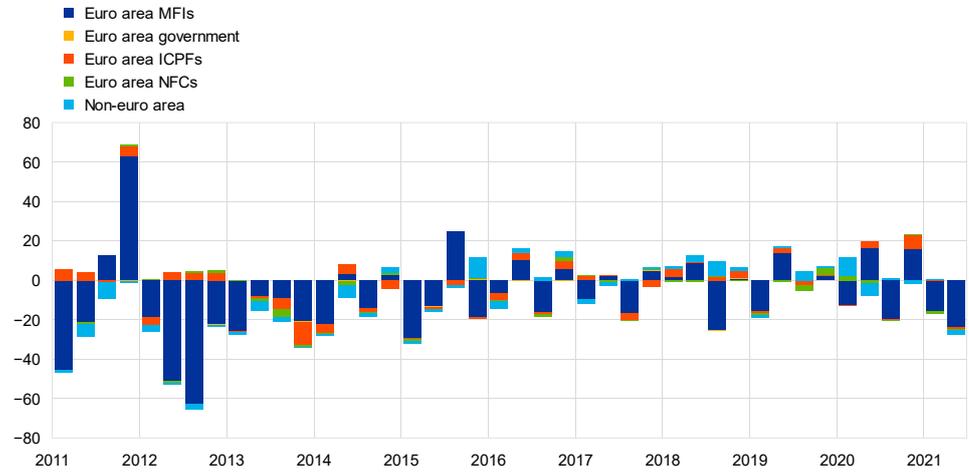


Sources: ECB (MFI BSI statistics) and ECB calculations.

Chart 43

Financial vehicle corporations (FVCs) – quarterly transaction volume by sector of loan origin

(quarterly data, Q1 2010 – Q3 2021; EUR billions)



Sources: ECB (FVC asset and liability statistics).

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