CNMV
Comisión Nacional del Mercado de Valores

Financial Stability Note

No. 27, December 2024

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The Financial Stability Note is one of the CNMV's duties within the framework of its monitoring of financial stability conditions in the areas it supervises. In particular, the Note assesses the stress level of **domestic securities markets during the past half-year**, flags any changes in the level of various financial risks and identifies major sources of risk.

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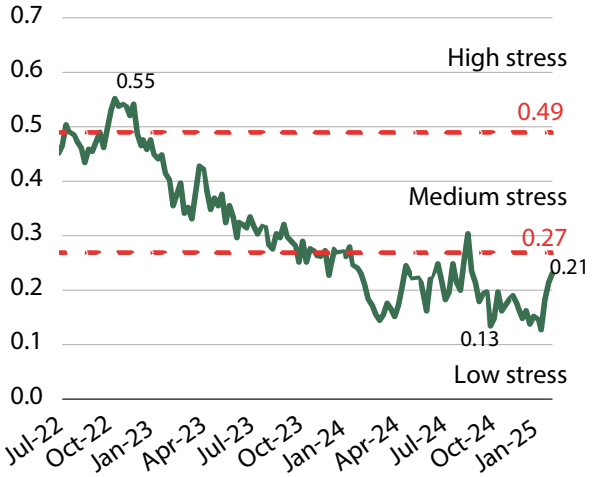
Summary

1 Risk level

✓ **The stress indicator of Spanish financial markets remained in the low-risk regime during the second half of 2024,[1] which was also the case in the first half, excluding the first days of August.** During this period, markets experienced turbulence of some intensity and pushed the stress indicator up to a level of 0.30 on 9 August, marking the highest level of the year and staying within the medium stress regime. The six segments that make up the indicator contributed to the upturn, although the degree of correlation of the system remained at medium levels. In the rest of the period, the indicator fell once again and ended the year at a stress level of 0.13, far below the threshold that separates the medium from the low stress level (0.27). The CNMV has been publishing the revised version of this indicator since 1 January 2025, which aims to improve or introduce new areas of stress (see explanatory note at the end of this document). In the first few days of 2025, the indicator had a slight upturn to a level of 0.21 due to an increase in indicators representing volatility in the different segments.

Total stress indicator

FIGURE 1



Source: CNMV.

For more details on the recent movements in this indicator and its components, see the statistical series of the CNMV (Market stress indicators), available at: http://www.cnmv.es/Portal/Publicaciones/SeriesWeb/Inicio.aspx?codrama=1295. For further information on the methodology of this indicator, see Cambón, M.I. and Estévez, L. (2016). "A Spanish Financial Market Stress Index (FMSI)". *Spanish Review of Financial Economics*, Vol. 14, No. 1, pp. 23–41, or as CNMV Working Document No. 60, available at: http://www.cnmv.es/DocPortal/Publicaciones/MONOGRAFIAS/Monografia_60_en.pdf.

[1] The closing date of this Note is 31 December, except for the stress indicator, which is 10 January, and other specific data.

Heat map[1]

FIGURE 2

Source: CNMV. See Cambón, M.I. (2015). "Identification of vulnerabilities in the Spanish financial system: an application of heat maps". *CNMV Bulletin*, Quarter I, pp. 103–115.

1 Data to 31 December. The colours of the risk levels on the right side of the map correspond to the current assessment of these risks. In the case of non-bank financial intermediation (NBFI), this assessment comes from the NBFI Monitor published by the CNMV.

2 Sources of risk

- **Geopolitical risk remains at high levels** due to the coexistence of several threats, among which we can highlight trade tensions and protectionism, originating mainly from the position of the United States, political instability in France and Germany, economic relations with China and the armed conflicts in Ukraine and the Middle East.
- **Interest rates** remain a significant source of risk, not so much due to the maintenance of the rates at elevated levels, as observed in previous notes, but rather to the possible divergence in the expected tones of monetary policies on both sides of the Atlantic, a tone which seems clearer in the euro area, with several interest rate cuts expected in 2025. These divergences may be a source of instability for financial markets.
- The **Spanish economy** continues to maintain growth rates that are significantly higher than those of the euro area. However, future developments are not free of uncertainty as a result of the geopolitical risks. In addition, risks related to the sustainability of public finances remain relevant.
- **The expansion of the new technology sector and its associated risks remain high**. In this Note, the risks related to crypto-currencies are particularly noteworthy, following the recent rally in their prices, and the possible regulatory laxity of the US Administration in this area. Cyber risks are also notable, which always take on greater importance in a context of heightened geopolitical risks.

3 Stock market developments

- **Equity markets** ended the year on a clearly upward trend, with few interruptions in 2024, in an environment of contained volatility and increased trading volumes. In the case of the Ibex 35, the cumulative gains in 2024 were 14.8%, outperforming most European indices. Worth noting is the growth of share prices in the financial, insurance and consumer services sectors. Closing numbers for Spanish securities totalled €717 billion in 2024 (up 14.3% on 2023) and liquidity conditions were favourable. Somewhat greater dynamism was also observed in primary markets, with total issues in excess of €9.3 billion (2.5 times more than in 2023), highlighting the increased activity in the BME Scaleup market for developing companies and, to a lesser extent, in the Portfolio Stock Exchange.

- **Fixed income markets** went through different phases in 2024 marked, mainly, by expectations about monetary policy. Long-term debt yields rose in the first half of the year and fell in the second half, except in the latter part of the year, which sharp increases that continued into the early days of 2025. Fixed income asset issuances by Spanish issuers totalled €166.67 billion, down 26.5% on 2023. Only the issuance of long-term securities abroad showed progress.

4 Recent activity in the field of asset management and investors

- **The household savings rate continued to rise in 2024 (13.7% of disposable income)**, narrowing the gap with the euro area (14.8%). Households' financial decisions showed trends similar to those recorded in 2023 following the increase in interest rates: disinvestments in means of payment and investments in fixed-term deposits, fixed-income securities and investment funds.
- **In 2024, growth in the collective investment sector continued**, with assets increasing by 11.5% to around €400 billion (Sept-24). The increase was driven by both net subscriptions from unitholders (especially in fixed income funds) and portfolio appreciation. Added to Spanish institutions, the assets of foreign collective investment schemes (CISs) marketed in Spain amounted to €275 billion, just over 40% of the total marketed. CIS assets with sustainability features (those covered by Articles 8 and 9 of the European Sustainability Disclosure Regulation, known as SFDR) maintain their relevance in the sector, with proportions of 35% (399 CISs and €147 billion) of the total.
- **The participation of retail investors in the equity market continues to increase.** These investors accounted for 7.7% of purchases and 9.2% of sales in Ibex 35 shares (compared to 7.4% and 8.9%, respectively, in 2023). The 2024 proportions appear to confirm a change in the trend of these investors, which could extend to other types of assets, including crypto-assets, which are high-risk and less protected. The increased participation of retail investors in the markets – driven by new technologies –, which is welcome because it contributes to promote the development of capital markets, also requires additional efforts in terms of investor protection.

5 Assessment of the main financial risks

- In the area of assessing the most common financial risks, the perception of **market risk in equity assets** continues to stand out, particularly in the US market. Credit risk has been partially mitigated in view of interest rate cuts made and expected, which are already resulting in improved financing conditions for agents. Finally, the indicators that assess contagion risk remain at moderate to high levels.
- In the area of **non-bank financial intermediation (NBFI)** – which is of particular interest to the CNMV, especially the investment funds segment due to its size – the assessment of liquidity and leverage conditions does not reveal any relevant risk and the results of the stress tests conducted on these institutions are consistent with this assessment. Concerning the assessment of other risks, worth noting is the high degree of interconnectedness between the funds, based on measures that assess the similarity of fixed income portfolios.

- Among the **medium and long-term risks**, those related to crypto-assets and cyber threats continue to stand out. In the first case, the escalating prices of these assets and the possible lack of ambition in their regulation and supervision in the United States should be monitored, not only because of the implications this market may have in relation to investor protection, but also from the point of view of financial stability. In Europe, two very important legislative texts regarding these two areas will come into force in 2025, the MiCA and DORA Regulations, which will foreseeably mitigate these risks.

1 Sources of risk

Geopolitical risks and other sources of political uncertainty: *still at very high levels*

- **Geopolitical uncertainties remain at very high levels, as in previous quarters.** This situation is due to political instability in countries such as France and Germany, the prolonged armed conflicts in Ukraine and the Gaza Strip and, more recently, to the possible direction of the new US Administration's economic and land policy. A direction that may result in new restrictions on trade and negative impacts on global demand or in more lax positions on issues such as sustainability or crypto-assets and, conversely, more aggressive on certain territorial issues (Greenland or the Panama Canal). There are also concerns about the future of US economic relations with China, as well as increased uncertainty about the future of monetary policy.[2]

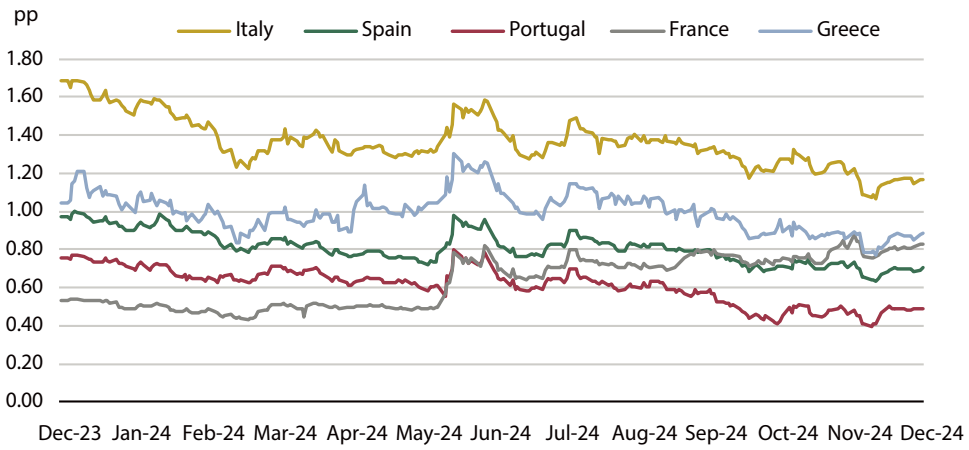
- **The risk from Russia's invasion of Ukraine remains critical, with escalating tensions and crossfire from both sides.** Meanwhile, the Israeli-Hamas conflict is at a turning point following the announcement of an agreement between Israel and Hamas on a ceasefire and the release of hostages. This fragile truce is a crucial step towards negotiating a permanent end to the war.

  Political instability has become a major risk factor in Europe. Political uncertainty is high in both France and Germany, with the resignation of the French Prime Minister in December and call for early elections in Germany at the end of February. This instability has resulted in increases in sovereign risk premiums in France (measured as the difference in yield compared to Germany) since June, when it stood below 50 bp, until the end of the year, when it reached 83 bp, higher than the values of this indicator in Spain and Portugal (see Figure 3). The information on credit default swaps (CDS) also points to certain tightening, more pronounced towards the end of the year, of 9 bp in the case of the French bond and 5 bp in the case of the German bond. In Germany, the 10-year sovereign bond yield grew by nearly 30 bp in December, ending the year at 2.36%, a trend which has continued into the first days of January. Overall, these indicators do not point to an overly alarming situation, but it is an area that will require monitoring in the coming months.

[2] See next section.

Sovereign risk premiums (yield spread with the 10-year German bond)

FIGURE 3



Source: Eikon Refinitiv.

- **Finally, political uncertainties also persist at the national level.** Some of these uncertainties stem from the high degree of parliamentary fragmentation, which may impede decision-making processes.

Interest rate environment: *rate cuts continue, but some divergence between the United States and the euro area is likely to occur this year*

- **On 12 December, the Governing Council of the European Central Bank (ECB) decided to lower the three key interest rates by 25 bp.** As a result, the interest rates on the main financing operations, the marginal lending facility and deposit facility now stand at 3.15%, 3.40% and 3.00%, respectively. The ECB's most recent projections indicate that while inflation will continue to moderate, it will remain above the target until the end of 2025. Specifically, they estimate inflation at 2.4% in 2024, 2.1% in 2025 and 1.9% in 2026.[3]

- Regarding the purchase programmes, the size of the asset portfolio under the Asset Purchase Programme (APP) is decreasing at the expected pace following the halt in principal reinvestments. Under the Pandemic Emergency Purchase Programme (PEPP), the reinvestment of the entire principal has been stopped, which is progressively reducing the programme's portfolio, with reinvestments expected to stop at the end of the year.

- **On 18 December, the Federal Reserve announced a further 25 bp interest rate cut, bringing the official interest rate to 4.25-4.50%.** This new cut, added to those already made in September (50 bp) and November (25 bp), implies a total reduction of 1 percentage point (pp) from its highs. Expectations of further rate cuts in 2025 have eased significantly due to the strength of the economy and forecasts of higher inflation.

[3] Forecasts for underlying inflation are estimated at 2.8% in 2024, 2.2% in 2025 and 2.0% in 2026.

Macroeconomic environment: *improving outlook, but some challenges remain*

- **In the third quarter of 2024 Spanish GDP grew by 0.8%, bringing the year-on-year rate to 3.3%, up 1 pp on the previous quarter.** This growth, which was mainly driven by domestic demand, continues to surpass that of the major economies,[4] with an average year-on-year increase of 0.9% in the euro area as a whole (see Figure A19). This increase in economic activity was reflected in the labour market, lowering the unemployment rate in the third quarter of the year to 11.2% (6 pp below the closing figure for 2023). Meanwhile, available data on public sector finances indicate a moderately positive trend, with a slight reduction in the consolidated general government deficit[5] to 1.66% of GDP at the end of September, compared to 1.68% in the same period of 2023.

- **The provisional inflation rate stood at 2.8% year-on-year in December, 4 pp higher than in November, accumulating three months of increases.** Inflation has increased by 1.3 pp since September but still remains below the 3.1% observed one year earlier. The underlying rate[6] also increased in December, although more moderately, specifically 2 pp more than in November, standing at 2.6%. Using disaggregated data up to November, the largest price increase was observed in the services sector (3.3% year-on-year), while growth of processed and fresh food prices has substantially moderated to 1.1% and 1.7%, respectively. Meanwhile, **the gap between the Spanish CPI and the euro area CPI fell steadily until September, remaining virtually unchanged since then** (0.1 pp in November).

- **Growth forecasts for the end of 2024 have been revised upwards, thanks to better-than-expected performance in the second quarter.** In this way, both the Bank of Spain and the International Monetary Fund (IMF) estimate that Spanish CPI will grow by 3.1% in 2024 (3 and 2 pp more than previous estimates). Growth forecasts for the euro area are significantly lower than those for Spain, with an estimate of between 0.7% and 0.8%. In 2025, the Bank of Spain estimates growth of 2.5% and the IMF 2.3%. This improved growth outlook has led to a downward revision of the deficit forecast from 2025 onwards, although for 2024, due to the support measures deployed for the DANA event in Valencia, the forecast has been raised to 3.4%, 0.1 pp higher than estimated in September.[7] Public debt, however, is expected to close the year at 103.1% of GDP (-2.3 pp from the previous forecast).

Use of new technologies: *low but growing risks*

- **The uninterrupted progress of new technologies in recent years continues to transform the economies and, in turn, the financial sector,** expanding the range of possibilities to operate, but potentially bringing various risks to financial stability. In this respect, the tools used by generative artificial intelligence (AI) continue to develop. Meanwhile, the cryptocurrency market continues to expand. The latest events in the United States, with the approval of bitcoin exchange-traded funds (ETF) at the beginning of the year and the result of the elections in November, have raised expectations about market developments, which has led to a generalised rise in prices.

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4 For example, in Germany the growth rate was 0.4% in the third quarter of 2024, the same figure as the euro area average, while in France it stood at 0.4%. In year-on-year terms, the growth of these economies was -0.3% and 1.2%, respectively.

5 Excluding local corporations and aid to financial institutions.

6 Which is calculated by excluding the most volatile elements from the general index, specifically energy and fresh products.

7 It is estimated that these measures in response to the DANA could entail an increase in expenditure of approximately 0.5%, distributed between 2024 and 2025.

In this respect, risks should continue to be monitored, especially those arising from the high correlation between the different crypto-assets, the possible interconnections with traditional markets and their high volatility. Meanwhile, risks associated to cybersecurity and cyber incidents remain prevalent. The cyber incident that occurred in CrowdStrike in July highlighted the existing vulnerabilities in operational risk. Some technological services, such as cloud storage, have concentrated their offering in a small number of providers, which can generate systemic risk. Regarding cybersecurity, current geopolitical tensions focus attention on this issue, as the number and sophistication of cyberattacks continue to grow. However, so far these attacks have not revealed vulnerabilities on a global level.

2 Performance of securities markets

Equity: *increase in share prices despite uncertainties*

- **Generally speaking, international equity markets rallied in the second half of the year, despite a period of turbulence in the first days of August and a weaker end to the year.** The first rate cuts made by central banks spurred the increase in share prices during most of the period, but different types of uncertainties caused index developments to diverge between economic areas at different points in time. As shown in Exhibit 1, US indices showed the most substantial increases in share prices in the second half of the year, in a context of positive surprises in its economic evolution indicators, while the lowest increases took place in Japan, as its indices were barely able to compensate for the heavy losses in August. In Europe, stock markets showed an upward but relatively weaker trend, downward in the last weeks of the year in nearly all of them, as domestic uncertainties (particularly those arising from political instability in France and Germany) were compounded by those originating abroad. These include, namely, those related to the possible decisions of the new US Administration, which could weigh down international trade and deteriorate economic activity. In addition, the rise in inflation at the end of the year in both Europe and the United States rekindled fears that central banks could slow the pace of rate cuts and weigh on equities prices.

- **In 2024, US indices[8] recorded the highest increases, ranging from 12.9% for the Dow Jones to 28.6% for the Nasdaq,[9] with the broader S&P 500[10] rising by 23.3%.** The performance of the Dow Jones, with a greater weighting of companies from the traditional economy – such as banks, oil and industrials – was more modest, whereas both the Nasdaq[11] and the S&P 500[12] benefited from strong gains in the technology sector and investor enthusiasm for artificial intelligence.

  The main European securities markets also recorded a general upward trend, but with much greater heterogeneity, with losses even being observed in the French Cac 40 index (see Table 1). Gains ranged from 5.7% for the UK's FTSE 100 to 18.8% for the German Dax 30, placing the European Eurostoxx 50 at 8.3% and the Spanish Ibex 35 at 14.8%. Over the year, namely, the banking and insurance sectors performed best across Europe, continuing to benefit from relatively high interest rates, along with the technology sector, while the automotive sector and some luxury goods companies recorded the greatest losses.

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8 All the main US indices (S&P 500, Nasdaq and Dow Jones), and the German Dax 30, ended the year with record highs, while the French Cac 40 and European Eurostoxx 50 reached their highest levels in the first half of the year.

9 The Nasdaq index rose by 43.4% in 2023.

10 The S&P 500 rose by 24.2% in 2023, recording its best performance in two years so far this century.

11 A significant number of Nasdaq stocks recorded significant gains in the year. Notably, the so-called "magnificent seven" (Amazon, Apple, Alphabet [Google], Meta [Facebook], Microsoft, Nvidia and Tesla) saw gains ranging from 12.1% for Microsoft and 171.2% for Nvidia.

12 The S&P index is most representative of the US economy, covering all sectors from technology to finance, health and industry. In 2024, technology companies accounted for more than 35% of its capitalisation, up from 29% at the end of 2023. Of the top ten companies by weighting in the index, eight are technology firms, making up more than 33% of the total.

Performance of the main stock market indices[1]

TABLE 1

%

	2021	2022	2023	2024	Mar-24	Jun-24	Sep-24	Dec-24
World								
MSCI World	20.1	19.5	21.8	17.0	8.5	2.2	6.0	-0.4
Euro area								
Eurostoxx 50	21.0	-11.7	19.2	8.3	12.4	-3.7	2.2	-2.1
Euronext 100	23.4	-9.6	13.3	4.2	9.4	-2.8	0.0	-2.1
Dax 30	15.8	-12.3	20.3	18.8	10.4	-1.4	6.0	3.0
Cac 40	28.9	-9.5	16.5	-2.2	8.8	-8.9	2.1	-3.3
MIB 30	23.0	-13.3	28.0	12.6	14.5	-4.6	2.9	0.2
Ibex 35	7.9	-5.6	22.8	14.8	9.6	-1.2	8.5	-2.4
United Kingdom								
FTSE 100	14.3	0.9	3.8	5.7	2.8	2.7	0.9	-0.8
United States								
Dow Jones	18.7	-8.8	13.7	12.9	5.6	-1.7	8.2	0.5
S&P 500	26.9	-19.4	24.2	23.3	10.2	3.9	5.5	2.1
Nasdaq-Cpte	21.4	-33.1	43.4	28.6	9.1	8.3	2.6	6.2
Japan								
Nikkei 225	4.9	-9.4	28.2	19.2	20.6	-1.9	-4.2	5.2
Topix	10.4	-5.1	25.1	17.7	17.0	1.5	-5.8	5.3

Source: LSEG Datastream.

1 In local currency. Data until 31 December.

- **In Spain, the Ibex 35 gained 14.8% in 2024, the second best performance among the main euro area indices and reaching its highest levels since 2010.** The index saw significant gains in the first and third quarter (9.6% and 8.5%, respectively) and slight declines in the other quarters (-1.2% and -2.4%), ending the year below 11,600 points. The Spanish index benefited from the high weighting and good performance of the financial sector, and from the increase in share prices in the consumer goods and services sectors, with a positive trend in corporate earnings. The performance gap observed since the start of the pandemic with the main European indices, which in 2024 reached their highest levels in recent years, narrowed but still remains unclosed. The increase in share prices and the prospects for a slowdown in corporate earnings growth caused the price-earnings ratio (PER) to increase from 10.8 in June to 11.4 in December, still below its historical average of 13.3 (see Figure A2).

- **All sectors performed positively in the third quarter, with large declines in the fourth quarter, except for the consumer goods sector and some industrial and construction companies, which continued their upward trend.** All sectors experiences favourable, albeit very uneven, progress in 2024 as a whole. The best performance came from the financial sector and insurance companies, as well as consumer services and textile companies. Banks and insurance companies continued to benefit from their rise in margins, while consumer goods companies were favoured by the excellent performance of service companies such as tourism, hospitality, leisure and airlines. Also highlighted is the good behaviour of the textile sector, driven by the positive results of Inditex, real estate and mid-cap companies[13] (11.7%). In contrast, the biggest declines (over 35%) were seen in

13 Small-cap companies showed modest performance, growing 2.6%.

renewable energy companies and the pharmaceutical sector. Renewable energy firms were adversely affected by the drop in wholesale electricity prices, while the pharmaceutical sector was weighed down by the sharp fall in the share price of Grifols,[14] which impacted overall sector performance. The fall in oil sector companies is also highlighted, due to the decline in the price of crude oil.

- **The liquidity indicator of the Ibex 35 (measured by the bid-ask spread) remained at satisfactory levels in the second half of the year (0.061%)**, although declining slightly compared to the first half of the year (0.06%) due to the increase in values achieved in the last quarter, which were affected by the fall in trading volumes.

- **Average daily trading on the continuous market reached €1.08 billion in the second half of the year, an increase of 3.4% compared to the same period the previous year, but remains very low in relation to its average historical values.** This is due to the context of low market volatility, which discourages algorithmic and high-frequency trading, and to competing BME trading venues. Average daily trading on the continuous market in the year as a whole reached €1.22 billion, up 5.2% on 2023, but below previous years.[15]

- **Total trading in Spanish equities in the second half of the year[16] reached €336.81 billion, an increase of 21.7% compared to the same period in 2024.** Of this amount, €134.60 billion was traded on BME, up 4.5% year-on-year, with the remaining activity taking place on competing trading venues. Despite the recovery in BME activity, the higher growth in trading in competing venues gave rise to a new drop in market share of the Spanish market benchmark, which accounted for 41.9% of total securities trading in 2024[17] (39% in the last quarter, see Figure 4).[18] In annual terms, trading exceeded €717 billion, of which €300.72 billion corresponded to BME and €416.52 billion to its competitors. Among them, Cboe stood out, with more than €323 billion. Cboe accounts for nearly 77% of total trading among BME competitors, with Aquis and Equiduct, which together accounted for nearly 15% of trading, growing particularly strongly. Furthermore, trading in Spanish equities through systematic internalisers moderated its growth to 6.7% in the second half of the year, increasing to just over 7% of total trading in 2024 as a whole (6.5% in 2023).

  In the most important European stock markets, a process of delocalisation of share trading from the markets of origin to other competitors similar to that in Spain has been observed. This process was somewhat more intense in the Frankfurt and Euronext Milan markets in 2024, although the latter retains the highest share price among its comparables. As shown in Figure 4, BME market share[19] stands at very similar levels to Euronext Amsterdam and slightly above Euronext Paris.

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14 Grifols has declined by 40.8% in 2024.

15 This indicator reached €1.16 billion, €1.39 billion, €1.45 billion and €1.65 billion in 2023, 2022, 2021 and 2020, respectively.

16 Information calculated using data obtained from the financial information provider Bloomberg and BME data.

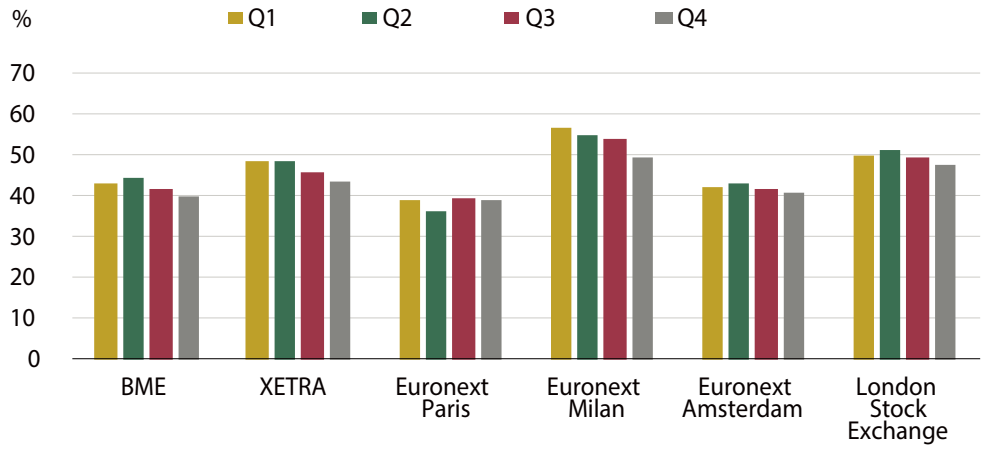
17 Total trading is understood as trading subject to non-discretionary market rules.

18 Other alternative sources of information, particularly those provided by BME based on Liquidmetrix data, estimate BME's market share in securities trading to be around 64.18% in December and to 65.25% in 2024 as a whole (compared to 67.46% in 2023). The discrepancy is mainly due to the trading volume on external trading venues, which is considerably lower in the data from Liquidmetrix.

19 For further details about the process of fragmentation of Spanish equity trading in a European context, in addition to the price formation process and liquidity, see Riba Meseguer, Q. and Cambón Murcia, M.I. (2024). *Fragmentation, price formation and liquidity of Spanish equities in a European context*. CNMV Working Paper No. 87. Available at: https://www.cnmv.es/DocPortal/Publicaciones/MONOGRAFIAS/DT_87_Fragmentacion_ENen.pdf

Market shares of the main regulated markets in Europe

FIGURE 4



Source: CNMV and BMLL.

- **Activity in the primary equity market, which had recovered in the first half of the year driven by the initial public offering (IPO) of Puig Brands, saw positive performance again in the second half, with cumulative issuance of €4.15 billion, nearly twice as much as in the same period of 2023.** Puig Brands[20] was joined in the second half of the year by Cox Energy and Inmocemento, which went public[21] through an IPO and a listing, respectively. The total amount issued in the year exceeded €9.3 billion, over 2.5 times more than the amount issued in 2023. In addition, notable issuance activity was observed in the BME Scaleup[22] market for developing companies, amounting to €1.36 billion, and to a lesser extent in the Portfolio Stock Exchange,[23] which saw €528.8 million. This stands in stark contrast to the decline in activity in the BME Growth alternative market, which saw only €884.6 million in issuances and the addition of five companies.[24]

Fixed income: *general decline in bond yields with the exception of the United States*

- **International bond markets saw a general decline in asset yields in the second half of 2024, interrupting the gains seen in the first half of the year.** These declines were driven by interest rate cuts decided by the main central banks in the last quarter of the year. The United States is an exception within this trend after Donald Trump's victory, whose Administration could shift the country's policies in certain areas. The US 10-year sovereign bond yield grew by 20 bp in the second half of the year, ending the year at 4.57%. In Europe, government bond yields reached their lowest levels of the year for the longer end of the curve in December. For 10-year sovereign bond yields, declines ranged between 10 bp in France and 54 bp in Italy (35 bp on average). Thus, at the end of the year, yields on these assets stood at 2.36% for Germany and 2.6% and 2.65% for the Netherlands and Ireland, respectively. Other European economies such as Spain, France and Italy stood above 3%, with yields of 3.07%, 3.19% and 3.53%, respectively.

[20] The family-owned company, one of the world's largest groups in perfumery, cosmetics, and fashion, had a market capitalisation exceeding €13.9 billion. The IPO, aimed exclusively at institutional investors, raised €2.8 billion through class B shares (with economic rights only and without voting rights only).

[21] The food company Europastry and the fashion company Tendam, which had announced plans to go public, have cancelled them due to the less favourable market conditions.

[22] The market for developing companies BME Scaleup ended 2024 with 20 companies, 19 of which are public limited companies which are listed real estate investment trusts (SOCIMIs or Spanish REITs), of which seven companies were added to the market in the first half of 2024 and the rest in the second half.

[23] Portfolio Stock Exchange currently has 15 companies, all of which are SOCIMIs (Spanish REITs).

[24] The amount issued in BME Growth reached a total of €1.72 billion, adding nine companies.

- **At the national level, interest rates on government debt also declined progressively across all segments of the yield curve. These declines were more pronounced in shorter maturities**, with declines of around 1 pp compared to the end of 2023. In this way, yields on 3-, 6- and 12-month Treasury Bills in December averaged 2.57%, 2.51% and 2.18%, respectively.[25] In the case of corporate debt, performance was more varied due to the diversity of the sample in terms of maturity, rating and degree of subordination. There were declines of 140 bp in the shorter segments (less than one year) and around 80 bp in the longer segments.[26]

- **Risk premiums on European sovereign debt generally trended downward throughout most of the year, with certain exceptions related to electoral processes in some countries.** Year-to-date, these indicators reflect a general decline except in France, where both the yield spread with the German bond (+29 bp) and the 5-year CDS (+15.9 bp) show an increase with respect to the beginning of the year. In Spain, the sovereign risk premium, measured as the difference between the 10-year government bond yields of Spain and Germany, also declined during the period, reaching its lowest levels for the year in mid-December. Over the year, it recorded a sharp drop from 97 bp to 70 bp (see Figure A9).

- **Similarly, risk premiums for Spanish private sector entities continued the downward trend of the first half of the year in the second half, due to the performance of financial institutions.** The still relatively high interest rates led to improved margins and, consequently, better results for these entities, allowing their average CDS to drop to 55 bp, 7 bp lower than the first half of 2024 and 30 bp less than at the beginning of the year. The average CDS for non-financial companies, which was already low, remained unchanged from the start of the year, holding steady at 50 bp.

- **The credit ratings of Spanish private issuers hardly changed significantly in the third quarter of 2024, with most Spanish debt maintaining high-quality levels.** In September, 90.9% of Spanish private debt was classified as investment grade, a slightly lower proportion than at the end of the year (90.5%).

  The higher credit quality of debt in the financial sector compared with that of non-financial companies[27] remains evident (92.5% of the outstanding debt of the former is investment grade, compared with 83.7% of the latter). Compared to the previous quarter, there was a slight decrease of 0.2 pp in the percentage of high-quality debt held by financial institutions. This was balanced by a 0.5 pp increase for non-financial companies, continuing the upward trend in debt credit quality of this subsector that began in 2022[28] (see Figure 5).

[25] The daily average yield on 3-, 5- and 10-month public debt in December averaged 2.30%, 2.47% and 2.91%, respectively.

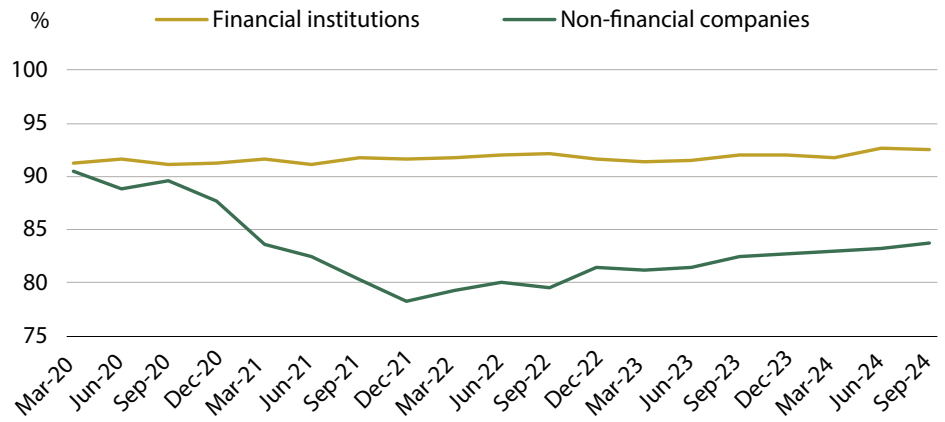
[26] The daily average yield on 3-, 6- and 12-month commercial paper in December averaged 2.97%, 3.73% and 2.61%, respectively. The yield on 3-, 5- and 10-month corporate bonds in December was 3.05%, 3.29% and 3.48%, respectively.

[27] The trend in the non-financial sector is largely attributable to industrial and technology companies, which account for around 65% of the total.

[28] For a more in-depth analysis see Exhibit 2 (Changes in the credit ratings of Spanish issuers' fixed-income assets since the pandemic), published in CNMV (2024). *CNMV Bulletin, Quarter I*, p. 49. Available at: https://www.cnmv.es/DocPortal/Publicaciones/Boletin/Boletin_I_Mayo_2024_ENen.pdf

Proportion of investment grade debt by sector

FIGURE 5



Source: Bank of Spain, Bloomberg and CNMV.

- **So far this year, debt issuance by Spanish issuers,[29] whether in domestic or foreign markets, totalled €166.67[30] billion, down 26.5% on 2023.** Of this amount, €96.54 billion was in long-term issuances (a decrease of 18.6%), while nearly €70.13 billion was in commercial paper (a decrease of 35.2%). The decline in issuance activity can be attributed, at least in part, to the tightening of financing conditions.
- **The analysis of these issuances shows a decline in volumes both in Spain (-50.5%) and abroad (-9.0%), with the domestic drop being much more pronounced.** Long-term private sector fixed income issuances registered with the CNMV in the first half of 2024 totalled €18.79 billion, a decrease of 58.7% compared to the same period in 2023. This decline affected almost all types of issuances, with particularly sharp drops in mortgage covered bonds (-86.8%) and plain vanilla bonds (all of which were issued abroad in 2024). The issuance of asset-backed securities was the only category to see an increase, remaining at very similar levels to those of 2023 (+0.5%, €14.74 billion). Meanwhile, issuances of commercial paper totalled €27.60 billion,[31] down 31.8% on the previous year. In contrast, as mentioned earlier, fixed income issuances abroad reached €119.13 billion. (data up to November), down 9% on 2023. In this case, worth noting is the mixed performance of medium and long-term bond issuances, which rose by 23.5% to €71.65 billion, and commercial paper issuances, which declined by -37.2% to €45.53 billion.

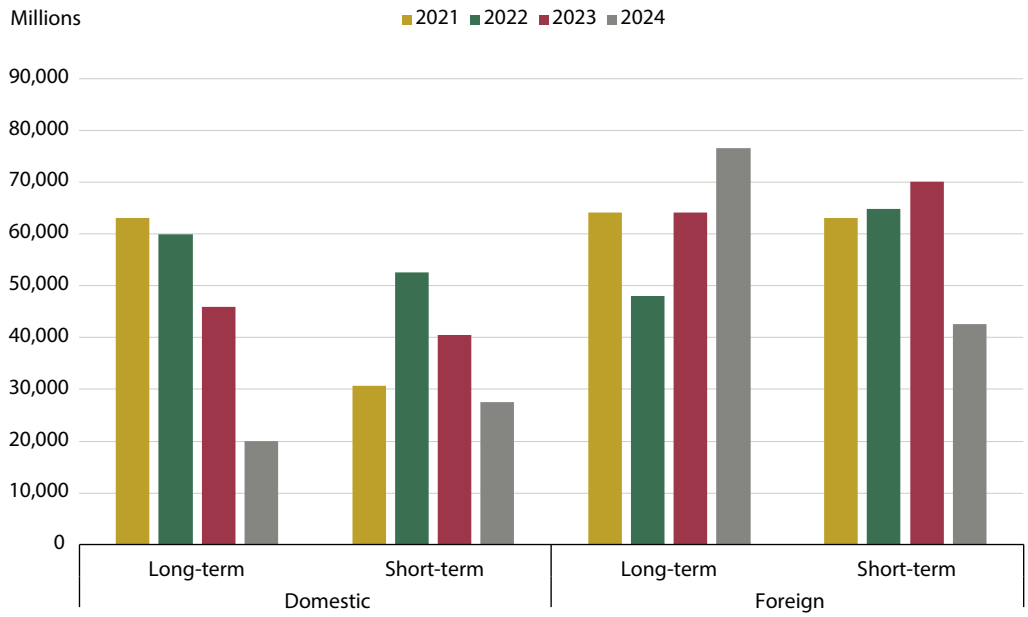
[29] Includes commercial paper issues admitted to trading in the different markets.

[30] Does not include issuances abroad in December.

[31] This amount includes admissions to AIAF and MARF.

Debt issuances made by Spanish issuers: term and country of issuance

FIGURE 6



Source: Bank of Spain and CNMV.

3 Recent activity in the field of asset management and investors

- **The data from the Financial Accounts for the third quarter of 2024 continue to show a progressive increase in the household savings rate, which stood at 13.7% of disposable income in September** (based on cumulative data for four quarters), compared to 11.5% one year earlier. Although these figures remain lower than the euro area average, where the savings rate was 14.8% at the end of June 2024, they indicate a narrowing of the gap. This increase was reflected in the acquisition of financial assets, which rose from 2.6% of GDP at the end of 2023 to 4.9% in September 2024 (cumulative data for four quarters, net). In addition, households continued to disinvest in means of payment (cash and demand deposits), with outflows exceeding €32.5 billion (2.1% of GDP) in 12 months.[32] They primarily invested in time deposits and fixed income securities (€64.25 billion, 4.1% of GDP) and in investment funds (nearly €35 billion, 2.2% of GDP).

- **In the first nine months of 2024, Spanish investment funds continued the expansion observed since 2022, with significant inflows into the more conservative categories and redemptions from those considered riskier.** Despite the slightly downward trend of interest rates in 2024, fixed income funds received by far the largest net subscriptions between January and September, amounting to €27.4 billion. By contrast, global funds and mixed equity funds saw net redemptions amounting to just over €3 billion and €2.3 billion, respectively.

- **High subscriptions, combined with the strong performance of the investment portfolio, led to a 11.5% increase in total assets of investment funds during the first nine months of the year.** Specifically, net subscriptions amounted to nearly €18.6 billion, while the appreciation of portfolio assets exceeded €16.5 billion. All categories experienced an increase in the value of their portfolios, with international equity funds seeing a rise of more than €7.4 billion. As a result, fund assets at the end of September stood at just under €394 billion, while unitholder accounts exceeded €16.3 million, after increasing more than €300 billion in nine months. These accounts corresponded to 5.3 million investors, nearly 200,000 more than at the end of 2023.

- Similarly, **the assets of foreign CISs distributed in Spain continued to grow between January and September 2024, rising by 9.3% until exceeding €275 billion.** This figure accounted for 41% of the total CISs marketed in Spain.

- **Retail investor participation in trading of Ibex 35 securities continues the upward trend of recent years (see Figure 7).** In 2024, retail investors accounted for **7.7% of total trading volume in purchase transactions and 9.2% in sale transactions** (compared to 7.4% and 8.9% in 2023, respectively). **The healthcare sector saw the highest level of retail investor involvement**, with retail investors making up 23.1% of total trading volume in purchase transactions and 22.7% in sale transactions, a large increase compared to 15.7% and 15.6% in 2023, respectively.

[32] Between June and September alone, resource outflows amounted to €24.5 billion.

- **Given the increasing participation of retail investors in equity markets, the need to monitor the risks associated with investor protection also rises.** In recent years, social networks have gained significant influence both on the prices of certain products and on investors' decisions. Although these can be a valuable source of information, they can also generate misinformation among investors, driving them to make decisions that may not be suitable for them, because of a lack of awareness of their characteristics and risks. In this regard, an increasing number of influential personalities in finance are leading investors to make decisions based on their popularity, sometimes without properly assessing the risks involved. This is particularly relevant in the area of crypto-assets, as mentioned in a later section.

Retail investor participation in trading of Ibex 35 securities

FIGURE 7

Source: CNMV.

4 Risk assessment

4.1 Categories of financial risk

Market risk: continues to be significant, especially in the United States

- Although the first interest rate cuts, inflation trends, improvement in some economic indicators and investor interest in securities linked to technology and artificial intelligence have helped stock markets and their valuations to rise in 2024, **investors may be underestimating the significance of some risks posed by rising levels of protectionism and a possible inflation rebound which, should it materialise, could cause shocks that would affect asset prices and generate negative contagion spirals.** A scenario characterised by an upturn in inflation, which reduces the likelihood of further interest rate cuts, a possible resurgence of geopolitical risks or an increase in credit risk premiums in some markets may lead to a sharp correction in asset prices. This could be more intense in those markets and assets with higher valuation metrics.

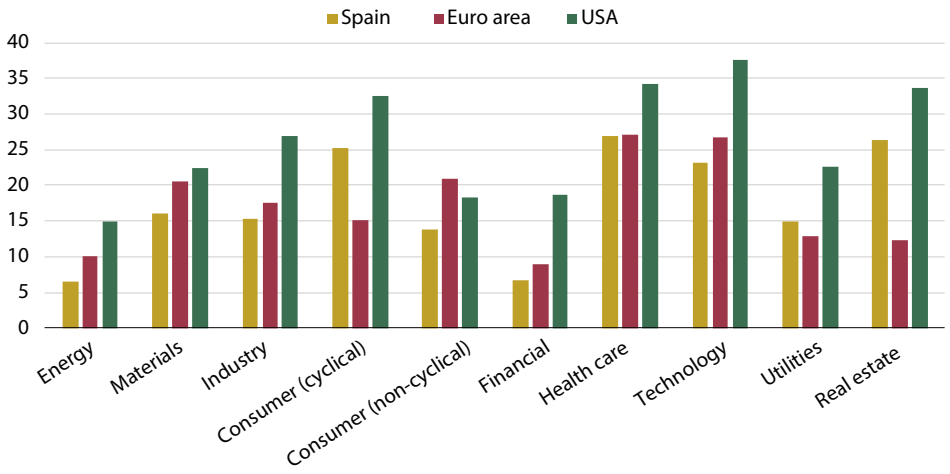
- **Rising stock market valuations have slightly increased P/E ratios in most markets in the past year, with the increase being much larger in US markets. There has also been a significant reduction in their risk premiums, indicating higher valuations across the board.** The highest valuation metrics that would suggest an overvaluation of shares are mainly concentrated in US markets, where prices of companies in some sectors (technology and healthcare), P/E ratios and risk premiums are at historic highs. European market indicators suggest a more realistic valuation, in line with their historical average. The occurrence of any kind of shock that could lead to adjustments in expected benefits could have a significant impact through the correction of valuations or via contagion, as was the case at the end of January 2025, causing significant falls in the Nasdaq technology index and, to a lesser extent, in the S&P 500, with companies linked to artificial intelligence and semiconductors[33] after the irruption in China of a competitor, DeepSeek, which develops advanced artificial intelligence models at a substantially lower cost and that could call into question the heavy investment made by the industry to develop this technology.

- **The sectoral distribution of P/E ratios continues to exhibit divergences across sectors and regions. Although, as noted above, they have increased in all regions and in most sectors, the highest values are concentrated in the technology, pharmaceutical and healthcare, consumer goods and real estate sectors (see Figure 8).** A priori, these sectors or markets would be the most vulnerable to higher price corrections, as has been the case, to some extent, in recent months for companies in the pharmaceutical and healthcare sector in view of the prospect of a cut in pharmacy spending by the new US Administration.

[33] The declines affected large technology companies, chip and semiconductor manufacturers, companies with high investments in the development of data centres and even energy companies exposed to massive energy consumption by these.

Sector P/E ratio by region

FIGURE 8



Source: Eikon Refinitiv.

- **In bond markets, market risk of debt assets remains at moderate levels, although it could increase (to a greater extent, in the longer sections of the curve) in the event that the upturns in inflation become consolidated and require central banks to reduce the prospects of new rate cuts.** However, this risk could be outweighed by rising credit risk or contagion risk from other markets, in the event of temporary volatility spikes in the risk premiums of some economies associated with political instability. It would be convenient to monitor this market risk in certain groups of debt assets, such as high-yield corporate debt, subordinated debt and even lower-rated public debt.

Credit risk: good performance, but dependent on political instability in France and Germany

- **The credit ratings of Spanish issuers and other financial indicators still do not show significant changes in credit risk, but there are some mixed circumstances to consider that could have an impact in the medium term.** On the one hand, the decline in interest rates and easing of financing conditions can favour the most heavily indebted agents with higher financing needs or greater difficulties in accessing credit. But on the other, **the high levels of public debt accumulated by some European economies, in addition to political turmoil in some regions – which encourages the abandonment of budgetary orthodoxy – could give rise to volatility spikes in their risk premiums[34] and even contagion phenomena** towards the most heavily indebted economies and with the most vulnerable public finances (see risk premiums in Figure 3).

- In the fixed income market, for example, some estimates suggest that over the next five years, more than half of the corporate debt of companies in the European Economic Area (EEA) will mature. This high level of debt will be partially refinanced at a significantly lower cost than just a few months ago, which will bring relief to the finances of many European companies and particularly to high-yield debt issuers. **However, the concentration of debt with short and medium-term maturities could pose a certain financing risk for some companies[35] in the event of volatility spikes in the markets**

[34] As indicated in the section on geopolitical risks, both the French and German 5-year CDS (the most liquid references) increased in the fourth quarter of 2024. The French 5-year CDS rose by nearly 9 bp (up 29.2%), while the German 5-year CDS rose by more than 4 bp (up 46.5%), with most of the increase concentrated in December, in line with the increase in political turmoil.

[35] This situation would favour the possibility of the recurrence of a certain degree of fragmentation of issuers according to their rating, which would affect issuers with lower credit ratings to a greater extent.

resulting from the reduction in the supply of available liquidity[36] and lead to the establishment of tighter financing conditions.

- **The Spanish private sector continues the deleveraging trend that began in the first half of 2021 and reduces its indebtedness to 109% of the GDP,**[37] a circumstance also observed in the public sector (see section on the macroeconomic environment and Figure A12), although the level of debt remains high. Among the companies, the greatest vulnerabilities are concentrated in the most heavily indebted companies with less capacity to address their debts (such as SMEs, some of which are still experiencing difficulties in fully recovering from the pandemic) and, among the sectors, the renewable energy sector, due to its high level of indebtedness. The NPL ratio of the private sector – as an indicator of this risk – has performed positively in recent months and remains at low levels (3.43% in September), whereas **the NPL ratio of consumer loans** exceeds 6% and is at its highest level in recent years.

Liquidity risk: good performance of price spreads

- **Market liquidity risk is low and Ibex 35 bid-ask ranges also remain at satisfactory levels.** However, trading is concentrated in a relatively small number of large-cap companies. Consequently, adverse market events could have a greater impact on the share prices of smaller companies and with significantly lower liquidity.
- **In bond markets, the spread on the 10-year sovereign bond also remained at satisfactory levels with hardly any change.** Its spread values remained very low in both absolute and relative terms (see Figure A13).

Contagion risk: the indicators do not signal significant increases

- **Contagion risk remains at a moderate level, with the indicators spanning from moderate to high risk.** The correlation between the returns on different types of Spanish fixed income and equity assets stood at moderate levels at the end of 2024. Additionally, the correlation among various financial sectors in our economy, as measured by the Spanish financial market stress indicator, remained at medium levels throughout most of the half-yearly period, dropping to moderate levels in October and November. Finally, the highest correlation levels were observed between the yield on Spanish sovereign debt and those of the major European economies, exceeding 90% in December.[38] However, it should be noted that in core countries the correlation decreased in October, standing at just over 50%.[39]

[36] In addition, the ECB concluded at the end of 2024 the reinvestment of the maturity amounts of the securities purchased under its PEPP debt purchase programme (€7.5 billion per month on average until now). As of now, it will stop reinvesting the maturities of its securities portfolio purchased under the APP and PEPP programmes and will progressively decrease the size of its balance.

[37] Corporate debt increased by €28.4 billion in the last 12 months, reaching €1.02 trillion in the third quarter of 2024, while household debt decreased by €2.2 billion, standing at €691.9 billion. In terms of GDP, the ratios decreased to 64.8% and 44.1% of GDP, respectively, compared to 67.2% and 47.2% during the same period in 2023.

[38] The correlation with core countries (Germany, France, Belgium and the Netherlands) was 88.5% and with peripheral countries (Italy, Ireland, Portugal and Greece) was 95.7%.

[39] This decrease was due to the low correlation of the yield of the Spanish sovereign bond with the German sovereign bond and, in particular, with the Belgium sovereign bond (43% and 22%, respectively, at the end of October).

- **The correlation between the daily returns of the different types of Spanish assets saw a gradual decrease from July to the end of November, after which it increased slightly, but without returning to the levels seen at the end of 2023.** The average correlation, which stood at 0.37 in June, decreased to 0.17 in November, recovering to 0.20 in December. These low figures were mainly due to the uneven performance of sovereign debt and financial equities, whose correlation dropped below -0.40 many times in October.

4.2 Non-bank financial intermediation (NBFI)

- **The financial assets of the institutions included in the narrow measure of the NBFI amounted to €347 billion in 2023, accounting for 6.6% of the total financial system.** Most of this amount, around 90%, corresponds to assets belonging to the so-called economic function 1, defined as the management of collective investment vehicles whose characteristics make them susceptible to runs.[40] Taking this into consideration, these vehicles deserve greater attention from the point of view of financial stability and, with this in mind, the CNMV has been carrying out an exhaustive analysis of the assets in their portfolios on a regular basis for years, particularly in terms of leverage and liquidity.[41]

- **In addition, in 2024, using 2023 year-end data, an analysis of the interconnectedness of their portfolios was made, on the basis of common exposures in sovereign debt and private fixed income assets.[42]** At least three clusters of funds with very high interconnections were identified, due to which the materialisation of a shock affecting the common assets of these institutions could lead to significant adverse effects within these clusters. One of these clusters would be connected by exposure to Spanish sovereign debt, another group by exposure to Italian sovereign debt and a third cluster by the debt issued by financial institutions. In addition, the interconnections between the funds of different clusters are also relatively high.

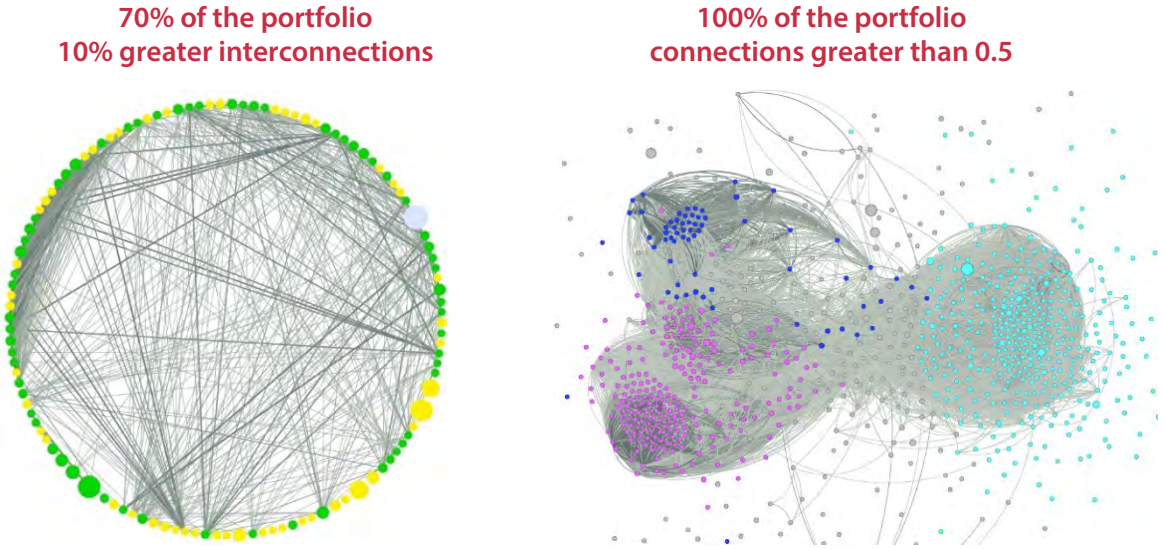
[40] All financial CISs, except for equity investment funds, are included in economic function 1.

[41] For further details on the evolution and risks of the NBFI in Spain, see CNMV (2024). *Non-bank financial intermediation. Financial year 2023*. Available at: https://www.cnmv.es/DocPortal/Publicaciones/Informes/Monitor_IFNB_2023_ENen.pdf

[42] This analysis considered the importance of each fund's investments in sovereign debt, differentiated by issuing country and the relevance of private fixed income investments, differentiated by sector. The two figures show the findings of this analysis from various perspectives. In total, 364,088 interconnections have been identified between pairs of funds.

Interconnections of the fixed-income portfolio of investment funds

FIGURE 9



Source: CNMV.

- **Estimates of leverage for CISs[43] based on June 2024 data indicate that it remains very low and continues to be below the maximum levels allowed by law.** At the end of June, gross exposure[44] of NBFI investment funds through derivative instruments accounted for 23.7% of their assets, a higher percentage compared to 2023 (19.3%), but well below the maximum permitted level of leverage (100% of assets). This ratio was 16.4% for fixed income funds, while for mixed funds it rose to 33.1%. On a case-by-case analysis, it can be observed that 1.9% of the fixed income funds and 6.2% of mixed funds (in terms of assets) exceeded the limit of 100% of leverage.

- **The liquidity conditions of Spanish investment funds remained satisfactory in June 2024, observing an improvement compared to the end of the previous year.** The ratio of high-quality liquid assets (HQLA)[45] stood at 60.0% for all NBFI funds (55.5% in 2023). This ratio was 55.5% for mixed funds, 64.3% for fixed income funds, and 66.1% for money market funds. Individually, most investment funds had a level of high-quality liquid assets exceeding 40%. However, although this is a very small proportion, some investment funds had a liquid asset ratio below 20%, specifically 0.3% of the assets in fixed income funds and 2.0% of the assets in mixed funds.

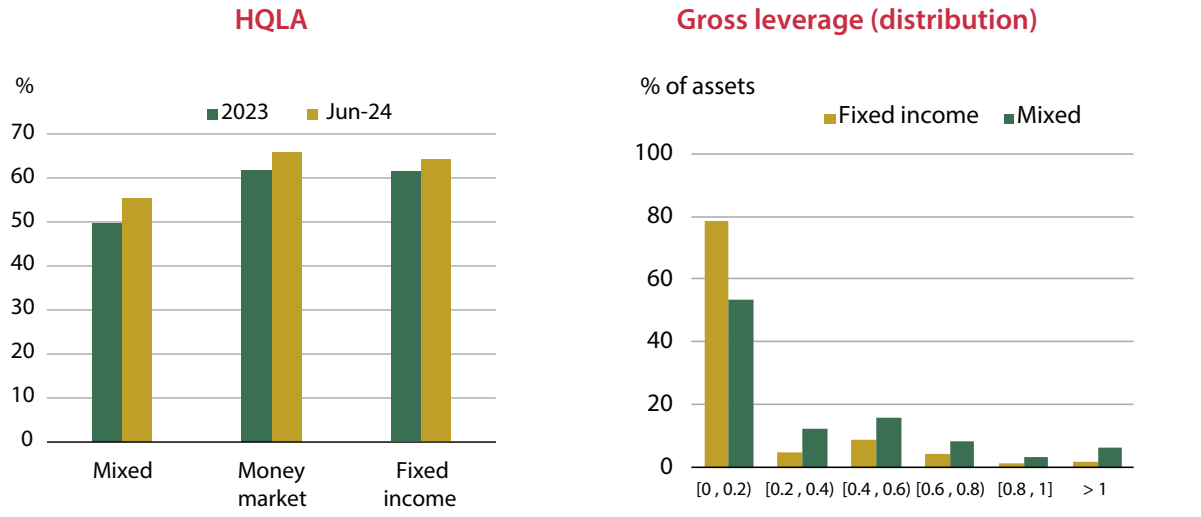
[43] We can consider both financial leverage (debt) and synthetic leverage (through derivatives). In the case of the former, Spanish legislation establishes that transferable CISs, except for hedge funds, can only incur debt to address temporary liquidity issues, and they must not exceed 10% of their equity in doing so. However, these institutions can be leveraged through the use of derivatives, a practice that may significantly increase other existing risks in these vehicles.

[44] Gross exposure is measured as the sum of the nominal amounts of derivative contracts, which allows for delta adjustment in the case of options.

[45] HQLAs are considered to be cash and deposits in their entirety, 50% of the value of equities, and varying percentages of public debt, private fixed income and securitisations, depending on their credit rating. Therefore, the percentage of public debt that would be considered liquid ranges between 0% and 100%, while that of private fixed income is between 0% and 85% and that of securitisations is between 0% and 65%. In addition, to obtain a metric as accurate as possible, the HQLA of the CISs in which the Spanish funds invest has also been quantified, instead of considering this investment as having zero liquidity.

Characteristics of investment funds belonging to NBFI

FIGURE 10



Source: CNMV.

- **In the context of liquidity risk management analysis, the CNMV conducts half-yearly stress tests on investment funds** to evaluate their robustness against a theoretical liquidity shock resulting from a sudden and significant increase in redemptions.[46] The latest results from these tests, using data from June 2024 and considering various shock scenarios on fund redemptions, continue to indicate that the investment fund market is generally resilient to the scenarios tested. In the most extreme simulated scenario,[47] a total of eight funds were identified as potentially experiencing liquidity issues in meeting the simulated increase in redemptions. These funds represent 7.1% of the total sample's assets and are all within the high-yield corporate bond category.

[46] These tests are carried out on UCITS and quasi-UCITS funds, and follow a methodology proposed by ESMA (within the framework of STRESSI) and subsequently extended by the CNMV (see the article by Ojea-Ferreiro, J. (2020). "Quantifying uncertainty in adverse liquidity scenarios for investment funds". *CNMV Bulletin*, Quarter II, pp. 25–47. Available at: https://www.cnmv.es/DocPortal/Publicaciones/Boletin/Boletin_II_2020_ENen.PDF).

[47] Depending on the category, this scenario is up to 19 times more severe than in the worst week of COVID-19.

4.3 Medium and long-term risks

Sustainability: risks remain relatively low, but there are concerns about lower ambition in some jurisdictions

- The **most significant risks related to sustainability** are associated with the identification and prevention of impacts derived from climate change, the proper valuation of assets with environmental, social, and governance (ESG) characteristics, and the prevention of greenwashing practices. Although at present these risks remain relatively contained, it would be necessary to consider whether the fragmentation of the position of the competent authorities of the different countries in this area could have a significant impact on said risks, in particular, negatively affecting the valuation of such assets. This fragmentation, which is perceived both in the holding of climate summits and, above all, in the different regulatory ambition of each country in this area, appears to be increasing with the new US Administration. In this respect, the change of stance in the US banking sector is noteworthy, as at the end of the year some of the most important US financial institutions decided to withdraw from the Net-Zero Banking Alliance (NZBA), an initiative promoted by the United Nations (UN) with the aim of aligning banks' positions on sustainability. In line with the foregoing, and at the European level, also noteworthy is the European Commission's new "Omnibus simplification package" initiative, which is expected to be announced in February and aims to reduce companies' reporting burdens on sustainability-related issues and it will foreseeably include the Taxonomy Regulation, the Corporate Sustainability Reporting Directive (CSRD) and the Corporate Sustainability Due Diligence Directive (CS3D). In addition, several countries, such as France and Germany, have publicly expressed the need to reduce the regulatory burden in this area or delay its application.

- **The latest available figures on sustainability-related investment vehicles show progress both in the area of CIS and in the case of fixed income issuances.** In Spain, the number of CIS qualifying under Articles 8 and 9 of the SFDR Regulation was 377 and 22, respectively. This totalled 388 investment funds, 4 SICAVs (open-ended collective investment companies) and 7 hedge funds, with assets amounting to €147 billion, representing 35% of the total assets of Spanish CIS. Meanwhile, the volume of debt issuances with ESG characteristics by Spanish issuers in 2024 amounted to €20.57 billion, surpassing the figure recorded in 2023 and close to that of 2022 (€16.80 billion and €21.43 billion, respectively). Sector analysis reveals advances in issuances by financial institutions and public administrations, as well as corporate issuances.[48] In terms of type of debt, there were increases in social and green issues, and decreases in sustainability and sustainability-linked issues (no sustainability-linked issues were issued). The most significant growth was in social issues, which rose by 67% compared to the previous year, although green issuances continued to be the predominant category by a considerable margin.[49]

[48] Private sector issuances (financial institutions and corporates) stood at €15.63 billion in 2024, up from €12.90 billion in 2023. Meanwhile, the balance of public administrations amounted to €4.94 billion in 2024, compared to €3.9 billion in the previous year.

[49] Green bonds are debt instruments whose funds are specifically allocated to finance environmental or climate change-related projects. Social bonds are debt instruments for financing social projects that benefit vulnerable population groups. Sustainable bonds combine the financing of both environmental and social projects. Sustainability-linked bonds are bonds whose financial characteristics change based on the achievement or non-achievement of specific sustainability targets.

- **With regard to existing regulations, the European Union took a step forward towards the transition to a more sustainable economy and an increase in the level of transparency of companies in this regard with the entry into force of the Corporate Sustainability Reporting Directive (CSRD).** This regulation was approved in December 2022 and is already applicable to sustainability reporting for 2024. The Directive establishes more stringent requirements and increases the number of companies to which it applies, including SMEs with more than 250 employees. In this way it is aimed at improving the reliability of sustainability reports and makes it possible to analyse and compare the information disclosed by companies to a greater extent. However, its implementation will be progressive, with not all companies being required to submit this report from the first year. Initially, only large companies will be obliged to do so.

- **In Spain, the body responsible for transposing this Directive is the Spanish Accounting and Auditing Institute (ICAC), which conducted a prior public consultation to gather feedback from the parties affected by the new regulation and which published a communication in conjunction with the CNMV last November, setting out the procedure to be followed until the transposition of the Directive.** In this statement, they recommended companies to already prepare the reports for 2024 pursuant to the CSRD and the European Sustainability Reporting Standards (ESRS) of the European Financial Reporting Advisory Group (EFRAG).

- **Also worth noting is Regulation (EU) 2023/2631 on European green bonds, which entered into force on 20 December 2023 and whose effective implementation was set for 12 months later.** This Regulation establishes a uniform regulatory framework for designating eligible bonds as "European green bonds" to ensure that they finance sustainable activities and do not engage in greenwashing practices in order to increase investor confidence.

- **In recent years, financing aimed at the ecological transition has increased substantially.** In accordance with the CPI (Climate Policy Initiative), has experienced a pronounced growth since 2020, reaching US$1.55 trillion globally. However, it is still insufficient to achieve the proposed goals, as it is estimated thatUS$7.4 trillion a year until 2030 would be needed to limit global warming to below 1.5 degrees, the main goal set at the climate summit in Glasgow, through which most future climate-related risks would be reduced to a large extent. In Spain, the flooding caused by the DANA in the region of Valencia highlighted the importance of addressing climate change-related risks.[50]

Cyber risk: highly significant in environments with high geopolitical risks

- **Cybersecurity risks remain highly significant due to the ongoing advances in new technologies and the current state of geopolitical tensions.** In the financial system, there is a risk of propagation due to the interconnections between participants and markets, which could threaten financial stability and investor confidence. Moreover, in recent years companies have become more dependent on new technologies, which has increased their vulnerability to cyber incidents. The occasional interruption of Microsoft[51] cloud services highlighted the importance of addressing propagation risks arising from the high concentration of providers of this type of services.

[50] The Bank of Spain estimates that the exposure of the financial sector in the affected areas would amount to €20 billion.

[51] It took place on 18 July, when Microsoft's cloud services experienced an outage due to a failure during a security update on an external platform (CrowdStrike). This event led to some worldwide disruptions in air traffic, and in medical and banking services. However, it did not have a significant effect on European secondary markets or their trading systems.

- **The direct losses recorded by companies due to cyber incidents are limited for now, but could become significant and give rise to some type of systemic risk.** According to the IMF, the median direct loss is around US$0.4 million and three-quarters are below US$2.8 million. However, it is noted that direct losses do not encompass all the costs of this type of incidents, as they do not take into account aspects such as reputational risk, which is of vital importance to the stability of the financial system.

- **Cyberattacks continue increasing, driven by geopolitical tensions.** According to the National Cryptographic Centre (CCN), most hacktivist[52] activity corresponds to the active Russian-Ukrainian and Israel-Hamas armed conflicts, which have led to the emergence of dozens of cybercrime groups for and against each side. According to information from this institution, Spain has been one of the countries that has received the most attacks from Russian hacktivists because of its support for Ukraine.

- **The most important legislative text regarding cybersecurity in the European Union is the DORA Regulation, which entered into force on 17 January.** This Regulation includes measures for strengthening cybersecurity and the operational resilience of financial institutions. In this way, it establishes uniform requirements aimed at increasing the security of networks and information systems of the companies within the financial system, as well as also involving third parties providing them with ICT-related services. Among the new requirements, the creation of an ICT-related risk management framework, regular digital operational resilience testing and management of risks arising from transactions with third parties stand out. In order to develop procedures and mechanisms to manage these risks on an ongoing basis, companies must follow the guidelines established by the European supervisory authorities (EBA, ESMA and EIOPA) in the Regulatory Technical Standards (RTS) and Implementing Technical Standards (ITS).

- **In Spain, the CNMV is established as the authority responsible for ensuring the application of the Regulation by the financial institutions under its supervision.** To determine how well institutions have adapted to the new Regulation, the CNMV circulated a self-assessment questionnaire asking about their level of preparation before the entry into force of the Regulation. Last December, the CNMV published a report with the results of this questionnaire.[53] In general, it has been observed that financial institutions have good governance, cybersecurity and business continuity measures, although in many cases there is a lack of regular review and follow-up of these measures. Additionally, more deficiencies have been identified in incident management, test management and ICT service provider risk management, especially in smaller institutions. The CNMV will collaborate so that the implementation is carried out efficiently while ensuring that the measures are adequately adopted.

[52] "Hacktivism" is a form of digital activism that combines hacking skills with political or social targets.

[53] CNMV (2024). *Report on the self-assessment results regarding companies' readiness for DORA*. Available at: https://www.cnmv.es/DocPortal/Ciberseguridad/Informe-autoevaluacion-DORA-2024_en.pdf

New technologies and crypto-assets: concern about crypto-asset all-time price highs

- **The crypto-asset market grew significantly in 2024, especially in recent months, reaching record highs in terms of market capitalisation of over US$3.7 trillion in December.** Although it experienced a market correction at the end of 2024 and closed the year at US$3.25 trillion, this value remained well above the peak of US$2.9 trillion reached in 2021. This growth was also observed in trading volumes, which peaked at the beginning of December, followed by a slight decline. Average daily trading was close to US$350 billion in the last days of December,[54] well above the previous highs of almost US$220 billion, recorded in May 2021 (see Figure A38).

- **Part of the most recent expansion of the crypto-asset market can be attributed to the latest events in the USA.** In January 2024, the viability of bitcoin ETFs, exchange-traded investment funds designed to replicate the performance of that cryptocurrency, was approved. Its approval had an effect on prices several months beforehand, as market expectations improved. Subsequently, the election of Donald Trump in November added the perception of a more lax Government in relation to financial innovation and further boosted investor confidence, driving crypto-asset market capitalisation.

- **It is important to remain vigilant with regard to this type of products** because, although their size remains smaller than traditional markets, their large expansion and increased connection to these may pose different risks that should not be ignored. On the one hand, there are investor protection risks due to the high volatility of the assets and the vulnerability of retail investors to potential scams or the lack of awareness of the risks associated with the products acquired. On the other, they pose risks to financial stability, mainly due to this growing interconnection with activities and participants in traditional financial markets.

- **On 30 December, Regulation (EU) 2023/1114 on crypto-asset markets (MiCA) came into force.** It establishes uniform rules for crypto-asset issuers and service providers promoting transparency, investor protection and the prevention of market abuses. Among other aspects, it regulates the issuance, public offering and services related to electronic money tokens and tokens referenced to assets or to other crypto-assets by requiring authorisation, disclosure of information and prudential measures. In this way, it seeks to promote financial innovation, ensuring financial stability, and investor protection.

- **In Spain, the competent authority for the supervision of MiCA compliance is the CNMV.** However, the Bank of Spain will exercise the supervisory, inspection and sanctioning functions concerning the obligations related to asset-referenced tokens and electronic money tokens. The Regulation enables EU Member States to apply a transitional period of 18 months. In the case of Spain, it has decided to reduce this period to 12 months. Last December, both the European Securities and Markets Authority (ESMA) and the CNMV issued communications on this matter. ESMA[55] warned of new record highs in the value of crypto-asset prices, confirming their highly volatile nature, and renewed its warning to investors about the risks of investing in these assets. The CNMV, for its part, issued two communications: one in the same vein as ESMA's previous communication, warning investors that, despite the fact that the MiCA Regulation is a

[54] Average daily trading in the last month for those crypto-assets with a market capitalisation of more than US$10 billion.

[55] ESMA (2024). "Crypto-assets on the rise but remaining very risky", 13 December. Available at: https://www.esma.europa.eu/sites/default/files/2024-12/ESMA35-1872330276-1971_Warning_on_crypto-assets.pdf

major step forward in investor protection, it is not at the same level as regulation on financial instruments,[56, 57] and another clarifying issues related to the transitional period and notification obligations.[58]

Artificial intelligence: new possibilities in a growing sector, but not without risk

- **Tools based on technology developed by generative artificial intelligence continue to advance rapidly in society, transforming sector production processes.** Specifically, the financial sector continues to make progress, with a high potential to increase the efficiency of capital markets through the automation of different processes. According to the IMF, data from job markets and patent applications suggest that the adoption of AI will soon increase significantly.[59]

- **AI can help mitigate risks related to financial stability due to its potential to improve the analysis of both its participants and supervisors and to reinforce risk management.** In addition, it allows to increase investment and monitoring possibilities through novel algorithmic trading strategies. However, for the time being, most of the use of AI consists of an extension of the use of machine learning, so further developments will need to be monitored.

- **On the other hand, the use of AI-based tools can also generate some risks, such as the acceleration of volatilities in stressful situations, the possible lack of transparency in the procedures and mechanisms, and greater vulnerability to fraud or cyberattacks.** In addition, AI services are currently limited to a few providers of this type of technological services, which poses concentration risks, increasing operational risk. Also in terms of risks and from the point of view of provider concentration, the possibility of common investment strategies (or herding behaviour) that ultimately increase investor vulnerability is worth considering.

- **On 1 August, the European Regulation on Artificial Intelligence came into force with the aim of regulating the proper development and use of AI.** It establishes a uniform framework for developers and implementers of tools that apply AI, establishing a series of requirements according to the level of risk. The aim is to encourage the development of secure and reliable AI systems that guarantee respect for citizens' rights. In this way, the transparency of this type of technologies is reinforced, increasing confidence in their use.

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[56] CNMV (2024). "Investor communication on the entry into application of the MiCA Regulation", 19 December. Available at: https://www.cnmv.es/webservices/verdocumento/ver?t=%7b0c1032a6-ea3e-42a3-b0e6-ccad82cfa953%7d

[57] The fact that investor protection is not at the same level as the regulation of financial instruments is attributable to the following elements: i) crypto-assets are not covered by an investor indemnity system, due to which if a crypto-asset provider cannot return them to investors there will be no "security network" (similar to the investment guarantee fund, in the case of Spain; ii) the regulation does not require all crypto-asset service providers to collect information from their customers with the aim of assessing their ability to understand the crypto-asset products they intend to acquire; and iii) the transitional period for the application of the regulation, which extends until December of this year permits, under the MiCA Regulation, the co-existence of authorised providers with signatories to the transitional regime, due to which the customers of these products may not benefit from the same degree of protection during this year.

[58] CNMV (2024). "Investor communication on the entry into application of the MiCA Regulation: Transitional period and disclosure obligations of the CNMV provided for in Title II", 19 December. Available at: https://www.cnmv.es/webservices/verdocumento/ver?t=%7b1928c29b-ce0e-4616-ba1a-fd1c67f0aec9%7d

[59] FMI (2024). *Global Financial Stability Report – Steadying the Course: Uncertainty, Artificial Intelligence and Financial Stability,* October. Available at: https://www.imf.org/en/Publications/GFSR/Issues/2024/10/22/global-financial-stability-report-october-2024

Market risk: yellow

Figure A1: Stock market prices

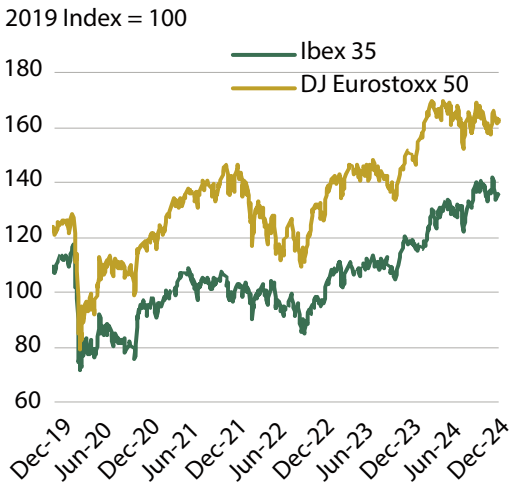
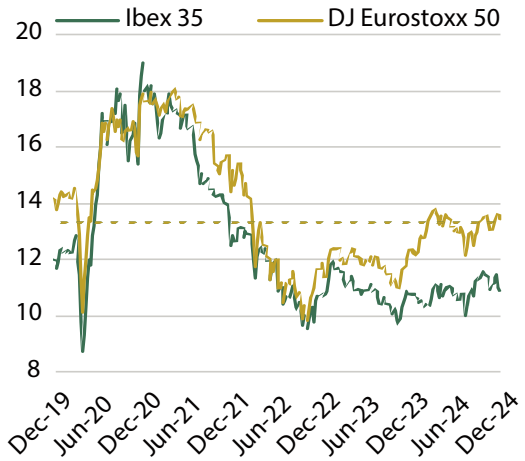


Figure A2: Price-earnings ratio (P/E)



The dashed lines correspond to the average P/E ratio calculated since 2000.

Figure A3: Short-term interest rates (3 months)

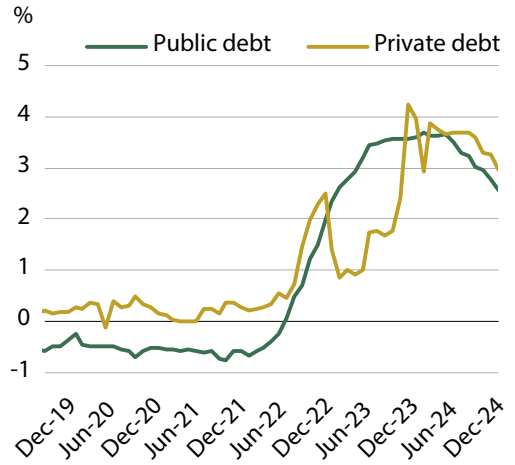


Figure A4: Long-term interest rates (10 years)

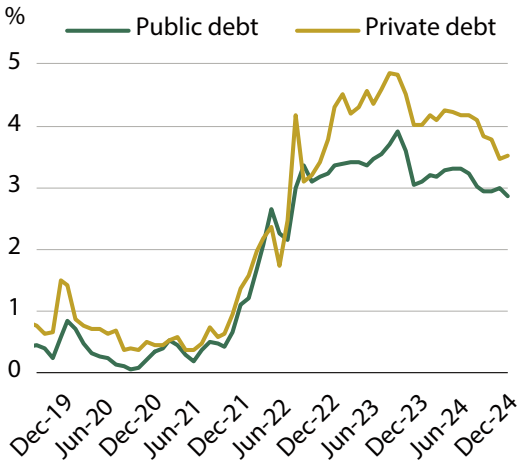
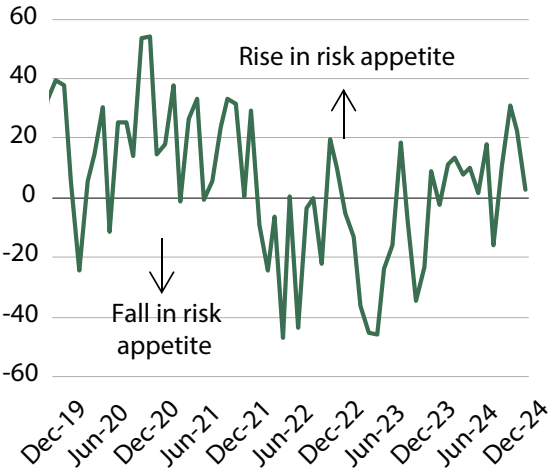


Figure A5: Oil price

Figure A6: Risk appetite (State Street)



Credit risk: green

Figure A7: Financing of the non-financial sector

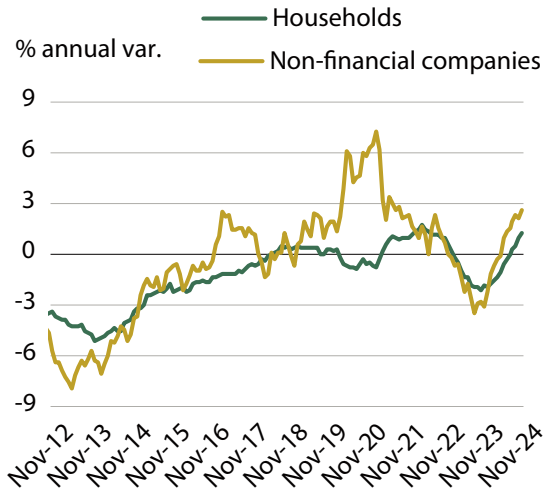


Figure A8: NPL ratio and unemployment rate

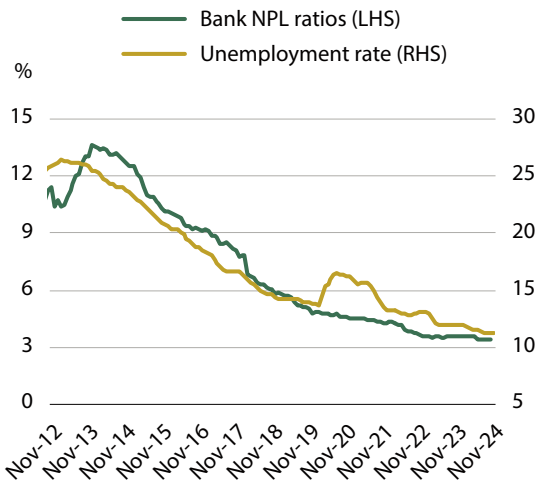


Figure A9: 10-year government debt risk premium (rate spread with Germany)

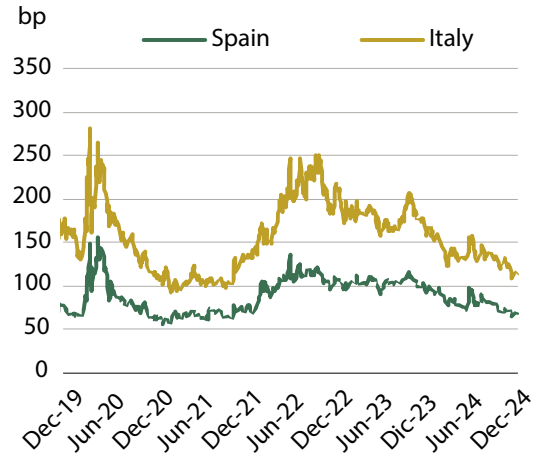


Figure A10: Private debt risk premium (5-year CDS)

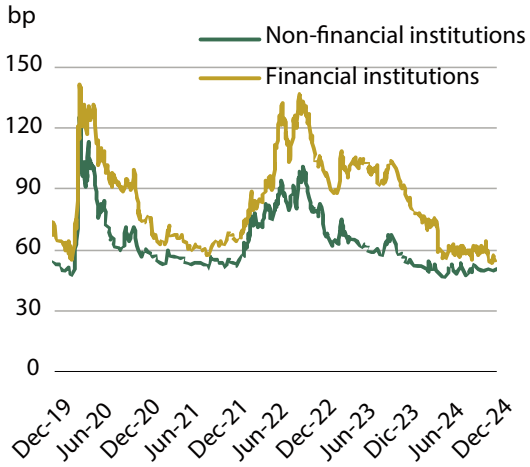


Figure A11: Housing prices (year-on-year change)

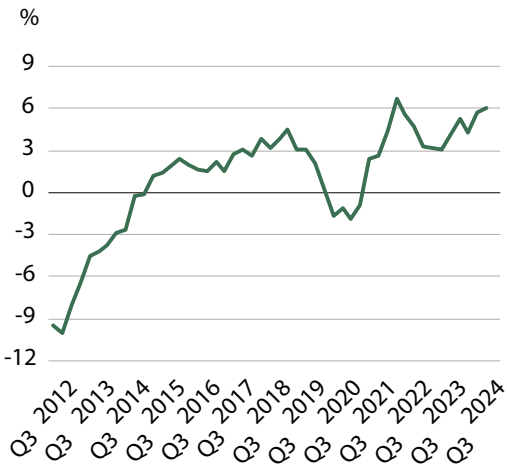
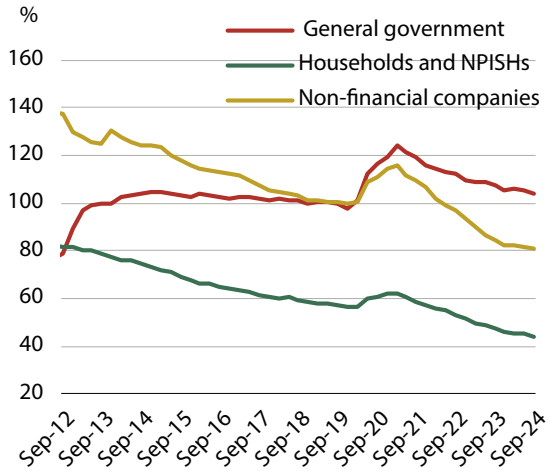


Figure A12: Indebtedness (% of GDP)



Liquidity, financing and fragmentation risk: yellow

Figure A13: Liquidity (bid-ask spread)

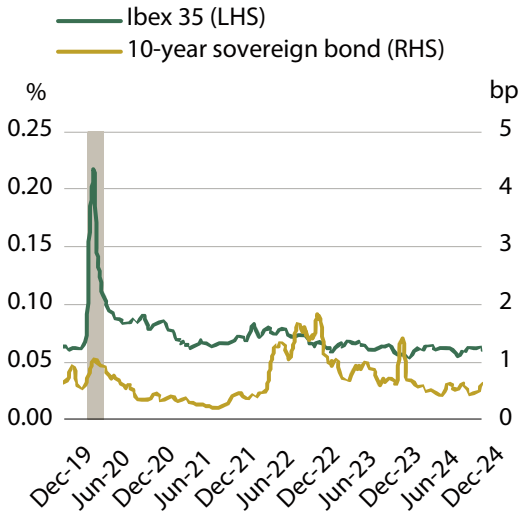


Figure A14: Volatility (1-month moving average)

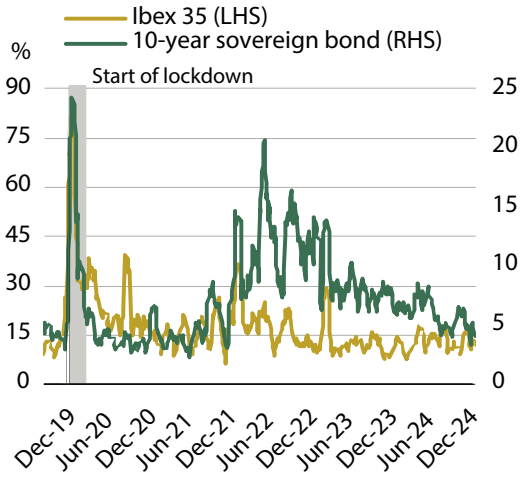
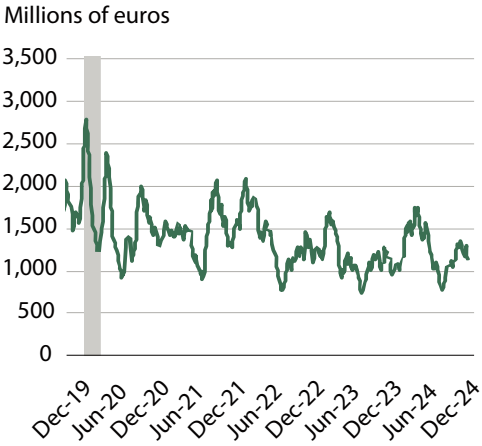


Figure A15: SIBE trading (1-month moving average)



The shaded area corresponds to the periods of prohibition of short selling.

Figure A16: Interbank spread (LIBOR-OIS)

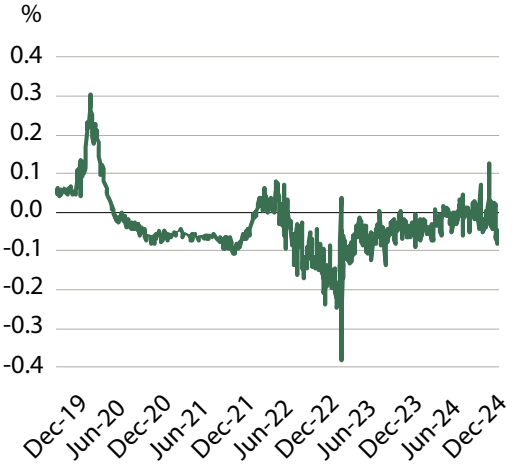


Figure A17: Spread (Spain-EMU) on corporate lending rate

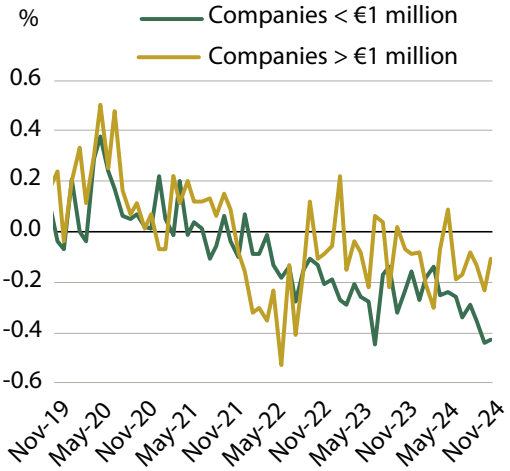
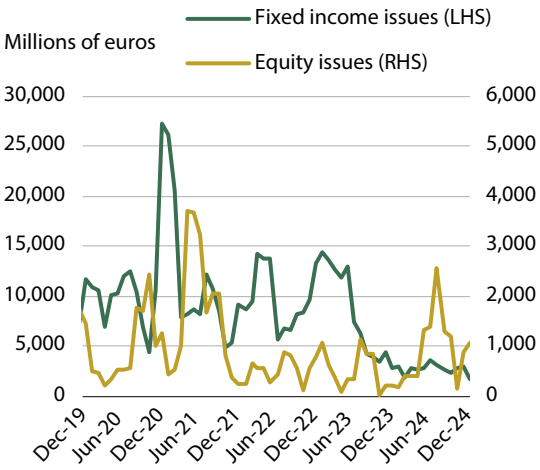


Figure A18: Issues (3-month moving average)



Macroeconomic risk: yellow

Figure A19: GDP (year-on-year change)

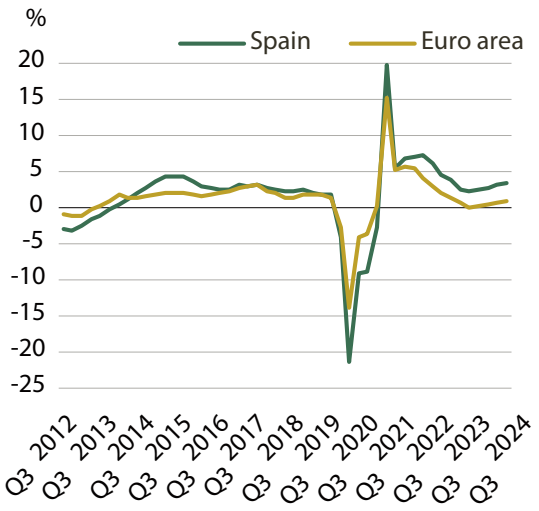


Figure A20: HCPI and core CPI (year-on-year change)

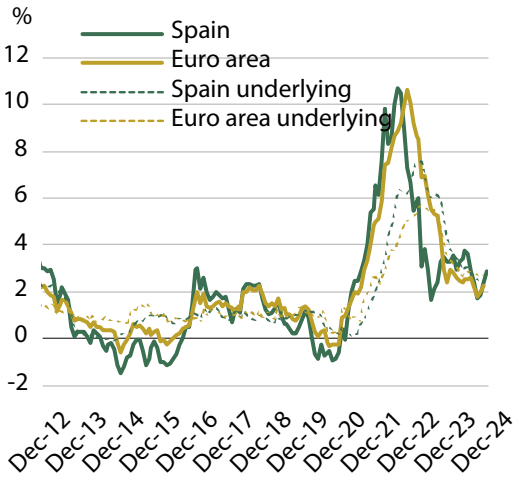


Figure A21: Employment (year-on-year change)

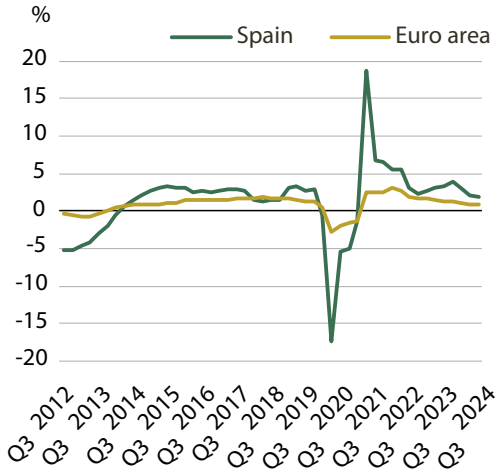
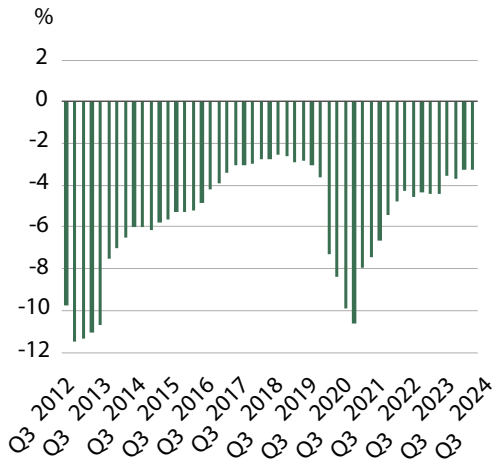


Figure A22: Public deficit (% of GDP)



Cumulative data for four quarters.

Figure A23: Exchange rates

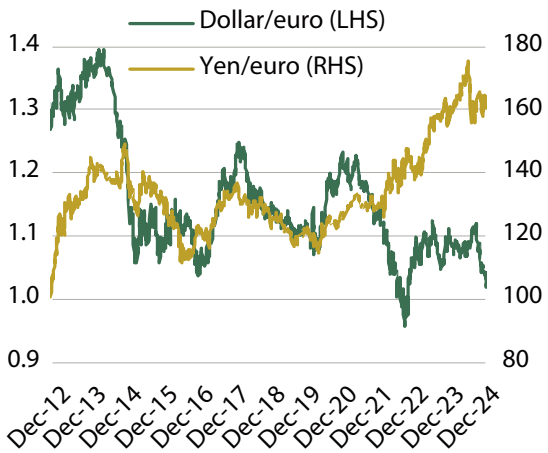
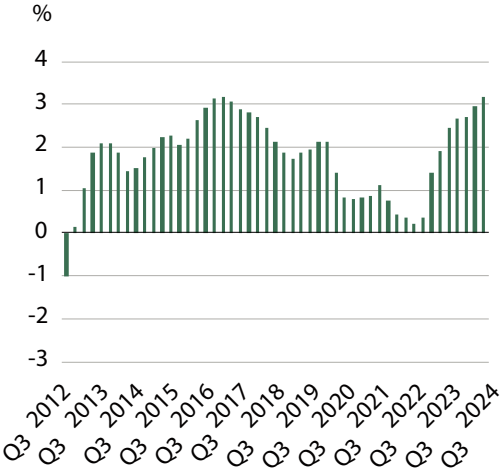


Figure A24: Current account balance (% of GDP)



Contagion risk: orange

Figure A25: Correlations among asset classes

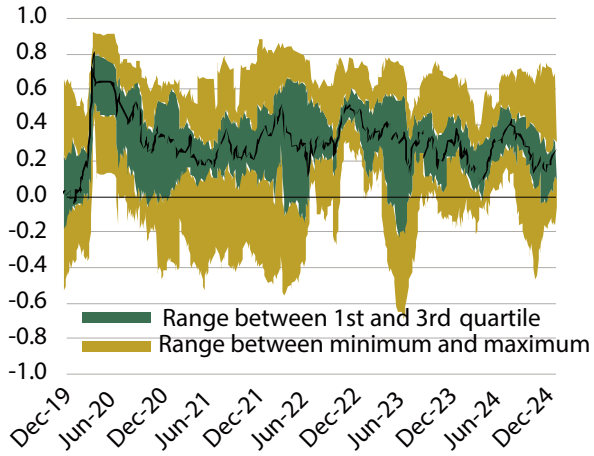
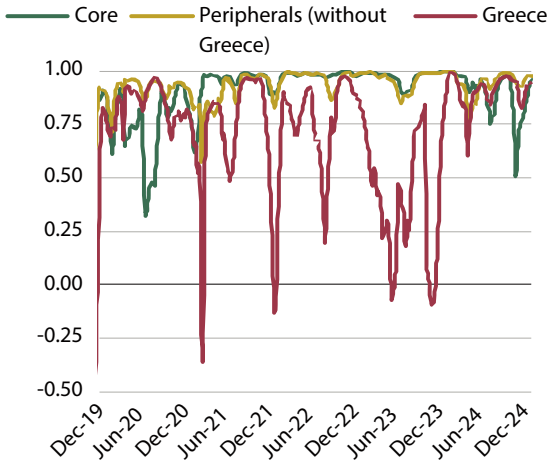
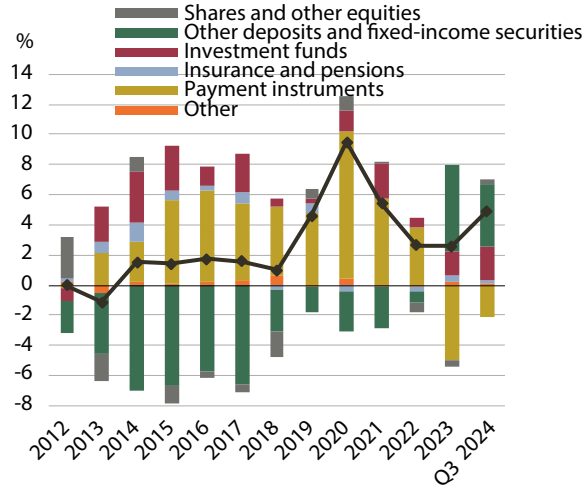


Figure A26: Correlation between the yield on the 10-year Spanish bond and other European bonds



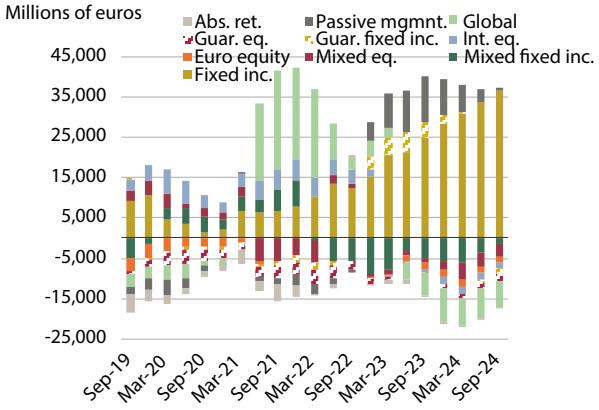
Investors

Figure A27: Households: net acquisition of financial assets (% of GDP)



Cumulative data for four quarters.

Figure A28: Net subscriptions to investment funds



Cumulative data for four quarters (millions of euros).

Figure A29: Households: savings (% disposable income)

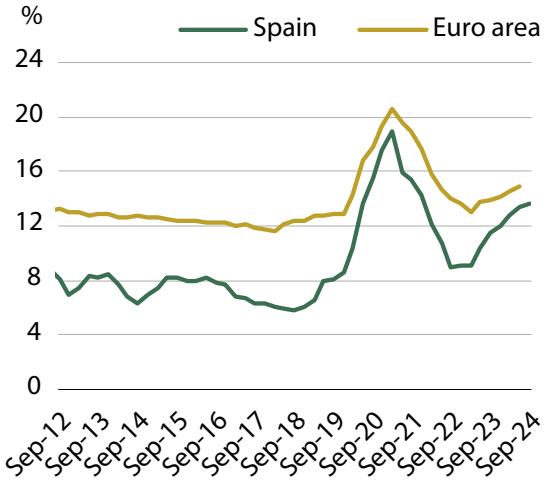
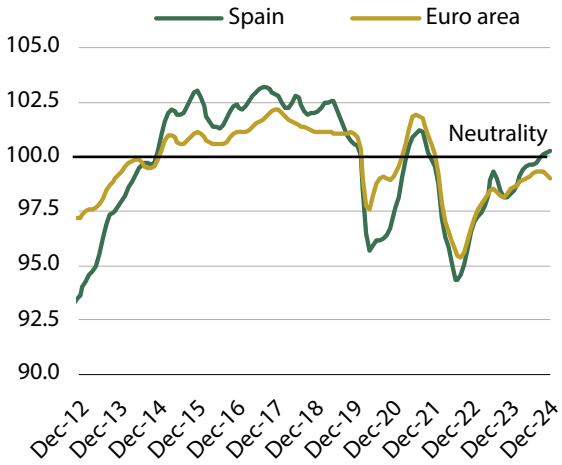
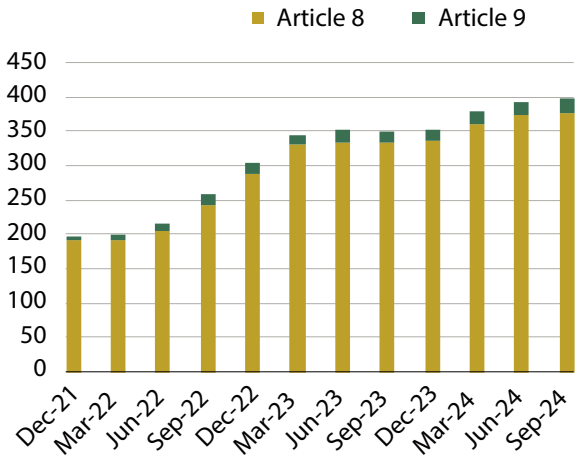


Figure A30: Consumer confidence index



Sustainable finance

Figure A31: CIS Articles 8 and 9 (number)



According to the SFDR Regulation.

Figure A32: CIS Articles 8 and 9 (assets)

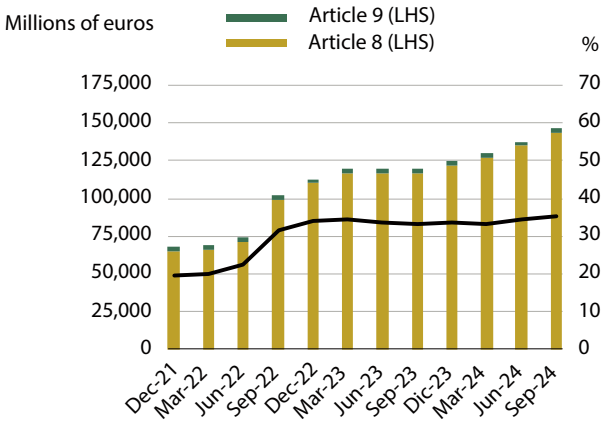


Figure A33: ESG debt issues of Spanish issuers (type)

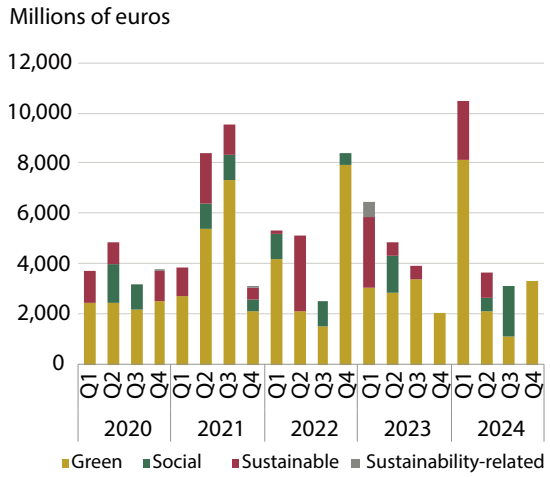


Figure A34: ESG debt issues of Spanish issuers (sector)

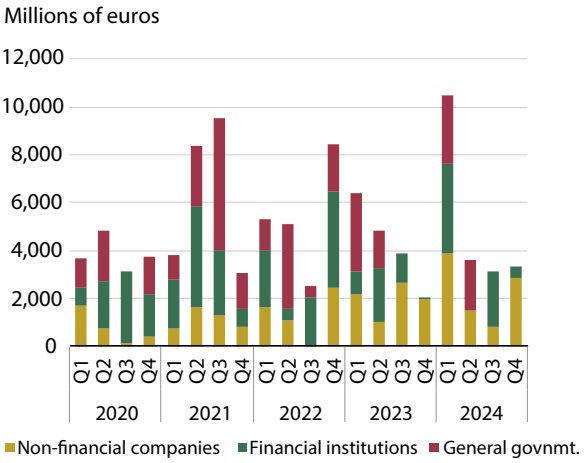
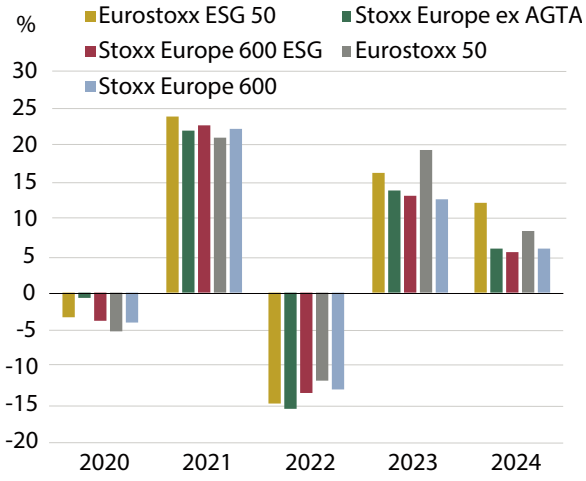


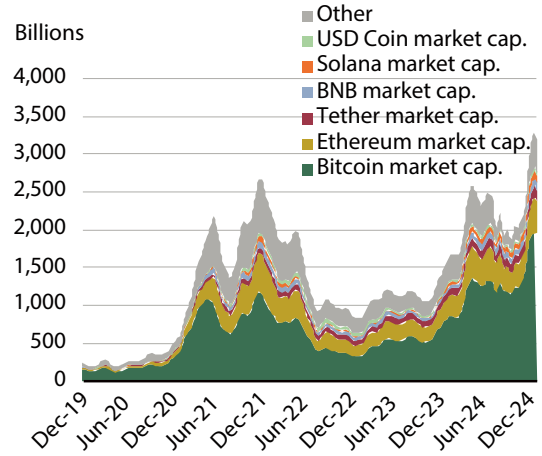
Figure A35: Coal price (EUR/tonne)

Figure A36: Yield of European ESG equity indices



Crypto-assets

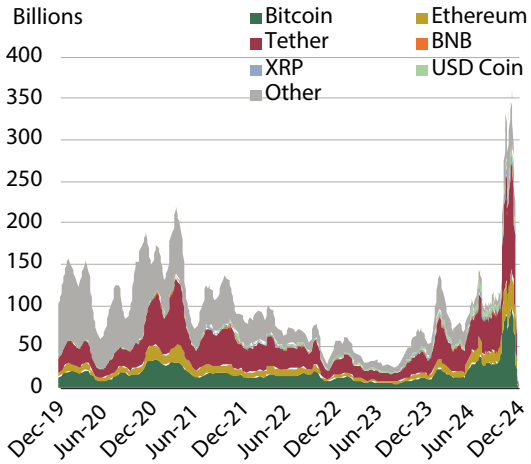
Figure A37: Crypto market capitalisation (US$)



Tether and USD Coin are stablecoins.

Since 4 July, "Other" includes cryptocurrencies with capitalisation exceeding US$10 billion.

Figure A38: Crypto trading (US$)



Tether and USD Coin are stablecoins.

Since 4 July, "Other" includes cryptocurrencies with capitalisation exceeding US$10 billion.

Figure A39: Non-stable crypto prices (US$)

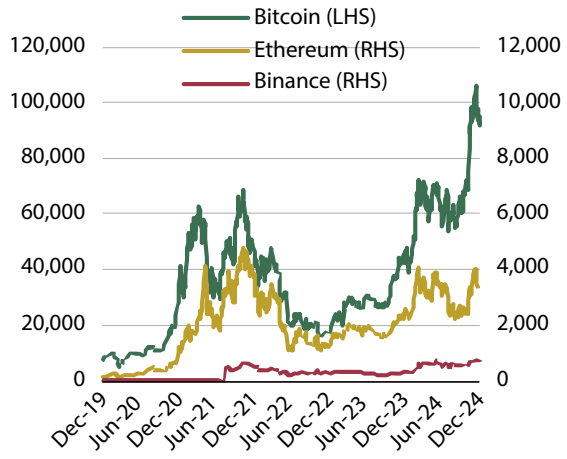


Figure A40: Bitcoin volatility

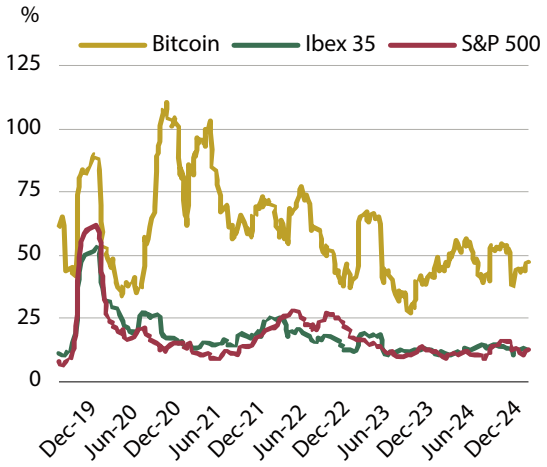
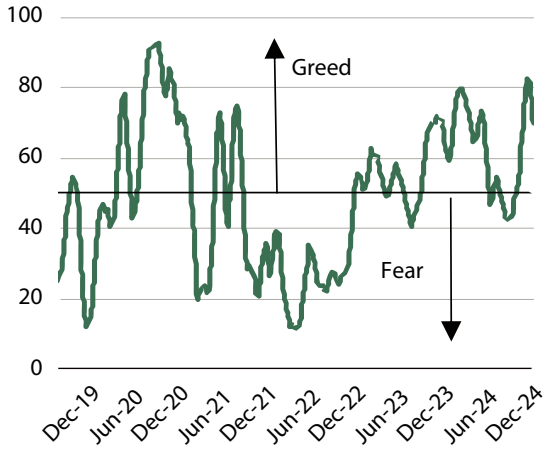
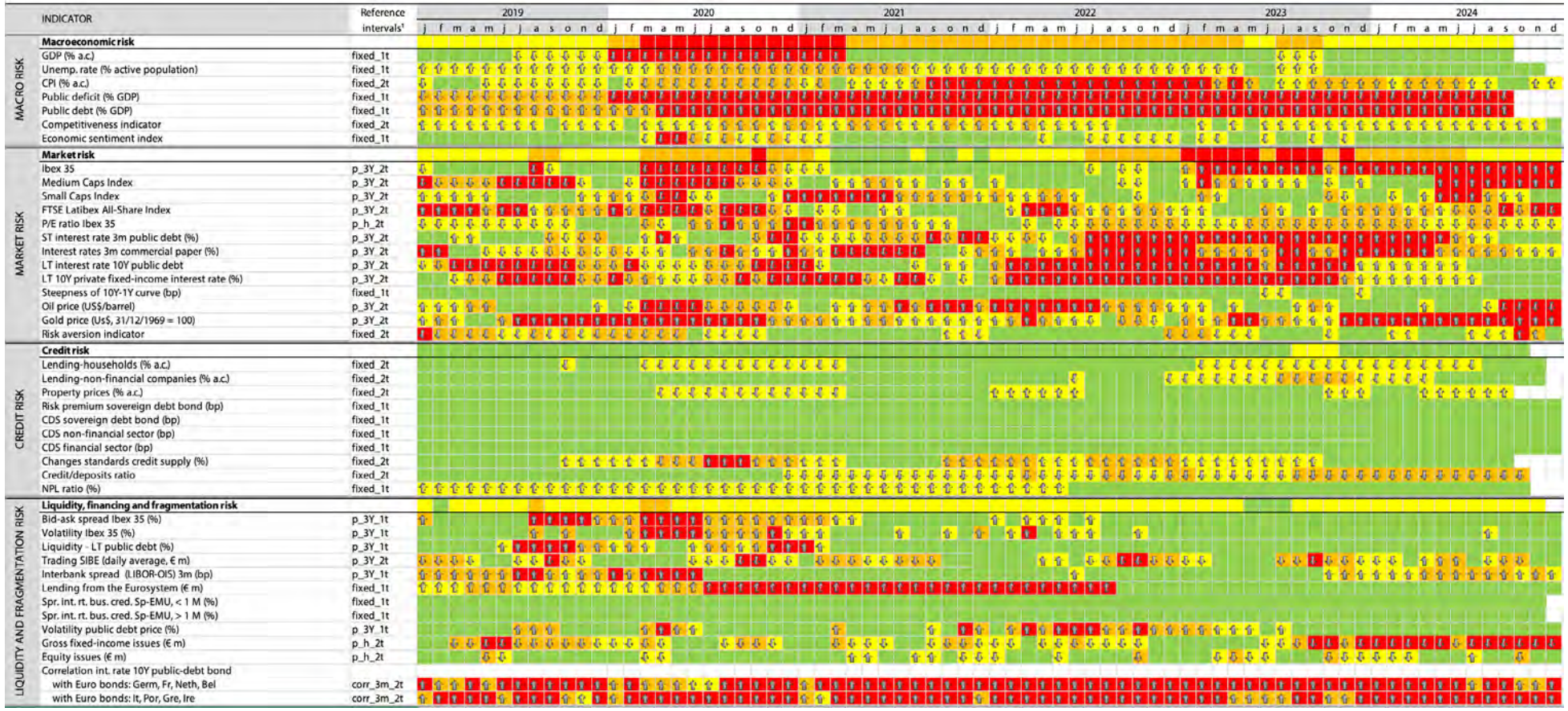


Figure A41: Bitcoin sentiment indicator (greed and fear index) (1-month moving average)



Heat map: risk categories



Source: CNMV, Bloomberg and Refinitiv Datastream.

1 Reference intervals may be: i) "fixed": predetermined numerical thresholds, one (1t) or two-tailed (2t); ii) "corr_3m": correlation coefficients calculated in 3-month windows; iii) "p_3Y": percentiles obtained from 3 past years distribution, one (1t) or two-tailed (2t); or iv) "p_h": percentiles obtained from historical distribution.

Explanatory notes

Sources of information: Most of the quantitative information used to define the indicators shown on the figures and heat maps of this Note are obtained from Refinitiv Datastream and Bloomberg. The following exceptions stand out: i) CIS data is obtained from the information available at the CNMV; ii) ESG issuance data is obtained from information from the Bank of Spain, the CNMV and Dealogic; iii) cryptocurrency capitalisation and trading indicators come from CoinMarketCap; and iv) the bitcoin sentiment indicator is obtained from Kaggle.

Spanish financial market stress index (Figure 1): The stress index provides a real-time measurement of the systemic risk facing the Spanish financial system, ranging from zero to one. To this end, stress is evaluated in six segments of the financial system (equities, fixed income, financial intermediaries, the money market, derivatives and the exchange markets) which are then aggregated to obtain a single figure. The stress for each segment is evaluated by means of cumulative distribution functions, with the subsequent aggregation taking into account the correlation between segments. In this way, the index places greater emphasis on stress situations in which correlations are very high. In general terms, the stress variables chosen for each segment correspond to volatilities, risk premiums, liquidity indicators and sudden loss of value. Econometric estimates indicate that index values below 0.27 correspond to periods of low stress in the financial system, while values between 0.27 and 0.49 correspond to periods of medium stress, and values above 0.49 indicate periods of high stress. The methodology of this index follows the work of Holló, Kremer and Lo Duca in 2012, who proposed a similar index for the euro area. For further details on recent movements in this index and its components, see the CNMV's statistical series ("Market stress indicators"), available at http://www. cnmv.es/portal/Menu/Publicaciones-Estadisticas-Investigacion.aspx. For further information on the methodology of this indicator, see Cambón, M.I. and Estévez, L. (2016). "A Spanish Financial Market Stress Index (FMSI)". *Spanish Review of Financial Economics*, Vol. 14, No. 1, pp. 23–41, or as CNMV Working Document No. 60 available at: http://www.cnmv.es/DocPortal/Publicaciones/MONOGRAFIAS/Monografia_60_en.pdf.

Heat map: summary by market and risk category (Figure 2 and final annex): The heat maps provided in this Note show the monthly trend of the most important indicators in the Spanish financial system in recent years. They contain information on domestic securities markets, the banking sector and also certain macro-economic variables. The main purpose behind the production of these maps is to provide an idea of the position of the reference indicators in relation to their recent history (in most cases three years) or with certain predetermined limits, by associating this position with a certain colour. When an indicator changes from green to a warmer colour (orange or red), it does not necessarily mean the existence of risk. Instead, it indicates a movement towards an extreme value (very high or very low) over the period or within the range of values used as a reference. If an indicator remains at extreme values for a prolonged period, it may suggest the need for a more detailed analysis; that is to say, it may be interpreted as an alarm signal. The most comprehensive heat map includes 43 indicators,[60] five of which are prepared by the CNMV. The large number of indicators taken into consideration allows us to make an analysis of vulnerabilities for each segment of the financial markets (equity income, fixed income, banking sector, etc.) or for different risk categories (macro, market, liquidity, credit, etc.), as shown in Figure 2. The colours of these aggregates are assigned by calculating a weighted average of the values of the individual indicators they comprise. In each aggregate, one of the individual indicators determines the generation of the overall colour: for example, in macro-economic risk, the indicator used to

[60] Since June 2017, the heat map includes an additional indicator: the bid-ask spread of the 10-year sovereign debt bond.

calculate the aggregate is GDP. For further details on the methodology and analysis of these maps, see Cambón, M.I. (2015). "Identification of vulnerabilities in the Spanish financial system: an application of heat maps". *CNMV Bulletin*, Quarter I, pp. 109–121.

Contagion risk: The indicators that make up this block are somewhat more complex. We set out the most important of these indicators below:

- **Correlation between asset classes (Figure A27).** The correlation pairs are calculated using daily data in three-month windows. There are six asset classes: sovereign debt, private fixed income from financial institutions, fixed income from non-financial firms and Ibex 35 securities, financial companies, utilities and other sectors. A high correlation between the different classes of Spanish assets would indicate the possible existence of herding behaviour by investors. This situation could lead to high volatility in periods of stress. Meanwhile, diversification would offer fewer advantages since in this context it would be more difficult to avoid exposure to sources of systemic risk.

- **Correlation between the yield on the 10-year Spanish bond and other European bonds (Figure A26).** The correlation is calculated using daily data in three-month windows. The countries of the core group are Germany, France, the Netherlands and Belgium, and the peripheral countries are Portugal, Italy, Greece and Ireland.

Investors

- **Consumer Confidence Index (CCI) (Figure A30):** The Index is an indicator of household consumption and savings prospects resulting from their answers to questions related to their expected financial situation, their feelings about the overall economic situation, unemployment and savings capacity. A value above 100 indicates an increase in consumer confidence in relation to the future economic situation, due to which they are less likely to save and, consequently, more likely to increase their expenditure in the following 12 months. Values below 100 denote a pessimistic attitude towards the economic situation, which leads consumers to save more and consume less.

Sustainable finance

- **Yield of European ESG equity indices (Figure A36):** ESG equity indices include Eurostoxx 50 ESG and Stoxx Europe Sustainability ex AGTAFA. The first is based on the Eurostoxx 50 index, based on which certain exclusion criteria are applied and, additionally, 10% of the companies with the worst ESG rating are replaced by companies of the same sector with a higher ESG rating. The excluded companies are, for example, those that do not fulfil the United Nations Global Compact Principles, those that are involved in arms disputes or tobacco producers. The second index related to ESG criteria contains information of a variable number of companies from 17 European countries that explicitly exclude those that obtain income from alcohol (A), gambling (G), tobacco (T), armament (A), firearms (F) and adult entertainment (A).

Crypto-assets

- **Bitcoin historical volatility (Figure A40):** Annualised standard deviation of daily price variations in 90-day windows.
- **Bitcoin sentiment indicator (greed and fear index)[61] (Figure A41):** This Index is a metric that assesses the prevailing market sentiment. It is based on different factors such as volatility, transaction volume, social media sentiment and surveys. It is measured on a scale of 0 to 100, in which the low values are interpreted as excessively negative market perceptions (fear) and the high values are interpreted as excessively optimistic perceptions (greed).

[61] Kaggle. "Bitcoin & Fear and Greed".

REVIEW OF THE SYSTEMIC INDICATOR OF THE CNMV (CISS)

RESEARCH AND STATISTICS DEPARTMENT

31 December 2024

Summary

- The **stress index of the Spanish financial markets** provides a real-time measurement of the systemic risk facing the Spanish financial system. To this end, stress is assessed in six segments of the financial system (equities, fixed income, financial intermediaries, money market, derivatives, and exchange market) which are then aggregated taking into account the correlation between them. Over the years, this indicator has adequately reflected the tensions in financial markets as a result of events of different nature and intensity, and its performance has been described in several CNMV publications (*Financial Stability Note*, *CNMV Bulletin* and *Annual Report*).

- Despite the excellent performance of the indicator, it has been considered adequate to propose that it be reviewed in order to determine whether its quality can be improved, either by modifying some metrics or incorporating others that reveal new areas of stress. This Note summarises the **assessment of three possible changes** and the conclusions reached:

  – Firstly, the possibility of **replacing the Euribor with the €STR** (Euro Short Term Rate) was considered after the interest rate benchmark reform. The analysis determined that, for the time being, the evolution of the Euribor (particularly over a certain period) is more in line with financial reality that the stress indicator aims to capture.

  – Secondly, an **alternative volatility measurement was calculated in the financial intermediaries segment**, which is more satisfactory as it shows short-term market movements more quickly.

  – Finally, it was deemed relevant to include in the long-term fixed income segment an indicator representing stress in the private fixed income market, as the three measurements calculated to date only make reference to public debt. To this end, a variable was included that measures the level of **liquidity of corporate debt assets**, using the average bid-ask spread for a set of representative bonds.

- The analysis made suggests the **convenience of adopting two of the three assessed modifications** and, since they do not have a substantial impact on the general indicator in 2024, **publishing the new version from 1 January 2025** in all of the CNMV's publications.

1 Introduction/motivation

Since 2016, the CNMV publishes a weekly stress indicator for Spanish financial markets based on the work methodology developed by Holló, Kremer and Lo Duca, who proposed a similar index for the euro area in 2012.[62] The stress index provides a real-time measurement of the systemic risk facing the Spanish financial system, ranging from zero to one. To this end, stress is evaluated in six segments of the financial system (equities, fixed income, financial intermediaries, money market, derivatives, and exchange market) which are then aggregated to obtain a single figure. In general terms, the stress variables chosen for each segment (three for each one) correspond to volatilities, risk premiums, liquidity indicators and sudden loss of value for each segment (see Table R1). The stress for each segment is evaluated by means of cumulative distribution functions and the subsequent aggregation takes into account the correlation between these segments, in such a way that the index places greater emphasis on stress situations in which correlations are very high.[63]

In addition to the design and calculation of the indicator, some econometric techniques are used in order to classify the values obtained at any given time in a stress regime in the financial system. The results of these estimates indicate the existence of three levels of stress, such that indicator values below 0.27 correspond to periods of low stress in the financial system, while values between 0.27 and 0.49 correspond to periods of medium stress, and values above 0.49 indicate periods of high stress.

[62] The stress indicator of the CNMV is available both in the statistical series of the website of the supervisory body (http://www.cnmv.es/portal/Menu/Publicaciones-Estadisticas-Investigacion.aspx) and in the data provider Refinitiv Datastream.

[63] For further information on the methodology of this indicator, see Cambón, M.I. and Estévez, L. (2016). "A Spanish Financial Market Stress Index (FMSI)". *Spanish Review of Financial Economics*, Vol. 14, No. 1, pp. 23–41, or as CNMV Working Document No. 60, available at: http://www.cnmv.es/DocPortal/Publicaciones/MONOGRAFIAS/Monografia_60_en.pdf

Markets and variables that comprise the systemic risk indicator of the CNMV

TABLE R1

	Source	Start date
Money market		
1 Realised volatility of the 3-month Euribor interest rate	Datastream	15/01/1999
2 Interest rate spread between the 3-month Euribor and 3-month Treasury Bills	Datastream	15/01/1999
3 Spread between 3-month depo-repo transactions	Datastream	08/01/1999
Bond market		
4 Realised volatility of the 10-year sovereign bond	Datastream	19/04/1991
5 Yield spread between the 10-year Spanish sovereign bond and 10-year German sovereign bond	Datastream	19/04/1991
6 Liquidity of the 10-year sovereign bond (bid-ask spread)	Bloomberg	12/09/1997
Securities market		
7 Realised volatility of the non-financial sector market index	Datastream	13/03/1987
8 Maximum loss (over a 2-year period) of the non-financial sector market index	Datastream	10/03/1989
9 Liquidity of the Ibex 35 (bid-ask spread)	Datastream since 2003 / CNMV 1999-2003	08/01/1999
Financial intermediaries market		
10 Realised volatility of idiosyncratic banking sector returns over Ibex 35 returns	Datastream	10/03/1989
11 5-year credit default swap of the main Ibex 35 financial institutions	Datastream	08/01/1999
12 Maximum loss (over a 2-year period) of the non-financial sector market index multiplied by the inverse of the price-book ratio of the same index	Datastream	05/01/1990
Exchange rate market		
13 Realised volatility of the dollar/euro exchange rate	Datastream	11/01/1980
14 Realised volatility of the yen/euro exchange rate	Datastream	11/01/1980
15 Realised volatility of the pound/euro exchange rate	Datastream	11/01/1980
Derivatives and commodities markets		
16 Realised volatility of Ibex 35 options	Datastream	08/01/1999
17 Realised volatility of open Ibex 35 futures positions	Datastream	24/07/1992
18 Realised volatility of oil prices	Datastream	11/01/1980

Source: CNMV.

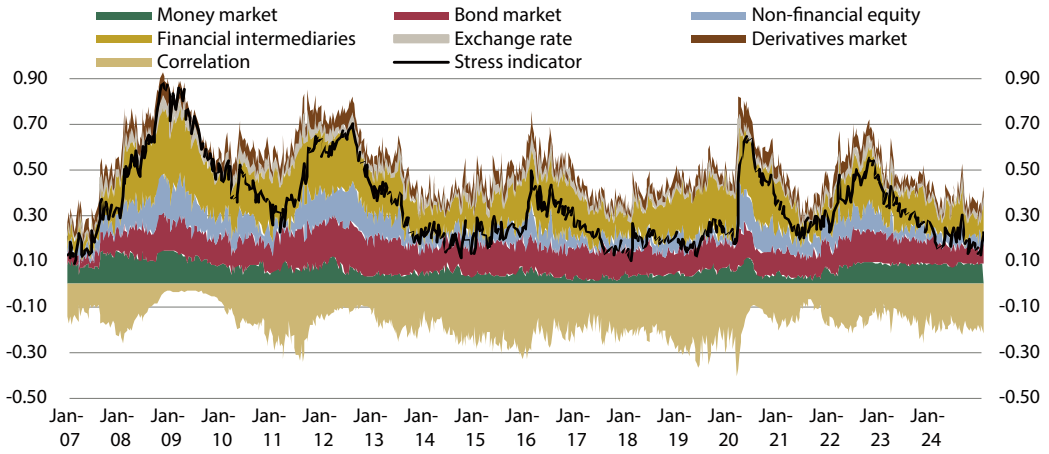
Over the years, this indicator has adequately reflected the tensions in financial markets as a result of events of different nature and intensity, such as the COVID-19 pandemic[64] or the consequences of the Ukraine war.[65] For example, after the announcement of the lockdown resulting from the pandemic in March 2020, the stress indicator grew from 0.26 to 0.56 in just three weeks (see Figure R1). In the case of the Ukraine invasion, the level of stress in the financial markets did not increase as sharply (0.30 to 0.47 in 4 weeks). However, in the second half of the year, following the rapid and aggressive turnaround in monetary policy and the turbulence in UK gilt markets, it reached values between 0.50 and 0.55. These values correspond to a high-risk regime.

[64] During the first weeks of the pandemic, this indicator was updated more frequently (intra-weekly) with the aim of incorporating daily market information.

[65] During the stress indicator creation process, the calculations for the period comprised between 1999 and 2015 were made, revealing that it was capable of reflecting the stress periods. This includes, namely, the financial crisis of 2008 – when the indicator reached a value of 0.87, its all-time high – or the European sovereign crisis of 2011–2012, when the stress level reached 0.69.

The performance of the stress indicator of Spanish financial markets is amply described in various CNMV publications including, namely, this *Financial Stability Note*, which includes the most recent trend of the indicator on its first page, and also the *CNMV Bulletin* reports and the *Annual Report*. Moreover, it was selected as the benchmark indicator to measure the stress of the Spanish financial system in the annual report of the Macro-prudential Authority Financial Stability Board (AMCESFI).

Spanish financial market stress indicator FIGURE R1



Source: CNMV.

Although the performance of this indicator was satisfactory in terms of its capacity to capture and illustrate periods of stress with information from financial markets, it might prove useful, on a regular basis, to consider the possibility of improving this ability of the indicator or even to incorporate other metrics that show areas of stress not included to date. This Note summarises the evaluation of three changes proposed in 2024 and the conclusions reached after the corresponding analysis. The changes evaluated, which are described in the following sections, related to the possibility of replacing the 3-month Euribor benchmark with the €STR, changing the measurement of volatility in the financial intermediaries segment for another alternative measurement and, finally, introducing an indicator that represents the liquidity conditions of private debt assets.

2 Changes in metrics that comprise the stress indicator

These potential changes, the reasons for this possible improvement and the conclusions obtained for each are enumerated below:

2.1 3-month Euribor and €STR (money market)

All the variables used in the money market are formed from 3-month Euribor data (see Table R1). The possibility of replacing the Euribor with the €STR was considered after the interest rate benchmark reform. After performing a comparative analysis between the two interest rates and observing the effect of this change on the stress indicator, it was decided, at least for the time being, to continue calculating the variables that make up the money market using the 3-month Euribor.

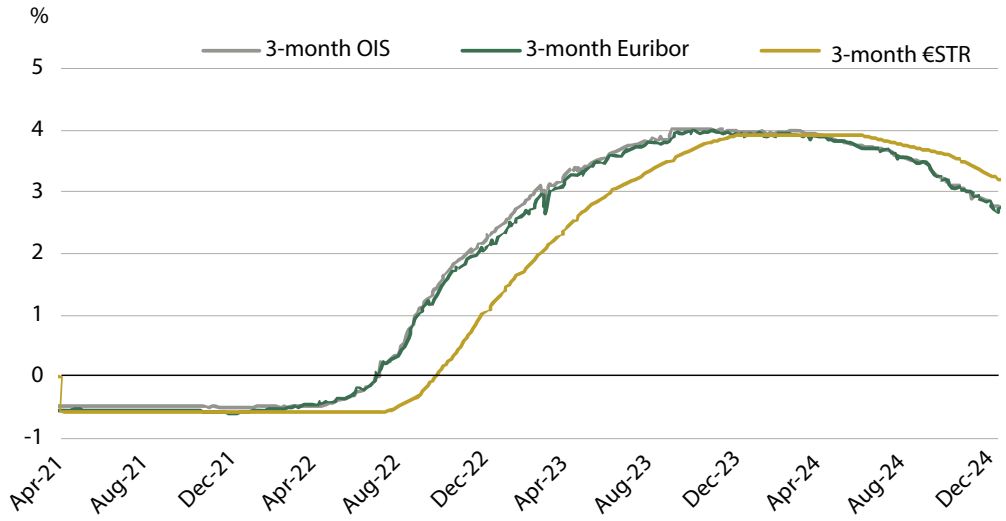
A reform of the benchmark interest rates (Euribor, Libor or Eonia) has been under way for several years after attempts to manipulate and reduce liquidity in money markets in the aftermath of the 2008 financial crisis. This has given rise to the appearance of new benchmark rates, such as the €STR or SOFR, while some existing indices have been modified and improved. As a result of this process of change, a modification of those variables containing some type of benchmark interest rate has been proposed. In this case, the proposed change would only affect the 3-month Euribor and, consequently, the three variables included in the money market segment.

The €STR was designed by the ECB to reflect the cost for banks of borrowing unsecured funds from other financial institutions within one day, with the aim of gradually replacing Eonia as the benchmark. In addition, in order to encourage the use of this type of benchmark in financial contracts and instruments, the ECB calculates (and publishes) daily compounded average €STR rates at different terms (from one week to 12 months) based on historical daily data.

Firstly, a comparison of 3-month Euribor was made with the €STR at the same term. As shown in Figure R2, the 3-month Euribor and 3-month €STR followed very similar trends, generally speaking, since the latter began to be calculated in mid-April 2021. However, a significant disparity can be observed between the two, from the second quarter of 2022 to the end of 2023, during which the Euribor was substantially higher than the €STR (66 bp on average). This disparity gradually decreased and was reversed in 2024, with the €STR rate standing above the Euribor in the second half of the year (31 bp on average in the second half of the year).

Evolution of benchmark indices

FIGURE R2



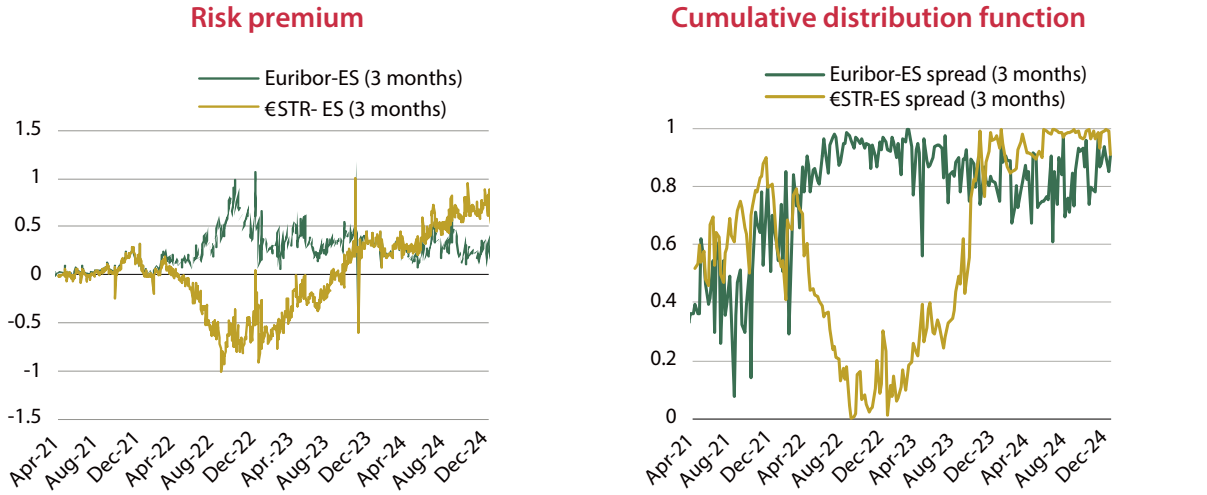
Source: CNMV.

The performance of the three individual risk indicators included in the money market was compared in order to analyse the suitability of using the €STR to calculate the stress indicator. Figure R3 represents one of them: the risk premium of the short-term banking market with respect to public debt calculated using both the Euribor and the €STR (left-hand panel) and their corresponding[66] cumulative distribution functions (right-panel panel). As shown in the left-hand panel of Figure R3, the disparity observed between the Euribor and the €STR between mid-2022 and the end of 2023 is decisive in the calculation of both risk premiums, giving rise to opposing behaviours between them during this time period. Consequently, the cumulative distribution functions (right-hand panel of Figure R3) also show significant disparities. The analysis of the economic and financial reality during this discrepancy period leads us to conclude that the risk premium calculated using the Euribor is more informative and adequate to this reality than that obtained with the €STR. For example, the risk premium calculated using the €STR does not provide an informative signal in terms of stress at times of turbulence in the UK sovereign debt markets in the second half of 2022 nor in the period in which several US (and European) banks experienced problems in the spring months of 2023.

[66] In order to add the variables that comprise the different segments, they are standardised within the range {0 , 1] through their cumulative distribution function. This function calculates, for a specific value within a sample, the total number of observations that are less than or equal to this value and divides it by the total number of observations of the sample.

Comparison of interest rate spreads (risk premiums)

FIGURE R3

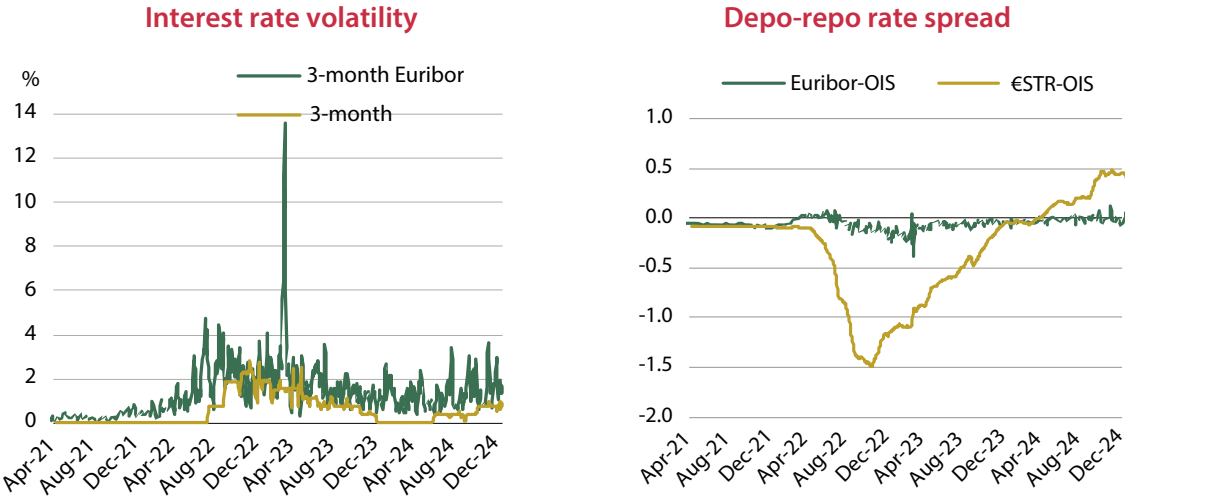


Source: CNMV.

In addition, Figure R4 shows that Euribor volatility was, generally speaking, higher throughout the entire period (from April 2021 to December 2024) and that the depo-repo spread was very low and clearly negative when using the €STR between April 2022 and December 2023. In the case of volatility, in addition to the low €STR, which should not be a negative aspect in itself in relation to the calculation of the stress indicator, it is observed that there are many months in which its value is equal to zero and, therefore, neither is it possible to obtain a signal that shows the daily fluctuations in financial market prices. In the case of depo-repo transactions spread, as mentioned earlier, the economic and financial context does not justify the performance of the spread.

Comparison of volatility and depo-repo spread

FIGURE R4



Source: CNMV.

In conclusion, the foregoing analysis makes it appropriate, for the time being, to continue using the 3-month Euribor in the calculation of the indicators that comprise the degree of money market stress, since their performance seems more aligned with financial reality than the stress indicator seeks to capture. It is possible that this decision will be reversed in the future and that, as the €STR has a longer history, it may acquire the desired representativeness. Moreover, it should be noted

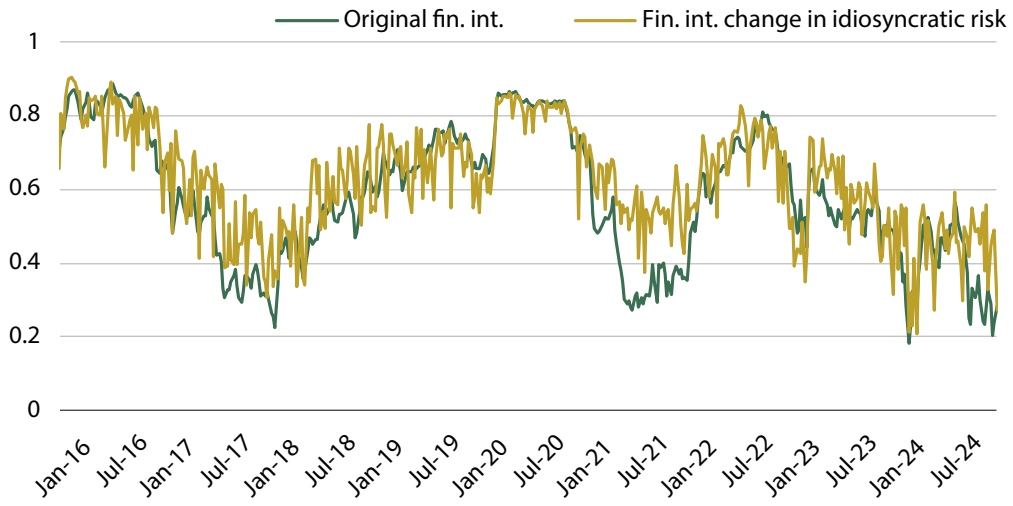
that the Euribor, after being declared a critical benchmark index by the European Commission, has experienced a substantial increase in quality after the reform of its methodology and control environment in 2019, which has made it possible to broaden the panel of contributors and prioritise the existence of real operations over expert judgement. Periodic re-evaluations of the two interest rates will be necessary in order to determine (and choose) which of the two has the best characteristics to represent market stress.

2.2 Volatility measurement (financial intermediaries segment)

To date, this indicator has been calculated on the basis of the volatility of the constant term of a regression of banking sector return over that of the Ibex 35 (2-year moving window). It is, therefore, the volatility of the idiosyncratic return of this sector. It was observed that this measure of volatility has been found to exhibit little variability in the short term, due to which it may not be capturing price movements in the market as quickly as desired and, in short, be uninformative. For this reason, the convenience of calculating an alternative volatility measurement has been proposed, based on the error term of the same regression.

To assess this possibility, a retrospective exercise has been carried out in which the aforementioned change has been applied in the calculation of the stress indicator between January 2016 and December 2024. The result can be observed in Figure R5, which shows the level of stress in the financial intermediaries segment, and in Figure R6, which shows the result of this change in the stress indicator as a whole. The differences in trend of the stress indicators in the financial intermediaries segment are not very significant. However, greater variability is observed, as might be expected, in the indicator calculated using the alternative volatility measurement, with slightly more extreme values in some specific weeks. In addition, it is observed that at certain points in time (part of 2017, 2018 and 2021), the alternative measurement of stress for the financial intermediaries segment was slightly higher than that calculated in its original version.

Stress indicator in the financial intermediaries segment FIGURE R5

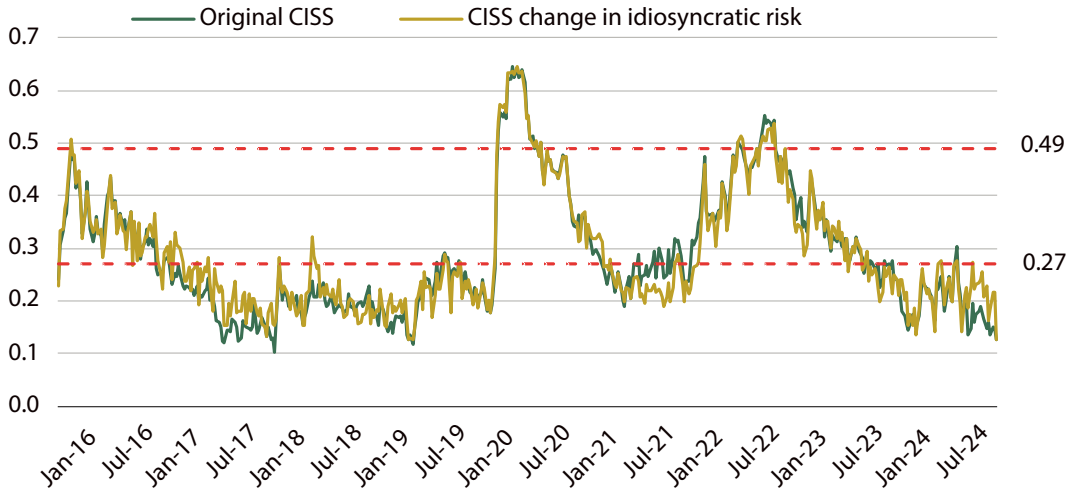


Source: CNMV.

If these results are transferred to the global indicator for financial markets, the differences arising from this methodological change are not very significant, observing only slightly different results between the second half of 2017, in 2021 and in the last months of 2024.[67] This is logical if one considers that the calculation of one of the 18 indicators that make up the total indicator is being modified and that this change has not had a substantial impact, not even on its own segment (financial intermediaries). However, this alternative measure of volatility does remove the difficulties in better representing short-term market movements. See, for example, the greater tightening that would have occurred in the new indicator compared to the original at certain times in 2018 and 2023. It should also be noted that both indicators showed a very similar level of stress in 2024. This fact, as discussed in the conclusions of this Note, is also important when deciding on the best time to change the methodology of the indicator, as it would be convenient to avoid a sudden jump caused by the modification of any of the calculation variables.

Financial market stress indicator

FIGURE R6



Source: CNMV.

2.3 Private debt liquidity (bond market)

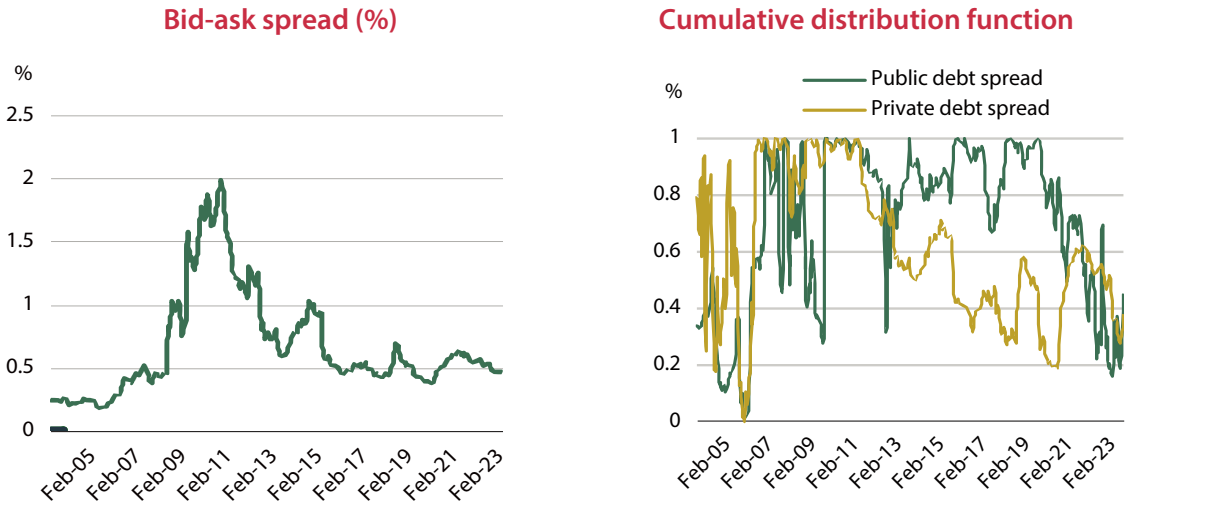
The long-term fixed income market segment (bond market) of the stress indicator only includes public debt market data. It has been considered that it would be relevant to evaluate the incorporation of an indicator that is representative of private fixed income market stress, which may also be a significant source of systemic risk. To this end, it was decided to use an indicator that describes the level of liquidity in the corporate bond market, as it could be a good metric to evaluate the risk perception of investors and issuers in this market.

[67] In 2021, with a slightly more pronounced difference than in 2017, the new indicator fell below the original, despite the fact that idiosyncratic risk, as mentioned earlier, was higher than the original and, therefore, also the risk for the financial intermediaries segment. This was caused by a significant decrease in the correlation between segments, which caused the financial system as a whole to fall below its systemic risk level.

In this way, the liquidity of corporate debt assets was measured using the average bid-ask spread for a set of representative bonds. This set of bonds is modified annually to include new issuances and exclude those which have matured.[68] This was carried out using the daily bid-ask price data of all the bonds included in the sample for the period comprised between January 2013 and December 2024. In addition, these data were complemented by the spread for the period 2005–2012, calculated in a previous working document of the CNMV.[69] This was done in order to have a sufficiently long data history covering as many phases of financial market turbulence as possible, as well as periods of normality. This makes it possible to obtain a cumulative distribution function that is representative as possible.

The result of this exercise is shown in Figure R7, whose left-hand panel corresponds to the bid-ask spread for the entire period (2005–2024), while the right panel shows the cumulative distribution function of these values, together with the cumulative distribution function of the public debt spread. As can be observed, the corporate debt spread fluctuated during this nearly 20-year period between minimum values of approximately 0.25% (2005–2007) and maximum values of nearly 2% (summer of 2012). In recent months, this spread has been around 0.5%, so that it would currently stand at relatively moderate values, below the 50th percentile. When compared with the public debt spread, in terms of its cumulative distribution function, it can be observed in both cases that between 2008 and 2013 the liquidity levels were generally low (high spreads). However, between 2014 and 2022 the level of liquidity of corporate debt assets improved, which was not the case for public debt.

Private debt liquidity FIGURE R7



Source: CNMV.

Once this variable was calculated, it was included in the bond market segment, with equal weights for each of the four variables that would comprise it after this change (three variables prior to the inclusion of private debt liquidity). With this, the new bond market risk indicator does not show significant changes (comparison made for the period 2016–2024), with a tendency to adopt slightly lower values (see Figure R8). This is because liquidity conditions for private debt assets in recent

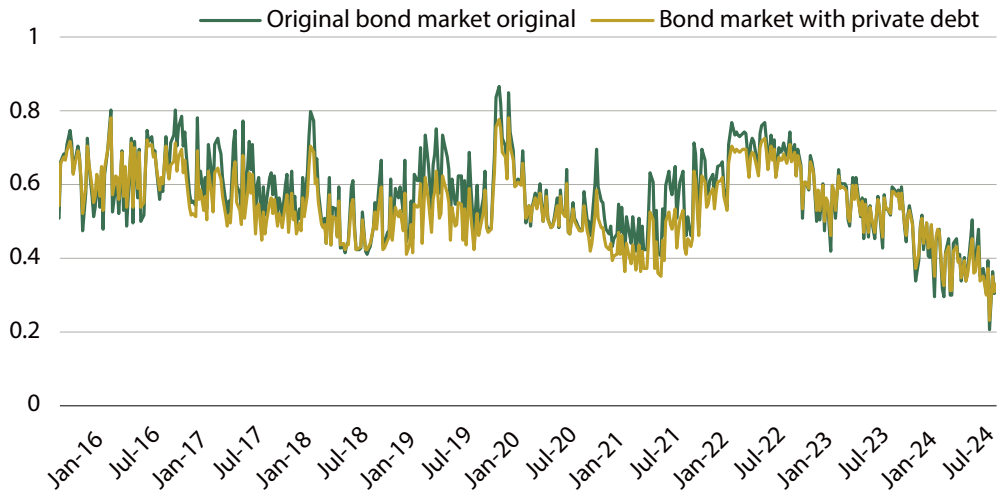
[68] Those securities whose issuers are Spanish companies maturing in more than one year and with a yield not linked to any other index or asset have been chosen for each year.

[69] Cambón, M.I., Cano, J.L. y González, J. (2017). *Measuring liquidity of Spanish debt. CNMV Working Paper* No. 66. Available at: https://www.cnmv.es/DocPortal/Publicaciones/MONOGRAFIAS/Measuring_liquidity_Spanish_debten.pdf

years have been better than in past crises, even in recent turbulent periods. However, this has not been the case of public debt which, as observed in the right-hand panel of Figure R7, in recent stress episodes, has shown liquidity deteriorations similar to those of previous crises. Therefore, the new private debt liquidity indicator enters the segment with values lower than those of the other indicators of its segment and gives rise to a slight reduction therein.

Risk of the bond market segment

FIGURE R8

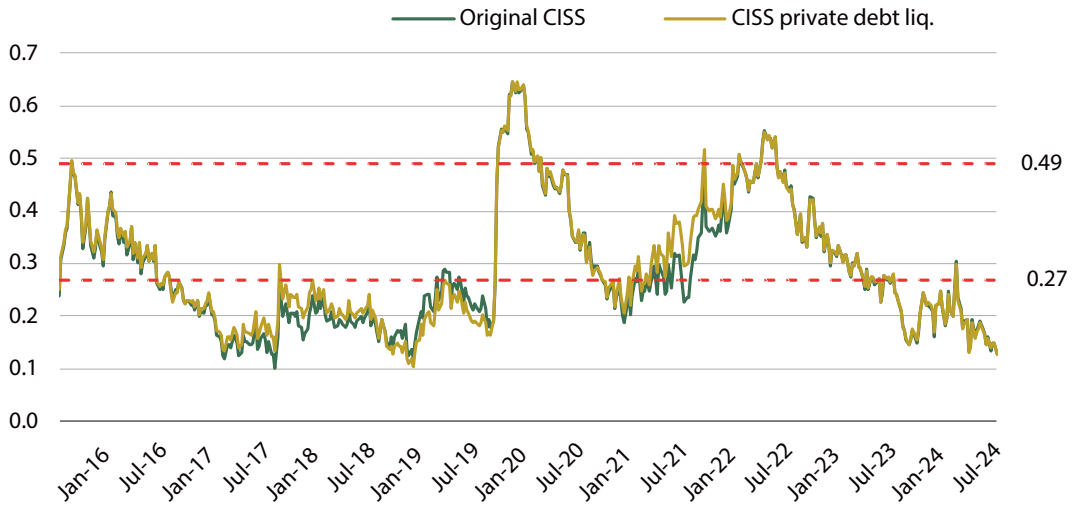


Source: CNMV.

If this modification in the bond market risk indicator is applied to the global indicator of the financial markets, the differences arising from the methodological change are not very significant, observing only slightly different results between the second half of 2021 and 2022.[70] Moreover, as already mentioned in the preceding section, it is important to analyse the events of recent months, as it would be convenient to change the methodology at a time when it would not give rise to a sharp jump. In this case, as in the preceding section, it can be observed that the inclusion of the liquidity of corporate debt has not substantially modified the risk level since mid-2022.

[70] As in the case of idiosyncratic risk, the change in correlation between the different segments caused the global indicator to move in the opposite direction to the movement in the bond market. Specifically, while the incorporation of private debt liquidity lowered the risk in bond markets, the level of risk increased in the financial system as a whole.

Financial market stress indicator FIGURE R9



Source: CNMV.

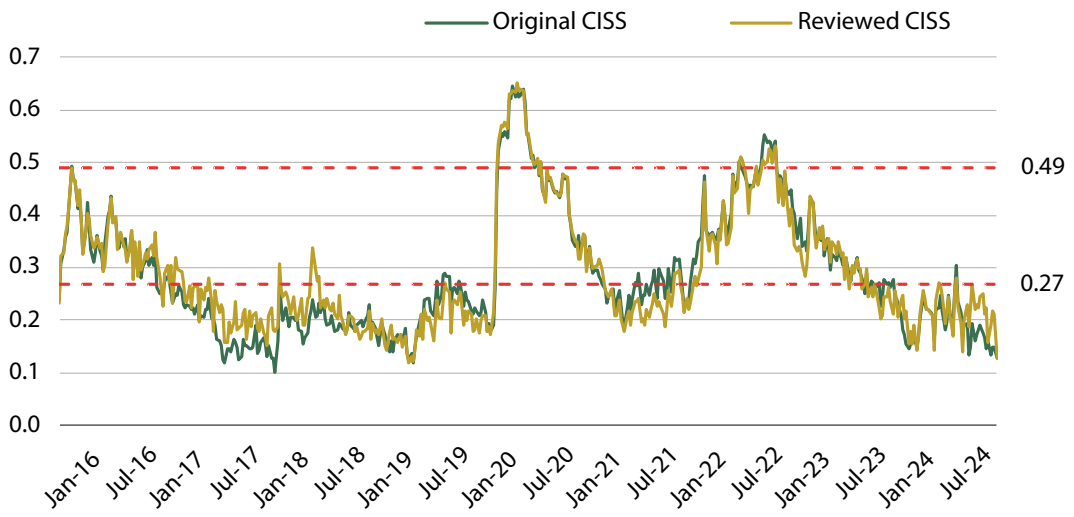
3 Conclusions

This Note presents the results of evaluating three possible changes in the metrics that comprise the Spanish financial market stress indicator, which was created nearly 10 years ago. Although the indicator has satisfactorily captured all the periods of stress over a very long period of time, some alternative metrics have been evaluated in order to see whether they can better reflect these periods of stress. The tested metrics relate to: i) the replacement of the 3-month Euribor benchmark by the €STR; ii) the modification of the calculation of the volatility indicator in the financial intermediaries segment; and iii) the inclusion of the private debt liquidity indicator.

The analysis revealed that the second and third change may bring about the desired improvements, better reflecting market stress, both by reformulating some metrics and incorporating others not included in first version of the indicator. As the two accepted modifications did not have a substantial impact on the general indicator in 2024, it was deemed convenient to make the proposed changes from 1 January this year, as of which the indicator is presented in its new version in all the CNMV's publications, including this Note. To finalise the description of this review, Figure R10 shows the original stress indicator together with the new proposed indicator.

Review of the financial market stress indicator

FIGURE R10



Source: CNMV.