Financial Stability Note

No. 19, July 2021

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The Financial Stability Note falls within the tasks that the CNMV carries out in monitoring financial stability conditions in the areas that it supervises. In particular, the Note assesses the stress level of domestic securities markets during the last quarter, flags any changes in the level of different financial risks and identifies the major sources of risk.

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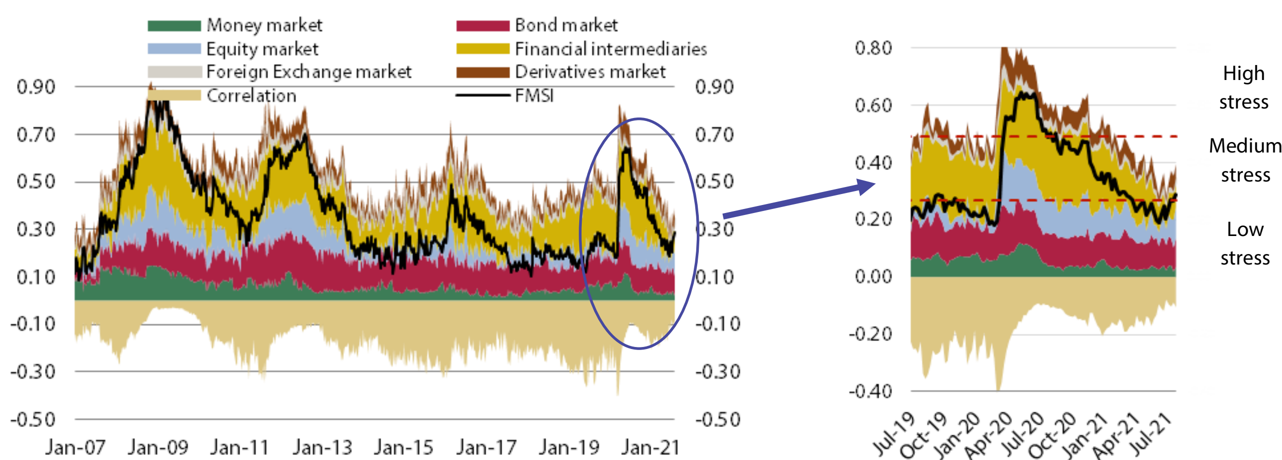
Summary

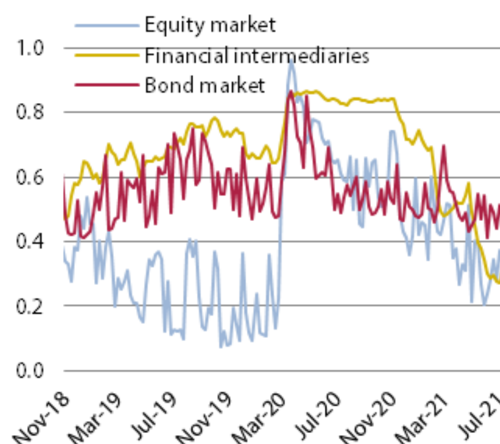
✓ Since the publication of the last Financial Stability Note[1] **the Spanish financial markets stress indicator** has remained in the low risk zone,[2] although it has shown some fluctuations associated with small rebounds in certain volatility indicators. These rises have placed the indicator close to the threshold that separates low from medium risk (0.27), which it exceeded it at the end of the period. Thus, from the end of April to the end of July, the indicator moved between 0.19 and 0.29. The decrease in stress observed in the financial intermediaries segment stands out, due mainly to the recovery of quoted prices of banks. The level of stress in this segment has fallen from values close to 0.50 to 0.28, and the segments that now show the highest levels of stress are non-financial equity (0.53) and fixed income (0.51). The level of correlation in the system remains at very high levels, similar to those observed in July 2020.

Spanish financial markets stress indicator FIGURE1



Total stress indicator

Stress indicators in the bonds, financial intermediaries and equity segment



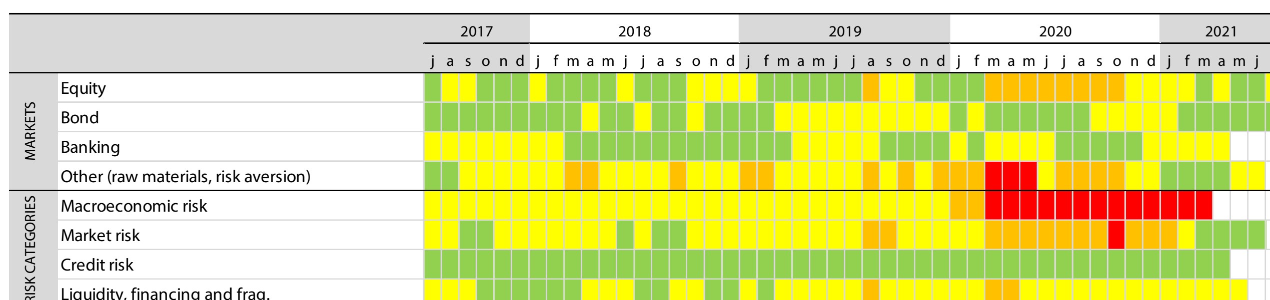
Source: CNMV.
For more detail on the recent movements in this indicator and its components, see the statistical series of the CNMV (Market stress indicators), available at: http://www.cnmv.es/Portal/Publicaciones/SeriesWeb/Inicio.aspx? codrama = 1295. For further information on the methodology of this index, 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 Paper No. 60 available at: http://www.cnmv.es/DocPortal/Publicaciones/MONOGRAFIAS/Monografia_60_en.pdf.

[1] 31 May (https://www.cnmv.es/DocPortal/Publicaciones/NotaEstabilidad/Nota_estab_ABR_21_En2en.pdf).

[2] The closing date of this note is 15 July, except for the stress indicator which is for 23 July, and certain other specific data.

- ✓ Quoted prices on **national equity markets** continued their upward trend during much of the second quarter of the year until mid-June, when fears over the spread of new variants of the virus and the possibility that further restrictions on movement could be established in some European regions led share prices to fall. In this context, the gain made by the Ibex 35 in the year to date reduced to 5.6%, with the index ranking lower than its main European peers. Market liquidity conditions remain favourable, despite the continuous decline in trading volumes – a trend that also seems to be observed in other markets. The **fixed income markets**, where the increase in inflation and inflation expectations gave rise to increases in long-term yields in the early months of the year, switched to a different course when the change in the monetary policy strategy of the European Central Bank (ECB) was announced. This change, which has introduced greater flexibility by setting an inflation target of 2% (changing the value of below but close to 2%), relieved expectations of a tightening of monetary policy tone and allowed for further declines in interest rates. Risk premiums remained stable in the second quarter of the year.
- ✓ The most prominent **risks of a financial nature** identified in this note are still market and liquidity risks, especially in regard to certain fixed income assets. Partial credit risk indicators are not, for the time being, showing significant deterioration, although the slowdown in business activity in many companies over the last few months, as well as the progressive completion of the support measures adopted by the government (guarantees, moratoriums and direct aid) make it necessary to continuously assess this risk. In the short term, the main triggers for these risks would be related to information that could have a negative impact on economic growth, while in the medium and long term they would be associated with other types of vulnerabilities, mostly relating to debt sustainability.
- ✓ In terms of financial stability, the **most significant sources of risk** are still related to the evolution of the pandemic, which is being favoured by the progress of the vaccination campaigns and hampered by the emergence of new strains of the virus, and this has a direct impact on expectations for economic activity. International political uncertainties continue to decrease gradually, while those of a domestic nature remain. Cybersecurity risks also persist and even have been exacerbated by the rise in remote activities taking place in the context of the pandemic. Financial risks associated with climate change are also worth mentioning. The most important work in this area is to determine the direct risks that derive from the physical impact of adverse events, as well as transition risks, linked to the transformation to a decarbonised economy, identifying the entities and assets that could be most affected by their direct or indirect exposure to these risks.

Heat map: Summary by market and risk categories[1] FIGURE 2



Source: CNMV. See article Cambón, M.I. (2015). "Identification of vulnerabilities in the Spanish financial system: an application of heat maps". *CNMV Bulletin*, Quarter I, pp. 109-121.

[1] Data to 15 July.

Sources of risk

Macroeconomic environment

- Spain' s GDP contracted by 0.4% in the first quarter of the year[3] (1 tenth of a point below the initial forecasts), which places year-on-year growth at -4.2%, compared to -1.3% in the euro area as a whole (GDP in the euro area fell by 0.3% in the quarter). This decline in Spanish economic activity was due to both changes in external demand, which made a negative contribution of 2 percentage points (pp) to growth, and in domestic demand, whose contribution was also negative by 2.2 pp. Within domestic demand, household consumption presented the most negative contribution, with a year-on-year decline of 3.5% (despite recovering by 5.9% on the previous quarter). External demand saw a contraction in exports that was much higher than the decrease in imports in year-on-year terms (10.7% compared to 5.2%), although, as in the case of household spending, the performance was positive in quarterly terms: +5.6% for exports and +4.2% for imports.

  The forecasts of the main institutions for 2021 and 2022 remain subject to a certain degree of uncertainty due to the evolution of the pandemic and the effectiveness of the vaccines against new mutations of the virus. Thus, the Bank of Spain' s macroeconomic projections published in the month of June estimated growth of 6.2% in GDP for this year, in its central scenario,[4] which is a small upward revision of 2 tenths of a point compared to its March report, on the back of better news about the pandemic and economic activity.[5] This growth rate coincides with the projections made by the European Commission in early July, which raised its estimates by 3 tenths of a point compared to May. This would make Spain the strongest-growing economy in the euro area, with an increase of 4.8%. According to these two institutions, activity would be set to recover by between 5.8% and 6.3% in 2022.

- In the labour market, social security affiliation figures showed an increase of just over 200,000 (seasonally adjusted) in the month of June, to 19.5 million. This growth was mainly due to the recovery of the sectors most affected by the restrictions: in the services sector alone, the increase in the number of affiliations was almost 188,000, 1.3% more than at the end of May.[6] This was reflected in the registered unemployment figures for June, which have shown a decrease of 167,000 people compared to the previous month and 248,500 compared to June 2020.

  The number of workers affected by furloughing schemes (ERTE)[7] stood at 447,800 at the end of the second quarter of the year, which is 44,692 fewer than one month previously. Thus, there has been an accumulated decline since the peak of the third wave of the pandemic (early February) of 530,000 workers. The Bank of Spain's forecasts for the end of 2021 indicate that the unemployment rate could, in its central scenario, stand at values very similar to those registered in 2020: 15.6% compared to 15.5% last year. This figure would range between 15.2% and 16.2%, depending on the scenario contemplated, values that are significantly lower than those projected in March, which were between 15.9% and 18.3%.

[3] However, during the second quarter of 2021, Spain's GDP grew by 2.8% compared to the first.

[4] In the favourable and adverse scenarios, Spanish economic growth would stand at 6.8% and 4.2%, respectively.

[5] It should be noted that these forecasts were made prior to the spike in infections that took place from the end of June, which has led to a fifth wave of the pandemic.

[6] Within the services sector, the number of affiliations in the hospitality sub-sector increased by 11.6%.

[7] In accordance with Eurostat and International Labour Organization (ILO) methodology these workers are considered employed.

- The inflation indicator for June reflects an increase in prices of 0.5% during the month, which means that the year-on-year rate remains at 2.7%, having risen steadily since February, when it was 0%. The increase in the year-on-year rate was driven firstly by housing, which rose by 10.9% as a result of the increases in the price of electricity, and secondly by food and non-alcoholic beverages. The core inflation rate, which excludes the most volatile components (energy and fresh food), has shown fairly stable behaviour in recent months, rising slightly from 0% to 0.2% between April and June. In comparison with the euro area as a whole, harmonised CPI (HCPI) data reflect a change of sign in the differential, which had been negative since the end of 2018. Thus, at the end of the second quarter, Spanish HCPI was 2.5%, 6 tenths of a point higher than for the euro area as a whole (in March it was 1 tenth of a point lower).

- Data for public sector finances provided by the Ministry of Finance show that in the first four months of 2021 the consolidated deficit of public administrations[8] stood at 1.81% of GDP, down from 2.55% in April 2020, at which time the first extraordinary expenditure related to the COVID-19 crisis had already occurred. By sub-sector, the deficit of both central government and social security funds decreased in relation to the same month last year,[9] while the autonomous regions saw their deficit increase from 0.05% to 0.26% of GDP.[10] The level of public debt increased by more than 5 pp in the first quarter of 2021, to 125.2% of GDP, and by 26 pp compared with the March 2020 figure. The most recent data show that between April and May public debt would have increased by 0.7%, to €1.40 trillion.[11]

  Looking to the end of 2021, the Bank of Spain's forecasts place the public deficit at between 7.8% and 8.9%, which represents an increase of around 5 tenths of a point compared to the forecasts made in March. This is largely a consequence of the projected increase in public spending deriving from both the extension of the furlough scheme approved in May and the future direct aid to companies with viability problems that was approved in March. Public debt is estimated at a figure very close to that of 2020 (between 119% and 123%), so it would not be reduced, as forecast in previous reports.

- According to data from the Financial Accounts, households' financial decisions in the first quarter of the year continue to reflect an increase in the saving rate, although at a much slower pace than in the middle months of last year when, in addition to precautionary savings which also occurred in the middle years of the financial crisis that started in 2008, in many cases it was impossible to make certain consumption decisions in the context of the restrictions on activity and movement imposed. Thus, at the end of March, Spanish household savings stood at 15.5% of gross disposable income, 8 pp higher than at the end of 2020 (see Figure 29). This high level of saving by Spanish households, while lower than the euro area average, was reflected, as in previous quarters, in the acquisition of financial assets, which, in net terms, reached 7.4% of GDP, the highest figure since the expansive period at the start of the 2000s (see Figure 27). The composition of this investment was the same as in previous periods: households continued to divest of term deposits and fixed income securities (2.8% of GDP) and

[8] Excluding local authorities and aid to financial institutions.

[9] The central government deficit went from 1.8% in April 2020 to 1.38% the same month this year, while for social security funds the figures were 0.7% and 0.17%, respectively.

[10] The increase in the deficit of the autonomous regions was the consequence of a 4.2% increase in spending compared to income that remained practically stable. In terms of spending, the 8.3% growth in employee remuneration stands out due mainly to the increase in health and education personnel.

[11] This level represents 126% of GDP (cumulative March 2020 – March 2021).

invested a large part of their savings in means of payment,[12] with an inflow of funds of over €15 billion in three months (€103 billion in one year, 9.3% of GDP). In this first quarter, households also used part of their savings to acquire units in investment funds (investment in which was higher than 3% of GDP in net terms; 0.9% of GDP in the last four quarters up to the first quarter of 2021).

The statistical data available on investment funds indicate that investors continued to opt for this type of saving on a large scale. As we have already seen, in the first quarter of 2021 there were net subscriptions of more than €7 billion in just three months. By category, the funds that received the largest inflows between January and March were, as in 2020 as a whole, mixed fixed income funds and international equity funds, with net subscriptions of €4.8 billion and €2 billion, respectively. Absolute return funds, which have seen redemptions since 2018, continued the trend marked in the first quarter of the year, with net outflows of over €2.3 billion. These movements continue to reinforce the polarisation that started to emerge in 2019, whereby one group of investors opts for risky funds in search of yield, while the other, more risk-averse and influenced by current uncertainty, prefers safer formulas.

Context of low interest rates

- The European Central Bank (ECB) has taken a further step in maintaining its expansive monetary policy and supporting the economic recovery of the euro area at a time when new concerns are arising over new variants of the virus. Thus, in addition to increasing its purchases in the second quarter to €80 billion a month, the central bank took a historic decision at the beginning of July to give scope to the continued application of an expansive policy, even if inflation temporarily exceeds the 2% target. The monetary authority has therefore concluded its monetary policy strategy in force since 2003, through which it established an inflation target of close to but below 2%, to move to a symmetric target of 2% in the medium term, from which upward or downward deviations are equally undesirable. This new context will allow the ECB to maintain its accommodative monetary policy over time with fewer restrictions. The move is expected to give the central bank greater flexibility and delay the withdrawal of monetary stimuli.

  While interest rates remained stable in most sections of the curve in the second quarter and there were only increases in the longer terms on fears that the rise in inflation could force the ECB to reduce the scope of its stimulus measures in the medium term, the change of strategy caused rates to relax once again[13] to stand at similar, or even lower, values in some sections compared to mid-April.

  In the United States, some voices suggest the Federal Reserve could increase interest rates in the medium term to control inflation[14] and prevent the overheating of the economy (which is showing signs of strong recovery). However, the monetary authority believes that the rise in prices will be temporary and considers that it is still too early to start to withdraw the stimuli, mainly because the country's employment levels remain significantly below pre-pandemic levels and the consequences of the crisis on a global scale could still pose risks to the US economy.

[12] Cash and demand deposits.

[13] The 1-year Euribor decreased in June to -0.484%, from -0.481% the previous month.

[14] US inflation reached 5.4% year-on-year in June.

- In this scenario, the risks already mentioned in previous notes remain valid, although the risk of a continuation of yield-seeking strategies is accentuated. Thus, given the lack of returns and the increasing costs of maintaining positions in liquidity and risk-free assets, investors are still likely to invest in assets with higher yield expectations (or are even more likely to do so)[15] and risk levels will consequently increase. These types of assets generally have high levels of volatility (equity, emerging market or cryptocurrency assets) and credit risk (they have worse credit ratings – subordinated debt and high yield assets), and are usually less liquid (subordinated debt and high yield assets, private equity funds or real estate assets). The likelihood that the scenario of low interest rates will be extended over time makes it difficult for the banking and financial sectors to increase their returns, which comes on top of the effects of the economic slowdown and business problems caused by the pandemic, which will foreseeably cause NPLs to rise. However, the low interest rates also have positive effects for these institutions, as they reduce financing costs for their clients, giving them more control over NPLs, which is accentuated in the context of economic recovery.

Sources of political uncertainty

- The United States has witnessed a substantial decrease in political uncertainty as the year has progressed. The challenges posed by the spread of COVID-19 remain evident and although the number of people affected by the virus has been reduced due to the vaccination programme, there are concerns about new, fast-spreading variants and vaccine-hesitancy among part of the population.[16] Uncertainties remain over the future relationship between the United States and China, as the trade tensions have not yet been fully resolved and political tensions have now emerged in relation to the origin of the pandemic, which could present a setback in the relationship between the two powers.[17] However, the trade tensions between the United States and Europe have eased greatly following a first approach of positions in March that led to the four-month suspension of the bilateral tariffs arising from the dispute over subsidies to Airbus and Boeing, making it possible to reach an agreement in mid-June that would resolve this conflict for a longer period of time. After almost 17 years of litigation, both parties agreed to suspend these tariffs (worth US$11.5 billion) for a period of five years. The EU and the United States also announced that they would jointly address any anti-trust practices carried out by third parties that could harm the large civil aircraft sector. Therefore, although there are still various sources of uncertainty, the risk that these will eventually lead to financial market turmoil has been significantly reduced.

- At the European level, the easing of uncertainties as a result of the agreement reached in December last year between the EU and the United Kingdom, which considerably reduced the possibility of a "hard Brexit", and one of the greatest sources of risk in recent years, stands out. Up until now, in terms of financial stability, market activity has been normal following the reorganisation of trading venues, which led several UK entities to open venues and transfer part of their trading volume to EU countries. The main

[15] The data on net subscriptions to investment funds for the first quarter of the year described above, as well as the preliminary information for the second quarter (strongly affected by fund mergers) reveal investors' clear preference for assets with higher yield expectations.

[16] According to data from the Centers for Disease Control and Prevention, 68.3% adults have received at least one dose of the vaccine, which is very close to the goal of 70% set by President Biden for 4 July.

[17] After the first phase of the trade agreement between China and the United States more than a year ago, the negotiation of the next phases is still pending. In recent months, the trade representatives of both countries have held talks on this issue in which they exchanged common concerns and agreed on the need to maintain bilateral contact between China and the United States.

uncertainties now relate to the Trade and Cooperation Agreement between the two parties, the most recent issue being border controls between the United Kingdom and Northern Ireland.

- At the national level, risks related to the coordination and management of the health crisis continue to stand out. Despite the speed of the vaccination process, daily infections and virus numbers are increasing rapidly, probably due to the easing of restrictions, the start of the summer period and the movement that this entails. This makes the situation more unstable and the possibility of new restrictions being implemented, that could have a negative economic impact, cannot be ruled out. In addition, parliamentary fragmentation remains high and, as indicated previously in these notes, this can give rise to tensions and make it difficult to reach agreements.

Climate change and ESG

- Climate risks are associated with significant direct and transition costs, so their size largely depends on the preventive measures adopted to mitigate them. In relation to physical risks, in recent weeks many parts of the planet have been seriously affected by floods, heat waves and droughts of increasing severity and frequency. Transitions risks are also becoming more relevant in the economic decisions taken by agents and the policies adopted to mitigate their effects on the economy and the financial markets. Despite the difficulties in properly assessing climate and environmental risks, a great deal of progress is being made. On 14 July, the European Commission adopted a series of legislative proposals aimed at ensuring carbon neutrality by 2050 and a net reduction in greenhouse gas emissions of at least 55% in less than 10 years. The package includes the review and expanded coverage of the carbon emissions market.

  Faced with the almost daily announcements of new policy measures to reduce carbon emissions (e.g. the abolition of the combustion engine in Europe in 2035) and rising carbon prices in Europe in recent months, investors are showing greater interest in decarbonising their portfolios while increasing their exposure to green assets and assets that meet sustainability criteria (ESG). The green and sustainable asset markets have favourable growth prospects. Many companies and governments are increasingly issuing green and sustainable bonds,[18] while more asset managers and rating agencies are incorporating new assets that meet sustainability criteria into their portfolios and analyses, respectively.[19] During this transition process, the growing demand of investors for green or environmentally sustainable assets may exceed the current supply, which heightens the risk of distortions in the price formation process. In an extreme scenario, this, coupled with the valuation problems caused by the lack of standardisation, could lead to sudden price corrections, as well as the green washing of assets that are considered sustainable in principle but in reality are not. The publication of the EU Climate Taxonomy in April is an important step in this area. This regulation establishes a common and official language for truly sustainable activities, which will eliminate heterogeneity in the market and reduce the risk of green washing. Also noteworthy is the proposal made at the beginning of July by the European Commission for a regulation to establish an EU Green Bond Standard – based on the EU taxonomy –, which will

[18] On 28 July, the Spanish government announced that the first sovereign green bond issuance programme will begin in September, which will be used to fund a wide variety of environmental programmes.

[19] See, for example, Chapter 5 of the IMF's *Global Financial Stability Report* (GFSR) for October 2020. Global Financial Stability Report: Bridge to Recovery (imf.org) or the Global Sustainable Investment Review 2020 report.

establish the conditions under which emissions can be considered sustainable, with the ultimate goal of preventing the risk of money laundering and helping to mobilise the funding needed to combat climate change and environmental degradation, thus boosting the EU's leadership role in the area of green finance. Other international initiatives such as those of the International Organization of Securities Commissions (IOSCO) stand out, whose task force on sustainability (of which the chairman of the CNMV, Rodrigo Buenaventura is deputy-chairman) dedicates its efforts, among other things, to promoting the implementation of an international standard to regulate this matter and sustainability ratings.[20]

For financial institutions, there is risk deriving from keeping a significant percentage of liabilities and loans to companies on their balance sheets that engage in carbon-intensive activities and are therefore subject to transition risk, as well as to sectors or activities subject to physical risks. Although Spanish financial institutions are beginning to redirect their balance sheets by increasing sustainable finance transactions, they still have a long way to go to develop a detailed decarbonisation plan. At the European level (ECB and European Banking Authority, EBA) measures are being taken to limit risks in this area, such as overexposure to stranded assets. Some financial institutions may have to bear losses as a result of the credit risk associated with the climate change transition of borrowers who have not correctly assessed the risks associated with this change, while borrowers could experience downgrades in their credit ratings, which could raise their financing costs.

However, it should be noted that the necessary transformation of the economy to reduce emissions and achieve the goal of carbon neutrality offers significant opportunities for growth and job creation, as well as productivity incentives associated with the use of new technologies (green FinTech). It is also a boost for the development of financial markets, offering new investment opportunities in assets linked to sustainability. Lastly, it enables companies to improve their ties with customers, society and different stakeholders, which should ultimately improve their perception of risk and hence, their credit ratings, and reduce their financing costs.

Other sources of uncertainty

- Cybersecurity is still one of the most worrying risks for organisations and companies, especially for financial institutions. As a result of increasing digitisation, exposure to this risk has grown as remote activities such as teleworking and telematic relationships have increased. Cyberattacks targeting a specific institution could affect several critical infrastructures and the financial markets if there is widespread contagion among different agents. In an increasingly interconnected environment, in which digital systems are vital for most financial institutions, such a security breach could even cause a general loss of confidence in the system and, consequently, it could be a source of financial instability. For this reason, investment in cybersecurity and the ongoing dedication of resources to manage this risk are essential for companies, users and supervisors.[21] At the European level, different regulations are being developed, among

[20] The IOSCO task force on sustainability has three subgroups dedicated, respectively, to: i) the analysis of ESG information necessary for investors; ii) information provided by fund managers and green washing, and iii) ESG ratings.

[21] Spain is ranked fourth (along with Korea and Singapore) in the 2020 Global Cybersecurity Index prepared by the International Telecommunications Union (reporting to the United Nations), which classifies the most cybersecure countries based on their performance during the previous year. This is a clear improvement compared to 2015, the year the first index of this type was published, when Spain ranked 30th.

which the Digital Operational Resilience Act (also known as DORA), which is currently at the approval stage, stands out. The main objective is to establish a common framework of obligations, principles and requirements in the area of cybersecurity, so that all financial institutions are subject to a set of standard regulations to mitigate and manage the security risks affecting networks and computer systems.

Risk categories

Market risk: green

- The advances in the vaccination programmes in both the United States and Europe, alongside the progressive reopening of their economies and accelerated pace of recovery, especially in the US,[22] have enabled the international stock markets to extend their rises in the second quarter of the year, and most of the large markets have recovered the losses built up in the previous year. Even so, progress slowed from June onwards and this trend continued in the first half of July. At first, the slowdown was associated with fears that high inflation rates could cause a premature tightening of monetary policy, a circumstance that was denied by both ECB and Federal Reserve officials, who advocated maintaining the stimuli over time. Subsequently, price trends were conditioned by concerns over the effects that new variants of the virus could have in some European regions, especially in sectors such as tourism and other service sectors, which could slow down the pace of recovery in some economies.

- Most of the international stock market indices posted significant rises in the second quarter,[23] which mostly continued in July, with stronger increases in the United States, somewhat weaker gains in European markets and even declines in Japan. In Europe, the weaker performance of the Spanish indices stood out once again, marking a more modest performance and ranking below the large European indices in terms of profitability.

  All US indices showed somewhat stronger gains in the second quarter, which extended until mid-July, when they reached new all-time highs.[24] Although the normalisation of activity and the relaxation of social distancing measures would invite us to think that the growth of technological companies[25] could slow, these entities continue to benefit from the changes in consumption and leisure habits adopted by society during the pandemic, resulting in gains by both the Nasdaq technology index and the S&P500[26] (of a more general nature but with an increasing weight[27] of this type of company) in the year of 12.8% and 16.1%, respectively. The Dow Jones index, which has a greater weight of industrial and financial companies from the traditional

[22] The US economy grew 6.4% year-on-year in the first quarter of 2021 supported by the recovery in consumption and the government's US$1.9 trillion fiscal stimulus plan.

[23] The US indices accumulated increases in the second quarter that ranged between 4.6% for the Dow Jones and 9.5% for the Nasdaq, which extended in the first half of July with additional rises of between 0.3% and 1.5%. In contrast, the European indices presented gains in the second quarter that ranged from 1.8% for the Italian Mib 30 and 7.3% for the French Cac 40, which reversed in July (with the exception of the German Dax 30), when they saw drops of between 0.2% for the European Eurostoxx 50 and 3.3% for the Ibex 35.

[24] The US economy continues to benefit from the third rescue package released since the pandemic started, which was approved in March and includes a fiscal stimulus plan valued at US$1.9 trillion.

[25] The shares of the main US technology companies, known as FAANG (Facebook, Apple, Amazon, Netflix and Google) posted gains of 18.1%, 12.1%, 11.2%, 1.3% and 18.4% respectively in the second quarter, with figures of 17%, 21.6%,17.4%, 4.1% and 23.2% in July. In the year to date, accumulated gains stand at 26.1%, 11.9%, 11.5%, 0.4% and 44.9%, respectively.

[26] The Nasdaq and S&P 500 indices grew by 43.6% and 16.3% in 2020, respectively.

[27] The weight of technology companies represents 26.2% of the capitalisation of this index, its highest proportion in history. Of the top 10 companies by weighting in this index, eight are technology companies and account for almost 25% of the total.

economy, rose by a substantial 14.3% in the same period, boosted by the economic recovery.[28]

Most of the main European stock market indices showed notable increases[29] in the second quarter, continuing the upward trend of the two previous quarters, although in almost all cases slight falls were observed in the first half of July. The gains made by the European markets so far this year are similar to those made by the US markets, although the economic cycle in Europe is lagging the United States as expectations of recovery are being factored in with a certain delay. Likewise, all markets saw a better performance from cyclical companies – such as the commodities, industrials and consumer sectors – and banks showed an improved relative performance, as they are best placed in terms of recovery and value generation.

- In Spain, the Ibex 35 fell 0.6% between April and July, reducing the accumulated gains in the year to 5.6% (between one half and a third of those accumulated by the main stock market indices in the euro area). Thus, the markets had shown notable increases until June, when there was a fall of 3.6%. This situation worsened in the first half of July when prices fell by an additional 3.3% after the travel restrictions established by the different European regions to the main tourist areas of the country were extended. The tourism sector and the services sector in general were the hardest hit in the last quarter, but the falls in the energy sector also stand out – reflecting the impact of all the regulatory changes, which could increase costs. There have also been losses in the consumer goods sector (on fears that new restrictions could have a negative impact on demand for these goods), the technology sector (due to its high dependency on tourism (Amadeus)), capital goods (due to the slowdown in investment) and renewable energies (where there have been adjustments in the growth outlook). On a positive note, banks, real estate firms, commodity companies and the telecommunications sector continue to perform well.

- The rise in quoted prices in the quarter, together with a somewhat stronger increase in corporate earnings expected in the coming months, caused the price-earnings ratio (PER) of the Ibex 35 to decrease from 17.4[30] in mid-April to 16.6 in July, its lowest level in the past year, while its historical average is 13.6 (see Figure 4).

- The international debt markets, where yields had risen in the longer-dated segments of the curve during the first quarter of the year due to rising inflation[31] and inflation expectations,[32] looked to the performance of prices[33] in the second quarter to assess whether these increases could be indicative of a premature tightening of monetary policy. Thus, the messages sent out by the president of the ECB, indicating that the monetary

[28] US GDP grew by 6.4% in the first quarter of 2021 year-on-year and both the Federal Reserve and the International Monetary Fund (IMF) indicate that it could rise 7% or more in 2021.

[29] All European indices rose in the second quarter: the euro area's Eurostoxx 50 by 3.7%, Germany's Dax 30 by 3.5%, France's Cac 40 by 7.3%, Italy's Mib 30 by 1.8% and Spain's Ibex 35 by 2.8%. Except in the case of the German Dax 30, which gained an additional 0.6% in July, all indices fell in the first 15 days of July, accumulating gains in the year to date of 14.2%, 13.9%, 17%, 11.9% and 5.6%, respectively.

[30] In the same period, the PER ratio of the US S&P 500 stock index fell to 21.6 times, while that of the European Eurostoxx 50 decreased to 16.8 times.

[31] US inflation stood at 5.4% year-on-year in June, its highest rate since the summer of 2008. In the euro area, inflation in Germany also reached 2.4% year-on-year in June, lower than the figure of 2.5% in May when it reached its highest level since 2011, while in Spain it remained at 2.7% year-on-year, its highest value since 2017.

[32] The increase in inflation expectations is a consequence of the strong growth in money supply in recent years and the impact of the programmes to expand public spending. The main central banks (Federal Reserve, ECB, Bank of England and Bank of Japan, among others) have implemented extensive monetary stimulus programmes in recent years.

[33] The heads of the main central banks have indicated that the increase in inflation will be temporary.

authority will continue to buy debt[34] at a "significantly higher" rate than in the early months of the year to support economic recovery led to these rate increases to ease. Subsequently, the announcement at the beginning of July of a change in the ECB's strategy to relax its inflation target translated into further rate cuts along the entire curve, which were more notable in the longer terms given the outlook that its monetary policy would remain accommodative for an extended period of time. Meanwhile, the Federal Reserve kept its debt purchases at US$120 billion per month and indicated that the economy would have to make "substantial further progress" before the extraordinary monetary support could be reduced, and that there are still uncertainties that could affect the global recovery.

- In this context, Spanish public debt yields, as well as those of the main European economies,[35] showed slight decreases in mid-July in the longest-dated terms of the curve, with 10-year interest rates below the levels at which they ended the first quarter. Thus, 10-year public debt yields remained negative in Germany, the Netherlands, Austria, Finland and Belgium; at values close to zero in France and Ireland and at around 0.3% in Spain and Portugal, while in Italy and Greece they stood at values close to 0.7%.

- Small falls in corporate debt yields were also observed in most sections of the curve,[36] although they are mostly concentrated in the shorter sections. Although yields are more dispersed depending on their rating and level of subordination, they also remain at low levels due to the search for yield phenomenon, which puts downward pressure on yields in the absence of returns from risk-free assets.

- Although the change in the ECB's inflation strategy suggests that interest rates in the euro area will remain at very low levels for a very long period of time, the market risk of debt assets remains high, particularly in the case of lower-rated high yield corporate debt and subordinated debt due to its generally lower liquidity and the fact that it is not directly supported by the ECB's buyout programmes. Likewise, the effects of the pandemic could have significantly weakened the financial structure of some companies, so the performance of the premiums required will largely depend on the evolution of the economic recovery and their own business activity. In this context, companies that are finding it harder to recover, as well as those with higher leverage and other financial vulnerabilities could experience problems obtaining funding at a reasonable cost. A similar situation could emerge in the most vulnerable economies and those with greater fiscal imbalances due to the strong recourse to debt to address the increase in public spending deriving from the pandemic in a context of falling tax revenues.

  Based on the above, the risk of a fall in the prices of some assets as a consequence of an eventual rebound in their risk premiums must be taken into account. This is significant in certain portfolios of funds – especially fixed income – which are sometimes exposed to illiquid assets,[37] are complex and have credit ratings that are lower than investment grade.

[34] The ECB's asset purchase programme (APP) had assets amounting to over €3.01 trillion at the end of June, including public debt (€2.42 trillion), corporate debt (€285 billion), covered bonds (€293 billion) and securitisations (€28.30 billion). The €1.23 trillion accumulated on the same date by the pandemic emergency purchase programme (PEPP) must be added to this amount. Purchases with data to the end of May were distributed between public debt (€1.06 trillion), commercial paper (€4.6 billion), corporate bonds (€31 billion) and covered bonds (€4 billion).

[35] US 10-year rates fell by around 45 bp between the end of March and mid-July.

[36] Corporate debt yields present greater dispersion depending on the type of asset (senior or subordinated debt), its credit rating and whether or not it is eligible for purchase by the ECB.

[37] The abundant purchases of corporate debt and some types of debt issued by financial institutions in both the primary and secondary markets by the ECB could be affecting the liquidity of issues with smaller volumes or whose ownership is concentrated in a limited number of investors.

Credit risk: green

- The outlook for the recovery of the Spanish economy, coupled with the continued support from the ECB, caused the sovereign risk premium to remain relatively stable in the quarter, while the premiums of Spanish private sector issuers once again marked a downward trend. Thus, the value of the former, measured as the difference between the yield on 10-year public debt in Spain[38] and Germany, reached 64 bp in mid-July, standing at a level similar to that seen at the end of the previous quarter and the beginning of the year (see Figure 11).

- Risk premiums in the sub-sectors of the economy continued to decline and the decreases were somewhat larger for financial institutions. Financial institutions are being boosted by the economic recovery and the growth in commercial activity, which should mitigate the expected increase in non-performing loans, as well as by the continuation of the ECB's favourable financing conditions.[39] The risk premiums of non-financial companies are clearly benefiting from the improved outlook for business performance, as well as from their financial expenses remaining low.[40] Thus, the average CDS of banks in mid-July stood at 61 bp, below the figure of 67 bp at which they started April, while the average CDS for non-financial companies stood at 53 bp, barely 5 bp lower.

- The information available on credit ratings of Spanish issuers reflects very few significant changes in credit risk. Thus, most Spanish debt[41] is high quality, since it belongs to the investment grade group (96.4% of the total outstanding balance) and, while the proportion of investment grade debt one notch above the high yield segment is still low, it has increased slightly compared to previous quarters (5.2% of total debt in March 2021 compared to 4.4% in December 2020).

  However, some circumstances must be taken into account when looking at the credit levels of Spanish issuers: i) the ECB's purchase programmes largely explain the small size of the risk premiums of all issuers in the euro area, including Spanish issuers, who are the object of these purchases; ii) the risk premiums of high yield issuers are also indirectly reduced as a result of investors seeking returns in the absence of profitable low-risk alternatives; iii) the ratings and risk premiums analysed correspond mostly to large or medium-sized companies that have either been less affected by the current crisis or have more financial muscle to deal with it. Further, support measures implemented by the authorities, such as public guarantees, moratoriums or direct aid, have so far prevented a significant increase in the financial problems of many companies, especially SMEs, but it is likely that in many cases these will worsen in the near future as the measures are withdrawn. Therefore, we see increasing credit risk in the coming months that could force many companies to carry out financial restructuring processes,[42] especially smaller companies or those belonging to the sectors most affected by the pandemic.

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[38] The ECB acquires Spanish public debt through its PSPP and PEPP asset purchase programmes, accumulating a balance of more than €424 billion, over 40% of the outstanding balance of long-term government debt.

[39] These include the different financing programmes for banks (TLTRO-III and PELTRO), as well as specific asset purchase programmes for assets issued by financial institutions. The ECB, through its latest covered bond purchase programme (CBPP3) and the asset backed securities purchasing programme (ABSPP), had accumulated purchases up to mid-July of €293.09 billion and €28.28 billion respectively, of which more than 36% and 54% respectively were carried out in the primary market. At the end of May the ECB had also accumulated covered bonds for €4.06 billion, acquired under the PEPP programme.

[40] The positive effect of the ECB's purchasing programmes contributes to this. The authority, through its corporate sector purchase programme (CSPP), which has been extended to all issuers that meet the conditions of the programme (minimum rating of BBB-), accumulated purchases of €285.37 billion by mid-July, of which more than 22% was acquired in the primary market. In addition, at the end of May it had accumulated corporate bonds and promissory notes amounting to €31.01 billion and €4.59 billion respectively, acquired under the PEPP programme.

[41] Includes debt of public administrations.

[42] A growing number of companies have requested financial support from the Solvency Support Fund for Strategic Companies, the objective of which is to provide temporary public support to strengthen the business solvency of non-financial companies affected by the pandemic.

- Financing extended to non-financial sectors[43] of the economy continued to slow as growth in loans to households was insufficient to offset the slowdown in business financing, which is at its lowest level since the outbreak of the pandemic. The former grew by 0.2% in May, the highest value seen in the past 12 months, due to the recovery of consumer credit (from -2.6% in March to 3.1% in May) and credit for home purchases (up 0.1% in May, the first positive year-on-year value in recent years). In the case of non-financial companies, the increase in total financing slowed to 1.3%, as the strong growth in funding via debt assets (12.5%) was offset by the slower growth in foreign loans (from 3.5% in March to 2.6% in May) and due to the fall in credit extended to companies (from 6.6% in March to 2.2% in May, the largest decline since first quarter of 2019).

Liquidity, financing and fragmentation risk: yellow

- Despite the abundant market liquidity, the fixed income issues of Spanish issuers registered with the CNMV decreased in the first half of this year as large issuers took advantage of the previous year to obtain liquidity under good conditions and many of the current issues are refinancing transactions. Specifically, fixed income debt issues registered with the CNMV in the second quarter totalled €24.64 billion,[44] 31.3% less that those made in the same period of 2020 (€35.88 billion), with the volume of covered bonds and regional covered bond issues standing out.[45] Likewise, debt issues made in the first six months stood at €48.18 billion, 14.9% lower than in 2020. Issues made by companies abroad grew by 4.9% year-on-year to May[46] (€48.56 billion), with the issuance of commercial paper representing 49% of the total. In the equity market, the listing process of the insurance company Línea Directa took place, in addition to a public offering and an IPO for the renewable energy companies Grupo Ecoener and Acciona Energía,[47] respectively. The planned offerings for the renewable energy company Opdenergy and logistics firm Primafrio were cancelled.

  In the primary markets, the strong growth in fixed income issues made by Spanish issuers that can be considered green, social or sustainable stands out. These issues totalled €14.75 billion in the first half of 2021, 50% more than the volume issued in the same period of 2020.[48, 49] These issues, which include those made by public administrations, are mostly carried out abroad: on average, between 2016 and 2021, 71% were made in foreign markets. Most of these bonds are considered green bonds and while the issuance of social and sustainable bonds is less prevalent, the proportion of these types of bonds has increased in recent years. In the first half of 2021, 62% of the bonds issued were green bonds, 27% were sustainable bonds and 11% were social bonds. There is a growing number of issuers of this type of bonds, primarily private sector entities, which account for three-quarters of the issues.[50] These private sector issues, which represented close to

[43] Source: Economic indicators of the Bank of Spain.

[44] Preliminary data for the first half of July show that in this period there were issues amounting to €14.54 billion, mostly concentrated in regional covered bonds and securitisation bonds.

[45] Issues of covered bonds and regional covered bonds represented more than half of the issues registered in the quarter.

[46] In 2021, issues registered with the CNMV exceeded those registered abroad, reversing the trend observed in 2020.

[47] Línea Directa, Grupo Ecoener and Acciona Energía went public on 29 April, 4 May and 1 July, respectively.

[48] Data source: Dealogic. Green bonds are bonds that are used exclusively for the full or partial financing or refinancing of a combination of new or existing green projects, and which are aligned with the four components of the Green Bond Principles (GBP). Social bonds are intended for new or existing social projects and aligned with the four components of the Social Bonds Principles (SBP); while sustainable bonds are used exclusively for financing or refinancing a combination of green and social projects.

[49] These issues have increased most significantly since 2018: in 2014, €1.74 billion of these bonds were issued compared to €3.5 billion in 2016, €6.32 billion in 2018 and €15.10 billion in 2020.

[50] 46% for non-financial companies and 29% for financial institutions.

7% of total long-term issues in 2020, could rise to a significantly higher percentage in 2021.

- The financing capacity of the Spanish economy reached €1 billion in April,[51] compared with the financing requirement of €900 million registered in the same period of 2020. This increase was due both to the improvement of the balance of non-tourism goods and services, which reached €700 million and to the pick up in the balance of tourism, €200 million. The accumulated 12 month figure shows financing capacity of €12.9 billion (€27.8 billion to the same month of 2020). Further, the increase in assets (net) deriving from the financial account balance, excluding the Bank of Spain, was €9.4 billion in April (€50.3 billion in the last 12 months).

- Consolidated household and corporate debt reached 149.3% of GDP in the first quarter,[52] totalling €1.66 trillion, 3.1 pp above the debt level registered in the same period of 2020. Household debt accounted for 62.8% of GDP, while corporate debt stood at 86.6%. Household financial wealth increased by 5.4% year-on-year to €2.39 trillion, 214.7% of GDP, while in net terms it stood at €1.63 trillion, 147% of GDP and 25.2 pp higher than the same period of the previous year. The increase can be explained both by the growth in net financial assets, due to the recovery in equity asset prices, and by the decline in GDP.

- Average daily trading volumes on the continuous market stood at €1,472 million in the second quarter,[53] 15.7% down on same period of 2020, but slightly above the €1,465 million of the previous quarter. The fragmentation of the trading of Spanish shares, which was at an all-time high in the first quarter, decreased slightly, with a slight recovery in the market share of Spanish Stock Markets and Financial Trading (BME) (53.7% of trading subject to market rules) in relation to competing trading venues,[54] in a context of reduced volatility. Likewise, trading of Spanish shares carried out through systematic internalisers fell to around 6% of total trading, compared to almost 8% in the previous quarter and well below the 17% seen in the same quarter of 2020. The low levels of trading in the continuous market can be partly attributed to the decrease in volatility, which discourages some trading formats such as algorithmic or high-frequency trading, as well as increased competition from other competing trading venues.

- The Ibex 35 liquidity indicator (measured through the bid-ask spread), which had progressively improved from the second half of 2020, increased once again to reach values similar to pre-pandemic levels. The improvements in the liquidity indicator have been enhanced by the drop in volatility levels, but are hampered to some extent by the decrease in the volumes traded. The sovereign bond spread decreased[55] throughout most of the period thanks to the greater size of the ECB's purchases, which increase market liquidity. Although the range is very small in absolute terms (less than 1 bp), the size appears to be significant in relative terms in the current low rate environment (see Figure 15).

[51] According to Bank of Spain monthly advance balance of payments data.

[52] Source: Financial Accounts of the Spanish Economy published by the Bank of Spain.

[53] Preliminary data for July show that the average daily trading stood at €1.21 billion in the first half of the month, 16.2% less than in the same period of 2020.

[54] The market share of trading venues other than the home market amounted to 48.4% in the six months of the year, despite the context of relatively low volatility.

[55] Although the spread is decreasing in absolute terms, it remains stable in relative terms due to the drop in interest rates. Even so, it remains conditioned by the transaction costs of agents, which are still very significant in an environment of low interest rates.

- Interest rate differentials between loans to companies in Spain and in the euro area remained unchanged in May for loans of less than €1 million (-2 bp in March), while for those with higher values decreased to 18 bp (22 bp in May).

Risk of contagion: orange

- The correlation between the daily returns of the different types of Spanish assets has continued the downward trend seen from the high values seen in March last year (when the median of these correlations reached 0.75). Although it is still higher than the levels observed before the start of the health crisis, the median has fallen with respect to the end of April (0.23) and stood at 0.19 in mid-July, below the mean values for the whole of 2020 (0.42). The minimum values of these correlations have remained at the same levels as in April (around -0.40), which are close to pre-pandemic levels. Meanwhile, the maximum values, which had decreased until April, rose to 0.66 (0.53 at the beginning of May). Although the current downward trend is ongoing, mainly caused by fewer uncertainties associated with the COVID-19 crisis, the correlation between the different sectors has fluctuated since May. Thus, some equity sectors (especially the financial sector) and public debt saw rallies followed by falls and others saw falls followed by increases in the correlation of some equity sectors (e.g. between the financial sector and utilities companies). It should be noted that lower levels of correlation reduce the chances of contagion among different types of assets and favour the diversification of portfolios.

- With regard to movements in European public debt assets, a small decrease in the correlation between the performance of these assets has been observed since the end of April, although it remains high. The correlation between the Spanish sovereign bond yield and those of core European countries has remained stable at around 0.97 since mid-February, although in the first half of July there was a small decrease to 0.94. This was mainly due to the fall in the correlation between the Spanish sovereign bond yield and the French bond yield. Similarly, the correlation between the yield on the Spanish sovereign bond and that of the peripheral euro area countries showed a small decrease relative to the end of April (see Figure 32). This indicator reflected some fluctuations, moving from 0.87 at the end of April to 0.83 in mid-June, a value at which it currently remains, mainly driven by the decrease in the partial correlation indicator between the Spanish and Irish bonds.

Market risk: green

Figure 3. Stock market prices

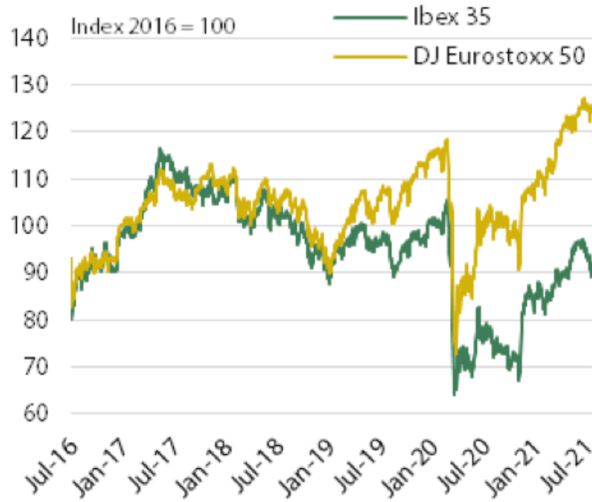
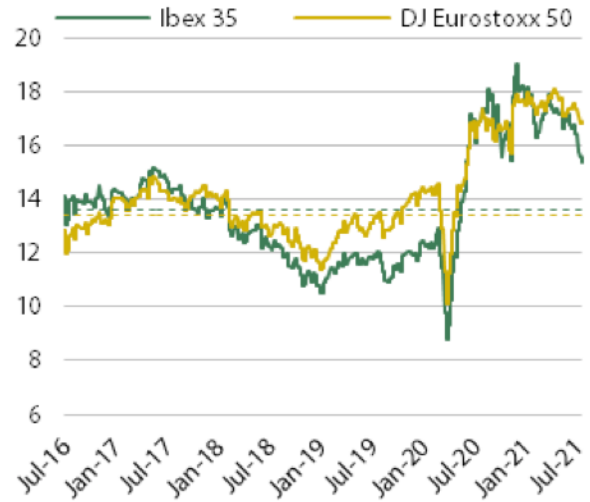


Figure 4. Price-earnings ratio (PER)



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

Figure 5. Short-term interest rates (3 months)

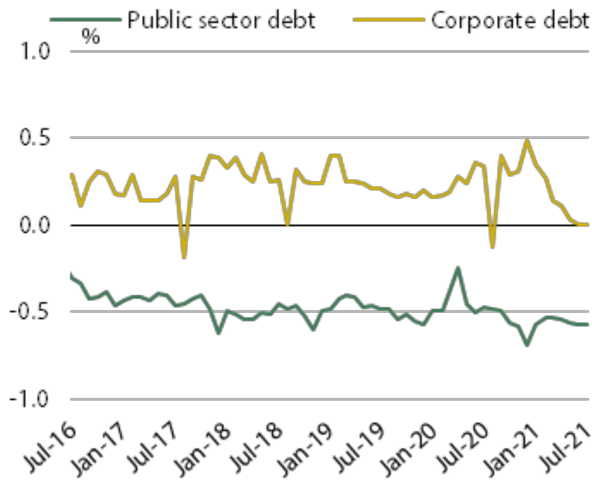


Figure 6. Long-term interest rates (10 years)

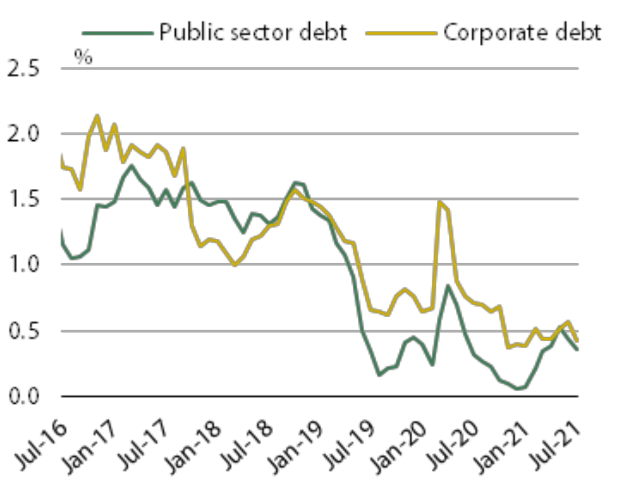


Figure 7. Oil price

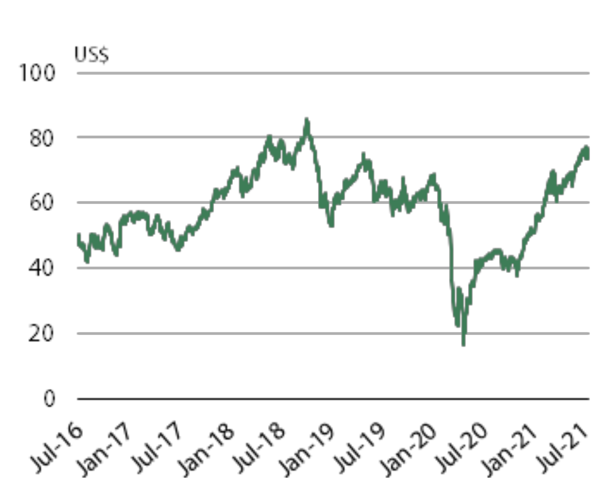
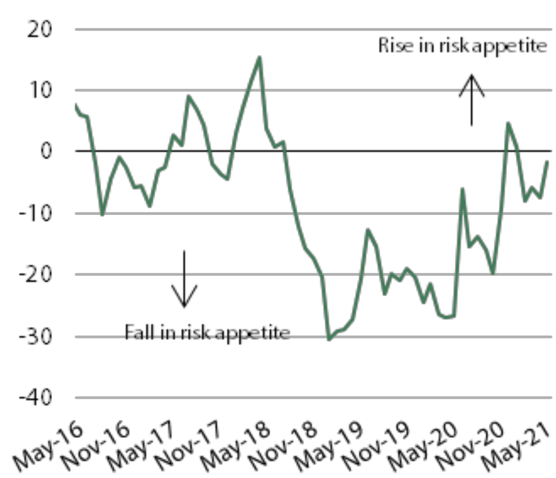


Figure 8. Risk appetite (State Street)



Credit risk: green

Figure 9. Financing of the non-financial sector

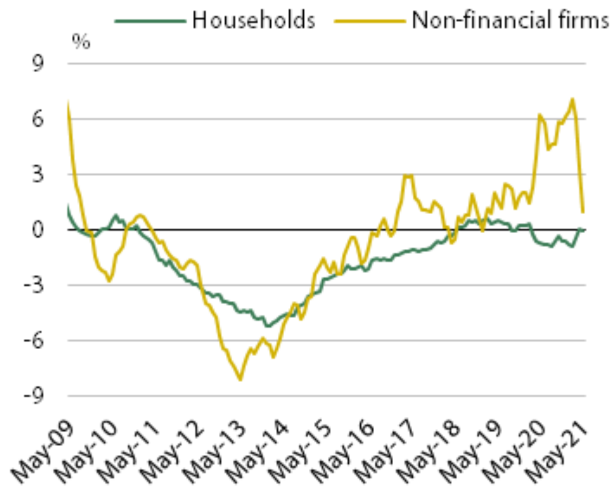


Figure 10. NPL (delinquency) ratio and unemployment rate

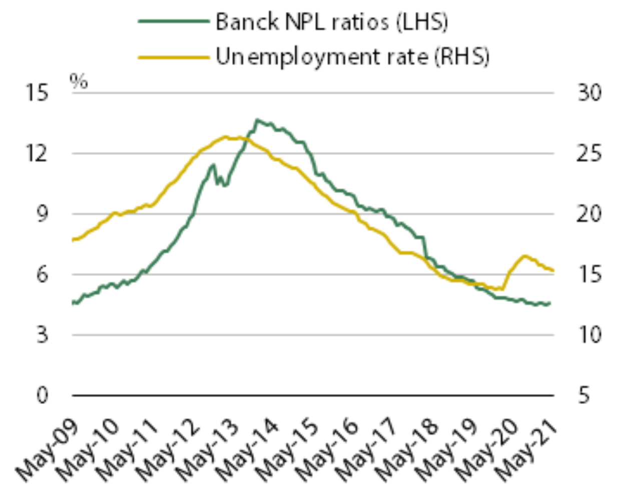


Figure 11. 10-year government debt risk premium (rate differential with Germany)

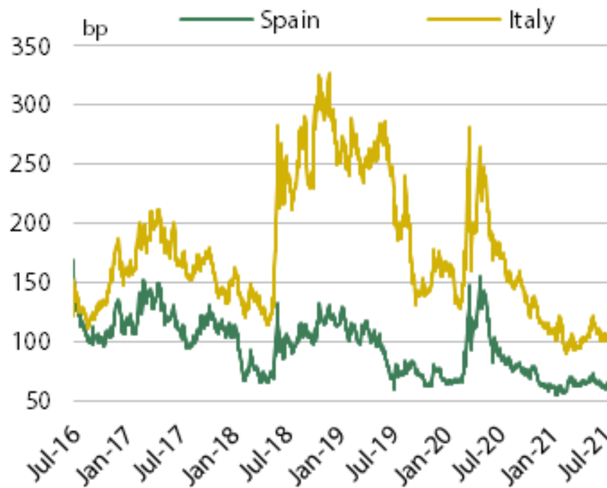


Figure 12. Private debt risk premium (5-year CDS)

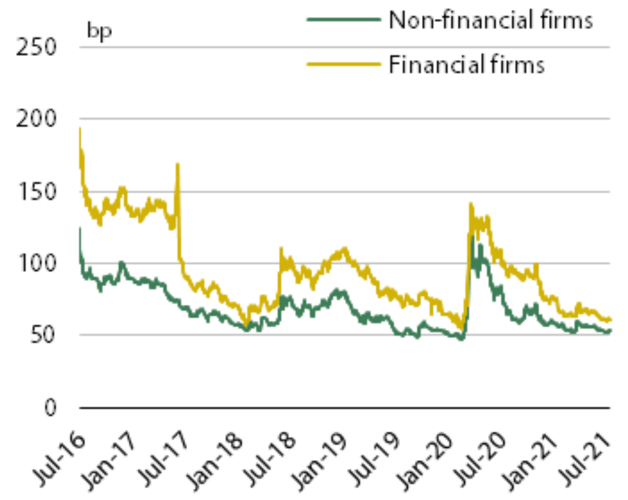


Figure 13. Housing prices (year-on-year change)

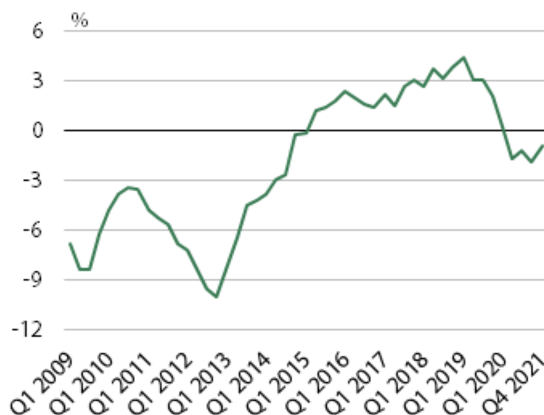
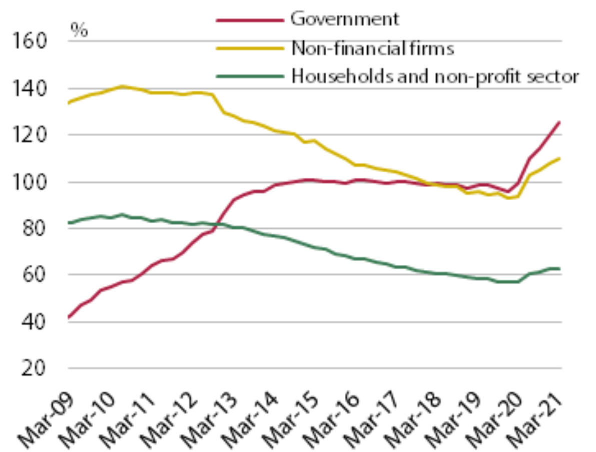
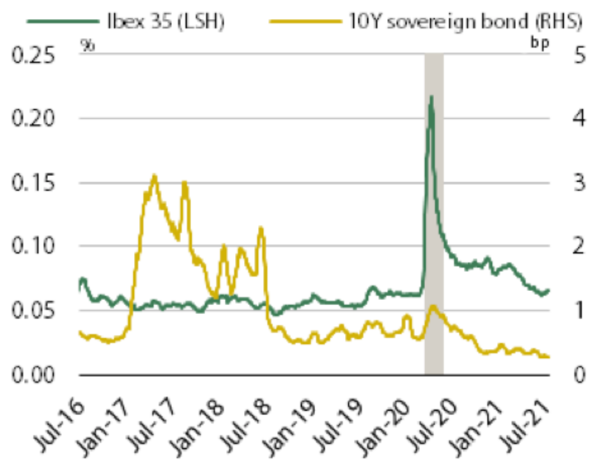


Figure 14. Indebtedness (% GDP)



Liquidity, financing and fragmentation risk: yellow

Figure 15. Liquidity (bid-ask spread)



The shaded area corresponds to periods when short-selling was banned.

Figure 16: Volatility (1-month moving average)

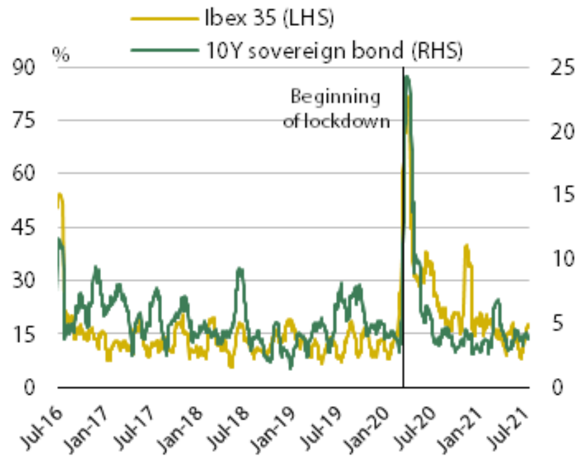


Figure 17. SIBE trading (1-month moving average)

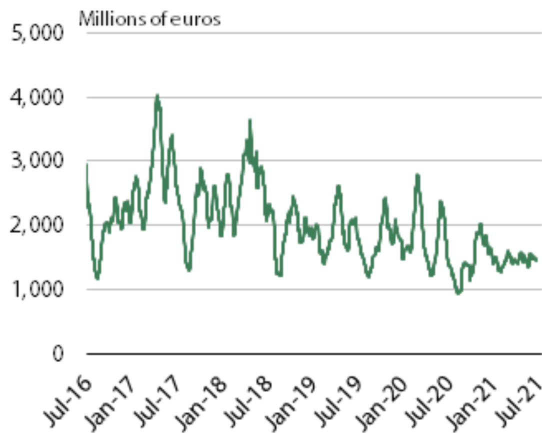


Figure 18. Interbank spread (LIBOR-OIS)

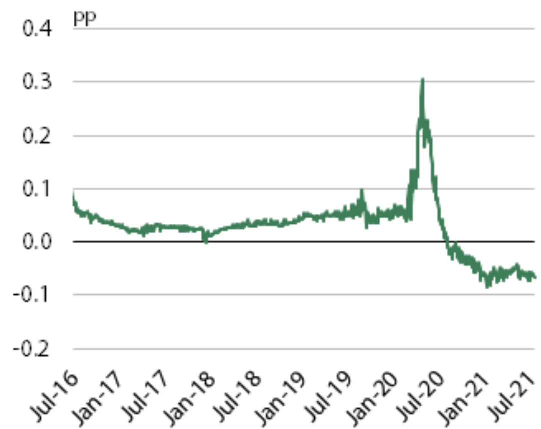


Figure 19. Spread (Spain-EMU) on corporate lending rates

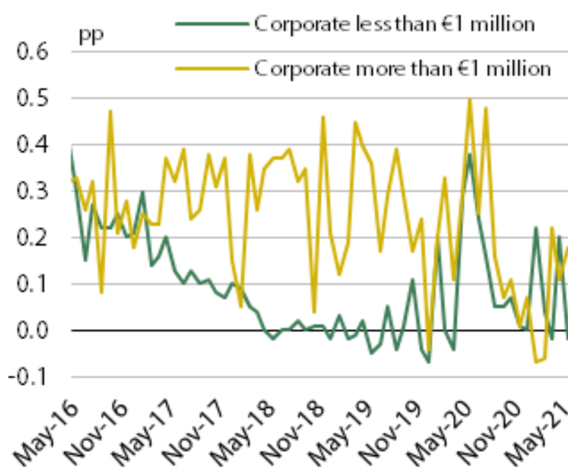
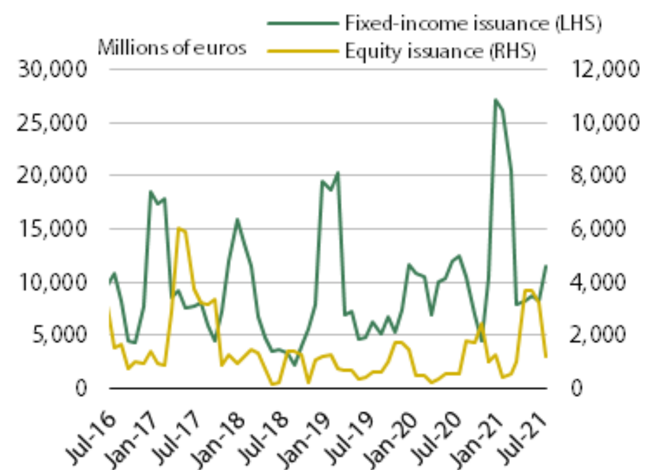


Figure 20. Issues (3-month moving average)



Macroeconomic risk: red

Figure 21. GDP (year-on-year change)

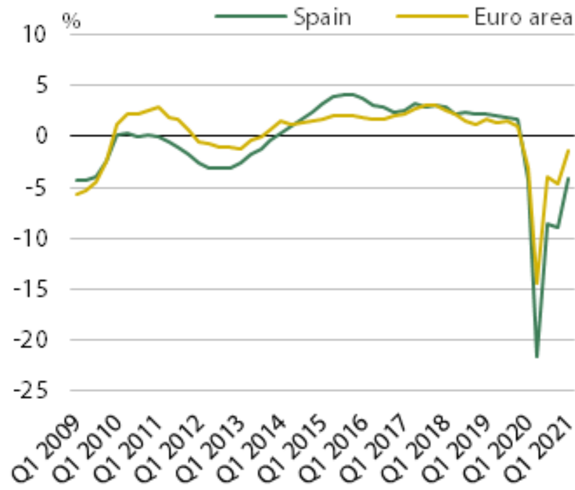


Figure 22. HCPI and core CPI (year-on-year change)

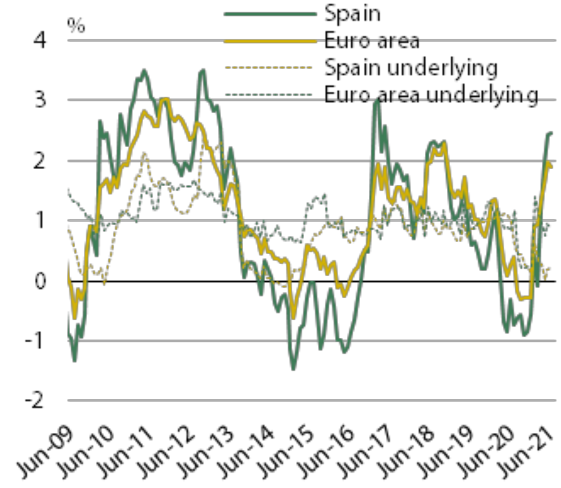


Figure 23. Employment (year-on-year change)

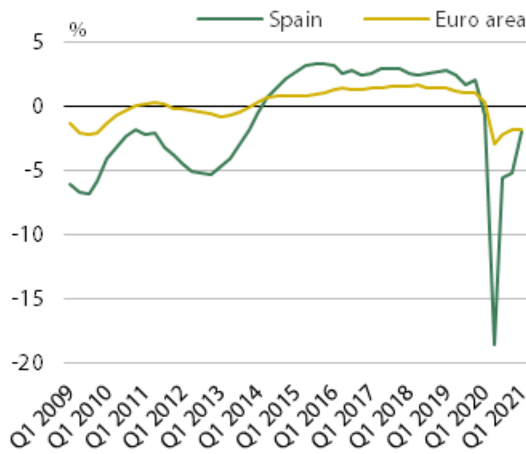
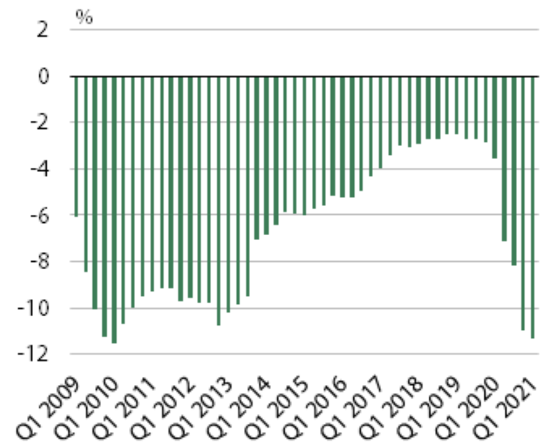


Figure 24. Public deficit (% GDP)



Cumulative data for four quarters.

Figure 25. Exchange rates

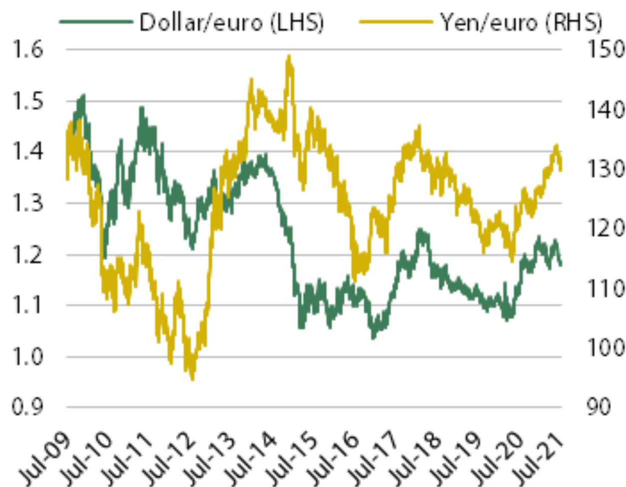
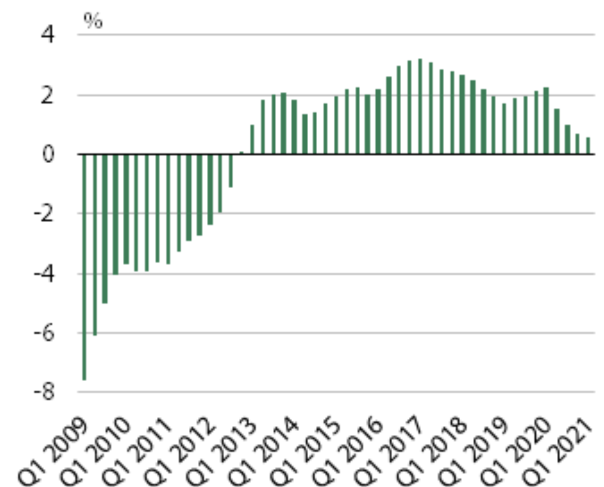
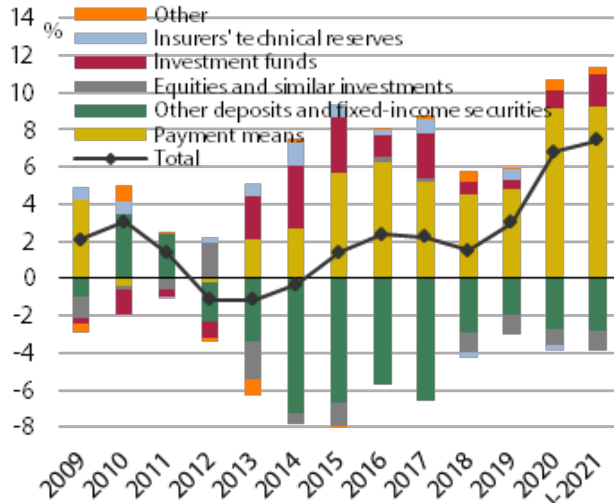


Figure 26. Current account balance (% GDP)



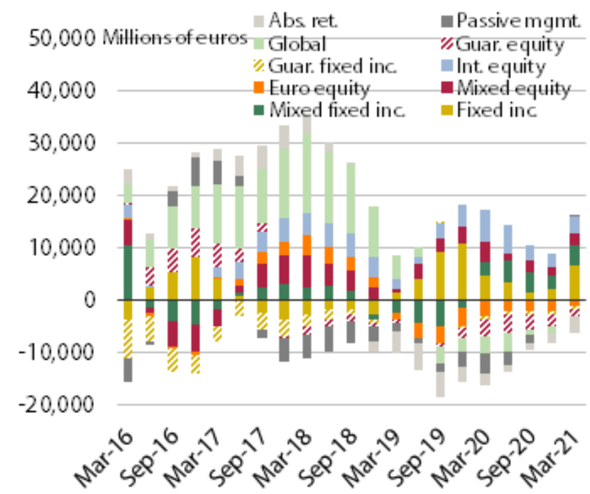
Investors

Figure 27. Households: net acquisition of financial assets (% GDP)



Cumulative data for four quarters.

Figure 28. Net subscriptions to investment funds



Cumulative data for four quarters (millions of euros).

Figure 29. Households: savings (% disposable income)

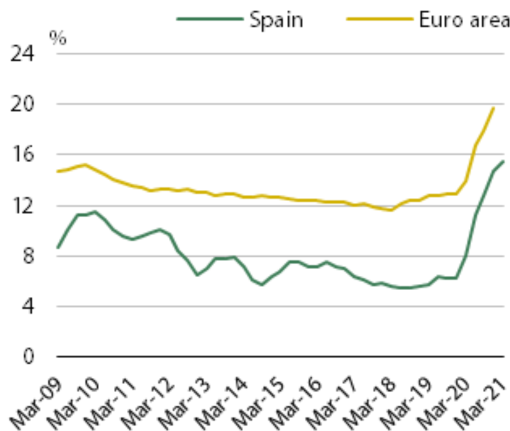
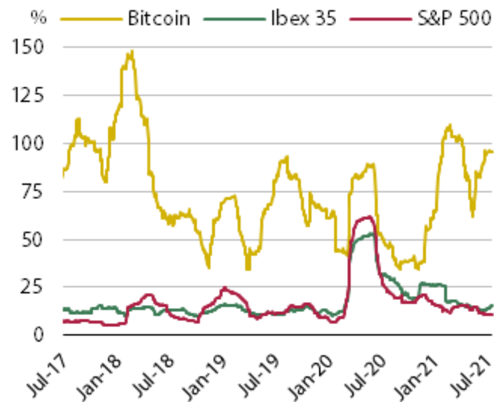


Figure 30. Bitcoin volatility



Risk of contagion: orange

Figure 31: Correlations among asset classes

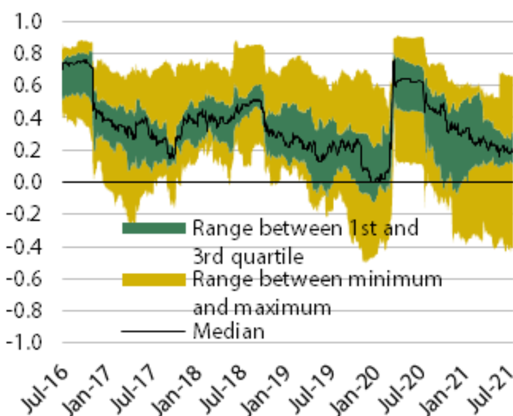
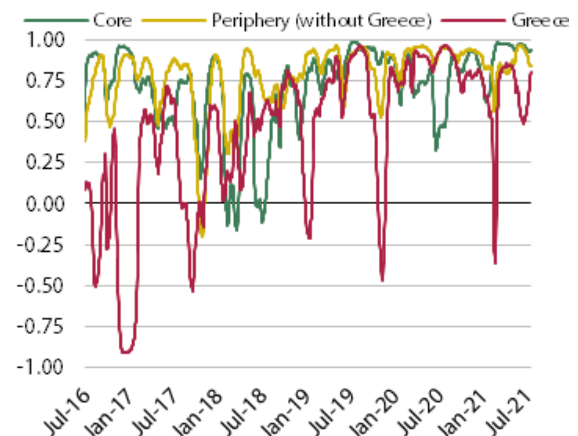


Figure 32. Correlation between the yield on Spanish and other European 10-year bonds



Heat map: Risk categories

Category	INDICATOR	Reference intervals[1]
MACRO RISK	**Macroeconomic risk**	
	GDP (% a.c.)	fixed_1t
	Unemp. rate (% active population)	fixed_1t
	CPI (% a.c.)	fixed_2t
	Public deficit (% GDP)	fixed_1t
	Public debt (% GDP)	fixed_1t
	Competitiveness indicator	fixed_2t
	Economic sentiment index	fixed_1t
MARKET RISK	**Market risk**	
	Ibex 35	p_3Y_2t
	Medium Caps Index	p_3Y_2t
	Small Caps Index	p_3Y_2t
	FTSE Latibex All-Share Index	p_3Y_2t
	P/E ratio Ibex 35	p_h_2t
	ST interest rate 3m public debt (%)	p_3Y_2t
	Interest rate 3m commercial paper (%)	p_3Y_2t
	LT interest rate 10Y public debt	p_3Y_2t
	LT 10Y private fixed-income interest rate (%)	p_3Y_2t
	Steepness of 10Y-1Y curve (bp)	fixed_1t
	Oil price (US$/barrel)	p_3Y_2t
	Gold price (US$, 31/12/1969 = 100)	p_3Y_2t
	Risk aversion indicator	fixed_2t
CREDIT RISK	**Credit risk**	
	Lending-households (% a.c.)	fixed_2t
	Lending-non-financial companies (% a.c.)	fixed_2t
	Property prices (% a.c.)	fixed_2t
	Risk premium sovereign debt bond (bp)	fixed_1t
	CDS sovereign debt bond (bp)	fixed_1t
	CDS non-financial sector (bp)	fixed_1t
	CDS financial sector (bp)	fixed_1t
	Changes standards credit supply (%)	fixed_2t
	Credit/deposits ratio	fixed_2t
	NPL ratio (%)	fixed_1t
LIQUIDITY AND FRAGMENTATION RISK	**Liquidity, financing and fragmentation risk**	
	Bid-ask spread Ibex 35 (%)	p_3Y_1t
	Volatility Ibex 35 (%)	p_3Y_1t
	Liquidity - LT public debt (%)	p_3Y_1t
	Trading SIBE (daily average, €M)	p_3Y_2t
	Interbank spread (LIBOR-OIS) 3m (bp)	p_3Y_1t
	Lending from the Eurosystem (€M)	fixed_1t
	Spr. Int. Rt. Bus. Cred. Sp-EMU, < 1m (%)	fixed_1t
	Spr. Int. Rt. Bus. Cred. Sp-EMU, > 1m (%)	fixed_1t
	Volatility public debt price (%)	p_3Y_1t
	Gross fixed-income issues (€M)	p_h_2t
	Equity issues (€M)	p_h_2t
	Correlation int. rate 10Y public-debt bond	
	with Euro bonds: Germ, Fr, Holl, Bel	corr_3m_2t
	with Euro bonds: It, Por, Gre, Ire	corr_3m_2t

Source: CNMV, Bloomberg and Refinitiv Datastream.

1 Reference intervals could be: i) "fixed": predetermined numerical tresholds, one (1t) or two-tailed (2t); ii) "corr_3m": 3 months windows correlation coefficients; 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.

2 Data until 15 July.

Explanatory notes

Spanish financial markets stress index (Figure 1): The stress index provides a measurement in real time of the systemic risk facing the Spanish financial system, ranging from between zero and 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 and the subsequent aggregation takes into account the correlation between segments, in such a way that the index places greater emphasis on stress situations in which correlations are very high. 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. These variables are good indicators of the presence of stress in the markets. Econometric estimates indicate that index values below 0.27 correspond to periods of low stress in the financial system, while scores 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 to propose 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 index, 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 Paper 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 release 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 some 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 some 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; rather it indicates a movement towards an extreme value (very high or very low) in the period or 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,[56] 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 illustrated in Figure 2. The colours of these aggregates (markets or risk categories) 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 calculate the aggregate is GDP. This means that until this is published, the macro-economic risk block is not given any colour in the map. For more detail 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.

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

Bitcoin historical volatility (Figure 30): Annualised standard deviation of daily price variations in 90-day windows.

Risk of contagion: The indicators that make up this block are of somewhat higher complexity. We set out the most important of these indicators below:

- Correlation between assets (Figure 31). 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 Spanish and other European 10-year bonds (Figure 32). 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.