CNMV
Comisión Nacional del Mercado de Valores

Financial Stability Note

No. 14 April 2020

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

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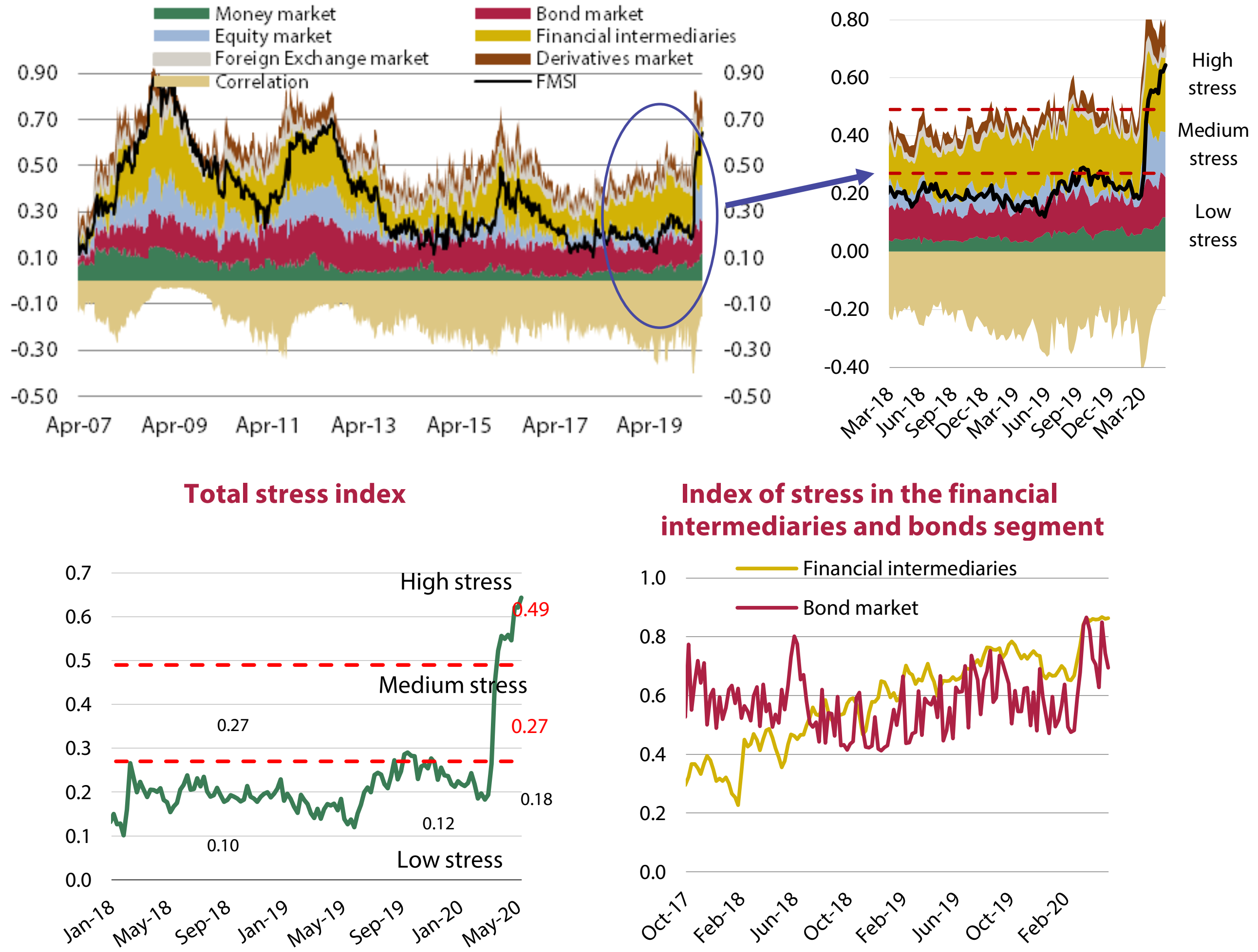
Summary

- ✓ Since the last stability note was published in February, the spread of the coronavirus has triggered an unprecedented crisis on a global scale. Moreover, the impact of the crisis is threefold: health, social and economic. This note describes the most significant trends observed in the financial markets in the past few weeks, paying special attention to the main sources of uncertainty and the risks identified in this context. The situation worsened in March when many governments adopted drastic lockdown measures, downward revisions to expectations of economic activity were made and the markets experienced severe turbulence. The Spanish financial markets stress indicator recorded the highest rebound in its history in a cumulative period of just a few weeks, reaching 0.65,[1] reaching its third highest level since 1999. All segments saw significant upturns, and there was also an increase in the degree of correlation among them.

Stress indicator of the Spanish financial markets FIGURE 1



Source: CNMV.

For more detail on the recent evolution of 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&lang=en. 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 Document No. 60 available at http://www.cnmv.es/DocPortal/Publicaciones/MONOGRAFIAS/Monografia_60_en.pdf.

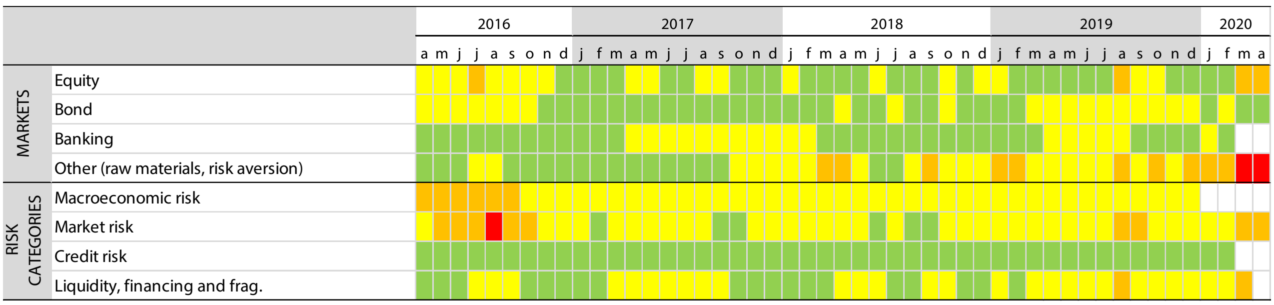
[1] The closing date of this note is 30 April, except for the stress indicator which includes 8 May, and certain other specific data.

- Spain's macroeconomic situation took a radical turn in March relative to the slightly slowing trend that had been observed in 2019. The isolation measures and the consequent freezing of much of the country's economic activity immediately led to significant increases in jobless figures and stoppages and risk of closure for many businesses. Leading institutions forecast GDP to contract this year by between 7% and 14%, the worst since records began, although these forecasts reflect a great deal of uncertainty, since they depend on numerous factors. These include how long the health crisis will last, how effective the measures taken by the government and the EU institutions will be, the speed and intensity with which activity will recover in key sectors such as tourism, and lastly the effects of possible changes in agents' patterns of consumption. One of the main economic challenges lies in adopting the necessary measures to alleviate the crisis while preserving the sustainability of public finances in the medium term.

- As we mentioned in the introduction to this note, the Spanish financial markets experienced severe turbulence in March, which eased in April. The equity markets saw very significant falls in prices and record increases in volatility, which ended up prompting restrictions on short selling, with other European jurisdictions following suit. In the debt markets there was pressure on risk premiums, which abated following the announcement of various measures by the European Central Bank (ECB). This turbulence gave rise to an increase in net redemptions of investment funds (estimated at just over 2% of assets on average in March-April, although certain types of funds were affected more than others and they were concentrated in March). These redemptions were carried out with no significant problems. In addition to keeping a special watch on managers with large exposures to relatively less liquid assets or to assets of lower credit quality, the CNMV is promoting the use of the various liquidity management tools available.

- The sources of risk existing in the current context are many and varied. In the political area, the most notable risk is the uncertainty regarding the lack of progress in trade-related matters and the difficulties in adopting a common European approach to the crisis. In the financial area, the main reasons for concern relate to liquidity and credit risk, including the possible consequences of any significant increase in the number of downgrades made by the credit rating agencies. Operational risk also takes on special relevance in this environment of increased remote working.

Heat map: Summary by markets 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 30 April.

Sources of risk

Macroeconomic environment

- At the end of 2019, Spain' s GDP had grown by 1.8% year-on-year, after increasing by 0.4% in the last quarter, the same figure as in the previous one. Preliminary data for the first quarter of 2020 indicate that the Spanish economy has already suffered the effects of the coronavirus crisis, contracting by 5.2% (4.1% year-on-year, see Figure 21). These quarterly data show household consumption plummeting by 7.5% (-6.7% year-on-year) and a decrease in investment (gross capital formation) of 5.3% (-5.5% year-on-year). Public spending increased by 1.8% between January and March, which represents a rise of 3.6% in the last four quarters, the largest since 2009.

  The forecasts of leading institutions for 2020 and 2021 are subject to a high level of uncertainty, since they depend on the evolution of numerous factors, notably the duration and rigour of the lockdown measures, the effectiveness of the measures implemented and the consequences of possible changes in patterns of consumption. For this reason, most institutions have tied their growth projections to different possible scenarios. For example, the Bank of Spain estimates that, depending on how the pandemic evolves and the impact of the corresponding measures,[2] GDP will fall this year by between 6.6% and 13.6%, while in 2021 it will recover by between 5.5% and 8.5%. In early May, the Spanish Confederation of Employers' Organisations (CEOE) presented its estimates, showing a contraction of the economy in excess of these figures.[3] The International Monetary Fund (IMF) published its forecasts in mid-April, taking as a reference a single scenario in which the pandemic is curbed in the second half of the year. In this context, the IMF estimates that the global economy will shrink by 3% this year, to grow in 2021 by 5.8%. In the case of Spain, the forecast for 2020 is -8.0% and 4.3% for 2021. These figures are slightly below the projections for the euro area, with an expected rate of contraction of 7.5% this year and of growth of 4.7% in 2021. The European Commission published its calculations in early May and its estimate for Spain in 2020 is -9.4% (-7.7% for the euro area), with growth of 7% in 2021. These values are very similar to those submitted by the Spanish government a few days earlier in the framework of the Stability Plan 2020-2021.

- Employment data for the first quarter of this year show a jobless rate of 14.4% (13.8% at the end of 2019), with a decrease of 285,600 in the number of people in employment.[4] These figures barely begin to reflect the job losses suffered by the Spanish economy and do not include the impact of furloughs.[5] At the end of March 578,300 people had been furloughed, with an increase of 563,000 in the last two weeks of the month alone. Initial labour market figures for April show that the number of unemployed workers registered with public employment offices increased by 282,000 compared with the previous month,

[2] In this report, published on 20 April, three possible scenarios are established: an 8-week lockdown with almost immediate normalisation, an 8-week lockdown with normalisation in the fourth quarter and a 12-week lockdown.

[3] In this case, the CEOE estimates a decrease of between 8% and 15.5%. The three scenarios considered (at the date of publication of its estimates, the government's plan for de-escalation in four phases and the estimated dates were already known) are the following: economic recovery in the third quarter, a re-emergence of the pandemic in the second half of the year with a relatively fast recovery and a scenario with a much harsher and longer shutdown period.

[4] Data from the EPA (Labour Force Survey).

[5] Furloughed workers are considered to be employed as long as the layoff is less than three months.

to end the month at 3.8 million unemployed, 8% more than one year previously. Records showed a 4% fall in the number of people making social security contributions to just under 18.4 million, while the number of furloughed workers totalled 3.5 million. Forecasts for the end of 2020 indicate that, depending on the different scenarios, the unemployment rate will be between 18.3% and 21.7%.[6]

- The leading inflation indicator for April shows an increase in prices during the month of 0.3%, which places the year-on-year inflation rate in negative ground, specifically at -0.7%. The goods and services referred to as the *special COVID-19 group*, which are those that are still being consumed during the lockdown,[7] have been analysed by the National Employment Institute (INE) individually, with the following results: the prices of goods belonging to this group have increased by 1.2% in 1 month (3.2% year-on-year, with the largest increase seen in fresh food, 6.9%), while services decreased by 1.4% (-4.3% year-on-year) as a consequence of the fall in the price of energy. With data to the end of March, a month in which prices fell by 0.4% from the previous month while remaining unchanged compared to the same month of 2019, it can be observed that the negative spread with the euro area as a whole (in terms of harmonised CPI) has widened slightly, from 0.3 percentage points (pp) in January and February to 0.6 pp in March. As regards core inflation, which excludes the most volatile elements (energy and fresh food), data for the first quarter of 2020 show a slight rebound in February and March, to 1.2% and 1.1% respectively, after five months at 1.0%.

- The year-end data for public sector finances show that the 2019 deficit remained below the 3% established in the Stability Pact, although it experienced a slight rebound of 0.3 pp, to 2.8% of GDP. Public debt stood at 95.5% of GDP, 2 pp less than the figure for September 2019 and year-end 2018. As regards 2020, data provided by the Ministry of Finance show that in the first two months of the year the deficit increased by 2.9% compared with the same period of 2019, to 11.2 billion euros.[8] Despite this increase, the central government deficit fell by 5.3% to 11.4 billion euros. Looking ahead to the end of the year, the increase in public spending and the sharp fall in revenues as a consequence of the COVID-19 crisis could lead to a public deficit of over 10% of GDP, according to the forecasts of leading institutions and organisations. For example, the CEOE puts the deficit at between 80 billion euros and 120 billion euros, a range of 7-11% of GDP. The Bank of Spain' s forecasts are similar and put this figure at between 7% and 11%, depending on the scenario applied, while the IMF estimate is 9.5%. Meanwhile, public debt could reach levels of between 110% and 120% of GDP.

- In relation to household financial decisions, the financial accounts data for year-end 2019 showed a prolongation of the trends observed since the beginning of the year, with a somewhat more conservative increase in investment in assets than in previous years, when households had shown a greater preference for relatively risky assets due to the context of low interest rates. Therefore, an increase was observed both in the household savings rate – which stood at 7.4% of disposable income at the end of 2019 compared with 5.9% in 2018 – and in the acquisition of financial assets, which reached 4.5% of GDP, net, the highest figure since 2007 (Figure 27). The breakdown of the acquisition of

[6] Specifically, the Bank of Spain estimates, for each of the possible scenarios, an end-of-year unemployment rate of 18.3%, 20.6% and 21.7%. The IMF forecast is 20.8%.

[7] The goods included in this special group are: food, beverages, tobacco products, household cleaning products, pet food and personal care products. Services relate to housing (rent, supplies, etc.), insurance, bank fees and funeral services.

[8] These data correspond to the combined deficit of the central government, the autonomous regional governments and the social security system. Therefore, they do not include the balance of local corporations or the amount of aid to financial institutions.

assets shows continuing divestment in term deposits and fixed income securities (-1.7% of GDP) and high volumes of investment in means of payment[9] (4.9% of GDP), although there were some differences in relation to the trends observed in previous years, which confirmed the somewhat more conservative nature of the portfolio. For example, although investment funds recorded net subscriptions in the year as a whole, these were concentrated in categories considered as low risk, particularly fixed income funds, which despite being the category with the poorest returns in 2019, saw net subscriptions of almost 10.7 billion euros.[10]

The start of the crisis in March this year led to a change in the pattern of investment in funds, which was manifested through an increase in redemptions. However, these were lower than the redemptions observed in other crisis periods. The first available data show, first of all, that between March and the third week of April, net outflows from investment funds were approximately 6 billion euros, around 2.1% of assets, with withdrawals made largely at the same time (basically in March) and in global and fixed income funds[11, 12] However, household deposits increased in March by more than 10 billion euros, to over 861 billion euros, 1.2% more than in the previous month and 5.3% more than a year earlier. In the coming months, the need for liquidity by households that are more financially vulnerable could lead to disinvestments in some assets, such as investment funds and equities. There could also be an increase in precautionary savings, as happened in the middle years of the financial crisis ten years ago.

Context of low interest rates

- The euro area monetary policy in the first part of the year was largely determined by the effects of the coronavirus crisis on the economy in general and interest rates in particular, with special attention given to trends in sovereign risk premiums. In this context, on top of the expansionary measures that remained in force (reduction of the marginal deposit facility rate to -0.50%, third round of financing to banks (TLTRO-III) with an extension of the term of the transactions from two years to three and net asset purchases of 20 billion euros a month since November), there were additional asset purchases of 120 billion euros to the end of the year and the relaxation of capital and liquidity rules for banks with the aim of establishing more favourable financing conditions for the real economy. Due to the scale of the challenge, in the second half of March the ECB announced its Pandemic Emergency Purchase Programme (PEPP), in an amount of 750 billion euros, the main objectives of which are to ensure the correct transmission of monetary policy and avoid a fragmentation of debt markets that could lead to an escalation in interest on the debt of those countries most affected by the spread of the coronavirus, ensuring that all sectors of the economy are able to benefit from favourable financial conditions and absorb the shock in an appropriate and uniform manner. In April, a new programme

[9] Cash and sight deposits.

[10] This was compatible with a group of investors who opted, especially in the final stretch of the year, for riskier categories of funds, such as global equities, which in the year as a whole saw inflows of more than 4 billion euros.

[11] It is important to note that more than 90% of these redemptions took place in March and that they gradually decreased over the course of April.

[12] In the context of the crisis, the CNMV's main work has been related to the liquidity of the assets in funds' portfolios and trends in redemptions by entity, maintaining permanent contact with fund management companies in order to monitor the situation and remind them of their obligations as well as the liquidity management tools available to them. In this regard, the CNMV has issued indications on the appropriateness in certain cases of valuation at bid prices or applying swing pricing schemes. In relation to the macroprudential tools available, it is worth noting the introduction, by virtue of Royal Decree-Law 11/2020 of 31 March adopting urgent complementary measures in the social and economic area to deal with COVID-19, of a new macroprudential tool consisting of the possibility of establishing prior notice periods for redemptions without adhering to the term, minimum amount and prior evidence requirements in the management regulations, which are ordinarily applicable. These terms can be established by the manager or by the CNMV itself. For more details on the CNMV's measures relating to CISs during the crisis, see exhibit "Actions of the CNMV in the face of the COVID-19 crisis" published in the *CNMV Bulletin* for the first quarter of this year.

called PELTRO[13] was added. This will consist of seven long-term refinancing transactions for banks and will provide them with abundant liquidity at a cost of -25 basis points (bp), allowing them to grant loans to businesses and households. These measures have kept interest rates at low levels in all segments of the yield curve in Spain and even at negative values up to three years, a circumstance that has enabled short-term corporate rates to be contained at low levels. The US the Federal Reserve has followed a similar policy, including two successive rate cuts to the range of 0-0.25%, in addition to asset purchase programmes and liquidity facilities for businesses and households.[14]

- In this environment, some of risks that have been discussed in previous notes remain in place and have even intensified: search-for-yield strategies will persist, and in the current context these can be especially risky since they may include assets with relatively poor credit quality, which could suffer additional downgrades in their ratings, high volatility and deterioration of liquidity. Meanwhile, the banking sector will continue to find it difficult to maintain its margins and, consequently, its profitability, which will be an incentive to take greater risks in search of higher returns. However, the low level of interest rates also mitigates some of the perceived risks by positively influencing the trend in delinquencies and, in general, lowering the cost of financing for indebted agents.

Sources of political uncertainty

- In Europe, Brexit has been one of the leading sources of political uncertainty for more than three years, and it finally took place on 31 January. Although the most important risk – the United Kingdom's withdrawal from the European Union (EU) without an agreement – had in principle been avoided, there is still uncertainty regarding the framework that will govern the relationship between the UK and the EU after 31 December 2020 when the transition period expires. By then, a new treaty should have been drawn up to regulate the future framework of trade and economic relations between the UK and the EU.[15] Negotiations in this regard, which already had tight deadlines, were postponed in view of the coronavirus crisis and resumed remotely in mid-April. The EU considers it essential not to jeopardise the single market and to reach an agreement that provides a "level playing field", in other words that ensures there are a number of conditions to prevent unfair competition. For example, it aims for example to prevent the UK from setting lower minimum environmental or tax standards than the EU that could provide incentives for EU companies to change location.

  Currently, there are large differences of opinion on key issues such as fishing, judicial and police cooperation in criminal matters and competition and unfair practices. Furthermore, the UK prefers to negotiate trade agreements by sector as opposed to a single comprehensive agreement. The lack of progress, the acknowledgement of serious divergences between the parties and the UK's refusal to countenance the possibility of an extension to the transition period (although the EU has not formally requested this, nor does it appear that it will), could translate into a disorderly departure by the UK, which would end up trading with the EU under WTO rules. Meanwhile, the transition period

[13] Pandemic Emergency Longer-Term Refinancing Operations.

[14] The asset purchase programme, which was initially for the amount of US$700 billion and included public debt and mortgage-backed assets, was expanded to an unlimited volumes and any amount that may prove necessary to keep the markets working normally and ensure the effective implementation of monetary policy. In addition, the institution announced an extraordinary injection of liquidity worth US$2.3 trillion for households and small businesses.

[15] In practice negotiations on the future treaty must be concluded by around November, as the agreement will need to be ratified in Parliament. There is the possibility of extending the transition period, although this can only be done if requested before 1 July 2020, which seems unlikely in view of the statements issued by the British government.

and the progress of negotiations in the midst of a pandemic are sources of uncertainty that could fuel turbulence in the financial markets.[16] In addition, the fact that the negotiations are being conducted in such a shifting crisis environment, which affects important aspects such as trade and the movement of people, represents an added risk. At the same time as the negotiations with the EU are taking place, the UK and the US have started parallel negotiations aimed at reaching a future trade agreement, which will probably influence the UK' s negotiations with the EU.

- One of the debates arising as a result of the coronavirus crisis within the EU relates to the suitability of a coordinated and unified response by EU member countries to mitigate the economic impact of the pandemic. Over several weeks, numerous forms of mitigating the economic crisis have been proposed, which have created tensions among member countries. An example of this was the debate about the possibility of issuing eurobonds (popularly known as "coronabonds") to finance the fight against the virus and its economic ramifications. The bonds would be joint EU public debt securities, which would alleviate the pressure on the countries most affected and, in general, the most highly indebted. These countries would be able to raise funds more cheaply, as they would be decoupled from individual country risk premiums. In this case, countries such as Spain, France and Italy were in favour of the measure, whereas others such as the Netherlands, Germany, Austria and Finland were opposed to it.

  In mid-April, an agreement was reached whereby the EU will mobilise more than 500 billion euros to address the economic crisis caused by the virus. Funds will be provided to governments in three ways: 240 billion euros through the European Stability Mechanism (ESM), 200 billion euros through the European Investment Bank (EIB) to support SMEs and 100 billion euros to combat unemployment through the European Commission.[17] While the crisis lasts, no conditions will be required for the funds provided by the ESM, if they are used for medical and prevention expenses. The conditions attaching to the use of these funds were the main point of contention, since in previous crises conditions were required to access similar mechanisms.[18] This stimulus package is in addition to the activation, at the end of March, of the general escape clause of the Stability and Growth Pact, whereby the deficit and debt control rules are temporarily suspended, and to the debt purchase programmes of the ECB, which have mobilised close to a trillion euros.[19] Even so, approval of additional measures to reactivate the economy may lead to fresh divergences between EU member states, as occurred with the proposed reconstruction fund.

- In regard to the trade war between the US and China, one of the uncertainties that has weighed most heavily on the world economy in recent years, progress appeared to have been made in January with the signing of the first phase of the trade agreement between

[16] In Spain, the CNMV has opened a new section on its website called "After Brexit: questions relating to the financial sector", which contains information that may be useful to market participants and investors.

[17] Loans will be granted to the countries most affected by COVID-19 to help finance measures to prevent layoffs caused by the pandemic. This initiative is known as SURE and, in the case of Spain, it will essentially go towards paying for furloughs (ERTE), although it could also be used for support measures for self-employed workers. However, key aspects of these loans have yet to be established, such as interest rates and terms.

[18] The ESM loans, known as Pandemic Crisis Support, are limited to 2% of the requesting member state's GDP for 2019. For Spain this would mean approximately 25 billion euros.

[19] In early May the German Constitutional Court ruled against the use of the ECB's Public Sector Purchase Programme (PSPP) and prohibited the Bundesbank from taking further part in the scheme until the ECB has proved that this will not have a disproportionate impact on fiscal policy (it has three months in which to do so). However, in 2018, the CJEU ruled that debt purchases were in line with the ECB's mandate and in any case this ruling should not affect the extraordinary purchasing programme designed in response to the coronavirus.

the two powers. However, the current health crisis has led to a distancing and a rise in hostilities between the two powers, which have jeopardised these advances. In fact, the US has announced that there will be significant consequences if China does not comply with the commitments to purchase US products established in the agreement reached in January.[20]

- Turning to Spain, the most notable risks relate to the economic management of the health crisis and the difficulty of reaching agreements. The high degree of parliamentary fragmentation could delay and possibly even prevent the adoption of certain measures to deal with the crisis and, consequently, intensify the uncertainty existing in the financial markets.

Other sources of uncertainty

- Cybersecurity has become a key aspect for organisations and companies, as the risk of cyber attacks is ever increasing and can have very harmful consequences. Prevention of this operational risk was already important in the pre-crisis context, and with the COVID-19 pandemic it has become even more important, if anything, given the significant increase in activities carried out remotely, and, in particular, teleworking (working from home). This situation could increase the vulnerability of companies and institutions that are unable to react quickly and safely to the new environment. Maintaining the security of the IT network and avoiding data leaks are essential issues, since cyber attacks could substantially affect businesses and spread to multiple sectors and services. Ultimately, if the contagion were to affect a sufficient number of agents, it could have negative consequences for the financial stability of the entire system. There are currently numerous initiatives from various sources, public and private, seeking to assess this risk, increase institutional resistance and where necessary identify the most effective mitigating factors and the most appropriate coordination mechanisms among institutions.

- Although lockdown measures are starting to be gradually lifted in many countries, the risk of renewed outbreaks persists, as the World Health Organisation (WHO) warns, both in the short term due to the relaxation of measures and in the longer term after the summer. A second wave of coronavirus without the availability of a vaccine could lead to a new series of lockdown measures and the consequent cessation of activities, which would damage the world economy even further and trigger renewed market turmoil.

[20] With the signing of the first phase of the trade agreement, China promised to increase its purchases of US products, focusing mainly on the agricultural, manufacturing and energy sectors, although due to the coronavirus pandemic, international trade has dropped off significantly. The United States has also frozen additional tariffs on Chinese products.

Risk categories

Market risk: orange

- The international equity markets, which had ended 2019 with notable gains in most financial centres,[21] began 2020 with slight reversals due to the uncertainties regarding the potential negative impact of the coronavirus on the economy, consumption, and global economic growth. In this context, after a short-lived rebound at the beginning of February thanks to the central banks maintaining their expansive monetary policy and the resolution of some elements of uncertainty,[22] they fell sharply in March as the virus spread rapidly through Europe, the US and many other parts of the world, forcing large swathes of economic activity to a halt in order to address the health effects of the pandemic. Stock markets suffered their largest ever falls in March, and their biggest ever falls in a single quarter, as a consequence of the sharp recession expected to take hold in the major world economies in the coming months, in a scenario of heightened uncertainty. Subsequently, in April, as the pandemic stabilised, most markets recovered part of their losses, thanks to the economic and financial measures taken by the main central banks and governments of the world's largest economies to combat the crisis, as well as investor interest in markets and companies with relatively good prospects of recovery. Even so, fresh setbacks for the markets can still not be ruled out, since there is great uncertainty surrounding several issues, as discussed at the beginning of this note. Prominent among these are the intensity and duration of the recession (indicators published in recent weeks have sought to demarcate the damage that economies and companies are suffering), the possible reactivation of trade tensions between the US and China and the possibility of further virus outbreaks in the future, which could increase the scale of the recession.

- All the main international stock indices have posted significant falls this year, attenuated by rallies of varying intensity in April,[23] which were more significant in some European markets. The US markets, after touching all-time highs in the first weeks of the year, fell sharply in March in an environment of high volatility,[24] recovering partly over the course of April thanks to the array of intense monetary stimulus measures and liquidity injections deployed by the Federal Reserve. Among the US indices,[25] the largest falls were seen in the Dow Jones, which posted losses of 14.7% to April, while the technology-heavy NASDAQ index was down by a modest 0.9% after recovering in one month almost all its initial falls. In the latter case, although for years now many investors and analysts have been repeatedly warning about the excessive valuation of certain technology stocks,[26] these have proven to be the great beneficiaries of this crisis compared with companies in the traditional economy, due to their greater flexibility and ability to adapt to the needs of consumers. In Europe, the losses were greater, ranging from 18% for Germany' s DAX 30

[21] The main international markets posted notable gains in 2019, by region: the euro area (from 11.8% for Spain's Ibex 35 to 28.3% for Italy's MIB 30), the US (from 22.3% for the Dow Jones to 35.2% for the NASDAQ) and Japan (18.2% for the Nikkei 225).

[22] Among them, the signing in mid-December of the first phase of the trade agreement reached between the US and China, as well as the foreseeable definitive resolution of Brexit.

[23] Market gains in April ranged from 2% for the Ibex 35 to 15.4% for the NASDAQ, which was the best performing US index.

[24] The historical volatility of the Dow Jones reached an all-time high of 103.2%, while the VIX volatility index exceeded 82%, a value higher than the maximum registered during the 2008 financial crisis.

[25] The main US stock indices fell by 23.2% (Dow Jones), 20% (S&P 500) and 14.2% (NASDAQ) to March, although they reduced their losses to 14.7%, 9.9% and 0.9% respectively by the end of April.

[26] Movements in the shares of the main US technology companies known as the FAANG (Facebook, Apple, Amazon, Netflix and Google) at the end of April were -0.3%, 0.05%, 33.9%, 29.7% and 0.5% respectively, where the outstanding performers were Amazon and Netflix, which reached all-time highs in April.

index to 27.5% for Spain' s Ibex 35,[27] which posted the worst performance along with Italy' s MIB 30 (-24.7%), reflecting the severity of impact of this crisis on these economies. European stocks and markets have generally seen greater declines than those of the US due to their higher exposure to sectors in the traditional economy such as consumer goods, finance, tourism and industry, as opposed to sectors of a more technological nature.

- In Spain, the Ibex 35 fell by slightly more than the rest of the European indices,[28] and staged a weaker recovery of just 2%. This relatively poor performance of the Spanish index compared with its European equivalents could be attributed in part to the different composition of the Spanish index (with a greater weight of the financial and tourism sectors, although with a lower weight of the consumer goods and industry sectors, which were all badly affected by the crisis) compared with other European indices, in which the participation of some sectors such as technology and pharmaceuticals and health is more significant and the impact of the losses appreciably less; but it could also be associated to some extent with the greater overall impact of the crisis on the Spanish economy.

- With the exception of the food sector, all sectors saw falls, albeit of uneven intensity both among sectors and among companies within them, depending on the expected impact of the health and economic crisis on their businesses and earnings. The biggest falls corresponded to companies in the consumer services sector, notably the airline IAG and hotel companies due to the strong impact that this crisis will have on both their activity and their business model and the foreseeable loss of the tourist season; banks, which are facing a more intense and prolonged scenario of reduced margins in an environment of possible increases in non-performing loans; Spain' s leading oil company Repsol due to the sharp drop in oil prices,[29] and the IT company Amadeus due to its close links with airlines and the tourism sector. In contrast, food companies rose by 8.8% thanks to their countercyclical nature, while both pharmaceutical companies (-3.6%) and electricity companies (-5.5%) were down slightly because they are expected to suffer to effects of the crisis to a lesser extent, and the former will also be boosted by the sustained demand for health-related goods. As on previous occasions, smaller companies performed better (-15.7%) than mid-caps (-26.8%) and than the market as a whole due to their greater flexibility in the face of adverse situations, whereas mid-caps are more affected by their heavy reliance on European export markets, which are also expected to suffer considerably from the effects of the recession.

- The sharp fall in prices in the quarter, together with a slower decline in the growth of expected corporate earnings for the coming months, caused the forward price-earnings ratio (PER) of the Ibex 35 to decrease from 12.3[30] in mid-January to 11.3 in April (its historical average is 13.4), compared with 9.8 in March, when estimates of expected corporate earnings were barely reflecting the scale of the shock that the temporary closure of the economies would represent for companies (Figure 4). Looking ahead, further variations in this ratio cannot be ruled out as earnings estimates are adjusted to the new economic reality.

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[27] The main European stock indices fell in the three months to the end of March by 25.6% (Eurostoxx 50), 25% (Germany's DAX 30), 26.5% (France's CAC 40), 27.5% (Italy's MIB 30) and 24.8% (the UK's FT 100) before reducing their losses at the end of April to 21.8%, 18%, 23.5%, 24.7% and 21.8% respectively.

[28] The main European stock indices showed gains in April that were significantly higher than that of the Ibex 35: Eurostoxx 50 (5.1%), DAX 30 (9.3%), CAC 40 (4.0%) and MIB 30 (3.8%).

[29] The price of oil was below $25, its lowest level since 2002.

[30] In the same period, the PERs of the Eurostoxx 50 and the S&P 500 fell to 14.7 x and 12.9 x respectively, in the former case above its historical average of 15.9 x and in the latter slightly below the historical average of 12.9 x.

- In this environment of extreme volatility and sharp falls in prices, the CNMV and subsequently several other European securities authorities,[31] decided to impose restrictions on short selling of certain shares.[32] These decisions can be taken on certain financial instruments in the event of significant price falls or, more generally, when circumstances arise that constitute a serious threat to financial stability. The CNMV adopted a first decision to prohibit the short-selling of 69 securities in the session of 13 March and a second subsequent decision to ban the building or increasing of net short positions, which affected all securities and was extended until 18 May.[33] Restrictions on short selling, which may be appropriate in exceptional situations, affect the efficiency of the markets, by reducing the speed at which prices adjust to available information and adversely affect some liquidity measures or trading volumes. The CNMV is carrying out a specific analysis to assess the impact of the measure adopted, and for the time being has not identified anything more than a slight deterioration of liquidity in the securities affected, which has tended to dilute over time.

- The spread of the coronavirus in Europe and the emerging turmoil in the financial markets put an end to any prospects of the ECB' s considering a change of sign in its monetary policy. In contrast, it was forced to extend its stimulus measures to unprecedented levels, just as other monetary authorities such as the Federal Reserve have also done. At times of greatest market turmoil, a process of replacing relatively high-risk debt assets with better credit quality debt (flight to quality) has been observed, while at the same time there has been a notable increase in the sovereign and corporate debt risk premiums of countries and companies perceived as most vulnerable. Although this trend was partially reversed when the ECB announced its new exceptional monetary policy measures,[34] the fact of the matter is that valuations of the market risk of debt assets have increased significantly, especially in the case of high-yield and subordinated corporate debt. The severe expected deterioration in the economic environment and consequently in credit risk could easily be transferred to risk premiums, and the effect would be most intense for the most indebted companies, but it could also extend to financially more vulnerable economies (those with high rates of indebtedness and large fiscal imbalances). Therefore, the increase in risk premiums could trigger falls in asset prices, which could be especially sharp for non-investment grade debt, where valuations are very sensitive to any uptick in required returns.

- Sovereign debt continued to benefit, if anything even more, from the ECB's ultra-expansive policy and its purchasing programmes,[35] as indicated in the previous paragraph, with only a short-lived uptick in rates observed in mid-March. Yields on European sovereign debt remain in most cases at low levels and not far from the historical lows observed a few months ago, although in recent months divergent behaviour has been observed between the debt of economies of the north and south of the euro area, which has contributed to increasing the risk premiums of the latter. The yield on long-term sovereign debt marked increases so far this year ranging from 26 bp in

[31] Regulators in France (AMF), Italy (CONSOB), Belgium (FSMA), Austria (FMA) and Greece (HCMC) also placed restrictions on short-selling of securities listed on their respective markets.

[32] ESMA also announced the obligation to temporarily require investors with net short positions in shares listed on regulated EU markets to report to the corresponding national authority when their position was equal to or greater than 0.1% of capital, as opposed to 0.2% in force until then.

[33] On 18 May the CNMV announced its decision not to extend this measure.

[34] See the section on "Context of low interest rates" for further details of these measures.

[35] In April 2020, the ECB's asset purchase programme (APP) had assets amounting to 2.7 trillion euros, of which 2.19 trillion euros corresponded to public debt. In April, net purchases of public debt stood at 38,489 million euros. The debt purchases under the PEPP programme must be added to this amount, which had assets of 118,811 million euros at the end of April, part of which corresponded to public debt. In April, net purchases under this programme were 103,366 million euros.

Spain – where the 10-year yield stood at 0.73% at the end of April – to 68 bp in Greece, compared with declines of between 4 bp in Ireland and 40 bp in Germany. The volume of Spanish government bonds held in the ECB' s portfolio stood at 270,892[36] million euros at the end of April. In the case of corporate debt, yields varied significantly according to the asset type, the credit quality of the issuer and whether or not it was eligible for ECB asset purchases. As a result, those issuers with the worst credit ratings or the most subordinated issues are already experiencing significant increases in the returns demanded by investors, especially in the case of subordinated debt, high yield and complex assets.

Credit risk: green

- Despite having the support of the ECB, Spain' s sovereign risk premiums and those of its private sector issuers have increased progressively in the first months of the year to practically double the values at the beginning of the year, which were very low. The sovereign risk premium, which had remained largely unchanged until the end of February, began to rise as uncertainty spread through the markets and the rise only slowed when the ECB announced a high volume debt purchase programme and intensified the scope of these purchases in secondary markets. The markets remain very sensitive to the effects of the crisis on European public finances, which could generate tensions in the risk premiums of those economies with relatively large public deficits and high debt levels if the ECB were to gradually withdraw its support at any time. Therefore, at the date of this report, the value of the risk premium – measured as the difference between the yield on the 10-year public debt in Spain and Germany – stood at 132 bp, double the 66 bp seen at the start of 2020, but below the figure of 148 bp reached in mid-March, just before the ECB announced it was stepping up debt purchases (Figure 11).
- Risk premiums in the financial sector showed a similar behaviour to public debt, ending April at an average of 123 bp, above the 65 bp seen in early 2020. Banks face a scenario of increasing uncertainty and risk due to the expected recession, which has led them to set aside large provisions charged to profit for the first quarter of 2020.[37] In the new scenario, net interest income will remain low for longer and there may well be a deterioration in delinquency levels in a context of reduced commercial and lending activity. On the positive side, ECB financing facilities[38] will be extended, which now include the new PELTRO programme,[39] and it will also significantly extend and increase its debt purchase programmes, which include specific programmes for the purchase of securities issued by financial institutions, such as mortgage bonds and securitisations,[40] in addition to the purchase of these securities through the PEPP.

[36] This amount represents 28.4% of the balance of the long-term government debt securities.

[37] The ECB has also recommended not to distribute dividends against 2019 and 2020 profits.

[38] The ECB has announced a package of temporary measures that relax the requirements on guarantees and the valuation of the collateral provided in loan transactions.

[39] The Pandemic Emergency Longer-Term Refinancing Operations (PELTRO) programme consists of seven refinancing operations that will begin in May and will expire, in a phased sequence, between July and September 2021. Auctions will be carried out as fixed rate tender proceedings with full allocation and an interest rate 25 bp lower than the interest rate on the main financing operations, which is currently 0%.

[40] Financial institutions also benefit from the ECB's purchase programme through the CBPP3 and ABSPP programmes, which include covered bonds – including mortgage bonds – and securitisations, respectively. Up to 1 May, 277,696 million euros worth of assets had been bought under the covered bonds purchase programme, 38% of these in the primary market. At the same date, the asset-backed securities purchase programme (ABSPP) had bought 30,936 million euros worth of securities, of which more than 51% were acquired in the primary market.

- In the case of non-financial corporations, the increases were similar, although their amount was somewhat more moderate (100 bp at the end of April, the highest level since the first half of 2016). Although these companies also benefit from the ECB's purchasing programmes,[41] the premiums applied reflect the economic deterioration of their businesses and earnings, as well as the foreseeable increase in financial expenses deriving from their reduced financial strength, in other words, their higher credit risk. Many companies have seen their credit ratings or outlooks downgraded, a trend that is likely to extend in the coming months and that could hinder access to capital markets for a large number of companies. In this context, possible downgrades in credit ratings of issuances in the lowest IG category, BBB, is particularly worrying, since it would mean that these instruments are considered high-yield and as such high-risk. The consequences of these downgrades, which are being analysed by various international institutions, are myriad, since in addition to entailing an increase in the cost of the issuer's financing (such cases are known as "fallen angels"), they may encourage some holders to sell these securities, which may also challenge the ability of the current high yield debt market to absorb a large volume of securities.

- Financing to non-financial sectors[42] of the economy slowed again as a whole due to the lower rate of financing extended to businesses, as well as the significant fall in lending to households, which again showed negative values as a result of the initial effects of the coronavirus on the economy. Lending to households decreased by 0.1% in March year-on-year, to its lowest value since May 2018, caused by the slowdown in the growth of consumer credit (from 4.1% in December to 3.8% in March), which was insufficient to offset the fall in the outstanding balance of housing loans[43] (from -1.1% in December to -1.5% in March, its lowest value since December 2018). In the case of non-financial corporations, total financing continued to slow in aggregate terms (from 1% in December to 0.6% in March) and its composition varied, with an increase in lending to businesses[44] to cope with the effects of the pandemic on SMEs (1.2% in March, its highest growth rate since the first half of 2009) and with a slowdown in financing through debt issuances, from 13.9% to 4.8%, the lowest rate since June 2018.[45] Therefore, the fact that a large number of companies had taken advantage of the favourable conditions in 2019 and the first two months of 2020 to obtain financing at low cost is compounded by the market' s greater difficulties in placing debt[46] at competitive prices for medium-sized or low-rated companies. In addition, the balance of foreign loans also showed a 1.8% decrease. It is foreseeable that in the coming months financing for businesses will continue to increase, while lending to households, for both home purchases and consumption, will decrease and there will be a deterioration in delinquencies[47] in consumer lending, which in the medium term could spread to mortgage loans and corporate borrowing if the recession is prolonged.

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[41] This programme includes a corporate sector purchase programme (CSPP), which has been extended to all issuers meeting the conditions of the programme (minimum rating BBB-). At 1 May 207,067 million euros of debt had been purchased under this programme, more than 19% of it in the primary market.

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

[43] New mortgage lending increased in February by 16.1% year-on-year, although the outstanding balance grew by only 10.7% in the same period. Despite this progress, new mortgage loans signed were not sufficient to offset the total of mortgage loans repaid and cancelled in the equivalent period.

[44] The financial institutions themselves, with credits either of their own or guaranteed by the public sector through the Official Credit Institute (ICO) have established a set of specific financing facilities for businesses and self-employed workers.

[45] All Ibex 35 companies, except Aena, Inditex, Mediaset, Siemens Gamesa and Viscofan, are currently financed to a greater or lesser extent with medium or long-term debt issuances.

[46] However, four Spanish non-financial issuers (Iberdrola, Naturgy, REE and Repsol) made five debt issuances in April for an aggregate amount of over 3.6 billion euros.

[47] According to data from the Bank of Spain, delinquencies in the Spanish financial system stood at 4.8% in February, although preliminary data on securitisations already reported a rise in mortgage defaults in March.

Liquidity, financing and fragmentation risk: orange

- Fixed income issuances registered with the CNMV until April totalled 33,339 million euros, 25.4% more than in the same period of 2019; prominent among them are a bond issuance by SAREB, the Asset Management Company for Assets arising from the Bank Restructuring (Spain' s " bad bank") for an amount of 4,064 million euros and five Banco de Santander issuances of internationalisation bonds (instruments with loans in support of the internationalisation of Spanish companies as underlyings) for an aggregate amount of 6,266 million euros. Also notable was the expansion of commercial paper issues, which are favoured by the return to Spain of the commercial paper programmes of certain large foreign companies.[48] Issuances made by Spanish companies abroad[49] fell by 0.7% in the first quarter, to 27,742 million euros, due to the 12.6% fall in long-term issuances, which were penalised by the complex situation of the markets in March (up to February they had grown at a rate of 48% year-on-year). In a context of approaching recession and, consequently, worse financial conditions for many companies accessing the capital markets as debt issuers, it should be noted that some companies may benefit from public guarantees[50] to boost their liquidity through the issuance of commercial paper, as long as these instruments are included in the AIAF Fixed Income Market or the MARF Alternative Fixed Income Market.[51] Likewise, in the equity markets there were no IPOs and in the immediate future it is highly unlikely that any such transactions will take place, given the complex scenario of economic uncertainty.

- Household deposits grew by 5.3% year-on-year in March, while those of businesses grew by 1.3%, to stand at 861.5 billion euros and 262.1 billion euros respectively. Households and businesses alike have chosen to accumulate liquidity in deposits (together 21.5 billion euros more) given the lack of profitable investment alternatives with low levels of risk and the possibility of having to address future needs in a context of high uncertainty surrounding receivable income.

- In the first 4 months of the year average trading on the continuous market was 1,879 million euros, barely 0.3% more than in the same period of 2019 and also slightly above average (1,820 million euros). The fact that trading volumes held up so well was due to the increase in volumes in March due to the situation of high volatility, since preliminary data for April show a further significant increase in daily trading volumes. In particular, average daily trading in April stood at 1,509 million euros, 38% less than in the previous year and the lowest April volume in the last ten years.

- Trading in Spanish shares through trading venues other than Spanish Stock Exchanges and Markets (BME) in relation to total trading subject to market rules (lit plus dark) increased in the first quarter of 2020 to a new all-time high of 47.8%[52] in a context of high

[48] As in the case of energy company Endesa, which has again registered its commercial paper issues with the CNMV.

[49] In 2019, issuances made abroad exceeded those registered with the CNMV for the first time, standing at 103,321 million euros, 53% of the total.

[50] In accordance with the guarantee programme recently established under the Royal Decree-Law of 21 April on complementary urgent measures to support the economy and employment.

[51] The third tranche of the guarantee programme, endowed with 24.5 billion euros, will include 4 billion euros to guarantee commercial paper issued on the MARF. The maximum amount of the guarantee will cover 70% of the total amount of the commercial paper issue, which may have a maximum maturity of 24 months. The cost of the guarantee will be 30 bp for issuances maturing up to 12 months and 60 bp for those lasting between 13 and 24 months, but the cost will be offset by a reduction in the return required by investors. The guarantees will be available until 30 September, on the following conditions: having registered a commercial paper issuance programme with the MARF before 23 April, the company's headquarters must be located in Spain and the funds obtained cannot be used to pay dividends. Up to a total of 44 companies that meet these requirements could benefit from the programme, including El Corte Inglés, MásMóvil and Gestamp.

[52] This trend and all-time high could be a consequence of the increase in algorithmic and high-frequency trading transactions, which have been favoured by the environment of high volatility and which, for the most part, take place in trading venues other than their markets of origin.

volatility. This proportion had seen ups and downs in 2019, although in no quarter did it fall below 40%. Preliminary data for April[53] show a partial reversal of this trend as volatility has eased. Further, trading of Spanish shares through systematic internalisers – and, therefore, not subject to market rules – has remained at around 15% of total trading[54] so far this year, at levels similar to those of 2019, reflecting the consolidation of this type of trading.[55] The CNMV also authorised a voluntary takeover bid[56] for the Spanish regulated market operator BME by the Swiss market operator SIX Group, once the purchase has been approved by the government through a resolution issued by the Council of Ministers.

- The Ibex 35 liquidity indicator (evaluated using the bid-ask spread, and an increase in which must be interpreted as a loss of liquidity) increased significantly between February and April, reaching its highest level in recent years and recorded worse metrics than those observed during the 2008 financial crisis. The deterioration in the liquidity of Spanish securities is explained by the decrease in trading volumes and the high market volatility, in addition, at least in part, to the effects of the restrictions on short-selling. As a consequence of these factors, the bid-ask spread reached over three times the historical average of the indicator, although a decrease has been observed in recent weeks. Liquidity conditions in the debt markets were favoured by the strength of the ECB's purchases. However, in the case of the 10-year sovereign bond, the bid-ask spread grew slightly in absolute terms and its size remained significant in the current environment of low interest rates[57] (Figure 15).
- The interest rate spread between loans to Spanish companies with loans to other euro area companies remained negative in February for loans of less than 1 million euros (1 bp), but returned to positive values for those over this amount (up to 31 bp in February, -4 bp in December), reaching the highest value since August 2019.

Risk of contagion: orange

- The correlation between the daily returns of the various types of Spanish assets, which had decreased significantly in the last quarter of 2019, grew very strongly in the first months of the year and reached its highest level since the second half of 2016 (see Figure 31). The median of these correlations, which started from values very close to zero this year, stood at 0.64 at the end of April, after registering highs of 0.75 in mid-March. These values are much higher than the average for the whole of last year (0.19) and closer to the average value for the last decade (0.5). The maximum value of the asset pair correlations has been close to 0.90 since mid-March and the minimum value, which also increased with respect to past values (-0.37 at the beginning of February), ended April at values close to 0.13, reaching highs of 0.41 in mid-March. These levels of correlation are the result of the increased uncertainty associated with the COVID-19 crisis, which led to widespread price falls and the transfer of risks deriving from the situation to the various

[53] In April, the market share of BME's competing trading venues stood at 43.7%.

[54] Total trading is understood in this context as the sum of the trading subject to market rules and that carried out through systematic internalisers.

[55] Although one of the initial objectives of MiFID II was to transfer part of the trading not subject to market rules to trading venues or organised markets where it would be subject to them, data do not currently reflect the achievement of these objectives.

[56] The offer is aimed at 100% of BME's capital and the offer price is 33.40 euros per share.

[57] The spread continues to stand out in relative terms, but is subject to agents' transaction costs, which are significant in an environment of low rates at 10 years. In absolute terms, there was an increase in the average spread, but it was less than 1 bp.

types of assets (securities, debt and credit). It should be noted that higher levels of correlation increase the chances of contagion among different types of assets and make diversification of portfolios difficult.

- With regard to the movements of European public debt assets, the correlation between the yield on the Spanish sovereign bond and that of the core European countries stood at the same level at the end of April as at the end of January (0.74). However, during these months its value has varied as a consequence of the uneven trend in the perception of risk of the Spanish economy relative to these economies in times of crisis. Therefore, from February to the beginning of March, the correlation increased to 0.91, due to the general decrease in the yields on public debt in European countries before the flare-up of the crisis. It subsequently fell to around 0.68 at the end of March as a consequence of the fall in the correlation between the yields on Spanish and German sovereign bonds. In recent weeks, this indicator has risen again, reflecting the slight decrease in tensions in the debt markets. On the other hand, as is usually the case in periods of turbulence, the correlation between the yield on the Spanish sovereign bond and that of peripheral countries increased, since common financial vulnerabilities are identified in these economies (see Figure 32). This correlation experienced some volatility in the period considered, showing a more pronounced initial increase (from 0.81 to 0.93 in mid-February), a slight subsequent decline, and stability from mid-March at around 0.95, which is a very high value.

Market risk: orange

Figure 3. Stock market prices

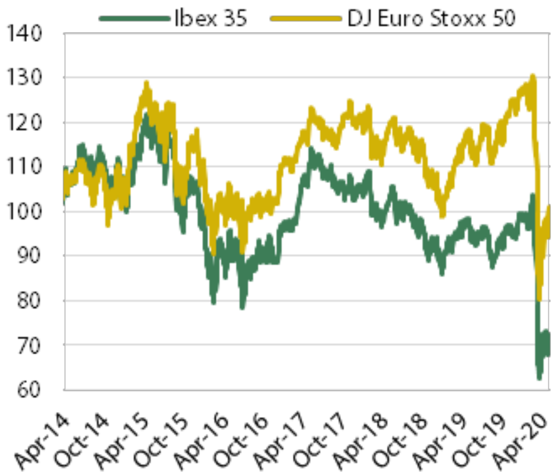


Figure 4. Price-earnings ratio (PER)

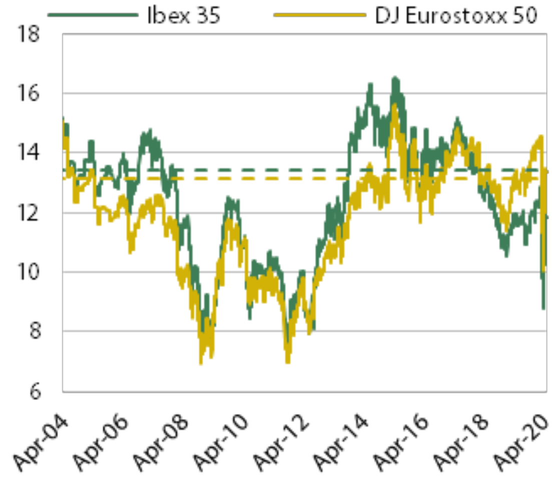


Figure 5. Short-term interest rates (3 months)

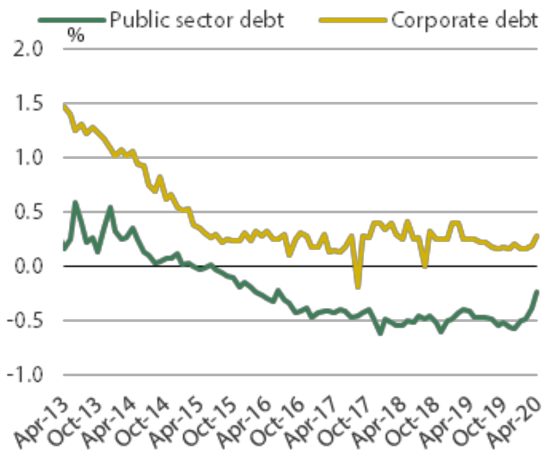
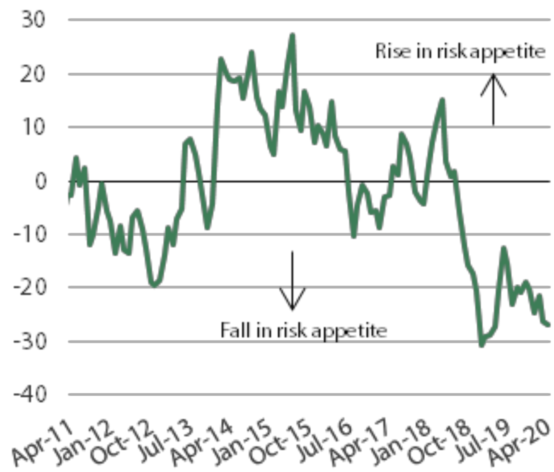


Figure 6. Long-term interest rates (10 years)

Figure 7. Oil price

Figure 8. Risk appetite (State Street)



Credit risk: green

Figure 9. Financing of the non-financial sector

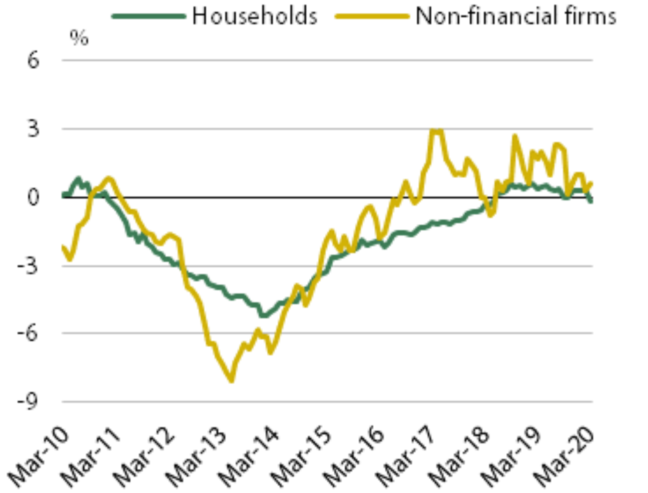


Figure 10. NPL ratio and unemployment rate

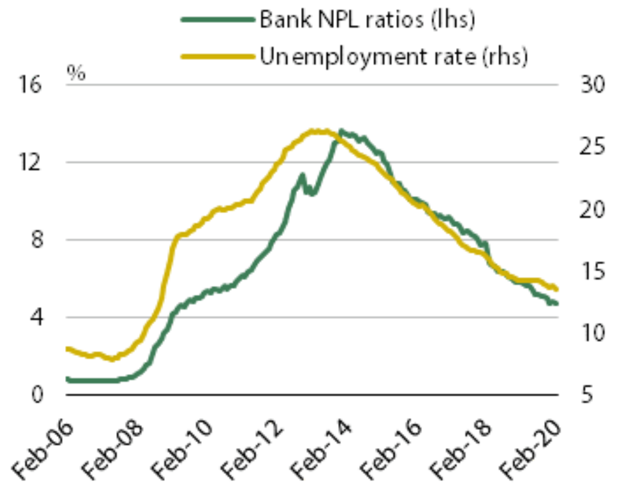


Figure 11. 10-year government debt risk premium (spread with Germany)

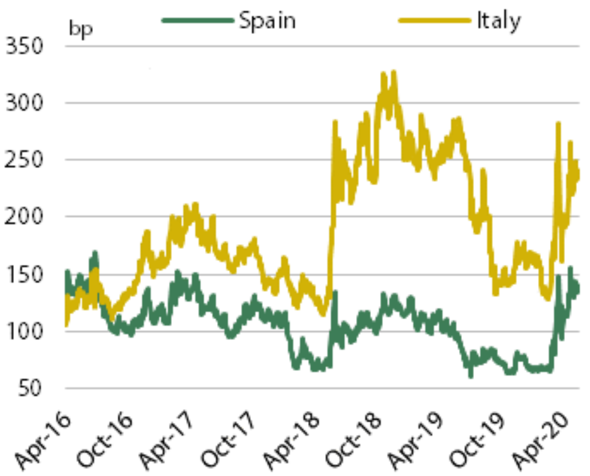


Figure 12. Private debt risk premium (5-year CDS)

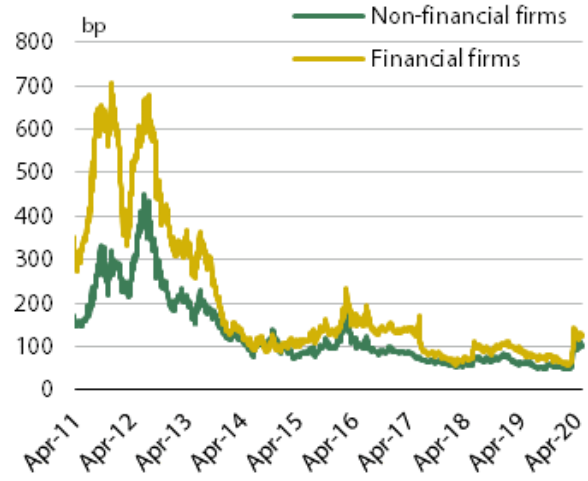


Figure 13. Housing prices (year-on-year change)

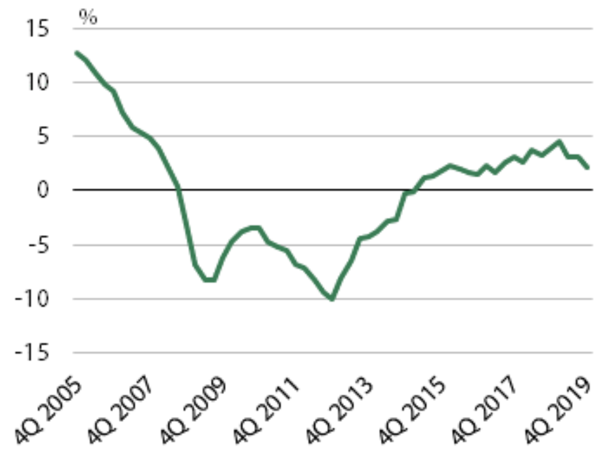
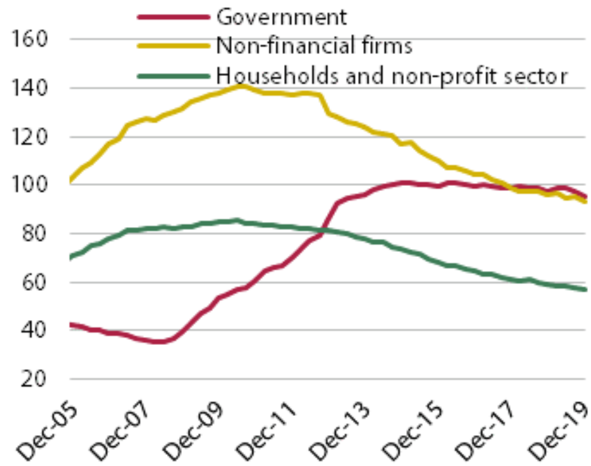
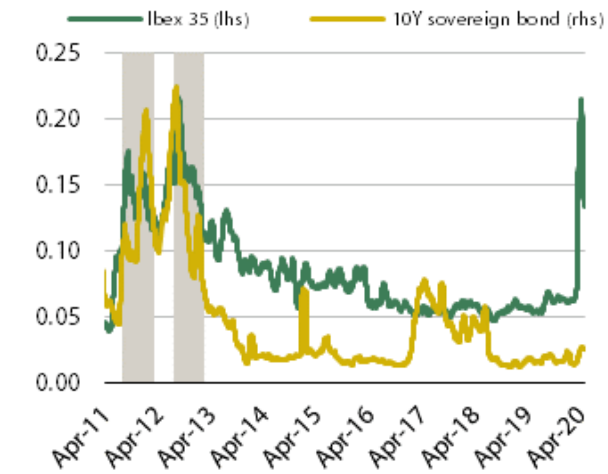


Figure 14. Indebtedness (% GDP)



Liquidity, financing and fragmentation risk: orange

Figure 15. Liquidity (bid-ask spread, %)



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

Figure 16. Volatility (1-month moving average)

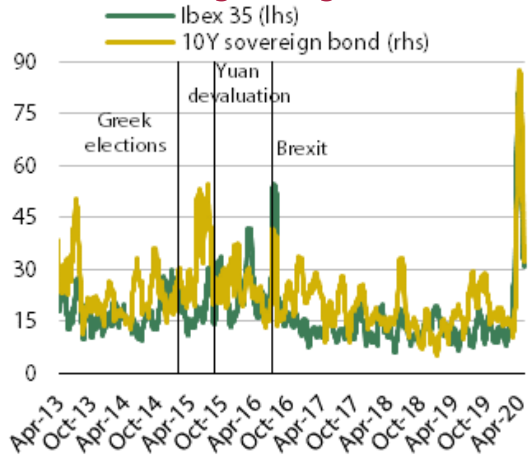


Figure 17. SIBE (electronic platform) trading (1-month moving average)

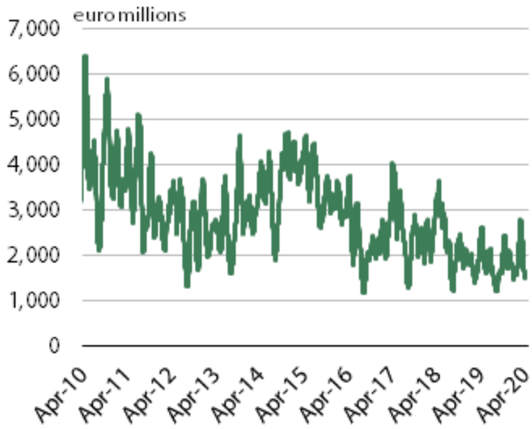


Figure 18. Interbank spread (LIBOR-OIS)

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

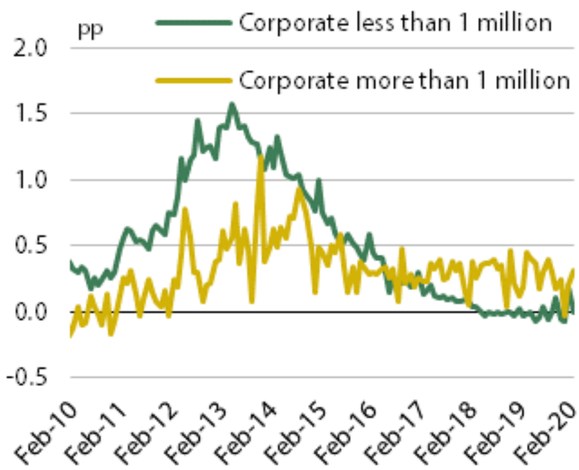
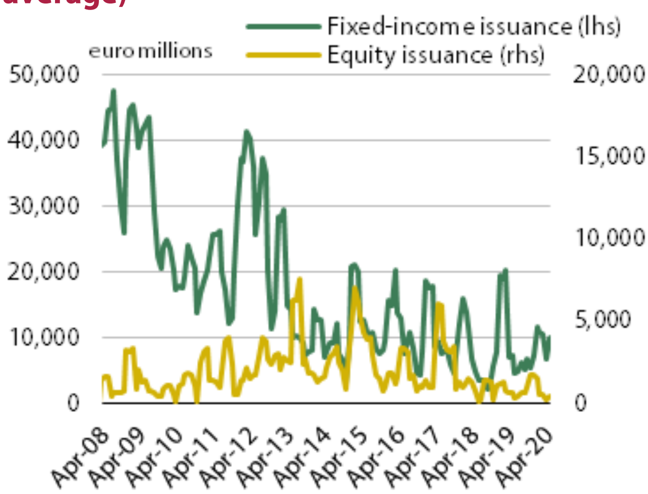


Figure 20. Issuances (3-month moving average)



Macroeconomic risk: yellow

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

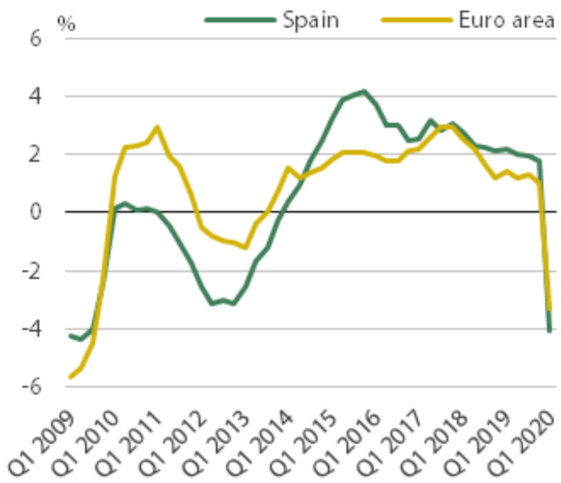


Figure 22. HCPI and core CPI (year-on-year change)

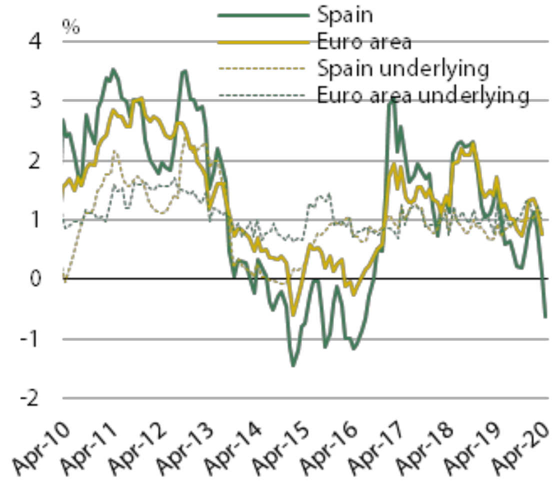


Figure 23. Employment (year-on-year change)

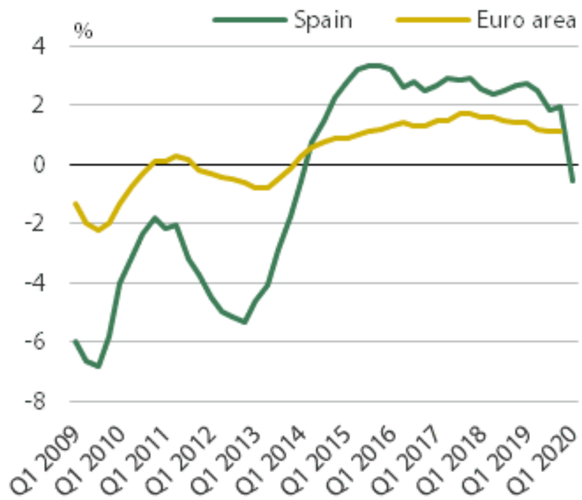
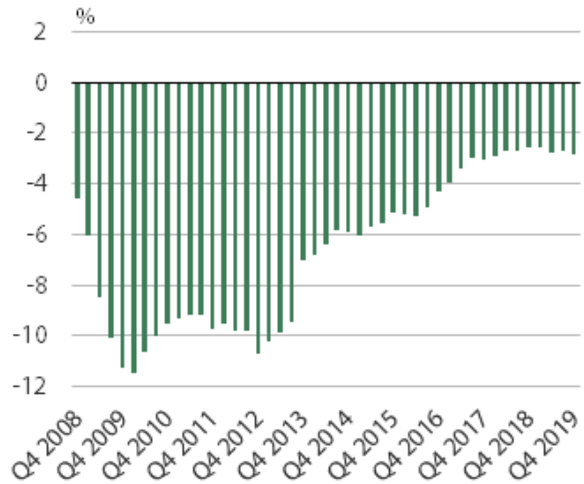


Figure 24. Government balance (% GDP)



Cumulative data for four quarters.

Figure 25. Exchange rates

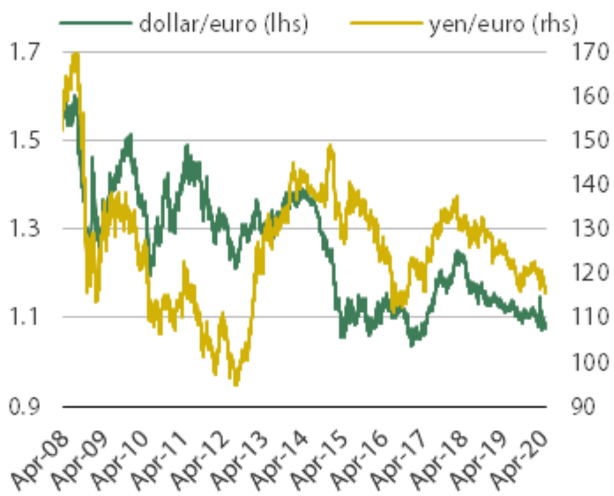
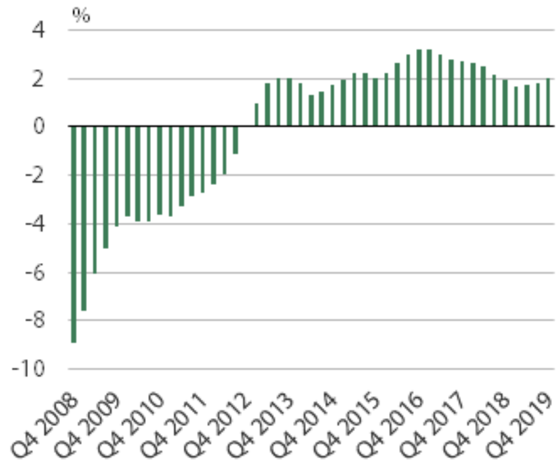
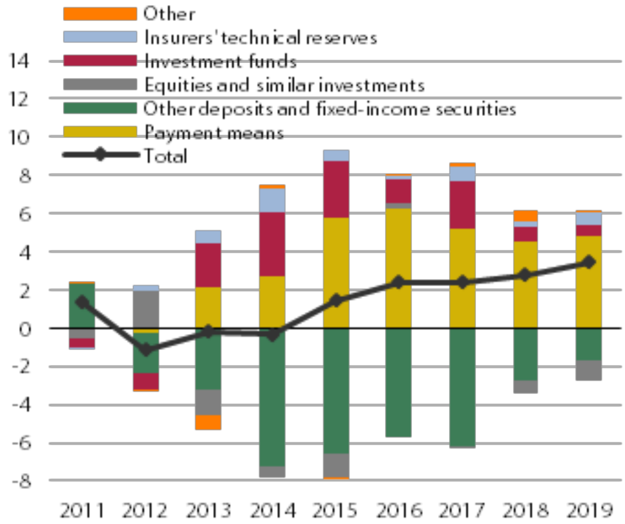


Figure 26. Current account balance (% GDP)



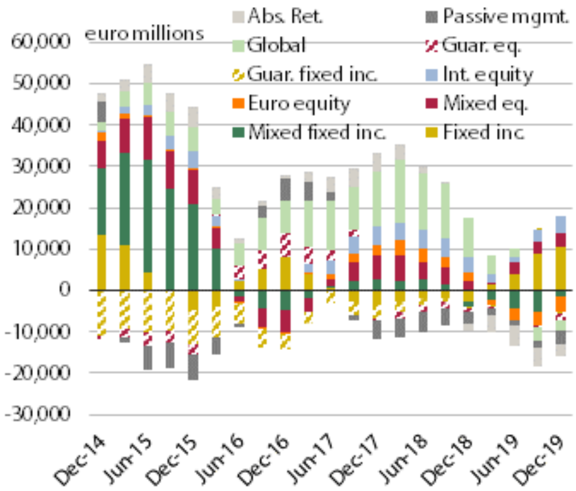
Investors

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)

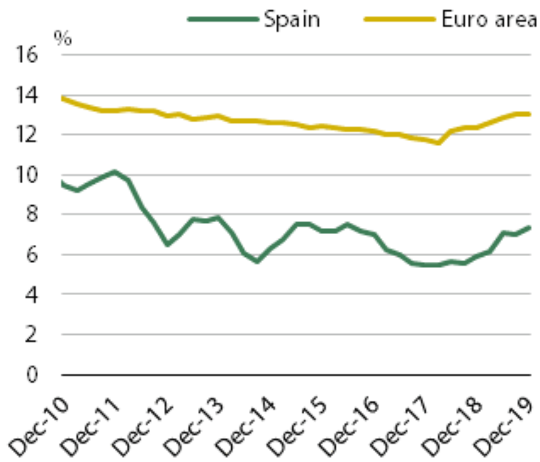
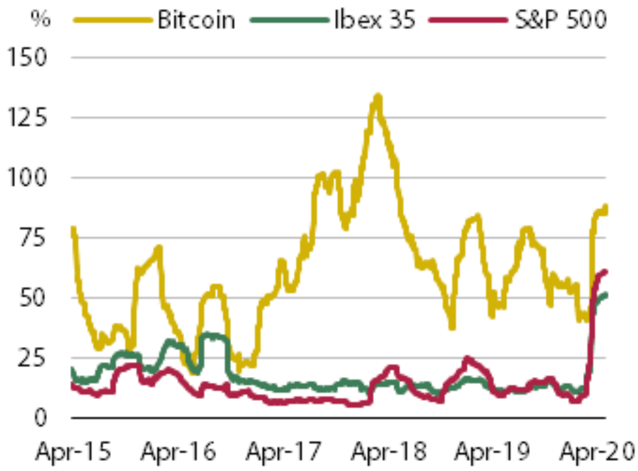


Figure 30. Bitcoin volatility



Risk of contagion: orange

Figure 31. Correlations among asset classes

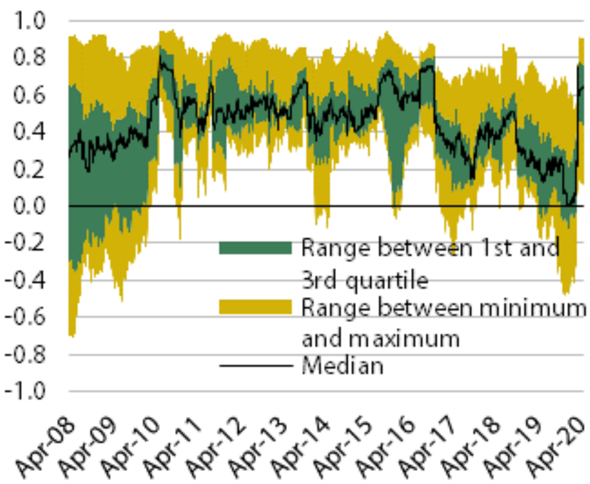
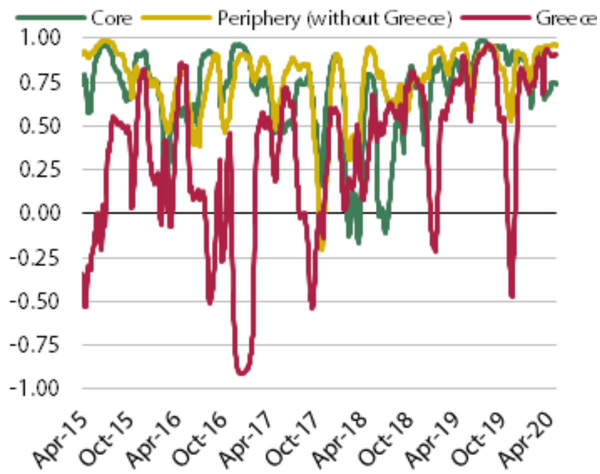
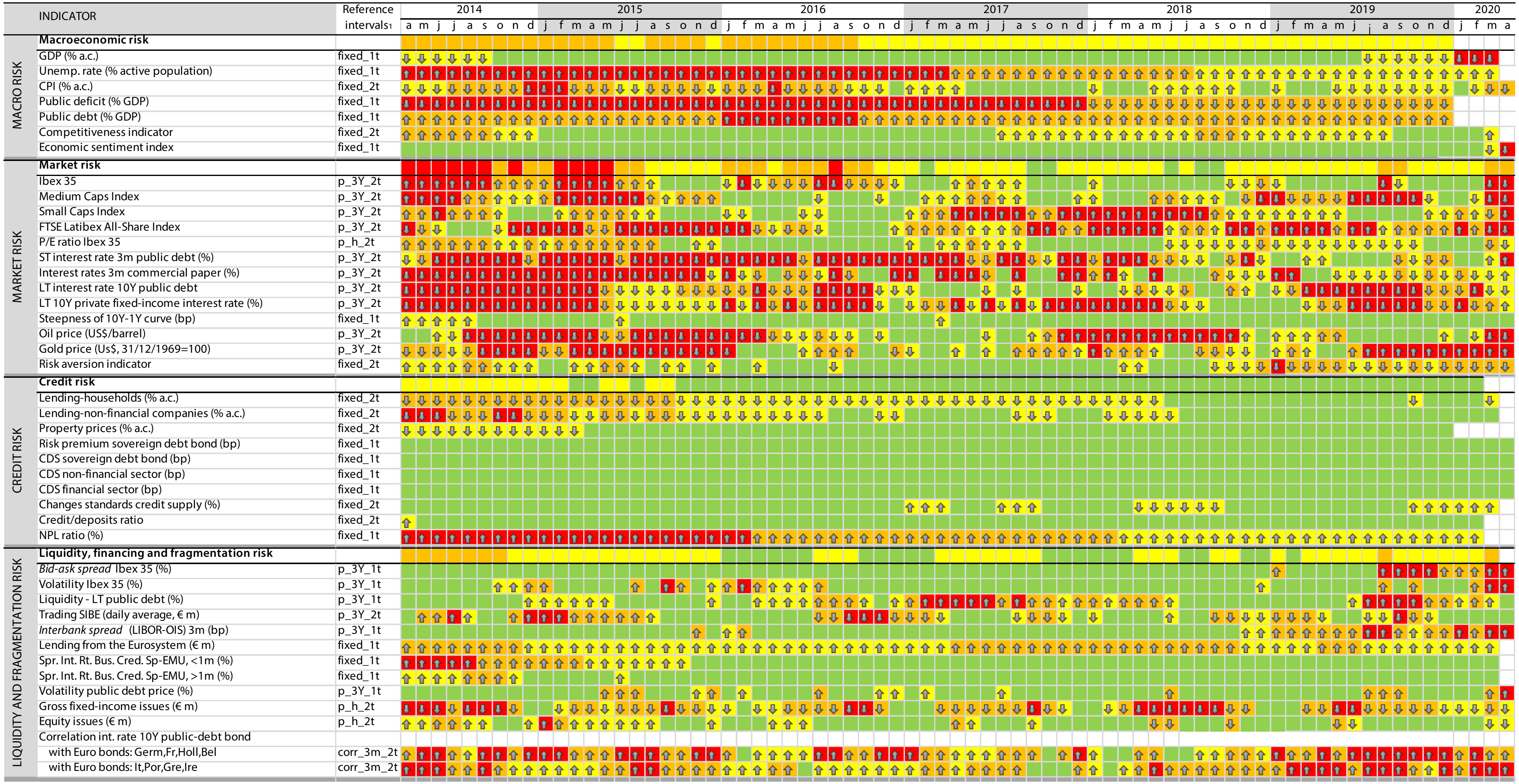


Figure 32. Correlation between the yield on Spanish and other European 10-year bonds



Heat map: Risk categories



(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. Source: CNMV, Bloomberg and Thomson Datastream.

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/Publicaciones/SeriesWeb/Inicio.aspx?codrama=1295&lang=en. 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 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 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 more comprehensive heat map (see last pages of the note) includes 43 indicators,[58] 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.

[58] 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 somewhat more complex. 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 core countries are Germany, France, the Netherlands and Belgium and the peripheral countries are Spain, Portugal, Italy, Greece and Ireland.