



Financial Stability Note

No. 6 April 2018



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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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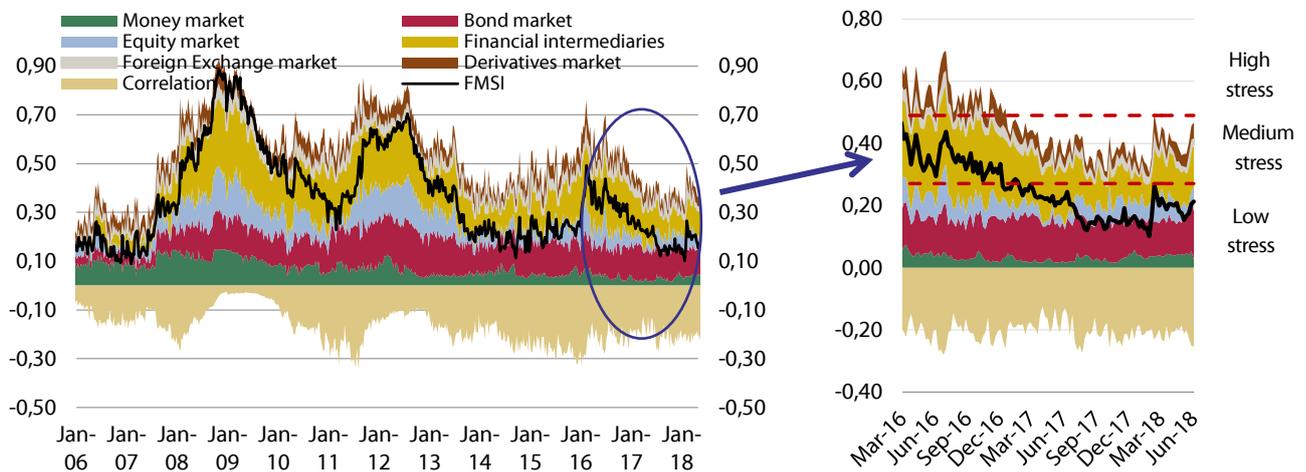
Layout: Comisión Nacional del Mercado de Valores

Summary

- ✓ Spanish financial market stress rose in the first few days of February to values that separate low from medium stress levels (0.27) and subsequently fell to values of around 0.15¹. The period of volatility in February, triggered by a change in expectations about US monetary policy, was followed by a few weeks in which uncertainty about the scope of the restrictive measures applied to world trade took on greater prominence. However, this uncertainty did not generate a significant increase in the level of market stress. By segment, the only noteworthy increase in stress was recorded in the bond market as a result of the loss of liquidity in these assets and the increase in volatility. A recurrence of some occasional outbreaks in volatility cannot be ruled out due to the high level of sensitivity that markets are showing with regard to the publication of unexpected data and the high level of interconnection between them.

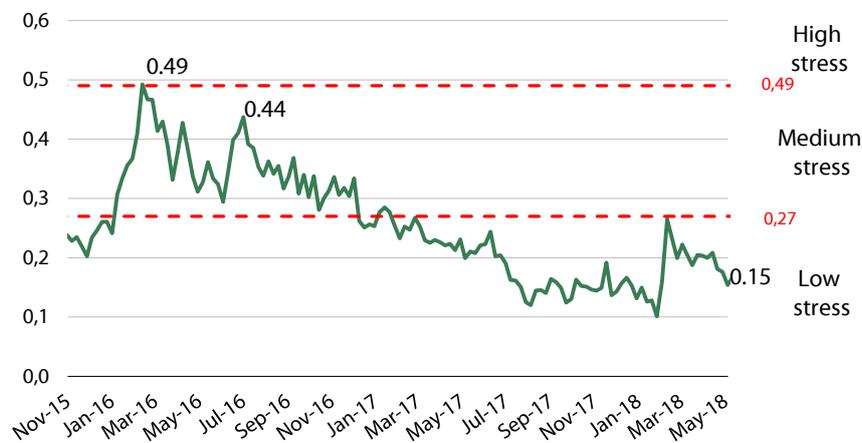
Spanish financial markets stress index

FIGURE 1



Source: CNMV.

For further details on recent movements in this index and its components, see the CNMV's statistical series (market stress indices), 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 14 (January (1)), 23-41 or CNMV Working Paper 60 (<http://www.cnmv.es/portal/Publicaciones/monografias.aspx>).

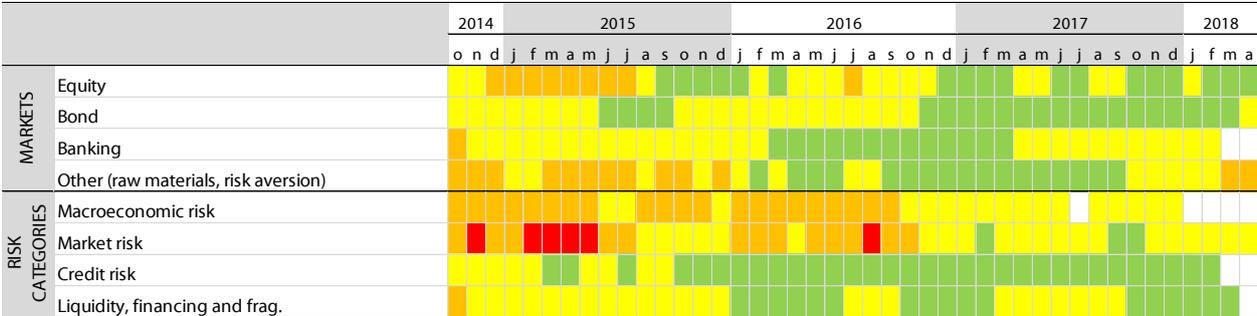


¹ The closing date of the note is 30 April, except for the stress index which is presented with data to 4 May and some other specific figures.

- ✓ The macroeconomic performance of Spain remains positive. The latest GDP growth data indicate that there has been a slight slowdown, but the rate of growth (2.9%) remains high. Both the IMF and the European Commission have recognised this favourable trend with an upward revision in their latest forecasts for this year of 0.4 and 0.3 percentage points, respectively (to 2.8% and 2.9%). This environment, together with the fall in finance costs, allowed the government deficit in 2017 to fall to 3.1% of GDP, in line with the targets set by the government. The process of fiscal consolidation will continue in 2018, which is expected to allow Spain to exit the Excessive Deficit Procedure in the event the deficit is reduced to levels below 3%. One of the main challenges for the Spanish economy is to lower the high level of government debt, which has been close to 100% of GDP for several years.
- ✓ Spanish financial markets have recovered from the turbulence recorded in February, when volatility peaked temporarily at 20%. In equity markets, prices have remained very close to their levels at the start of the year. New developments in the fixed-income market included upgraded ratings of Spanish sovereign debt in 2018, which had a significant downward impact on the risk premium, which at the start of April reached levels not recorded since 2010 (66 bp).
- ✓ The most significant risks that continue to affect financial markets are market risk and, in some fixed-income assets, liquidity risk. Market risk in the case of Spain includes the significant increase in value of small-cap companies. Noteworthy in international financial markets was the recent increase in the price of some commodities, such as gold and precious metals, which may in part be due to investors seeking the protection of safe haven assets, and also in the price of oil. In this context, it is important to be aware of the possible effects that any increase in interest rates that is faster or sharper than expected may have: (i) on the most indebted market agents, as their financial costs would increase significantly, and (ii) on the holders of fixed-income assets, who would suffer significant losses in their portfolios. Both facts are especially significant in a context in which market agents remain highly indebted and in which non-bank participants are taking on greater importance.

Heat map: summary by market and risk category

FIGURE 2



Source: CNMV. See article in CNMV Quarterly Bulletin Quarter 1 2015. "Identification of vulnerabilities in the Spanish financial system: an application of heat maps".

Sources of risk

Macroeconomic environment

- In the first quarter of 2018, the Spanish economy continued the growth that began in 2014, although it recorded a slight slowdown (Figure 21), with GDP growth of 2.9% in year-on-year terms (0.7% quarter-on-quarter). These figures are above those recorded in the euro area, where year-on-year growth stood at 2.5% and quarter-on-quarter growth at 0.4%. Employment continued growing strongly (Figure 23), at rates of slightly under 3%. However, the unemployment rate² rose slightly between January and March 2018 to 16.74% of the active population, 0.2 percentage points above the figure at year-and 2017. In year-on-year terms, however, this figure represents a reduction of two percentage points. Meanwhile, inflation stood at a year-on-year rate of 1.2% in March, 0.1 percentage points more than in February, with fresh food and clothing having the biggest upward impact on the index. Core inflation also stood at 1.2%, while in the euro area it stood at 1%. The preliminary information from April indicates that inflation is remaining relatively stable at a year-on-year rate of 1.1% and a month-on-month rate of 0.8%
- Public sector finances improved in 2017 compared with the previous year as a result of both the recovery of the economy and the reduction in the debt interest expense, which also continued in the first few months of 2018. The government deficit stood at 3.1% of GDP at the end of 2017 (4.5% in 2016), thus meeting the targets set by the government. In turn, the combined deficit of the Central Government, Autonomous Regions and the Social Security stood at 0.82% between January and February of this year, 0.13 percentage points below the figure recorded in the same period of 2017³. Deducting the debt interest payments, the State recorded a primary surplus of 1.59 billion euros in the first quarter of the year, almost double that recorded in the same period of 2017. According to the government's forecasts in its 2018-2021 Stability Programme, the deficit target for this year stands at 2.2%, which would allow Spain to exit the Excessive Deficit Procedure (began in 2009) as it would fall below the 3% threshold set out in the Stability and Growth Pact. The most significant challenge for the Spanish economy continues to be the need to reduce the level of public debt, which closed 2017 at 98.3% of GDP (99% in 2016).
- According to the IMF forecasts of April this year, the expansion of the world economy that began in the middle of 2016 will continue with growth of 3.9% (in 2017 it stood at 3.8%). Against this background, the forecasts for the Spanish economy are positive, with expected growth of 2.8% in 2018, after being raised by 0.4 percentage points⁴, and

² Unemployment rate according to the EPA (labour force survey).

³ This figure does not include the balance of local authorities or the amount of the aid given to banks, which in the first two months of the year amounted to 42 million euros. By sub-sector, it is worth noting the fall, as in 2017, in the deficit of the Central Government, which stood at 0.82% of GDP to February, 10.2% lower than in January-February 2017, and especially the deficit of the Autonomous Regions, which fell by 59.1% compared with February 2017. The Social Security Funds recorded a surplus of 0.12% of GDP, similar to that recorded in the first two months of the previous year.

⁴ In the January IMF report, the forecast for Spain was downgraded by 0.2 percentage points, basically as a result of the political uncertainty in Catalonia.

2.2% in 2019⁵. These figures are above the expected rate for the euro area, which the IMF has set at 2.4% for this year and 2% for next year. Nevertheless, in addition to the need to reduce public sector debt, the Spanish economy still has to address certain challenges arising, for example, from the high unemployment rate, the ageing population and the continued political instability in Catalonia.

Low interest rate environment

- Interest rates remain at very low levels in the euro area: the ECB's main refinancing rate has stood at 0% since March 2016, the 12-month Euribor has been in negative territory since February 2016 and yields on long-term government bonds are at historic lows in a number of economies⁶. However, in the United States, yields have been rising for several months in line with the shift in the monetary policy stance adopted by the Federal Reserve⁷. The ECB, however, has not shown any signs to indicate an imminent increase in interest rates, but the monetary policy stance is expected to change gradually given the upcoming end of the debt purchase programme as from September⁸ and the upturn in economic growth. In this context, it is not unreasonable to think that interest rates are likely to rise in the future, which may be further supported by an additional increase in inflation if oil prices continue to rise⁹. Therefore, as discussed in the summary of this note, it is important to consider what the most important effects of this increase would be, particularly in the event the rate rise is sharper and faster than expected and whether this might be deemed a risk to financial stability.
- The consequences of a quick and substantial increase in interest rates (or risk premiums) as a result, for example, of unexpected changes in monetary policy or growth forecasts would mainly be focused on the most indebted market agents and also on investors in debt assets. With regard to the indebtedness of market agents, it should be noted that in Spain there has been a downward trend in the level of private sector debt in the economy since the start of the financial crisis, although it still remains high, while public sector debt has increased significantly. At the end of 2017, the ratio of Spanish household debt to disposable income¹⁰ stood at close to 100% (130% in 2011), more than five percentage points above the figure recorded for the euro area. The debt of non-financial companies recorded even larger falls, dropping from levels of close to 170% of GDP in 2011 to under 130% in 2017, which is lower than the figure recorded in the euro area. Government debt has risen from historic lows of 36% in 2007 to slightly above 100% since 2014¹¹. It can therefore be concluded that the level of indebtedness of the Spanish economy remains relatively high despite

⁵ These forecasts are in line with those made by other agencies. For example, the Bank of Spain has estimated that GDP will grow by 2.7%, while the European Commission has published a growth figure of 2.9%.

⁶ At 30 April, the yield on ten-year sovereign bonds was below 1% in Germany, France, the Netherlands, Belgium and Ireland and between 1% and 2% in Spain, Italy and Portugal.

⁷ The yield of the ten-year sovereign bond in the US rose from 2.1% at the start of September last year to 2.9% at the end of April 2018.

⁸ From that date onwards, only the amounts due will be reinvested.

⁹ In the first four months of the year, the price of oil rose by 12.4% to over 75 dollars per barrel.

¹⁰ Euro area financial accounts.

¹¹ In December 2017, public debt stood at 98.3% of GDP.

the adjustments carried out over the crisis. Some market agents are therefore somewhat vulnerable to a hypothetical rise in interest rates.

- The changes in the structure of the financial system over recent years, characterised by increased prominence of entities that perform market-based credit intermediation (known as “shadow banking”) are also important when assessing the impact of any interest rate rise. In this regard, it should be noted, as a result of their volume, the significant expansion of the Spanish investment fund industry, which at year-end 2017 held assets of 265 billion euros. In addition to the growth in their assets, there has been a marked shift over recent quarters towards higher risk fund categories. In fact, the proportion of these categories¹² in total assets rose from 48.7% in 2016 to 58.2% in 2017. This change would mitigate somewhat the expected direct impact of the rate hike on investment fund assets as fewer debt instruments would be affected, although the rate hike may also have an impact on equity markets by making the option to invest in fixed-income assets more attractive.
- The banking sector continues to face considerable difficulties in increasing its margins in an environment of low interest rates and a high, albeit falling, level of non-performing assets. In Spain, the sector’s solvency conditions are favourable and the buoyant economy plays in its favour with a certain laxity in lending criteria noted. All in all, the challenges faced by the sector are considerable, some of them related to a need to increase efficiency and others of a technological nature (fintech).

Sources of political uncertainty

- In the domestic environment, the political instability generated by the institutional crisis in Catalonia, which had a limited impact on financial markets in the fourth quarter of 2017, decreased in the early months of the year. This reduction in political risks has in part allowed several credit rating agencies to upgrade the rating of Spanish government bonds¹³ and for several institutions to upgrade their forecasts for growth in the Spanish economy in 2018¹⁴. Nevertheless, the effects that the political situation in Catalonia might have on financial markets and on the real economy in the medium term would depend on the outcome of events over the coming months.
- In Europe, the Brexit negotiations remain one of the main sources of political risk for the economic and financial environment. In this regard, the European Council¹⁵ recently restated its determination to have as close as possible a partnership with the UK although it stressed that any agreement must be based on a balance of rights and obligations. Specifically, the Council warned that the UK not having access to the

¹² Mixed fixed income, mixed equity, euro equity, international equity, global and absolute return funds have been used for the calculation.

¹³ In January, Fitch upgraded Spain’s sovereign credit rating from BBB+ to A- with a stable outlook, while Standard & Poor’s upgraded the rating in March from BBB + to A- with a positive outlook. Subsequently, DBRS and Moody’s followed suit in the first half of April, raising their ratings from A (low) to A with stable outlook and from Baa2 to Baa1 with stable outlook, respectively.

¹⁴ In its report published in May, the European Commission forecast growth of 2.9% in 2018 (0.3 pp more than in the previous report), while the IMF’s April forecast placed GDP growth in 2018 at 2.8% (0.4 pp more than in the previous forecast).

¹⁵ <http://www.consilium.europa.eu/media/33458/23-euco-art50-guidelines.pdf>

Single Market would have negative economic consequences, particularly for the UK. The details of the agreement shaping the future relationship between the European Union and the United Kingdom will be worked out during the transition period, which is expected to start in March 2019 and end in December 2020. In addition, the elections that recently took place in Italy in March resulted in a fragmented parliament, making forming a government difficult. The European Commission, in its economic forecast report published in May¹⁶, warned that political uncertainty had intensified in Italy and that if it continued, it could have a negative impact on financial markets and economic sentiment.

- International stock markets recorded losses in February, while the VIX volatility index hit its highest level in over two years in that same month, in response to the possibility of a faster than expected normalisation of monetary policy in the United States. In this context, the protectionist measures announced by the US administration in March and April (resulting in 25% tariffs being applied to imports of steel and aluminium and the possibility of tariffs on aeronautical and automotive imports) together with the reprisals announced by the Chinese government triggered additional corrections in international equity prices and episodes of moderate volatility, although the impact was limited in terms of size and duration. Should these tensions in commercial relations extend over time, they might have a negative impact on global economic activity in the medium and long term.
- Finally, geopolitical risks remain significant. Events linked to heightened tensions between different powers, such as those caused by the withdrawal of the United States from the Iranian nuclear deal and the possibility of terrorist attacks globally might have a substantial impact on financial markets.

¹⁶ https://ec.europa.eu/info/sites/info/files/economy-finance/ip077_en.pdf

Risk categories

Market risk: yellow

- The Ibex 35, which accumulated losses of over 4% in February in the wake of the falls on Wall Street, later recovered almost all the losses and reduced the cumulative fall for the year to 0.6%¹⁷. The main international indices had a mixed performance, with falls recorded in most markets in the US and Asia¹⁸ in response to the expectation of new rate rises by the Federal Reserve¹⁹, which was compounded by fears of a trade war and rising oil prices. In the case of Europe²⁰, most markets recovered their initial losses in response to the expectation that the future tightening of the ECB's monetary policy may be further delayed by the slowdown in activity in the first quarter of the year and a stable inflation environment. The largest rises corresponded to oil, industrial, metal and mineral companies and to small-cap companies, whose gains were linked to the economic cycle, which rose by almost 14%²¹. In contrast, the largest falls were for textile companies, whose revenue is suffering as a result of competition from e-commerce, and for real estate companies and banks, for which, despite their positive results, a hypothetical increase in interest rates would raise uncertainties about their business due to an adjustment in valuations and an environment of rising financial costs for their customers²².
- The price-earnings ratio (P/E) of the Ibex 35 fell from 13.8 in the middle of January to 12.7 in April (its lowest level of the last two years) due to growth in corporate profits and, to a lesser extent, the fall in prices (Figure 4). Reported aggregate short positions at the end of April remained above 0.8% of total market capitalisation (Figure 3). As in recent quarters, particularly large short positions were recorded in Día and Técnicas Reunidas, which were joined this quarter by Neinor Homes.
- The main market risks remain in fixed-income assets as revealed by the losses in the sovereign debt of the major euro area economies every time that interest rates have temporarily increased. The prospect that the ECB's accommodative monetary policy may be extended over time²³ has temporarily eased pressure on debt yields (rises so far this year of only 15 bp for the largest economies). In addition, there were reductions in the yields required from the debt of peripheral countries (between 15 and 25 bp)

¹⁷ With data to 30 April. In the first few days of May, the Ibex 35 rose significantly, leading to a cumulative gain over the year of 2.3% (up to 11 May).

¹⁸ Up to 30 April, the main indices recorded falls, with losses in the US Dow Jones and S&P 500 of 2.2% and 1%, respectively, in the MSCI World of 0.8%, and the Japanese Nikkei 225 and Topix of 1.3% and 2.2%, respectively. Only the US Nasdaq recorded gains (2.4%).

¹⁹ The yield on 30-year US bonds rose above 3% for the first time since May 2017.

²⁰ The main European indices recorded both positive and negative performance, with the Eurostoxx 50, the French Cac 40 and the Italian Mib gaining 0.9%, 3.9% and 9.7%, respectively, while the German Dax 30 lost 2.4%.

²¹ These types of companies gained 8.9% and 31.4% in 2016 and 2017, respectively, compared with a loss of 2% and a gain of 7.4% in the Ibex 35 over the same periods.

²² In early May (after the closing date of the note), Argentina sought IMF aid in a complex environment of sharp rises in interest rates and interventions in foreign exchange markets that failed to stabilise the country's financial markets. In Spain, several large companies in the banking, telecommunications, energy, tourism and food sectors have interests in Argentina, but they remain cautious as it is too early to assess the consequences of a possible worsening of the Latin American economy.

²³ At its April meeting, the ECB agreed that the monetary policy needs to remain accommodative in order to accompany economic expansion and support the rise in inflation. In January, it had confirmed that net asset purchases at a monthly pace of 30 billion euros would continue until the end of September, or beyond if necessary.

thanks to improvements in their ratings²⁴. Against this backdrop, the yields on German and French sovereign bonds of terms of up to 5 years remain negative or close to zero. The yield on corporate bonds remains at minimum levels thanks to the extension of the ECB's purchase programme²⁵ at least until September 2018, as well as the positive performance of corporate bond spreads as a result of the increase in company profits. Although no significant interest rate rises are expected in the very short term, as indicated in the previous section of this note, it is worth considering the effects that any increase in interest rates might have on the most indebted market agents and those that are most exposed to fixed-income assets, particularly in the case of riskier assets (whose risk premiums might rise once again) and complex illiquid assets. The volume of Spanish public debt acquired by the ECB stood at 241.6 billion euros²⁶ at the end of April.

Credit risk: green

- The risk premiums on Spanish corporate issuers also suffered the volatility of financial markets in February and increased slightly and temporarily from the 2008 lows recorded at the end of January. In April, the average risk premium of financial institutions stood at 70 bp. In theory, a scenario of normalisation of the monetary policy stance favours bank margins, but it also implies greater uncertainty due to increases in their customers' finance costs, the foreseeable falls in the valuation of fixed-income assets in the portfolio and real estate assets, together with a possible increase in market volatility. The average risk premium of non-financial companies has not fallen from 58 bp as a scenario of normalisation of rates would entail an increase in their financial costs and a fall in the positive impact of the ECB's purchase programme (Figure 12). Similarly, the sovereign risk premium (measured as the spread between the yields on the ten-year bonds in Spain and Germany) improved significantly as a result of the upgrading of the Spanish sovereign debt rating by the main rating agencies²⁷. At the start of April, this spread reached its lowest level since the sovereign debt crisis in 2010 (66 bp) and ended the month at slightly higher values (Figure 11).
- The falls recorded over recent months in outstanding household loans continued to narrow, while lending to companies once again fell following the timid recovery at the end of 2017. Lending to households fell in March by 0.4% on a year-on-year basis (-0.6% in December 2017), thanks to the continued expansion of consumer loans (6%) and the slowdown in the fall in mortgage loans (-2.5%). In the case of companies (-1.4% in March), both SMEs and large corporations have taken advantage of the improvement in the economy to undertake deleverage measures, while at the same time the largest companies continue replacing part of their traditional bank lending

²⁴ In September 2017, Standard & Poor's upgraded the rating of Portugal's sovereign debt to BBB-, therefore allowing it to escape from the rating of junk bond, while in April 2018 DBRS raised it from BBB to BBB stable, placing it in investment grade.

²⁵ Up to 30 April, the ECB had acquired European corporate debt amounting to 151.85 billion euros, including securities from 17 Spanish issuers, of which 17.85% was purchased in the primary market.

²⁶ Representing 27.8% of the outstanding balance of long-term debt securities issued by the State.

²⁷ See footnote 12.

with corporate debt issues. In addition, the balance of foreign loans has been falling for more than half a year.

Liquidity, financing and fragmentation risk: green

- Fixed-income issues registered with the CNMV to April amounted to 22.07 billion euros, 31% down on the same period of 2017, with one particularly noteworthy bond issue by SAREB (Asset Management Company for Assets Arising from Bank Restructuring) for an amount of 4 billion euros, one issue of mortgage-covered bonds for 3 billion euros and two issues of preferred shares aimed at institutional investors for a total amount of 1.6 billion euros. Similarly, issues by Spanish corporations abroad grew by 20% in year-on-year terms in the first quarter of the year (26.57 billion euros), with particular growth noted in short-term commercial paper, which accounted for 47% of the total. Noteworthy in equity markets were one public offering of shares and one initial public offering, both by real estate companies (Metrovacesa and Azora Altus, respectively). The first took place in February (for a value of 645 million euros) and the prospectus for the second was filed with the CNMV in April²⁸ (for an expected amount of 454 million euros).
- In the first four months of the year, average daily trading on the electronic market fell by 7.1% (year-on-year) to 2.52 billion euros, in line with the average recorded over 2017 - 2.51 billion euros - (Figure 17). Trading in Spanish shares on markets other than their original market once again grew significantly in the first quarter of 2018, to 38% of total trading subject to market or MTF rules (lit plus dark), its historical high, above the 33.3% and 31.7% of the last quarter and 2017 as a whole, respectively.
- With regard to the functioning of financial markets, it should be noted that the entry into force of MiFID II/MIFIR has been implemented satisfactorily. One of the pillars of this regulation is related to an increase in market transparency, which includes a series of waivers relating to orders at reference prices from another market²⁹ and prearranged transactions. These waivers may be suspended temporarily if any of the double volume caps are exceeded so as not to hinder price formation. On 7 March, 10 April and 8 May, ESMA published the first lists of securities that had exceeded the threshold, meaning that such waivers could not be used (until 12 September, 13 October and 14 November, respectively). These lists included 16 securities admitted to trading on Spanish stock exchanges³⁰. According to preliminary studies, trading of the securities affected by this measure might have fallen somewhat.
- The Ibx 35 liquidity index (assessed through the bid-ask spread) remains at satisfactory levels although it worsened slightly in February, thus reflecting increasing market volatility, before improving again in April. The spread of the ten-year sovereign

²⁸ Subsequently, Azora Altus, in a significant event dated 9 May 2017, indicated its decision to withdraw from the initial public offering, and, consequently, to postpone the process of its admission to trading on Spanish stock markets.

²⁹ Regulated under Article 4.1 of MiFIR.

³⁰ See the CNMV communications of 8 March, 11 April and 9 May implementing ESMA's resolutions: <http://www.cnmv.es/portal/AIDia/Informacion-Sector.aspx>

bond rose slightly in March and then fell to end April at levels lower than the 2017 average.

- The spread between loans to euro area companies and Spanish companies fell for loans lower than 1 million euros, to 7 bp on average over the last three months, its lowest level since 2008, but rose for loans of a higher amount (to 34 bp vs 28 bp in December 2017).

Contagion risk: yellow

- The median value of the correlation between different types of Spanish financial assets remained relatively stable over the first four months of the year, following the increase recorded at the end of 2017, and stood at 0.35 in April (see Figure 31). This figure remains below the average median value recorded over the last decade (0.48). In general, lower levels of correlation make it possible to achieve a greater level of diversification and reduce the possibility of contagion between the different asset types.
- Over the first few months of the year, the correlation between the yields on Spanish debt and that of other European countries fell drastically. This divergence was due to the reduction in the perceived credit risk of the Spanish sovereign bond, as evidenced by the upgrading of its rating by the leading credit rating agencies. Thus, the yield on the Spanish ten-year bond fell by 41 bp in the first quarter, while the yield on the sovereign bond of other core countries was much more stable and, therefore, the correlation with this group fell into negative territory (-0.17) in the middle of March. In contrast, the correlation with the yield on the bonds of peripheral countries recorded a smaller fall as a result of the more even performance of the prices of Spanish and Portuguese (and, to a lesser extent, Italian) public debt. However, the correlations with both groups rose once again in April to similar levels as those recorded at year-end 2017 (see Figure 32).

Market risk: yellow

Figure 3: Short selling



Figure 4: Price-earnings ratio (P/E)

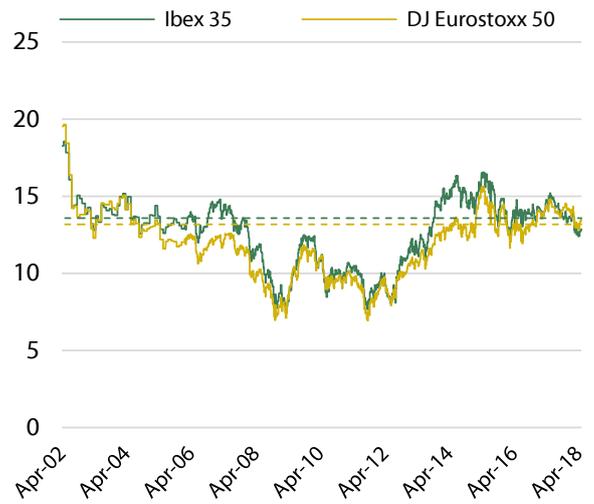


Figure 5: Short-term interest rates (3m)

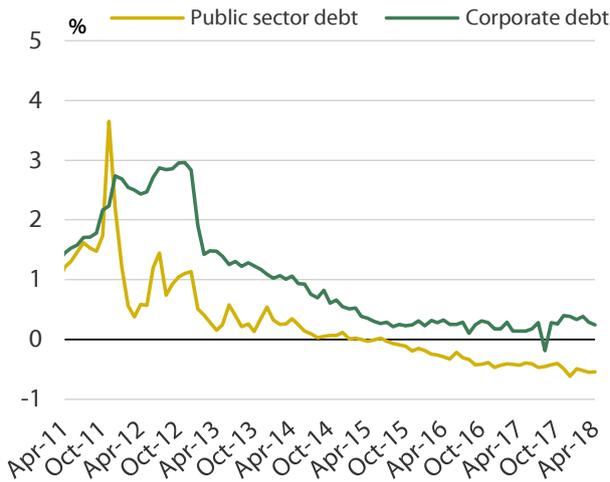


Figure 6: Long-term interest rates (10y)

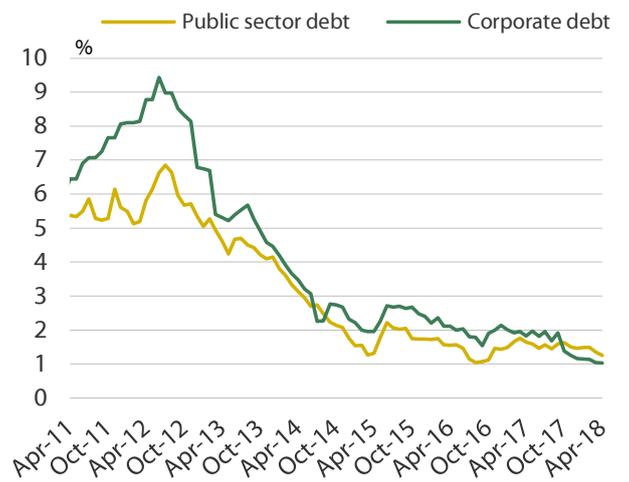
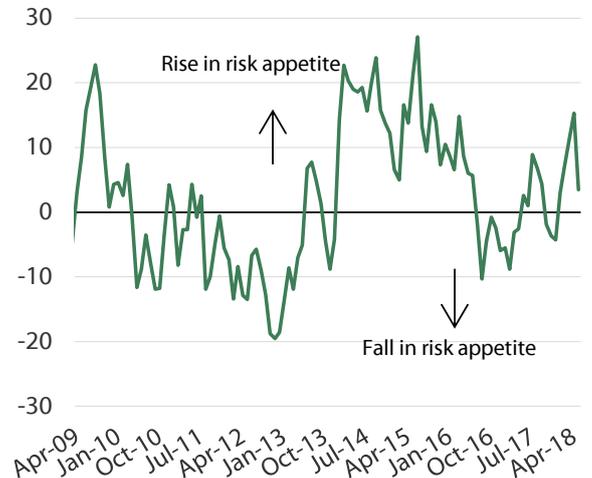


Figure 7: Oil price



Figure 8: Risk appetite (State Street)



Credit risk: green

Figure 9: Financing of non-financial sector

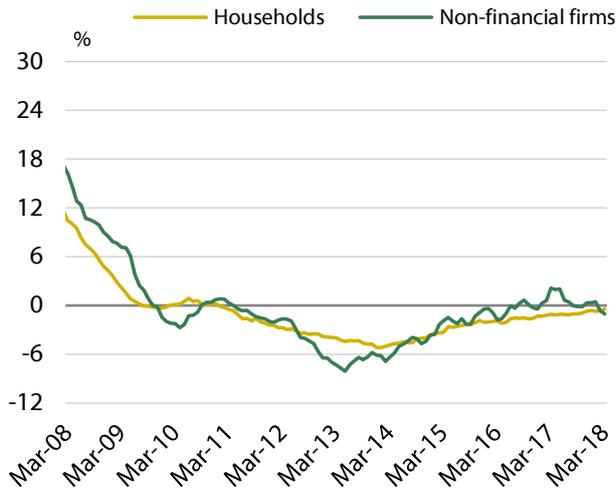


Figure 10: NPL rate and unemployment rate

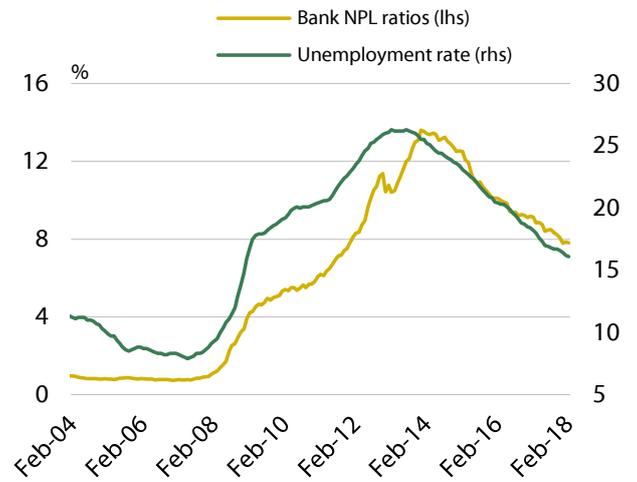


Figure 11: 10-year government debt risk premium (spread with Germany).

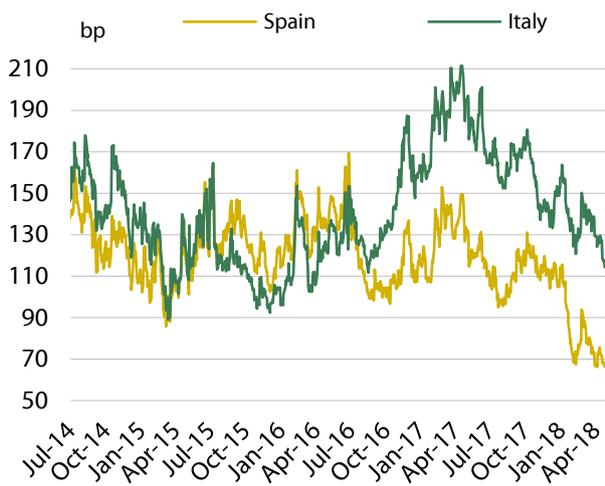


Figure 12: Private debt risk premium (5-year CDS)

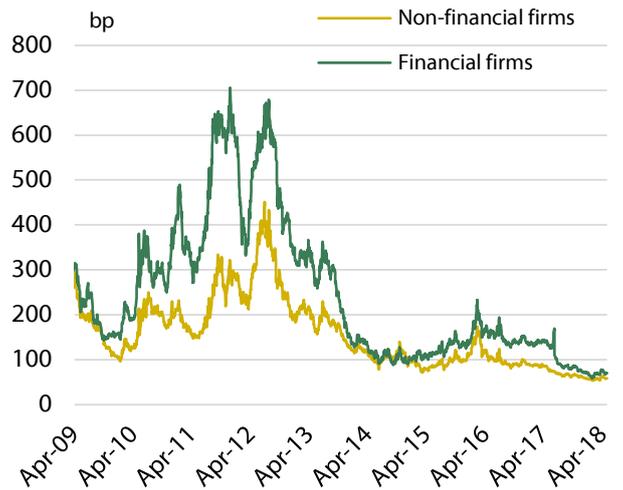


Figure 13: House prices (year-on-year change)

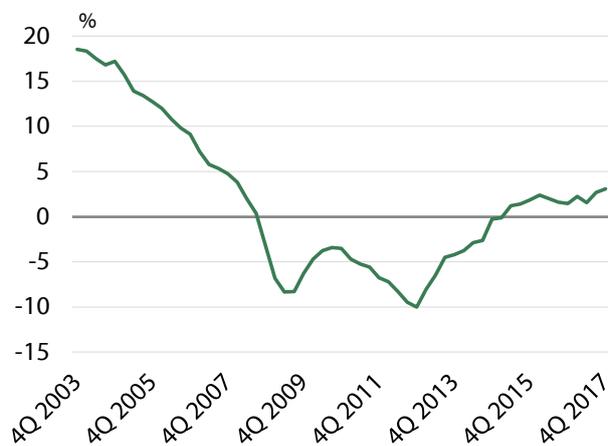
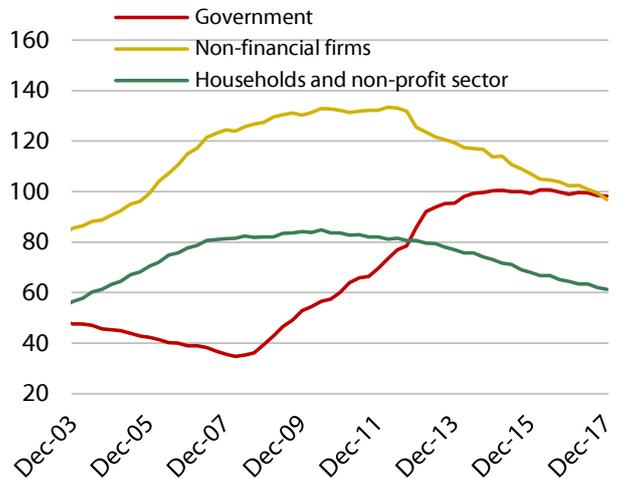
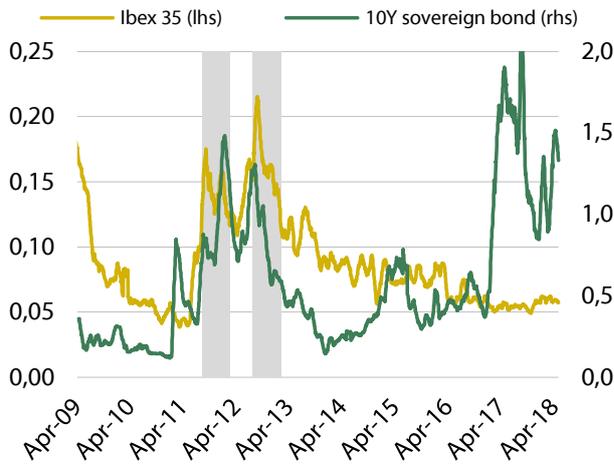


Figure 14: Borrowing (% GDP)



Liquidity, financing and fragmentation risk: green

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



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

Figure 16: Volatility (1m moving average)

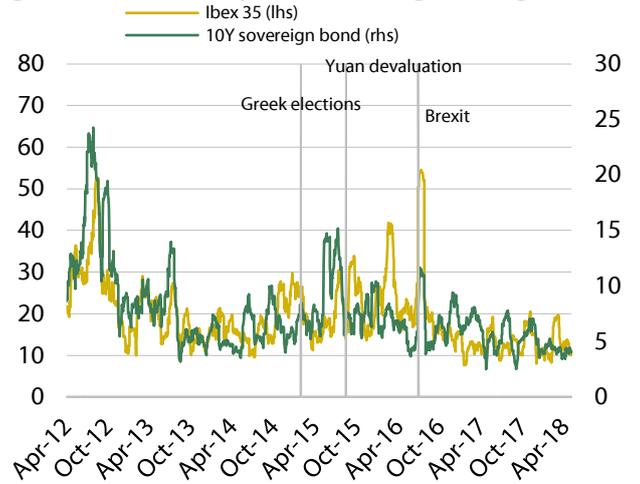


Figure 17: SIBF trading (1m moving average)

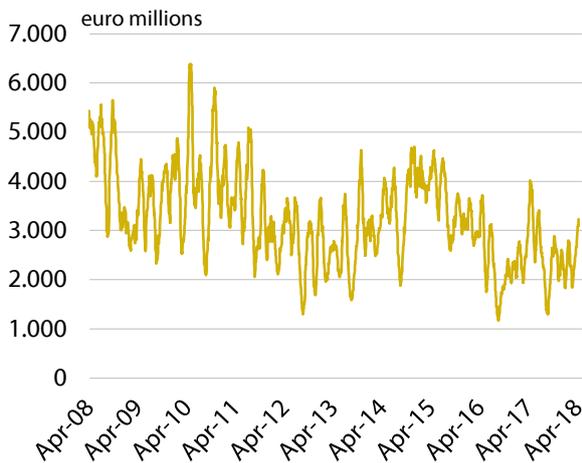


Figure 18: Interbank spread (LIBOR-OIS)

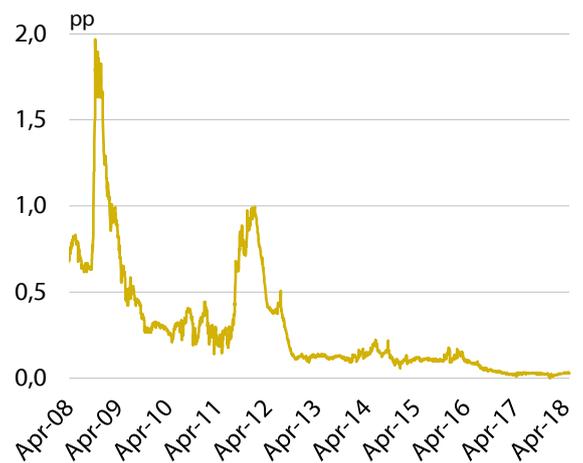


Figure 19: Spain-EU spread on corporate lending rates

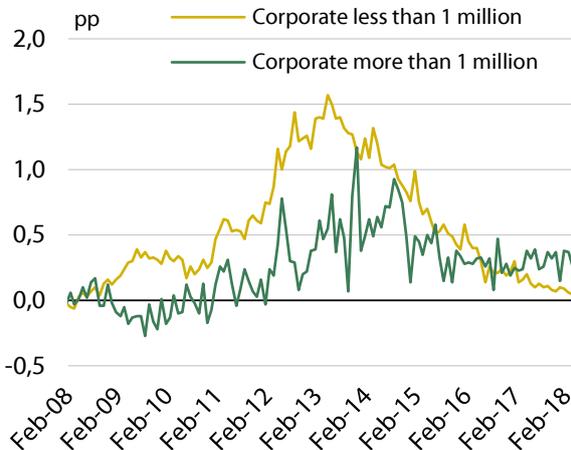
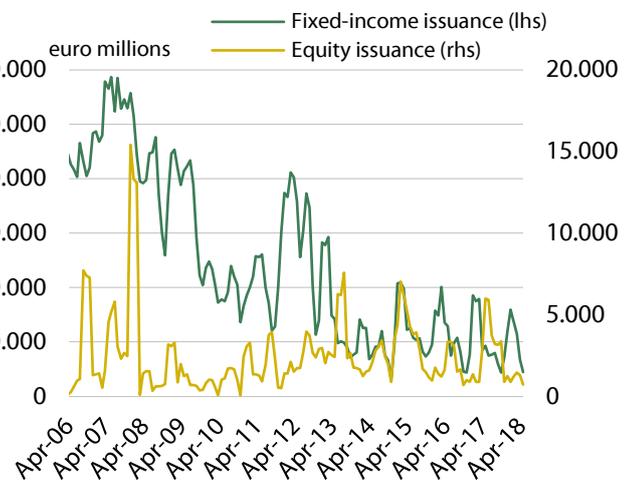


Figure 20: Issues (3m moving average)



Macro-economic risk: yellow

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

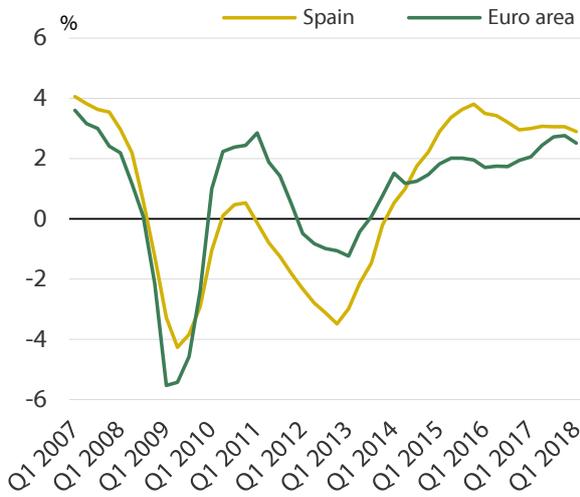


Figure 22: HCPI and core CPI (year-on-year change)

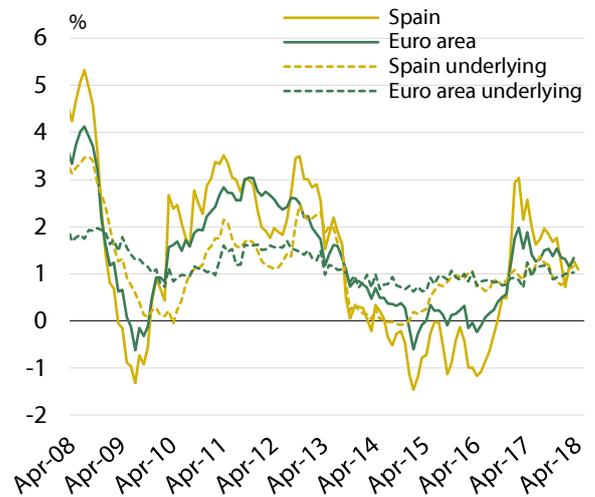


Figure 23: Employment (year-on-year change)

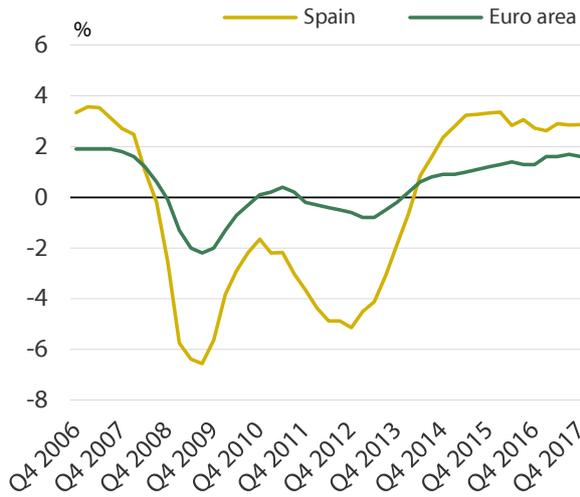
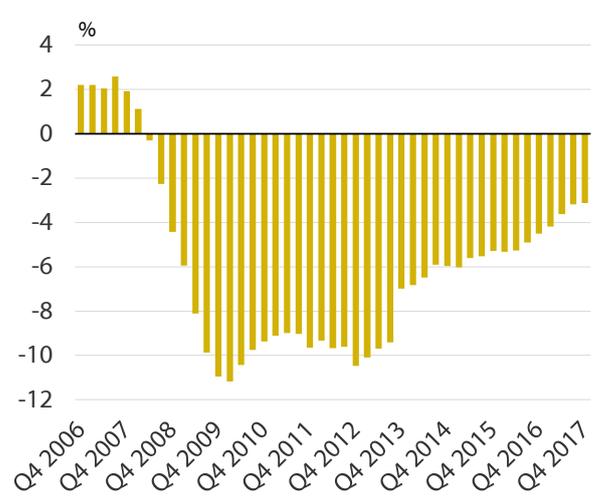


Figure 24: Government balance (% GDP)



Cumulative data four quarters.

Figure 25: Exchange rates

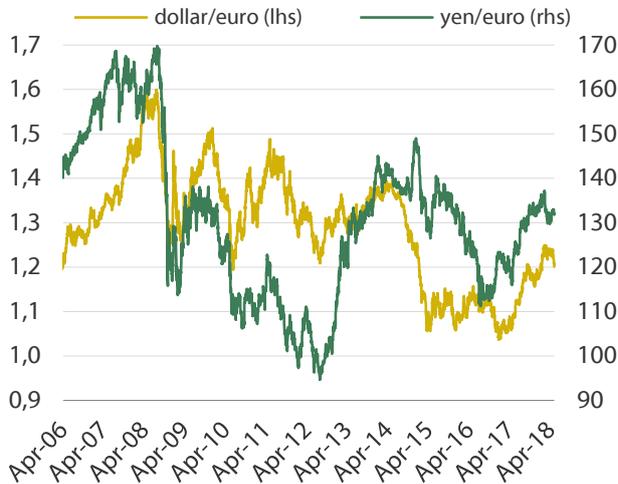
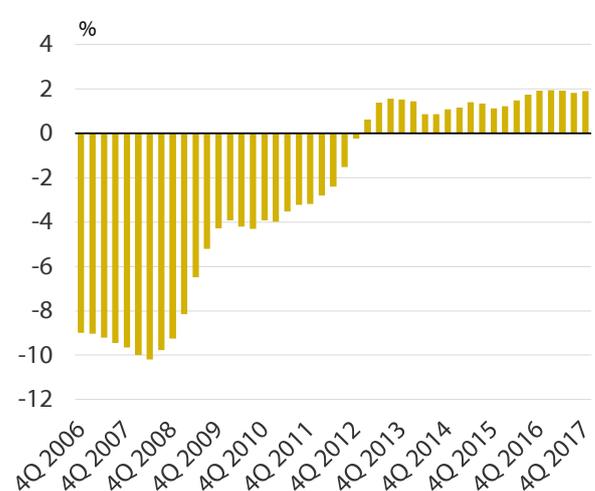
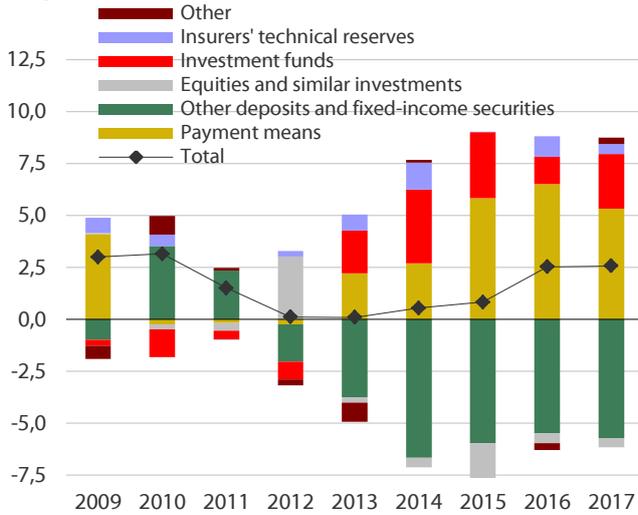


Figure 26: Current-account balance (% GDP)



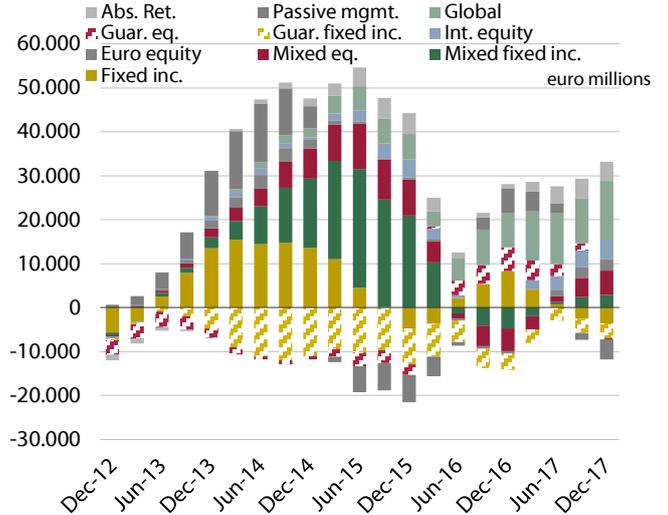
Investors

Figure 27: Households: net financial asset acquisitions (% GDP)



Cumulative data four quarters.

Figure 28: Net subscriptions to investment funds



Cumulative data four quarters (million euros)

Figure 29: Bitcoin price and searches

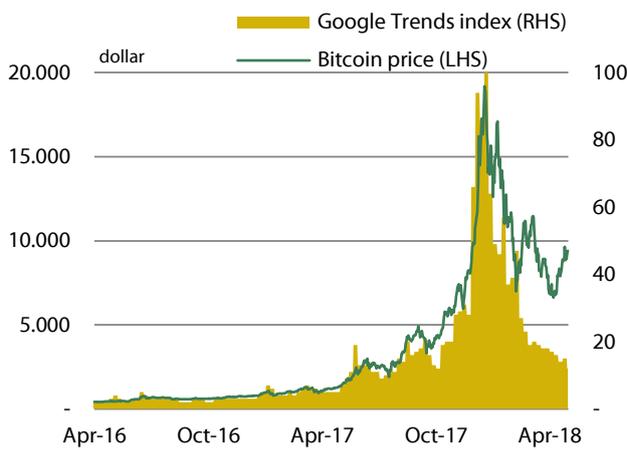
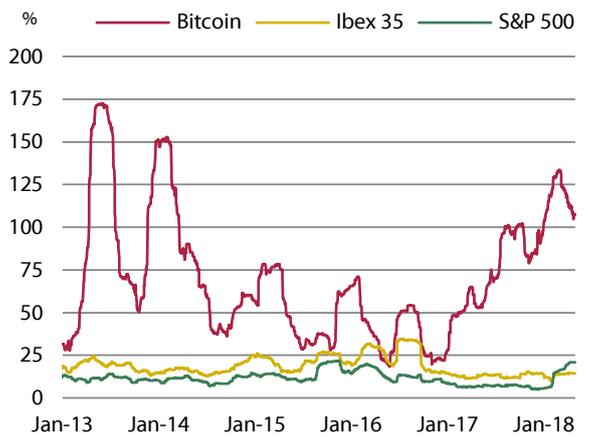


Figure 30: Bitcoin volatility



Contagion risk: yellow

Figure 31: Correlations between asset classes

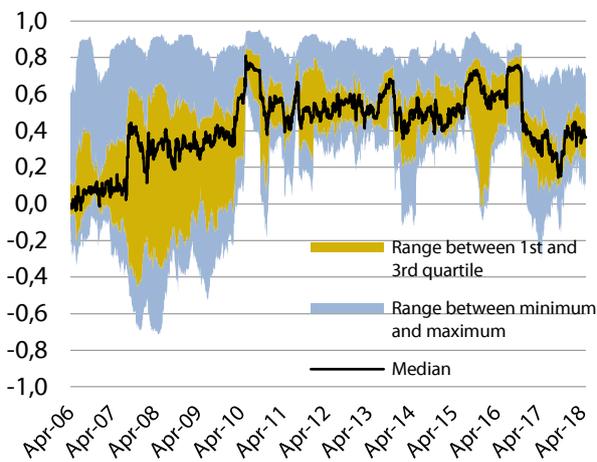
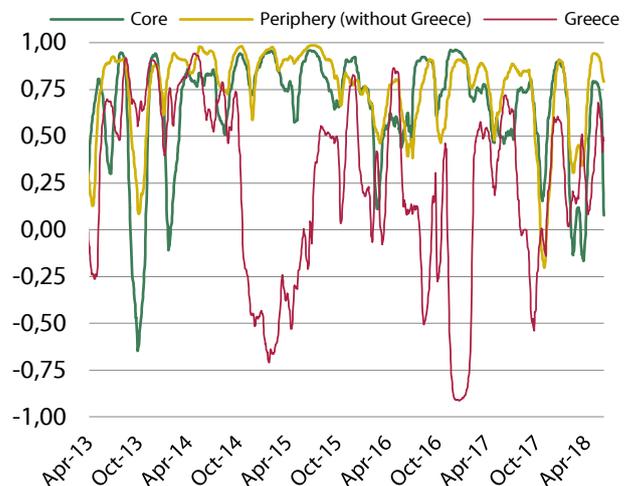


Figure 32: Correlation between the yield on the Spanish and European 10Y bonds



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 (equity income, 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 indices), 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 14 (January (1)), 23-41 or CNMV Working Paper 60 (<http://www.cnmv.es/portal/Publicaciones/monografias.aspx>).

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 (see page 13) includes 43 indicators³¹, 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

³¹ Since June 2017, the heat map includes an additional indicator: the bid-ask spread of the ten-year sovereign bond.

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 detailed information on the methodology and the analysis of these maps, see the article “Identification of vulnerabilities in the Spanish financial system: an application of heat maps”, published in the Quarterly Bulletin of the CNMV corresponding to the first quarter of 2015.

Short positions (Figure 3): The figure for aggregate net short positions includes the sum, to the reference date, of the individual positions declared (0.5% or higher), plus the total for positions of 0.2% or higher but lower than 0.5%. The series only reflects the positions declared at each date and is therefore not recalculated to take into account any later changes or exceptional inclusions of notifications of positions at a date previous to that of each aggregation.

Bitcoin price and searches (Figure 29): The Google Trends index reflects users’ interest in the Google search engine for a specific subject in a certain region and period. In this case, the index shows the term “bitcoin” globally from 2016 up to the reporting date of the Stability Note.

Bitcoin Historical volatility (Figure 30): Annualised standard deviation of the daily changes in prices in 90-day windows.

Contagion risk: The indicators making up this block are of somewhat greater 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 European 10Y bond (Figure 32).** The correlation is calculated using daily data in three-month windows. The countries of the core group are Germany, France, Holland and Belgium, and the peripheral countries are Portugal, Italy, Greece and Ireland.