CNMV
Comisión Nacional del Mercado de Valores

Financial Stability Note

No. 5 January 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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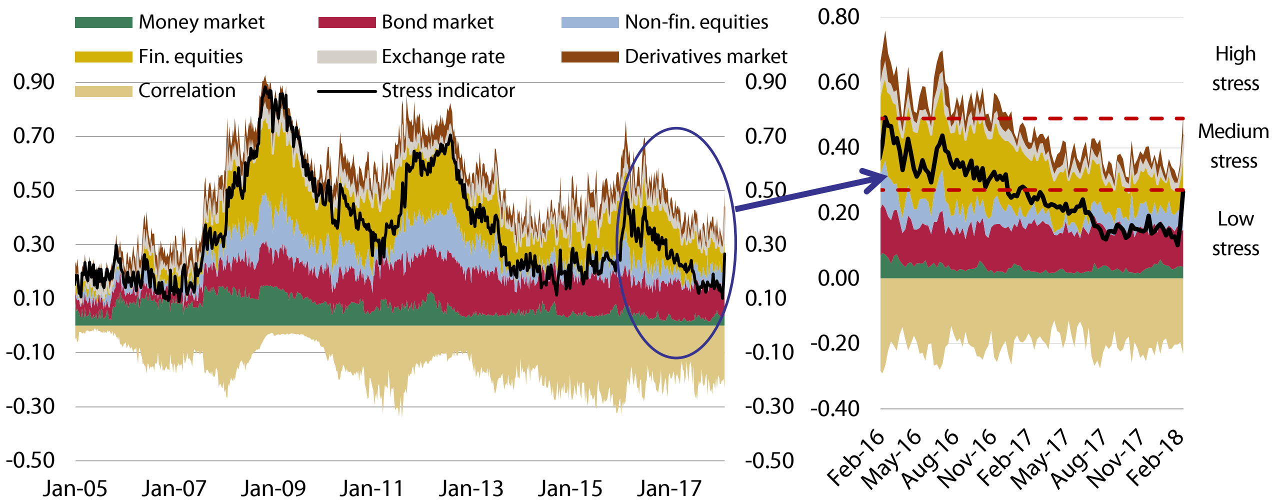
Summary

- ✓ Spanish financial market stress, which had remained at very low levels for several months, rose in the first few days of February[1] to 0.27, the threshold separating low stress and medium stress (see Figure 1). This increase is linked to the episode of turmoil recorded in US equity markets, in which strong employment and rising salaries led to a change in inflation expectations in the US and, consequently, in the process of interest-rate rises. These events had an impact on European stock markets, which suffered sharp falls in prices and significant rises in volatility. The Spanish financial markets stress index thus recorded upturns in the equity, derivatives and exchange rate segments. New turmoil in the future resulting from changes in inflation expectations or a possible reassessment of financial risks is not ruled out.

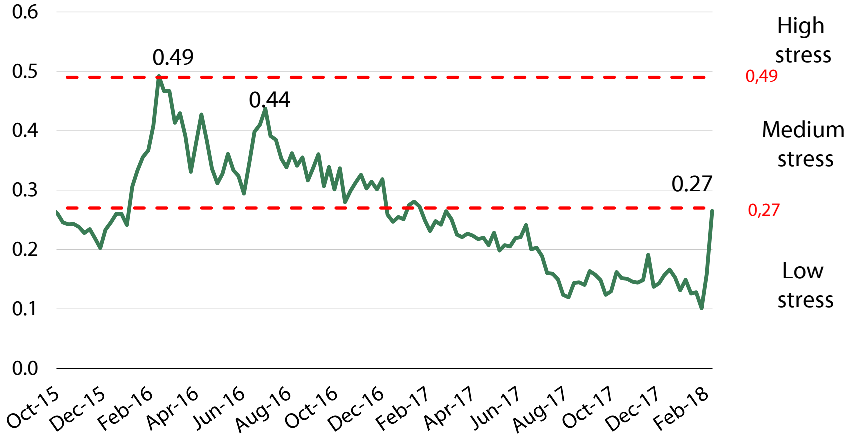
Spanish financial markets stress index

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 reporting date of this note is 9 February with regard to the stress index, stock market prices and interest rates and 31 January for other information.

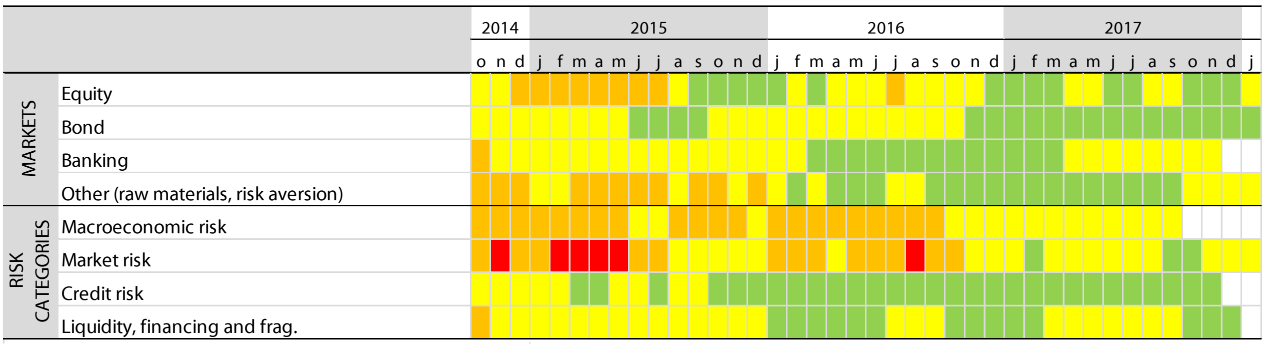
- ✓ Spanish financial markets performed positively last year and in January of this year on the basis of strong economic growth, which is more balanced than in previous expansionary phases. The uncertainties resulting from the crisis in Catalonia did not lead to a significant upturn in market stress in 2017, but there was a notable deviation in the trend of the Spanish stock market compared with European markets, which narrowed in the first month of 2018. The upward trend of the Ibex 35 at the start of the year stalled in February as a result of the turmoil in US markets, which cancelled out the initial gains and gave rise to cumulative losses of 4% (-5.1% for the Euro Stoxx 50, -6.3% for the German Dax and -4.4% for the French Cac). For its part, the risk premium of Spanish sovereign debt has fallen significantly to date this year (to 68 bp) having benefited from the improvement in the rating published by Fitch and the fact that it was not affected by the aforementioned turmoil.

- ✓ The most significant risks that continue to affect financial markets are those related to market risk and liquidity risk, particularly in some corporate bond segments. In addition, in the current context of prolonged low interest rates in Europe, it is important to bear in mind the possibility that some investors, seeking higher returns, might be acquiring assets that entail too much risk for their profile. The spectrum of these assets is very wide and covers shares, high-yield debt and, more recently, much riskier assets, such as cryptocurrencies.

- ✓ As mentioned above, the macro-economic performance of Spain remains positive. According to the latest data, GDP grew by 3.1% in 2017 (more than half a percentage point above the euro area), the number of employed people rose by almost 500,000, the public deficit (in the absence of data from one month) was able to remain close to 3% of GDP and inflation fell significantly as energy prices normalised. For 2018, the IMF forecasts GDP growth of 2.4%, 0.1 points lower than its previous forecast due to internal political uncertainties. For its part, the European Commission forecasts growth of 2.6%. The most significant risks perceived this year for the Spanish and other European economies is the possible impact of the appreciation of the euro on exporters.

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

- The Spanish economy continued to consolidate its growth in 2017, although there was a slight slowdown towards the end of the year (Figure 21). In the fourth quarter of 2017, GDP growth stood at 3.1% in year-on-year terms (0.7% quarter-on-quarter), slightly above the growth recorded in the euro area (2.7% year-on-year and 0.6% quarter-on-quarter), and in the year as a whole GDP grew by 3.1%, 0.6 percentage points higher than in the euro area. Employment continued to grow strongly (Figure 23) at rates of just under 3%, which led to a fall in the unemployment rate[2] to 16.55% of the active population in the fourth quarter of the year, two percentage points lower than at year-end 2016. The number of employed people has grown by over 1.8 million over the last four years. Inflation stood at 1.1% in December in year-on-year terms, 0.6 points lower than in November as a result of the fall in inflation in energy and fresh food. In 2017, the average inflation rate stood at 2% (1.5% in the euro area) and the underlying rate stood at 1.1% (1% in the euro area). The preliminary information from January indicates that inflation has recorded a new and substantial fall (to 0.5%) as a consequence of the sharp fall in energy inflation[3].

- Public sector finances improved significantly in 2017 as a result of the recovery in the economy as well as the sharp fall in spending on debt interest. Up to November, the combined deficit of the Central Government, Autonomous Regions and the Social Security stood at 2.06% of GDP, well below the 3.38% recorded in the same period of the previous year[4]. Deducting the debt interest payments, there was a primary surplus of 0.18% of GDP (compared with a deficit of 1.1% in 2016). Although December is a month of high spending for the government, the performance of the public accounts to November suggests that the deficit target set for 2017 (3.1% of GDP) may be reached or it may even fall slightly below the 3% threshold, which would lead to exit from the Excessive Deficit Procedure which began in 2009. The most significant challenge for the Spanish economy in this area will be related to the need to reduce the level of public debt, which stood at 98.7% of GDP in the third quarter of last year.

- According to the information published by the IMF in January, world growth accelerated significantly in 2017 (from 3.2% to 3.7%) and was marked by a high level of synchrony between advanced and emerging economies. According to the IMF forecasts, the global economy will continue to grow in 2018 and 2019 (by 3.9% in both years), mainly as a result of the impact of the US fiscal reform and the upturn in world trade. Against this background, the Spanish economy will grow, according to the IMF,

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

[3] The decrease in energy inflation is the result of both the fall in electricity prices in January 2018 and the comparison with the sharp increase in fuel prices in January 2017 (which is known as the base effect).

[4] This figure does not include the balance of Local Authorities or the amount of the aid given to banks, which in 2017 amounted to 442 million euros (2.35 billion euros in 2016). By subsector, the deficit of the Central Government fell sharply from 2.52% of GDP in 2016 to 1.51% in 2017, while the Autonomous Regions moved from a negative balance in 2016 (-0.43%) to a surplus in 2017 (0.11%). The Social Security Funds recorded a very similar deficit (-0.7% in 2017 compared with -0.65% in 2016).

by 2.4% in 2018 (2.6% according to the European Commission), slightly above the expected rate for the euro area (2.2%). Spain was the only major advanced economy that suffered a slight downgrading in the forecasts, as a result of the political uncertainty in Catalonia. In addition to the challenge of reducing public sector debt, the Spanish economy faces other challenges resulting from the high unemployment rate (currently falling), the impact of the recent appreciation of the euro on the export sector and internal political uncertainty.

Low interest rate environment

- Interest rates remain at very low levels, although there was a turning point in the trend in the first few weeks of 2018. It is still only at the initial stages, but should it continue, it might have significant consequences for the most indebted market agents, for the banking sector and for investors (particularly those that have a high portion of fixed-income instruments in their portfolio). The largest rises in bond yields were recorded in long-term maturities both in the US (42 bp to 2.8% for 10-year government bonds), driven by the new tax reform and, in general, by the context of growth and higher inflation expectations, and in Europe, where yields on the British, German and French bonds have recorded increases of 39 bp, 33 bp and 20 bp in the year to date. In Europe, the rise in yields (which did not apply to the Spanish bond) was a result of the positive performance of the economy and the reduction in sovereign debt purchases by the ECB. In this context, the most significant risk is related to the possible publication of new indicators that entrench the expectations of higher inflation in the US, which might bring forward (and intensify) the process of rate hikes by the Federal Reserve and generate new episodes of turmoil in financial markets similar to those recorded in the first few days of February.

- Data for households, meanwhile, show that the major trends in place since 2013 continued in the third quarter of 2017: investors are withdrawing their investments in term deposits and bonds (6.5% of GDP[5]) as a result of low returns, and they are investing in more liquid assets[6] (6.3% of GDP) and in investment funds (2.3% of GDP). In the case of investment funds, it is important to indicate that investors are showing a clear preference for higher-risk categories: in fact, cumulative figures in the last four quarters to September 2017 show that the most conservative categories recorded net redemptions of over 7.3 billion euros, while higher-risk categories received a significant inflow of investment. Among the latter category, there was significant investments in global funds (over 10 billion euros) and in absolute return, mixed equity and international equity funds, with amounts for each category ranging between 3.9 and 4.5 billion euros (see figure 28).

- The performance of the banking sector continues to depend on conflicting factors. On the one hand, low interest rates, an NPL ratio that remains high (although in decline)

[5] Cumulative data from four quarters up to the third quarter of 2017.
[6] Cash and overnight deposits.

and a certain overcapacity in the sector continues to weigh down on the profitability of banks in Spain and in other European economies. On the other hand, the strength of domestic demand, led by private consumption, and the identification of attractive investment projects, is allowing lending to recover to some extent, which, if the change in trend for interest rates is confirmed, may have a positive impact on the sector's income statement in the medium term. Finally, the sector faces challenges relating to technology applied to finance (fintech), which have led banks to make significant investments.

Sources of political uncertainty

- In the domestic context, political tensions in Catalonia have eased and it is likely that the impact that the institutional crisis had on financial markets and on the real economy over the last quarter of the year was limited and temporary. The easing of political stability was reflected in the markets over January, when the Ibex 35 index rose by 4.1%, a figure higher than those recorded in most of the leading European stock markets in the same period[7], although this increase was reversed in the first week of September as a result of the turmoil caused by US stock markets (see the section on Market Risk). For its part, the yield of the 10-year sovereign bond has fallen by 10 bp since the start of the year, to 1.47 %[8], in contrast with the increases in the yields of other European sovereign bonds, which oscillated around 25 bp. However, the effects that this episode might have on markets and economic activity in the medium term are uncertain and will depend on how events unfold during the coming months.

- In Europe, the main political risks for the financial and economic environment stem from the Brexit negotiations. In this regard, the progress achieved over recent weeks in the first stage of negotiations have made it possible to move onto the start of the second stage, in which the transition period and future relationship between the European Union and the United Kingdom will be shaped. Brexit is scheduled for March 2019 although this deadline may be extended if both parties deem it appropriate. In Germany, the long and laborious process of forming a coalition government has not been free from significant uncertainties with regard to achieving a final agreement or the possible implications that such an agreement would have. Similarly, the results of the elections that will be held in Italy at the start of March may be significant for political stability in the EU.

- In the US, the uncertainty relating to the tax reform proposed by the Trump administration dissipated at the end of December, when Congress approved a set of measures that will allow corporate income tax to be substantially reduced over the coming years. As a consequence of the approval of this tax package, the IMF increased its GDP growth forecast for the US to 2.7% in 2018 and 2.5% in 2019, an increase of 0.4 pp and 0.6 pp, respectively, compared with their previous forecasts. In the area of

[7] 3% in the Eurostoxx 50, 2.1% in the German Dax 30 and 3.2% in the French Cac 40.
[8] This reduction is partially the result of the improvement announced by Fitch on 19 January of the credit rating of Spain, which went from BBB+ to A-.

trade policy, a shift towards applying protectionist measures (for example, in the renegotiation of the NAFTA agreement) might have a negative impact on global economic activity over the medium and long term.

- Finally, geopolitical tensions remain high. Events linked to worsening relations between different powers and the possibility of terrorist attacks on a global scale might have a substantial impact on financial markets.

Other emerging risks

- Cybersecurity. With the increasing digitisation of information and trade and post-trade processes, cybersecurity has become a key element in managing risks that might affect the integrity, efficiency and resilience of financial markets. For this reason, the European Commission adopted the NIS Directive[9], which aims to improve the level of cyber-resilience in the EU and which will need to have been transposed by all States by May of this year. It is also essential to promote awareness about this matter in the context of corporate culture. A report by the European Union Agency for Network and Information Security (ENISA)[10] reveals that 50% of cybersecurity incidents are due to basic user errors.

- Cryptocurrencies. The phenomenon of cryptocurrencies, and virtual assets in general, is attracting a great deal of interest from authorities[11] as a result of their extraordinary growth over recent quarters and the potential risks surrounding this activity, particularly with regard to investor protection. In the specific area of cryptocurrencies, investors should be aware that: (i) Although their trading has grown exponentially, these assets have no intrinsic value besides the expectation of being able to exchange them for goods, services or other assets in the future[12] and (ii) their extreme volatility makes them very risky assets (see Figures 29 and 30). It should also be pointed out that the anonymity of transactions performed with cryptocurrencies raises concern in several sectors as this feature may be used with illicit objectives or in relation to illegal activities (tax evasion, money-laundering, terrorist financing, etc.). Lastly, the technology underlying cryptocurrencies – blockchain - has not been submitted to sufficient testing and therefore problems relating to transaction speed and security cannot be ruled out[13].

[9] Directive (EU) 2016/1148, of the European Parliament and of the Council, of 6 June 2016, concerning measures for a high common level of security of network and information systems across the Union.
[10] https://www.enisa.europa.eu/publications/looking-into-the-crystal-ball
[11] See the Joint press statement by CNMV and Banco de España on "cryptocurrencies" and "initial coin offerings" (ICOs) https://www.cnmv.es/loultimo/NOTACONJUNTAcriptoEN%20final.pdf and the ESMA warning https://www.esma.europa.eu/press-news/esma-news/esas-warn-consumers-risks-in-buying-virtual-currencies
[12] BIS Quarterly Review, September 2017.
[13] https://www.esma.europa.eu/press-news/esma-news/esma-highlights-ico-risks-investors-and-firms

Risk categories

Market risk: yellow

- The Ibex 35, which had gained 4.1% in January, offsetting the 3.3% fall in the last quarter of 2017[14], fell once again in the first sessions of February, recording cumulative falls of 4% in the year, dragged down by the falls on Wall Street. The US indices[15], which had started the year with significant gains, fell sharply as a result of the expectations that the Federal Reserve would bring forward the scheduled rate hikes following better-than-expected unemployment data and an upturn in wages. Their falls were passed on to the leading European indices[16], which fell into negative territory and recorded falls greater than those of the Spanish index. Despite these falls, the Spanish market recorded gains in bank shares[17], which benefited from the positive effects on their margins that the expected monetary policy tightening could have, as well as in small-companies most linked to the economic cycle. The most significant decreases corresponded to companies in the electricity and gas sector, whose regulated income may fall as a result of regulatory change and, to a lesser extent, the most leveraged companies as a result of more expensive borrowing.

- The price/earnings ratio (P/E) of the Ibex 35 fell from 13.9 in mid-September to 13.7 in December, but rose once again in January 2018 to 13.8 (its historic average is 13.6). Over recent months, the growth in corporate earnings has followed a similar path to that of equity prices, thus keeping the ratio relatively stable. Reported aggregate short positions, which remained at around 0.7% of total capitalisation of the securities in the last quarter of 2017 (Figure 3), once again rose at the end of January to above 0.8% of total capitalisation. As in recent quarters, the greatest volume of short positions was in Día and, to a lesser extent, Técnicas Reunidas.

- The greatest market risk remains in fixed-income assets, as demonstrated by the losses in the sovereign debt of the biggest euro area economies, whose yields have started to rise (between 22 and 38 bp since the end of October) in response to the expectation that the ECB's debt purchase programmes[18] will be reduced and eventually disappear over 2018. The yield of the five-year German sovereign bond rose and moved into positive figures[19], while the one-year Euribor stopped falling and rose slightly in January for the first time since 2015. In the case of corporate debt, despite the January reduction of the ECB's debt purchase programme[20] to 30 billion euros per month, its

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[14] In the fourth quarter of 2017, the Ibex 35 suffered the impact of political uncertainties and performed worse than most of the leading European indices. Thus, in the same period, the Dax gained 0.7%, while the Eurostoxx 50, the Cac 40 and the Mib 30 recorded losses of 2%, 0.3% and 3.7%, respectively.

[15] The Dow Jones, S&P 500 and Nasdaq indices, which gained 5.8%, 5.6% and 7.4%, respectively, in January, recorded falls of 2.1%, 2% and 0.4% up to 9 February.

[16] In January 2018, the main European share indices gained between the 2.1% of the German Dax 30 and the 7.6% of the Italian 30 Mib. The European Eurostoxx 50 index and the French Cac 40 rose by 3% and 3.2%, respectively, over the same period. Up to 9 February, the Eurostoxx 50, the Dax 30 and the Cac 40 recorded losses of 5.1%, 6.3% and 4.4%, respectively, while the Italian Mib 30 gained 1.4%.

[17] On 20 November, the CNMV decided to lift the ban on adopting short positions on Liberbank, which had been in force since 12 June 2017.

[18] On 25 January, the ECB confirmed that net asset purchases for 30 billion euros per month will continue until the end of September 2018, or beyond, if necessary, and in any case until the Governing Council sees a sustained adjustment in the path of inflation consistent with its inflation aim.

[19] The five-year German sovereign bond has not stood in positive terrain since the second half of 2015.

[20] Up to 26 January, the ECB had acquired European corporate debt amounting to 136.92 billion euros, including securities from 17 Spanish issuers, of which 15.13% was purchased in the primary market.

yield remains at minimum levels as a result of the confirmation that the purchases will continue until September 2018, as well as the good performance of the risk premiums of large companies due to growth in the economy. In this context, it is important to consider the consequences of a possible rise in interest rates on the most indebted market agents and those with most exposure to fixed-income assets, particularly higher-risk assets (whose risk premiums may once again increase) and to illiquid complex assets. The volume of Spanish public debt acquired by the ECB stood at 230.6 billion euros[21] at the end of December.

Credit risk: green

- The risk premiums on Spanish corporate issuers narrowed to end January at their lowest level since 2008, although they also suffered the effect of volatility in international financial markets and lost part of their initial falls. The biggest improvements were for financial institutions, whose risk premiums fell on average to 69 bp, benefiting from the strength of their balance sheets and the expectation that the normalisation of the ECB's monetary policy would be brought forward, while the risk premiums of financial companies dropped to 58 bp thanks to the positive effect of the ECB's purchase programme (Figure 12). Similarly, the sovereign risk premium (measured as the spread between the yields of the 10-year bonds in Spain and Germany) overcame the effects of the institutional crisis in Catalonia and improved significantly to 72 bp in February (Figure 11), its lowest level since the sovereign debt crisis of 2010. This fall, which was not interrupted by the stock market turmoil, also reflected the improvement in the credit rating given by Fitch to Spanish sovereign debt (from BBB+ to A-) and allowed Spanish sovereign debt to perform better than those of other leading European economies.

- There was a slowdown in the falls recorded over recent months in outstanding household loans, while lending to companies[22] once again grew following the falls recorded between August and October. The fall in household borrowings slowed down (annual rate of -0.8% in December) thanks to the acceleration in consumer lending (5.6%) and the slowdown in the fall in mortgage loans. In the corporate market (0.9% in December), the growth in economic activity once again activated loans to SMEs, as the larger companies continue to replace part of the traditional bank lending with corporate debt issues.

Liquidity, financing and fragmentation risk: green

- Fixed-income issues filed with the CNMV in the fourth quarter stood at 47.82 billion euros, 14% down on the same period of 2016, with one significant bond issue by

[21] Representing 27.37% of the balance of the long-term debt securities issued by the State.
[22] Includes loans from resident institutions, securities other than shares and loans from abroad.

SAREB (Asset Management Company for Assets Arising from Bank Restructuring) for an amount greater than 10 billion euros. In 2017, these issues amounted to 109.46 billion euros, 21.3% down on 2016 – the lowest volume of recent years – with Spanish companies continuing to increase the proportion of issues made abroad, which rose by 51.9% to November (79.8 billion euros). The preliminary data for January 2018 indicate that debt issues stood at 8.66 billion euros, more than double the figure for the same period of 2017, with noteworthy issues of mortgage covered bonds and securitisations. In equity markets, there were two noteworthy public offerings of shares by two real estate companies, Aedas Homes in the last quarter of 2017 and Metrovacesa, whose prospectus was filed with the CNMV in January.

- Average daily trading volumes in the electronic market stood at 2.47 billion euros in the fourth quarter of 2017, 16% up on the same period of the previous year, but somewhat lower than the average of the year as a whole (2.51 billion euros). Preliminary data for January this year indicate daily trading remained at low levels (2.27 billion euros), 10.3% down on January of the previous year (Figure 17). Trading in Spanish shares on markets other than their original market seemed to have stabilised in the last part of 2017, amounting to around one third of total trading subject to market or MTF rules (lit plus dark) in the fourth quarter.

- The Ibex 35 liquidity index (assessed through the bid-ask spread) remained at satisfactory levels, but rose slightly in the fourth quarter, remained stable in January and increased again in February, thus reflecting the increasing intraday volatility in the stock market. In the case of the 10-year sovereign bond, its spread fell slightly to then rise once again in January, standing at high figures compared with its historic average.

- The spread between loans to euro area companies and Spanish companies remained stable for loans lower than 1 million euros (at 10 bp), but improved for those of a higher amount (to 15 bp).

Contagion risk: yellow

- Since the last publication of the Stability Note, levels of correlation between prices of different Spanish financial asset classes have increased significantly. However, most of this rise took place at the end of October, coinciding with one of the times of greatest tension of the institutional crisis in Catalonia (see Figure 31). Although the median value of correlations at the end of January stood at its highest level for more than a year, it should be noted that it remained below the average recorded over the last decade.

- The correlation between the yields on Spanish public debt and that of other European countries, which stood at low levels in October, reflecting the domestic political uncertainty, rose significantly between November and December to around 0.9 at the end of the year (see figure 32). In the first month of the year, however, the path of sovereign bond yields once again diverged from that of other European countries, mainly as a result of the improvement in the sovereign debt rating of Spain by a leading credit rating agency. Thus, the yield on the Spanish sovereign bond fell by 15 bp in January, while that of the core countries rose by around 20 bp, causing the correlation between both to fall to levels close to zero. The decline in the correlation in the case of peripheral economies was more moderate and stood at 0.4, largely as a result of the even performance recorded in the yield on Spanish, Portuguese and Irish public debt (the latter two received improved credit ratings in December).

Market risk: yellow

Figure 3: Short selling

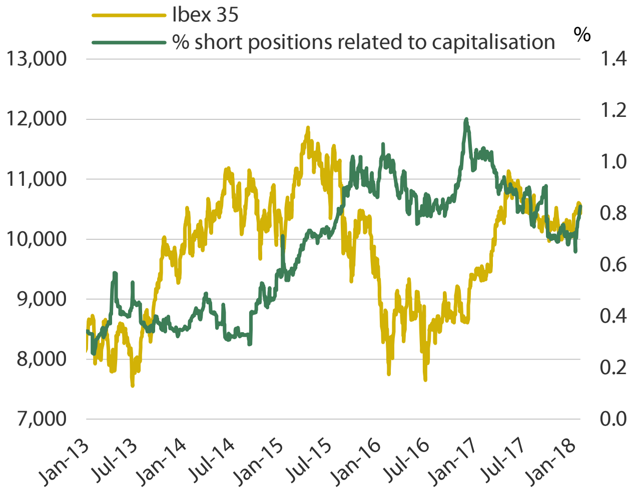


Figure 4: Stock market indices (100=01/02/14)

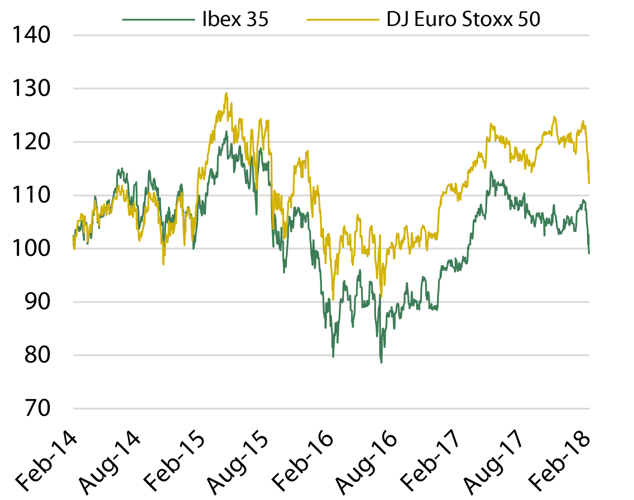


Figure 5: Short-term interest rates (3m)

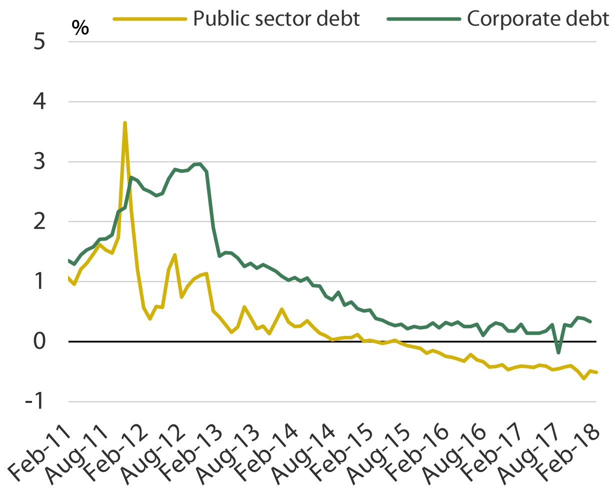


Figure 6: Long-term interest rates (10y)

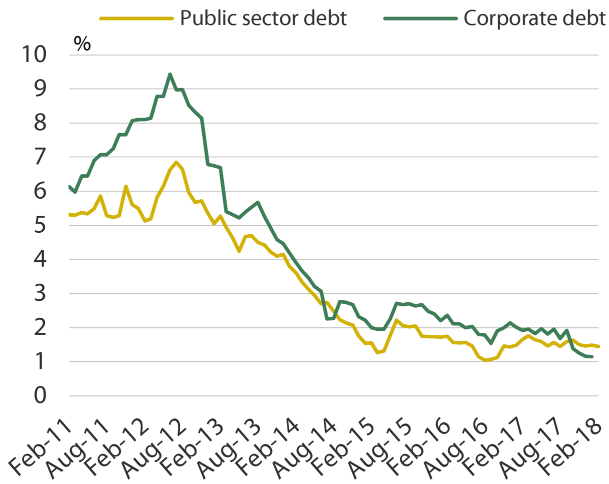
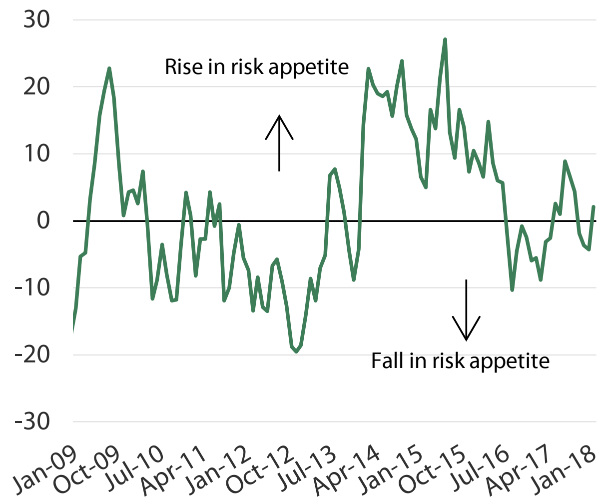


Figure 7: Oil price

Figure 8: Risk appetite (State Street)



Credit risk: green

Figure 9: Financing of non-financial sector

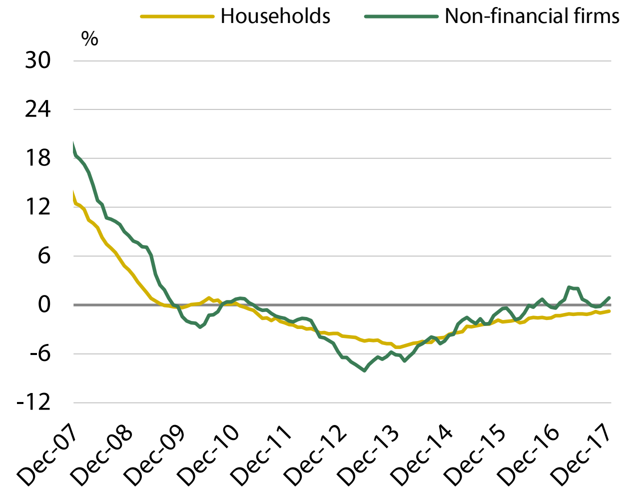


Figure 10: NPL rate and unemployment rate

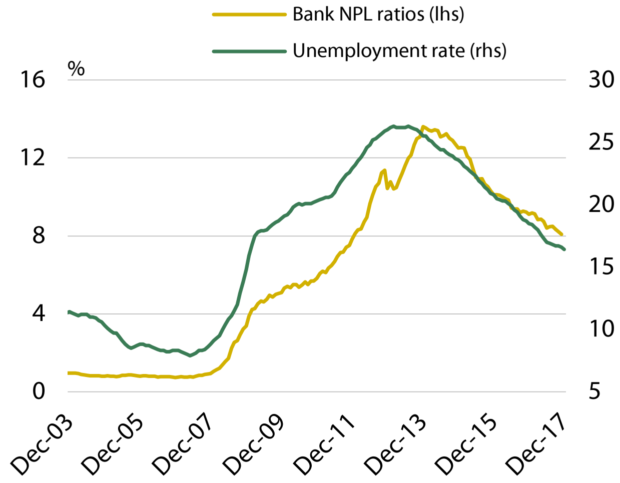


Figure 11: 10-Year government debt risk premium (spread with Germany)

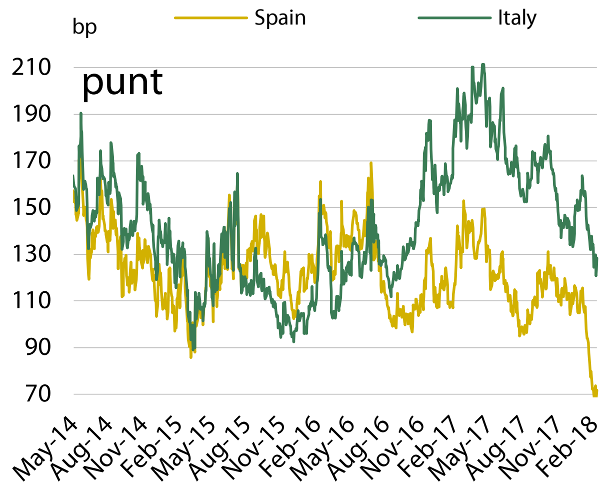


Figure 12: Private debt risk premium (5-year CDS)

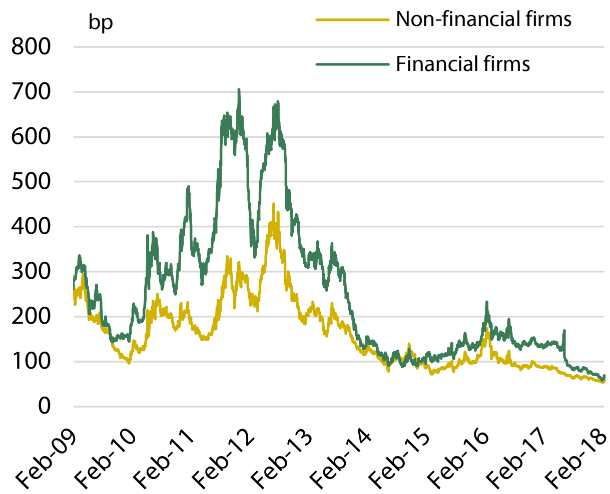


Figure 13: House prices (year-on-year change)

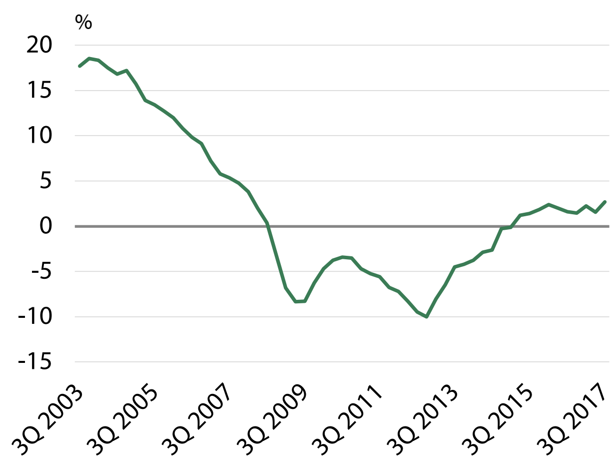
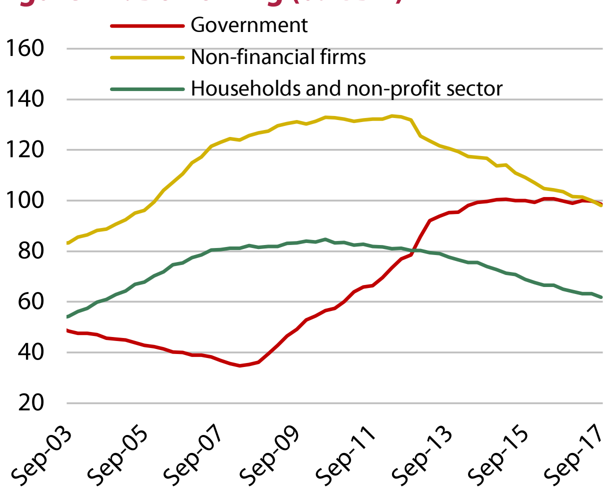
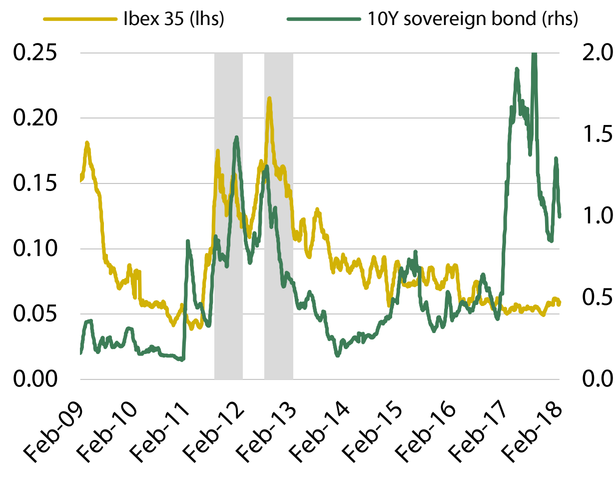


Figure 14: Borrowing (% GDP)



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)

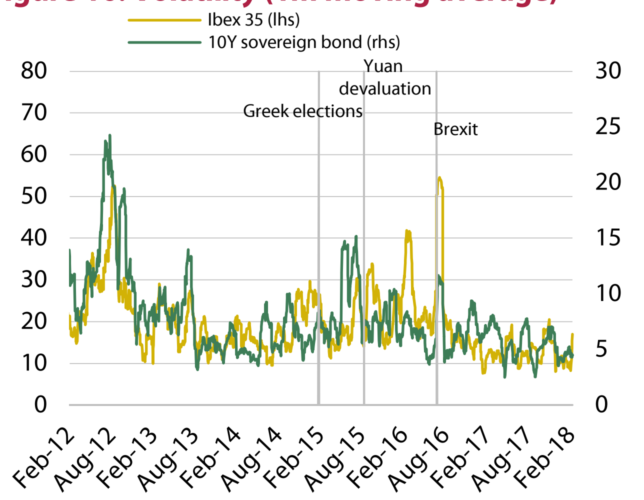


Figure 17: SIBE trading (1m moving average)

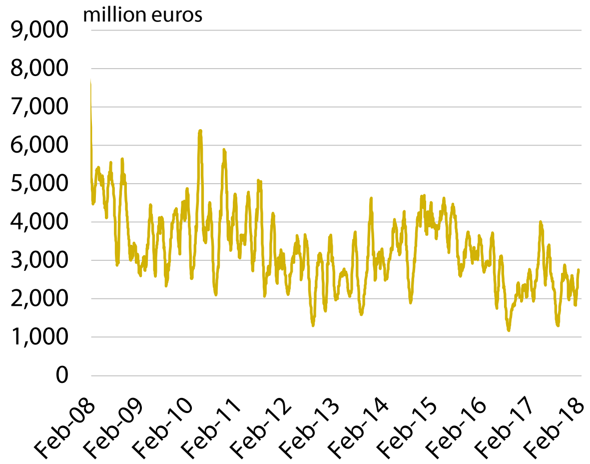


Figure 18: Interbank spread (LIBOR-OIS)

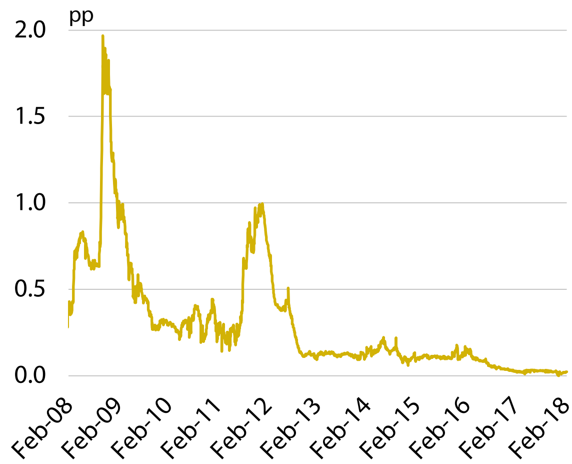


Figure 19: Spain-EU spread on corporate lending rates

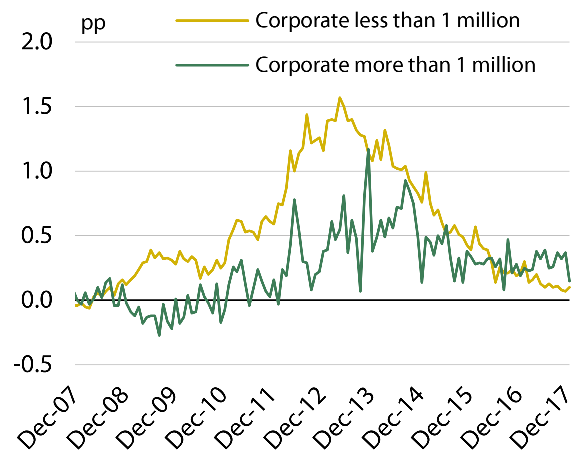
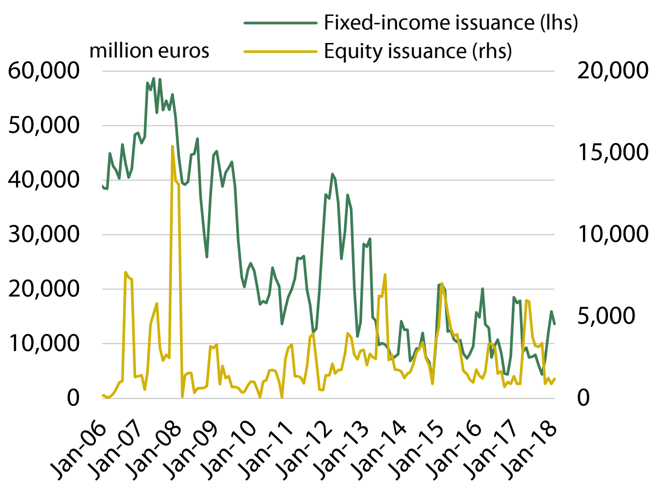


Figure 20: Issues (3m moving average)



Macro-economic risk: yellow

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

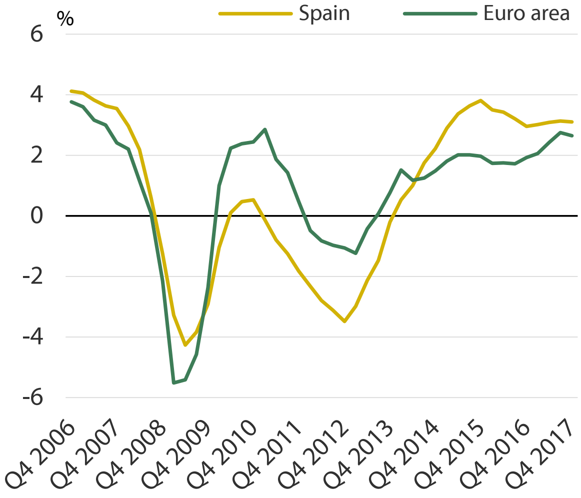


Figure 22: HCPI and core CPI (year-on-year change)

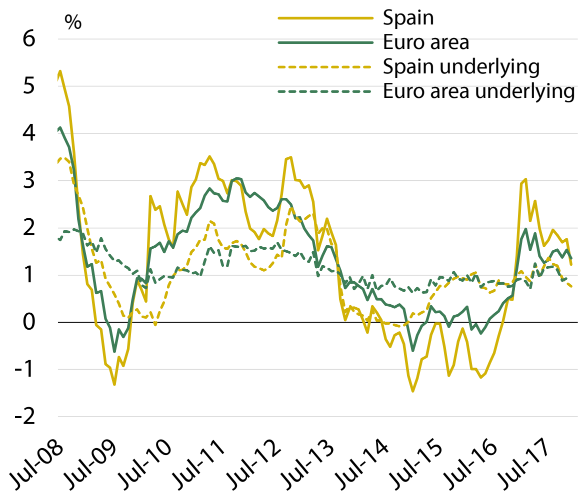


Figure 23: Employment (year-on-year change)

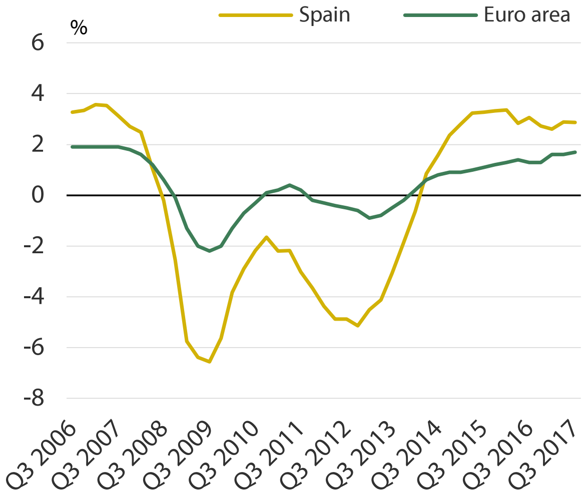
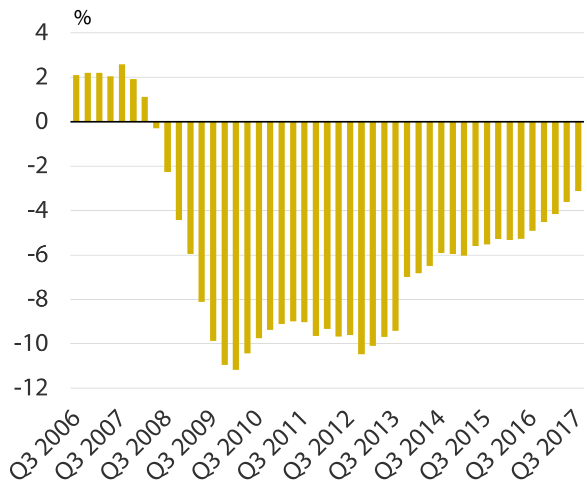


Figure 24: Government balance (% GDP)



Cumulative data four quarters.

Figure 25: Exchange rates

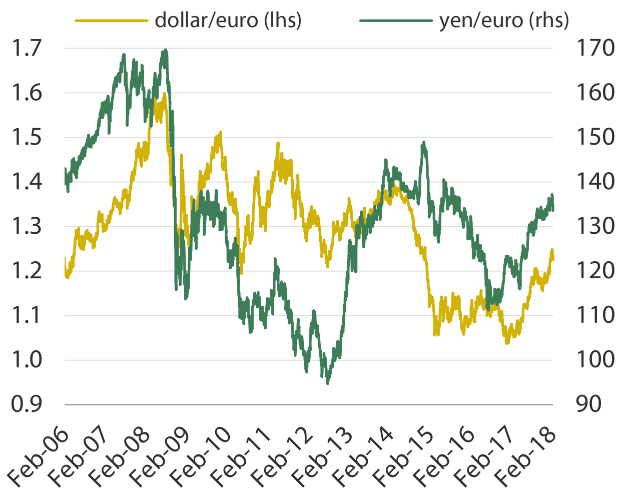
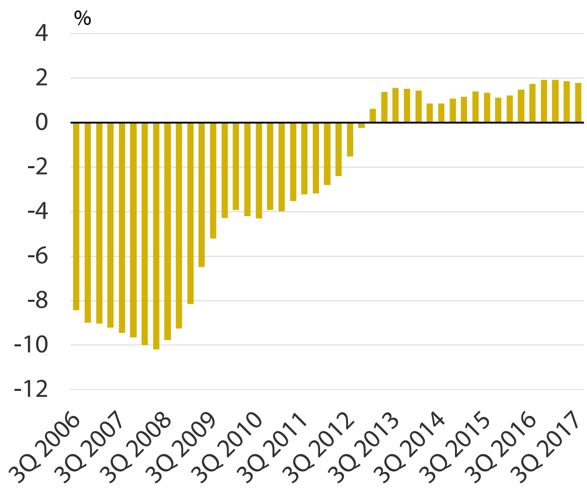
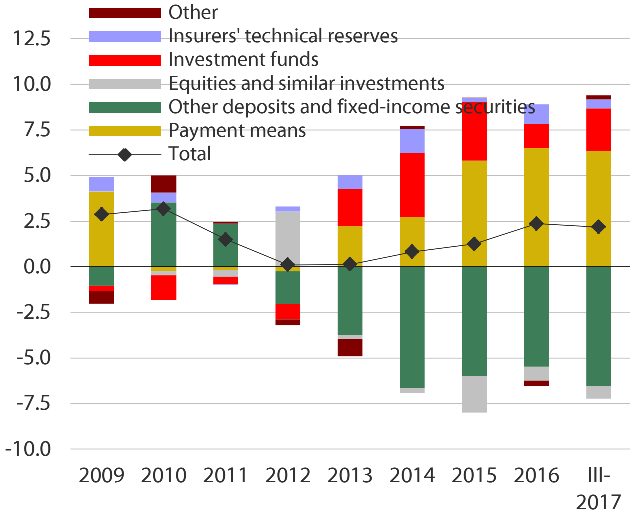


Figure 26: Current-account balance (% GDP)



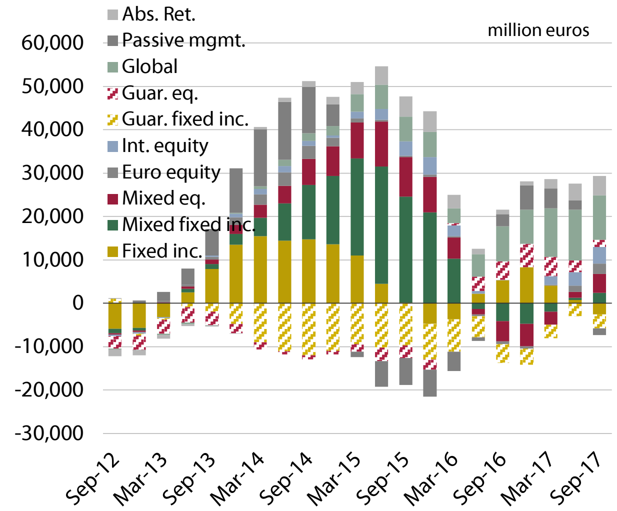
Investors

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

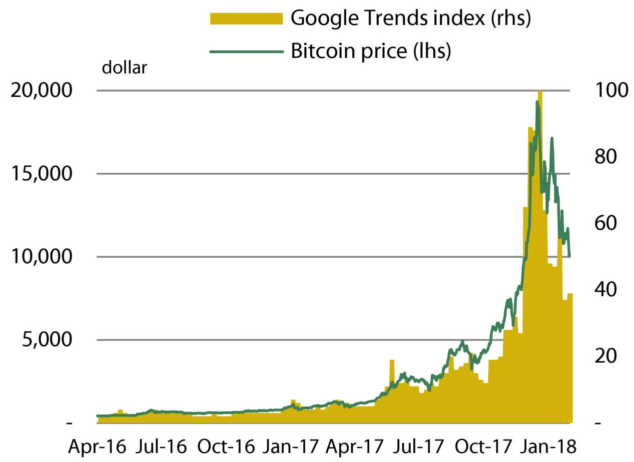
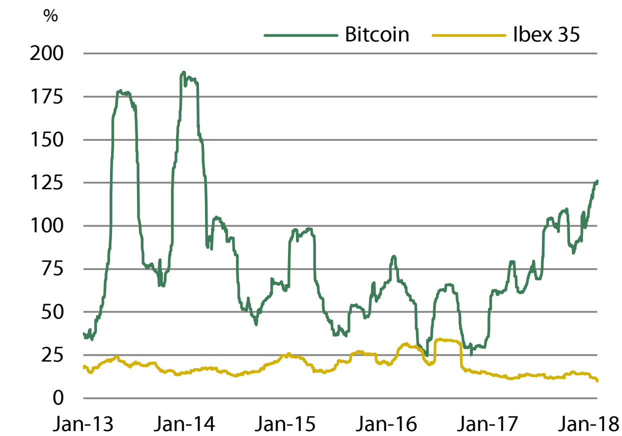


Figure 30: Bitcoin volatility



Contagion risk: yellow

Figure 31: Correlations between asset classes

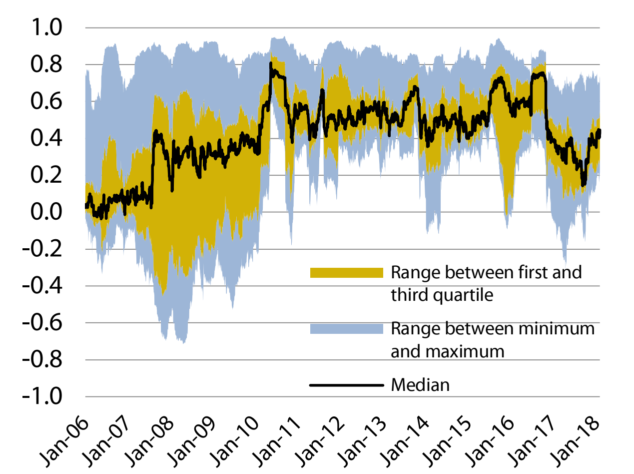
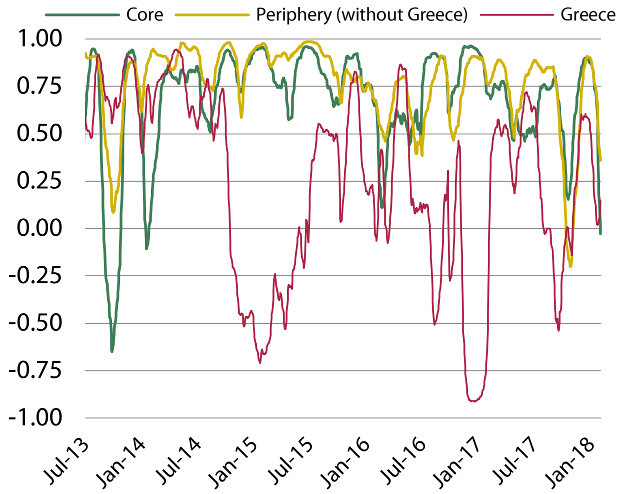
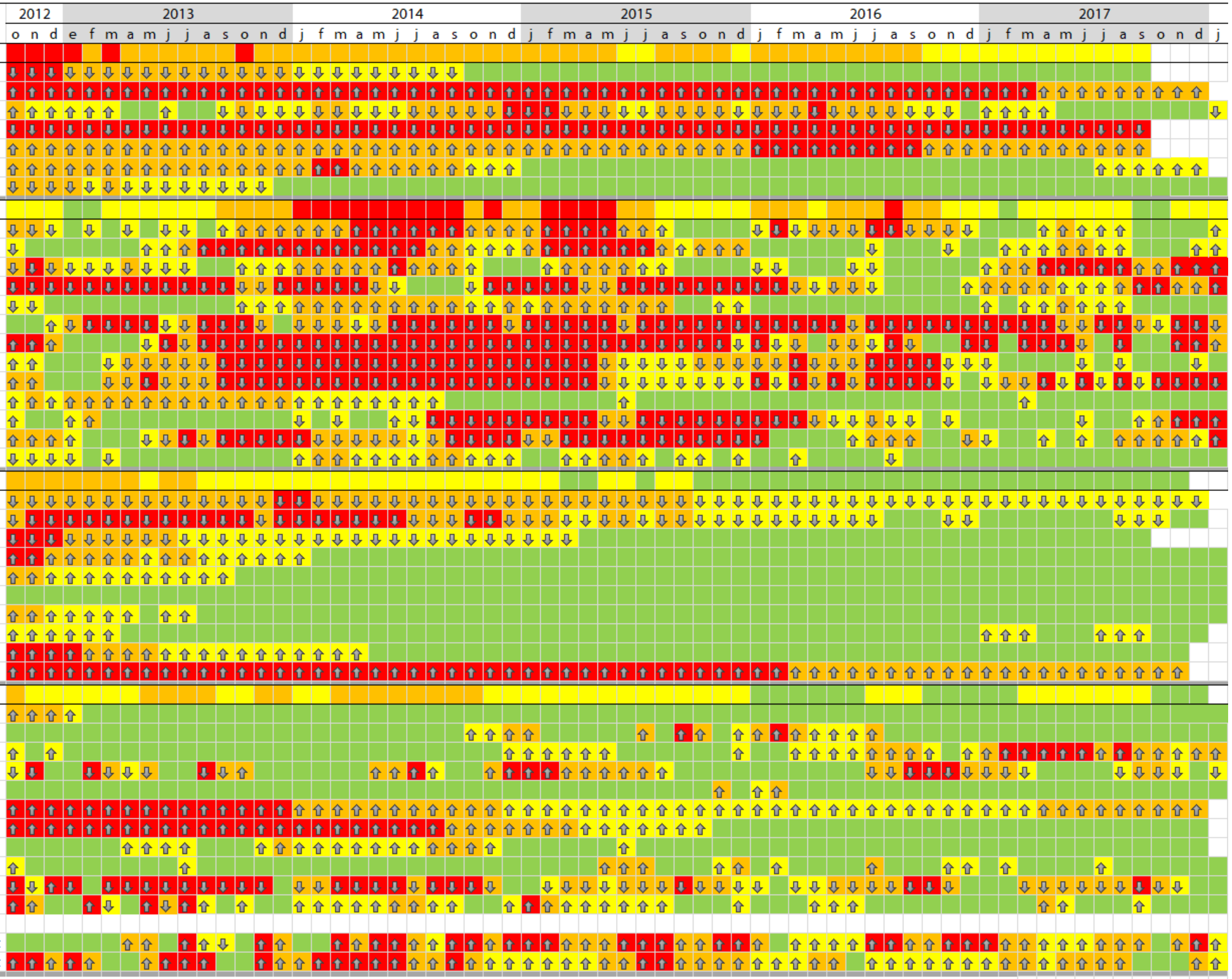


Figure 32: Correlation between the yield on Spanish and European 10Y bonds



Heat map: risk categories

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



(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 market 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 more detailed information on the recent trend of this index and its components, see the CNMV statistical series (Market Stress Indexes), available at http://www.cnmv.es/portal/Menu/Publicaciones-Estadisticas-Investigacion.aspx. For further information about 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 Document no. 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 indicators[23], 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

[23] Since June 2017, the heat map has included an additional indicator - the bed-ask spread for the 10-year sovereign debt 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 therefore is 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 a somewhat greater complexity. We set out the most important of these indicators below:

- Correlation between asset classes (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 return on the Spanish and other European 10-year bonds (Figure 32). The correlation is calculated using daily data in three-month windows. The countries of the core group are Germany, France, Holland and Belgium, and the peripheral countries are Portugal, Italy, Greece and Ireland.