RISK OUTLOOK

Autumn 2017
# Index

RISK SUMMARY REPORT  \hspace{1cm}  1

## MACRO-FINANCIAL AND CREDIT OVERVIEW  \hspace{1cm}  2

1. Global Risks  \hspace{1cm}  2
1.2 Systemic Risk  \hspace{1cm}  3
1.3 Market Sentiment  \hspace{1cm}  4
1.4 Macroeconomic Outlook  \hspace{1cm}  6
1.5 Credit Environment  \hspace{1cm}  10
1.6 Residential Real Estate Developments  \hspace{1cm}  12

## SECURITIES MARKETS  \hspace{1cm}  14

2. Equity Markets  \hspace{1cm}  14
2.2 Market Venues  \hspace{1cm}  19
2.3 Bond Markets  \hspace{1cm}  20
2.4 Investors  \hspace{1cm}  22
2.5 Fintech and Related Risks  \hspace{1cm}  28
### SUMMARY OF RISKS

#### CMVM Risk assessment

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Systemic</td>
<td>●</td>
<td>→</td>
<td>→</td>
</tr>
<tr>
<td>Funding</td>
<td>●</td>
<td>↓</td>
<td>→</td>
</tr>
<tr>
<td>Equity Market</td>
<td>●</td>
<td>→</td>
<td>↓</td>
</tr>
<tr>
<td>Bond Market</td>
<td>●</td>
<td>↓</td>
<td>→</td>
</tr>
<tr>
<td>Real Estate</td>
<td>●</td>
<td>→</td>
<td>↑</td>
</tr>
<tr>
<td>Investors</td>
<td>●</td>
<td>→</td>
<td>→</td>
</tr>
<tr>
<td>Fintech</td>
<td>●</td>
<td>→</td>
<td>↑</td>
</tr>
</tbody>
</table>

Notes: colours indicate current risk levels for risk segments in Portugal; Coding: ● = potential risk; ● = elevated risk; ● = high risk; ● = very high risk. Change is measured with respect to the previous year. Arrows indicate change in risk levels. Outlook consists of forward-looking assessment. Upward arrow = increase in risk level; horizontal arrow = no change in risk level; downward arrow = decrease in risk level.

<table>
<thead>
<tr>
<th>Risk Segment</th>
<th>Risk drivers</th>
</tr>
</thead>
</table>
| Systemic       | - Financial intermediaries continue to weigh on systemic risk
|                | - Excessive risk taking                                                      |
|                | - Geopolitical risks & arise of protectionism                                |
| Funding        | - High NPLs ratio and low profitability                                      |
|                | - Inflationary tensions                                                     |
|                | - Reversal in interest rates might jeopardize deleverage                     |
| Equity Market  | - Very low market volatility & overdue feeling of safeness                   |
|                | - Increase of short selling positions                                        |
|                | - Potential sudden asset re-pricing                                          |
| Bond Market    | - Misperception of risk pricing                                              |
|                | - Reduction of ECB’s purchases                                               |
| Real Estate    | - Search for yield behaviours                                                |
|                | - Asset valuation in some geographies                                        |
|                | - Pressure on credit & risk assessment                                       |
| Investors      | - Sub-sized market dimension                                                 |
|                | - High exposure to sovereign debt                                            |
|                | - Complexity of some retail instruments                                     |
| Fintech        | - Risk of malpractice & related reputational contagion                       |
|                | - Operational risks due to outsourcing                                      |
|                | - Cyber risks and systemic relevance                                         |
1 Macro-Financial and Credit Overview

1.1 Global Risks

Growth in major advanced economies has strengthened and outlook prospects have improved. Nevertheless, political uncertainty and geopolitical risks, tensions and events are known to set the stage for changes in the financial markets and in the business cycle.

Economic political uncertainty indices have increased since mid-2016, both in the US and Europe. High political uncertainty weighs on consumers’ confidence, delays investment, internationalization and hiring decisions by companies, and thus affects growth prospects worldwide. In the US, political uncertainty might be associated with expected shifts in fiscal, trade and immigration policies by the new administration. In Europe, political uncertainty derives from factors that may impact economic integration in the European Union, such as the rising awareness of populist parties and the agenda around Brexit. Increased political uncertainty may also lead to a decline in the economies’ activity and uncertainties around central bank’s monetary policy decisions may hamper market liquidity.

Implied volatility in the US and Europe has subdued and reached new historical lows. In mid-August, volatility spiked somewhat due to rising geopolitical tensions relating to North Korea. Nevertheless, implied volatility returned to low levels by the beginning of September.

However, the SKEW index has registered a maximum value in 2017, providing evidence of high implied risk of a negative event and an increasing probability of outlier returns. Moreover, the divergence between SKEW and VIX continues to grow.

Graph 1. Political Uncertainty, Geopolitical Risks and Implied Volatility


Note: The Geopolitical Risk Index is developed based on automated text search results of words related to geopolitical, nuclear, war and terrorist threats and acts, published by leading international newspapers.

Graph 2. VIX and SKEW Indexes


Note: SKEW Index is calculated from the S&P 500 of out-of-the-money portfolio options, similar to the VIX. Sesh is an independent measure of the slope of the implied volatility curve that increases as this curve tends to steepen.

In spite of the improvement in world trade, the rise of protectionism is a major source of concern. Trade barriers, unilateral restrictions and retaliatory measures can put a downward pressure on economic integration, delay firms’ entry in
international markets, decrease job creation and harm growth. In modern supply chains intermediate products cross borders multiple times during the production process, and an increase in tariffs may impact production costs, resulting in consumer welfare losses. The rise of protectionism may also deteriorate trade relationships between economies, increasing geopolitical tensions and conflicts.

**Graph 3. Attention to protectionism**


Note: Adapted from World Bank, Global Economic Prospects of June 2017. The Google Search Volume Index includes the worldwide search volume of: protectionism, trade restrictions, trade war and import tariffs.

European countries and the US have registered unprecedented levels of concern regarding migration issues since 2015. In Europe, the recent flood of immigrants and refugees, namely from the Middle East and Northern Africa, have fuelled security fears, and the terrorist attacks in different countries originated terror and panic amongst populations. Terrorist attacks had an impact on stock market volatility and sentiment.

Migration flows and migration fears are in the political agenda and have created social and security concerns and uncertainty regarding possible and adverse economic consequences. Indeed, migration fear indicators and migration-related policy uncertainty indicators show strong correlation. The medium and long-term economic impact of these flows of immigrants and refugees (e.g., in output level, government debt and unemployment rate) may depend on the ability to quickly integrate the newcomers.

A cluster of environment-related risks (e.g., extreme weather events, climate change, water crisis) linked with the management of “global commons” (e.g., oceans, atmosphere, climate system) featured among the top 5 global risks identified by the 2017 World Economic Forum. Environmental incidents can trigger or exacerbate other geopolitical risks.

### 1.2 Systemic Risk

In spite of challenging external and financial developments, the financial systemic indicators strengthened during 2017, in response to cyclical upturn in growth, policy support and some regulatory enhancements. Accordingly, systemic risk indicators have generally improved.

The Composite Indicator of Systemic Stress (CISS) has remained contained during 2017, with a slight downward trend observed from the first to the third quarter. Financial intermediaries show the highest contribution to systemic risk during the year, followed by the equity markets and the bond markets. Although European bank equities have improved, they have recovered slower than the overall market in the period under analysis. EU banks’ capital ratios, quality of loan portfolios and profitability experienced a slight improvement in 2017.

These structural issues are amplified by prospects of low yield low growth for long. Incurring conduct costs and lengthy processes to settle cases of detrimental business practices add to uncertainties and adversely affect market sentiment for banks. Concerns about the potentially increasing risks associated with consumer and credit card related exposures, in particular for auto loans, are also high.

---

Four banks in Italy and Spain were recapitalized or failed in June and July 2017, resulting in a short-term increase in CISS and in the financial intermediaries, equity and bond markets sub-indexes. Nevertheless, in 2017Q3 the EuroStoxx banks sub-index was 58% above the value registered after the Brexit outcome and the EuroStoxx index 28% above the value registered in June 2016.

suggesting a strong correlation between Portugal and its Euro Area peers. In Portugal, the main contributors for the indicator are the financial intermediaries and the equity market, showing clear signs of the banking sector’s fragilities.

The Euro Area sovereign stress has remained subdued. In general, the stress levels observed in 2017 for most countries (Portugal included) are lower than those recorded in 2016. In 2017Q3 Czech Republic, Greece, Denmark, Portugal and Finland registered the highest sovereign CISS (SovCISS) values. Although Portugal still registers values above the Euro Area average, the minimum for 2017 was reached in September.

The probability of a simultaneous default of two or more EU sovereigns/large banks registered controlled values. Taking into account all of the above, systemic risk is considered to be contained.

1.3 Market Sentiment

In October 2017, the Sentix Global World International Index reached its highest value since
July 2007 and expectations for the short-term embedded in this indicator have also improved.

The assessment of the economic landscape by institutional and private investors in Europe is rising slightly. The Sentix index for the Euro Area has risen to its highest level since June 2007 and Europe stands out positively from the US. Asia is also creating strong economic optimism. US investors are shaking their intermittent worries about the economic outlook, political uncertainty, and geopolitical threats.

The European Economic Sentiment Indicator (ESI) in the Euro Area (EA) improved significantly and in September 2017 it registered a new high since May 2007. According to the European Commission (EC), this resulted from the marked increases in five survey market confidence indices (industrial, service, consumer, construction and retail). The financial services confidence (not included in the ESI) also improved. The levels of economic sentiment in Portugal (although slightly higher) are in line with EA’s average.

In Portugal, the monthly search for negative terms in 2017 decreased and the search for positive terms increased, suggesting an increase in investor sentiment revealed by Google search data.

The weight of short-selling in the market capitalization of Portuguese companies whose shares were subject to short selling reached a new maximum in September 2017, a value almost 2.5 times higher than the same weight for European shares. The number of companies whose shares were shorted increased as well. Financial entities register higher levels of short selling in all quarters except 2017Q1. The correlation between the short selling of Portuguese stocks and PSI20 returns in the previous month is a negative 29%. All in all, short selling can be viewed as an investor sentiment indicator, particularly for the institutional sector that seems to be betting against the market.
Looking at mutual fund flows by fund type, the principal component analysis reveals the existence of two main components. The first represents a generic demand effect accounting for general shifts in and out of investment funds and thus captures a broad investor sentiment pertaining to the investment fund sector. It suggests a co-movement among fund investors with medium and higher risk profile in Portugal.

The second principal component points out the importance of the polarity between safer (money market funds and variable income bond funds) and riskier fund categories (equity funds, fixed income bond funds and hybrid funds) as a driving force behind fund flows. This risk-safety contrast allows the identification of “flight to safety” behaviours. A shift from riskier funds to safer investments could be observed during the sovereign debt crisis and the period after high market uncertainty related to Brexit. On the contrary, a shift from lower risk funds to riskier investments points out a “speculative effect”, visible between September 2013 and May 2015.

Both components are above average during the first half of 2017, but in 2017Q3 the search for riskier funds is more prominent. Thus, not only the positive generic demand suggests positive investor sentiment, but there is also evidence of search for yield among fund investors in Portugal.

### 1.4 Macroeconomic Outlook

After the deceleration observed in 2016, global growth is back on a positive trajectory. A stable growth recovery is expected in 2017 and 2018, boosted by emerging markets and some advanced economies. Within emerging markets and developing economies, in the first semester of 2017 China’s growth rate is above the world's average, while Brazil returned to positive growth rates.

Growth forecasts for countries such as Canada,
Japan, France, Germany, Italy and Spain were revised upwards. The US growth forecasts suffered a markdown, reflecting the uncertainty surrounding the economic and trade policies (particularly fiscal policy) under the new administration, and for the UK there were revisions in both directions, signalling the concerns about the exact terms and conditions of Brexit.

### Graph 12. GDP Growth (yearly changes)

Euro Area’s economic growth in 2018 is projected to maintain the pace observed in the last few years, benefiting from a still accommodative monetary policy, recovery in global trade and stronger consumers’ confidence, combined with robust job creation.

For Portugal, the real GDP growth rate has been revised upwards, and is expected to reach 2.6% in 2017 and 2.1% in 2018. The positive contribution of domestic demand to 2017Q3 GDP growth was higher than in the second quarter of the year, driven by the acceleration of private consumption, while net external demand contribution was negative due to strong imports of goods and services.

The growth prospects for the Portuguese economy benefit from a favourable international environment, with global demand accelerating and ECB monetary stimulus still in place. However, the economy remains vulnerable to external developments and the banking system is still facing challenges.

At the start of the year, confidence indicators exhibited a better outlook than short-term production and turnover indicators. As the year went on, the economic activity and the economic climate indicators stabilized (in August and October, respectively).

Consumer Confidence increased in October, after decreasing in August and September 2017, reflecting the positive contribution of the perspectives on savings and on household’s and the country’s economy. Both the retail trade turnover and confidence indexes observed a positive path, whereas in services the turnover index accelerated and the confidence indicator decreased in October. The construction and public works confidence indicator diminished due to the negative employment perspectives, while the confidence indicator for trade stabilized reflecting negative opinions on the sales evolution and positive perspectives on the business activity.

The results from the April 2017 Investment Survey point to a 5.1% nominal increase of the entrepreneurial Gross Fixed Capital Formation in 2017 (3.8% in October 2016). The increase on the investment intentions for 2017 reflects the positive contribution of the firms with more employees. Amid the investment purposes firms indicate the objectives of streamline production, even though the main limitative factors identified in the survey were the
deterioration of the sales perspectives and the lack of self-funding capacity.

Euro Area’s labour market conditions continued to improve in 2017. The reduction was stronger in Member States where unemployment increased dramatically during the crisis. In Portugal, employment has been supported not only by tourism, but also by the recent recovery in construction. Although unemployment rates have been gradually decreasing, job creation is expected to lose some momentum with rising wage pressures that will increase unit labour costs.

Portugal’s gross public debt-to-GDP ratio rose slightly to 130.4% in 2016, mainly due to higher issuance of government debt for the recapitalisation of CGD. It reached 132.1% in 2017Q2, 43.0 p.p. above the EA average. The EC forecasts a decline in 2017 and 2018, due to primary budget surpluses and continued economic growth.

While the Portuguese economy has continued to recover, it remains vulnerable to shocks. Growth is still very dependent on private consumption whereas the conditions for investment remain challenging. The external rebalancing of the Portuguese economy is still underway and at a moderate pace. More importantly, the stock of public debt and the government deficit, together with the fragile growth, expose the country to changing economic conditions.

However, the pick-up in global growth should raise foreign demand for EA exports, which should also help lift investment. The WTO’s World Trade Outlook Indicator (WTOI) rose from 100.9 in 2016Q4 to 102.2 in September 2017.

Portugal registered a higher trade deficit for 2016 vis-à-vis the previous year. There is a high exposure of the Portuguese exporters to the EA countries. The...
main trading partners continue to be Spain, France and Germany, which, together, concentrate more than half of exports and imports.

Exports and imports of goods present a YoY growth of 5.8% and 8.1% in September, respectively (13.9% and 12.1% in August). The exports increase was largely driven by industrial supplies, fuel and lubricants. Additionally, exports of services played a major role since the beginning of the year, particularly tourism services, with the highest growth rate of the last years.

Global trade recovery is forecast to be supported by a stabilisation of commodity prices. Average Brent prices for 2017 have been revised slightly downwards while oil price in euros presented a higher monthly growth rate in September 2017 when compared to the previous year. While this may contribute to impair the domestic trade deficit, it may on the other hand foster commercial relations with oil exporting countries, such as Angola.

The prices of other commodities are estimated to continue to increase, but this trajectory is not expected to be maintained in 2018. Food prices present a recovery that is related to the increase in cereal prices, and are projected to decrease in 2018. The recovery of basic metal prices in 2017 is associated with trade rebalancing, mine closures and other policy measures from producers.

The Harmonised Index of Consumer Prices (HICP) in the Euro Area has increased significantly in the past quarters, following the recovery of oil prices, but is set to gradually slow down as the temporary impact of energy inflation diminishes. A similar path is expected for Portugal, where consumer price inflation is projected to reach 1.5% in 2017. Most of the increase is driven by the recovery in energy prices and also pressured by the strong rise in house prices observed in 2016 (7.1%), which increased rents and accommodation services activity.
1.5 Credit Environment

Lending is a major pillar of EA’s member state economies. Banks, supported by the ECB’s stimulus, lowered active interest rates, and credit increased.

The ECB’s bank lending survey of October 2017 points to an increase on net demand across all loan categories and to an easing of credit standards on loans to corporates and to households for house purchase, driven by competitive pressure. However, the banking sector still faces high levels of nonperforming loans (NPL) in countries such as Greece, Portugal and Italy.

Graph 19. Bank Gross Non-performing Loans and Advances (% of total gross loans and advances)

Source: ECB; CMVM calculations. Last data point: March 2017.

The data for June 2017 on overdue loans in Portugal indicate that, although with a smaller decrease in recent months, both non-financial corporations (NFC) and households continue to observe high levels of non-compliance. Size seems to be inversely related to the share of overdue loans: micro and small corporates were responsible for 78.7% of the overdue loans. The amount of overdue loans is lower than in December 2016, but only the percentage of overdue loans in medium size corporates has diminished. In terms of evolution, overdue loan ratios are increasing in bigger corporates. The ratio of overdue loans increased in agriculture and mining industries and construction. The highest percentage of companies with overdue loans is in the construction sector (which was strongly hit by the crises).

Graph 20. NPL ratio by institutional sector – Portugal

Source: ECB; CMVM calculations. Last data point: March 2017.

The latest indebtedness data for the Portuguese public and private sectors, considering not only loans but also debt securities (nominal value) and trade credits, reveal some deleveraging in private balance sheet exposures that are at least 90 days past due, or unlikely to be repaid without recourse to collateral.

3 Overdue loans comprise amounts overdue within a maximum of thirty days after due date, while the NPL definition considers on-
corporations and individuals, while the general government debt continues to rise. In August 2017, both the non-financial public sector and the private sector indebtedness increased when compared with December 2016 (to €319.2 billion\(^4\) and €404.0 billion respectively). The increase in public sector indebtedness was mostly due to financing granted by the financial sector and private individuals. On the other hand, the rise in private sector indebtedness resulted from higher external indebtedness of private corporates, although partially offset by a decline in the indebtedness of households\(^5\) through the resident financial sector.

As a percentage of GDP, households’ indebtedness has been slowly but steadily reducing since December 2007, reaching a minimum in August 2017 (75.2%). Private corporations exhibit the lowest ratio (139.4% of GDP\(^6\)) since March 2008, though still above the EA average.

Firms increased bond issuance particularly in countries (e.g. Spain, Italy and Portugal) where bank lending has exhibited a slower pace. In Portugal, the outstanding amount of securities issued by residents increased to €452.7 billion in September 2017. The outstanding amount of securities issued by NFC reached €149.4 billion (€2.2 billion more than in August 2017), of which the majority were equity securities.

Money growth was at 5.1% in 2017Q3, continuing the trend that began in mid-2015. Nominal long-term rates rose marginally in the end of 2016 and are forecasted to slightly increase. However, with half the amount, the ECB’s asset purchase programme, which is scheduled to last until at least September 2018, should contribute to low and controlled nominal long-term rates.

The lending conditions to the non-financial sector in Portugal became more attractive, essentially due to the ECB’s accommodative monetary policy, but also due to the acceleration of economic activity. In August 2017, the annual change rate in loans granted to NFC increased, whereas loans to exporting companies observed a lower annual rate of change when compared with the previous month.

---

\(^4\) One billion equals 10\(^9\) throughout this report.

\(^5\) The scope goes beyond considering households. It also considers self-employed entrepreneurs and non-profit institutions serving households.

\(^6\) Non-consolidated values.
The amounts of new loans granted for house purchase purposes increased in the first semester of 2017, attaining a maximum since the end of 2010. The behaviour observed in the credit for house purchase is largely driven by significant dynamics in the residential market, which have been accelerating since 2014, driven by non-residents demand at first and in the last year supported by the boost in consumers’ confidence and overall activity growth.

The recovery of economic activity, the boost in the real estate market and more competition in the banking sector may contribute to easing on credit standards. So far, the increase in loans is essentially registered in credit for consumption, with a high contribution of automobiles purchase. Although non-financial indebtedness has been decreasing, it remains high among the Euro Area, and vulnerable to changes in interbank interest rates and, in spite of the improved outlook, there are still fragilities that must not be under evaluated.

Ten years have passed since the sub-prime crisis struck global markets and the real estate segment in particular. Monitoring real estate prices has become a critical tool to tackle possible threats to financial stability. The real estate market has been on the radar as a possible source of risk transmission across multiple sectors and past recent developments in China, the UK – since the aftermath of Brexit – and more recently in the US stress out that lessons learned in the past must not be forgotten.

In the EU, residential real estate markets have behaved heterogeneously. Taking end of 2007 prices as a reference, in Sweden (145%), Austria (133%) and Germany (118%) prices are already higher, and in the UK, France and Portugal are below but near (around 95%) 2007 prices. On the other hand, in Italy (77%), Ireland (67%), Spain (63%) and Greece (57%) house prices are well below the levels reached in 2007.

Graph 24. Change in Credit Granted to Households (% change)
Nonetheless, market prices - as well as the number of houses sold - have been climbing in Portugal, especially since the heavy contraction that occurred between 2010 and 2013Q1. The number of transactions (mainly involving used properties) almost doubled and prices increased 18% between 2014Q2 and 2017Q2 (22% and 10%, respectively, for used and new properties). This increase in transactions and prices was more prominent in the Oporto and Lisbon centres and near surroundings, but also in Algarve, which suggests that tourism is a driver for crescent demand and prices. The 8% price increase registered in the market as a whole – 2017Q2/2016Q2 – was more scarcely reflected in real estate banking appraisal values, since these only changed 4.6 in the same period and 5.5 between 2017Q3/2016Q3. As price indices registered a higher increase than banking appraisal values, banks may be more prudent in their evaluations when compared to other market practitioners.

The occupancy rates of domestic real estate funds’ properties have significantly improved in the last four years due to increased demand from tourism, commerce and services as a whole. The housing segment - despite slightly below two thirds of full rental capacity – has registered a threefold increase in occupancy since 2013. Although most open-ended fund returns remain negative in both five and ten year horizons, the reduction of vacancy rates has contributed to positive (but yet shy) real estate fund returns in the last year.
The recent dynamics in residential real estate markets seem to increasingly warrant close surveillance by regulators and also government bodies.

## 2 Securities Markets

### 2.1 Equity Markets

There is some heterogeneity in the values of capital raised through IPO across different world regions through time. Interestingly, Asia seems to be a region of its own: for example, the highest annual value of capital raised through IPO is registered in 2010 (2007 elsewhere). Furthermore, all world regions (except from Asia) show a positive percentage variation in capital raised through IPOs from 2016 to 2017Q3. In contrast, Portugal has only experienced 4 years of IPO activity: 2007 (€552 million), 2011 (€57 million), 2013 (€527 million) and 2014 (€141 million).

Most stock market indices continue to register a positive trend since the 2008 crisis, but global indices have been outperforming regional and domestic...
stock market indices. Since 2015, the Portuguese and Italian stock market indices are the two lowest performers among those analysed.

**Graph 31. EuroStoxx - 19 Sectoral Indices**

Source: Bloomberg; CMVM calculations. Last data point: October 2017.


The average dispersion of the 19 European sectoral indices has been growing since 2008 and in 2017 is likely to reach (if not surpass) the highest value registered in 2015Q2. Since the beginning of 2017 sectoral indices exhibit an average performance of 6.7% (‘year-to-date’). Zooming in, the ‘Technology’ and ‘Oil & Gas’ sectors, respectively, have the highest (18.4%) and lowest (-5%) year-to-date performance, and the ‘Financial Services’ (16%), ‘Banks’ (11%) and ‘Insurance’ (5.6%) show distinct trends.

Market volatility featured a major decline from December 2016 onwards. In the case of the S&P 500, the one-month volatility hovered around 6% for September 2017 and averaged 7% for the first three quarters of 2017, which compares with a 12.7% average in 2016. Similar patterns are observed for other international indices, suggesting that global stock market volatility plummeted in recent quarters. The decline in volatility also extends to the Portuguese stock market: the PSI 20 one-month volatility reached 9.2% in September 2017 (minimum since 2007). Very low equity market volatility, together with high prices, has been in the past and in some markets, a leading indicator of strong stock market corrections, and thus deserving of close monitoring.

**Graph 32. Realised Equity Volatility**

Source: Bloomberg; CMVM calculations. Last data point: September 2017.

Another important feature of financial markets concerns liquidity. A composite measure of liquidity calculated for four markets (Portugal, Italy, Spain and France) is shown below. There is visual evidence of an improvement of liquidity conditions in three of those markets between 2016Q3 and 2017Q3, Spain being the exception. Nevertheless, in 2017Q3 liquidity is above the historical average in all four cases.

Concerning Portugal, a decline of both transaction costs and price impact of trades is observed, whereas trading activity increased. Consistently, the median bid-ask spread and the Amihud indicator declined in the last four quarters, whereas the turnover value and the turnover ratio evolved positively. The number of liquid shares in view of EU Regulation No 1287/2006 for Portugal is 10, one less than in 2009.
The difference between the stock market earnings yield and the 10-year Treasury bond spot rate has been declining steadily for US markets. A comparison of point estimates for 2010Q3 and 2017Q2 shows that the differential plunged approximately 1.8 p.p. for the S&P 500, and 1.3 p.p. for the NASDAQ 100. In Europe and Japan, that difference was above 5%. The earnings yield for the DJ Eurostoxx50 (Nikkei) hovered around 5.2% (5.4%) in 2017Q2 and is below (above) the 17-year historical average.

As for Portugal (PSI20), the difference between the stock market earnings yield and the 10-year Treasury bond spot rate soared in the last three years, reaching a maximum of 5.7% during 2017Q2. This pattern is explained by the behaviour of long-term yields, due to lower sovereign credit risk, and suggests that in the first half of 2017 the Portuguese stock market managed to produce competitive returns.

The Net Present Value of Growth Opportunities (NPVGO)\(^7\) of the Portuguese PSI20 index has gone up in the last year, moving from circa 20% in

---

\(^7\) The NPVGO informs on the % of the market price that represents expected growth in the future. A NPVGO of x% means that x% of the price is based on future expectations and a (1–x%) of value can be seen at time 0. The NPVGO is calculated using value-weighted PSI20 stock prices and earnings per share, and a constant cost of capital of 9% as suggested by MATA, Maria Eugénia; DA COSTA, José Rodrigues; JUSTINO, David (2017). The Lisbon stock exchange in the twentieth century. Coimbra. ISBN 978-989-26-1302-4. The formula for the NPVGO (the net present value of growth opportunities in period 0) is: NPVGO =
2016Q1 to 31% in 2017Q2. In other words, the expectation of an average market participant has increased about 50% y-o-y. This is likely to reflect market participants’ optimism with respect to future developments of the Portuguese stock market.

In contrast with the recent past, the EA banking sector outperformed the EuroStoxx50 Index. Notably, while the EuroStoxx50 Index gained 11.8% between January and September of 2017, the EuroStoxx Banks Index surged 20.1%. However, if one attends to the accumulated performance of the last ten years, the EuroStoxx Banks Index devalued 88.7 percentage points vis-à-vis the EuroStoxx50 Index, an indication that the banking sector underperformed sectors that constitute the real economy. The 2017 EA’s banking valuation trend suggests that investors are anticipating a recovery in the sector, which is however less pronounced than in the US and the UK’s bank stock prices.

The evolution of the prices of the stock issued by the two remaining listed Portuguese banks (BCP and Banco BPI) has been dissimilar. Since the end of 2016 they have both been increasing although at different paces (partially explained by the BPI’s acquisition by CaixaBank). This evolution is also evident when one looks at the price to book ratio: in September 2017, the market capitalization of BCP only represented 25% of its book value, and the Banco BPI’s price to book ratio reached 57%.

The price to book ratio of Eurostoxx Banks is slightly above 85% at the end of 2017Q3, 45% below the level displayed before the onset of the 2008 financial crisis. The performance of European banks contrasts with that of US banks. The latter (represented by the S&P Banks index) show a price to book value of approximately 130%, closer to the level displayed prior the financial crisis. The factors underlying the low valuation of the banking sector in Portugal and in the Euro Area cannot be dissociated from structural issues influencing the sector: low profitability, excess capacity, low interest rates and nominal growth, low asset quality and high non-performing loans.

\[ \frac{EPS_{PSI20}^P}{r_0} = P_{PSI20}^P \]

where \( P_{PSI20}^P \) is the PSI20 price in period 0, \( EPS_{PSI20}^P \) represents the PSI20 earnings per share in period 1, \( r_0 \) is the cost of capital of firms listed in the PSI20 in period 0.

The structural profits of the S&P500 have been growing steadily since 2000 at an average rate of 4.9% per year, well above inflation. Between 2016Q2 and 2017Q2, structural profit growth reached 9.7%. The cyclically adjusted price earnings (CAPE) for the S&P500 hiked to 22.6 in June 2016, higher than the long-term average (19.1). This could signal that US
stock prices are being sustained by both current earnings growth and future growth opportunities anticipated by investors.

In contrast, Euro Area companies have not fully recovered from the 2008 financial crisis: nominal structural profits for 2017Q2 are still 27.4% below those for 2008Q2, and 22.1% below the long run constant trend. However, the CAPE of the MSCI Euro index was 24.5 in June 2016, above the long run average (20.5).

Graph 38. CAPE – MSCI – Euro Area

Source: Bloomberg; CMVM calculations. Last data point: June 2017.

One key driver of firms’ operational performance is the pattern of sales growth. Sales/revenues increased 5.6% and 6.2% from 2016Q2 to 2017Q2 for US and EA firms, respectively, a pattern that conforms to the improvement of business and consumer confidence in the two regions. Importantly, the level of sales/revenue of US firms was 29% above 2007Q2 in nominal terms, whereas in Europe it was just 3%. The contrasting patterns of US and Euro Area firms, as of the beginning of the financial crisis, help to explain why the structural profits of the latter are diverging from their EPS constant long-term growth, whereas in the US they are not.

The profit margin of a firm is another important financial indicator, since it enables pinpointing of how much profit a firm can extract from its overall sales. From a macroeconomic viewpoint, the pattern of the profit margin is determined by the aggregate demand. Specifically, during recessions firms tend to cut prices to meet the demand, whereas the opposite tends to occur during expansions. In addition, the operational leverage exhibited in some industries hampers profitability when sales and revenues diminish. The profit margin of (firms that integrate) the S&P 500 was above 9% during the first semester of 2017, higher than the 8.2% in 2006Q2 and the 8.0% average for the period 2005-2017.

Graph 39. Profit margin of major indices

Source: Bloomberg; CMVM calculations. Last data point: June 2017.

Euro Area firms also witnessed a profit margin improvement in the first semester of 2017: this indicator hovered around 6.1%, an improvement of one percentage point compared with 2016. Nevertheless, the profit margin of EA firms is still below its 2005-2017 average (6.6%), and this is an additional explanation for the lower structural profits. Thus, an important challenge to Euro Area firms continues to be the enhancement of their profit margins, which in part relies on overall economic conditions.

The dividends paid by Portuguese firms mounted from 2008 to 2012, a (long) period marked by a deep economic recession and low valuation of companies. Accordingly, the dividend yield reached a maximum of 9.1% by the end of 2011. The dividends has been steadily declining in the last few years, which means that, on average, firms were not able to afford those high level of dividends.

The dividend yield of the PSI20 declined sharply from 2016 onwards, and this is first and foremost explained by the appreciation of the PSI20. Nevertheless, lower firms’ dividends also accounted partially for the dividend yield reduction.
2.2 Market Venues

After a negative change in the previous year, the value of stocks traded in major international indices observed positive variations in the end of September 2017. In particular, both S&P 500 and DJ Euro Stoxx 600 trade values increased (1.0% and 4.4%, respectively in the end of September), while for the Nikkei 225 the value of stocks traded continues to fall.

In the Portuguese market, the value of equity share trading has been decreasing gradually since the end of 2013, even though there was an increase between 2016Q3 and 2017Q1. The total amount traded in 2017Q3 represents a decrease of 20.3% when compared with the previous quarter. The reduction observed in the value of regulated market transactions is related to the lack of IPO, the transfer of substantial part of the negotiation to alternative platforms and low investor confidence.

Comparing the most recent information, the relevance of lit market trading increased in 2017Q3. However, lit market trading has been losing market share since the end of 2013, and the relevance of off-book (i.e., executed over the counter) and dark pool trading has been increasing. The lower information requirements associated with OTC and dark book trading pose additional challenges to transparency and supervisory practices.

Using the order-to-trade ratio, i.e. the ratio between the number of orders routed to the system and the number of orders that resulted in a trade, it is possible to grasp the extent to which buy/sell intentions materialise. The order-to-trade ratio increased in 2017Q3 when compared to the previous quarter, with both the total number of orders and the number of

---

**Graph 40. PSI20 Dividend Yield – Monthly Average**

Source: Bloomberg; CMVM calculations. Last data point: September 2017.

**Graph 41. Value of Stocks Traded (Portugal)**


**Graph 42. Market Share of Trading Venues (PSI20 constituents)**

Source: Fidessa; CMVM calculations. Last data point: September 2017.
executed orders decreasing. The number of executed orders and the number of trades have taken the same direction in the majority of months since the beginning of the year. Higher order-to-trade ratios can be an indication of algorithmic or high-frequency trading, since algo/high-frequency traders continuously place, update, and withdraw orders in the order book, during a trading day.

MiFID II is going to have an impact on trading venues. In fact, there is going to be a limit to the reference price trades to midpoint and double volume caps on the reference price and negotiated trade waivers. Additionally, the alteration in the large in-scale threshold is expected to redirect trade to the lit market.

### Graph 43. Lit Venue Market Share

![Lit Venue Market Share](image)

Source: Fidessa; CMVM calculations. Last data point: September 2017.

### Graph 44. Order-to-trade Ratio (PSI20)

![Order-to-trade Ratio](image)


### 2.3 Bond Markets

Volatility in major asset classes across the globe remains very low, compared with historical benchmarks, which is striking given the geopolitical events and political uncertainties that have been occurring.

The implied volatility in the US bond market (MOVE Index) and the US equity market (VIX Index) registered a 10-year minimum in August 2017 and October 2017, respectively. Bond market volatility in Europe is low by historical standards, in line with low bond yields. The compression of bond market volatility might be influenced by the ECB monetary policy and an improvement in the economic outlook and investors’ market sentiment.

Subdued volatility combined with stretched valuations in risky markets might be of concern, suggesting a market complacency scenario. During periods of low volatility both individual and institutional agents increase the subjective feeling of safeness and thus risk taking strategies. As volatility is a key input for investment decisions, a long period of low volatility might overestimate admissible size of trades and levels of leverage. The longer the calm period, the higher imbalances may originate in the financial system in case of an unexpected event that creates the need to change investing strategies.

### Graph 45. Volatility Bonds, FX and Equity

![Volatility Bonds, FX and Equity](image)

Source: BIS; last data point: September 2017

Notes: FX = JPMorgan VXY Global Index; Bonds = Implied volatility of at-the-money options on long term bond futures of DE, UK, JP and US (weighted average based on GDP and PPP exchange rates); Equities = Implied volatility of S&P 500, EuroStoxx 50, FTSE 100 and Nikkei 225 indices; weighted average based on market capitalization
Credit conditions for corporates continued to improve in 2017. In 2017Q3, the spread of A and BBB US corporate bonds towards the 10Yr Treasury bills reached values markedly below the ones observed just before the pike of the crisis in 2008. Furthermore, those values are around half the ones registered at the heart of Europe’s sovereign debt crisis. However, the credit gap spread between BBB and A US corporates is still at levels that suggest a misperception of risk pricing: 48 b.p. in 2017Q3, a value not so distant from the ones observed before the Summer of 2007.

After a slight increase in early 2017, the spread differential between BBB and A European corporates initiated a new descent in 2017Q3. The value registered in September 2017 (14 b.p., almost an historical minimum) translates into a very worrisome flattening of risk, cautioning for alert in the short-term concerning this effect of risk mispricing in bond value. Currently, this gap is slightly less than one third the one registered in the US. This evolution might also be explained by search for yield behaviours, given that prime European sovereign yields continue to be historically low.

This possible search-for-yield attitude and risk mispricing concerns are well reflected in the positive evolution of BBB corporate bond prices not only towards AA and A companies (whose indices are below the 2005 starting value), but as well when compared with AAA firms (that underperformed BBB firms since mid-2009).

Regarding the 10Yr sovereign yields, Portugal exhibits a negative year-on-year change (-95 b.p.), while Germany, UK, Spain and France display positive year-to-year variations (0.58 b.p., 1.37 b.p., 0.72 b.p. and -0.56 b.p., respectively).
Portugal is also the only country with a significant negative variation in the spread vis-à-vis Germany. By the end of September 2017 the 10Yr sovereign spot rates for Portugal stood around 2.36%, which is significantly below the average for the 2002-2008 period (4.18%), representing nonetheless a striking jump in the comparative spread to Germany (0.12 p.p., on average, in 2002-2008, and 1.90 p.p. in the end of 2017Q3). This occurs even with the ECB, under its public sector debt purchase programme, still continuing to intervene in secondary markets to sustain yield levels (although the programme is gradually undergoing de-phasing).

The duration of sovereign debt traded in world markets is still at unprecedented levels. The modified duration of a global government bond index sponsored by Citigroup is 7.7 years (although below an all-time high of 8 years in 2016Q3), almost doubling the value reached when the index was launched (1985). The duration for US bonds is 6.1 years, 7.4 years for the Euro Area and 10.2 years for Japan. Based on not very dissimilar figures for October 2016, the Bloomberg Barclays sovereign debt index estimations pointed that a one p.p. interest rate increase would result in $2.1 trillion losses for global investors, a scenario which, considering recent global inflation rates, may not be discarded.

In Portugal, the duration of mutual funds’ bonds portfolio is a good proxy to ascertain how institutional investors position themselves towards the interest rate curve and how hard bond prices would be impacted by an increase in interest rates. In general, duration has been low (around 2.1 years for all mutual funds in September 2017, 2.7 years for bond funds), showing that domestic fund managers have a more cautious position on the yield curve than world investors overall. However, individual portfolio managers’ debt portfolios exhibit a much higher modified duration (4.2 years) and the exposure to domestic sovereign debt’s yield curve averaged around 5 years in 2017Q3.

### 2.4 Investors

**Investment Management**

AuM of individual portfolio management increased by 1.1% in the first 9 months of 2017 and AuM of collective investment stabilised. However, a trade-off occurred between alternative funds and UCITS, the latter increasing 20%. Despite higher real estate prices as well as occupancy rates, real estate funds’ AuM augmented just by 3%.
Private equity and venture capital managers continue to focus their investments on distressed and highly indebted companies. Though start and seed capital have received further attention in 2017, the value of investments only amounts to €650 million. Nonetheless, no Portuguese company entered the stock market through an IPO after being assisted by domestic venture capitalists, suggesting that the sector is not yet large enough to allow a proper capitalization of domestic companies.

With the exception of money market funds and other funds (and due to the reclassification of some money markets onto other categories), the AuM of the different fund types have been relatively stable. AuM of equity funds register some growth since 2016Q3. However, funds specialised in Portuguese stocks continue to slowly fade away and, more and more, do not provide a real alternative for domestic companies’ turnaround and liquidity. Altogether still with a small private and venture capital sector (amounting just €4.5 billion of AuM), this poses probably the most relevant financing constraint that companies face. Furthermore, the ‘preference’ for potentially costlier bank credit may result in higher cost of capital associated to unbalanced capital structures.

Bond funds’ AuM increased in the last year. Notwithstanding that, the longer trend reduction is probably associated to recent default episodes in commercial paper and bonds of relevant listed Portuguese companies. These most likely implied reluctance among bond fund investors regarding future direct investment in bonds and in specialised collective investment schemes (CIS) of such nature. This occurred despite average positive bond fund returns in five of the last six years.

The modified duration of CIS’ global bond portfolio shows some stability in the yield curve maturities’ exposure. However, probably as a response to better credit conditions and correlative yields caused by rating upgrades and an improved macroeconomic environment, public debt duration has been increasing.
Fund returns compared to appropriate benchmarks in a period of almost seven years show that collective investment – after fees and taxes – still pays more than (or equal to) other risk/reward comparable investments. Open-ended real estate funds (€3.3 billion in 2017Q3) are an exception since they generated negative aggregate returns in the last seven years (below an alternative investment in an average 2-year bank deposit). Bond fund managers, even though positioned in a significantly lower yield bond curve duration relative to the selected benchmark, continue to show the ability to outperform it.

Graph 54. Fund Returns vs. Benchmarks

Net flows of a wide array of financial instruments available to investors continue to reveal a consistent flight to safety from securities and insurance investments to investment in bank deposits and public debt offered directly to retail investors. In a period of almost eleven years, around €30 billion were divested from securities and insurance markets and almost €60 billion floated to deposits and retail public debt. This shows that, regardless of the low (and sometimes even negative) interest rate environment, investors still prefer to allocate their savings in bank deposits. Despite the resolution of two banks in 2014 and 2015, investors seem to prefer the risk of a possible €100,000 covered bail-in and to bear the risk of the Portuguese Republic than to invest their savings in the securities markets.

However, the year up to September has been positive not only for Public Debt (sold to individuals as Certificados de Aforro and Certificados do Tesouro) and bank deposits, but for all the remaining investment instruments as well, which, with the exception of alternative funds, experienced inflows in the period. Foreign UCITS marketed in Portugal also registered positive inflows (this being so for the last 5 years). Despite a very low savings rate, investors have again shifted some of their money to the securities markets, suggesting that investor confidence in investment funds has gained a new momentum in 2017.

Graph 55. Net Flows (subscriptions minus redemptions) by Fund type

Note: MMF - Money Market Funds; FIBF - Fixed Income Bond Funds; VIBF - Variable Income Bond funds; EF – Equity Funds; HBF – Hybrid Bond Funds; HEF - Hybrid Equity Funds; PRF – Personal Retirement Funds; FF – Flexible Funds; OF – Other Funds.
Source: APFIPP; CMVM calculations. Last data point: September 2017.
On the other hand, retail investors seem to be progressively moving apart from individual portfolio management (IPM) since their number of portfolios under management has decreased around 21% from December 2016. As a consequence, the average portfolio size increased from €260,000 to €350,000. On the other hand, the average portfolio of institutional investors (namely investment and pension funds) has increased 7.5% (despite a slight decrease in the portfolios’ number, the increase in the value under management compensated this latter effect). Both these movements are consistent with an industry oriented for professional investors and high-net-worth individuals.

One third of the investments carried out by IPM are concentrated in bonds, both corporate and sovereign. Sovereigns are core to these investments, with domestic debt weighing 73% of all sovereign debt targeted by IPM and mounting to €19 billion (almost 9% of the outstanding Portuguese sovereign debt).

Regarding corporate debt, the geographical dispersion of issuers is more balanced, although debt issued by US companies has been emerging as
strategic allocation preference for IPM, probably because both the economy and US markets have outperformed their European peers in the last two years.

Panel B – Corporate Debt

IPM’s bonds portfolios duration stands a bit above 4 years, almost the double of CIS bond’s portfolio. Furthermore, domestic sovereign bonds have a 5 year duration in IPM, which makes their price more sensitive to interest rate changes and stresses the potential risk attached to these investments if monetary authorities increase reference rates.

Graph 59. Individual Portfolio Management - Bonds Modified Duration

Source: CMVM. Last data point: September 2017.

Structured Retail Products

Structured retail products (SRP) continue to observe a reduction in the amounts placed as well as in the riskiness of products. Capital protected SRP are again slightly dominant (in terms of value).

The evolution of the SRP market cannot be disconnected from the default of Portugal Telecom International Finance’s bonds, which were the underlying of several SRP, including credit linked notes. After this credit event, in 2016Q3 ISDA determined a 20% recovery value for PTIF bonds causing investors to lose at least 80% of the money they invested in several SRP of this nature (estimations point out for a global issue value of around €900 million). This event undermined significantly the confidence of investors and probably pushed issuers to adjust their offer towards lower risk products.

Nonetheless, the aforementioned is not entirely reflected in the alert type included in the SRP’s informational documents, since products flagged with a green alert (100% capital protection) decreased both in number and in proportion. On the other hand, the number of products with a red alert rose to half of the SRP issued in 2017. This has resulted in spreading products complexity over several small amount SRPs whose pay-off and other products’
mechanisms may be hard for retail investors to apprehend. With the exception of one SRP, all the other issued in the first three quarters of 2017 were tagged as having special complexity. Thus, although the amount of SRP placed has decreased and the proportion of capital guaranteed has improved, the probability that an average retail investor will not be able to understand how those SRP function continued to increase.

**Investor Complaints**

The number of complaints increased markedly in 2017Q2. The spike in aggregate complaints is attributable to bond/debt instruments and is caused by poor (or lack of) information given to clients, especially through investment advice.

This higher number of complaints was driven by a resolution measure applied to a bank in 2015, affecting all subordinated debt issued. Without this inflow, the number of complaints would have decreased in the most recent quarter.

Apart from the poor quality or lack of information, the other leading cause of complaints in the second quarter was general administration and customer services, including custody and safekeeping services. The number of complaints related to stocks increased.
2.5 Fintech and Related Risks

The term Fintech (Financial technologies) is used to describe a ‘technological enabled financial innovation that could result from new business models, applications, processes, or products with an associated material effect on financial markets and institutions and the provision of financial services’. Fintech is driving a rapid change in financial services markets, creating opportunities, challenges and risks for firms, consumers and supervisory authorities.

Examples of Fintech include, among others, robo-advice, crowdfunding, alternative trading venues, block chain applications and algorithmic trading.

Figure 1. Fintech products and services

<table>
<thead>
<tr>
<th>Sectoral Innovations</th>
<th>Market Support Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit, deposits, and capital raising services</td>
<td>Portal and data aggregators</td>
</tr>
<tr>
<td>Payments, clearing and settlement services</td>
<td>Ecosystems (infrastructure, open source, APIs)</td>
</tr>
<tr>
<td>Investment management services</td>
<td>Data applications (big data analysis, machine learning, predictive)</td>
</tr>
<tr>
<td>High frequency trading</td>
<td>Distributed ledger technology (block chain, smart contracts)</td>
</tr>
<tr>
<td>Copy-trading</td>
<td>Security (customer identification and authentication)</td>
</tr>
<tr>
<td>E-trading</td>
<td>Cloud computing</td>
</tr>
<tr>
<td>Robo-advice</td>
<td>Internet of things/ mobile technology</td>
</tr>
<tr>
<td></td>
<td>Artificial intelligence (automation in finance, algorithms)</td>
</tr>
</tbody>
</table>

Source: Adapted from BCBS.

Fintech is expected to facilitate the interaction between financial intermediaries and consumers. The spread of digital offerings and the increasing market electronification can be advantageous for market participants. Other potential benefits from Fintech include supply of new products and services, cost savings, greater efficiency, transparency, and security, decentralization and diversification of services, increased competition and greater financial increase market participation of consumers and firms.

On the other hand, Fintech may lead to new risks and detriment for financial market players. For example, the increasing adoption of alternative financing platforms (e.g., crowdfunding) may expand operational risks and the risk of collapse/bankruptcy, misselling and misconduct by firms, risks of fraud and scams by platform users, risks of liquidity due to the lack of a secondary market, all of which may result in increased cross-border risks. These risks can also undermine trust in financial markets and hinder their sound development, which is another source of concern for financial market regulators.

Risks in both retail trading and investment platforms (e.g., robo-advice, financial aggregation platforms) include errors in algorithm-trading, failure by robo-advisors to properly incorporate consumers' preferences and needs in their recommendations/solutions, as well as increased consumer difficulties in understanding and using the services provided.

Operational risks from Fintech may arise from third party service providers (e.g., cloud computing). For example, disruptions to these services can damage data confidentiality and result in systematic risks, especially if such services cover the wide financial services markets.

For example, Fintech increases the exposure of the
financial system to cyber risks. Cyber-attacks in financial markets have increased in frequency, sophistication and persistence and resulted in higher costs over the past few years. Cyber risks can arise from involuntary technical faults or malicious attacks, each of which relate to data integrity. From an investor protection perspective, cyber-attacks could, for example, result in loss of data integrity, misappropriation of investor assets and fraud/scams to the end consumer.

Moreover, market abuse may increasingly feature a cyber component, such as obtaining and misusing inside information, market manipulation using a false identity, cloning of firms, dissemination of false information, high tech front running, interfering in the order flow by disrupting the physical pathway to the market, among others, all of which may improperly affect the stability of financial markets.

The emergence of a business ecosystem in the cryptocurrency industry stems from four key sectors: exchanges (purchase, sale and trading), wallets (storage), payment companies and mining (blockchain). The main operational risk factors for exchanges are security breaches, fraud, business model and reputational risks. For wallet providers operating globally, the compliance requirements might be less clear than for those providers that hold a formal license from a national regulatory authority. From the payment companies’ perspective, one of the main risks is market liquidity (difficulty of obtaining money-transfer operator relationships). Mining activities face operational risks such as distributed denial of service (DDoS) attacks against mining servers and unexpected changes to the protocol (e.g., the current proof-of-work PoW algorithm) and market risks (sudden large price drop). Cryptocurrencies expose users to a number of operational risks, including hackers and scammers and newcomers may underestimate market risks. Finally, consumer protection rules are still limited. National and international regulators currently deal with Fintech risks by producing regulation specifically targeted at Fintech. For example, implementing detection or protection systems and responding to and recovering from the consequences of such risks. Although there is no current evidence of the materialisation of these risks in the Portuguese securities market, CMVM is working (including with its counterparties) to ensuring Fintech works in the consumers of financial services’ best interest.

11 The following currencies were the largest in terms of market capitalization: bitcoin (the leader), ETHEREUM, DASH, MONERO, RIPPLE and LITCOIN.