JC 2018 07

JOINT COMMITTEE REPORT ON RISKS AND VULNERABILITIES IN THE EU FINANCIAL SYSTEM

APRIL 2018

Executive summary and Policy actions 1
1 Introduction 3
2 Risk related to valuations and repricing of risk premia 3
3 Risks related to the UK's decision to withdraw from the EU 10
4 Operational risks - ICT risks 12
5 Climate change risks 15

EXECUTIVE SUMMARY AND POLICY ACTIONS

Valuation risk and the potential for sudden risk premia reversals remained a major concern in the second half of 2017. During that time, equity prices continued to increase amid volatility at historically low levels. While low volatility reflected to some extent expectations of continued monetary policy support, the absence of market reaction to recent events possibly increased investor complacency and the probability of sudden risk repricing. This might have contributed to the return of global equity market volatility in February 2018 and associated equity price falls, with the VIX increasing above 40%, the highest in several years. Despite the recent spike in volatility, the risks related to valuations and repricing of risk premia remain and could, among other things, adversely impact profitability and asset quality across sectors. Asset quality in the banking sector has recently improved and volumes of non-performing loans (NPLs) disposals are increasing. Yet amounts of NPLs in banks' balance sheets are still high and require further action by banks and supervisors.

Uncertainties around the terms of the UK's withdrawal from the EU still have the potential to expose the EU27 and the UK to economic and financial instability and to weaken market confidence, in particular if negotiations end in a disorderly fashion. The absence of a conclusive agreement on the withdrawal terms could affect the legal framework for financial services and hence the continuity of financial contracts as well as imply challenges for the operations of firms.

Cyber risks have become a significant and highly escalating threat to investor protection, the financial markets and their stability worldwide. They threaten data integrity and business continuity and are particularly dangerous because of their risk multiplier effect as well as other business risks. Similarly, risks related to virtual currencies have recently materialized, inter alia driven by extraordinary high levels of volatility and associated price falls.

Climate change and the transition to a lower-carbon economy raise concerns about the sustainability of investments across large parts of the financial sector, and have recently received increased attention from both national and international supervisory and regulatory bodies. So far, it has been highlighted that climate change can affect asset quality through different transmission channels, which could in turn affect the solvency position of financial institutions.

In light of the ongoing risks and uncertainties discussed in this report, especially those around the process of the UK's withdrawal from the EU, supervisory vigilance and cooperation across all sectors remains key. The Joint Committee advises the following policy actions by the ESAs, national competent authorities and financial institutions moving forward:

1. Against the backdrop of the potential for sudden risk premia reversals, the development and regular use of stress tests across all sectors remains crucial. EIOPA has recently published the results of its Occupational Pensions (IORP) stress test and ESMA the results of its Central Counterparties (CCP) stress test. Further stress testing activities for 2018 are underway. The EBA has launched the 2018 EU-wide bank stress test in January and EIOPA is going to run a pan-European insurance stress test in 2018. On the asset management side, ESMA is progressing on the conceptual development of its approach to stress testing in the asset management industry, including model-based stress simulations. Moreover, ESMA is developing guidelines for stress testing carried out by money market funds as well as guidelines for asset managers on liquidity stress testing in all funds.

2. EU financial institutions and their counterparties, as well as investors and retail consumers should consider appropriate mitigation actions to prepare for the UK's withdrawal from the EU in a timely manner. Such contingency planning should consider timely responses to all potential challenges, such as contract continuity and possible relocations. ESAs' Opinions on these issues provide important guidance for financial institutions and national competent authorities in this regard.

3. Supervisors should continue to encourage financial institutions to improve fragile IT systems, explore the risk that they are undertaking in the context of information security and address concerns about connectivity and outsourcing to third-party providers. To support this, ESAs continue to pay supervisory attention to these risks. ESMA envisages to further work to address cyber risk, through supervisory convergence activities, as well as its direct supervision work. In addition, ESMA is launching a supervisory project on cloud computing. EBA is developing Guidelines on the management of information and communication technologies (ICT) risks for institutions, and has issued guidance for the use of cloud service providers by financial institutions. EIOPA is currently conducting a qualitative exercise on cyber risk involving national supervisory competent authorities and the industry to obtain more insights into this new emerging risk. The survey focuses on issues related to underwriting of cyber insurance, covering topics such as cyber underwriting strategy, products, potential build-up of risks, among others.

4. Financial institutions should be encouraged to take a more forward-looking approach to include sustainability risk in their governance and risk management frameworks, and to develop responsible, sustainable financial products. Moreover, supervisory authorities should enhance their analysis of potential risks related to climate change for the financial sector and financial stability. This also involves a stronger engagement of the ESAs in the area of climate change risks.

1 INTRODUCTION

The autumn 2017 Joint Committee Report on Risk and Vulnerabilities considered (i) the risks related to the UK's withdrawal from the EU, (ii) risks around the adequate valuation of asset prices in the context of an uncertain outlook for yields, (iii) the persistent low profitability of financial institutions, and (iv) challenges resulting from rapid developments in the area of FinTech as key risks to the EU financial system.

In the last semester, the overall EU macroeconomic environment continued to improve. GDP growth in the EU accelerated to 2.4% in 2017 and it is forecasted at 2.3% in 2018[1]. Financial market conditions were benign, with continued support from monetary policy and asset price volatility at historical lows throughout 2017. However, political and economic risks continue to linger, in particular with respect to uncertainties around the UK's withdrawal from the EU. Tendencies towards protectionism and the slow implementation of structural reforms add to risks globally. Geopolitical tensions may moreover trigger abruptly increasing yields, affecting asset prices and possibly causing stress on financial markets.

Against this background, risks around the adequate valuation of asset prices and risks related to the UK's withdrawal from the EU are still considered as key in the spring 2018 report. Concerns about the profitability of banks and insurers also remain, though some improvement is observed since the last report. This report highlights the significance of cyber risk, risks associated with crypto-assets and the importance for financial institutions and competent authorities to assess climate change risks.

2 RISK RELATED TO VALUATIONS AND REPRICING OF RISK PREMIA

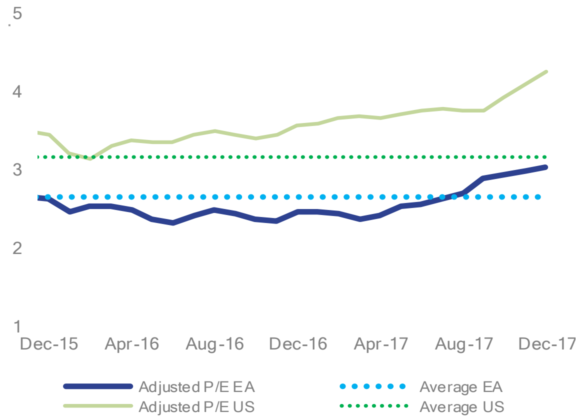
Risks that abruptly increasing yields could lead to losses across asset classes and generate substantive volatility in asset prices were identified in previous iterations of this report. These risks remain imminent in the context of the continued environment of low interest rates and low volatility. This chapter describes the drivers of valuation risk and possible implications for financial institutions and retail consumers, as well as the importance of stress testing as a tool to assess the possible impact and prepare for the materialization of these risks.

EU equity prices have risen 10% in 2017 after remaining flat in 2016, supported by the improving macroeconomic environment and accommodative monetary policies. This fuelled concerns of **possible asset overvaluation**, strengthened by the development of Euro Area wide price-earnings ratios, which are high relative to their long-term average, though still below previous peaks observed in 1998, 2000 and 2007 (Figure 1).

Volatility remained very low by historical standards in 2017, with the VSTOXX one-month implied volatility declining to around 13% at the end of 2017, far below its long-term average of 20%. This was despite recent increasing geopolitical tensions, which could have a direct impact on the economic environment and global financial stability (Figure 2). While low volatility reflects to some extent expectations of continued monetary policy support, the relative absence of market reaction to adverse events also **potentially increased investor complacency and the probability of sudden risk repricing.** This might have contributed to the sudden return of global equity market volatility in February 2018, with the S&P 500 losing 4.1% in one day and the VIX jumping to around 40%, the highest in several years.

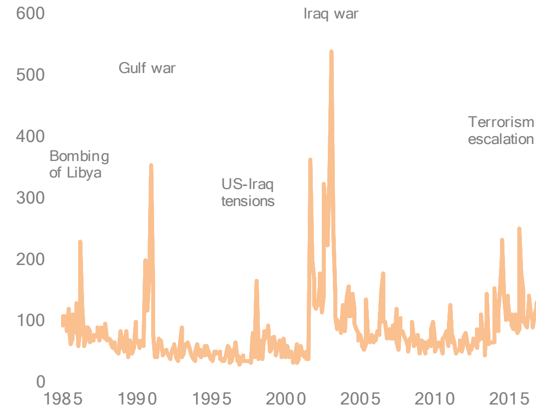
[1] EU Commission Winter 2018 interim economic forecast, 7 February 2018: https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-forecasts/winter-2018-economic-forecast_en

Figure 1: Equity valuation



Note: Monthly earnings adjusted for trends and cyclical factors via Kalman filter methodology based on OECD leading indicators; units of standard deviation. 25-year averages excluding 1998-2000 asset bubble.
Sources: Thomson Reuters Datastream, ESMA.

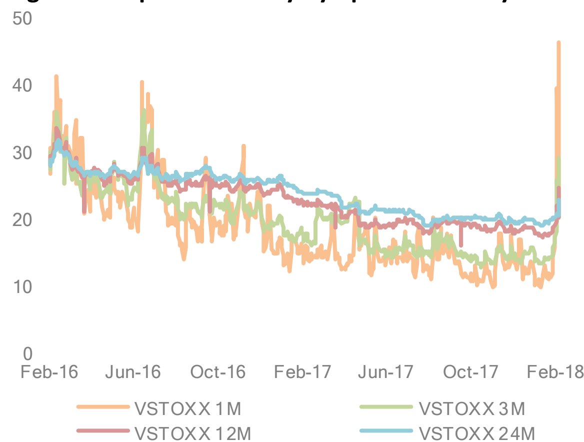
Figure 2: Geo-political risk



Note: Geopolitical Risk Index, computed from January 1985 to December 2017.
Sources: Caldara, D. and M. Iacoviello, "Measuring Geopolitical Risk," Working Paper, Board of Governors of the Federal Reserve Board, December 2017.

Implied volatility in 2017 was particularly low in historical terms when the shortest option maturity is taken into account. One-month implied volatility at the end of 2017 was around 13%, which is below the fifth percentile, while 12-month implied volatility was around the fifteenth-percentile of its historical distribution (Figure 3). Compared to the mid-2000 pre-crisis period, the second half of 2017 displayed larger difference between shorter- and longer-term implied volatilities. These larger differences indicate expectations that **volatility may increase in the future**. Low volatility coupled with low interest rates and ample liquidity may have **led to a build-up in excessive risk and to an increase of medium-term vulnerabilities**. The return of equity market volatility at the beginning of February and associated market corrections (a 6% drop in EU equity during the week of 5 February) have confirmed this assessment. On corporate bond markets the continued compression and decline of corporate bond spreads suggests the **persistence of search-for-yield** strategies (Figure 4). The expectations of policy changes as well as the materialisation of risks in financial markets may trigger abruptly increasing yields, lead to losses and volatility spikes in asset prices. A resulting period of financial stress may affect the availability of collateral, which is already relatively scarce (Box 1).

Figure 3: Implied volatility by option maturity



Note: Eurostoxx50 implied volatilities, measured as price indices, in %.
Sources: Thomson Reuters Datastream, ESMA.

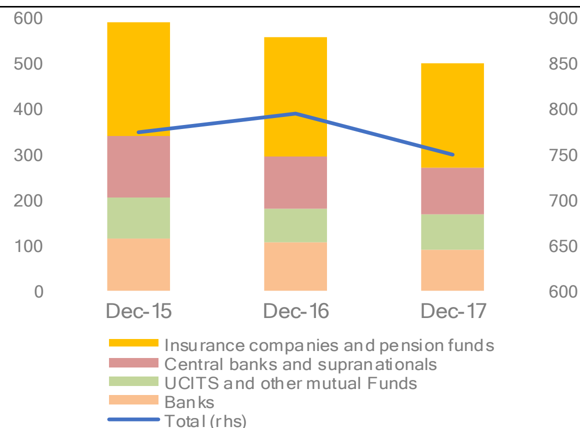
Figure 4: EU corporate bond spreads by credit rating

Note: EA non-financial corporate bond spreads by rating between iBoxx non-financial corporate yields and ICAP Euro Euribor swap rates for maturities from 5 to 7 years, in bps.
Sources: Thomson Reuters Datastream, ESMA.

BOX 1: Collateral availability in EU markets

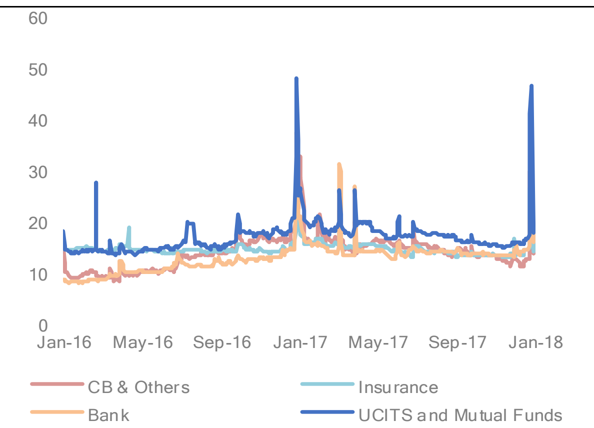
Since mid-2015, there appears to be a scarcity of high quality assets available as collateral. The growing demand for collateral is related to market and regulatory developments in recent years. The ECB asset purchases programme has been cited for having an impact on collateral availability. In addition, fiscal consolidation reduces the availability of high quality collateral on the supply side. The total amount of European government bonds available for lending has decreased over the last three years across sectors, according to the available data on securities lending transactions (Chart 1).[2] This relative scarcity of collateral is mainly reflected in the higher cost of collateral, with sovereign repo rates deep in negative territory, and higher fees for government bond lending. Moreover, since the end of 2016 the euro repo market has experienced several episodes of high volatility and a general increase in high-quality collateral premia, reflecting signs of potential scarcity in the EU financial system[3]. In securities lending markets, the European government bonds lent by UCITS and other mutual funds are associated with greater volatility and tend to attract higher fees on average than the loans from other sectors (Chart 2). This may reflect several factors, such as the specific characteristics of the government bonds on loan or the type of collateral provided.

Chart 1: EU government bonds available for lending, by sector of the lender



Note: Monthly average of EU government bonds available for lending (right axis), and average by sector, in billion euros. The sum of the sectors adds to 75% of the total, the rest is not attributed to a specific sector.
Sources: Markit Securities Finance, ESMA

Chart 2: Government bond lending/borrowing fees, by sector of the lender



Note: Securities lending fees on EU government bond securities, by ownership sector, in basis points.
Sources: Markit Securities Finance, ESMA

The risks related to valuations and repricing of risk premia could adversely affect bank profitability and asset quality. Increased net trading income – the key driver of improved bank profitability in 2017 - is often driven by increasing equity prices and decreasing spreads. Investments into riskier assets made in the low yield and high valuation environment pose additional risks should asset price valuations reverse. Rising risk premia could adversely affect asset quality in the medium term, which remains an issue of concern in the EU banking sector (Box 2). Moderately increased medium- and long-term interest rates nevertheless provide for an outlook of increasing net interest margins (NIM) with a positive impact on bank profitability.

Recent bank lending surveys[4] indicate a further easing of credit standards in particular for corporate lending and housing loans. Although some relaxation of credit standards is conducive to promote lending, easing credit standards in a context of search for yield should nevertheless warrant close supervisory monitoring and should adequately reflect risks. Increasing NIM in an improving macroeconomic environment may also outweigh potentially decreasing net trading income.

[2] ESMA "Report on securities financing transactions and leverage in the EU": https://www.esma.europa.eu/sites/default/files/library/2016-1415_-_report_on_sfts_procyclicality_and_leverage.pdf
[3] ESMA Report on Trends, Risks and Vulnerabilities No. 2, 2017: https://www.esma.europa.eu/sites/default/files/library/esma50-165-416_trends_risks_and_vulnerabilities_no.2_2017.pdf, page11
[4] ECB Bank lending survey Q3 2017: https://www.ecb.europa.eu/stats/ecb_surveys/bank_lending_survey/html/index.en.html

BOX 2: Asset quality

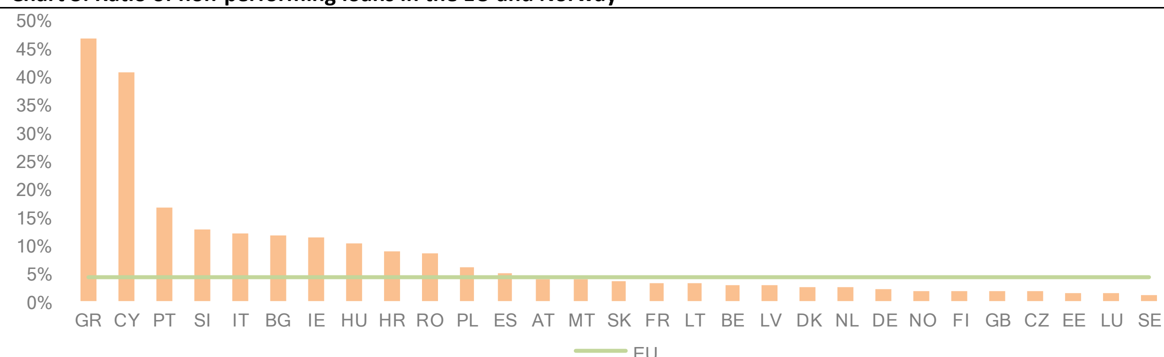
Asset quality in the EU banking sector continues on an improving trend. In Q3 2017, the average ratio of NPLs to total loans decreased to 4.2% in Q3 2017, a decrease by 120 bps year-on-year. The coverage ratio has remained broadly stable in 2017 at ca. 45%, but dispersion among countries is high. **The decreasing NPLs trend is the result of increased efforts of both supervisors and banks to address outstanding legacy NPL**, with the amount of NPLs decreasing to EUR 854bn in Q3 2017, compared to EUR 1,038bn in Q3 2016, as well as of higher loans volume. The decreasing NPLs trend was observed across all banks-size classes, but in particular at smaller banks.

Asset quality nevertheless remains an issue of concern in the EU banking sector. Amounts of NPL in EU banks' balance sheets are still high, and asset quality in EU countries remains widely dispersed. At the current rate of reduction, NPLs will not reach the pre-crisis level in a short time. It is therefore important to speed up the improvement of asset quality to increase the resilience of banks.

Further supervisory actions to support the ongoing cleaning of balance sheets should include close monitoring of actions undertaken by banks to reduce NPL. **Banks are expected to define a clear and consistent strategy to address the stocks of NPL, in line with supervisory guidance**. Given the high dispersion of coverage ratios among countries, a rigorous and consistent assessment of the evaluation process, especially for real estate collateral is highly recommended. Additional attention should focus on banks' underwriting standards, in order to detect potential credit standard loosening which could affect the quality of new loans.

To enhance supervisory guidance to address NPLs across the whole EU, the **EBA is developing Guidelines on NPL on the management of non-performing and forborne exposure**[5]**,** which will provide supervisory guidance to banks with the aim of achieving a sustainable reduction of NPLs to strengthen the resilience of balance sheets and support lending into the real economy.

Chart 3: Ratio of non-performing loans in the EU and Norway



Note: Weighted averages by countries[6]. Source: EBA

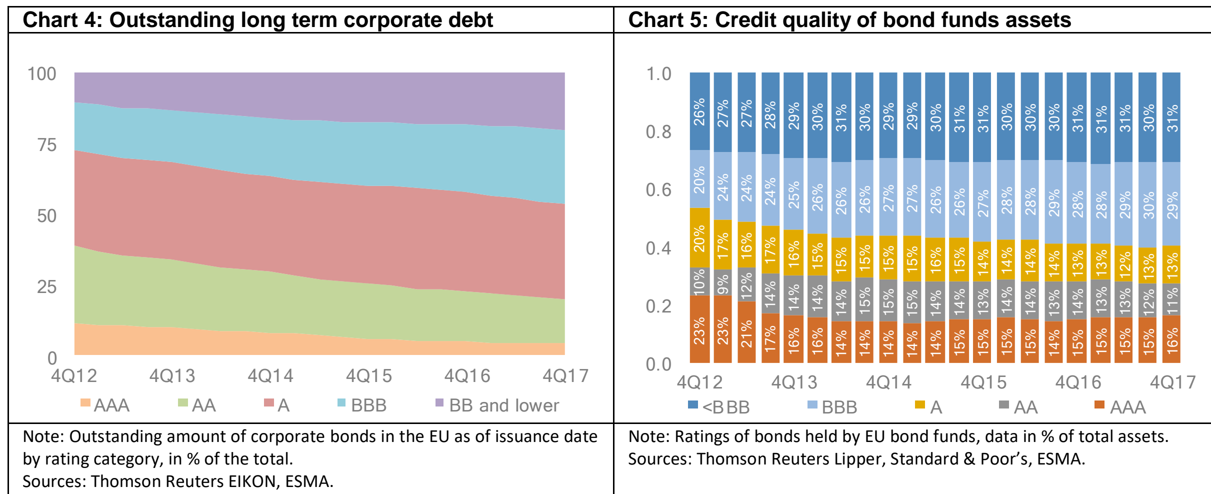
The guidelines will be consistent with the Single Supervisory Mechanism (SSM)'s guidance to banks on NPL, but apply to all banks in the EU. In order to address the emergence of new NPL the EBA will also develop Guidelines on banks' loan origination monitoring and internal governance. The EBA has moreover developed and published templates for NPL transactions, providing a common EU data set for the screening, financial due diligence and valuation during NPL transactions. The templates are designed to create a foundation for NPL transactions across the EU.

Looking at asset quality in the corporate bond markets, also relevant for insurance undertakings, IORP's and asset managers, the longstanding trend of deteriorating credit quality of corporate bonds continued in 2017, though at an increasingly slower pace (Chart 4). Similar trends can be observed for the credit quality of outstanding sovereign bonds. It is also worth noting that in 2017 the issuance of high-yield corporate bonds increased by EUR 26bn (to EUR 112bn) compared to the first half of 2017, as persisting search-for-yield strategies continued to support the strong demand for low rated bonds. These developments are reflected in the development of bond fund asset quality (Chart 5).

[5] EBA Consultation Paper on Guidelines on management of non-performing and forborne exposure, 8 March 2018: https://www.eba.europa.eu/regulation-and-policy/credit-risk/guidelines-on-management-of-non-performing-and-forborne-exposures

[6] Based on aggregated data of a list of banks for EBA supervisory reporting: https://www.eba.europa.eu/documents/10180/1766251/EBA+List+of+Institutions+for+Supervisory+Reporting+-+2017+update.pdf/575e4249-043a-4d59-a0c5-e7be47487aec

Chart 4: Outstanding long term corporate debt | **Chart 5: Credit quality of bond funds assets**



Note: Outstanding amount of corporate bonds in the EU as of issuance date by rating category, in % of the total.
Sources: Thomson Reuters EIKON, ESMA.

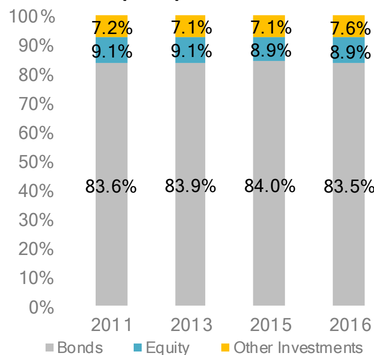
Note: Ratings of bonds held by EU bond funds, data in % of total assets.
Sources: Thomson Reuters Lipper, Standard & Poor's, ESMA.

Retail consumers are affected by a repricing of risk premia through their portfolio holdings. According to ECB data, the exposure of Euro Area households to globally listed equities amounted to EUR 950bn in the third quarter of 2017, while they held EUR 1,890bn in investment fund shares. Significant market turmoil resulting in negative portfolio returns can reduce household consumption, via wealth effects or realised losses.

The prolonged low interest rate environment provides an incentive for insurers to search for yield. An EIOPA survey conducted in 2017 revealed that although the overall investment allocation of insurers has remained broadly stable since 2011 at an aggregate level (Figure 5), a deeper look into each of the main investment categories reveals a number of trends that could be associated with search for yield.[7] The first of these trends is an increased exposure to lower credit quality bonds. The amount of AAA bond investments has significantly decreased in favour of the BBB+ to BBB- rating segment (Figure 6). Though this can be partly explained by the deterioration in the credit quality of corporate and government bonds that took place during the period and the fact that bond investments are often held for the long-term, a trend towards an increase in the maturity structure of the bond portfolio was also reported. Insurers have also increased their exposure to less liquid assets. Their investment allocation shifted towards non-listed equity and loans since 2011. Moreover, insurers plan to invest more into less liquid asset classes such as infrastructure, mortgages, loans and real estate over the coming years. Although these trends are a natural reaction to the low interest rate environment and can improve asset diversification, they also demand new risk management capabilities related to new risk exposures and close supervisory attention.

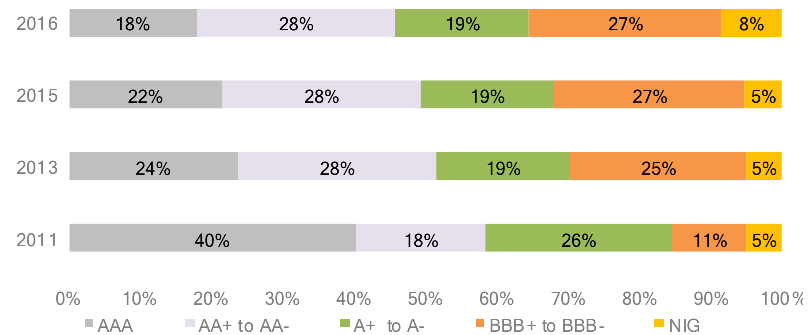
[7] EIOPA Investment behaviour report, 16 November 2017:
https://eiopa.europa.eu/Publications/Reports/Investment_behaviour_report.pdf

Figure 5: Insurers' investment allocation (in %)



Note: Excludes index linked and unit linked products.
Source: EIOPA Investment Behaviour Report.

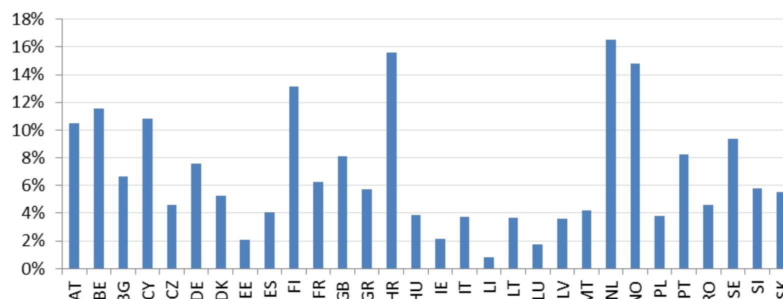
Figure 6: Breakdown of insurers' bond investments by rating (in %)



Note: The chart includes sovereign bonds, corporate bonds, structured notes and collateralised securities. Excludes index linked and unit linked products.
Source: EIOPA Investment Behaviour Report.

A further analysis on the exposures of European insurers to real estate-related assets revealed that these currently account for around 7% (EUR 642 bn) of total assets, with great variability across countries. Some of the most exposed countries received a warning on residential real estate vulnerabilities by the ESRB in 2016. Besides being more illiquid, investments in real estate also expose insurers to market and credit risk in case of vulnerabilities in real estate markets. Nonetheless, based on a sample of insurance undertakings using the Solvency II standard formula, EIOPA estimates that a decrease of 25% in property values would lead to a limited reduction (of less than 10%) in own funds for insurers in most countries.

Figure 7: Insurers' real estate-related assets (in % of total assets)



Note: EIOPA Quarterly Solo. Excludes assets held for index-linked and unit-linked contracts. Reference date: 31/03/2017.
Source: EIOPA Financial Stability Report, December 2017.

Pension funds are also vulnerable to an abrupt and large drop in asset prices triggered by a sudden reassessment of risk premia, especially if combined with low interest rates ("double-hit" scenario). The 2017 IORP stress test conducted by EIOPA indicates that the European Defined Benefits (DB) and hybrid occupational pension sector has, on average, insufficient assets to meet pension liabilities in both the baseline and the adverse scenarios, with great variability across countries. These results are valid under both the national and the common (market-consistent) balance sheets (Figures 8 and 9). The shortfalls would need to be covered by increased sponsor support and/or by benefit reductions, with potential spill-over effects to the real economy and financial stability, especially where sponsors would not be able to fully support the pension commitments following the adverse scenario. Existing national recovery mechanisms and high discount rates may contribute to mitigating the short-term spill-over effects. However, if the necessary adjustments are postponed too far, restoring the sustainability of IORPs can only be achieved by putting a disproportionate burden on the younger

generations. The Defined Contribution occupational pension sector, in turn, would experience a drop of 15% in the market value of investment assets in the adverse scenario, reducing the individual accounts of pension scheme members. In case this scenario persists, this implies a lower pension income at retirement.

Figure 8: Funding ratio of DB/Hybrid pension schemes in baseline and adverse market scenario, % liabilities (national balance sheet)

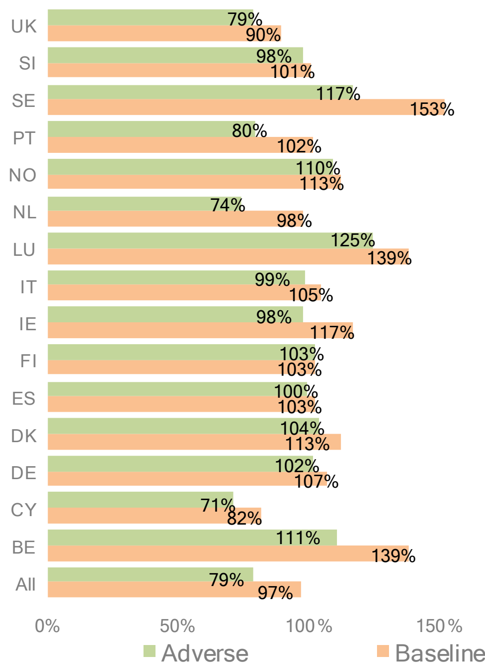
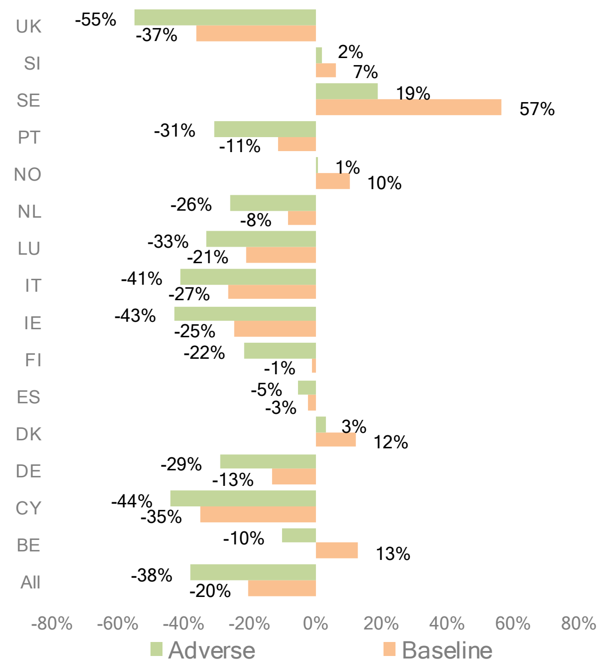


Figure 9: Excess of assets over liabilities for DB/Hybrid pension schemes in baseline and adverse market scenario, % liabilities (common balance sheet)



Source: 2017 EIOPA IORPs Stress Test.
Note: Figures excluding sponsor support, pension protection schemes and benefit reductions. National balance sheets are subject to different valuation standards, while common balance sheets are used by EIOPA to evaluate occupational pensions sectors across countries on a market-consistent basis. Funding ratio corresponds to net assets covering technical provisions in national regulatory regimes.

The IORP stress test illustrates the **importance of the development and regular use of stress evaluation tools** across all sectors. This helps to analyse and mitigate the potential consequences of the reversal of risk premia. In this regard, all ESAs plan to carry out stress tests in 2018 or have recently done so (see Box 3).

BOX 3: ESA stress testing activities in 2018
In 2018 ESMA tested the resilience of 16 European CCPs with approximately 900 clearing members EU-wide, of which the results were published in February. Whereas the 2016 stress test focused on counterparty credit risk only, this second exercise also includes liquidity risks – examining whether CCPs would meet their liquidity needs under different stress scenarios. The results[8] of the second EU-wide stress test show that overall the system of EU CCPs is resilient to multiple clearing member defaults and extreme market shocks. The aggregate amount of collateral held by CCPs on the test date in the form of margin requirements and default fund contributions was approximately €270bn. In addition, the report also highlights individual CCP-specific results. Moving forward, ESMA is progressing on the conceptual development of its approach to stress testing in the asset management industry, including model-based stress simulations. In addition, ESMA is developing guidelines which define reference parameters for stress testing carried out by money market funds, as well as guidelines for asset managers on liquidity stress testing in all funds.

[8] ESMA EU-wide CCP Stress Test 2017, 2 February 2018:
http://firds.esma.europa.eu/webst/ESMA70-151-1154%20EU-wide%20CCP%20Stress%20Test%202017%20Report.pdf

With respect to the banking sector, the EBA has launched the 2018 EU-wide bank stress test in January. The exercise is conducted on a sample of 48 EEA banks, covering ca. 70% of total banking sector assets in the Eurozone, other EU Member States, and Norway. IFRS 9 accounting standards are incorporated for the first time. The adverse stress scenario assumes the materialisation of four systemic risks considered as most material at the current juncture: (i) an abrupt and sizeable repricing of risk premia in global financial markets, (ii) adverse feedback loop between weak bank profitability and low nominal growth resulting from a decline in economic activity in the EU, (iii) public and private debt sustainability concerns, and (iv) liquidity risks in the non-bank financial sector with potential spill-overs to the broader financial system. The implied EU real GDP growth rates under the adverse scenario implies a deviation of EU GDP from its baseline level by 8.3% in 2020, resulting in the most severe scenario compared with the previous EBA exercises. The EBA expects to publish the results by 2 November 2018.

EIOPA is going to run a pan-European insurance stress test exercise in 2018 with the aim of assessing the vulnerability of the sector to specific adverse scenarios affecting life and non-life businesses. The scenarios will comprise combined market and insurance specific stresses and will also analyse the impact of natural catastrophe events. The exercise will target European (re)insurance groups selected by EIOPA in cooperation with National Competent Authorities among the top ranked in terms of total assets, gross written premium and technical provisions. Publication of results is envisaged by year-end 2018.

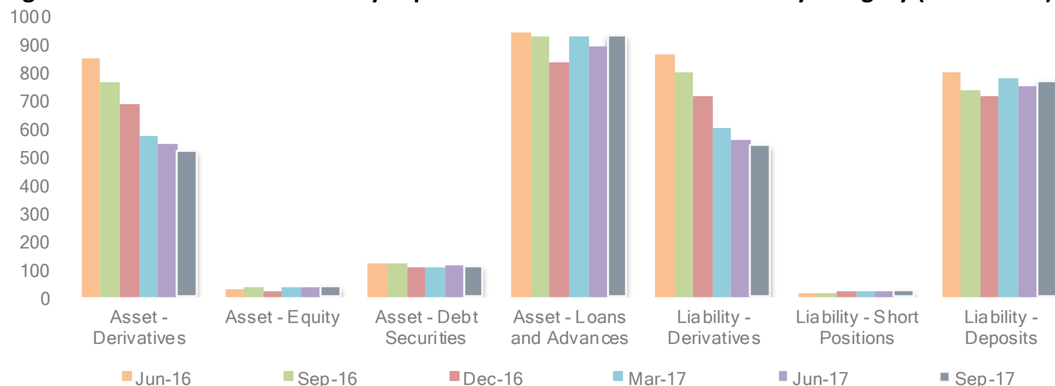
3 RISKS RELATED TO THE UK'S DECISION TO WITHDRAW FROM THE EU

The autumn 2017 report already indicated that uncertainties around the terms of the UK's withdrawal from the EU have the potential to expose the EU27 and the UK to economic instability and to weaken market confidence, in particular if negotiations end in a disorderly fashion. This chapter identifies some initial implications of the UK's decision to withdraw from the internal market for the EU financial sector, and highlights relevant risks that inconclusive agreements on the withdrawal terms would pose. The chapter ends with outlining possible risk mitigating actions that EU financial institutions should take.

The **impact of the UK's withdrawal observed to date varies across the financial sector**. Concerning securities markets, the structural impact of the UK's decision to withdraw appears to be limited to date. In terms of registrations, clear-cut trends are not yet observable, neither for the fund industry nor for financial market infrastructures and individual financial instruments. Relatively few firms have enacted contingency planning that has led to structural changes such as relocation. However, increased relocation activity can be expected closer to the withdrawal date, since market participants need to be ready by March 2019 in case of no transition period. It is important for EU financial institutions seeking relocation to the EU27 to apply soon for relevant operating licenses given the length of time needed to secure authorisations. By the time legal certainty on a potential transition period may be attained, financial institutions would not have sufficient time to take necessary measures.

In the insurance sector, the overall investment exposure of insurers in the European Economic Area (EEA) to UK is small (2.13%), just like cross-border business by insurers from the EEA in the UK and vice versa. Nonetheless, it cannot be excluded that some insurance companies more substantially exposed to UK assets might be affected in the short to medium term in the event of a drop in values for some asset classes, which could ultimately negatively impact their solvency positions. In the banking sector, exposures towards the UK differ greatly across banks. On average, a steady reduction of exposures of EU27 financial institutions towards the UK has been observed since the UK referendum in June 2016. This results mainly from a decrease of EU banks' exposures to derivatives contracts towards the UK (Figure 10). Yet heterogeneity of exposures across member states is strong. Moreover, decreasing exposure volumes are to some extent attributable to exchange rate fluctuations.

Figure 10: Total Asset and Liability Exposures of EU27 banks to the UK by category (billion EUR)



Source: EBA Supervisory data.

A possible consequence of the UK's withdrawal from the EU is the relocation of financial services activities. **Common EU efforts to ensure a consistent EU supervisory approach to potential relocations of financial institutions are necessary to protect the integrity of the Single Market.** In the banking sector, the EBA published an Opinion[9] providing guidance to ensure the consistent application of Union legislation to businesses seeking to establish or enhance their EU 27 presence in order to retain access to the Single Market. The EBA will monitor how the principles set out in its Opinion are applied in practice. Regarding securities markets, ESMA published four Opinions in 2017 with principles on authorisation, supervision and enforcement issues related to UK financial firms seeking relocation to the EU27. In order to ensure credible application of these principles, national securities supervisors consistently share information about the application of these principles to ensure Single Market integrity. Regarding the insurance sector, EIOPA has issued an Opinion to national supervisory authorities setting out principles to foster supervisory convergence and to ensure consistency in the authorisation process related to the relocation of insurance undertakings from the UK.[10] The principles introduce guidelines on granting authorisation and approvals, governance and risk management, the outsourcing of critical and important activities and the on-going supervision as well as monitoring by EIOPA. Work related to the withdrawal of the UK is ongoing in the three ESAs in 2018 and includes continuous market monitoring and risk analysis to ensure timely regulatory or supervisory responses should this be required.

Market participants need to prepare for the risk of reduced access to market infrastructure and contract continuity upon the UK's withdrawal from the EU. Financial institutions are responsible for ensuring that they are able to fulfil their contractual obligations under all circumstances, not least with respect to derivatives, liquidity provision, and swap contracts EU 27 parties have entered into. A range of further issues may arise, including the restructuring of legal entities and possible portfolio transfers. In the short term, UK's withdrawal from the EU may also affect access of EU 27 households and corporates to financial services provided in the UK and it may affect market confidence. This has potential implications on market liquidity and risk premia, and the risk of further adverse feedback loops.

With respect to the banking sector, the December 2017 EBA Risk Assessment Questionnaire (RAQ) shows that, while only 10% of respondents expect material negative implications to their business should withdrawal negotiations end in a disorderly or inconclusive fashion, more than one third of banks are concerned about the continuity of financial contracts in such a scenario. The UK's withdrawal also risks affecting access of EU 27

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[9] EBA Opinion on issues related to the departure of the UK from the EU, October 2017: http://www.eba.europa.eu/-/eba-provides-guidance-to-authorities-and-institutions-on-brexit-relocations

[10] EIOPA Opinion on supervisory convergence in light of the United Kingdom withdrawing from the European Union, 11 July 2017: https://eiopa.europa.eu/Publications/Opinions/EIOPA-BOS-17-141%20Opinion_Supervisory_Convergence.pdf

parties to UK-based Central Counterparties (CCPs). In a no-agreement scenario, the UK would be considered a third country, which implies a potential period where UK CCPs are no longer authorised and are not recognised to operate in the EU. This might pose risks to market continuity, as financial flows could be disrupted and liquidity provided by UK-based counterparties could be affected. It might also challenge banks domiciled in the EU 27 through increased capital requirements for exposures to UK CCPs. These exposures are substantial, as UK CCPs currently act as clearing-houses for a large share of the derivatives trading activity of EU 27 parties.

To mitigate the contract continuity risk for insurers, EIOPA has issued an Opinion urging supervisory authorities and insurance undertakings to ensure insurance contracts concluded before the withdrawal date will be fulfilled after the withdrawal of the UK from the European Union.[11] In particular, insurance undertakings are advised to have in place contingency plans considering all the eventualities. The aim is to ensure that insurers are able to fulfil their contractual obligations (service continuity) so that policyholders and beneficiaries are not exposed to unnecessary uncertainty regarding the status of their contracts.

It is important that EU financial institutions and their counterparties, as well as investors and retail consumers prepare appropriate mitigating actions in a timely manner, to prepare for the UK's withdrawal from the EU. The ESA Opinions provide important guidance for financial institutions in this regard. Contingency planning should consider timely responses to all potential challenges, such as contract continuity and possible relocations. Competent authorities concerned should monitor the plans that financial institutions have in place and encourage the implementation, where required, of adequate contingencies. Institutions should be clear about the implementation timelines concerned, and undertake appropriate actions in sufficient time. The ESAs should facilitate EU-wide supervisory co-operation to address joint challenges.

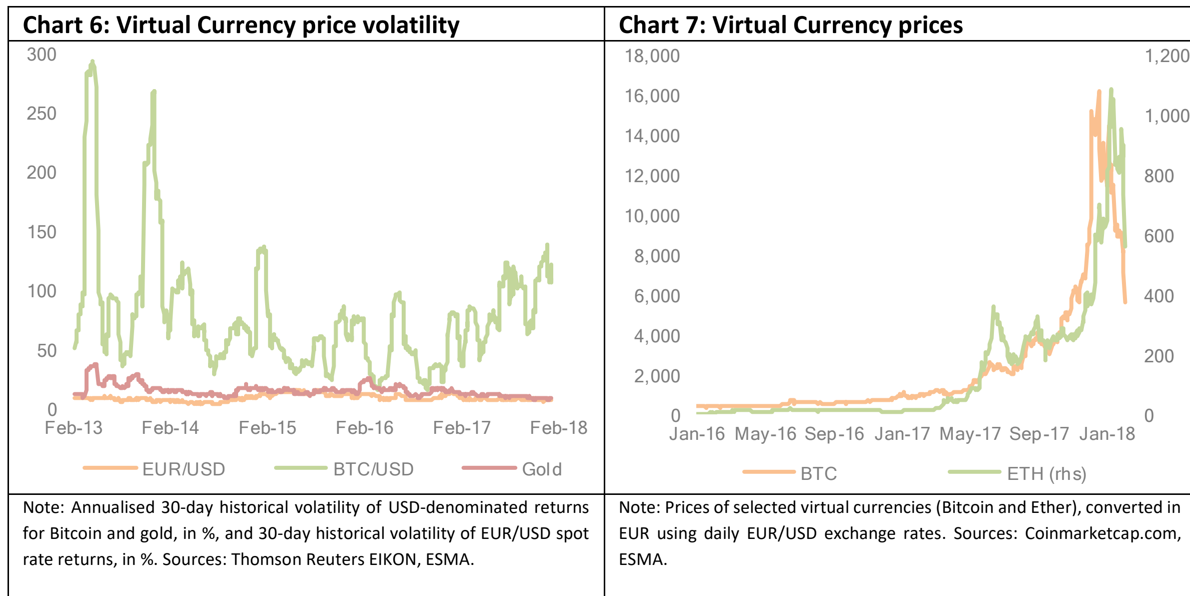
4 OPERATIONAL RISKS - ICT RISKS

Notwithstanding the opportunities provided by technological innovation in the financial sector for consumers and investors, cyber risks have become a significant and increasingly escalating threat to investor protection, the financial markets and institutions and financial stability worldwide. Further challenges arise with increased outsourcing of financial institutions' systems and processes that support regulated activities to cloud service providers. This chapter covers these risks and elaborates on the steps the ESAs have taken to mitigate these risks, after highlighting the risks related to virtual currencies (Box 5).

BOX 4: Risks related to virtual currencies
Apart from cyber risks, virtual currencies can raise significant consumer protection issues. In this context, the three ESAs issued a joint consumer warning on virtual currencies on 12 February 2018. The warning focused on the risks of buying and trading virtual currencies, and financial products exposing consumers directly to virtual currencies, noting that such actions were of high risk, and consumers could lose most or all of the capital invested.[12] Among the risks that were noted were the extreme volatility and bubble risk (see Charts 6 and 7), the lack of a robust secondary market, operational disruptions as well as the lack of price transparency. Further, the Warning highlighted that as virtual currency platforms are not regulated under EU law, consumers do not enjoy any of the specific safeguards and legal protections that are associated with regulated financial services.

[11] EIOPA Opinion on service continuity in insurance in light of the withdrawal of the United Kingdom from the European Union, 21 December 2017: https://eiopa.europa.eu/Publications/Opinions/2017-12-21%20EIOPA-BoS-17-389_Opinion_on_service_continuity.pdf

[12] ESA warning on virtual currencies, 12 February 2018: https://www.esma.europa.eu/press-news/esma-news/esas-warn-consumers-risks-in-buying-virtual-currencies



Note: Annualised 30-day historical volatility of USD-denominated returns for Bitcoin and gold, in %, and 30-day historical volatility of EUR/USD spot rate returns, in %. Sources: Thomson Reuters EIKON, ESMA.

Note: Prices of selected virtual currencies (Bitcoin and Ether), converted in EUR using daily EUR/USD exchange rates. Sources: Coinmarketcap.com, ESMA.

Cyber risks threaten data integrity, data confidentiality, data protection and business continuity. The risk is particularly significant because of possible multiplier effects, leading to further business risks, such as supply chain risk and reputational risk. Moreover, it can trigger high (legal) costs, for example in cases of data breaches with notifications, litigation and solution, as well as in case of fraud. Insufficient protection against cyber incidents and a disruption in the availability of critical IT infrastructures could lead to major damages for financial institutions concerned, and potentially to the wider financial system. Consequently, cyber risk is receiving increased attention from all the ESAs.

In the banking sector, 42 % of respondents of the EBA RAQ identify cyber risk and data security as the main drivers for increasing operational risk, while 16 % of respondents mention IT failures as an additional risk driver. Against this background, and in efforts to foster ICT resilience of EU banks, the EBA is developing Guidelines on the management of ICT risks for institutions. ICT security measures are also included in the EBA Guidelines on ICT risk assessment under the Supervisory Review and Evaluation Process (SREP) published in 2017.[13] With regard to the provisions of payment services, ICT security measures are included in the Guidelines and Regulatory Technical Standards mandated by the Payment Service Directive 2 (PSD2)[14].

While cyber-attacks could entail an emerging opportunity for insurance companies due to the potential increased demand for cyber coverage products, these products are still relatively new. The lack of track records on incidents is an obstacle for the assessment of potential aggregate losses. Furthermore, increasing sophistication and complexity of cyber incidents makes the reliance on past events a limited parameter for

[13]EBA Guidelines on ICT Risk Assessment under the SREP, 11 May 2017: https://www.eba.europa.eu/regulation-and-policy/supervisory-review-and-evaluation-srep-and-pillar-2/guidelines-on-ict-risk-assessment-under-the-srep

[14] EBA Guidelines on major incidents reporting under PSD2, 27 July 2017: https://www.eba.europa.eu/documents/10180/1914076/Guidelines+on+incident+reporting+under+PSD2+%28EBA-GL-2017-10%29.pdf; EBA RTS on strong authentication and secure communication under PSD2, 23 February 2017: https://www.eba.europa.eu/documents/10180/1761863/Final+draft+RTS+on+SCA+and+CSC+under+PSD2+%28EBA-RTS-2017-02%29.pdf; EBA Guidelines on security measures for operational and security risks under PSD2, 12 December 2017: https://www.eba.europa.eu/documents/10180/2060117/Final+report+on+EBA+Guidelines+on+the+security+measures+for+operational+and+security+risks+under+PSD2+%28EBA-GL-2017-17%29.pdf.

estimating the probability of future events. Due to the nature of the services provided to consumers, insurers could potentially be a target for cyberattacks themselves. The same holds for pension funds.
Currently, EIOPA is conducting a qualitative exercise on cyber risk involving national supervisors and the industry to obtain more insights into this new emerging risk. The survey focuses on issues related to underwriting of cyber insurance, covering topics such as cyber underwriting strategy, products and the potential build-up of risks, among others. Recognizing the increasing importance of digitalization for the insurance and pension industries, EIOPA has included InsurTech as a cross-cutting theme in its annual work program for 2018. The aim is to undertake work to help ensure that financial innovation by means of the ongoing digitalization does not develop in a manner that causes undue detriment to consumers.

In the context of its direct supervision activities on Credit Rating Agencies (CRAs) and Trade Repositories (TRs), ESMA receives periodically information about system and network penetration tests, security assessments, audits and vulnerability assessments performed by TRs. Any information security or cyber security incidents faced by the CRAs and TRs have to be reported. With this information, ESMA monitors the cyber threat landscape. Going forward in 2018, ESMA envisages further work to address cyber risk, through supervisory convergence activities, as well as its direct supervision work.

New challenges arise with the increased outsourcing to cloud service providers. Cloud computing offers many benefits in the way market participants perform their business activities, mostly related to increased scalability of infrastructure, operational efficiencies and cost-effectiveness. However, outsourcing to cloud service providers also poses risks beyond those of the traditional IT outsourcing. Increased reliance on service providers, in particular with regards to critical activities, may impact the ability of institutions to manage their strategic, reputational, compliance and operational risks. In addition, concentrations of outsourcing providers may lead to increased systemic risk, for example when technical problems or solvency issues lead to have non-continuity of the services covered by cloud providers.

Therefore, ESMA is launching a supervisory project on cloud computing. The main objective of the project is to explore the compliance risk of cloud computing outsourcing, with a view to formulating a clearer supervisory response and strategy. Supervisory requirements will be based on the EBA Recommendations for the use of cloud service providers by financial institutions published in October 2017[15]. EU-wide supervisory expectations are clarified where institutions intend to adopt cloud computing. This allows them to leverage the benefits of using cloud services, while ensuring that any related risks are adequately identified and managed. Based on its work on direct supervision of CRAs and TRs, ESMA moreover considers developing further general guidance on outsourcing to cloud computing service providers for market participants.

Moving forward, **supervisors should continue to encourage financial institutions to improve the robustness of IT systems, and to address concerns about connectivity and outsourcing to third-party providers**. They should pay particular attention to cybercrime risks and information security risks. An important initiative in this regard is the General Data Protection Regulation (GDPR), which intends to strengthen and unify data protection for individuals within the EU. This regulation will be applied by May 2018 in all the EU Member States and requires an improvement on security procedures.

[15] EBA issues guidance for the use of cloud service providers by financial institutions, 20 December 2017: http://www.eba.europa.eu/-/eba-issues-guidance-for-the-use-of-cloud-service-providers-by-financial-institutions

5 CLIMATE CHANGE RISKS

Climate change and the transition to a lower-carbon economy are relatively new, emerging risks for large parts of the financial sector, which have recently received increased attention from both national and international supervisory and regulatory organizations. The Financial Stability Board, the G20, as well as the French, British and Dutch supervisory authorities have issued warnings about the potentially destabilizing effects of climate change, while the ESRB has launched a working group on scenario analysis and climate risk stress testing. Furthermore, a network of national European and global supervisory authorities[16] was launched in December 2017, which – among other things - aims to identify best practices on the supervisory and macro financial dimensions of climate-related and environmental risks.

Even though climate risk is receiving increased attention amongst supervisors, our knowledge about the impact of these risks on the financial sector is still relatively limited. So far, it has been highlighted that a rising global temperature is expected to cause an increase in severe weather events, such as droughts, floods and storms. If insured, these losses can directly affect the financial position of insurance companies, especially reinsurers. For example, a deterioration of some profitability and underwriting indicators was reported for some reinsurers following the natural catastrophes observed in the third quarter of 2017.[17] If losses are uninsured, the burden to cover damages might fall on governments, households and corporates, which could impair their ability to repay loans and bonds, or pay out dividends. This in turn affects the value of financial assets, which can harm the solvency position of financial institutions and can lead to losses for investors. The transition to a lower-carbon economy also imposes valuation risks. This transition could lead to significant adjustment costs in carbon intensive sectors, such as the fossil, utilities, and transportation industries, as well as in agriculture and real estate. This imposes valuation risks for financial institutions and investors exposed to these sectors. Even though the possible transmission channels of climate risks are known, there is a lack of an integrated framework to evaluate direct and indirect effects of climate events in the financial sector.

The transition to a lower-carbon economy also provides new opportunities in the area of sustainable finance. The worldwide market for green bonds increased from 0 to 90 billion dollars between 2012 and 2016, for example.[18] At the same time, financial institution should be wary of new risks that may emerge, such as green bubbles and reputation damage resulting from greenwashing.

The High Level Expert Group on Sustainable Finance of the EU has formulated recommendations to embed sustainability into EU financial legislation, including into the mandate of the European Supervisory Agencies. The latter has also been proposed by the European Commission in the context of the ESFS review and would enhance the possibilities to explore the consequences of climate related financial risks moving forward.

Going forward, financial institutions should be encouraged to take a more forward-looking approach to include sustainability risk in their governance and risk management frameworks, and to develop responsible, sustainable financial products. In addition, competent authorities should enhance their analysis of potential risks related to climate change for the financial sector and financial stability. This also involves a stronger engagement of the ESA's in the area of climate change risks.

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[16] Central Bank and Supervisors Network for Greening the Financial System (NGFS)
[17] EIOPA 2017Q3 Risk Dashboard: https://eiopa.europa.eu/financial-stability-crisis-prevention/financial-stability/risk-dashboard
[18] DNB 2017 An exploration of climate related risks for the Dutch financial sector: https://www.dnb.nl/en/binaries/Waterproof_tcm47-363851.pdf?2017110615