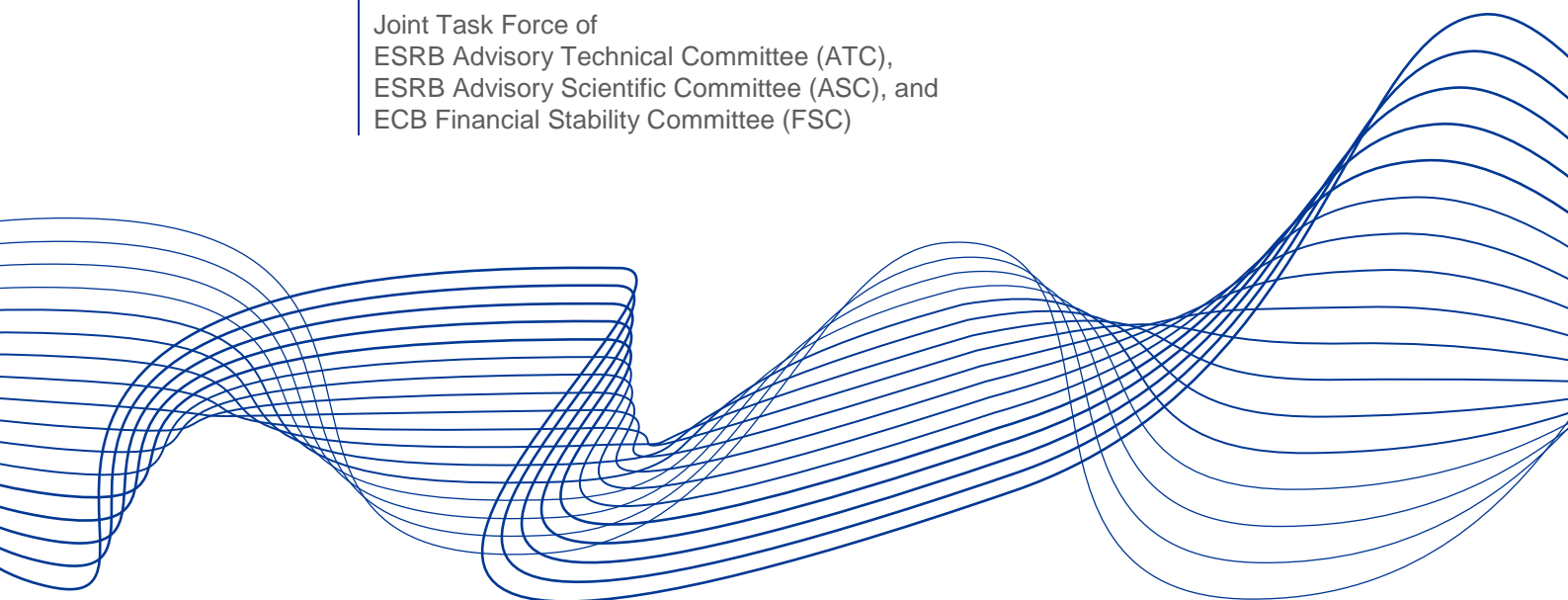


Macroprudential policy issues arising from low interest rates and structural changes in the EU financial system

November 2016

Joint Task Force of
ESRB Advisory Technical Committee (ATC),
ESRB Advisory Scientific Committee (ASC), and
ECB Financial Stability Committee (FSC)



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Technical Documentation (available as separate volumes)

Section A: The low interest rate environment and structural changes in the economy

Section B: The impact of low interest rates and ongoing structural changes on the banking system: assessment of vulnerabilities, systemic risks and implications for financial stability

Section C: The impact of low interest rates and ongoing structural changes on non-credit institutions: vulnerabilities, systemic risks and implications for financial stability

Section D: The impact of low interest rates and ongoing structural changes on financial markets and financial infrastructure: assessment of vulnerabilities, systemic risks and implications for financial stability

Section E: The impact of low interest rates and ongoing structural changes from horizontal, cross-country and EU-wide perspectives



Executive Summary

The current macro-financial environment is characterised by exceptionally low, and even negative, nominal interest rates, which can have both a positive and a negative impact on the financial system and the economy. This report, in accordance with the mandate of the Task Force, discusses the sources, implications and potential vulnerabilities and risks for the EU financial system deriving from the low interest rate environment and ongoing structural changes in the financial system.¹ The analysis considers two possible scenarios for future nominal interest rate trends over the next ten years: a protracted low interest rate environment accompanied by low growth (“low for long”) and an economic recovery scenario under which interest rates rise gradually (“back to normal”). Each of the two scenarios makes different assumptions concerning the contribution of structural factors to the currently observed interest rate and growth trends. Quantitative evidence is provided, wherever possible, to support the analysis. The report proposes a holistic macroprudential policy approach aimed at enhancing financial stability and mitigating systemic risks in the low interest rate environment. This includes an assessment of risks, implications for the broader economy and considerations about the market structure in view of the Action Plan on Building a Capital Markets Union. The main findings may be summarised as follows:

1. The main financial stability risks identified in the prolonged low interest rate environment relate to profitability pressures and weakening resilience in some sectors of the financial system, broad-based risk-taking affecting financial markets, as well as risks associated with an accelerated transition to a more market-based structure, implying a possible risk of higher sensitivity to market shocks. While financial stability risks related to the sustainability of business models, and to some extent to broad-based risk-taking, are already observable and thus should be given a priority in terms of policy response, other risks (including those related to changes in the financial system structure) are more of an emerging or conjectural nature. A gradual recovery in interest rates can also entail financial stability risks from activities undertaken in the low interest rate environment (in particular bank lending at low and long-term fixed rates and crowded financial market positions in higher-risk assets). However, these are viewed as less significant overall given the increasing economic growth under this scenario.
2. The protracted low interest rate environment puts pressure on the profitability and solvency of financial institutions that provide longer-term return guarantees, i.e. guaranteed-return life insurers and defined-benefit pension funds. In the long run this could render traditional guaranteed-return business models unviable, and could pose challenges in terms of recovery and resolution. The evidence in this report shows that the insurance and pension sectors are already moving from guaranteed-return to unit-linked business models, which means that the financial sector is withdrawing from the provision of longer-term return guarantees.
3. The low interest rate environment is also weakening the resilience of the EU banking sector, due to the longer-term negative impact on bank profitability of reduced net interest income, while low economic growth is preventing stronger loan growth. Credit standards may be relaxed excessively by banks facing longer-term profitability pressures and growing competition from non-banking sectors, as they seek to increase profitability by engaging in riskier activities. This, combined with protracted low growth, may lead to a deterioration in

¹ The report addresses the financial stability implications of low nominal interest rates without discussing the impact of nominal negative interest rates on individual financial intermediaries.



asset quality, although this could be counteracted in part by the higher debt servicing capacity of borrowers due to low interest rates.

4. Financial stability risks related to financial markets may increase in the low interest rate environment due to the search for yield, resulting in a build-up of leverage to beyond risk-bearing capacities, crowded positions in risky assets, as well as uncertainty regarding fundamental asset price values, which already prevail in some financial market segments and real estate markets. As a result, the risk of asset re-pricing may materialise either (i) if interest rates remain low, via a reassessment of risk premia in the light of low growth or (ii) if interest rates increase, via losses on fixed-income assets and the synchronised unwinding of crowded positions. The revaluation of assets may be impacted by lower structural market liquidity and may have a simultaneous adverse effect on a number of financial sectors, which will become more closely interconnected through exposures to increasingly correlated assets.
5. The low interest rate environment is likely to accelerate the transition towards a more market-based structure. While the shift of activities to the non-banking sector entails the benefit of a “spare-wheel function”, i.e. an alternative source of finance for the real economy in the event of shocks to the banking sector, it implies a possible risk of higher sensitivity to market shocks. New lending by banks may be constrained by costs related to capital requirements for balance sheet expansion, or by deleveraging requirements. At the same time, competition for credit and deposit-like savings products from other financial intermediaries is expected to intensify, facilitated by technological innovations and the search for yield caused by the low interest rate environment. These developments may result in lower lending standards, higher leverage, insufficient buffers to absorb shocks, and calls for the enhanced supervision of risks stemming from bank-like activities in the non-banking sector. As a broader consequence of structural changes fostered by the low interest rate environment, system-wide sensitivity to liquidity risk and cross-sectoral interconnectedness are likely to increase due, for example, to stronger indirect links via exposures to correlated financial market assets.
6. The two scenarios considered in this report create different challenges for macroprudential policy. The low interest rate environment has already persisted for several years and has been accompanied by a build-up of vulnerabilities, which may become relevant in some sectors if interest rates gradually increase. Although financial markets do not generally expect interest rates to rise in the short to medium-term, some international institutions and private forecasters are predicting a recovery close to a “back to normal” scenario. Financial stability risks under a scenario of interest rates returning to “back to normal” are viewed as less significant overall than under a “low for long” scenario, mainly because increased economic growth would be expected to mitigate identified vulnerabilities. Increased interest rates would have a mainly negative effect on the profitability of those banks, which have been originating a significant amount of long-term loans at low fixed rates without hedging the interest rate risk. In financial markets, interest rate increases are expected to drive asset prices down (mainly bond prices) with potential liquidity pressures if higher funding costs give rise to asset disposals from crowded positions.
7. The “low for long” scenario constitutes a far-reaching and permanent change of the conditions in which the financial system operates, and could lead to some business models becoming unviable. Consequently, the appropriate policy response should aim to ensure a smooth exit from unviable business models, preserving the resilience of the financial system. Given the risks faced under this scenario, failure to take prompt action could be costly. Since the findings of this report suggest that the low interest rate environment is likely to continue into the future, policies to address risks under the “low for long” scenario, in particular those already currently observed, should be considered promptly to prevent the further build-up of vulnerabilities and to mitigate associated financial stability risks. The policy response should



be holistic, providing mechanisms that protect sectors from market price reversals and developing activity-based instruments. Macroprudential policies should select instruments that enhance the resilience of financial institutions and market structures, as this raises confidence in the robustness of the financial system, while also supporting other macroeconomic policies in strengthening the economic recovery.

8. This report presents policy options for financial stability risks identified in the risk assessment, focusing on currently observed risks. In addition, policy options are presented for conjectured future risks. With regard to the identified risks, policy options are proposed for the following three domains: sustainability of business models, broad-based risk taking, and risks related to changes in financial system structure. The policy options include measures that could be implemented in the short term, and which in some cases are already being included in existing ESRB projects, as well as in longer-term endeavours to identify, assess and mitigate systemic risk. The report acknowledges the different time frames needed to implement particular policy measures. Generally, macroprudential policies seek to counter systemic risks. If multiple instruments are available, those instruments should be selected that enhance financial stability effectively but do not stand in contradiction to other policy areas such as microprudential, structural, fiscal or monetary policy.
9. The following policy options have been identified to mitigate currently observed risks:
 - (a) Since the low interest rate environment poses the most immediate risks for the business models with return guarantees on long-term liabilities, measures enhancing the resilience of vulnerable companies within the life insurance and pension fund sectors are of paramount importance. The ongoing implementation and future review of Solvency II could address risks from the protracted low interest rate environment, in particular by reviewing the ultimate forward rate methodology and the long-term guarantee package, as well as by exploring additional prudential tools (such as restricting dividends or discretionary benefits before a breach in the solvency ratio or increasing capital requirements at an early stage, before recovery tools are needed). Moreover, work should continue to develop and harmonise effective recovery and resolution frameworks for insurance companies at EU level. Resolution regimes could explore legal options that give the authorities in charge of resolution the power to modify the terms of existing contracts as a last resort, where these contracts are not covered by an insurance guarantee scheme. In the pension fund sector, the EIOPA's recommendation to enhance risk assessment and the transparency of pension funds in all EU countries should be implemented, and will help the relevant authorities and schemes to identify and take steps to address potential shortfalls. This may support requirements for increases in pension fund reserves and capital, including through sponsor support. It could be useful to further investigate the potential systemic impact of (underfunded) pension funds on the real economy, taking differences between member countries into account.
 - (b) In the light of increased sensitivity to interest rate risk and asset revaluation, the BCBS guidance could be swiftly implemented into EU law (CRR/CRD) to achieve the harmonised assessment and regulation of interest rate risk in the banking book.
 - (c) To complement the above measures, given that risks related to the low interest rate environment are likely to occur simultaneously in several sectors, the efficiency and cross-sectoral consistency of recovery and resolution frameworks could be evaluated and their consistent implementation ensured. These frameworks would allow for the restructuring and recovery and, if necessary, removal of institutions that are unviable in the low interest rate environment, due to their failure to adjust their business models.



- (d) As the basis for a comprehensive assessment of financial stability risks, remaining data gaps would need to be closed and the monitoring of risks further enhanced in cross-border and cross-institutional cooperation, in particular with a view to strengthening early warning systems.
 - (e) In relation to the risk of asset price misalignments in the real estate sector, macroprudential authorities should have the necessary means to monitor financial stability risks, in particular in respect of lending standards, including credit intermediation by non-bank institutions. In order to counter the risks, macroprudential authorities should be able to conduct loan affordability tests and should have the instruments available to address these risks. For instance, limits on loan-to-value and debt-to-income ratios or the prudent valuation of collateral could be implemented to contain the build-up of imbalances related to excessively loose lending conditions. Where significant imbalances have already accumulated, policies should aim to increase financial system resilience.
10. The following policy options have been identified to mitigate conjectured risks:
- (a) Risks related to the growth of the non-banking sector, especially the provision of bank-like services in the non-banking sector, need to be tackled comprehensively by the relevant institutions and existing ESRB substructures, with a particular focus on assuring cross-sectoral consistency and reducing possibilities for regulatory arbitrage. As an initial step, the regulation and supervision of bank-like activities in the non-banking sector could be reviewed and cross-sectoral consistency in the treatment of similar financial activities should be assured. To achieve this, activity-based regulation (for example, LTV limits applied across the financial sector) could be introduced where necessary to complement entity-based regulation, in order to remove incentives for regulatory arbitrage. Some aspects of non-banking activities still not fully addressed by the existing regulation could be covered, e.g. in respect of leverage, funding, liquidity and interconnectedness.
 - (b) Finally, the stress testing framework could be further enhanced for macroprudential purposes so that a system-wide financial assessment of the impact of price and liquidity shocks can be conducted.



Section 1

The low interest rate environment and structural changes

The current macro-financial environment in the European Union is characterised by exceptionally low nominal and real interest rates. The decline of nominal rates started in the mid-1980s, as part of a global phenomenon seen in advanced economies related to a fall in real interest rates, disinflation and the “Great Moderation”. The process accelerated in the aftermath of the global financial crisis and the European sovereign debt crisis, reflecting the severe crises-induced recessions and the related monetary policy responses by the major central banks.² The decline in market rates has been associated with a decline in the financing costs of banks, non-financial corporations, households and governments.

There are two main views as to the main drivers of interest rates in recent decades, one relating to cyclical (“financial cycle”) factors and the other to structural (“secular stagnation”) factors. According to the “financial cycle” view, economic agents accumulated excessive debt in the period leading up to the global financial crisis, probably on the basis of overly optimistic expectations of future revenues. This later led to an extensive need to deleverage, which had a dampening effect on investment and interest rates. Additionally, nominal interest rates fell in response to the global financial crisis-induced recession and the accompanying monetary policy responses by major central banks. According to the “financial cycle” view, these factors impacted interest rates for a long time, although not necessarily permanently, so interest rates are expected to recover from their current low levels. The “secular stagnation” view claims that, beyond cyclical factors relating to the global financial crisis, interest rates have declined permanently for structural reasons related to, for example, demographic trends and a decline in total factor productivity growth (supply-side factors), as well as an increased preference for scarce safe assets, and rising inequality (demand-side factors). These factors have led to savings permanently exceeding investment and a fall in real interest rates, thus exerting downward pressure on nominal rates. Consequently, as the role of cyclical factors diminishes over time, nominal interest rates will remain relatively low due to structurally depressed real rates. A detailed overview of the relevant factors behind the low interest rate environment, its interaction with regulatory and technological changes and the implications for the real economy, is presented in Appendix A and Technical Documentation, Section A.

In accordance with the two main views above, this report bases its analysis on two possible scenarios for future nominal interest rate trends: a “low for long” and a “back to normal” scenario, taking structural and regulatory developments into account.³ The scenarios assume differing contributions from structural factors to the currently observed interest rate and growth trends.

In the “low for long” scenario, short and long-term nominal interest rates are expected to remain low over the next decade, combined with a period of low economic growth. The rationale behind this scenario is that structural factors, such as demographic trends, total factor productivity or an increased preference for scarce safe assets, along with cyclical factors, have pushed interest rates down to low levels. While the effects of cyclical factors will fade gradually over time, the structural factors will remain in place. This will keep consumption, investment growth, as

² For references to a broader discussion of global trends, see Technical Documentation, Section A.

³ For further details see Technical Documentation, Section A. The scenarios are simulated using a Panel VAR model conditional on demographic factors and total factor productivity growth. Several model specifications, as well as a set of other models, were analysed for the purposes of robustness. The results are compared with the projections of major international institutions.

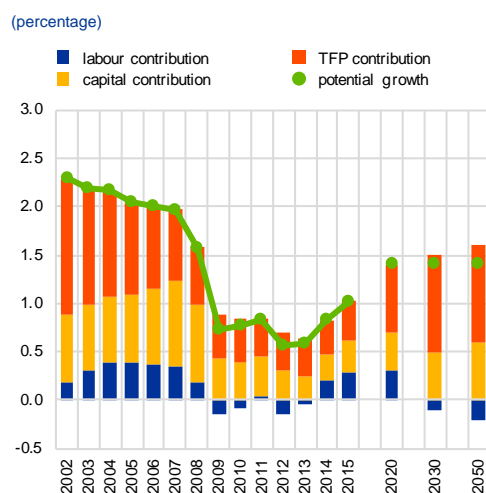


well as nominal and real (short and long-term) interest rates at low levels, reflecting an environment of “secular stagnation”.

Under the “back to normal” scenario, nominal and real interest rates are expected to increase gradually over ten years, reflecting improved output and investment growth. This “back-to-normal” scenario builds upon the view that the current low interest rate environment is mainly due to cyclical factors, including deleveraging (“financial cycle”). As cyclical factors ease, output, consumption and investment growth, as well as nominal and real interest rates, will increase. An alternative interpretation of the “back to normal” scenario is that the impact of the structural factors underlying the “low for long” scenario will gradually fade.

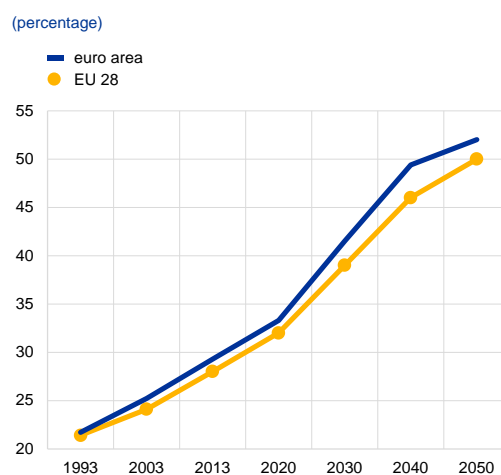
While both structural and cyclical factors have contributed to current observable economic trends, this report’s findings suggest that structural factors may play a major role, which implies that the low nominal interest rate environment is likely to persist. Both model-based and indicator-based evidence suggests that structural factors, such as trends in demographics and productivity, have contributed significantly to the currently observable low interest rate environment (see Charts 1-2 for examples of data for selected factors).⁴ International institutions’ projections for a number of EU countries appear to be in line with the “low for long” model-based scenario with robust results across a set of specifications (see Charts 3-4). Model-based counterfactual analysis, a series of downward revisions in key economic indicators across regions in recent years (see Table 1), as well as downward shifts in market-based expectations, provide further evidence of a significant contribution from structural factors to nominal interest rate trends.

Chart 1
Contributions to EU potential growth



Source: European Commission.

Chart 2
Old-age dependency ratios



Source: European Commission.

⁴ For detailed evidence see Technical Documentation, Section A.



Chart 3
Comparison of projections in 2020:
real GDP growth

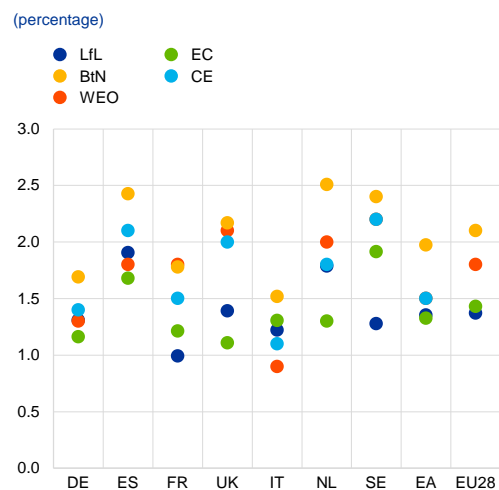
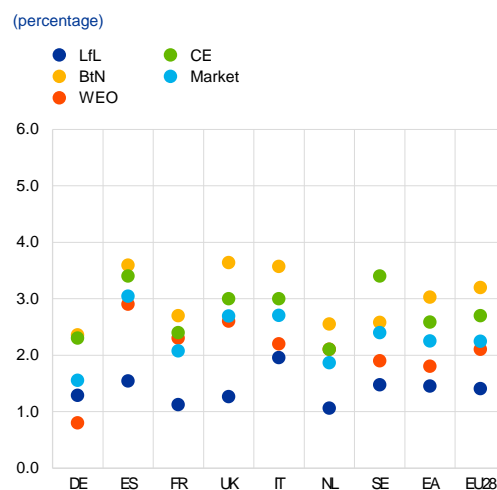


Chart 4
Comparison of projections in 2020:
long-term interest rate



Source: Technical Documentation, Section A.
 Note: Low for long (LfL) and back to normal (BtN) refer to the projections described in Technical Documentation, Section A. IMF projections (WEO): World Economic Outlook (April 2016), EC: estimates of potential output included in the 2015 European Commission Ageing Report; CE: Consensus Economics (CE April 2016), available only for the largest EU countries, Market: market-based long-term interest rate expectations. The figures for the euro area and the EU-28 are computed as weighted averages for the individual countries reported in the charts.

Table 1
Revisions in real GDP growth projections by the IMF and the EC

(percentage)

Country	WEO – Oct. 2010	WEO – Oct. 2013	WEO – Oct. 2015	Ageing report 2009		Ageing report 2012		Ageing report 2015	
	2015	2018	2021	2020	2025	2020	2025	2020	2025
minimum	1.2	1.2	0.9	1.5	0.9	1.0	0.7	0.1	0.6
first quartile	1.9	1.7	1.6	1.9	1.7	1.4	1.4	1.4	1.3
median	2.7	2.5	2.1	2.4	1.9	1.8	1.8	1.8	1.5
third quartile	3.5	3.1	2.9	2.7	2.3	1.9	2.0	2.1	1.9
maximum	5.0	4.0	4.0	3.9	3.2	3.3	3.4	3.0	3.0
std. dev.	1.0	0.8	0.8	0.6	0.5	0.5	0.6	0.6	0.6

Source: Technical Documentation, Section A.
 Note: The table reports the projections by the IMF reported in the World Economic Outlook for the last year in the projection horizon: 2015 for the October 2010 WEO, 2018 for the October 2013 WEO and 2012 for the April 2016 WEO. As for the European Commission, the table shows the projections of potential output growth for the years 2020 and 2025 reported in the 2009, 2012 and 2015 Ageing reports. Source: IMF World Economic Outlook and European Commission Ageing Report.

Current developments include a marked uncertainty among economic agents as to the state of the economy and which of the two scenarios currently applies, and this may lead to misallocations of capital and resources. The key characteristic of the current low interest rate environment is uncertainty over the long-term level of interest rates, which relates to potential economic growth and the long-term level of returns for a broad set of asset classes. In the last few quarters this uncertainty has been reflected, for example, in significant revisions to the growth outlook across regions. Economic agents may adjust their behaviour to meet expectations of a recovery in nominal interest rates and growth and yet be surprised later by low growth materialising over time. This, in turn, could lead to re-allocations of capital once the probability of scenarios has been reassessed by economic agents. Moreover, the uncertainty may also exert further downward pressure on interest rates. If non-financial corporations withhold investment out of fear of low



demand and households save as a precaution, additional downward pressure on interest rates is generated endogenously, prolonging the low interest rate environment.

The low interest rate environment should be analysed in the light of technological and structural changes in the financial system, as well as regulatory reforms implemented in recent years. Recent technological advances have changed the business environment greatly, and are having a major impact on the structure and functioning of financial markets. For example, traditional financial intermediaries are facing competition in many business lines, while algorithmic trading and other innovations are affecting the process of trading in financial markets. On the regulatory side, the implemented and upcoming financial sector reforms were needed to improve the resilience of the EU financial system, but in some areas they have increased sensitivity to interest rate developments, such as the valuation of insurance balance sheets in Solvency II, or may have implications for market liquidity, such as the requirements for the liquid asset holdings of banks. Some regulatory reforms should be specifically considered from a risk perspective in the low interest rate environment.⁵

⁵ For a more detailed discussion of structural and regulatory factors, see Technical Documentation, Sections A-E.



Section 2

The main implications for the structure and stability of the EU financial system

The low interest rate environment contributes to a build-up of vulnerabilities and financial stability risks in a number of areas of the EU financial system and the economy.⁶ The analysis of risks across the main segments of the financial system takes place along several risk dimensions, and is also related to the intermediate objectives of macroprudential policy.⁷ The approach is based on quantitative analysis, such as the results of available stress tests for the main sectors, model projections, and assessments using data available to the ESRB Member Institutions, also drawing on related work by other institutions and fora. Given that the horizon of the analysis is relatively long and that its scope includes a discussion of structural changes in the financial system, expert assessment plays a significant role. An overview of the risk assessment is presented in Tables 2-3, and in more detail in Appendix D, with extended discussions included in Sections A-E of the Technical Documentation.

The identified financial stability risks are prioritised, with a particular focus on currently observed risks. The report focuses on those financial stability risks for which policy options need to be explored (marked as red in Appendix D and Tables 2-3). Moreover, a number of other financial stability risks have been identified and require close monitoring (marked as yellow in Appendix D and Tables 2-3). Some of the identified financial stability risks related to the low interest rate environment are materialising, and can therefore be observed and assessed empirically (e.g. risks related to resilience in Tables 2-3 and Appendix D). Additionally, the low interest rate environment also brings some risks which are currently only partly observable or conjectured, but which may lead to a build-up of broader vulnerabilities in the medium to long term (e.g. risks related to market structure, including risks stemming from bank-like activities in the non-banking sector, liquidity risk and interconnectedness, as shown in Tables 2-3 and Appendix D). In order to prioritise policy proposals, Chapter 3 maintains a focus on currently observed risks, while policies related to conjectured risks are treated as less urgent.

Table 2
Overview of risk assessment – “low for long” scenario

	Banks	Insurance companies / pension funds	Investment funds	Markets	Real economy	Cross-sectoral aspects
Resilience	Red	Red	Red	Yellow	Yellow	Red
Credit / financial cycle	Yellow	Yellow	Yellow	Red	Red	Yellow
Funding, liquidity / maturity transformation	Yellow	Yellow	Red	Yellow	Yellow	Red
Risk concentration / Market structure	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Interconnectedness	Yellow	Yellow	Yellow	Red	Yellow	Red

Source: Technical Documentation, Section E, Chart A.33 in the Annex.

⁶ In accordance with the mandate of the Task Force, this report focuses on identifying vulnerabilities and financial stability risks.

⁷ As outlined in the ESRB Recommendation on intermediate objectives and instruments of macroprudential policy (ESRB/2013/1).



Note: The table is based on the results of the sectoral risk assessment included in the Technical Documentation, Sections A-D, respectively. The table only shows financial stability risks where policy options need to be explored (marked in red) and financial stability risks which do not require immediate policy action, but need to be monitored (marked in yellow). The risk dimensions (first column) relate to the intermediate objectives of macroprudential policy, as outlined in the ESRB Recommendation on intermediate objectives and instruments of macroprudential policy (ESRB/2013/1). The analysis is based on both quantitative and qualitative analysis, including the results of stress tests of the main sectors, model projections and data available to the ESRB Member Institutions.

Table 3
Overview of risk assessment – “back to normal” scenario

	Banks	Insurance companies / pension funds	Investment funds	Markets	Real economy	Cross-sectoral aspects
Resilience						
Credit / financial cycle						
Funding, liquidity / maturity transformation						
Risk concentration / Market structure						
Interconnectedness						

Source: Technical Documentation, Section E, Chart A.33 in the Annex.

Note: The table is based on the results of the sectoral risk assessment included in the Technical Documentation, Sections A-D, respectively. The table only shows financial stability risks where policy options need to be explored (marked in red) and financial stability risks which do not require immediate policy action, but need to be monitored (marked in yellow). The risk dimensions (first column) relate to the intermediate objectives of macroprudential policy, as outlined in the ESRB Recommendation on intermediate objectives and instruments of macroprudential policy (ESRB/2013/1). The analysis is based on both quantitative and qualitative analysis, including the results of stress tests of the main sectors, model projections and data available to the ESRB Member Institutions.

Overall, the scenario of a protracted low interest rate environment accompanied by low growth (the “low for long” scenario) implies more significant financial stability risks to the EU financial system than a scenario of gradually increasing interest rates and an economic recovery (the “back to normal” scenario). The two scenarios considered in this report create qualitatively different challenges for macroprudential policy. The “low for long” scenario constitutes a far-reaching and permanent change of the conditions in which the financial system operates, and may mean that some business models will become unviable. Financial stability risks related to a gradual recovery in interest rates result from activities undertaken in the low interest rate environment. These risks are, however, considered to be less significant overall as economic growth will accelerate under this scenario. Financial stability risks under the “low for long” scenario can also be seen in terms of first-round and second-round effects. First-round effects could relate to the low profitability and sustainability of business models, while second-round effects may result from the corresponding adjustments made by financial institutions, such as increased risk taking or exploring possibilities for regulatory arbitrage (see also Appendix E).⁸ Such actions might be rational on the micro level, but could create systemic risks on the macro level, and the macroprudential authorities might consider taking action against this. Generally, the risks related to the low interest rate environment are interdependent and may accumulate into significant cross-sectoral and system-wide risks. The potential impact of these risks materialising is seen as heterogeneous across the EU countries, depending on the structural and cyclical characteristics of

⁸ Some of the actions taken by financial institutions to counteract profitability pressures could be positive for financial stability, e.g. financial institutions could increase efficiency by introducing cost cutting.



each financial system, including the quality and maturity of existing assets (see also Appendix C for a cross-country overview of structural indicators related to the low interest rate environment).⁹

2.1 The resilience and sustainability of business models¹⁰

A protracted low interest rate environment is likely to weaken the resilience of several sectors and to affect the sustainability of business models. If the low interest rate environment persists, business models offering longer-term return guarantees and those relying on traditional maturity transformation as their main income source may become unviable, potentially leading to failures in the relevant sectors. Therefore, the identified main risks of the protracted low interest rate environment are related to the solvency pressures on guaranteed-return life insurance and defined-benefit pension fund sectors, as well as to the lower resilience of banks due to profitability pressures.

The resilience of the EU banking sector is expected to weaken under the “low for long” scenario, because of the longer-term negative impact on bank profitability of reduced net interest income and potentially further deteriorating asset quality, particularly given an environment of low growth. The “low for long” scenario implies low net interest income because lower income on loans is combined with the difficulty of setting negative rates for bank depositors. Since interest income is the main source of overall income in the traditional bank business model, this puts significant pressure on bank profitability (see also Charts 5-8 for evidence of falling net interest margins and weak bank profitability). Overall, because of assumed low growth under the “low for long” scenario, credit demand is expected to be subdued while the competition to provide credit is expected to intensify. It is therefore difficult for banks to compensate for declines in interest margins by increasing loan volumes.¹¹ A more competitive environment and higher substitutability of financial services also makes it more difficult to increase non-interest income for the banking sector as a whole.¹² Consequently, banks’ ability to accumulate capital via retained earnings and to supply credit may be reduced, raising viability concerns for weakly capitalised banks. In the face of longer-term profitability pressures and growing competition from non-banking sectors, credit standards may be relaxed as banks face incentives to “gamble for resurrection” by engaging in riskier activities.¹³ Given the current asset quality of banks in some EU countries, this could impede the resolution of problem assets and cause asset quality to deteriorate further. This is particularly worrying given the low growth environment, which is resulting in an increase in NPLs, a

⁹ If risks materialise the impact may be heterogeneous across countries, depending on the size and the structure of indebtedness and financial wealth, as the capacity to absorb losses by the non-financial private and public sector differs according to the level of indebtedness.

¹⁰ This section discusses risks for which policies need to be explored in the dimension of resilience of the financial system under the “low for long” scenario (see Charts 6-7 and Appendix D, with extended discussions included in Sections A-E of the Technical Documentation).

¹¹ Additionally, gains from maturity transformation are limited due to flatter yield curves, while income from payment services may be suppressed in view of competition from financial technology companies. If credit demand is high at the beginning, for example in view of initially high expectations of economic growth in the starting phase of the low interest rate environment, an increase in lending activity would temporarily support bank profits, notwithstanding the depressed interest margins. In respect of the differences among bank business models, initially low interest rates negatively impact the interest income of banks granting, in particular, floating rate loans. If the low interest rate environment is protracted and features a flat yield curve, banks granting fixed-rate loans will also be left with a depressed net interest margin on new loans. See also Dombret (2015): “The impact of low interest rates – Results of a survey among German banks”.

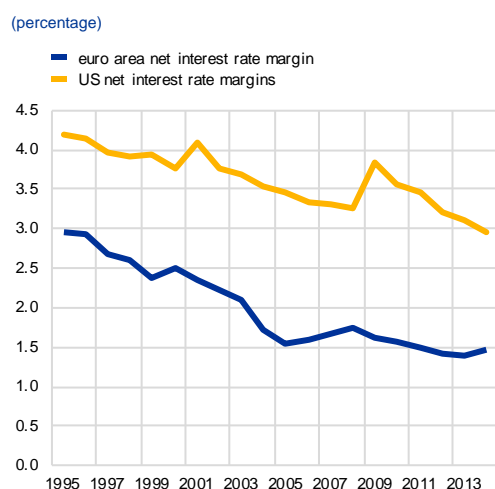
¹² For the “low for long” scenario, Chart 11 does not show a worst-case outcome, as it is assumed that this sample of banks, which has been able to increase ROA during moderate periods of low interest rates in the past, can repeat this success over a much longer period in the future. Country differences in the EU are dispersed in a range between almost 0% and 0.4%. By comparison, the ROA of Japanese banks during 20 years of low interest rates was, on average, close to zero. The difference between the projected paths under the two scenarios provides an assessment of the impact of the “low for long” scenario relative to the “back to normal” scenario. Focusing on the difference has the benefit of being less subject to model miss-specification that might influence the levels of the projected variables.

¹³ For example, competition for borrowers, by banks and non-credit financial institutions, in the environment of subdued growth and low interest rates may incentivise a relaxation of credit standards and/or widespread forbearance, lowering the quality of banks’ asset growth.



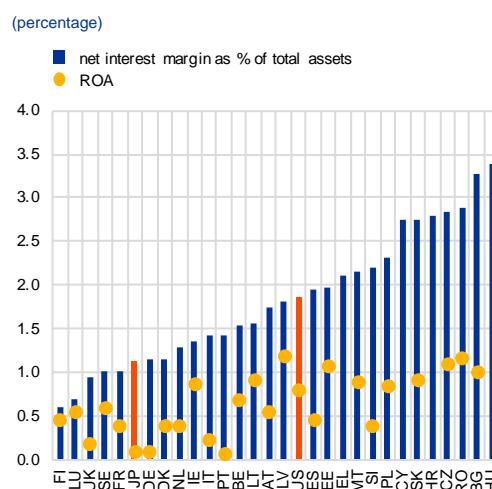
deterioration of credit standards, misallocation of capital and possible adverse macro-feedback on growth.¹⁴ In particular, banks could face incentives to forbear and hold on to non-performing loans which had been granted in the past at higher lending rates, since new lending yields lower interest income (see, for example, data on forbearance based on the 2015 EBA transparency exercise).¹⁵ Moreover, the quality screening of new loans might be compromised in the environment of low cost of funding and suppressed risk pricing.¹⁶ A detailed overview of relevant channels is presented in Appendix B, while a cross-country assessment of key current bank indicators is shown in Appendix C.

Chart 5
Net interest margin



Source: Thomson Reuters, ECB calculation and Federal Reserve Bank of Saint Louis.
Note: Weighted average of 66 euro area banks. See also Technical Documentation, Section B.

Chart 6
Low net interest income and profitability



Source: ECB Consolidated Banking Data, FDIC (US) and OECD Banking Database.
Note: See also Technical Documentation, Section B. Data for the EU banking systems refers to end-2015. Japanese and US data refer to the average in the period 1989-2010. Return on assets of banks in CY, GR, HU, HR was negative in 2015 and, for presentational purposes, is not shown in the chart.

¹⁴ Initially, low interest rates support an improvement in the debt service capacity of floating rate loans, which results in a lower rate of non-performing loans and a lower recognition of impairment charges in the income statements of banks. However, in the long term debt service capacity is likely to come under pressure because the low interest rate environment is likely to go hand in hand with an environment of protracted low growth.
¹⁵ Moreover, low interest rates reduce the present value costs of maturity extensions.
¹⁶ While the low interest rate environment has already been in place for several years, lending surveys show some relaxation of credit standards only in the most recent quarters (see the Technical Documentation, Section B for evidence of some signs of recent loosening of credit standards in the euro area for certain types of loans).



Chart 7
Model-based estimates of net interest margin

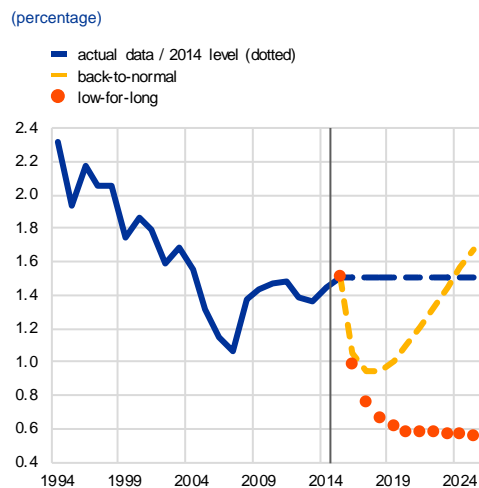
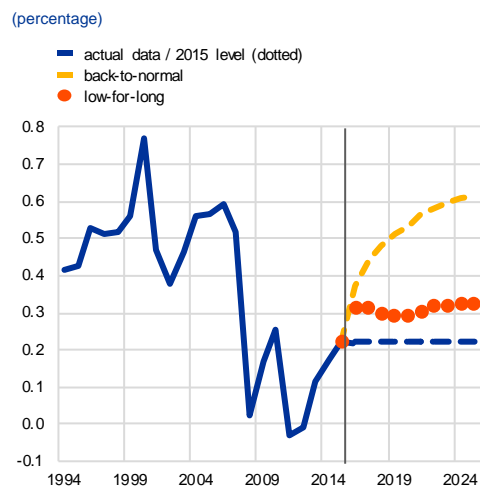


Chart 8
Model-based estimates of ROA



Source: Technical Documentation, Section B, as based on Bloomberg and World Bank data and economic projections described in Technical Documentation, Section A.

Note: The model is based on a panel of individual bank data. A dynamic modelling approach is adopted in order to account for the potential time persistence of the Net Interest Margin (NIM) and the Return on Assets (ROA). The model is estimated using a generalised method of moments (GMM) estimator system based on the work of Arellano and Bover (1995) and Blundell and Bond (1998). The empirical analysis relies on an unbalanced panel of annual data from 1994 to 2014 for a sample of 105 EU banks for the NIM regressions and 100 EU banks for the ROA regressions. The banking data in the regression were taken from Bloomberg. The macroeconomic variables were sourced from the World Bank's World Development Indicator database. The chart shows the central forecast, without considering the confidence intervals for presentational reasons.

The low interest rate environment creates risks for the profitability and solvency of certain types of non-credit institutions, in particular guaranteed-return life insurers and defined-benefit pension funds, weakening their resilience and increasing the risk of failures.¹⁷

Moreover, it fosters a trend for business models towards unit-linked investments, shifting interest rate risk to policyholders. The low interest rate environment makes it difficult to earn sufficiently high asset returns¹⁸ to meet guaranteed values for long-term liabilities (a cross-country assessment of the importance of guaranteed-return business models for life insurance and pension funds is presented in Appendix C and Chart 9). In this respect, the 2014 EIOPA insurance stress test was an important exercise, showing that almost a quarter of companies included in the stress test sample exhibited vulnerabilities in the prolonged low-yield scenario, with significant cross-country differences.¹⁹ Moreover, the 2015 EIOPA IORP (Institutions for Occupational Retirement Provision) stress test showed that the EU occupational pension fund sector would face a shortfall of over EUR 750 billion in adverse scenarios, with a shortfall of over EUR 400 billion in the pre-stress scenario.²⁰ The problem extends to a broad range of long-term pension liabilities with defined benefits (the IORP sector is only a part of all pension liabilities), probably affecting the sponsoring

¹⁷ In some Member States low interest rates have also put the profitability of non-life insurers under pressure as a low interest rate environment makes it more difficult to compensate for losses (in markets with intense competition) with income from high investment returns.

¹⁸ In particular as yields on fixed-income investments are low.

¹⁹ In this respect, the forthcoming 2016 EIOPA insurance stress test is expected to give a more up-to-date picture of the vulnerabilities of insurance undertakings in a protracted low interest rate environment. Moreover, the new stress test also includes a double hit scenario where, in addition to low interest rates, asset prices are also stressed.

²⁰ For detailed information, see IORP's Stress Test Report 2015, EIOPA 26 Jan 2016, available at ([link](#)). Note that scenarios applied in the 2014 EIOPA insurance stress test and the 2015 EIOPA IORP stress test were not identical to the "low for long" scenario applied in this report, but took a broader range of risks into account. Still, both stress tests included a module of low interest rates, which can be broadly compared with the low interest rate environment as understood in this report.



corporates involved and state balance sheets in the long run. The timing of the impact of low interest rates on solvency ratios depends crucially on regulatory regimes. For example, for insurers frameworks may include provisions that smooth the effects of low interest rates on solvency ratios over time to take the longer-term business model into account (e.g. Solvency II currently discounting liabilities with above-market long-term rates beyond the last liquid point). If interest rates remain low for long, business models with guaranteed long-term liabilities may run into solvency problems, which will be particularly problematic for highly-specialised entities. In situations in which resolution is necessary, the transfer of liabilities to other market participants may be difficult if the book value of liabilities is significantly lower than the market value and/or if multiple entities simultaneously run into distress. This increases the risk of failures, in particular in view of the lack of a resolution framework for insurers or pension funds in some countries or the related cross-border coordination mechanisms. The evidence from the sector-specific analysis in this report shows that, following several years of low interest rates, the insurance and pension sectors are already moving towards offering services that are similar to those of the asset management business model. These offer more unit-linked products by gradually lowering or generally removing guarantees on returns (see also Chart 10 for evidence of declining guarantees on returns).²¹ Consequently, risks related to longer-term returns on assets are largely allocated to end-investors, i.e. policyholders and plan members, while the financial sector takes on the sole intermediation role of distributing investment products, with limited risk and loss participation. Moreover, in a situation where defined-benefit pension funds become unviable, possibly at the same time as guaranteed-return life insurance, policies could be considered that allocate the shortfall, given the social importance of these sectors and the fact that the members and beneficiaries may not be in a position to bear the whole burden of such risks materialising. The costs related to the materialisation of these risks in the low interest rate environment could fall disproportionately on younger scheme members, for example via reductions in pension benefits for the younger generation (see an example of possible disproportionalities in the defined-contribution satellite module of the EIOPA IORP stress test 2015, showing that younger pension beneficiaries face larger losses in the low interest rate environment than older beneficiaries) or via state balance sheets, which are under additional pressure due to weak growth.²²

²¹ For detailed evidence see Technical Documentation, Section C. While in some countries this trend has already been under way for a long time, the low interest rate environment currently affects countries that still have a relatively high level of guarantees on outstanding contracts.

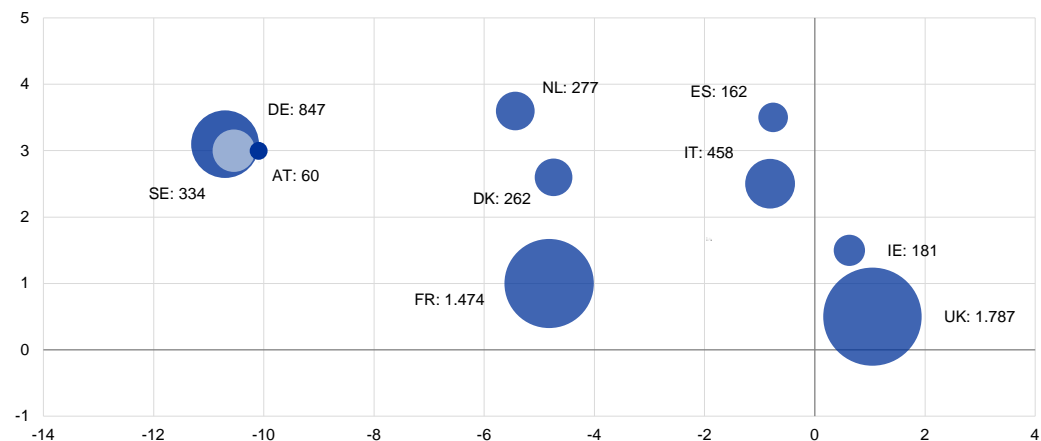
²² In addition to pressures on indebtedness from weakening growth (denominator effect), the low interest rate environment may incentivise increasing public indebtedness, as it implies lower interest payments (nominator effect).



Chart 9

Life insurance: average guaranteed rate and duration mismatch

x-axis: duration mismatch (years)
 y-axis: average guaranteed rate in %
 bubble size: size of the industry in EUR billion)

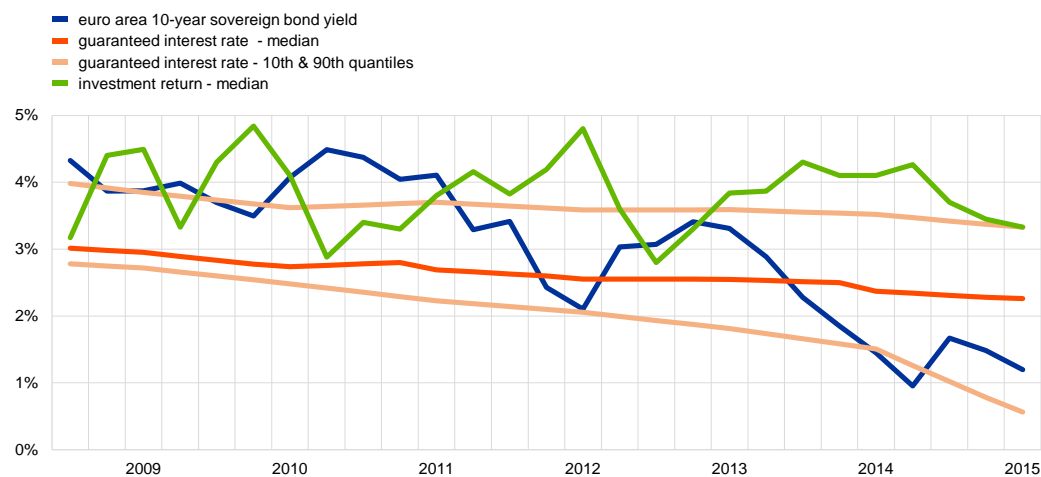


Source: ESRB Insurance Expert Group and EIOPA.
 Note: For further details, see Technical Documentation, Section C. Negative duration gap: longer maturity of liabilities vs. assets.

Chart 10

Life insurance: decline in rate of guarantees

(percentage)



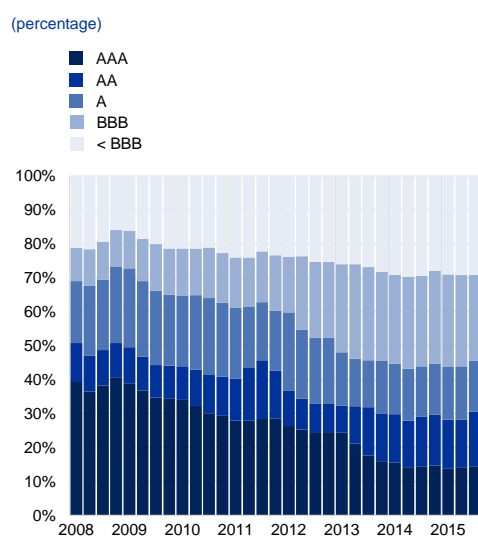
Source: EIOPA.
 Note: The figure is based on a sample of 32 large insurance groups in the EU and Switzerland. See also Technical Documentation, Section C.



2.2 The financial stability implications of broad-based risk-taking²³

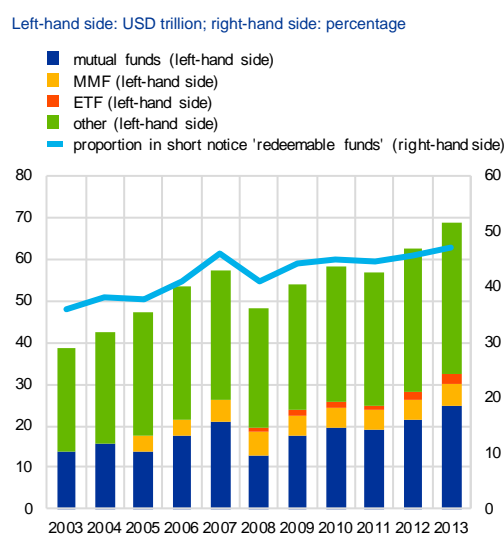
The protracted low interest rate environment is likely to lead to a search for yield and increased risk taking by multiple institutions/sectors, not least in the light of profitability and solvency pressures. The “low for long” environment may increase financial stability risks related to financial markets through broad-based risk-taking that is beyond the risk-bearing or risk management capacities of both financial firms and individuals. Elevated asset prices and access to cheap funding may incentivise investors to increase on and off-balance sheet leverage and boost demand for assets with higher expected returns, lower liquidity and higher risk (see also Chart 11 for evidence of increasing asset management investments in lower-rated asset classes, which also tend to be less liquid).²⁴ This could contribute to the build-up of vulnerabilities and may amplify potential shocks, leading, for example to increases in liquidity and redemption risks that could exacerbate the potential for abrupt price reversals (see also Chart 12 for evidence of the increasing role of redeemable investment funds). Among financial institutions, hedge funds and some investment funds could increase risk-taking more than banks and insurers, as banks face deleveraging needs and higher costs in terms of capital requirements for balance sheet expansion, while insurers, occupational pension funds and most investment funds are constrained by existing regulations on their ability to leverage.²⁵

Chart 11
Asset management corporate bond holdings by rating



Sources: Lipper, ESMA, Standard & Poor's.
Note: See also Technical Documentation, Section D.

Chart 12
Growth of redeemable investment funds



Sources: Boston Consulting Group, ICI, The City UK, Bank of England

²³ This section discusses risks where policies should be explored for the financial cycle and liquidity dimensions of the “low for long” scenario (see Charts 6-7 and Appendix D, with extended discussions included in Sections A-E of the Technical Documentation).

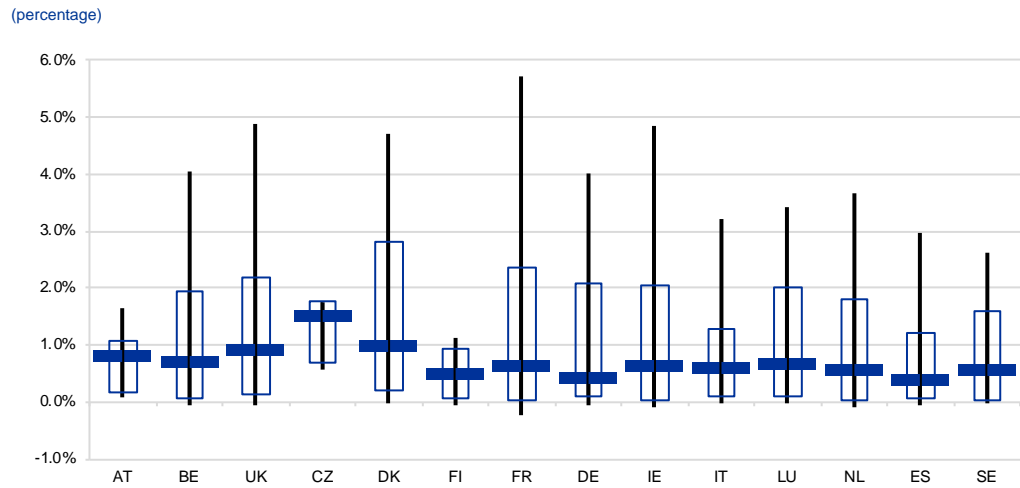
²⁴ The related risks are, to some extent, reduced by regulations which require adequate collateral, in particular in segments subject to central clearing. Still, as investors are searching for new sources of profits, this may lead to crowded asset positions that could push correlations upwards, not least in view of new trading technologies.

²⁵ The uncertainty regarding the relative likelihood of the materialisation of the scenarios under consideration and related expectations of market participants may also influence the strength of the search-for-yield process. If market participants expect long-term potential growth to pick up in line with the “back to normal” scenario, but the actual developments follow the “low for long” scenario, then misaligned expectations will fuel search-for-yield and asset price imbalances. When expectations are adjusted to the actual outcome, asset price reversals will occur.



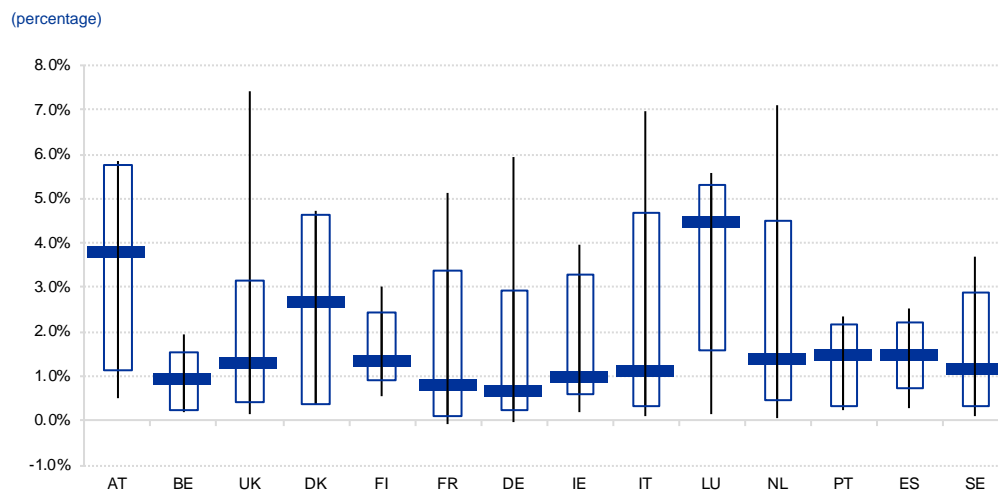
Increased risk-taking by multiple institutional sectors would impact financial asset valuations and correlations, creating risks of abrupt price reversals. An intense and broad-based search for yield may lead to financial asset price misalignments, creating risks of abrupt price reversals, e.g. in the event of a reassessment of risk premia or a correlated unwinding of positions (see also Charts 13-15 for evidence of high valuations in the EU corporate bond markets, reflecting low risk-free rates, but also implying very low pricing of corporate default risk and other risk premia, and Chart 16 for evidence of a recent episode of re-pricing and cross-market spillovers). Such price reversals could, in turn, negatively impact stability across the financial system, affecting several sectors at the same time.

Chart 13
Yields of EU corporate bonds:
investment grade



Sources: Bloomberg data on bonds included in the Merrill Lynch corporate bond index and the ESRB Secretariat's calculations.
 Note: See also Technical Documentation, Section E. Includes bonds with maturity above 0.5 year. For all markets shown at least five corporate bonds are available. The distributions of yields are presented by lines (min-max range), boxes (10th-90th percentiles) and markers for average yield. Non-rated bonds included in non-investment grade. Last observation: 29 Apr 2016.

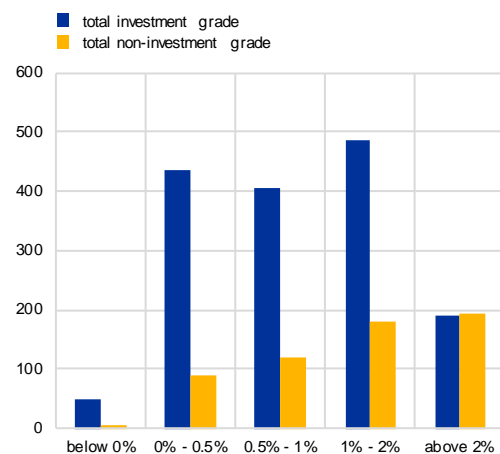
Chart 14
**Yields of EU corporate bonds:
 non-investment grade**



Sources: Bloomberg data on bonds included in the Merrill Lynch corporate bond index and the ESRB Secretariat's calculations.
 Note: See also Technical Documentation, Section E. Includes bonds with maturity above 0.5 year. For all markets shown at least five corporate bonds are available. The distributions of yields are presented by lines (min-max range), boxes (10th-90th percentiles) and markers for average yield. Non-rated bonds included in non-investment grade. Last observation: 29 Apr 2016.

Chart 15
EU corporate bonds trading at low yields

x-axis: percentage of volume of all bonds included in the reference index



Sources: Bloomberg data on bonds included in the Merrill Lynch corporate bond index and the ESRB Secretariat's calculations.
 Note: See also Technical Documentation, Section E. Includes bonds with maturity above 0.5 year. Non-rated bonds included in non-investment grade. Last observation: 29 Apr 2016.

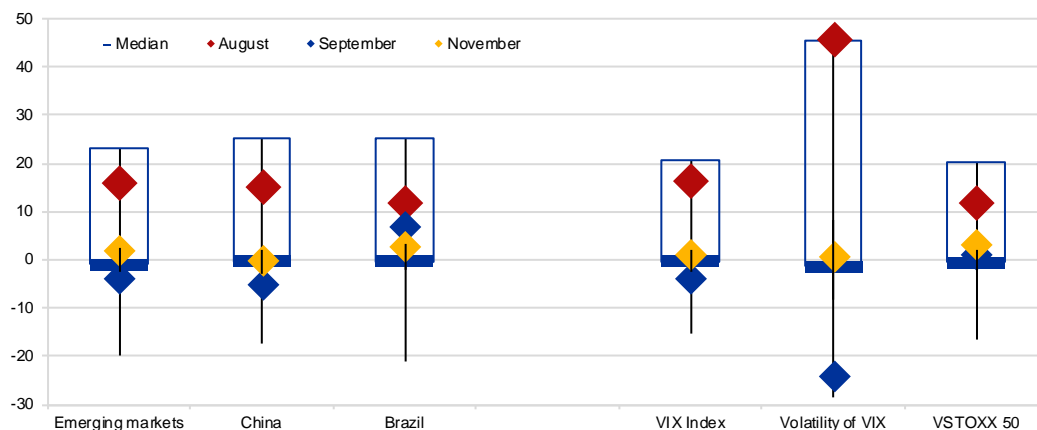
In addition to financial assets, increased risk-taking and search-for-yield could also interact with the availability of longer-term funding to fuel strong demand for real estate. The environment of low interest rates intensifies search for yield by banking and non-banking entities, so the available longer-term funding may also be channelled to finance real estate investment in some countries, including both commercial and residential real estate. If high demand for real estate continues for a long time after improvements in economic fundamentals, higher valuations and uncertainty over the fundamental level of real estate prices may become a recurrent financial stability concern in some countries.²⁶ At the same time, structural and country-specific factors play a significant role in this market.

²⁶ See also the ESRB 2015 Report of the Real Estate Expert Group and the ESRB press release of March 2016.



Chart 16

Spillovers of risks via market channels during China crash in Aug 2015



Sources: ESRB Risk Presentation, GB 2015-09, based on Bloomberg data and the ESRB Secretariat's calculations.

Note: Lines refer to the highest and lowest monthly index (change for the right-hand chart) in the data range, box describes first and third quartiles of monthly index change for the period from 1 January 2000 to 14 September 2015. For further details see Technical Documentation, Section E.

2.3 Structural changes in the financial system and the resulting financial stability risks²⁷

The low interest rate environment could accelerate the transition towards a more market-based financial structure, enhancing the resilience of the economy to shocks and complying with the broad policy agenda of the Capital Markets Union. In view of profitability pressures and higher risk-taking in the low interest rate environment, the role of banks in the EU financial system is expected to diminish, which is an important development given the current structure of the European financial sector,²⁸ and is also in line with the broad policy agenda of the Capital Markets Union. The shift of activities to the non-banking sector produces benefits as it provides for a “spare-wheel function” i.e. an additional source of finance for the economy in the event of bank shocks. New lending by banks may be constrained due to several factors including (i) costs in terms of capital requirements for balance sheet expansion, (ii) deleveraging needs, and (iii) forbearance on outstanding loans. At the same time, non-credit institutions could search for yield in investment classes like consumer credit or mortgage loans (for example in the bank-originated securitised asset format, but possibly also via direct lending as is already the case in countries like the Netherlands, where a significant share of mortgage loan intermediation has recently been taken over by non-bank institutions). They could also raise funds by offering deposit-like products, since they are potentially able to offer better conditions for depositors and debtors than banks due, for example, to more lenient regulatory requirements. Furthermore, the increased reliance of non-financial corporations on market-based financing is likely to be fostered in the context of the Capital Markets Union.

²⁷ This section discusses risks where policies need to be explored for the dimensions of resilience (aspect of shadow banking) and interconnectedness under the “low for long” scenario (see Charts 6-7 and Appendix D, with extended discussions included in Sections A-E of the Technical Documentation).

²⁸ See also ESRB (2014) “Is Europe overbanked?”



Although the benefits of a more market-based financial structure are acknowledged, it is important to be aware of and account for systemic risks that could arise, as the stability of the non-banking financial sector is important for the stability of the EU financial system as a whole. In addition to benefits, the shift towards more market-based financing could also generate some financial stability risks. A number of risk characteristics make the non-banking financial sector systemic: size and concentration, reliance on leverage, liquidity and maturity transformation, as well as interconnectedness with the broader financial system. Other challenges relate to the high degree of diversity and rapid pace of innovation (e.g. for “retail alternative” funds). Finally, limited ability to assess risks in the shadow banking sector is a key concern for macroprudential policy.²⁹

The development of bank-like activities by non-banks implies risks of regulatory arbitrage and challenges in terms of monitoring and supervision from a macroprudential perspective, as different regulations apply to institutions engaged in similar activities. The transition towards a more market-based structure, accelerated by the low interest rate environment, may bring challenges in terms of the monitoring and supervision of risks in the relatively heterogeneous market-based intermediation sectors. It may lead to greater homogeneity of products (e.g. unit-linked savings), increased interconnectedness, and sensitivity to market liquidity risk. In particular, potential for regulatory arbitrage and increased risk-taking via higher leverage³⁰ calls for enhanced supervision of risks in the non-banking sector, particularly from a macroprudential perspective. In the light of increased competition between the banking and the non-banking sectors, credit intermediation to higher-leveraged households may be facilitated by the non-banking sector (e.g. by purchases of bank-originated ABS or in some cases via direct intermediation), and thus needs to be closely supervised. In particular, in the low interest rate environment households that are leveraged have no incentive to make the necessary balance sheet adjustments and may forgo deleveraging (e.g. if more borrowing contracts are converted into longer-term contracts), keeping debt at levels that might not be sustainable, even when accounting for lower debt servicing costs.³¹ Non-banking entities may be in a better position to provide credit to leveraged households, because in some cases they are not subject to the same regulatory constraints as the banking sector.

²⁹ In its shadow banking risk monitoring, the ESRB employs an entity-based approach focused on Investment Funds (including Money Market Funds) and Other Financial Institutions (namely Financial Vehicle Corporations, Securities and Derivative Dealers, Financial Companies engaged in Lending, and other OFIs). In addition, an activity-based approach is employed, as some financial activities may pose shadow banking risks which are not fully captured by an entity-based mapping approach. This focuses on risks from market activities involving leverage, including leverage obtained through secured funding and derivatives, and also covers market liquidity and interconnectedness risks. Drawing on underlying market data collections, the framework aims to address the financial stability mandate given to EU authorities in several EU directives and regulations adopted since the onset of the crisis, including EMIR, AIFMD, MiFID II and SFTR. See also ESRB 2016 EU Shadow Banking Monitor and the Methodological Background Note, as well as ESRB 2016 Occasional Paper No 10: Assessing shadow banking – non-bank financial intermediation in Europe.

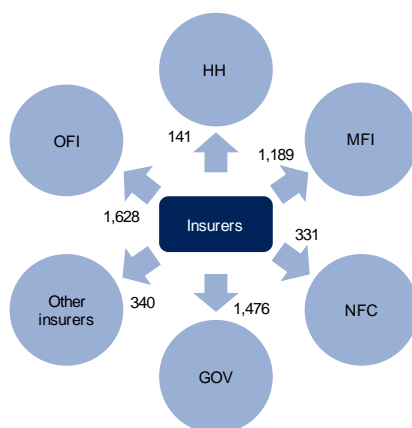
³⁰ See also discussion and evidence in Section 2.2. For further analysis, see also Technical Documentation, Section D, as the ESRB report “Market liquidity and market-making”, published in October 2016.

³¹ In fact, the quarterly bottom-up survey of ESRB Member Institutions shows that the risk related to deteriorating debt sustainability is currently one of the main risks to financial stability, which the low interest rate environment is likely to increase further due to, inter alia, subdued growth (denominator effect). Also, incentives to reduce debt (e.g. by households) are missing because borrowing costs are very low and real returns on savings are negative.



Chart 17
Insurers' asset exposure to other sector

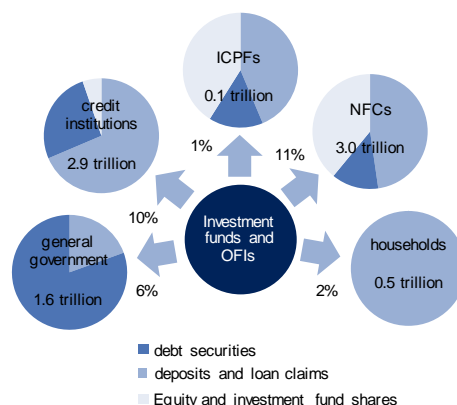
(EUR billion)



Sources: ESRB Insurance Expert Group.
 Note: The sectors include households (HH), non-financial corporations (NFC), government (Gov), monetary financial institutions (MFI) and other financial institutions (OFI). For further details, see Technical Documentation, Section E.

Chart 18
Interconnectedness: Exposures of euro area investment funds and OFIs to other euro area sectors

(EUR trillion and % of all fund exposures)



Sources: ESRB Secretariat calculations.
 Note: The data cover only euro area entities and are based on unconsolidated balance sheet information. The remaining shares of exposures and funding represent the rest of the world. ICPF: insurance corporations and pension funds, NFC: non-financial corporations.

As a broader consequence of structural changes fostered by the low interest rate environment, sensitivity to liquidity risk and cross-sectoral interconnectedness are likely to increase. Traditionally, liquidity risk has been concentrated in the banking sector and largely absent in the non-banking sectors due to the longer-term nature of the contracts (life insurance, pension funds, AIF funds)³² or to a parallel valuation of asset/liabilities and the liquid nature of investments (UCITS funds). Structural changes may lead to liquidity risk also being more prominent in the non-banking sectors, as demand for lower-rated and/or less liquid assets increases (see Section 2.2 and Chart 11, as well as Section E of the Technical Documentation) and life insurance/pension funds switch to unit-linked/defined contribution models which are more easily surrendered, as is the case for some investment funds (see Section 2.1).³³ In an environment of increased competition in asset management products, search for yield and crowded investment positions (e.g. via increased investments in less liquid asset classes), correlated asset price movements may affect several financial sectors simultaneously (see also Chart 16 for an example of correlated asset price reversals and Charts 17-18 for evidence of cross-sectoral interconnectedness via direct exposures). Greater interconnectedness results also from (i) a more homogenous range of products offered (e.g. an increased supply of unit-linked products by life insurance) and investments chosen across the financial system (e.g. exposure to credit risk via lending activities of life insurance and investment funds), (ii) higher leverage in growing non-banking sectors, as well as possibly also from (iii) higher reliance on market funding by banks (due to relatively cheap market funding and to competition from deposit-like savings products offered by

³² These sectors often acted in a countercyclical way, thus limiting the risks related to fire sales by taking an opportunity to buy assets sold by banks at discounted prices. In addition, for the insurance sector, the inversion of the productivity cycle should be also noted.

³³ For example, the funds without the liquidity management tools which investment funds have under UCITS. The shift towards unit-linked products may not in itself necessarily expose the insurance company to liquidity risk.



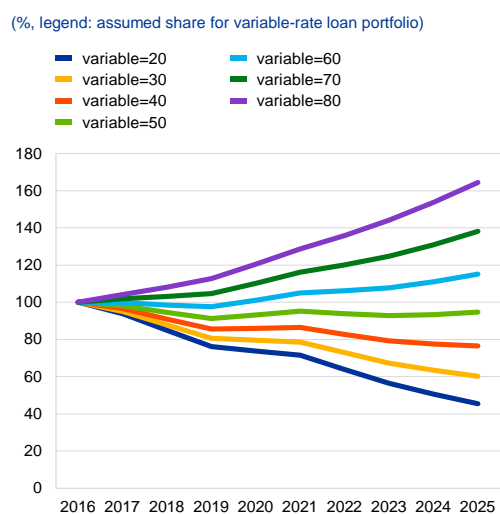
non-banks), and (iv) strong ownership links between financial companies and sectors (due to more profitable business lines). The materialisation of risks related to liquidity and interconnectedness could be triggered by asset price revaluations, while funding and liquidity risks in the form of fire sales could amplify market shocks, affecting many market participants (sectors) simultaneously.

2.4 Financial stability risks related to a gradual increase in interest rates³⁴

A gradual increase in interest rates in the “back to normal” scenario could lead to financial stability risks deriving from activities already undertaken in the low interest rate environment.

The low interest rate environment has been in place for several years, and has led to a build-up of vulnerabilities in banking and other financial market sectors, which could materialise if interest rates were to increase gradually. Although interest rate increases in the short to medium-term are not widely expected by market participants, a recovery close to the “back to normal” scenario is projected by several institutions for some countries (see Charts 3-4 in Section 1). Compared to the case of a protracted low interest rate environment accompanied by low growth, financial stability risks are generally expected to be lower for a scenario where interest rates gradually recover and return to normal, given the assumption that economic growth will accelerate.

Chart 19
The impact of gradually increasing interest rates on banks, depending on the share represented by variable-rate loan portfolios



Sources: MIR Statistics (ECB), Consolidated Banking Data (ECB), Bank of England and ESRB Secretariat calculations.

Note: The chart shows the projected evolution of net interest income from 2016 (where net interest income is set at 100) to 2025, depending on the share represented by the variable-rate loan portfolio marked in the legend). The underlying data are based on eight countries (BE, DE, DK, FR, GB, ES, NL, IT), which jointly account for 87% of EU loans and advances to households and non-financial corporations. On average, fixed-rate new loans represent 49% of new loans granted in each country, with significant cross-country differences (see also indicators 28 and 31 in Appendix C).

Rising interest rates are expected to have a negative impact on the profitability of those banks which have been originating long-term loans at low fixed rates.

If banks have already adjusted to the low interest rate environment by reducing their lending rates for fixed-rate loans, they will face losses from suppressed margins when interest rates rise and if the exposure is not hedged (see Appendix C for an overview of the importance of fixed-rate loans in the EU banking system and Chart 19 for data on the evolution of interest margins). Rising interest rates could also lead to the materialisation of credit risk and increased impairments, particularly if banks have granted floating rate loans to higher-indebted households for whom debt servicing could become more challenging, and especially if a scenario of interest rate increases has not been accounted for in the creditworthiness analysis.

The “back to normal” scenario could drive asset prices and liquidity down, particularly if higher funding costs lead to asset disposals.

Following a build-up of crowded, and potentially leveraged, positions in higher-yielding segments (e.g. lower quality asset classes) in the period of low interest rates, even

³⁴ This section discusses risks for which policies need to explore the dimensions of resilience and the financial cycle under the “back to normal” scenario (see Charts 6-7 and Appendix D, with extended discussions included in Sections A-E of the Technical Documentation).



a gradual rise in interest rates could lead to stress in financial markets.³⁵ For example, increasing funding costs and potentially excessive redemptions could provoke asset disposals and expose the underlying fragility of market liquidity (see Chart 12 for evidence of the growth of redeemable funds).³⁶ Also, following a period of widely-available and cheap funding, liquidity and risk premia may increase back to previously observed levels, affecting the financial system via changing market valuations. Possible price falls in some asset classes could be exacerbated by a collective unwinding of correlated positions. The impact of such investor behaviour on asset price volatility could be amplified by low market liquidity, as has already been seen under the current market conditions.

³⁵ If the interest rate increase were to occur more abruptly, the consequent financial markets repercussions would be stronger.

³⁶ Rising interest rates may imply liquidity constraints for investment funds and some other types of non-credit institutions. For example, highly leveraged entities exposed to substantial liquidity risk are likely to be most affected. The current regulatory framework has a number of provisions to deal with issues related to disorderly asset disposals (e.g. Undertakings for Collective Investment in Transferable Securities Directive 2009/65/EC). The effectiveness of these provisions will partially depend on the speed of the interest rate adjustment, as well as features of business models, e.g. the scale of leverage.



Section 3

Policy options

Policy actions to mitigate risks in the low interest rate environment should take a holistic and system-wide perspective. A system-wide policy approach is required given the interrelated nature of identified risks (see Appendix E). Only by adopting a holistic perspective can regulation and supervision address the financial system as a whole and mitigate regulatory arbitrage.

This report presents some policy options for those financial stability risks identified in the risk assessment as meriting policy consideration. In order to prioritise policies, the report focuses on policy options for currently-observed risks, although it also presents options for conjectured future risks. In line with the risks identified in Section 2, potential policy options for the following three domains are proposed: sustainability of business models, broad-based risk-taking, and risks related to changes in financial system structure. While financial stability risks related to sustainability of business models, and to some extent those related to broad-based risk taking, are already observable, risks related to changes in the financial system structure are more of a conjectured and emerging nature. Policy options are therefore outlined following this logic.

While the focus of the report is on macroprudential policies, other policy measures are also relevant, such as enhancing consumer awareness of risks, aligning incentives to address excessive risk taking, and reducing reliance on shorter-term debt funding. The proposed policy options take existing EU-wide and national regulations into consideration, as well as regulatory reforms that will soon enter into force. The policy options outlined in this report acknowledge the different time frames needed to implement specific policy measures. The report includes measures that could be taken in the short term, and that are in some cases already being developed in ongoing ESRB projects, and in the longer-term, to identify, assess and mitigate systemic risks.

As the basis for a comprehensive assessment of risks and the design and calibration of policy options, the remaining data gaps should be closed and risk monitoring further enhanced in cross-border and cross-institutional cooperation. There is no doubt that regulatory reforms implemented in recent years have significantly improved the availability of data for the purposes of supervisory monitoring and public data disclosure in a number of sectors of the EU financial system. However, in order to mitigate risks related to the low interest rate environment, some remaining data gaps need to be closed and macroprudential risk monitoring enhanced in cross-institutional cooperation, making full use of existing and future data sources (e.g. EMIR, AIFMD). In particular, disclosure requirements and the understanding of leverage and funding positions need to be improved significantly, as does information about collateral re-use. This is essential in order to identify spillover channels and critical nodes in the interconnected financial system. Moreover, in order to increase transparency and resilience given the growth of the shadow banking sector, public disclosure requirements on the mandatory reporting of shadow banking activities, including investment fund leverage, should be enhanced. In general, the monitoring of financial and real asset valuations should be stepped up (i.e. residential and commercial real estate) to supplement information on financial institutions' investments.

The proposed policy options are summarised and described in further detail in Appendix F.

3.1 Policy options to mitigate currently observed risks

This sub-section outlines potential policy options that could address financial stability risks related to the sustainability of business models and broad-based risk-taking in the real-estate sector.



A number of sector-specific policy actions, including increases in reserves and capital, could be implemented to improve the resilience of the sectors that are most vulnerable to the low interest rate environment. As seen in Section 2, since the low interest rate environment poses the most immediate risks to business models with return guarantees on long-term liabilities, the relevant authorities should place major importance on policy measures that enhance the resilience of vulnerable companies within the EU life insurance and pension fund sectors.

The ongoing Solvency II implementation and future review is an opportunity to address financial stability risks deriving from the prolonged low interest rate environment, in particular by reviewing the ultimate forward rate methodology from a macroprudential forward-looking perspective, and the long-term guarantee package, as well as by exploring additional prudential tools, including: the power to request a reduction in the maximum level of interest-rate guarantees offered in new contracts, the power to cancel or defer dividend distributions (even before the solvency ratio has been breached) and introduce discretionary benefit limitation options, and the power to retain more capital to increase resilience. Regulatory actions addressing current solvency risks in the life insurance sector should not, however, lead to life insurance becoming more pro-cyclical in the future.

With regard to resolution tools (see below), it may be worth giving the authorities in charge of resolution the power to restructure insurance liabilities as a last resort. This could include the power to modify the terms of existing contracts, which would involve a decrease in guaranteed rates of return, where these contracts are not covered by an insurance guarantee scheme and the modification does not leave policyholders worse off than under insolvency proceedings.

In the pension fund sector, the EIOPA's recommendation to enhance risk assessment and the transparency of pension funds in all EU countries should be implemented, in order to help the relevant authorities and schemes identify potential shortfalls and take steps to address these. This could support requirements for increases in pension fund reserves and capital, including through sponsor support. Furthermore, the EIOPA stress tests could be used to assess the impact of increased future contributions on sponsors and the real economy.

Due to the importance of interest rate risk to the resilience of the banking system, a harmonised assessment and regulation of interest rate risk in the banking book (IRRBB) could be carried out. The low interest rate environment increases the sensitivity of banks to interest rate risk. To account for this, a harmonised assessment and regulation of interest rate risk in the banking book could be implemented in EU law through the CRR/CRD, based on the new standards developed by the Basel Committee on Banking Supervision.³⁷

To complement the above measures in situations where risks related to the low interest rate environment simultaneously affect the sustainability of business models in several financial sectors, the recovery and resolution frameworks should be evaluated, enhanced and harmonised, where needed, also with regard to cross-border activities, and implemented consistently. Some institutions may prove unable to successfully adjust their business models to the protracted low interest environment, and so, if all other measures fail, their orderly exit should be assured.

Moreover, options should be included to deal with risks related to the low level of interest rates into the recovery planning of institutions. In the life insurance sector, effective recovery and resolution procedures could be further developed, where needed, and harmonised across EU countries, ensuring the effective winding down of institutions whose business models prove

³⁷ See also Basel Committee on Banking Supervision (2016) "Standards. Interest rate risk in the banking book", ([link](#)).



unviable in the protracted low interest rate environment. Where appropriate, supervisors should have the power to ask for formal recovery plans.

The resolution process for EU banks could be further operationalised, with an appropriate focus on not exacerbating systemic risk and on protecting the core functions of the banking system during the resolution of entities not equipped to manage longer-lasting profitability pressures related to the low interest rate environment.

With regard to the risk of asset price misalignments in the real estate sector given broad-based risk-taking and growing credit intermediation by non-bank institutions in the low interest rate environment, adequate tools and policy instruments should be made available to the real estate sector.

One way to address the growth of imbalances would be to introduce a comprehensive monitoring framework for lending standards in EU countries. This would encompass bank and non-bank credit intermediaries, possibly together with activity-based instruments to mitigate the risks of incomplete coverage. Such a framework could also include consistent loan affordability tests in order to contain risks should lending rates increase.

Importantly, the macroprudential authorities would need to have access to the relevant tools and instruments available so they can act when monitoring suggests that systemic vulnerabilities are building up due to an excessive relaxation of lending standards. In particular, measures such as limits on maximum loan-to-value, debt-to-income ratios or the prudent valuation of collateral could be implemented on a country-specific basis to contain the build-up of vulnerabilities. Overall, best practices could be adopted across sectors in the form of loan affordability tests and collateral valuation standards, in line with prudent lending principles. Where significant imbalances have already accumulated, policies could seek to enhance the resilience of the exposed financial institutions and their customers, prevent the further build-up of vulnerabilities, and address misaligned incentives.

3.2 Policy options to mitigate conjectured future risks

This sub-section presents possible policy options that could address financial stability risks related to changes in the financial system structure and, to some extent, broad-based risk-taking.

First, financial stability risks related to the growth of shadow banking activities should be tackled comprehensively, in particular by ensuring cross-sectoral consistency and reducing possibilities for regulatory arbitrage. As an initial step, it is essential to review the regulation and supervision of the bank-like activities of non-banks. In order to avoid leakage and regulatory arbitrage, cross-sectoral consistency should be ensured in the treatment of similar activities. To achieve this, activity-based regulation could be introduced, where necessary, to complement entity-based regulation. For example, some countries already have certain instruments which apply to all financial institutions undertaking credit intermediation (e.g. LTV limits in the Netherlands).

Currently, some aspects of shadow banking activities remain partly unaddressed by existing regulation, e.g. with respect to leverage, liquidity, funding and interconnectedness. Policies that address these dimensions could be further considered. In particular, in order to mitigate systemic risks related to an excessive search for yield in some segments of the investment fund sector, existing regulatory provisions for limiting leverage could be complemented by supervisory guidance enhancing the consistency of implementation across Member States and in different market scenarios.

From a cross-sectoral perspective, a more strongly interconnected financial system calls for raising systemic resilience to the risk of repricing and negative system-wide liquidity



spirals. Given differences in business models and sectoral regulatory frameworks, a range of tools could be considered where needed, including buffers (capital, liquidity), leverage limits and other macroprudential instruments such as liquidity management regulations.

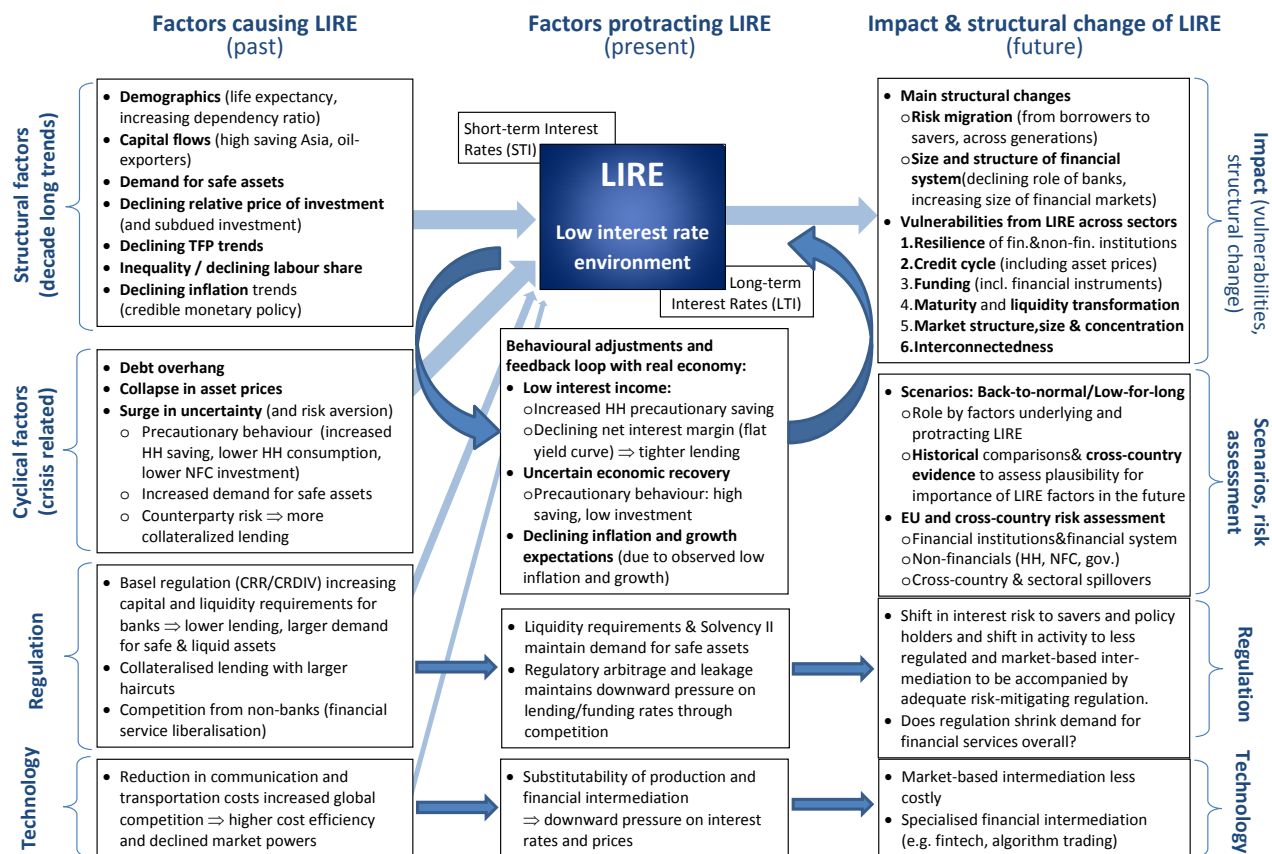
Further steps could be taken towards a framework using margins and haircuts as macroprudential instruments. This could also include assessing the adequacy of setting minimum margin requirements and, in the longer term, exploring possible obligatory central clearing for securities financing transactions.

In view of growing interconnectedness and risks related to asset revaluations and the correlated liquidity risk, the stress testing framework could be further enhanced to enable a system-wide assessment of the impact of price and liquidity shocks. The current stress testing framework could be improved so that it is able to provide system-wide coverage and an understanding of the commonalities of exposures across sectors, accounting for growing interconnectedness and potential risk transfer through price and liquidity shocks. In practice, this could be implemented through enhanced cross-country and cross-sectoral cooperation between micro- and macroprudential supervisory authorities, and could encompass (i) a dynamic approach that includes banks' behavioural feedback reactions to the scenarios; (ii) a comprehensive two-way interaction between banks and the real economy; (iii) an assessment of contagion effects stemming from interconnectedness among financial institutions, including non-banks; and (iv) interaction with other non-financial sectors that are relevant for risk management across financial intermediaries.



Appendix A

The low interest rate environment and structural changes

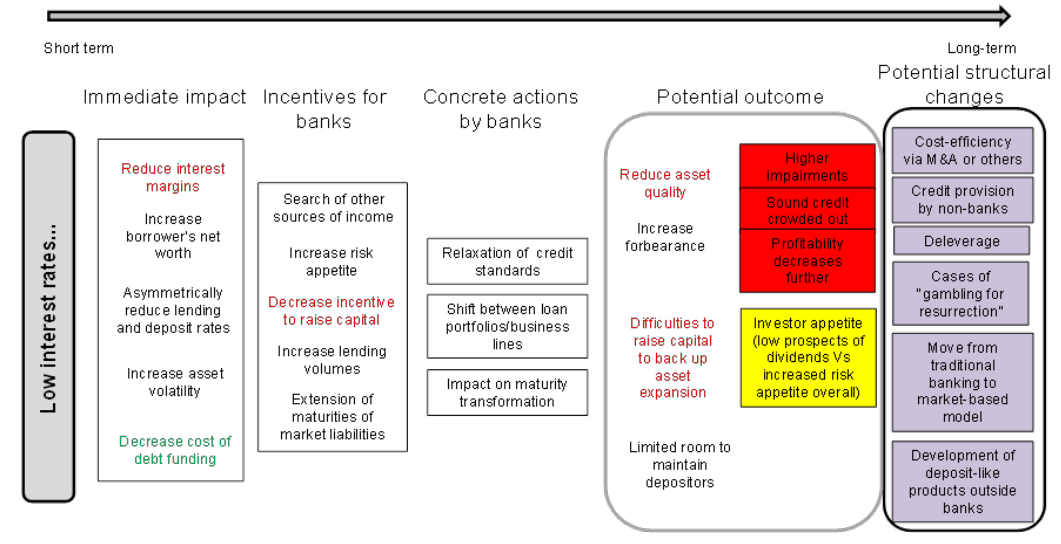


Source: Joint ATC/ASC/FSC Task Force on "Macroprudential Issues and Structural Change in a Low Interest Rate Environment".



Appendix B

The expected impact of low interest rates on banks



Source: Technical Documentation, Section B, Annex 1, prepared by Workstream 2 of the Joint ATC/ASC/FSC Task Force on "Macroprudential Issues and Structural Change in a Low Interest Rate Environment".

Note: Red-coloured text denotes the negative effects of the low interest rate environment, green-coloured text denotes positive effects. The assessment of the potential outcome includes boxes indicating developments, which may be verified quantitatively once the data are available (red box denotes negative effects, yellow box denotes an unknown effect due to the potential interplay of several factors).



Appendix C

A cross-country overview of the main indicators related to the low interest rate environment

	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK	Median	
Banks																														
1	Banks net interest income / assets	1.7%	1.5%	3.3%	2.7%	2.8%	1.1%	1.1%	2.0%	1.9%	0.6%	1.0%	2.1%	2.8%	3.4%	1.4%	1.4%	1.6%	0.7%	1.8%	2.2%	1.3%	2.3%	1.4%	2.9%	1.0%	2.2%	2.8%	1.0%	2%
2	Banks return on assets	0.6%	0.7%	1.0%	-0.6%	1.1%	0.1%	0.4%	1.1%	0.5%	0.5%	0.4%	-2.8%	-0.9%	-0.1%	0.9%	0.2%	0.9%	0.6%	1.2%	0.9%	0.4%	0.9%	0.1%	1.2%	0.6%	0.4%	0.9%	0.2%	1%
3	Banks cost-to-income	60%	59%	48%	44%	49%	73%	57%	45%	51%	51%	68%	67%	62%	87%	61%	65%	53%	54%	45%	39%	58%	60%	60%	57%	53%	61%	55%	66%	57%
4	Banks coverage ratio	51%	42%	50%	37%	N/A	37%	35%	43%	47%	32%	51%	48%	59%	58%	40%	46%	32%	38%	37%	34%	38%	55%	41%	57%	27%	59%	57%	77%	43%
5	Banks loans-to-deposits	118%	67%	78%	130%	79%	101%	287%	108%	127%	163%	115%	142%	83%	88%	116%	114%	96%	120%	64%	68%	116%	94%	115%	87%	224%	90%	97%	0%	104%
6	Banks percentage of impaired loans	7%	4%	14%	49%	3%	3%	4%	2%	6%	2%	4%	47%	13%	14%	15%	17%	5%	1%	4%	7%	3%	7%	19%	14%	1%	20%	N/A	2%	6%
7	Forebearance ratio for total loans	3%	2%	9%	27%	1%	2%	2%	2%	8%	1%	1%	20%	5%	6%	14%	5%	4%	0%	5%	7%	2%	3%	12%	8%	1%	13%	N/A	2%	4%
8	Tier 1 capital ratio	13%	16%	20%	16%	16%	15%	18%	35%	13%	22%	14%	16%	18%	13%	23%	12%	24%	20%	19%	19%	17%	15%	13%	16%	21%	18%	16%	16%	16%
9	Interbank market dependence	12%	8%	8%	17%	8%	13%	5%	7%	8%	18%	7%	2%	12%	9%	12%	8%	11%	15%	6%	38%	3%	5%	9%	15%	4%	12%	4%	5%	8%
10	Credit-to-GDP gap	-8%	-7%	-21%	-29%	5%	-7%	-33%	-16%	-54%	0%	0%	-12%	N/A	-31%	-46%	-13%	-14%	-74%	-32%	-26%	-20%	-6%	-41%	-9%	-2%	-34%	-4%	-21%	-16%
11	Banks assets as % of GDP	253%	273%	108%	493%	130%	255%	393%	113%	259%	287%	378%	218%	128%	104%	406%	241%	66%	1918%	126%	523%	382%	94%	246%	57%	297%	105%	89%	349%	249%
12	Share of domestic credit institutions (% total assets)	68%	51%	24%	81%	10%	96%	88%	6%	95%	33%	95%	98%	9%	53%	52%	92%	8%	12%	53%	33%	93%	41%	77%	10%	93%	66%	15%	63%	53%
13	Share of the top 5 credit institutions (% total assets)	36%	65%	58%	68%	63%	31%	68%	89%	60%	75%	47%	95%	73%	53%	46%	41%	87%	31%	65%	81%	85%	49%	70%	57%	58%	59%	72%	37%	62%
Life insurance																														
14	Life insurance as % of household financial assets	12%	15%	1%	4%	6%	17%	27%	2%	7%	9%	34%	2%	4%	5%	14%	13%	2%	13%	1%	10%	7%	5%	12%	1%	9%	8%	7%	9%	7%
15	Life insurance as % of GDP	23%	55%	1%	12%	6%	32%	117%	5%	16%	25%	74%	4%	5%	5%	116%	34%	2%	308%	1%	43%	46%	5%	11%	1%	N/A	9%	17%	97%	16%
16	Insurers' rate of return gap	-0.9	-0.1	-0.6	-0.4	-1.0	0.4	-0.1	0.1	-1.1	-1.4	0.6	-1.6	0.6	0.4	-1.3	-0.6	-1.6	0.0	N/A	1.4	-0.2	0.3	-1.3	-1.2	0.5	-0.7	-0.8	0.1	-0.4
17	Insurers' duration gap	10.1	1.4	3.3	6.2	1.6	10.7	4.7	5.0	0.8	5.4	4.8	2.0	5.9	3.0	-0.6	0.8	10.6	5.5	N/A	7.6	5.4	3.4	1.3	0.8	10.5	8.3	-0.7	-1.1	4.7
18	Approx. share of guaranteed life insurance	N/A	85%	N/A	N/A	57%	90%	67%	39%	90%	28%	77%	56%	100%	38%	11%	73%	35%	24%	74%	59%	28%	37%	98%	46%	N/A	N/A	68%	30%	57%
Pension funds																														
19	Pension funds as % of household financial assets	6%	7%	8%	8%	7%	14%	22%	12%	8%	8%	N/A	2%	20%	4%	33%	6%	6%	4%	10%	0%	62%	9%	6%	5%	29%	8%	13%	50%	8%
20	Approx. share of defined-benefit pension funds	26%	100%	N/A	N/A	N/A	100%	100%	N/A	1%	100%	N/A	N/A	37%	N/A	56%	6%	N/A	71%	N/A	N/A	99%	N/A	92%	N/A	100%	100%	N/A	81%	92%
21	Approx. share of defined-contribution pension funds	74%	N/A	100%	N/A	N/A	N/A	N/A	26%	N/A	N/A	100%	63%	N/A	44%	94%	N/A	15%	100%	N/A	1%	100%	8%	100%	N/A	N/A	100%	19%	74%	
22	DB average cover ratios	100%	130%	100%	N/A	N/A	122%	111%	N/A	102%	118%	N/A	N/A	106%	N/A	99%	N/A	N/A	113%	100%	N/A	109%	100%	106%	134%	143%	109%	100%	97%	106%
23	Return on asset	8%	11%	8%	N/A	N/A	5%	14%	N/A	6%	10%	N/A	3%	10%	N/A	16%	6%	N/A	7%	5%	N/A	18%	4%	7%	9%	11%	7%	3%	5%	7%
24	Penetration rate	6%	6%	0%	N/A	N/A	7%	2%	N/A	3%	2%	N/A	1%	0%	N/A	48%	7%	N/A	3%	1%	N/A	176%	0%	9%	3%	4%	6%	2%	98%	3%



	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK	Median
Financial markets and financial structure																													
25	Stock price growth (avg. % p.a. since 2011)																												
26	Share of market-based financing in the economy																												
27	3-month Euribor																												
28	Share of new real estate floating rate loans to households																												
29	Bank interest rates to household for house purchase																												
30	Spreads of interest rates for house purchase over EURIBOR																												
31	Share of new floating rate loans to households and NFCs																												
32	Current lending rates for loans																												
33	Average investment-grade yields																												
34	Average non-investment grade yields																												
Indebtedness																													
35	Sovereign debt to GDP ratio																												
36	Household debt to GDP ratio																												
37	Household debt-to-gross disposable income ratio																												
38	Non-financial corporations debt to GDP ratio																												

Source: Technical Documentation, Section E, Chart A.32 in the Annex, prepared by Workstream 5 of the Joint ATC/ASC/FSC Task Force on "Macroprudential Issues and Structural Change in a Low Interest Rate Environment".

Note: The following sources are used: Indicators 1-5: ECB statistics, consolidated banking data for Q4 2015. Indicators 6-7: European Banking Association (EBA), data for Q1 2016. Indicators 8-13: ECB statistics, consolidated banking data for Q4 2015. Indicator 14: ECB Quarterly Sector Accounts. The indicator is computed as the ratio of household total life insurance and annuity entitlements over total financial assets. Indicator 15: EIOPA website for gross technical provisions of life enterprises for 2014 (Table 7 of EU/EEA (re)insurance statistics) and Eurostat National Accounts. Indicator is computed as life insurance liabilities over GDP. Data on gross technical provisions of life enterprises are missing for Italy in Table 7 of EIOPA's EU/EEA (re)insurance statistics, and are therefore based on EIOPA, Table 4 of breakdown of gross technical provisions in life insurance. Indicators 16-17: EIOPA Insurance stress test report 2014, Table 2: Mismatches in internal rate of return and durations. Positive duration gap indicates a longer maturity of liabilities, as compared to assets. Positive rate of return gap indicates a higher required return to cover the liabilities than the expected return on assets. Indicator 18: EIOPA website, Table 4 of breakdown of gross technical provisions in life insurance. The indicator is computed as the share of gross technical provisions of non-linked life assurance to gross technical provisions of total life assurance. Non-linked life assurance is defined by DIRECTIVE 2002/83/EC. The data for PL are provided by the Polish Financial Supervision Authority, the data for Bulgaria, Cyprus and Slovenia are based on 2013 (2014 not available). Indicator 19: ECB Quarterly Sector Accounts. The ratio of household pension entitlements to total household financial assets, end of Q1 2016. Indicators 20-21: EIOPA website, EU/EEA occupational pensions statistics, Table 3: Relative size of the sector per type or scheme. The remaining pension funds are hybrid schemes. Indicators 22-24: EIOPA statistics. Indicator 25: Bloomberg. Stock price growth is computed as price change in the last five years, presented in annual growth terms. Indicator 26: Share of market-based financing in the economy computed as debt securities and listed shares, as a share of total financial liabilities of the economy. Eurostat data on liabilities, listed shares and debt securities in the non-financial corporations sector, according to European System of accounts (ESA 2010). Indicator 27: 3-month EURIBOR rate, Reuters. Indicators 28, 31: ECB Risk Assessment Indicators, based on MFI Interest Rates Statistics (MIR). Indicator 29, 30, 32: ECB MFI Interest Rates Statistics (MIR). Indicators 33-34: Bloomberg data for Merrill Lynch Corporate Bonds, investment grades are BBB and above, 1 Apr 2016. Indicator 35: ECB statistics, Government finance (Maastricht debt), Q1 2016. Indicators 36-38: ECB Quarterly Sector Accounts, data available for Q1 2016.



Appendix D

An overview of financial stability risk assessment

	Low for long					
	Banks	Insurance companies, pension funds	Investment funds	Markets	Real economy sectors	Cross-sectoral / system-wide aspects
Resilience	<p>Low profitability (mainly as a consequence of decreasing net interest margin) reduces banks' ability to accumulate capital organically via retained earnings and to supply credit.</p> <p>Low profitability will raise viability concerns for the weakly capitalised banks and provides an incentive for "gambling for resurrection".</p> <p>Risk of persistent weakness of balance sheets which impedes resolving problem assets and potentially further deteriorating asset quality (e.g., increase in NPLs, deterioration of credit standards, misallocation of capital and possible adverse macro-feedback on growth).</p>	<p>Risk of failures of life insurers and pension funds (pressure on profitability/solvency, traditional guaranteed-return/defined benefit business model challenged)</p> <p>Risk-taking beyond risk bearing capacities (search for yield)</p> <p>Risks arising from expansion of non-traditional non-insurance activities</p>	<p>Risks arising from increased leverage (search for yield)</p> <p>Risks arising from expansion of less regulated shadow banking activities within conglomerates</p>	<p>Risk of disruptions in market functioning related to falls in value of collateral as result of shocks in risk premia or real estate overvaluation correction (where related instruments are used as collateral)</p>	<p>Risk of NFC failures and household balance sheet weakness (pressure on profitability)</p>	<p>Broad-based pressure on profitability and solvency lowers system resilience and increases risk of failures of unsustainable business models, impacting several sectors at the same time</p> <p>Broad-based risk-taking beyond risk bearing capacities (search for yield)</p> <p>Risks related to expansion of shadow banking activities, including:</p> <ul style="list-style-type: none"> Regulatory arbitrage and associated increase in risk taking Increased leverage and resultant fragility of shadow banking entities Growing importance for the financial system and the real economy,
Credit / financial cycle	<p>Given subdued growth and low credit demand, wide-spread credit boom is unlikely, but country-specific build-up of some cyclical imbalances possible.</p>	<p>Increased investment in assets with higher credit risk (search for yield, e.g. infrastructure, real estate)</p> <p>Increased risk taking through shift into bank-like credit products without proper expertise and risk management</p>	<p>Increased investment in assets with higher credit risk (search for yield)</p>	<p>Risk of asset price misalignments, which can lead to an abrupt revaluation in case of an increase in risk premia (risk of revaluation)</p>	<p>Risk related to build-up of imbalances in residential / commercial real estate in some countries</p> <p>Shift of investment risks to households</p> <p>Risk of misallocation of investment due to asset price misalignments</p>	<p>Risks related to inefficient allocation of capital</p> <p>Income volatility and reduced life-insurance and pension fund benefits increase riskiness of borrowers</p> <p>Risks related to systemic effects of imbalances in real estate in some countries</p>



	Low for long					
	Banks	Insurance companies, pension funds	Investment funds	Markets	Real economy sectors	Cross-sectoral / system-wide aspects
Funding, liquidity / maturity transformation	<p>Funding risk due to declining traditional deposit base</p> <p>Increased reliance on wholesale funding (at the cost of equity) could indirectly increase leverage.</p>	<p>Risk of selective redemptions by policy holders generating liquidity risk due to investment in less liquid/ long-term assets(e.g. infrastructure, real estate)</p> <p>Liquidity risk associated with transfer of investment risk to policyholders, including broader provision of unit linked products, redeemable at short notice</p> <p>Risks from shift into bank-like savings products without adequate expertise and risk management</p>	<p>Increased liquidity and redemption risk due to investment in less liquid as-sets (search for yield, e.g. infrastructure, real estate) and shift into bank-like savings products while preserving easy redemption; redemption risk may be triggered by increase in risk premia, especially for funds used as substitutes for bank deposits (e.g. MMF)</p>	<p>Risk of a drying-up of market liquidity as an amplifying factor for as-set price revaluation</p>		<p>Emergence or increase in liquidity risk in non-banking sectors (including shadow banking), accompanied by less diversity (more homogeneous risk-taking) in the financial system and consequently higher likelihood of fire sales.</p> <p>Materialization of funding and liquidity risks could amplify market shocks, affecting many market participants (sectors) simultaneously</p>
Risk concentration / market structure	<p>Banks with largest profitability tensions may engage in M&A transactions.</p> <p>Higher market concentration leading to risks related to too-big-to-fail problems, though limited by stronger non-bank activity</p>	<p>Stronger market concentration leading to risks related to too-big-to-fail problems</p>	<p>Risks related to increasing size and concentration of investment fund sector</p>			<p>Risks related to reduced system-wide resilience due to lower institutional diversity</p>
Interconnectedness	<p>Risk related to higher interconnectedness through higher funding from insurers and investment funds as well as higher lending (liquidity lines, leverage) to investment funds; byproduct of shift of business to non-bank financial institutions</p>	<p>Risk related to higher interconnectedness through higher lending to banks: byproduct of shift of business to non-bank financial institutions</p> <p>Greater product similarity with investment fund sector due to shift to unit-linked products increases the weight of shared risk factors for these sectors</p>	<p>Risk related to higher interconnectedness through higher funding from banks (liquidity lines, leverage) as well as higher lending to banks; byproduct of shift of business to non-bank financial institutions</p>	<p>Risk of spillovers via higher correlation between asset classes due to similar trading behaviour (related to search for yield, see dimension resilience and financial cycle above)</p> <p>Risks from common exposures and interconnections through wholesale funding</p>	<p>Risks related to house-hold consumption being more dependent on financial market developments</p>	<p>Greater importance of risks originating in financial markets (interconnectedness raises via common exposures to correlated assets and via cross-sectoral exposures, including as a result of growth of shadow banking); materialisation of risks can be triggered by asset price revaluation, see dimension liquidity/markets above).</p>

Source: Technical Documentation, Section E, Chart A.33 in the Annex. Note: The table is based on the results of the sectoral risk assessment included in the Technical Documentation, Sections A-D. The table only shows material financial stability risks where policy options need to be explored (marked in red) and financial stability risks which do not require immediate policy action, but need to be monitored (marked in yellow). The risk dimensions (first column) relate to the intermediate objectives of macroprudential policy, as outlined in the ESRB Recommendation on intermediate objectives and instruments of macroprudential policy (ESRB/2013/1). The analysis is based on both quantitative and qualitative analysis, including the results of stress tests for the main sectors, model projections and data available to the ESRB Member Institutions.



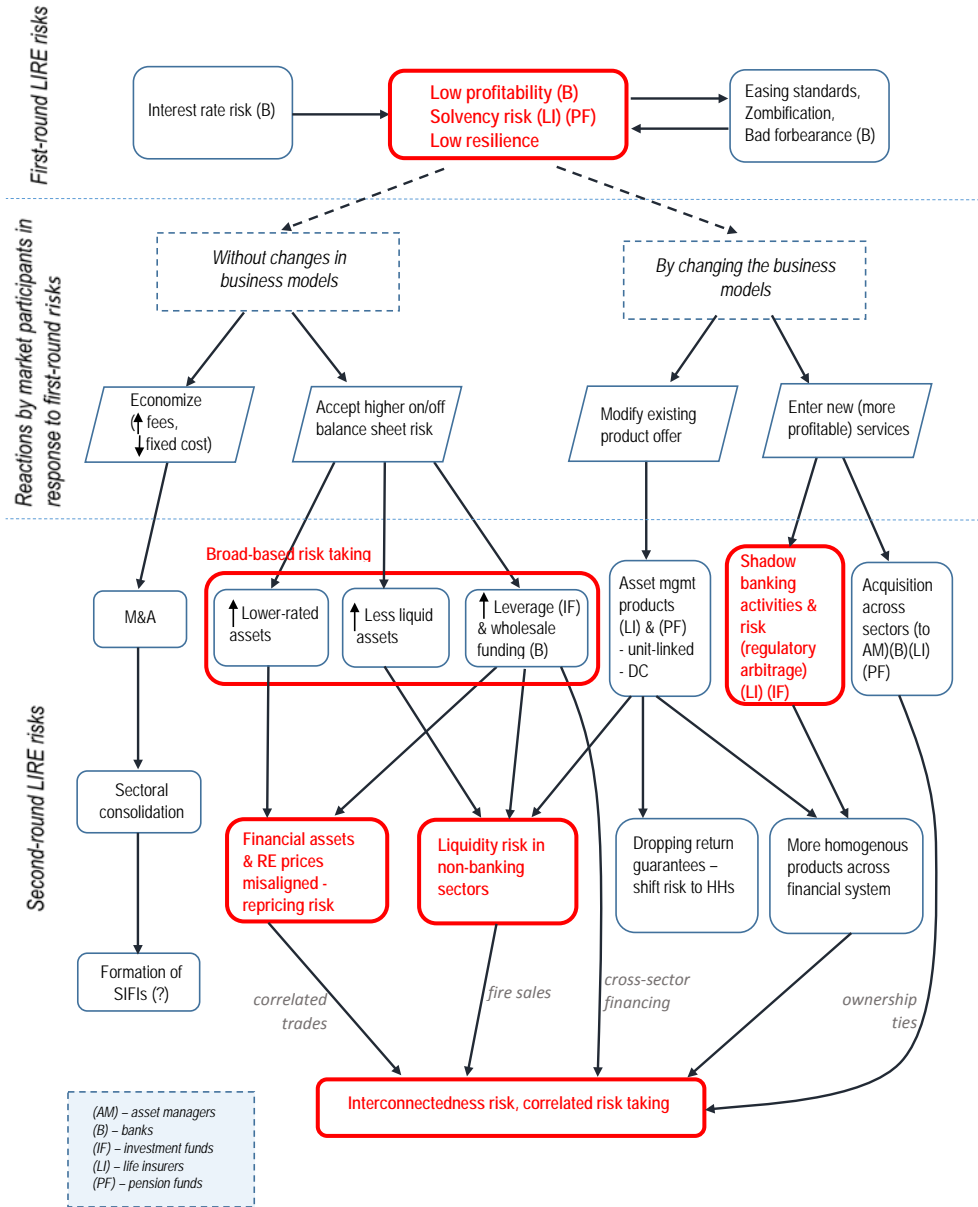
	Back to normal					
	Banks	Insurance companies, pension funds	Investment funds	Markets	Real economy sectors	Cross-sectoral / system-wide aspects
Resilience	<ul style="list-style-type: none"> Risks related to banking book portfolios originated in the low yield environment, including <ul style="list-style-type: none"> risk of impaired loans (higher debt servicing costs for floating rate loans, refinancing); interest rate risks in the banking book (where fixed-rate loans dominate), leading to negative NIM 		Risks related to un-winding of activities undertaken in the low yield environment		Risk of balance sheet impairments for non-financial firms and households due to higher debt servicing costs and asset revaluation	Interest rate risk as a macroeconomic risk that can hardly be hedged at a systemic level Correlation of interest rate, credit, and counterparty risk implies feedback loops negatively impacting resilience
Credit / financial cycle	Risk of lower credit supply due to NPL and forbearance overhang (related to risk of impairments due to increase in rates, see dimension resilience above)			Risk of asset re-valuations (induced by gradual increases of interest rates), exacerbated by low market liquidity.		Risk of asset re-valuations leading to synchronised unwinding of activities undertaken in the low yield environment by institutions from multiple sectors negatively impacting stability across the financial system
Funding, liquidity / maturity transformation	Refinancing risk (e.g., debt securities) due to broad-based deleveraging in other financial sectors		Redemption risk	Risk of a drying-up of market liquidity as an amplifying factor for asset price revaluation		Materialization of funding and liquidity (including redemption) risks could amplify asset revaluations
Risk concentration / market structure						
Interconnectedness				Risk of high correlation across asset classes especially in declining markets Risk of deleveraging phases when adjusting back to normal		Risk of contagion from shadow banking sector stress due to rising rates to the rest of the financial system

Source: Technical Documentation, Section E, Chart A.33 in the Annex. Note: The table is based on the results of the sectoral risk assessment included in the Technical Documentation, Sections A-D. The table only shows material financial stability risks where policy options need to be explored (marked in red) and financial stability risks which do not require immediate policy action, but need to be monitored (marked in yellow). The risk dimensions (first column) relate to the intermediate objectives of macroprudential policy, as outlined in the ESRB Recommendation on intermediate objectives and instruments of macroprudential policy (ESRB/2013/1). The analysis is based on both quantitative and qualitative analysis, including the results of stress tests for the main sectors, model projections and data available to the ESRB Member Institutions.



Appendix E

Interrelations among financial stability risks



Source: Joint ATC/ASC/FSC Task Force on "Macprudential Issues and Structural Change in a Low Interest Rate Environment".



Appendix F

Policy options

Policy actions to mitigate risks in the low interest rate environment should take a holistic and system-wide perspective. This is necessary in order to take the interrelated nature of identified risks into account, address the financial system as a whole and mitigate regulatory arbitrage. Macroprudential policies seek to mitigate systemic risk and safeguard financial stability. They may support other policy areas through the use of instruments which enhance the resilience of financial institutions and market structures, and by guaranteeing robust financial intermediation to the real economy, which generates confidence in the financial system itself and promotes sustainable growth. The policies suggested in this report were selected to mitigate key identified risks in the low interest rate environment, taking into account existing EU-wide and national regulations, as well as reforms due to come into force in the near future. While the focus of the report is on macroprudential policies, other measures may be relevant, such as raising consumer awareness of risks, and aligning incentives to address excessive risk-taking or reliance on shorter-term debt funding, through tax policies.

For the risks identified in the Technical Documentation, Sections A-E, policies are proposed for the following three domains: sustainability of business models, broad-based risk-taking, and risks related to changes in the financial system structure. Policy proposals generally apply to risks and vulnerabilities identified under the “low for long” scenario, although in most cases they also apply to the “back to normal” scenario. Besides, the policy options outlined in this report include measures that could be taken in the short term, and which in some cases are already being developed in existing ESRB projects, as well as longer-term projects to identify, assess and mitigate systemic risk. The report recognises that different time frames are needed to implement specific policy measures.

The policy proposals are summarised over the following two pages and then explained in more detail. In order to prioritise the proposals, the focus of policy remains on currently observed risks, while policies related to conjectured risks are treated as slightly less urgent.



A. Policies to address currently observed risks			
	Nature of actions to be taken	Sector/risk dimension	What type of actions needs to be taken
A. Sustainability of business models	Enhance resilience of entities, accounting for interest rate risk	Insurance companies (resilience)	A.1.1.1: The ongoing implementation of Solvency II and its future review should address risk from the protracted low interest rate environment by reviewing the risk-free rate, and in particular the ultimate forward rate methodology, taking a macroprudential perspective, as well as relevant areas in the long-term guarantee package. The use of additional prudential tools should also be explored, including the power to request a reduction in the maximum level of interest rate guarantees offered in new contracts, the power to cancel or defer dividend distributions (even before the SCR has been breached) and introduce discretionary benefit limitation options, and the power to increase resilience by retaining more capital.
		Pension funds (resilience)	A.1.1.2: To endorse EIOPA's Opinion recommending the strengthening of EU regulation applicable to pension funds with a common framework for risk assessment and transparency, including the market-consistent valuation of liabilities and an evaluation of additional funding (including sponsor support). To further investigate the interaction and potential systemic impact of (underfunded) pension funds on the real economy, including via future stress tests, taking differences between Member States into account.
		Banks (resilience)	A.1.1.3: Harmonised assessment and regulation of interest rate risk in the banking book through swift implementation into EU law (CRR/CRD) of the BCBS guidance.
	Resolve or consolidate unsustainable entities	Banks (resilience)	A.1.2.1: Finalise the resolution framework under the BRRD on country and EU levels.
		Insurance companies	A.1.2.2: Develop effective recovery and resolution procedures for insurance companies (at national and EU level) whose business models prove unviable, including exploring legal options for modifying the terms of existing contracts with guaranteed returns as part of the resolution process, and as a measure of last resort if other instruments like guarantee schemes have proved insufficient and the modification is in the interest of policyholders.
	Cross sectional/system wide (resilience)	A.1.2.3: Evaluate the consistency of resolution regimes across borders and sectors (to ensure their efficiency and minimise costs/cross-sectoral spillovers)	
B. Broad-based risk taking	Enhance monitoring of risk taking	Markets (credit & financial cycle)	A.2.1.1: Enhance the monitoring of financial and real asset valuations, with a view to strengthening early warning systems and communication (e.g. by giving it more prominence in the Risk Dashboards and in the work programmes of relevant institutions).
	Enhance resilience to risk revaluation	RRE/CRE price misalignment (credit & financial cycle)	A.2.2.1: Implement, on a country-specific basis, macroprudential measures (LTV, DTI, etc.) to strengthen resilience to risk revaluation and pre-empt the build-up of imbalances and systemic risks from the relaxation of lending conditions. A.2.2.2: Adopt, on a country-specific basis, prudent lending principles across real estate lenders, including loan affordability tests, (accounting for the impact of interest rate changes) and collateral valuation standards.

Source: Joint ATC/ASC/FSC Task Force on "Macroprudential Issues and Structural Change in a Low Interest Rate Environment".



B. Policies to address currently conjectured future risks			
	Nature of actions to be taken	Sector/risk dimension	What type of actions needs to be taken
B. Broad-based risk taking	Enhance monitoring of risk-taking	Markets (interconnectedness)	B.1.1.1: Enhance data sharing, analysis and risk monitoring related to interconnectedness across the EU financial system in order to build knowledge of how risks are moved through different parts of the financial system, detect spillover channels and identify key nodes in the system (including, among others, SFT, collateral re-use and derivative exposures).
		Investment banks, shadow banking risks (resilience)	B.1.1.2: Consider increasing the disclosure requirements of investment funds and other non-banks to better monitor leverage (including synthetic leverage), liquidity conditions and funding positions, including Securities Financing Transactions (SFT), collateral re-use and derivative use, if required.
	Enhance resilience to risk revaluation	RRE/CRE price misalignment (credit & financial cycle)	B.1.2.1: Implement a monitoring framework for lending standards for all credit lending institutions, not limited to banks (framework to be strengthened over time as data gaps are being closed).
		Broad-based risk taking beyond capacity (resilience)	B.1.2.2: Review the need, within and across sectors, for increasing liquidity buffers or strengthening liquidity management tools B.1.2.3: Review the need, within and across sectors, to contain leverage to counter the risk of repricing effects and as a backstop limiting contagion risk (the precondition is to close data gaps)
C. Risks related to changes in financial system structure	System-wide stress tests	Markets (interconnectedness)	B.2.1.1: Increase cooperation and establish common ground across sectoral stress tests, with the ultimate goal of developing and implementing system-wide stress tests in the long term that include common shocks related to asset prices and liquidity
	Develop and strengthen macroprudential toolkit for non-banks and financial markets	Shadow banking risks, investment funds, liquidity risk in non-banking sector (resilience, funding and liquidity/maturity transformation)	B.2.2.1: Ensure cross-sector consistency to avoid regulatory arbitrage, by fostering activity-based regulation (complementing entity-based regulation). B.2.2.2: Support efforts aimed at developing a strategy for macroprudential policy beyond the banking system, including a review of the current framework for the regulation of leverage, liquidity and financing in the non-banking sector, with the aim of limiting systemic risk; the development of margins and haircuts as macroprudential instruments.

Source: Joint ATC/ASC/FSC Task Force on "Macroprudential Issues and Structural Change in a Low Interest Rate Environment".



A. Policies to address currently observed risks

A.1 Sustainability of business models

A.1.1 Enhance resilience of entities, accounting for interest rate risk

Proposed policy (short name)

Policy A.1.1.1: The ongoing implementation of Solvency II and its future review should address risk from the protracted low interest rate environment by reviewing the risk-free rate, and in particular the ultimate forward rate methodology, taking a macroprudential perspective, as well as relevant areas in the long-term guarantee package. The use of additional prudential tools should also be explored, including the power to request a reduction in the maximum level of interest rate guarantees offered in new contracts, the power to cancel or defer dividend distributions (even before the SCR has been breached) and introduce discretionary benefit limitation options, and the power to increase resilience by retaining more capital.

Description of the policy

The Solvency II Directive includes several measures for insurance products with long-term guarantees (LTG measures), with two purposes:

- to provide recognition in the solvency position of undertakings where they are not subject to spread risks (matching adjustment) due to insurance companies holding assets to maturity or to prevent pro-cyclical investment behaviour (volatility adjustment) due to insurance companies holding assets long term or to maturity;
- to give undertakings time to adapt to current and future temporary market conditions (e.g. through transitional measures and extensions of the recovery period) and to take appropriate strategic and management action.

The LTG measures aim to counter the unintended consequences and incentives resulting from a full market-consistent valuation, when applied to long-term business. Together with the ultimate forward rate (see below) these measures may have a significant impact on the value of the liabilities of insurers. The impact of the LTG measures must be assessed by EIOPA on an annual basis and Article 77f of the Solvency II Directive requires the European Commission to review the measures by 2021.

Article 77 of the Solvency II Directive states that the best estimate of the insurance liabilities is discounted using the relevant risk-free interest rate term structure. The level and the shape of that term structure in its extrapolated part will depend, among other parameters, on the level of the ultimate forward rate (UFR). A low interest rate environment has an impact on the level of the UFR (which should be reviewed given the probability of a prolonged period of low interest rates) as well as on real GDP growth which will be lower than currently assumed (given that the assumed level of long-term real interest rates used in the current UFR calculation implies real GDP growth of 2.2%, while the protracted low interest rate environment implies a significantly lower value – see also Technical Documentation, Section A and the Final Report).

Implementing appropriate methodology that produces a UFR at the right level is crucial to obtaining an accurate view of the solvency and financial strength of insurers. Additionally, the convergence period and the last liquid point are also key parameters for the shape of the RFR curve and, as such, these parameters should also form part of the scope of this review.



In order to pre-empt the risk of widespread failures of life insurers in a low interest rate environment, it is proposed to explore within the on-going Solvency II review the relevance of macro-prudential tools to countercyclically address risks, in addition to those already existing (for example, symmetric adjustment to the equity capital charge, extension of the recovery period), and includes:

- the power to request a reduction in the maximum level of interest-rate guarantees offered in new contracts;
- tools aimed at retaining capital, such as the power to cancel or defer dividend distributions and introduce discretionary benefit limitation options, even before the Solvency II solvency capital requirement (SCR) has been breached and even if the current dividend distribution does not threaten the fulfilment of the SCR in the short-run;
- the power to retain more capital (or to impose a capital add-on) due to the situation in financial markets, in order to increase resilience for macroprudential purposes.

Links to identified risks

Resilience of insurance companies: low interest rates may challenge the sustainability of certain business models. Although transitional measures from the LTG package are not directly linked to low interest rates, the use of these measures can have a significant impact on insurers' solvency. The level of the UFR takes into account expectations of the long-term real interest rate, so a prolonged period of low interest rates under macroeconomic conditions such as those under the "low for long" scenario would have a direct impact on UFR via interest rates expectations.

Proposed policy (short name)

Policy A.1.1.2: To endorse EIOPA's Opinion recommending the strengthening of EU regulation applicable to pension funds with a common framework for risk assessment and transparency, including the market-consistent valuation of liabilities and an evaluation of additional funding (including sponsor support). To further investigate the interaction and potential systemic impact of (underfunded) pension funds on the real economy, including via future stress tests, taking differences between Member States into account.

Description of the policy

EIOPA recommends, in an Opinion to the EU institutions dated April 2016, the strengthening of EU regulation applicable to pension funds (i.e. the IORP Directive) by introducing a common framework for risk assessment and transparency. According to that Opinion, which the ESRB should fully endorse given the risks and vulnerabilities identified in a period of low interest rates, pension funds:

- should value their balance sheets on a market-consistent basis and include all security and benefit adjustment mechanisms, including sponsor support, pension protection schemes and benefit reductions;
- should conduct a standardised risk assessment by applying common, pre-defined stress scenarios to the balance sheet;
- should be transparent through public disclosure of the market-consistent balance sheet and the outcomes of a standardised risk assessment, where appropriate.

EIOPA recommends not amending the existing funding/capital requirements for pension funds at this time.

The proposed policy would provide better insight as to the impact of the low interest rate environment as it would allow for a comparable, market-consistent view of pension liabilities, the



funding situation of pension funds and the need for future sponsor support and benefit adjustments under current and stressed circumstances.

It may be beneficial to study in depth the potential systemic impact of (underfunded) pension funds on the real economy, taking differences between Member States into account. It is also possible that, in common with other long-term investors, pension funds will search for yield in a prolonged low yield environment, so further assessment will be needed to determine pension funds' investment behaviour and the risks this may create, the pro- or counter-cyclical impact on the financial system, or the long-term effects on pension funds' resilience. To this end, providing access to relevant data should be emphasised. One of the most important tools for assessing the resilience and potential vulnerabilities of pension funds is carrying out regular, relevant stress tests at European and national level, maintaining consistency with stress tests in other parts of the financial system.

Links to identified risks

Resilience of pension funds: low interest rates may challenge the sustainability of defined benefit pension funds. Furthermore, sponsoring entities may face high financial burdens due to defined benefit (DB) pension fund deficits in an environment of low interest rates or, in Member States where that is legally possible, members could face significant reductions in future benefit payments, possibly impairing households' future retirement income and increasing the need for additional pension savings.

Proposed policy (short name)

Policy A.1.1.3: Harmonised assessment and regulation of interest rate risk in the banking book through swift implementation into EU law (CRR/CRD) of the BCBS guidance.

Description of the policy

Interest rate risk in the Banking Book (IRRBB) is usually assessed over two dimensions: how sensitive the Economic Value of Equity of a bank's Banking Book is to interest rate changes (EVE approach) and how sensitive the Net Interest Income of a bank is to interest rate changes (Earnings or NII approach).

The two approaches have partly conflicting objectives: the minimisation of NII volatility is best pursued by a "fixed-rate" balance sheet structure, while the minimisation of EVE volatility discourages the assumption of long-term fixed-rate assets, given the relatively scarce supply of long-term fixed-rate liabilities.

The current treatment of IRRBB in the EU (i.e. CRR/CRD package) dates back to BCBS principles set out in 2004 and complemented by EBA Guidelines in 2015. Both documents focus on the stability of the Economic Value of Equity, for which it is easier to establish a link to capital requirements. In particular, banks are expected to incur capital consequences when EVE volatility, in the event of a parallel shock in IR, exceeds a threshold of 20% of total regulatory capital.

The Basel Committee has recently published revised standards tightening the above threshold to 15% of Tier 1 capital and prompting banks to disclose their risk in accordance with standardised templates and a few mandatory calculation assumptions. The Basel Committee has also set out additional qualitative criteria that banks should take into account in their risk management practices and that supervisors should enforce during their supervisory reviews.

EU authorities will have to incorporate the revised IRRBB standards into EU law – possibly through the forthcoming update of the CRR/CRD package. However, given that discussions on implementation in the EU have not yet begun, EU implementation of the standards might be



delayed beyond the BCBS deadline of 1 January 2018. The EBA will probably be asked to update its existing guidelines for the management of IRRBB (2015).

Links to identified risks

Resilience of banks: banks' business models may be called into question during a prolonged period of low interest rates – this policy proposal is especially relevant for the “low for long” scenario. Indeed, the suppressed risk premia in the low interest rate environment incentivises banks to take more term risk (duration mismatch risk). In addition, given that significant changes in exposure to IRRBB can only be made over a long-term horizon, an increase of banks' resilience to rising IRRBB and rising risk premia should be implemented soon, even under a “low for long” scenario. For the “back to normal” scenario, the proposal should help to increase resilience to the potentially negative impact of an interest rate increase.

A.1.2 Resolve or consolidate unsustainable entities

Proposed policy (short name)

Policy A.1.2.1: Finalise the resolution framework under the BRRD on country and EU levels.

Description of the policy

In an environment where persistently low interest rates may render the business models of some banks in the EU unsustainable, it is essential that failing institutions can be resolved in an orderly manner, without generating further stress in the financial system. With this in mind, the Bank Recovery and Resolution Directive (BRRD) provides an EU-wide framework for the recovery and resolution of banks in distress. This Directive is a major step forward in regulatory reform as it aims to strengthen financial institutions' resilience, even during economic downturns, and provides the tools, processes and governance to manage failures in an orderly and structured manner, while avoiding spillover effects in the economy.

However, there is still a certain degree of uncertainty regarding some aspects of the procedures for recovery and resolution, which would benefit from clarification. Examples of areas requiring further clarification which are the object of legislative review are (a non-exhaustive list): TLAC/ MREL calibration and quality, consistent application of bail-in rules and creditor hierarchy. Contact with market participants often reveals regulatory uncertainty, in particular on the implementation of the BRRD. In addition, the Level 2 legislation derived from the BRRD must be finalised on time, according to the calendar set by the BRRD, in order to anchor the expectations of market participants and to ensure an operational resolution framework for EU banks in the short term.

A partial implementation of the BRRD provisions would be seen by the markets as a failure to achieve a common resolution framework for banks, which could lead to further turbulence as uncertainty about the viability of certain institutions grew. That would become even more acute if differences across EU countries in the level of application of the BRRD were perceived by market participants.

Links to identified risks

Resilience of banks: broad-based pressure on profitability and solvency lowers system resilience and increases failure risk for unsustainable business models. In this context, a fully operational recovery and resolution regime is needed to allow the orderly exit of failing institutions.



Proposed policy (short name)

Policy A.1.2.2: Develop effective recovery and resolution procedures for insurance companies (at national and EU level) whose business models prove unviable, including exploring legal options for modifying the terms of existing contracts with guaranteed returns as part of the resolution process, and as a measure of last resort if other instruments like guarantee schemes have proved insufficient and the modification is in the interest of policyholders.

Description of the policy

In a prolonged period of low interest rates, the lack of adequate returns to meet liabilities with higher guaranteed returns will lead to a slow deterioration of insurance companies' balance sheets until they breach their minimum capital requirements. These companies may eventually become insolvent if additional capital is not provided. As insolvency can trigger other actions that cause further loss of value to the insurance company, policyholders may be better off accepting a modified contract with lower benefits, in order to avoid insolvency.

In a situation where a recovery and resolution (R&R) framework is being set up for an insurance undertaking, it may be worth exploring the possibility of giving the authorities in charge of resolution the power to restructure insurance liabilities as a measure of last resort.

In the event of resolution, this tool would allow authorities to minimise losses for policyholders (compared to the losses generated by the insolvency of the insurance undertaking). It foresees a "scaling ladder" for intervention, without overriding existing policyholder protection schemes. Furthermore, this measure could facilitate the recovery of the insurance undertaking by reducing its liabilities.

The instrument could be considered in a future R&R directive, following the model of the BRRD for banks.

This R&R framework would address: (i) recovery and resolution planning, (ii) early intervention, (iii) resolution tools and powers, and (iv) insurance guarantee schemes. An EU-wide solution, probably in the form of common minimum features for the procedures, with due flexibility allowed for smaller insurers, would be needed to adequately consider insurers with cross-border activities as well as regulatory costs for smaller institutions.

Links to identified risks

Resilience of insurance companies: broad-based pressure on profitability and solvency lowers system resilience and increases risks of failures for unsustainable business models.

Proposed policy (short name)

Policy A.1.2.3: Evaluate the consistency of resolution regimes across borders and sectors (to ensure their efficiency and minimise costs/cross-sectoral spillovers)

Description of the policy

The main objective of this policy proposal is to ensure that resolution regimes in different areas of the financial system are consistent with each other and do not raise systemic risk in other sectors, e.g. by causing domino effects or by treating some creditors more benignly than others. Besides, the expected expansion of shadow banking activities³⁸ means that the costs and benefits of

³⁸ For the scope of the term "shadow bank" here and in the rest of the appendix, please refer to footnote 28.



institutions offering similar products or services should receive level-playing field treatment from a regulatory point of view. This also applies to recovery and resolution.

Consistency among resolution regimes could reduce contagion across sectors via spillovers and should ensure a more level playing field for EU financial institutions.

Links to identified risks

System-wide resilience of financial institutions: broad-based pressure on profitability and solvency lowers system resilience and increases risks of failure for unsustainable business models, impacting several sectors simultaneously.

A.2 Broad-based risk-taking

A.2.1 Enhance monitoring of risk-taking

Proposed policy (short name)

Policy A.2.1.1: Enhance the monitoring of financial and real asset valuations, with a view to strengthening early warning systems and communication (e.g. by giving it more prominence in the Risk Dashboards and in the work programmes of relevant institutions).

Description of the policy

The ultimate objective of the policy is to develop a more formalised risk monitoring system co-ordinated by the ESRB, highlighting – and as much as possible, quantifying – risks related to asset valuations. There are two possible, and complementary, ways of achieving this. One is to give more prominence in the work programmes of relevant institutions to developing methods for monitoring and assessing asset valuations more effectively. The other could be to increase the weight of related information in the relevant Risk Dashboards.

On the basis of this formal evaluation, the communication of perceived risks to stakeholders or the public could also be considered.

If the asset price communication system could contribute to avoiding the formation of, or where necessary to orderly deflate, asset price bubbles, large benefits could be obtained, although designing such a system would be difficult.

The ESRB, in consultation with the relevant authorities, could accordingly explore whether it is worth establishing such a formalised risk monitoring system. A communication system could also receive the results of market-wide stress tests as well as those of stress tests for individual entities or sectors.

The added value of the proposal is that it could coordinate risk identification and assessment. It could also clarify links between risks and the real economy as well as the need to inform the general public of potential asset price misalignments in a clear and concise manner. Given the national specificities dominating certain markets (like real estate) an attempt should be made to involve national macroprudential authorities closely and actively in the process.

Links to identified risks

Credit and financial cycle: risk of asset price misalignments, which can lead to abrupt revaluations in case of an increase of risk premia, and risks related to the build-up of imbalances in residential and/or commercial real estate.



A.2.2 Enhance resilience to risk revaluation

Proposed policy (short name)

Policy A.2.2.1: Implement, on a country-specific basis, macroprudential measures (LTV, DTI, etc.) to strengthen resilience to risk revaluation and pre-empt the build-up of imbalances and systemic risks from the relaxation of lending conditions.

Description of the policy

Each macroprudential authority should implement a sound and comprehensive system to monitor lending standards parameters (e.g. limits to LTV, DSTI, LTI ratios and maturity in the case of retail housing loans). The extent of the monitoring should be proportionate and tailored to the level of risk in each country, ensuring that tail risks (e.g. the share of loans with high LTV and DSTI) are adequately captured.

Basic principles and definitions should be harmonised, following the ESRB Recommendation on closing real estate data gaps and should be complemented by those credit standard indicators considered relevant at national level. In particular, when vulnerabilities are found, national macroprudential authorities are expected to intervene in the following areas:

1. Lending standards for Commercial Real Estate (CRE) financing: Awareness of the fragmentation of the CRE sector across countries could lead macroprudential authorities to consider intervening in countries where elevated risks have been identified in the CRE sector (due to already high indebtedness, loose lending standards and increasing concentration risk). Specifically, debt-to-equity caps could be introduced to discourage speculative strategies (highly leveraged projects).
2. LTV / LTI / DTI / DSTI limits: Borrower-based instruments should be considered in cases where risks in Residential Real Estate (RRE) have been identified.
3. Maturity limits and amortization requirements³⁹: Countries with risks stemming from large indebtedness or high growth in indebtedness should ensure that loans are gradually repaid. This can be ensured by requiring loans to be amortised by regular monthly instalments or by setting a maturity limit by which the loan should be fully repaid. The maturity limit should take into account the riskiness of the loan and the capacity of the borrower to meet repayments (mainly with respect to any potential decrease in customers' income on retirement). Unless they can be specifically justified, bullet loans – loans with significantly deferred or temporarily decreased payments – should not be granted at all. Alternatively, minimum amortisation rules should be set at certain periods. Loans secured by financial collateral (i.e. not representing a net debt) could be exempted from this requirement.
4. Risk weights Articles 124/164 CRR: Pursuant to Article 124 (164) of CRR competent authorities may set higher risk weights (minimum loss given default (LGD) values) or set stricter criteria, where appropriate, for exposures fully and completely secured by mortgages, on the basis of financial stability considerations. Stricter criteria can take the form of, for example, (i) a limit to preferential treatment for owner-occupied properties only (excluding

³⁹ Maturity limits are already in force (non-exhaustive list), by CZ (since June 2015), EE, LT (since September 2011 and further tightened in 2015), NL, PL (since 2014), RO (for consumer loans, since 2011) and SK (since March 2015), and amortisation requirements have already been implemented by DK, NL, SK (since March 2015) and SE (since 2016).



rental properties); (ii) the exclusion from preferential treatment of properties owned by multi owners; or (iii) a modification of the thresholds for Market Value or Loan to Value. According to the list published on the EBA website (last updated on 07/06/2016) these instruments have already been implemented in HR, IE, MT, NO, RO, SE and the UK.

These policies are closely interrelated: the borrower-based instruments may be used in conjunction with lender-based instruments, like add-ons to risks weights.

Links to identified risks

Credit and financial cycle: Low interest rates are conducive to an increase in loan volumes as they foster loan creation, as long as credit demand is not suppressed by low economic growth. Lower credit standards may therefore be incentivised, reducing asset quality in the long run (especially if a borrower's net worth is overestimated due to collateral mispricing or incorrect income expectations in the low rate environment).

Proposed policy (short name)

Policy A.2.2.2: Adopt, on a country-specific basis, prudent lending principles across real estate lenders, including loan affordability tests, (accounting for the impact of interest rate changes) and collateral valuation standards.

Description of the policy

Measures relating to lending standards should be included in the standard toolkit of all national macroprudential authorities. Each Member State should therefore ensure that its macroprudential authority has the power to implement such measures (as a minimum, LTV limits including sound real estate valuation principles, LTI/DSTI limits including loan affordability tests for a possible interest rate jump and maturity/amortisation limits).

The affordability tests should verify whether the customer would still be able to repay his/her debt in the event of an interest rate increase, if the interest rate is not fixed to maturity. Any DTI/DSTI limit should be met even if the payment increases due to the higher interest rate. The test can be applied as a recalculation of the regular payment for a certain interest rate increase. It should be applied to new loans and to all existing loans where the interest rate is not fixed to maturity. For FX mortgage loans, an exchange-rate shock should be included.

National authorities are advised, in addition to the general principles laid down in Article 209 of CRR and Article 19 of MCD, to adopt further measures in respect of standards for the valuation of residential immovable property. Possibilities that could be explored further include (i) the valuation should not be higher than the market value; (ii) the value of the property should be adjusted mostly downwards; (iii) haircuts/tighter LTV limits could be applied if the market has risen in previous years; (iv) haircuts/tighter LTV limits could be applied if the property price is well above the average price for similar properties in the same neighbourhood; and (v) guidelines should be defined for ascertaining the independence of the valuation. For the sound implementation of LTI/DSTI limits, national authorities are recommended, in addition to Articles 125 and 126 of CRR and Article 18 of MCD, to adopt further valuation measures, e.g. a DTI cap/minimal level of residual income, or creditors should be required to take a retirement period into account if it is relevant during the credit life.

Links to identified risks

Credit and financial cycle: A low interest rate environment creates an opportunity for households to borrow extensively at variable rates, although they may be exposed to increases in short-term rates. In this case low interest rates increase indebtedness rather than decrease the debt service burden. In the absence of sensitivity tests, the affordability assessment might be overoptimistic and



households may not be able to repay their variable-rate debt when interest rates rise again. Furthermore, households that have borrowed extensively against income at variable rates in the current low interest rate environment may be exposed to an increase in short-term rates under the scenario. Depending on how much mortgage debt servicing costs increase, households may not be able to repay their debt. These risks might be amplified by a worsening economic situation (which is mainly relevant if rising interest rates relate to a rising spread rather than a rising risk-free rate). Banks should regularly monitor their exposure to such risks and adjust their lending policies accordingly if these vulnerabilities are detected.

B. Policies to address conjectured future risks

B.1 Broad-based risk-taking

B.1.1 Enhance monitoring of risk-taking

Proposed policy (short name)

Policy B.1.1.1: Enhance data sharing, analysis and risk monitoring related to interconnectedness across the EU financial system in order to build knowledge of how risks are moved through different parts of the financial system, detect spillover channels and identify key nodes in the system (including, among others, SFT, collateral re-use and derivative exposures).

Description of the policy

Multiple risks result from market interconnectedness and the dynamics of asset and funding markets (see also Technical Documentation, Section D). Making full use of available data across EU countries is therefore a precondition for implementing activity-based monitoring to complement an entity-based approach. To that end data exchange among relevant institutions, fully respecting confidentiality, should be fostered and used as effectively as possible, in order to enrich an understanding of interconnectedness across the EU financial system. This heightened analysis of financial markets will allow the timely identification of market participants displaying concentrated exposures or a high turnover in securities or derivatives. A regular assessment of changes in the resilience of market liquidity is also essential for supervising the prudent valuation and risk management of market participants (including the extent of liquidity transformation, redemption risk and potential fire sales).

It is particularly important to monitor and analyse turnover volumes and concentrated market shares in High Quality Liquid Assets, unsecured bank funding markets, MMF and ETF, and OTC derivatives. There should be special focus on assets prominently used as collateral. Data should cover both traditional entities and alternative or new liquidity providers and trading platforms, and should also enable regulators to assess the impact of algorithmic trading on the resilience of market liquidity. MIFID and other data have been used to analyse the liquidity of individual securities and asset classes, e.g. by the EBA (2013).⁴⁰ On this basis the regular EU monitoring of liquidity risks should be extended, and country level assessments should be considered.

⁴⁰ For example, EBA (2013), *Report on appropriate uniform definitions of extremely high quality liquid assets (extremely HQLA) and high quality liquid assets (HQLA) and on operational requirements for liquid assets under Article 509(3) and (5) CRR*, December 2013.



The monitoring of collateral re-use activity is essential to improve the transparency of this interconnectedness channel. This could be explored where the additional reporting of such activities is warranted in the non-banking sectors (banks already report quarterly collateral re-use activity under the asset encumbrance reporting regime) bearing in mind that re-use in the context of securities financing markets is reported under SFTR.

In addition to supporting the ongoing assessment of various identified risks (also via stress testing), data and indicators derived from MIFID, EMIR and other sources could be used to guide the activation, calibration and impact assessment of macroprudential instruments – specifically for liquidity and funding risks.

Links to identified risks

Interconnectedness and cross-sectoral resilience: Broad-based risk-taking beyond risk bearing capacity (search for yield) can take the form of accumulating concentrated positions in increasingly illiquid assets. Adequate data on the resilience of market liquidity are required in order to assess the liquidity of assets held.

Cross-sectoral resilience and system-wide aspects: Risks relate to the expansion of shadow banking activities. Monitoring should include the build-up of liquidity risks within this sector as well as from the links between entities and other financial sectors; increased leverage in this sector could imply less resilience of market liquidity and a higher probability of fire sales.

Cross-sectoral funding and liquidity: Adequate data are required to assess the extent of homogeneity in risk-taking by market participants and its potential impact on the resilience of financial markets and liquidity.

Proposed policies (short name)

Policy B.1.1.2: Consider increasing the disclosure requirements of investment funds and other non-banks to better monitor leverage (including synthetic leverage), liquidity conditions and funding positions, including Securities Financing Transactions (SFT), collateral re-use and derivative use, if required.

Description of the policy

With evidence of receding supply of liquidity services in market segments, a prolonged environment of low interest rates would be conducive to a search for yield and leverage, and would increase vulnerabilities to pro-cyclical asset price developments and contagion across markets. In this context particular attention should be given to the assessment of investment fund liquidity and leverage risks, particularly those risks stemming from secured funding and derivative transactions. Contingent on existing regulations with regard to disclosure requirements, it should be ensured that financial institutions providing financial services similar to those provided by banks and insurance companies provide adequate information on their governance and ownership, incentive schemes, portfolio exposures, funding structures, counterparties disclosure, and risk assessments. This is also with a view to assessing the scope for regulatory arbitrage. Some of this information may be reported confidentially to supervisors, without triggering its dissemination to third parties or the public.

1. Evaluation of current disclosure requirements for investment fund liquidity risks: Assessment of existing disclosure requirements, in particular where funds are open ended and offered to retail investors, to determine whether additional disclosure is needed. Investor disclosure could clarify the potential impact of low liquidity in portfolio holdings on investment fund return volatility. Moreover, it could improve the assessment of fund managers' ability to use specific



tools or exceptional measures that affect investors' redemption rights. This could usefully be coordinated with – or be contingent on recommendations made by – the FSB.

2. Evaluation of current disclosure requirements regarding leverage risk in investment funds within and across relevant EU regulations: In order to assess the effectiveness of leverage disclosures in EU directives, an evaluation should be made of how they have been implemented across different jurisdictions in the EU. Initial analysis performed by the ESRB highlights significant cross-country differences in the availability of leverage measures across EU Member States, as well as wide variations in disclosure practices across jurisdictions with regard to the frequency, lag of reporting and reporting detail under the provisions of AIFMD and UCITS.

Together with ESMA, the ESRB could engage with international organisations such as the FSB and IOSCO, in order to assess the feasibility of developing, for macroprudential purposes, a harmonised definition and measurement of leverage across the investment fund sector. Despite the challenges, this work should continue to aim to develop a set of consistent measures for macroprudential purposes.

Links to identified risks

Resilience of investment funds: risks arising from increased leverage (search for yield).

Funding and liquidity of investment funds: increased liquidity and redemption risk due to investment in less liquid assets and a shift into bank-like saving products, while preserving easy redemption.

Cross-sectoral funding and liquidity: liquidity risk in non-banking sectors accompanied by less diversity (more homogeneous risk-taking).

B.1.2 Enhance resilience to risk revaluation

Proposed policies (short name)

Policy B.1.2.1: Implement a monitoring framework for lending standards for all credit lending institutions, not limited to banks (framework to be strengthened over time as data gaps are being closed).

Description of the policy

A prolonged period of low interest rates may give rise to broad-based risk-taking within the EU financial system and a search for products offering higher returns (albeit with higher risks). This risk-taking may exceed the risk-bearing or risk management capacities of both financial firms and individuals, who may not be able to withstand the losses related to these products in the event of price reversals.

In order to enhance the resilience of the whole financial system to potential losses from risky investments, the macroprudential authorities in each Member State could implement a monitoring framework for lending standards. Segments of the financial system where risk appetite and lending are growing significantly and which require careful attention could then be identified ex ante.

Although it is expected that, in the short term, the monitoring framework for lending standards will focus on banks and their lending to the real estate sector (see Policy A.2.2.2), the expected structural change in the EU financial system, with an increasing weight of non-banks in lending activities, means that the framework should be extended gradually to other financial institutions. The scope of the monitoring framework should also be widened to include lending beyond the real estate sector in order to monitor any incentives for lenders to lower credit standards or take on excessive risks.



Widening the scope of the monitoring framework for lending standards requires a major improvement in the information currently available to regulators. Quantifying lending standards is a challenging task that requires intensive statistical sampling work based on assumptions and estimates. While monitoring frameworks already exist for bank lending standards in the EU, their scope can only be extended to other sectors of the financial system once existing data gaps have been closed and sufficient statistical work has been completed.

Links to identified risks

Credit and financial cycle: While low interest rates support increases in loan volumes, lower credit standards may be incentivised, reducing asset quality in the long run. The relative uncertainty as to how long the period of low interest rates will continue may contribute to a relaxation of credit standards. This trend may be seen in exposures to the real estate sector and longer-term trends could also extend to exposures in other sectors. Also, in a context of broader risk-taking, the trends could extend to credit intermediaries other than banks.

Proposed policies (short name)

Policy B.1.2.2: Review the need, within and across sectors, for increasing liquidity buffers or strengthening liquidity management tools

Description of the policy

An assessment of the vulnerabilities arising from a prolonged period of low interest rates suggests that increased risk-taking by multiple institutional sectors may create a risk of abrupt price reversals and may cause liquidity to dry up in the financial markets. Stressed market conditions could trigger larger-than-normal redemptions and herding behaviour by investors, with concomitant risks to financial stability. The EU regulatory framework provides tools to manage liquidity risks (for banks, insurers, asset managers and other types of financial institutions).

However, the persistence of low interest rates over time and the potentially negative consequences of adverse liquidity shocks justify a review of liquidity regulation across sectors and across countries, in particular in cases where the framework is not fully harmonised at EU level (for example heterogeneities exist across jurisdictions in respect of investment funds' options for reacting to redemption stress and the disclosure obligations of open-ended funds to retail investors).

In the banking sector, the Liquidity Coverage Ratio has been recently introduced and the Net Stable Funding Ratio will be introduced in the EU after its legislative proposal by the EC by the end of 2016.

In the insurance sector, liquidity risk is covered, together with other risks, by Solvency II.

For asset managers, two important regulations to consider in this context include UCITS and the AIFMD. UCITS contains asset diversification requirements and eligible asset rules which provide that UCITS funds must invest in liquid assets and that the suspension of redemptions can take place on a fund's own initiative or following a request from the competent authorities, and if in the public's or investors' interests (Article 84). Under the AIFMD, AIFs must demonstrate that appropriate liquidity management systems match the funds' investment strategy, redemption policy and liquidity profile. AIFs must also maintain an appropriate level of liquidity for the fund's obligations (i.e. its liabilities). In addition, stress tests should be performed to assess liquidity risk. A range of other liquidity management tools is also available including gates, side-pockets and the suspension of redemptions. Some of these tools can be implemented following a request from the competent authorities (Article 46).



The proposed review could start with an evaluation of the liquidity management tools provided for in EU directives, across sectors, for the purposes of macroprudential policy (also covering cross-country frameworks if there is no EU-wide framework). Details worth assessing could include, in particular, whether available liquidity management tools can be effectively used for macroprudential purposes, to deal with large, concurrent and uncoordinated withdrawals from funds. Such an assessment might consider: i) the scope for using liquidity management tools; ii) the effectiveness of such tools; and iii) the conditions under which authorities should deploy these tools.

Links to identified risks

Cross-sectoral and system-wide liquidity: emergence of an increase in liquidity risk in non-banking sectors accompanied by less diversity (more homogeneous risk-taking).

Resilience of investment funds: risks arising from increased leverage (search for yield).

Funding and liquidity of investment funds: increased liquidity and redemption risk due to investment in less liquid assets and a shift into bank-like saving products while preserving easy redemption.

Proposed policies (short name)

Policy B.1.2.3: Review the need, within and across sectors, to contain leverage to counter the risk of repricing effects and as a backstop limiting contagion risk (the precondition is to close data gaps)

Description of the policy

In an environment of low interest rates which may induce search-for-yield behaviour and consequent broad-based risk-taking, financial institutions may be tempted to increase their leverage in order to obtain resources and expand their balance sheets. This may be particularly true for shadow banking entities.

Against this background, a thorough review should be conducted of the tools currently available across sectors, especially among non-banks, to contain leverage, and avoid excessive leverage amplifying financial stress and spreading contagion across the financial system. Remaining data gaps in respect of leverage (mostly related to non-banks) may need to be closed before this review can start.

A leverage ratio will be introduced before the end of 2016 in the banking sector, limiting the amount of debt banks can take on as a proportion of their own funds. Since there is no system of risk weights in the insurance regulatory framework, such a leverage ratio does not exist for insurers, although there are provisions in Solvency II that address excessive leverage.

Investment funds can leverage their assets through direct borrowing, securities lending and repurchase agreements, or using derivatives (futures, options, swaps), the latter enabling them to take on so-called “synthetic” exposures. Direct borrowing is limited under UCITS and funds (including AIFs) generally rely on synthetic leverage. Excessive leverage can generate financial stability risk, typically by triggering pro-cyclicality in prices and contagion, or by amplifying illiquidity risks, although available evidence does not indicate that such risks are currently prevalent. High profile cases of hedge fund (quasi-) failures have, in this regard, proven to have a systemic dimension in the past. In the field of asset management, the competent authorities have the power to intervene to address leverage risks in investment funds at a macro level. In particular, they can impose leverage caps on UCITS funds – limits which do not apply to AIFs. In this respect AIFMs are, however, required to set internal limits themselves and significantly leveraged funds are required to report on their exposures. NCAs and macroprudential authorities have intervention powers, giving the competent authorities the power to enforce caps similar to those of UCITS under the provisions of Article 25 (3, 7) of AIFMD, if either the leverage set by an AIFM is deemed inappropriate or systemic risk concerns apply. Leverage reporting to supervisory authorities,



however, appears to differ across Member States and funds in the same jurisdiction, as well as across fund types.

With respect to risks concerning leverage, the ESRB could:

1. propose a review of the available toolkit for containing leverage across sectors, with the aim of identifying areas where such tools are insufficient to address episodes of excessive risk taking;
2. offer guidance on the key risks of using macroprudential leverage instruments in a counter-cyclical manner and limiting leverage to ensure the stability and integrity of the financial system;
3. call for a review of implicit subsidies to debt relative to equity, especially in the tax system and regarding bail-out guarantees.

These proposals should also bear in mind that liquidity risk management tools may complement leverage limits, and both instrument types could therefore be used sequentially. Accordingly, in line with the FSB's current work, counter-cyclical leverage limits might be considered, while liquidity management instruments (such as redemption limits) could be used instead as crisis management tools. In addition, leverage ratios may be less subject to individual judgement than capital ratios, and may therefore be more robust than risk-weighted concepts.

Links to identified risks

Cross-sectoral and system-wide aspects: broad-based risk-taking beyond capacities (search for yield).

Resilience of investment funds: risks arising from increased leverage (search for yield).

Funding and liquidity of investment funds: increased liquidity and redemption risk due to investment in less liquid assets and a shift into bank-like saving products, while preserving easy redemption.

B.2 Risk related to changes in financial system structure

B.2.1 System-wide stress tests

Proposed policy (short name)

Policy B.2.1.1: Increase cooperation and establish common ground across sectoral stress tests, with the ultimate goal of developing and implementing system-wide stress tests in the long term that include common shocks related to asset prices and liquidity

Description of the policy

The end target of this policy measure is to produce a system-wide stress test encompassing the combined effects of – and interaction between – market liquidity, the behaviour of investors and intermediaries, and the value of individual assets and financial entities. To achieve this in a gradual manner, common ground should be established across sectoral stress tests and cooperation increased significantly so that a consistent framework can be built.

The purpose of the system-wide stress test is to assess the effects of rapid asset price changes on:

1. the value and financial conditions of financial intermediaries;
2. their risk-bearing capacities and risk appetite;



3. their liquidity management;
4. their interconnectedness; and
5. the entire financial system's reaction, and the interaction amongst participants.

In addition, the stress test would also include the reactions of final investors to such price shocks.

The aims of system-wide stress-testing include: assessing the actions of various market participants and understanding the interactions between them, examining risks on a forward-looking basis, assessing the system-wide implications of potential policy measures targeting certain investor groups, and taking a holistic approach to identifying vulnerabilities, across the entire financial system. The test could uncover vulnerabilities due to the interplay of interconnectedness, common exposures, market liquidity, and high leverage. In the medium term the exercise should include the regular stress testing of asset values, taking account of endogenous correlations across all markets, market liquidity and exposures to less regulated entities.

Links to identified risks

Interconnectedness across financial markets: risk of spillovers given a higher correlation between asset classes due to similar trading behaviour.

Cross-sectoral and system-wide aspects: broad-based risk-taking beyond risk-bearing capacities (search for yield – and unwinding of search for yield).

B.2.2 Develop and strengthen macroprudential toolkit for non-banks and financial markets

Proposed policy (short name)

Policy B.2.2.1: Ensure cross-sector consistency to avoid regulatory arbitrage, by fostering activity-based regulation (complementing entity-based regulation).

Description of the policy

Given that financial markets are expected to play a bigger role and that non-banks are starting to provide bank-like services, regulation should concentrate on the nature of the activities under consideration instead of targeting a given subset of institutions. For the specific example of banks, the extensive regulation of banking activities may provide incentives that encourage the undertaking of similar activities in a sector with a different regulatory framework, which may have been designed for different purposes and which may not adequately address risks from bank-like activities. Relying on activity-based regulation ensures a level playing field across the many institutions involved in similar activities (and offering similar products).

In other words, by adding a focus on activities to the focus on the regulation of institutions, opportunities for regulatory arbitrage could be reduced. In addition, it might be possible to address potential loopholes in the EU regulatory framework which could, in the long term, have a harmful impact on the financial system.

Links to identified risks

Cross-sectoral and system-wide aspects: risks related to the expansion of shadow banking activities.

Cross-sectoral and system-wide aspects: the emergence or increase in liquidity risk in non-banking sectors accompanied by less diversity in the financial system.



Cross-sectoral and system-wide aspects: the greater importance of risks originating in financial markets.

Proposed policy (short name)

Policy B.2.2.2: Support efforts aimed at developing a strategy for macroprudential policy beyond the banking system, including a review of the current framework for the regulation of leverage, liquidity and financing in the non-banking sector, with the aim of limiting systemic risk; the development of margins and haircuts as macroprudential instruments.

Description of the policy

In the light of the structural changes that are forecast to take place in the EU financial system in the coming years, meaning that financial markets will play a more important role to the detriment of the banks, the ESRB should continue to facilitate efforts aimed at developing a macroprudential policy strategy that applies beyond the banking system. Potential macroprudential policy instruments for the non-banking financial sector could include the following:

1. liquidity stress testing with top-down scenarios;
2. macroprudential minimum standards of liquidity risk management linked to stress test results (e.g. liquidity buffers, limits to maturity transformation, redemption practices, floors for margins and haircuts, and measures to counter negative externalities of “sudden stops” in securities lending and in the re-use of collateral, prudent asset valuation);
3. liquidity-based macroprudential policy tools for the non-banking financial sector that national authorities integrate explicitly into their general macroprudential strategy and whose operationalisation is explained in the technical documentation;
4. counter-cyclical capital/leverage requirements for the non-banking financial sector to reduce pro-cyclicality;
5. capital buffers/leverage requirements for those systemic non-bank institutions which offer liquid redemption on funds provided to them and operate with non-negligible financial leverage.

A framework should be explored that uses margins and haircuts as macroprudential instruments, and that could include a set of minimum haircuts for different asset classes. These could be raised in a counter-cyclical manner during exuberant market conditions when the build-up of leverage may become excessive. A similar time-varying approach to minimum margin and haircut requirements could be considered for centrally and non-centrally cleared derivative transactions (ESRB, 2015; ECB, 2015; CGFS, 2010). This could build on existing regulatory frameworks (as developed for standardised margin and haircut schedules as defined in the FSB minimum haircut framework and for OTC derivatives within the BCBS-IOSCO⁴¹) and policy recommendations as applicable to derivatives and SFTs at EU and global level.

⁴¹ See minimum haircut framework by FSB: “Transforming Shadow Banking into Resilient Market-based Finance - Regulatory framework for haircuts on non-centrally cleared securities financing transactions” (http://www.fsb.org/wp-content/uploads/SFT_haircuts_framework.pdf) as well as margin and haircut schedules by BCBS and IOSCO: “Margin requirements for non-centrally cleared derivatives”, March 2015 (<http://www.bis.org/bcbs/publ/d317.pdf>, Appendix A and B).



Links to identified risks

Cross-sectoral and system-wide aspects: risks related to the expansion of shadow banking activities, emergence or increase in liquidity risk in non-banking sectors accompanied by less diversity in the financial system, greater importance of risks originating in financial markets and broad-based risk-taking beyond capabilities.

Resilience of investment funds: risks arising from increased leverage.

Funding and liquidity of investment funds: increased liquidity and redemption risk due to investment in less liquid assets and a shift into bank-like saving products while preserving easy redemption.



Appendix G

Task Force Members

TF Chairs: Jacek Osinski (ATC), John Fell (FSC), Elena Carletti (ASC, since Dec-2015), Philip Lane (ASC, until Oct-2015)
ESRB Coordinators: Tuomas Peltonen, Sini Matikainen (until May 2016), Tomas Konecny (until Nov 2015) (all ESRB)
Assistance to TF Chairs: Stephan Fahr (ECB), Paweł Gąsiorowski, Adam Głogowski, Paweł Smaga (all National Bank of Poland)



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Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.esrb.europa.eu

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