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A potential macroprudential approach to the low interest rate environment in the Solvency II context

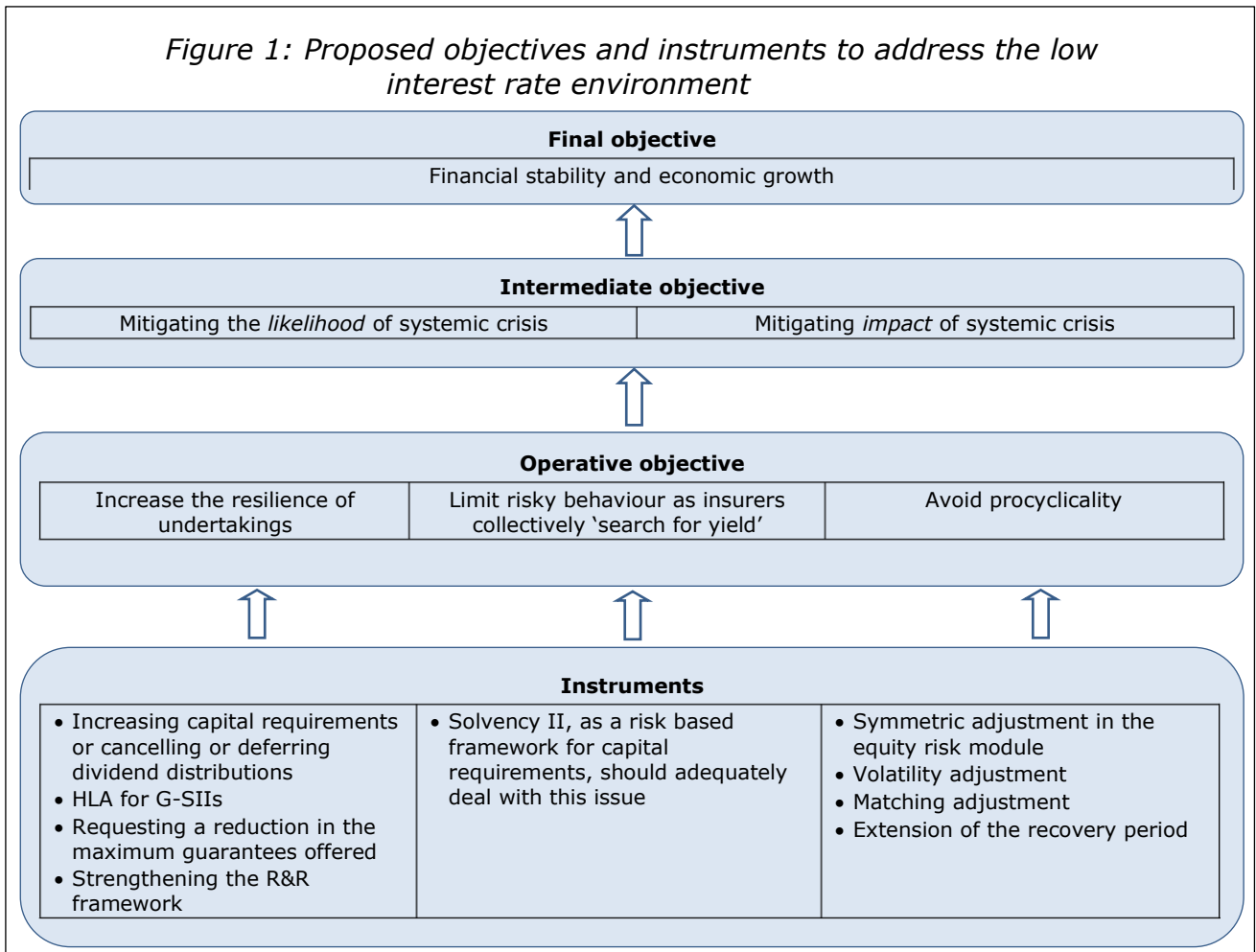
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Executive Summary

1. In line with the Solvency II Directive, the main objective of insurance regulation and supervision is the **adequate protection of policyholders** and beneficiaries. Financial stability is another objective that should be taken into account without undermining the main objective.
2. A prolonged low interest rate environment **can raise significant challenges** for insurance undertakings (especially for life companies that offer guaranteed products) and, ultimately, for the stability of the financial system as a whole.
3. For already several years, **EIOPA and National Supervisory Authorities (NSAs) have been devoting a lot of attention** to this risk with the aim of understanding and monitoring the implications of such an environment. A series of sequential actions have been taken. At a European level, EIOPA has published an Opinion on Supervisory Response to a Prolonged Low Interest Rate Environment (2013), included a low yield module in the Insurance Stress-test in 2014 and carried out a low interest rate environment stock taking exercise which was disclosed together with the stress-test results.
4. Not all Member States are equally affected by the low interest rate environment. This is, for example, due to diverging market conditions, different product lines, varying levels of guaranteed interest rates or the behaviour of insurers. Nonetheless, substantial measures have also been taken by NSAs, particularly in those countries that are more affected by such an environment. In addition to intensifying monitoring and/or increasing the reporting requirements, NSAs have also carried out national stress-testing or sensitivity analysis, issued recommendations and public statements, requested the establishment of special provisions for interest rate risk, requested a change in the undertakings' investment policies, or limited the allocation of bonuses and profit sharing, to name a few measures.
5. This paper approaches the issue of the low interest rate environment by **applying a macroprudential framework** composed of a final objective (i.e. the achievement of a stable financial system and, by extension, stable economic growth), two intermediate objectives in which the final objective can be broken down (i.e. mitigating the likelihood and the impact of a systemic crisis) and three operative objectives to be targeted by authorities. In order to define the operative objectives, the paper first considers the potential problems posed by a low interest rate environment; thereafter the solutions of these potential problems are defined as operative objectives to be pursued:
 - Increasing the resilience of the insurance sector;
 - Limiting risky behaviour as insurers collectively "search for yield"; and
 - Avoiding procyclicality.
6. As a next step, **a set of instruments within or compatible with Solvency II** are addressed for each of the operative objectives defined. To address the first objective, the following could be considered: (i) the possibility of increasing capital requirements or cancelling or deferring dividends; (ii) the need to have higher loss absorption (HLA) capacity for Global Systemically Important Insurers (G-SIIs); (iii) the possibility of requesting a reduction in the maximum guarantees offered in new contracts; and (iv) the need to strengthen the recovery and resolution (R&R) framework. Regarding the second objective – limiting risky behaviour as insurers collectively "search for yield"– the

implementation of the Solvency II requirements could limit such risky behaviours. Due to the fact that Solvency II is a risk sensitive framework, increased riskiness of an investment portfolio should generally lead to higher capital requirements. Lastly, on the need to avoid procyclicality, the paper touches upon the series of measures such as the volatility adjustment, the matching adjustment or the extension of recovery period that were designed, among other things, to address the issue of procyclicality. Figure 1 provides an overview and summary of the approach taken and the issues discussed.



7. Overall, **several instruments are available and measures can be taken in a Solvency II environment** in order to address the challenges of a situation of prolonged low interest rates. Solvency II and the measures that it contains will have an impact that will go beyond the prudential implications, affecting the way in which insurance works. From this point of view, it can be asserted that the new prudential framework is a substantial step forward. However, as **Solvency II entered into force in January 2016**, it is an ongoing pertinent debate whether these instruments address in full all the challenges posed by a low interest rate environment.
8. In this context, **there is currently little evidence** that would enable concluding whether a macroprudential framework supplementing the microprudential one would be needed. This is particularly relevant in insurance, where further research is still needed in order to understand the sources of systemic risk and the transmission channels clearly; a prerequisite to argue for the development of a macroprudential framework.

Possible actions

9. In terms of **proposed actions**, in the short term **intensified monitoring** and analysis of the ongoing risks by EIOPA and NSAs, in particular, the effect of the long term guarantee measures, should be put in place to continue to assess the need for additional instruments, or changes to existing instruments. For this purpose, a set of indicators to assess relevant and significant developments are proposed in the paper.
10. In the medium term, EIOPA believes that there is substantial work to be done in the field of recovery and resolution. There is a need to enhance further and **harmonise the recovery and resolution framework** where appropriate in Europe with the aim of minimising the probability of default of insurance companies or to make it feasible to resolve them if they are no longer viable, without severe systemic disruption or exposing taxpayers to loss. In this context, EIOPA is currently initiating a Work Stream on Recovery and Resolution. It is also very important that any development in the International Association of Insurance Supervisors' (IAIS) work regarding the policy measures and Higher Loss Absorbency (HLA) for G-SIIs is closely followed and that its implementation in Europe is duly considered.
11. Furthermore, **EIOPA will also monitor and ensure the consistent application** of Solvency II. In particular, the Authority will derive and publish the risk-free interest rate term structures, the fundamental spreads for the calculation of the matching adjustment and the volatility adjustment. EIOPA also has a key role in the declaration of exceptional adverse situations for the extension of the recovery period. EIOPA has also issued Guidelines on the application of the Long Term Guarantee (LTG) measures. In addition, the Authority will also report to the Parliament, the Council and the Commission annually and until 2021 on the impact of the application of the LTG measures, and will submit to the Commission, where appropriate after consulting the European Systemic Risk Board (ESRB) and conducting a public consultation, an opinion on the assessment of the application of the LTG measures.

1. Introduction

12. The weak macroeconomic environment together with the monetary policy followed by central banks has put downward pressures on market interest rates in Europe. In addition to that, due to the sovereign debt crisis, a duality in the European government bond market was observed, in which some countries are experiencing negative yields at some maturities due to a “flight to quality”, while others have experienced the opposite tendencies, reflecting creditworthiness concerns in periods of higher uncertainty in the markets.
13. Conscious of the impact of these market conditions on insurers, EIOPA has undertaken several studies that led to an Opinion on Supervisory Response to a Prolonged Low Interest Rate Environment (2013). As a follow-up to this Opinion, EIOPA included a low yield module in its Insurance Stress-test 2014 and undertook a low interest rate environment stock taking exercise, to explore what actions had been taken in light of the Opinion. Going forward, EIOPA also aims to address the low interest rate environment in the upcoming insurance stress test. Lastly, the issue of the low interest rate environment and its impact has also been addressed in several EIOPA Financial Stability Reports and in a dedicated work stream on “search for yield” behaviour.
14. In parallel, EIOPA staff has also started working on a framework on macroprudential objectives and instruments for insurance. So far, European discussions on macroprudential policy have focused on the banking sector due to its systemic importance and the negative externalities involved. Although the issue is less clear in insurance, lately the discussion has started to arise, and there is a need to develop an approach that takes into account the insurance specificities. In this respect one needs to consider that a macroprudential approach would be needed in case insurance creates systemic risk leading to negative externalities to the financial sector or to the real economy.
15. The current paper seeks to apply the macroprudential approach developed in EIOPA’s staff paper¹ to the specific issue of the existing low interest rate environment, taking into consideration the current legal framework, i.e. Solvency II. The impact of the low interest rate environment was analysed in EIOPA’s insurance stress test 2014. A low yield module simulating a Japanese-type scenario of prolonged low interest rates was included to assess the scope and scale of the risk posed by such scenario. According to the results, 24% of insurers in the sample would not meet their Solvency Capital Requirements (SCR) and certain companies could face problems in meeting their promises in 8-11 years’ time.
16. This document is structured as follows. After discussing the systemic importance of insurance and the potential need for a macroprudential framework, the paper proposes a framework for addressing the concerns around a low interest rate environment. It first discusses the operative objectives that are affected by such an environment and subsequently considers the instruments that could be used in a Solvency II context. As a next step, the paper proposes a set of indicators and concludes.

¹ See references at the end of the document.

2. Discussion on the systemic importance of insurance and the potential need for a macroprudential framework

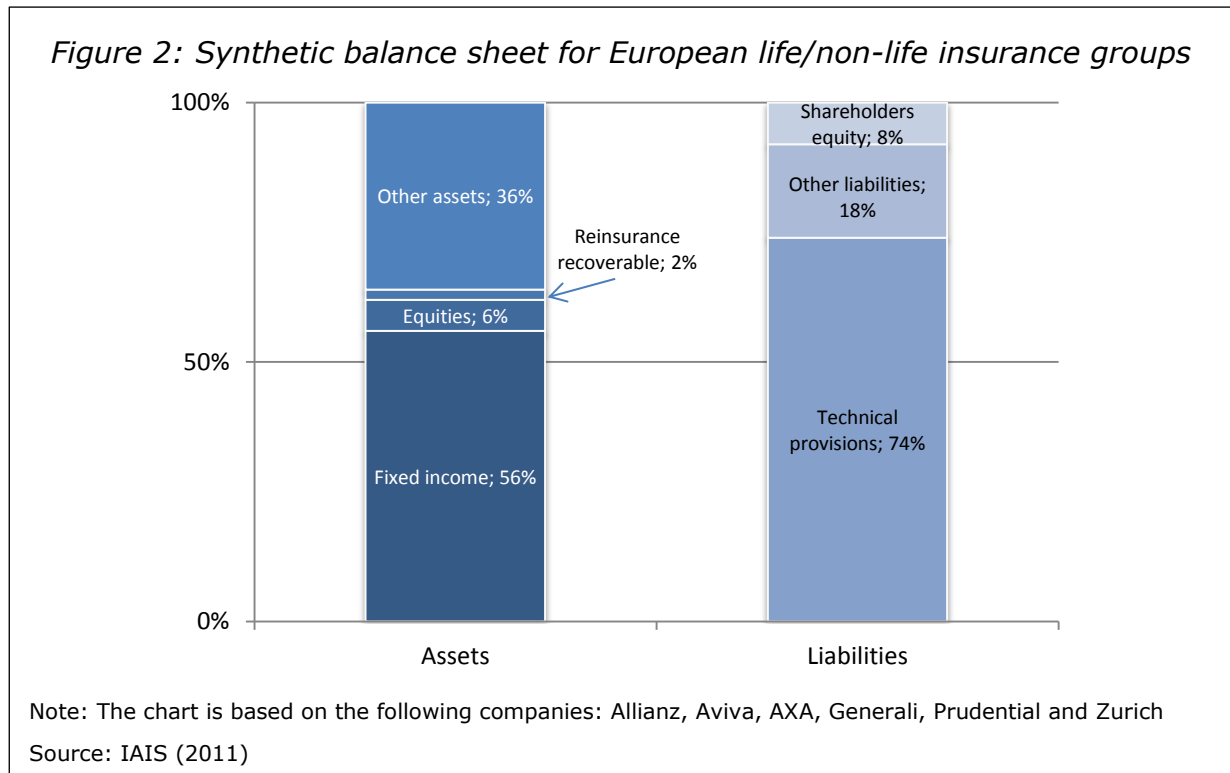
17. The rationale for having a macroprudential framework in place lies in the need to limit financial system-wide distress. The macroprudential approach, therefore, focusses on the assessment of risks for the system as a whole (cf. Borio, 2011). The microprudential approach which, in turn, deals with the risk of individual institutions, can be considered supplementary to the macroprudential approach.
18. So far, discussions on macroprudential policy have focused on the banking sector due to its prominent role in the recent financial crisis and because the existence of systemic risk is quite clear in banking. Indeed, the business model of banks, the role they play in the real economy and the interconnectedness with other banks and other segments of the financial system make them especially prone for a macroprudential approach.
19. Traditional insurance differs from banking quite substantially. Some relevant features of traditional insurance are the following:²
 - Insurance is characterised by the existence of an inverted production cycle. While premiums are paid up-front, claim payments are generally only settled in case the insured event occurs.
 - The inverted production cycle generates a stable cash flow to insurers and makes the traditional insurance business less dependent on short-term funding.
 - The nature of liquidity risk is operational rather than strategic, as a result of the extended claims payment period, which allows a better planning of the necessary funding. Even during the crisis in 2008-2009, insurers did not face significant liquidity crunches.
 - In contrast to banks, traditional insurers are not involved in maturity transformation or credit intermediation and are less dependent on the economic cycle.
 - Although the interconnectedness within an insurance group or financial conglomerate is not negligible, the interconnectedness within the insurance sector is small. Reinsurance increases the interconnection between institutions, but it does not create the same network dynamics.³
20. Furthermore, while insurers are not immune to failures, one difference between banking and insurance is the fact that insurers are far less likely to be confronted with a so-called "run on the company". The way the failures are resolved is another distinctive point. Insurers can be declared insolvent as quickly as banks but usually their business model does not require a rapid liquidation of assets to meet short-term liabilities as it happens with banks. As such the "over the weekend" pre-requisite to resolve a bank orderly does not generally apply to insurance. Even if a run on the insurer did occur, it might be dampened by the existence of penalties and lengthier cancellation procedures. Although much less pronounced than in banking, a liquidity problem cannot be fully ruled out if policyholders start massively lapsing and surrendering their policies.⁴

² See IAIS (2011).

³ In fact, reinsurance is in itself a risk management tool for insurance companies.

⁴ There is also empirical evidence that lapse risk could materialise in the form of a "policyholder run" if interest rates were to increase sharply (see Feodorina and Förstemann (2015)).

21. In addition to that, insurers are required by regulation to hold technical provisions in order to meet their claims and address risks. Technical provisions normally make up the largest part on the liability side of insurers' balance sheets (see Figure 2). Together with capital requirements these are required to enable insurers to withstand severe yet plausible events and to provide sufficient loss absorbency capacity and reduce any potential negative externalities (IAIS, 2011).



22. Insurance undertakings, therefore, exert systemic importance in a different way than banks. The analysis carried out by the IAIS (2013a) identified that the systemic significance of insurance arises from:
- Size – Some insurers are among the largest financial institutions and their failure could generate significant contagion.
 - Global activity – Some companies that operate on a global basis could create large externalities in case they fail.
 - Interconnectedness – Insurance might also be part of the network dynamics that characterises modern financial systems. If highly interconnected, an insurance failure could have an impact on other segments of the financial system.
 - Non-traditional and non-insurance (NTNI) activities – Certain lines of insurance business underpin the provision and build-up of systemic risk and have a significant impact upon failure.
 - Substitutability – Substitutability is relevant in the context of the insurance sector as there have been episodes where certain types of insurance cover have either been unavailable or available at a very high price.
23. The traditional insurance business model is generally unlikely to become a source of systemic risk. However, insurers engaging in NTNI activities are more susceptible to financial market developments and could “amplify, or contribute

to, systemic risk”, as the characteristics of non-traditional business materially change their risk profile (IAIS, 2011). Thus, the IAIS G-SII identification methodology (IAIS, 2013a) weighted such activities very highly with 45% (interconnectedness 40%; size, global activity and substitutability each 5%).⁵

24. These criteria have been proposed by the IAIS to classify an insurer as G-SIIs and were agreed by the Financial Stability Board (FSB).⁶ G-SIIs pose greater risks to the global financial system and the global economy compared to other internationally active insurance groups (IAIG). Potential negative externalities should ideally be internalised by the institutions themselves – but firms may not do so without regulatory intervention.⁷
25. A macroprudential approach could be needed for insurance in case insurance creates systemic risk, where its materialisation would spread to other parts of the financial sector or to the real economy (externalities). Contrary to what happens in banking, however, in insurance there is a need for further research in order to clearly understand the sources of systemic risk and the transmission channels.⁸ Further, while systemic importance can be assumed for large and complex banks, the case is less clear in the insurance sector. Without having a proper measure of systemic risk upon which the macroprudential framework can be developed, a macroprudential approach to insurance becomes a real challenge.
26. As a consequence, the issue of whether a banking-type macroprudential framework (on top of the microprudential one) is needed to address systemic risk in insurance is still unclear. A simple mapping of banking to insurance would ignore the fundamental differences between these types of institutions, as well as their differing degree of systemic importance.
27. Furthermore, particularly in the case of a low interest rate environment, where the main challenge is ensuring adequate resilience of insurance companies, the differentiation of macroprudential and microprudential instruments is not clear-cut. For example, requesting a higher level or quality of capital strengthens the ability of a particular company to withstand a shock and, therefore, in an aggregated way, it also reduces the accumulation of systemic risk, but may lead to an inefficient allocation of resources. This is the reason why microprudential and macroprudential policies need to be aligned, to avoid that additional macroprudential requirements on top of the microprudential ones end up in that mentioned inefficient allocation of resources.
28. In addition to that, it should also be mentioned that the macroprudential approach to the challenges posed by a low interest rate environment should not be viewed in isolation. Instead, it should be viewed as part of a holistic framework that includes other relevant elements such as:
 1. The measures taken by microprudential authorities and EIOPA;
 2. Other actions by companies to cope with the low interest rate environment;and

⁵ It should be noted, however, that even if an insurer is classified as systemically important, it cannot be directly concluded that the level of “systemicity” of this company is necessarily equal than the one of a systemically important bank in term of the financial stability implication of a potential failure. There are different levels also within financial institutions.

⁶ G-SIFIs are defined by FSB (2010) as “institutions of such size, market importance, and global interconnectedness that their distress or failure would cause significant dislocation in the global financial system and adverse economic consequences across a range of countries.” The IAIS considers G-SIIs are one class of G-SIFIs.

⁷ See IAIS (2013b) for a set of policy measures to be applied to G-SIIs.

⁸ See ESRB (2015) Annex 3 for a categorisation of the potential sources of systemic risk in insurance.

3. The legal environment in place (i.e. Solvency II).

29. Starting from the first element, microprudential authorities (i.e. NSAs) and EIOPA have been closely monitoring and analysing the effects of a low interest rate environment for some time. Furthermore, several measures have also been taken with the aim of minimising its impact not only on a company level, but also on the insurance sector as a whole. Table 1 provides a summary of actions taken by the NSAs and EIOPA.⁹ Thus, the interplay between such microprudential measures and any additional macroprudential ones needs to be considered.

Table 1: Supervisory response and companies' reaction to the low interest rate environment

Supervisory response		Company response
EIOPA	NSAs	
<ul style="list-style-type: none"> • Opinion on Supervisory Response to a Prolonged Low Interest Rate Environment (2013) • Inclusion of a low yield module in the Insurance stress-test 2014 • Low interest rate environment stock taking exercise 2014 • EIOPA Financial Stability Reports 	<ul style="list-style-type: none"> • Intensified monitoring and/or increased reporting requirements with regard to interest rate • National stress testing or sensitivity analyses taking into account the low interest environment • Issuing recommendations / public statements • Requesting the establishment of special provisions for interest rate risk • Amending the valuation approach for technical provisions (e.g. adjusting discount rates) • Reducing maximum guarantees/ rates for new business • Requesting a change in undertakings' investment policy • Limiting the allocations of bonuses/ profit shares • Amending level of required solvency margins • Prohibiting sale of certain affected products • Reducing maximum guarantees/ rates for future premium of existing business • Other measures 	<p><i>Product strategy for new business:</i></p> <ul style="list-style-type: none"> • Decreasing guarantee levels for new contracts • Shifting in new business focus towards products with no guarantees / less dependent on investment income (e.g. unit linked, pure risk covers) • Stopping the sale of certain guarantee products • Introducing revision clauses for guarantees • Introducing market value adjustment clauses in case of lapse/surrender • Shortening the duration of new contracts • Exploring new business alternatives such as credit guarantees/insurance, etc. <p><i>Product strategy for existing business:</i></p> <ul style="list-style-type: none"> • Reducing profit shares • Setting up preventive reserve funds/additional technical provisions • Campaigning for policyholders to switch to new product conditions or other types of products • Renegotiating contract terms for existing business, where feasible <p><i>ALM strategies and other:</i></p> <ul style="list-style-type: none"> • Implementing efficiency/cost cutting initiatives • Amending ALM strategies, e.g. with regards to matching and hedging • Increasing share of higher yielding sovereign bonds in investment portfolio or increasing share of other higher yielding instruments/asset classes

30. The list of measures taken is indicative, i.e. non-exhaustive. Other targeted measures may have been taken in the affected jurisdictions. Additionally, not all jurisdictions are equally affected by the low interest rate environment and, therefore, not all supervisors had the same need to adopt measures against it. The reason for this can be diverging market conditions (e.g. what refers to government bond yields), different product lines in the countries or the behaviour of insurers.

⁹ More details about the different options can be obtained in EIOPA (2014b). Note that not all the measures are available to NSAs in all jurisdictions.

31. Several NSAs have also undertaken different types of exercises to test the impact of a low interest rate environment in their markets during the last years, providing them with a clear overview of the situation in their national markets. One important measure is the application of the Guidelines on the Own Risk and Solvency Assessment (ORSA) requirements, which have started as preparatory Guidelines throughout the years 2014-2015. By fulfilling this exercise undertakings and NSAs should improve their understanding on the undertaking's risk profile and its solvency needs in stressed scenarios, i.e. in further extended low interest environment in the medium and/or long term perspective.
32. As shown in Table 1, companies have also reacted to the low interest rate environment, sometimes triggered by the measures implemented by the supervisors. While the supervisory measures strive to mainly limit the consequences of a certain risk, the measures taken by the companies directly reduce their risk exposure in this case.
33. Going forward, companies and NSAs will be subject to a new legal environment, Solvency II, rather than their previously existing frameworks. This poses the question of how this new prudential framework interacts with the potential development of a macroprudential approach.
34. Although Solvency II is not a macroprudential framework, it contains several elements which will be addressed in this paper that may have macroprudential implications. These elements should be taken into account when determining if additional tools for macroprudential purposes are warranted. Otherwise, additional tools could either conflict with Solvency II and reduce its effectiveness or be duplicative.
35. Given that Solvency II has only recently entered into force, there is no empirical evidence available at this stage that could solve the issue of whether there is a need for supplementing the framework with additional macroprudential tools.
36. The rest of the document sets out the specific issues insurers face in a low interest rate environment from a macroprudential point of view. The paper then provides a review of available tools in Solvency II that can theoretically deal with an environment of prolonged low interest rates. This is done by following a structured approach as the one defined in the next section.

3. A potential macroprudential approach to the low interest rate environment - Operative objectives

37. The EIOPA staff paper published in May 2015 developed a macroprudential approach specific for the insurance sector that links the achievement of a certain ultimate objective by defining intermediate and operative objectives, as well as a set of instruments.¹⁰
38. In macroprudential terms, the ultimate objective is financial stability and, by extension, less volatile economic growth. This ultimate objective can be broken down into two intermediate objectives which can be defined more clearly, i.e. mitigating the likelihood and mitigating the impact of a systemic crisis.
39. The operative objectives are defined by macroprudential authorities in a way that their achievement exercises an influence on the intermediate objectives. These objectives can be achieved by means of implementing or adjusting a set of properly calibrated instruments.

¹⁰ See, Christophersen and Zschesche (2015).

40. The indicators form a crucial piece of the framework, to the extent that they provide macroprudential authorities with relevant information regarding the achievement of the operative objective and, in turn, the calibration of the instruments.
41. This approach is followed in the rest of the document to analyse the issues posed by a low interest rate environment. From a macroprudential point of view, the ultimate objective and the intermediate objectives are the ones described in the previous paragraphs. The low interest rate scenario poses several problems from a macroprudential point of view, whose solution can be considered as the operative objectives to be pursued. These are the following:
- Increase the resilience of the insurance sector. In a low interest rate environment, companies have additional difficulty in building adequate reserves for their long term liabilities, potentially leading to multiple insurers becoming thinly capitalised and more vulnerable to shocks. As such, the insurance sector may become more vulnerable to multiple insurance failures.
 - Limit risky behaviour as insurers collectively “search for yield”. Low interest rates may encourage other business model changes, such as alterations in asset allocations in a “search for yield”, which may create new risks on the asset side of the balance sheet.
 - Avoid procyclicality. A low interest rate environment increases the likelihood of a double-hit affecting both sides of the balance sheet of companies, which may lead to fire sales of assets and procyclical behaviour in the short term.
42. The operative objectives are explained in more detail in the following paragraphs.
- ***Need to increase the resilience of the insurance sector***
43. Persistent low interest rates affect insurers in different ways. On the liabilities side, they lead to an increase in the present value of undertakings’ obligations due to the lower discount rates.
44. On the assets side, two effects can be identified. First, an effect due to the use of market consistent valuation, which leads to an increase in the value of fixed-income assets in the balance sheet, other things being equal. Unless assets are perfectly matched with liabilities, this increase will usually be less than the increase in the value of liabilities for life insurers because their liabilities have a longer duration and are therefore more sensitive to interest rates, resulting in less capital in terms of assets over liabilities.¹¹ In case of adverse market developments, such as the so called double-hit scenario, the adverse price developments caused by sudden increases in spreads may lead to a material deterioration of the investment portfolio, in combination with an increase in the value of technical provisions caused by low risk-free rates. In that case, insurers would be experiencing a shock that affects both assets and liabilities.¹² In a double-hit, the need to increase resilience is especially acute. Nevertheless, some of the LTG measures foreseen under Solvency II were designed to avoid, at least partly, some of the potential procyclical behaviour that might arise in such situations.
45. A second effect refers to the impact of low interest rates on the investment returns and on the reinvestment risk of assets, which determines the insurers’

¹¹ In addition to that, the assets backing the technical provisions are not composed of fixed-income assets only, but also of other types of assets such as equity.

¹² EIOPA Insurance Stress-test 2014 showed that under a double-hit scenario, about half of the insurance groups that participated in the stress test core module would have a SCR ratio below or very close to 100%.

ability to honour their policyholder obligations. This problem is even more pronounced where guaranteed rates of returns have been offered to policyholders. In the case of non-life insurance business, lower returns reduce the financial margin available to offset adverse combined ratios. From a macroprudential point of view, this is a *direct challenge* that requires ensuring sufficient loss absorbing capacity to withstand its effects.

- **Limiting risky behaviour as insurers collectively "search for yield"**

46. In a low interest rate environment, companies under pressure might have incentives to replace low yielding assets with higher yielding, but lower quality assets. Another potential change could be an increase in the proportion of alternative investments. This includes the risk that undertakings take on risks that are new and unknown. These changes in the asset allocation of companies are usually called "search for yield".
47. So far, no definition or classification of "search for yield" behaviour exists. Strictly speaking, all kinds of investment decisions seek to optimise or maximise returns and, in that sense, all of them entail a logical "search for yield" element.
48. There is a need, however, to differentiate between usual behaviours to optimise yields by re-allocation of portfolios from undesired behaviours resulting in an uncontrolled or unsustainable increase in risk exposure. The term "search for yield" as used in this paper refers to the latter.
49. From this point of view, a "search for yield" may become undesirable if the undertaking's risk appetite exceeds its risk bearing capacities and risk management capabilities. Furthermore, a "search for yield" behaviour might also lead to an abrupt yield reversal, and therefore to the materialisation of the double-hit scenario, as described above.

- **Avoiding procyclicality**

50. A low interest rate environment poses also an *indirect or second round challenge* if it induces or amplifies procyclicality by changing the asset allocation of companies. As explained by Bank of England (2014), there are two ways to define procyclicality that should be considered. A first definition of procyclicality refers to the short term tendency to invest in a way that exacerbates market movements and contributes to asset price volatility, which can in turn contribute to asset price feedback loops. But there is also a second definition of procyclicality that refers to a medium term tendency to invest in line with asset prices and economic cycles, so that willingness to bear risk diminishes in periods of stress and increases in upturns.
51. Under a low interest rate environment, the main trigger for procyclicality arises from a double-hit scenario as described before. As a reaction to this shock, insurers may sell risky assets in the market under the expectation that prices may go down and replace them with less risky assets.¹³ The tendency for insurance undertakings to be procyclical in aggregate will depend on the speed with which they make changes to their asset allocation decision and the extent to which those changes are coordinated and correlated.¹⁴

¹³ For example, Impavido and Tower (2009) consider that the equity markets fall in 2001-2003 provide evidence that insurance companies contributed to a downward spiral in markets when they sold equities seeking to bolster balance sheets which, in turn, led to further declines in the market. Such procyclical effects might need to be avoided in order to mitigate the likelihood of a systemic crisis and its impact.

¹⁴ ESRB (2015) Annex 3, p. 32.

52. Table 2 provides an overview of some of the main issues discussed in this section.

Table 2: Challenges and potential impact of a low interest rate environment per operative objective

Macroprudential objective	Challenge	Low yield environment – Potential impact on balance sheet	
		Asset side	Liability side
Need to increase the resilience	<ul style="list-style-type: none"> - Ensure that companies have sufficient resources to pay policyholders - Maintain solvency of companies 	<ul style="list-style-type: none"> - Changes in the value of the portfolio which depend on the share of fixed-income assets and the evolution of spreads - Poor investment results - Increased reinvestment risk 	<ul style="list-style-type: none"> - Increase in technical provisions (usually greater than increase in market value of fixed-income assets)
Limit risky behaviours as insurers collectively “search for yield”	<ul style="list-style-type: none"> - Ensure the stability of the financial system 	<ul style="list-style-type: none"> - Replacement of lower-risk to higher risk asset classes in the portfolio under a “search for yield” behaviour 	<ul style="list-style-type: none"> - Increase in technical provisions
Avoid procyclicality	<ul style="list-style-type: none"> - Ensure the stability of the financial system 	<ul style="list-style-type: none"> - Herding behaviour in replacing higher-risk to lower-risk asset classes in a double-hit scenario 	<ul style="list-style-type: none"> - Increase in technical provisions

4. Potential instruments per objective

53. Once the operative objectives have been defined, the focus should be put on the instruments that could serve as a basis to achieve the operative objectives. Solvency II is not a macroprudential framework and, therefore, its instruments are not calibrated to address a system-wide risk. This fact, however, does not preclude that certain elements of Solvency II have macroprudential implications that may help to overcome the challenges posed by a protracted low interest rate environment.
54. To some extent, Solvency II has several “built-in” mechanisms to deal with the low interest rate environment. For example, the SCR covers market risk and in particular interest rate risk that arises from changes in the level of the basic risk-free interest rates so that insurers are incentivised to better match their assets cash flows with their liability cash flows. Alternatively insurers can hedge their interest rate risk on the liabilities with the use of derivatives. These two approaches imply different risks for the undertakings (credit or counterparty risk) also with regards to interconnectedness with other financial institutions.
55. The calculation of the capital requirements in Solvency II is risk sensitive, which implies that it is a model-based system. It is flexible to the extent that it allows the use of the standard formula or the use internal models when the risk profile of undertaking is better reflected. However, to minimise the potential model risk, there is an absolute floor for the minimum capital requirement (MCR) which is totally independent of the model (either factor-based as a result of a linear function or an absolute amount).

56. The LTG measures have been incorporated into the Solvency II framework after its initial publication in 2009 through the Omnibus II Directive in 2014. Being mostly part of the risk-free rate methodology, these measures are based on market indicators to determine whether there is a wider (macroeconomic) market reaction which should be limited. This important element remedies the risk of reflecting artificial market volatility in the solvency balance sheet. In a pro-active forward looking perspective this approach is reflected in the ORSA requirements of Solvency II.
57. It should be stressed again that additional instruments should only be considered if it is demonstrated that the issue of low interest rate environment creates a systemic risk leading to potential negative externalities that are not properly accounted for from a microprudential point of view. These measures are generally designed to discourage undertakings from fire sales and to enable the holding of assets to maturity.

4.1. Increasing the resilience of undertakings

58. Generally, in microprudential supervision, potential policy instruments should follow the concept of the supervisory ladder of intervention. The objective is to capture any ailing insurers before a serious threat to policyholders' interests arises. The main tools possibly to increase resilience of undertakings that are being considered are the following:¹⁵
 - (a) Increasing capital requirements or cancelling or deferring dividend distributions;
 - (b) Require higher loss absorption capacity for G-SIIs;
 - (c) Requesting a reduction in the maximum guarantees offered in new contracts; and
 - (d) Strengthening the recovery and resolution framework (not yet finalised).
59. Instrument c is dedicated directly to the challenges posed by a low interest rate environment, whilst instruments a, b and d are not only useful in such an environment, but are broader in terms of its implications and impact.
60. Focus should be put on those institutions that are more affected by a low interest rate environment, on the basis of the jurisdiction they operate in, their business model, asset allocation, and duration gap, i.e. the asset/liability mismatch.

- ***Increasing capital requirements or cancelling or deferring dividend distributions***

61. Higher capital requirements or cancelling or deferring the distribution of dividends, which would force insurers to retain capital, are an obvious response in order to increase the resilience of companies in times of distress. It is probably also the instrument in which the microprudential approach converges most markedly with the macroprudential one. Also, the cost of requesting additional capital needs to be accounted for in a cost-benefit analysis.
62. EIOPA's low interest rate stock taking exercise (2014) showed that limiting dividend distribution is indeed a power available to several NSAs and that the

¹⁵ Two possible instruments are deliberately left out. First, the issuance of debt, as this is usually not a traditional way of funding by insurance companies. A requirement to issue debt instruments that may absorb shocks under certain conditions could therefore have a notable impact on the liability structure of companies that should not be neglected. Second, an increase in the risk margin over best estimates for macroprudential purposes. This option is not considered as it would severely obscure the valuation of technical provisions.

way in which it is exercised ranges from a “soft supervision”, in which companies are asked not to distribute profit sharing or dividends, to stronger measures whereby the NSAs can temporarily forbid the distribution of shareholders’ dividends in certain circumstances (e.g. in case the interests of policyholders or beneficiaries are under threat).

63. In Solvency II, there are defined mechanisms for the automatic cancellation or deferral of dividends/distributions when the SCR/MCR is breached.¹⁶ From a Pillar II perspective, supervisors could also challenge an undertaking’s medium-term capital management plan, including the impact of their dividend policy. When the undertaking is above the SCR level, Solvency II does not provide supervisors with specific powers to cancel/defer distributions.
64. In terms of capital requirements, it should be considered that the role of capital is somehow different in insurance compared to banking as it deals with risks on both the assets and liability sides of the balance sheet. To understand this role, one should consider how the liability side of the balance sheet is constructed (see Figure 2 on page 8). Starting with the technical provisions, in a Solvency II environment, they are composed of the best estimate and the risk margin. The former reflects the present value of the expected future cash flows calculated on a relevant risk free rate curve. The latter is an additional premium over the best estimate, which is intended to reflect the cost of holding solvency capital (i.e. the SCR) in order to support the business under a run-off scenario. The risk margin should ensure that the value of the technical provisions is equivalent to the transfer value that a third party reference undertakings would be expected to require in order to take over and meet the insurance and reinsurance obligations. In addition to that, insurance companies follow a liability-driven investment approach, i.e. the investment decisions are taken with a view to hold sufficient and appropriate (in terms of cash flow characteristics like duration, liquidity and currency) assets to meet its liabilities over time.¹⁷

Box 1: The ultimate forward rate

In Solvency II assets and liabilities are valued on a market consistent basis. On the liability side, the value of the technical provision should correspond to the funds needed by the insurer to be able to meet the commitment to policyholders. Considering that these commitments are to be honoured, a risk-free interest rate term structure is used to discount the expected future cash flows and convert them to present day values.

Due to the fact that the insurance liabilities may have very long maturities, calculating their present value is difficult because reliable market data on the risk free interest rates for long term maturities are rare. As such, there is a need to have a methodology in place to overcome this situation.

In Solvency II, the risk-free interest rate term structures for discounting technical provisions are derived from rates of interest rate swaps that are traded in deep, liquid and transparent markets.¹⁸ For the long maturities referred above the term structures need to be extrapolated. According to Article 77a of the Solvency II Directive the extrapolated forward rates should converge smoothly to an ultimate forward rate (UFR), which indicates the value of the forward rate in the very long term.

¹⁶ Whether it is a cancellation or deferral and whether it is applied upon the breach of the SCR or MCR depends on the nature and tiering of the own-fund item.

¹⁷ This is the case for traditional insurance and may not apply to non-traditional or non-insurance business.

¹⁸ Where interest rate swaps are not available from deep, liquid and transparent financial markets, government bond rates are used.

The UFR is the percentage rate that the forward rates of the risk-free interest rates converge to at a pre-specified maturity (e.g. 60 years for the euro). The UFR takes the expected inflation and the expectations of the long-term real rate into account. The UFR is expected to be stable over time and is only expected to change due to changes in long-term expectations.

The UFR that EIOPA currently applies to calculate the term structures for most currencies is 4.2%. This rate was derived as the sum of 2.2% expected real rate and an expected inflation of 2%. The expected inflation is consistent with the inflation target of the ECB.

The UFRs to calculate the risk-free interest rate term structures for Solvency II will remain unchanged until the end of 2016.

EIOPA is currently reviewing the methodology to derive the UFRs. The review will include a public consultation in 2016. EIOPA intends to decide on the outcome of the review in September 2016. It is not intended to change the currently used UFRs until at least the end of 2016 in order to ensure the stability of the framework for the implementation of Solvency II by insurance and reinsurance undertakings and supervisory authorities.

65. On top of the technical provisions, losses which, for some reason, exceed the provisioning (including the risk margin) would need to be covered by solvency capital in the form of own funds, so that even in an adverse scenario such as the low interest rate environment, insurers' obligations to policyholders continue to be met.
66. Unless there is a run on the company –which is an exceptional situation in insurance– the process of resolving an insurance company can be very long and sometimes take many years.
67. Solvency II does not currently offer clear tools for requiring additional capital for general macroprudential purposes on top of the microprudential requirements with the aim of maintaining the stability of the financial system. Under certain circumstances, there is, however, the possibility to address the issue of a higher SCR on a company-by-company basis by applying a capital add-on where the risk profiles of the undertakings are more affected by a low interest rate environment or a double-hit scenario than reflected in their current capital requirements.¹⁹ The current SCR is calculated by either the standard formula or an internal model.
68. Supervisors could apply a capital add-on, following the supervisory review process including considering other measures. Therefore the use of this tool is understood to be exceptional and restricted to certain cases in which the supervisory authority concludes that the risk profile of the insurance or reinsurance undertaking deviates significantly from the assumptions underlying the SCR calculation, as well as cases of significant deficiencies in the undertaking's system of governance or deviations from the assumptions underlying the adjustments to the risk-free rate and transitional measures. The capital add-on should be reviewed at least once a year by the supervisory authority, which grants on-going monitoring of its use in line with possibly changing circumstances.
69. Further, it is important to highlight the power of NSAs to require the use of internal models in the case where the risk profile of the insurance or reinsurance undertaking deviates significantly from the assumptions underlying the SCR

¹⁹ Article 37, Solvency II Directive.

calculated through the standard formula. When used, this tool would contribute to a better reflection of the interest rate risk for the most affected companies.

70. If internal models are used, the SCR calculated should already include the effects of a low interest rate environment in the parameters of the model and the scenarios considered. Furthermore, NSAs are in charge of analysing and approving the internal models of companies, and could therefore reject them in case they do not reflect the economic and financial reality. In addition to that, as explained above, on the basis of the supervisory review process, a capital add-on could also be considered when companies use internal models or could be requested when changes to their existing internal model have not been incorporated.
71. While a strengthening of the capital requirements determined with internal models by supervisory authorities would increase the resilience of the insurance sector as a whole, it should be stressed, however, that this is costly for the company and eventually for policyholders, and that full resilience is neither possible nor financially desirable.
72. Furthermore, it should be mentioned that capital is not considered as a substitute for strong governance, risk management and internal controls. Solvency II is designed to enhance governance and control in a rigorous way, and to require insurers to bring a more organised and comprehensive approach to governance, risk management and control even in a forward looking perspective.
73. In this regard, under Pillar 2 risk management, all insurance undertakings should have a regular practice of assessing their own overall solvency needs and their solvency needs under the supervisory capital requirements with a view to their specific risk profile, i.e. the ORSA which in addition should form part of the company's business strategy and business decisions.²⁰ The assessment should include, among other things, approved risk tolerance limits, the undertaking's risk appetite and how these are linked to the business strategy of the undertaking.

- **Higher Loss Absorption capacity for G-SIIs**

74. Five of the nine G-SIIs are headquartered in the EU. The IAIS has been working on a set of policy measures to be applied to such institutions.²¹ In terms of ensuring sufficient loss absorbing capacity, the IAIS proposes mandating higher loss absorption (HLA) capacity for G-SIIs. The main objective of these additional requirements is to internalise some of the costs that may arise from these activities, to reduce the likelihood and impact of a potential failure, as well as to provide incentives to reduce the systemic importance.
75. When applying the HLA, all activities that give rise to systemic importance should be targeted, but with primary emphasis on NTNI activities.²²
76. As mentioned by the IAIS, HLA capacity requirements should be met by the highest quality capital; namely, permanent capital that is fully available to cover losses of the insurer at all times on a going-concern basis.

²⁰ For example, sovereign risk may be a substantial part of the risk profile of some undertakings. Although it is not captured in the standard formula, this issue should be addressed in ORSA or in the internal models, if the latter are being used.

²¹ See IAIS (2013b).

²² It should be noted, however, that NTNI activities are not always clear-cut. Additional work is needed to make the concept more operational.

77. It is very important that these measures, once finalised, are transposed into EU law to be applicable to EU insurance companies in order to increase the resilience of G-SIIs.

- **Requesting a reduction in the maximum guarantees offered in new contracts**

78. Insurers can, in certain jurisdictions, be required to lower the maximum guarantees offered in the new contracts, making sure that they are more aligned with the yields they can actually obtain in the market. As shown by EIOPA (2014b), this tool, which is available in 12 jurisdictions, has been used by five supervisors in the last 2-3 years. This measure, which would be implemented at national level, is not contained in the Solvency II framework but is compatible with it.

79. Although it obviously only affects the new business directly, a reduction in the maximum guarantees in the new contracts reduces the average guaranteed rate offered by companies. The impact of this measure on the resilience of companies would therefore be more effective in the medium to long term.

- **Strengthening the recovery and resolution framework**

80. Even though a recovery and resolution regime is essentially a microprudential instrument, it has also macroprudential effects. Indeed, an effective recovery regime contributes to a faster and more structured reaction by companies, for example, to de-risk in case of financial distress, thereby reducing the probability of default. Resolution planning, in turn, makes it feasible to resolve an insurer without severe systemic disruption or exposing taxpayers to loss, while protecting vital economic functions.

81. A proper recovery and resolution regime is notably relevant in a low interest rate environment and a double-hit scenario, as they could lead to collective failures of companies, thereby putting the stability of the financial system as a whole at risk. Therefore, strengthening the recovery and resolution framework –although a medium-term solution– could be seen as a relevant macroprudential measure to reduce the likelihood and impact of potential failures.

82. At international level, the work on recovery and resolution has moved forward quite substantially since the financial crisis. The publication of the FSB *Key Attributes of Effective Resolution Regimes for Financial Institutions*, which in its 2014 revision included an insurance annex, constituted a key milestone. It is very important to stress that a recovery and resolution framework for insurance should not be a simple extension of the banking framework. It should take into account the insurance specific features and the distinct business model, including the way in which companies transit from a going-concern to a gone-concern situation.

83. Regarding the EU, while Solvency II does introduce some tools to assist in recovery, it does not contain a complete recovery and resolution regime. The absence of a common recovery and resolution framework poses a risk that inconsistent or even contradictory national solutions emerge. In practice it increases the difficulty of coordinated actions that might possibly be needed in crisis situations, with the correspondent risk to financial stability.

84. In terms of recovery measures, Solvency II already provides for mandatory recovery plans and finance schemes to be submitted to supervisors in case of

financial distress.²³ Whereas the recovery plan should be submitted within two months from the observation of non-compliance with the SCR, the finance scheme should be submitted within one month from the observation of non-compliance with the MCR. Insurers should take remedial measures to achieve the reestablishment of the level of own funds or the reduction of their risk profile to ensure continuous compliance with the regulatory capital requirements. They should be able to provide an estimation of the financial resources intended to cover the technical provisions as well as the SCR and MCR. In case of deteriorating financial conditions, supervisors are widely empowered to adopt all measures necessary to safeguard the interest of policyholders. Solvency II does not request pre-emptive recovery and resolution plans. Such plans, which would be drafted in normal times, could be a relevant instrument to be considered by authorities as part of the risk management of the undertaking.

85. In the context of recovery and resolution, the role of Insurance Guarantee Schemes (IGSs) should also be considered. Here again, the lack of harmonisation in this area poses different problems, not only regarding the protection of policyholders in different Member States, but also from a financial stability point of view, due to the potential role that IGS can play in the recovery and resolution phases.

4.2. Limiting risky behaviour as insurers collectively “search for yield”

86. As Solvency II constitutes a risk based approach to capital requirements, increased riskiness of an investment portfolio generally leads to higher capital requirements. In this regard, there is currently no evidence that the calibration of Solvency II would not be enough to capture the risks of generalised “search for yield” behaviour.
87. In addition to that, Solvency II includes the “prudent person” principle, by which undertakings shall only invest in assets and instruments the risks of which they can properly identify, measure, monitor, manage and control as well as appropriately take into account in the assessment of their overall solvency needs. Also, assets held to cover the technical provisions shall also be invested in a manner appropriate to the nature and duration of the insurance and reinsurance liabilities. Those assets shall be invested in the best interest of all policyholders and beneficiaries taking into account any disclosed policy objective.
88. In this space, the current Solvency II framework seems to contain a range of tools to allow supervisors to identify insurers’ “search for yield” behaviour and take appropriate supervisory actions where the insurer is not able to demonstrate that it can manage the associated risks. Currently, there does not seem to be a need to apply insurance specific macroprudential tools.

4.3. Avoiding procyclicality under a double-hit scenario

89. In a market valuation environment such as Solvency II, any change in the value of the different balance sheet items will affect the overall solvency position of the undertaking, e.g. if there is exaggerated volatility in the market, this will be immediately reflected in the balance sheet of undertakings. In order to overcome this situation, several measures were included in Solvency II and the LTG

²³ Articles 138, 139 and 142.

package, with the aim of avoiding fire sales and reducing potential procyclical behaviours in periods of stress.²⁴

90. The following instruments could be considered to avoid procyclicality under a double-hit scenario: symmetric adjustment within the equity risk module, volatility adjustment, matching adjustment and the extension of recovery period. These instruments have financial stability implications and are therefore also relevant for macroprudential purposes.²⁵
91. EIOPA has a clear role in the consistent application of the LTG measures. The Authority will derive and publish the risk-free interest rate term structures, the fundamental spreads for the calculation of the matching adjustment and the volatility adjustment. EIOPA will declare the existence of exceptional adverse situations that will allow supervisory authorities to extend the recovery period in case of a breach of the SCR. Furthermore, the Authority has also issued Guidelines on the application of the LTG measures.
92. EIOPA shall also report to the European Parliament, the Council and the Commission annually until 2021 on the impact of the application of the LTG measures. Furthermore, the Authority, where appropriate after consulting the ESRB and conducting a public consultation, shall submit to the Commission an opinion on the assessment of the application of the LTG measures. That assessment shall be made in relation to the availability of long-term guarantees in insurance products, the behaviour of insurance and reinsurance undertakings as long-term investors and, more generally, financial stability.

Box 2: Some considerations around the LTG adjustments and transitional measures

From a macroprudential point of view, some analysts have expressed some concerns regarding the LTG measures, which can be summarised in two aspects. First, it is sometimes argued that most of these measures are only designed to alleviate the capital requirements in periods of stress without requiring the offsetting build-up of resilience in upturns, i.e. the measures do not work in a symmetric way, which some argue might reduce their macroprudential effects. This is something that should be analysed in more detail going forward, once data on the effects of the application of these measures are available.

Second, it is sometimes considered that the application of these measures is largely expected to reduce technical provisions and increase available own funds, thereby potentially hiding some vulnerabilities in the insurers' balance sheets. As such, some of these measures are considered to be designed to mitigate the volatility of balance sheets, rather than to mitigate the impact of a low interest rate environment, which may have a rather negative impact for part of the sector at the current conjecture. Several issues should, however, be considered:

- The "pure" application of market consistent and risk-sensitive regime may imply incentives for procyclical behaviour.²⁶ Furthermore, the adjustments are on top of a prudential regime that uses market values for assets and liabilities and, therefore, cannot be compared with a regime that, for example, uses book values for portions of its portfolio. The use of several mitigating measures helps avoiding the potential procyclical behaviours.

²⁴ Where these measures increase the amount of capital, that capital is eligible to cover the SCR and MCR.

²⁵ Two other measures were part of the LTG package: transitional measure on risk-free rates and transitional measure on technical provisions. These measures are not directly aimed at reducing procyclical behavior but are intended to avoid valuation disruptions on existing legacy contracts and adverse effects on writing new business. The mechanism is to gradually phase-in the Solvency II valuation framework over a 16 years transitional period.

²⁶ ESRB (2015) Annex 5.

- The EU legislation has designed the LTG measures to avoid procyclical behaviour in the market. Their design does not alleviate the pressure on reaching a strong solvency position. Instead, it supports undertakings to operate into that direction without unintended immediate pressure. The shift to Solvency II is a major shift in legislation which will need a few years to settle. The revision of the LTG measures by 2021 might be a good time to focus on the implications of the framework.
- In addition to that, companies using some of these measures are required to put in place a liquidity plan, assess the sensitivity against the underlying assumptions of these measures and should publicly disclose the impact of such measures on their financial position to ensure adequate transparency (solvency position with/without each measure/transitional). NSAs should follow up with companies for which they expect problems and which would not be sufficiently solvent without the LTG and enforce appropriate measures.

- ***Symmetric adjustment in the equity risk module***

93. The capital charge for equity holding in the standard formula increases when equity prices are above their medium-term average and decreases in the opposite case, thus acting in a countercyclical manner.

- ***Volatility adjustment***

94. The volatility adjustment allows insurance and reinsurance undertakings to adjust the relevant risk-free interest rate term structure for the calculation of the best estimate of technical provisions to mitigate the effect of exaggerations of bond spreads. The volatility adjustment works on the basis of reference portfolios of assets for the relevant currencies and considers spread increases in such portfolios. It is a symmetric measure which can be negative when the market is too optimistic.
95. The rationale of the volatility adjustment is avoiding procyclicality investment behaviour and fire sales in stressed market conditions. The resulting adjustment to the risk-free rate curve should limit the fluctuation of the technical provisions, keeping the balance sheet more stable.
96. Although the volatility adjustment reduces procyclicality it also introduces a new risk if the increase in credit spreads is not temporary, or artificial, but rather a reflection of decreasing creditworthiness and thereby a true solvency decrease should be the consequence. Solvency II addresses this issue by requiring insurers to show their solvency without the volatility adjustment and to report to their supervisory authority the potential measures they have at hand to improve their solvency without the volatility adjustment.

- ***Matching adjustment***

97. In cases where insurance undertakings have assigned a portfolio of assets, consisting of bonds and other assets with similar cash flow characteristics, to cover the best estimate of the portfolio of insurance obligations and maintain that assignment over the lifetime of the obligations, they are not exposed to the risk of changing spreads on those assets. The matching adjustment seeks to avoid changes of asset spreads from impacting on the amount of own funds of those undertakings. Subject to supervisory approval, companies are allowed to adjust the relevant risk-free interest rate term structure for the calculation of the best estimate in line with the spread movements of their assets.
98. The allowance of a matching adjustment is restricted to asset and liability portfolios for which it can be demonstrated by the undertakings that several conditions are met. Its application is permanent (as long as the eligibility

conditions are met), symmetric (regardless of whether market conditions are advantageous or disadvantageous for companies) and subject to strict eligibility criteria.

99. By matching specific assets and liabilities, the volatility of these assets is removed from the balance sheet and short-term fluctuations and pro-cyclical effects are reduced. Furthermore, the matching adjustment further encourages alignment of asset and liability cash flows which is a very effective measure in mitigating interest rate risk and further stabilises the solvency position and by extension, the financial stability of the insurance market.

- ***Extension of the recovery period***

100. Insurance undertakings are required to comply with their SCR on a continuous basis. Where undertakings observe that their SCR is no longer complied with, undertakings should submit a realistic recovery plan for approval by the supervisory authority within two months. Authorities should then require companies to take any necessary measures to restore their financial soundness within six months (extendable to a maximum of 9 months) from the breach of the SCR.
101. However, according to article 138 of the Solvency II Directive, in the event of an exceptional adverse situation (exceptional fall in financial markets but also a persistent low interest rate environment or high impact catastrophic events), as determined by EIOPA, an extension of recovery period by a maximum of 7 years may be granted to the undertaking by the supervisory authority concerned.
102. The extension of recovery period is designed to tackle possible pro-cyclical effects of a systemic breach of SCR (adverse situations affecting a significant share of the market or lines of business), such as distressed sales of assets on financial markets. Therefore the extension is a tool to further prevent systemic risks.
103. On the other hand, allowing the extension of the recovery period cannot be seen as an excuse to postpone action by undertakings in order to restore the situation. It should be avoided that the insurer remains too risky in terms of its available capital for a prolonged period of time. The measure needs to be accompanied by a supervisory process that closely tracks progress on recovery plans, in line with Solvency II. Furthermore, considering that the existence of a persistent low interest rate environment is not a sudden shock but rather a slow process, undertakings are expected to take measures before the breach of the SCR. In addition to that, in the case EIOPA declares that the exceptional adverse situation no longer exists, NSAs are expected to assess the use of this measure and to possibly change the period granted for the extended recovery period. Undertakings need to be prepared to take appropriate measures in this case as well.
104. The extension of the recovery period should also be considered within the concept of "ladder of intervention" which provides for an intensification of the supervisory intervention between the two levels of capital requirements (the SCR and MCR) in order to ensure that corrective measures are taken sufficiently early.
105. It should be noted that the extension of the recovery period is only applicable with respect to the breach of SCR. In case of breach of the MCR, if the insurance undertaking fails to restore compliance within three months from the observation of non-compliance (or the supervisory authority considers that the finance

scheme submitted is manifestly inadequate), the authorisation of the insurance undertaking concerned shall be withdrawn.

5. Indicators

106. This section provides an overview of a set of targeted indicators that could be used to capture the issue of low interest rate environment. Indicators are a fundamental piece of a macroprudential framework. They are useful for two main purposes. First, indicators allow macroprudential authorities to identify the build-up of potential risks and assess their size. Second, they provide relevant information as to the extent that the operative objective is being achieved. In that sense, macroprudential authorities can be alerted on the need to re-calibrate the instruments that are in place, activate additional instruments or deactivate the existing ones.

107. Two relevant observations should be made:

- (a) Indicators are only an input for analysis. Not only individual indicators should be considered. For example, composite indicators, which compile a set of individual indicators into a single index on the basis of an underlying model and econometric analysis, could also be used. Indicators in isolation do not provide macroprudential authorities with the information needed. The results should be supplemented, where possible, with stress testing analysis and other quantitative tools.
- (b) The set of indicators needs to be supplemented with an understanding of indicative thresholds levels, together with expert judgement. Furthermore, they should be estimated on a regular basis with the most updated information available and followed up throughout a certain time horizon, which enables the identification of certain trends and developments.

108. In order to capture the risks in a low interest rate environment, the following indicators could be considered at a company level:

- A. *Solvency ratio*. This ratio shows the ability of a company to pay back its debts. In Solvency II, the SCR aims at ensuring that a company is able to meet its obligations over the next 12 months with a probability of at least 99.5%. The MCR, in turn, signals the threshold below which the supervisor would trigger the "ultimate supervisory action". Furthermore, Solvency II has a market risk module that is divided into seven sub-modules. Among those, three of them, i.e. spread risk, interest rate risk and equity risk could signal the risk that companies are taking. It is also interesting to see the impact of LTG and transitional measures on the solvency position of undertakings, if these are being used.
- B. *Duration gap* (expressed as the difference between the duration of assets and the duration of liabilities). Life insurance companies typically operate with a negative duration gap, as the duration of liabilities is usually greater than the duration of assets. Depending on the definition and calculation method of the duration, a duration gap can be interpreted as a higher vulnerability of a particular company to the low interest rates and to the reinvestment risk.
- C. *Size of relevant business* (in terms of technical provisions). This indicator shows the business affected by the low interest rates focusing on the technical provisions. For example, the share of the technical provisions that refers to life insurance business offering options or guarantees.

- D. *Average guarantee levels* for exposed business. This indicator shows how high the guarantees offered by a certain company are, which can be compared with the return on investment that it is obtaining. Buckets could be used, showing the portion of business per guarantee level.
- E. *Profitability indicators* such as return on investments, i.e. total investment results as % of total investments.²⁷ Comparing the return on investments with the guaranteed return would provide a measure of the investment gap.
- F. *Investment structure of the company*. The investment structure of a company, in conjunction with other indicators, provides useful information. On the one hand, it helps identifying those assets that are most exposed to low interests, as well as their share and changes within the overall portfolio. Furthermore, correlated changes of assets across insurance companies could signal procyclical behaviours. On the other hand, observing the composition of the portfolio over time may also reveal potential “search for yield” behaviour (e.g. observing how the average credit quality of the bond portfolio evolves).
109. Indicators B, C and D could be split according to the type of contracts that are more affected by the low interest rate environment. In the case of life insurance the contracts with options or guarantees as well as those that have a surrender value are the key ones.
110. Solvency II reporting will form a good base for the calculation of most of these indicators. However, work would need to be undertaken to define the precise calculation method for these indicators based on the reported data.
111. The indicators considered so far are based on historic data. As such, they might be supplemented with additional forward-looking information, such as cash flow mismatch analysis (showing, for example, potential negative net cash flows in a certain number of years); the expectations of the company regarding the evolution of guaranteed rates over a certain period; or the point at which their asset returns could be insufficient to cover guarantees under a “runoff” assumption, i.e. assuming that no new business is underwritten.
112. From a macroprudential point of view, company data should also be aggregated to provide a view of the vulnerability of the sector as a whole.

6. Conclusions

113. This paper considers the challenges and potential measures to be taken in a situation of protracted low interest rates in a Solvency II environment. In a first instance the discussion revolves around the potential systemic importance of insurance. The paper then applies a structured macroprudential approach to address those challenges and considers the possibilities offered or compatible with Solvency II.
114. The main conclusions can be summarised as follows:
- In the case of a low interest rate environment, the macroprudential approach to the challenges posed by a low interest rate environment should be viewed as part of a holistic framework that includes other relevant elements such as the measures taken by microprudential authorities and EIOPA; other actions

²⁷ When interpreting this indicator it needs to be considered that realised returns are not a guarantee of future returns. In fact the expected effect of a prolonged low interest rate environment will materialise in future lower profitability for those companies with a mismatch of duration of assets and liabilities due to increasing technical provisions on the liability side and reinvestment risk on the asset side. Therefore, it is particularly important to look at the evolution of this profitability indicator over time.

by companies to cope with the low interest rate environment; as well as the legal environment in place (i.e. Solvency II).

- EIOPA and NSAs have been active in taking measures to monitor and mitigate the challenges posed by a low interest rate environment. Companies have also been adapting to such an environment, also as a result of the measures taken by authorities.
- From a macroprudential point of view, the low interest rate environment may create three main potential problems whose solution is considered as the operative objective that authorities should pursue. These are the need to a) increase the resilience of the insurance sector; b) limit risky behaviour as insurers collectively “search for yield”; and c) avoid procyclicality.
- Solvency II offers different tools to address these concerns, which are grouped and explained according to the defined operative objectives. From this point of view, the new prudential framework can be considered as a step forward.
- Due to the fact that Solvency II only entered into force in January 2016, the macroprudential implications of some of these measures as well as the potential impact on the behaviour of the insurers cannot be fully foreseen at this stage.
- Furthermore, in insurance there is a need for further research in order to clearly understand the sources of systemic risk and the transmission channels.
- Taking the above into consideration, the paper concludes that the issue of whether a banking-type macroprudential framework (on top of the microprudential one) is needed to address systemic risk cannot be conclusively solved at this stage.

115. The paper also stresses the need to monitor and continuously assess if additional instruments, or changes to existing instruments are needed, for which a set of indicators is also proposed.

116. The paper also concludes that following and implementing the developments resulting from the work of the IAIS regarding the policy measures and HLA for G-SIIs and further enhancing and harmonising the recovery and resolution framework in Europe are key milestones to ensure that the challenges posed by a low interest rate environment are properly addressed.

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