5. Risk assessment

Current data and projections reveal a stable picture of the European insurance market. The profitability projection, within the limit of the applied model, is positive for the whole insurance sector and this is mainly driven by a positive forecast of stock indices and GDPs. GWPs are expected to grow both for life and non-life business under the contribution of policies underwritten outside the reference jurisdiction. The analysis of the systemic risk of the financial service industry and in particular of the insurance industry currently shows low level of riskiness. Nevertheless positive signals come with several points of attention that need to be thoroughly overseen.

Profitability may be based on changes both in business models and investment strategies. Despite empirical evidence limited to a change in the investment behaviour emerges from the available data, the persistent low yield environment may increase the risk appetite of insurers both on the asset side (search for yield) and on the liability side (exposure to non-policyholder liabilities). Foreign dependence of GWP growth could represent another point of attention; in fact, despite the fact that average growth rate of extra-EU markets is expected higher than the average rate of GDP growth of mature economies, signals of an economic slowdown arrives from China. Concerning systemic risk, the level of interconnectedness of the financial service industry is currently low, but with an increasing trend towards more fragile situations.

5.1. Qualitative risk assessment

The low interest rate environment as a key risk for both insurance and pension sectors has further increased (Figure 5.1 and 5.2). Qualitative risk assessment is an important part of the overall financial stability framework. Based on the responses of the Autumn Survey among national supervisors22, the key risks and challenges classified as the most imminent in terms of their probability and potential impact remain broadly unchanged. The survey suggests increased risk of the impact of the low interest rate environment as well as equity risks for both insurance and pension sectors over the last six months.

22 The survey was responded by 27 and 23 Member States (for insurance and pension funds sector respectively).
EIOPA updates this survey every six months in order to track the changes in risk assessment. Based on the latest responses, further increase of the main risks is expected in the future by the national supervisors (see Figure 5.3).

**Figure 5.3. Supervisory risk assessment for insurance and pension funds - expected future development**

Note: EIOPA members indicated their expectation for the future development of these risks. Scores were provided in the range -2 indicating considerable decrease and +2 indicating considerable increase.

**Persistent low interest rates affect insurers in different ways.** On the liabilities side, they lead to an increase in firms’ obligations in today’s terms and, consequently, to a deterioration of their financial position. On the assets side, low interest rates have a positive impact on investment valuation, but typically not offsetting negative
impacts on liabilities due to the longer duration. Furthermore, the prolonged low yield environment increases the reinvestment risk. This problem is even more pronounced where guaranteed rates of returns defined at the inception of long-term contracts have been offered to policyholders. In the case of short-term non-life insurance business, lower returns reduce the financial margin available to offset adverse underwriting results. Furthermore, low interest rates may encourage other business model changes both on the assets and liability sides. On the asset side, a “search for yield” may alter the asset allocation towards more risky assets. On the liability side the constant pressure on profitability may lead insurers to pursue non-core insurance activities increasing their non-policyholder liabilities, which make them more prone to systemic events.

*If the current low interest rate environment prevails for long, the gap between insurance returns and formerly guaranteed rates could widen and thereby endanger the solvability and profitability of at least some companies.*

This is an issue for both life and non-life insurers. For life insurers who have embedded minimum guarantees in their products there is a risk of negative interest margins, i.e. the bond yields being lower than the minimum guarantees. If life insurers are required to value liabilities on a market-consistent basis lower investment returns will increase liabilities thus negatively impacting capitalisation. For non-life insurers, who predominantly invest in bonds, lower investment returns mean that it will be more difficult for them to compensate underwriting losses with investment gains.

*Investment portfolios are largely concentrated on fixed income instruments.*

Companies in most countries did not actively change their asset mix during the first half of 2015 as profiles of insurers’ back books also showed in the past (Figure 5.4 a)). This means that, in general, minor changes in exposures to equity risk are due to market movements. Some countries also mention that interest rate risk on liabilities is effectively mitigated by the prevalent use of interest rate derivatives by insurance companies. It also appears that insurers have extended their portfolio maturities in order to reduce the asset-liability maturity mismatch by purchasing ultra-long term government bonds. In particular life insurers have faced duration gaps between assets and liabilities and the associated reinvestment risks. Within the EU duration gaps significantly differ though. Finally, it was noticed that this risk is to some extent passed on to policy holders through unit-linked contracts in the recent past.
Figure 5.4 a). Average composition of the investment portfolio of the insurance sector Q2 2015 vs. year-end 2014

Figure 5.4 b): Pension fund Investment Allocation - 2015

Source: EIOPA. Note: The estimation for the insurance figure is based on a sample of 32 large insurers.

For the pensions chart - variable definitions are available at: EU/EEA occupational pensions statistics - Annex 2

To preserve investment returns in the long run an increased risk appetite is empirically seen from 2008 to 2014 (Figure 5.5), namely an increase in portfolio weight of equity (from 10% in 2008 Q4 to 14% in 2015 Q2) against a reduction in corporate bonds – financials and non-financial (from 17% in 2008 Q4 to 14% in 2015 Q4) can be observed over time.

Figure 5.5. Evolution of the investment portfolio of the insurance sector over time

Source: EIOPA

Note: estimation based on a sample of 32 large insurers
5.2. Quantitative risk assessment

This chapter is devoted to investigate relevant risk factors included in the insurers' risk profile that can impair the stability of the European insurance sector. The most relevant topic is still the prolonged low-yield environment. Thus its direct and indirect impacts on the different aspects of the industry are investigated. At first, the growth in written premiums - the main cash inflow in insurance - is projected. An updated analysis of the scale and the drivers behind the expansion of insurers in foreign markets follows. In addition, the direct impact of the declining interest rates on the market valuation of assets and reserves is analysed. Finally, the evolution of the profitability in the insurance market is investigated. The section concludes with a contribution on the systemic implication of the insurance industry investigated through the analysis of the level of interconnectedness of the global financial market and its evolution over time.

In a persistent low-yield environment projected cash flows of insurers are relevant figures to check in order to investigate the stability of the insurance market in general and of life insurance companies exposed to long-term guaranteed contracts in particular. GWPs represent a relevant part of insurers' cash inflow hence they require particular attention.

The pattern of the market growth for life and non-life business over a 12 year horizon (Figure 5.6) displays a high variance of the market growth in particular for the life business that reports the lowest value in correspondence to the past financial crises (2008, 2011). It confirms how the life business is more prone to financial crises than the non-life business that reports a more stable growth rate. Market growth for life and non-life insurers is expected to be positive from 2016 to 2018 with some distinctions. On the one hand, the life business displays a positive slope of the growth curve in the first 2 years of the projection. On the other hand non-life business, although characterised by a positive increase in GWP, reports a flat curve in 2016 and 2017 and a slight positive slope in 2018 only. From that we can infer that non-life insurance is less sensitive to economic growth than life, with the latter reacting faster to recovery signals coming from the European economy. In addition, compulsory business lines tend to stabilise the non-life market.
Figure 5.6: Gross Written premiums (GWP) projection for the euro zone

Source: EIOPA and ECB Survey of Professional Forecasters (SPF)

Note: Data corresponds to aggregates for the euro zone dashed lines represent the EIOPA projection using macro scenarios based on ECB SPF developed according to Christophersen, C. and Jakubik, P. (2014) Insurance and the Macroeconomic Environment. EIOPA Financial Stability Report, May 2014.

**Growth rates of the European insurers are supported by expansion outside national borders (Figure 5.7).** The increasing trend of the share of GWP abroad in the past years is confirmed by the projections (until 2016) for both life and non-life insurers where non-life has a higher increase as life business. After 2016 the almost linear growth of life insurers is confirmed, whilst a slight decrease of the foreign component of GWP for the non-life is displayed. Cross-border expansion is a necessary choice for insurers constantly looking for higher returns. This applies in particular to life insurers with no short-term perspective of increase in the interest rates. The constant increase of activities in emerging countries characterized by more volatile business cycles and, in some regions, geopolitical risks, would affect the risk profile of insurers.
Figure 5.7: Share of Gross Written Premium (GWP) abroad

![Graph showing share of GWP abroad]

Source: EIOPA

Note: Data corresponds to aggregates for EU/EEA countries, dashed lines represent the EIOPA projection using a macro scenario based on the IMF World Economic Outlook, October 2015 developed according to Christophersen, C. and Jakubik, P. (2014) Insurance and the Macroeconomic Environment. EIOPA Financial Stability Report, May 2014.

Decreasing interest rates in the euro area and their impact on insurance market are one of the most investigated topics among regulators and practitioners. Hence, it is useful to analyse the impact of the interest rates on the ratio between technical provisions and assets (Figure 5.8). On the one hand, non-life business presents an almost flat curve with the exception of 2011/12 driven by regulatory changes. One the other hand, life business displays an increase from 2010 onwards. This can be determined by the discount rate or the variation in flows (lapse rates or new underwritten contracts). The fact that flows do not show a clear increasing/decreasing pattern suggests that the upward trend in the ratio between technical provisions and assets is mostly driven by decreasing trend of interest rate\(^{23}\). This observation corresponds with a typically higher duration mismatch for life compared to non-life insurers.

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\(^{23}\) European long-term interest rate is approximated with the 10-year German Bund. The average European 10-year government bond reports a constant positive spread over the 10-year Bund, but it displays a comparable pattern over time.
The persistent low-yield environment and adverse macro-economic conditions threatened the profitability of the European insurance industry. Monetary policy intervention, despite keeping interest rates around zero, is slowly revamping the economies of European countries partially offsetting the negative effects of the low-yield environment on the profitability of (re)insurers.

Life business (Figure 5.9 a)) reports a ROA curve characterised by frequent inversion of the slope. After a two years recovery from the sovereign debt crisis of 2011, the profitability of the life industry drops below 0.4% in 2014. From 2014 onwards the profitability increased and a positive trend is confirmed by EIOPA projections based on the model proposed by Dorofti and Jakubik (2015) in their contribution "Insurance Sector Profitability and the Macroeconomic Environment". As a matter of fact the curve displays a slow but constant increase from 2015 to 2017 and a flat pattern in 2018 mainly driven by the improving economic conditions. The projection on ROE (Figure 5.9 b)) reports a slight decrease for year 2015, in line with a trend that started in 2013. This trend inverts in the following years with a recovery up to 10% by 2018.
The data suggests high sensitivity of the life business to financial trends and macro-economic changes.

**Figure 5.9:** a) Return on Assets - Life insurers  
**Figure 5.9 b)** Return on Equity - Non-life insurers

Source: EIOPA


The quantitative section concludes with an analysis on the systemic implications of the insurance industry. The analysis aims at understanding i) whether and to what extent the effects of the 2011 sovereign debt crisis are still present on the market and ii) if insurers are prone to spill-over effects from the insurance industry as such or from other financial sectors. In this context, we assess the systemic risk of the financial service industry via network analysis.\(^{24}\) More specifically we follow the approach proposed by Billio et al (2012) in their contribution "Sovereign, Bank and Insurance Credit Spreads: Connectedness and System network" by applying a linear Granger Causality test to the CDS time series (monthly data). This time series comprises a sample of 118 institutions that is divided into 39 insurers, 62 banks and 17 sovereigns.\(^ {25}\)

The Granger causality test particularly aims to test the dynamic propagation of shocks to a system due to its ability in providing information not only about the connectedness between institutions but also about the directionality of the relationship

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\(^{25}\) We thank Professor Pelizzon and the SAFE Research Centre - Goethe Universität Frankfurt for running the model and providing the graphs displayed in Figure S.10.
thereof. This characteristic allows inferring who is responsible for spill-over effects and who is prone to that.

To appreciate how the degree of interconnectedness is able to capture the level of distress of the financial system and its evolution over time, the significant "causing" connection among the selected institutions is reported in Figure 5.10. This is done for five different rolling windows from Q3 2008 - Q3 2011 to Q3 2012 - Q3 2015 and this provides a clear picture of how crises periods are associated to a higher level of connectivity among companies (Q3 2011) compared to tranquil periods (Q3 2012 and Q3 2013). The low level of connection in Q3 2012 shows how the sovereign debt crisis has been absorbed by the financial system. In the following periods, the density of connections is gradually increasing. However, the number of significant connections is still far from the pre-crisis level. This trend does not allow the conclusion that a new systemic event is approaching, but indicates that the system is potentially becoming more fragile due to the increased level of interconnectedness.

Insurers (marked in blue colour in the graphs below) tend more to "cause" than to "receive" during the crisis but play an opposite role in tranquil periods acting as a net recipient especially form banks. The most recent period shows how insurers and banks playing an equally active role increase the mutual level of interconnectedness.

Figure 5.10: Network diagram of linear Granger-causality relationship

Source: SAFE - Goethe Universität Frankfurt

Note: Graphs display the statistically significant (1%) "cause" relationship based on the linear Granger-causality test among the monthly changes of the expected losses of the different entities (Banks, Insurance undertakings, and Sovereigns). The type of "causing" entity is defined by colour.
5.3. Maximum Guaranteed Interest Rate in Europe as of September 2015

Under the current Solvency I regime, several jurisdictions are characterised by setting a maximum guaranteed interest rate for all or certain life insurance contracts prompting, amongst others, the question of whether or not this system will continue under the future Solvency II regime. In order to map the latest state of affairs and have an idea of the future evolutions across Europe, EIOPA’s Financial Stability Committee issued a survey in the course of 2015 to get an overview of the situation. The table below gives an overview of the countries currently applying a system which sets a maximum guaranteed interest rate, the height of this rate (as of September 2015), and whether or not the system will continue to exist under the upcoming Solvency II regime. A total of 30 countries participated in the survey of which the countries mentioned below have a maximum guaranteed rate in place.

<table>
<thead>
<tr>
<th>Country</th>
<th>Maximum guaranteed interest rate/maximum discounting rate by legislation (in %)</th>
<th>What will happen under Solvency II?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>1.50</td>
<td>Continuation of the system of maximum guaranteed interest rate</td>
</tr>
<tr>
<td>Belgium</td>
<td>3.75</td>
<td>Continuation of the system of maximum guaranteed interest rate</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1.30</td>
<td>No continuation of the system of maximum guaranteed interest rate</td>
</tr>
<tr>
<td>Denmark</td>
<td>1.00</td>
<td>Continuation of the system of maximum guaranteed interest rate</td>
</tr>
<tr>
<td>France</td>
<td>0.00</td>
<td>Continuation of the system of maximum guaranteed interest rate</td>
</tr>
<tr>
<td>Germany</td>
<td>1.25</td>
<td>Currently under review</td>
</tr>
<tr>
<td>Greece</td>
<td>3.35</td>
<td>No continuation of the system of maximum guaranteed interest rate</td>
</tr>
<tr>
<td>Italy&lt;sup&gt;27&lt;/sup&gt;</td>
<td>1.00</td>
<td>No continuation of the system of maximum guaranteed interest rate</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>0.75</td>
<td>Continuation of the system of maximum guaranteed interest rate</td>
</tr>
<tr>
<td>Lichtenstein</td>
<td>1.50</td>
<td>Continuation of the system of maximum guaranteed interest rate</td>
</tr>
<tr>
<td>Norway</td>
<td>2.00</td>
<td>No continuation of the system of maximum guaranteed interest rate</td>
</tr>
<tr>
<td>Romania</td>
<td>2.50</td>
<td>No continuation of the system of maximum guaranteed interest rate</td>
</tr>
</tbody>
</table>

<sup>27</sup> The revised Insurance Code (which implements the SII directive) states that, by performing its supervisory functions and in periods of financial market turbulence, IVASS can set limits to the technical assumptions used for the construction of tariffs and to the guarantee interest rates related to life insurance contracts, which are applicable for a defined period of time.
The average maximum guaranteed rate following the survey equalled 1.66%. Belgium and Greece are characterized by the highest rates (both are above 3%), the rate for France was the lowest actually equalling 0% at the time the survey was closed. The fixing of the maximum guaranteed interest rate is often linked or, at least, inspired by the rate of the home-country government bonds\textsuperscript{28}, but differences in calculation algorithms are observed e.g. the observation period to take into account when calculating the average of the government bond rates. Furthermore, for some countries, the rate is determined in a more or less automatic way by directly following the evolution of certain government bond rates e.g. France or Italy Other countries, apply a more ‘subjective’ approach, i.e. e.g. Austria, Germany or Belgium

The system of maximum guaranteed interest rates explained above, should not be mixed up with a system of maximum discounting rates which are applied under Solvency I/Local GAAP in order to restrict the discounting benefit insurance companies can apply when calculating the value of their technical provisions. Applying a system of maximum guaranteed interest rates should mainly be understood as a prudential mechanism which tries to prevent insurance companies, taking into account the economic environment, from selling insurance products with interest rate guarantees which can be difficult to maintain. To some extent, such mechanisms recognize that, under a certain commercial pressure, insurance companies might be tempted to sell products which do not correspond to their risk-bearing capacities. Even under Solvency II, where such ‘dangerous’ commercial behaviour would be directly translated in higher technical provisions requirements and insurers will have to demonstrate on an ongoing basis that they have the capabilities to face risks embedded in their business (i.e. under risk management and ORSA requirements), such a system could do its worth. The survey shows that, in any case, a number of countries is currently envisioning a continuation of the system under the new prudential regime. Given the low yield environment, countries applying a system with maximum guaranteed interest rates could face strong(er) debates about the system, being confronted with both the pros and cons. On the one hand, and as explained above, the system helps to prevent insurance companies from the negative consequences of excessive commercial behaviour by keeping prudential limits (over the risk sensitive Solvency II framework) on the interest rate risks they can accumulate during a low yield environment. Finally, the continuation of different national regimes on this issue would keep a legislative fragmentation among different

\textsuperscript{28} As per article 20 of Directive 2002/83/EC
jurisdictions, despite the Solvency II regime. On the other hand, all parties should be aware that a low maximum guaranteed interest rate (although the capital is guaranteed) might hamper the attractiveness of long term insurance saving contracts, putting at least more focus on tax advantages taking conferred to some life insurance policies and the profit sharing schemes which insurance companies will try to apply in order to convince the consumers of the added value of a long term life insurance savings contract compared to other saving products.