EUROPEAN INSURANCE
AND OCCUPATIONAL PENSIONS AUTHORITY

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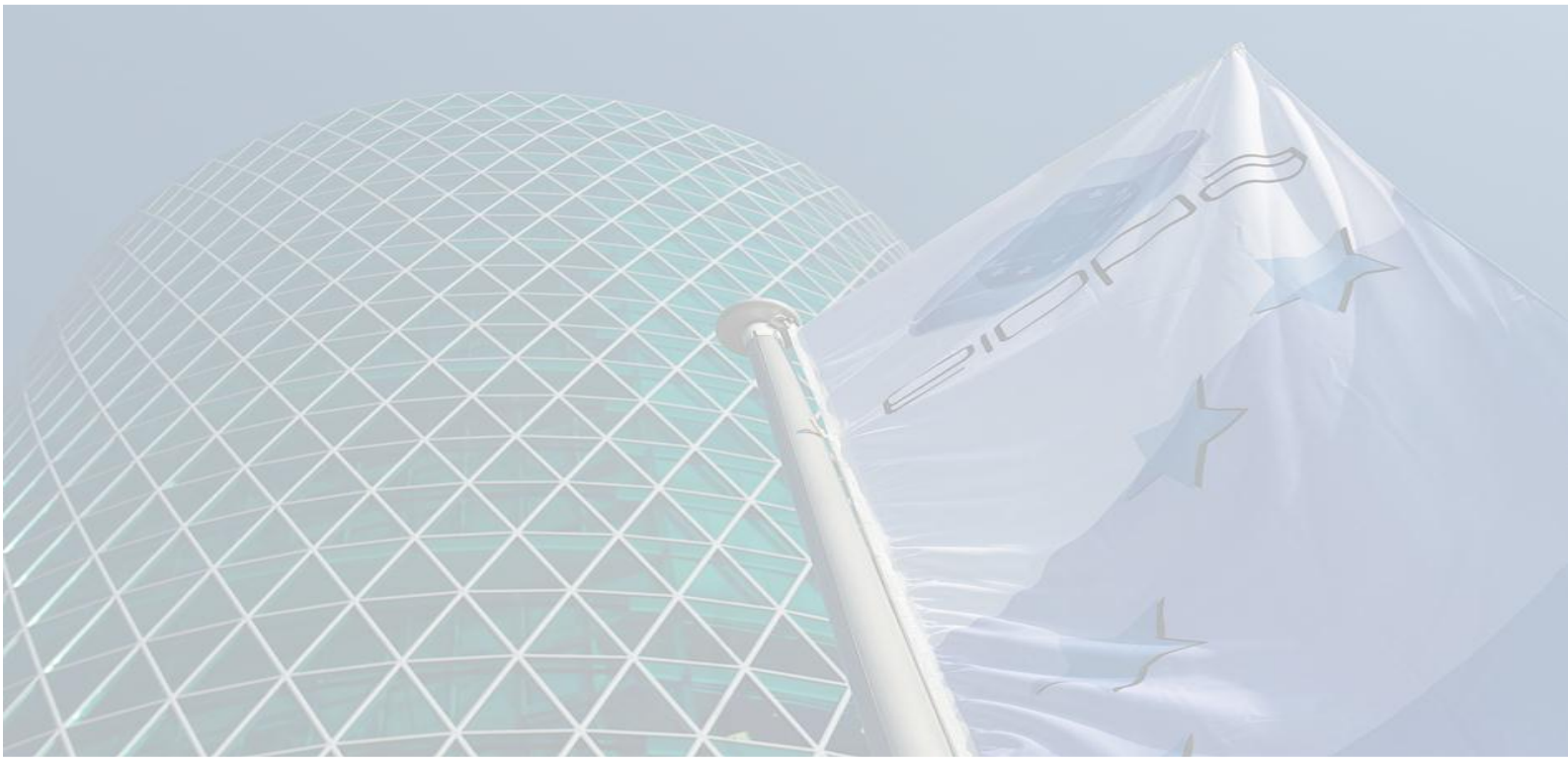
Financial Stability Report

May 2015



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Foreword by the Chairman

The first half of 2015 continued to show a very challenging environment for the insurance and pension fund sectors. The current monetary policy of quantitative easing launched in March 2015 in the euro area is designed to improve the inflation and growth outlook whilst it also aims to improve consumer confidence. Although it should have a positive impact on the European insurance and pension sectors in the long run when economic growth will improve, new challenges have been created in the short-term. Quantitative easing has further lowered the risk-free rate with negative consequences for insurers and pension funds. It is, and will be, extremely difficult for insurers and pension funds with the most exposed business models to maintain their profitability without taking more risks.

Hence, it is important, that EIOPA continues to monitor and assess the risks facing the sector, not only to increase risk awareness, but also to facilitate a coordinated supervisory response. The recent EU-wide insurance stress test 2014 revealed the sector's vulnerability to the potentially harmful effect of a risk reversal scenario combining low risk free rates with an increase in risk premiums. A first Euro wide pension stress test will be conducted this year to assess the resilience of occupational pension funds. It is an important milestone that will yield insights on the main risks and vulnerabilities of occupational pensions in the EU.

Operationally, 2015 will be a challenging year for the EU insurance industry as we move to implementation of Solvency II from 1 January 2016. EIOPA has been working hard, together with the National Supervisory Authorities in all Member States to ensure a successful transition to the new regime. In a prolonged period of low interest rates, a robust risk assessment is absolutely essential. Hence, the timely implementation of the Solvency II risk based framework recognising these challenges is more needed than ever.

In this environment it is fundamental that supervisors monitor the situation very closely and challenge the industry on the sustainability of their business models. Furthermore, action is needed from the industry to deal with the vulnerabilities of the "in-force" business and to restructure their mix of products. The transitional measures included in Solvency II should be used to ensure a smooth transition to the new

regime, avoiding disruptions in the market, while ensuring that firms will take the necessary steps to restructure their businesses.

In the current Financial Stability Report, EIOPA presents an assessment employing different analytical tools of the main risks. We also present more detailed analysis of specific issues and broader policy discussions within the thematic article section. I am confident that a constructive dialogue between EIOPA, national supervisors and the different stakeholders will smooth the implementation of Solvency II for the benefit of the internal market, industry and consumers.

Executive Summary

In the first quarter of 2015 a confirmation of the trends that had started in 2013 and 2014 can be seen: the weak macroeconomic environment, a continuation of the low yield environment and credit risk. Although the current QE policy decreases the potential risk for a reversal in the investment flows (that has been compressing spreads on higher yielding assets) slightly, the risk remains high in the medium to long term. A re-aggravation of the sovereign debt crisis driven by the situation in Greece and increasing geopolitical risks would trigger such a scenario with severe negative implications for the insurance and pension sector. The current QE policy in Europe together with sustained expectations of low inflation and moderate growth is moving yields further down and drives the expectations to a continued low yield environment. Declining risk free rates create an enormous challenge for the profitability of insurance companies, especially for life insurance companies. Overall, the Eurozone prospects remain weak. As a consequence of the QE policy, rebalancing from sovereign bonds into more risky asset classes reduces credit spreads. Tightened credit spreads reflecting market future expectations do not seem to be in line with the current economic conditions. The QE programme substantially reduced the market volume for some assets classes which significantly increased volatility of their daily returns. In such an environment, a risk reversal scenario could be triggered by a relatively limited market move.

All in all, growth in insurance premiums remains limited although the life segment showed some recovery in premium income for the median company in 2014 (compared to 2013), whilst only a minor growth in premiums in the non-life sector was reported. Profitability challenges remain. Yields are at their lowest level ever and offering competitive rates that appeal to policyholders is getting increasingly difficult. Insurers' earnings will continue to be challenged by the persistent low interest rate environment, which will adversely affect returns and pressure the profitability of products. The Solvency I ratio has remained adequate for the whole European insurance sector; the start of Solvency II next year marks a major step forward in modernizing and harmonizing European insurance regulation. As stated in the EIOPA stress test report, problems on the sustainability of the capital level will in general take more time to materialise. However, some time has passed and interest rates have fallen further since the stress test has been carried out.

The reinsurance premiums have been pressurised because reinsurers face continuing competition from non-traditional resources. 2014 was very benign in terms of losses and fatalities. The pressure related to the risks arising from the low yield environment foreseen in the coming years may lead the reinsurance industry to consolidate. Alternative sources of capital push the sector's capitalization levels higher and pressure pricing. The rise of alternative capital (AC) is a key risk for the traditional reinsurance market, as it has contributed to lower rates and increased competition.

The ongoing macroeconomic environment continues to generate increasing challenges to the European occupational pension fund sector. Defined Benefit (DB) plans are directly adversely affected by declining interest rates given the asset-liability mismatch on their balance sheets. New types of hybrid (HY) schemes have emerged to deal with the current challenging conditions. Furthermore, in Defined Contribution plans (DC), future benefits driven by lower long-term expected returns are under pressure.

The low interest rate environment continues to impact both the pension and the insurance sector alike. Market growth for both life and non-life insurers is expected to be positive in 2016 and 2017. However, as a consequence of the current QE policy in Europe, their investment portfolios might be rebalanced towards more risky asset classes, whilst also further new growth opportunities in emerging markets are expected. The current difficult environment deteriorates the solvency position of insurers. This was confirmed by the EIOPA Insurance Stress Test 2014 that revealed substantial vulnerabilities for some insurance companies. The risk reversal scenario that was tested in this context also supports this view. A holistic view of recovery options (complexity and interrelations between groups, assessment of potential herding behaviour) for the European insurance sector should not be forgotten to avoid further negative implications for the insurance sector.

The report consists of two parts – the standard part and the thematic article section. The standard part is structured as follows: the first chapter discusses the key risks identified for insurance and occupational pension sectors. The second, third and fourth chapter elaborates on these risks covering all sectors (insurance, reinsurance and pension). The fifth chapter provides the final qualitative and quantitative assessment of the risks identified and monitored in previous chapters. This assessment is done in terms of the scope as well as the probability of their materialization using econometric techniques and questionnaires.

The thematic articles section elaborates on two specific topics in more detail and underpins the analysis and discussions provided in the standard part. The first article deals with profitability issues and the macroeconomic environment, whilst the second one focuses on macroprudential objectives and instruments for insurance.

About EIOPA Financial Stability Reports

Under Article 8 of Regulation 1094/2010, EIOPA is, inter alia, mandated to monitor and assess market developments as well as to undertake economic analyses of markets. To fulfil its mandate under this regulation EIOPA performs market intelligence functions regarding its supervisory universe, develops a market surveillance framework to monitor, and reports on market trends and financial stability related issues. The findings of EIOPA's market development and economic analyses are published in the Financial Stability Report on a semi-annual basis.

(Re) insurance undertakings and occupational pension funds are important investors in the financial market and provide risk sharing services to private households and corporates. In the financial markets, they act as investors, mostly with a long-term focus. Their invested assets aim to cover liabilities towards policyholders or members of pension schemes to which long-term savings products are offered, for example in the form of life assurance or pension benefits. Aside from offering savings products, (re)insurance undertakings provide risk sharing facilities, covering biometric risks as well as risks of damage, costs, and liability.

Financial stability, in the field of insurance and pension funds, can be seen as the absence of major disruptions in the financial markets, which could negatively affect insurance undertakings or pension funds. Such disruptions could, for example, result in fire sales or malfunctioning markets for hedging instruments. In addition, market participants could be less resilient to external shocks, and this could also affect the proper supply of insurance products or long-term savings products at adequate, risk-sensitive prices.

However, the insurance and pension fund sectors can also influence the financial stability of markets in general. Procyclical pricing or reserving patterns, herding behaviour and potential contagion risk stemming from interlinkages with other financial sectors, are examples that could potentially make the financial system, as a whole, less capable of absorbing (financial) shocks. Finally, (re)insurance undertakings might engage in non-traditional/non-insurance business such as the provision of financial guarantees or alternative risk transfer, which also needs to be duly reflected in any financial stability analysis.

The Financial Stability Report draws on both quantitative and qualitative information from EIOPA's member authorities. Supervisory risk assessments as well as market data are further core building blocks of the analysis.

First half-year report 2015

EIOPA has updated its report on financial stability in relation to the insurance, reinsurance and occupational pension fund sectors in the EU/EEA. The current report covers developments in financial markets, the macroeconomic environment, and the insurance, reinsurance and occupational pension fund sectors as end of March 2015 if not stated otherwise.

PART I

1. Key developments

The overall macroeconomic environment remains very challenging for the European insurance and pension sector. The yields have been further compressed and are substantially below the tested levels of the EIOPA Insurance stress test 2014. This has been the consequence of the recent decision of the European Central Bank on the Quantitative Easing (QE) policy driven by deflationary pressures in Europe supported by the global oil prices drop. This environment might affect investment behaviour of insurers and pension funds to rebalance their portfolios towards more risky assets. At the same time macroeconomic imbalances remain as both private and public sectors are heavily indebted and unemployment and market fragmentations are high. Due to the current QE policy the potential risk for a reversal in the investment flows (that has been compressing spreads on higher yielding assets) has been slightly decreased, but remains high in the medium to long term. A re-aggravation of the sovereign debt crisis driven by the situation in Greece would trigger such a scenario with severe negative implications for the insurance and pension sector. Moreover, worsening geopolitical risks such as the situation in Ukraine or Middle East could also cause a risk reversal scenario.

Financial markets in the first quarter of 2015 showed a confirmation of the trends that had started in 2013 and 2014: a prolonged low yield environment (see 1.1), weak macroeconomic fundamentals (see 1.2.) and credit risk (see 1.3).

1.1. Low yield environment

The current QE policy in Europe together with sustained expectations of low inflation and moderate growth is moving yields further down and drives the expectations to a continued low yield environment. A substantial move of the yield swap curve down (Figure 1.1) and very low forward rates indicate this prolonged market trend (Figure 1.2).

Figure 1.1: EUR swap curve

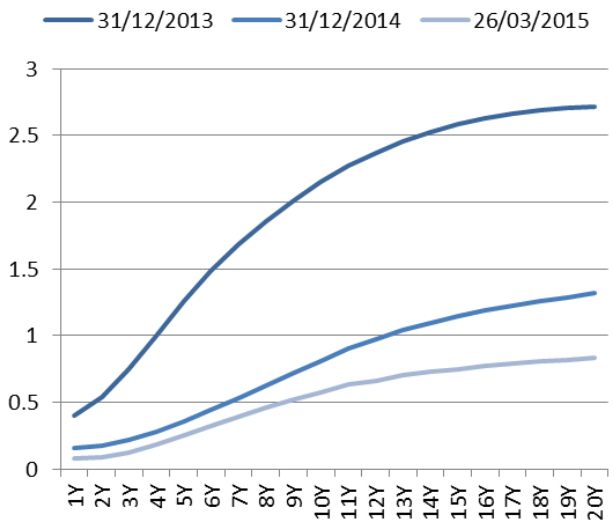
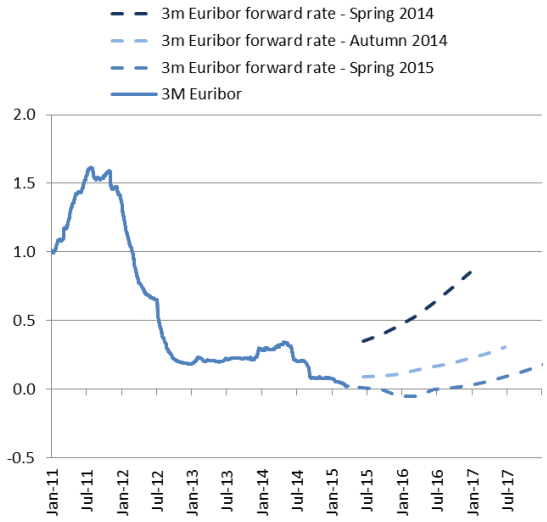


Figure 1.2: 3M EURIBOR



Source: Bloomberg - Final observation: 26 March 2015

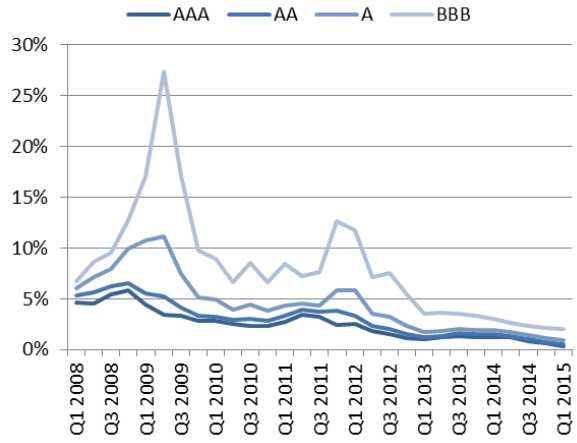
A portfolio rebalancing is a key transmission channel of the QE policy that has direct implication on the insurance and pension sector. It lowers the risk-free rate (as shown above) as well as the funding costs. Furthermore, rebalancing from sovereign bonds into more risky asset classes should reduce lending spreads and also help to stimulate the economy. Finally, it could trigger a portfolio outflow from the economies who apply QE policies.

Declining risk free rates creates an enormous challenge for the profitability of insurance companies. It raises the question how insurers and pension funds can respond to this situation (Figure 1.3). As investors they have a natural appetite for assets that match their liability profiles and allow them to manage their duration and cash flow positions. The development of successful financial instruments with features attractive to both insurers and pension schemes is still an area for development (for example in relation to infrastructure investments). New asset classes, however,

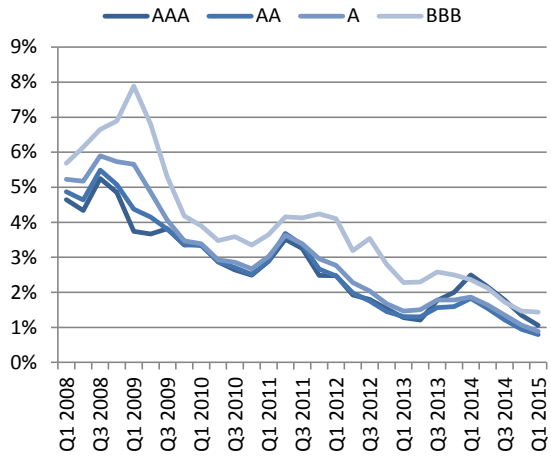
should be approached in a careful manner and should entail appropriate investment analysis and risk management skills within the organisation. Moreover, the treatment of these asset classes for solvency capital requirements needs to be properly calibrated, as evidenced by EIOPA's work in refining the capital treatment of securitised assets. At the same time, based on a survey conducted by EIOPA, large insurance groups have allocated a much shorter duration to their portfolio. The aim is to ensure that new investment opportunities are captured in the short run, whilst also becoming more resilient to a sharp rise in interest rates. Insurance companies should have appropriate expertise and resources to take advantage of the new investment opportunities. Apart from this, insurers increasingly offer new products, with varying degrees of guarantees. For example, some insurers have contracts with guarantees reset regularly, e.g. every 10 years, instead of being a lifetime guarantee. This increases investment flexibility. Other insurers have improved cost efficiency and invested in their asset liability management to offset lower investment result. On the pension front, low yields remain negatively impacting the performance and cover ratios of pension schemes and continue to be a point of concern.

Figure 1.3: Corporate bond yields in the euro area

EMU Financial



EMU Non-financial

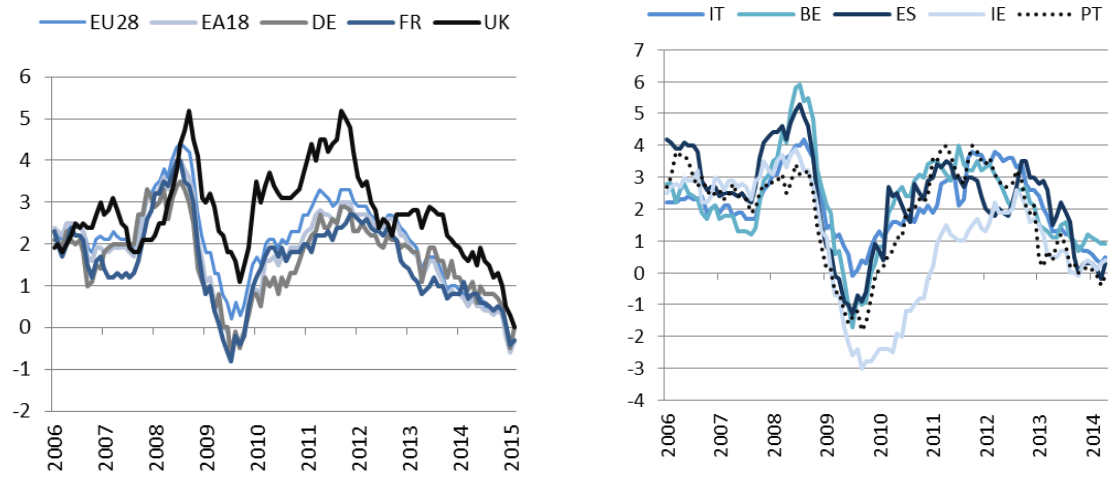


Source: BoA Merrill Lynch Global Research, used with permission

Last observation: 2015 Q1

A further increase in deflationary risk increases the likelihood that interest rates remain low (Figure 1.4). Despite the current QE policy, some countries still experience deflationary trends. Due to substantial lower inflation levels that are mostly below the ECB's mid-term goal (on the back of the steep fall in energy prices), monetary policy is expected to remain loose.

Figure 1.4: Inflation rate (in %)



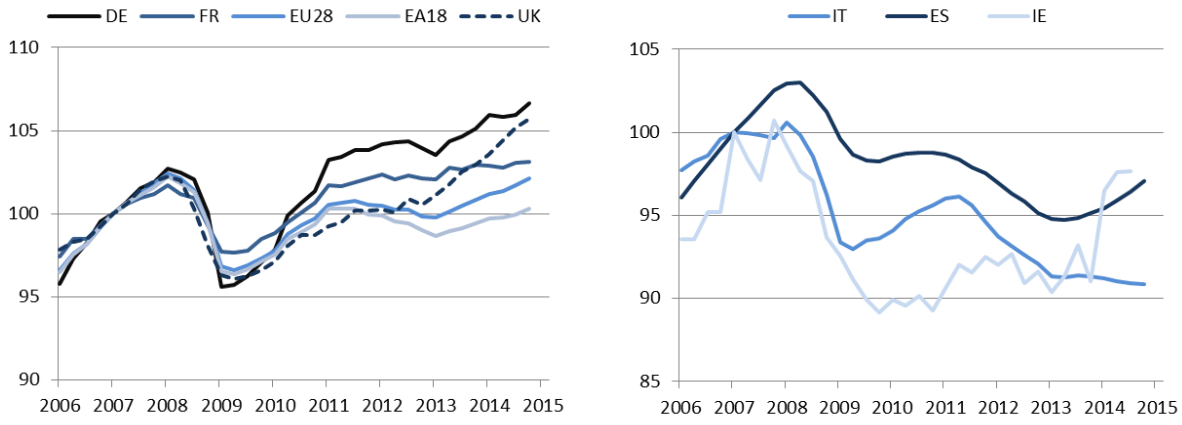
Note: Inflation rates refer to Harmonized Indices of Consumer Prices (HICP).

Source: ECB and Eurostat - Last observation: February 2015.

1.2. Weak macroeconomic environment

Economic growth in the euro area and in the EU is still positive in the majority of countries, although it remains very fragile (Figure 1.5). The recovery rate continues to be slow. Many countries, especially Southern European countries, have not caught up yet to pre-crisis GDP levels.

Figure 1.5: Real GDP development (index 2007Q1=100)

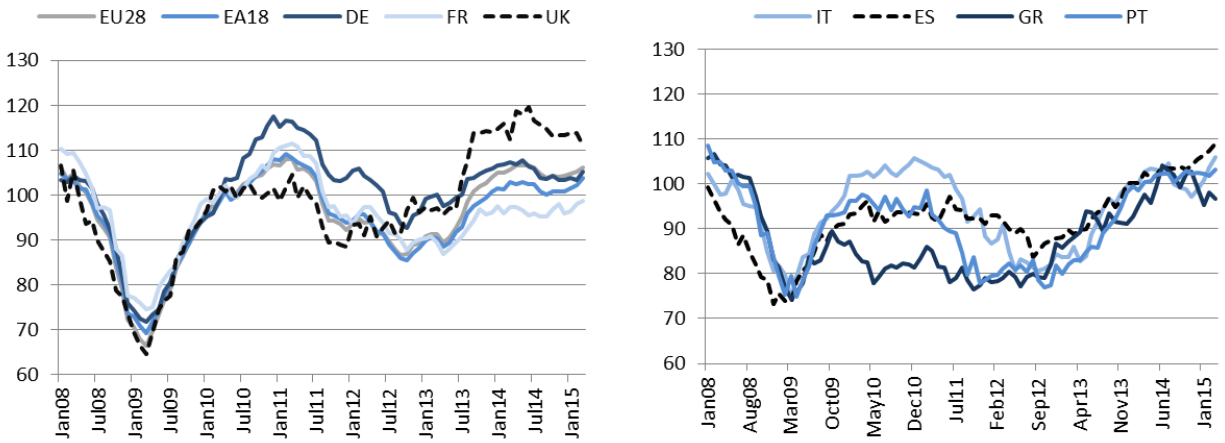


Source: Eurostat and EIOPA calculations - Last observation: 2014Q4 (2014Q3 for IE).

The Economic Sentiment Indicator (ESI) increased slightly in the euro area and the EU following a period of stagnation or decline. The improvement of the euro-area sentiment resulted from marked increases in consumer and retail trade confidence, only partly offset by declines in confidence in the services and construction sector. In February 2015, the European Commission Flash estimate of

the consumer confidence indicator increased markedly in both the EU and the euro area compared to January 2015. The ESI is also expected to increase (Figure 1.6).

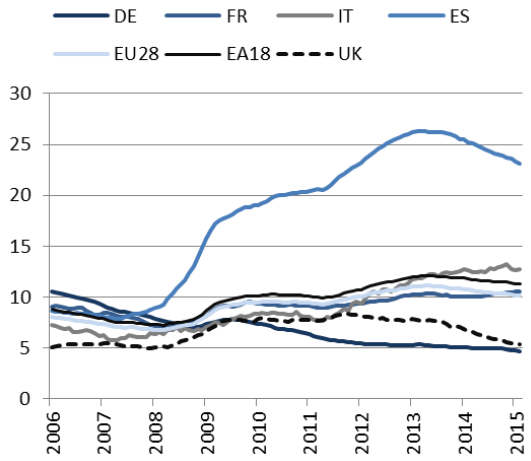
Figure 1.6: Economic Sentiment Indicator (ESI)



Source: European Commission - Last observation: March 2015

Despite prevailing macroeconomic imbalances, markets seem to be relatively optimistic on the future economic development. However, persistently high unemployment and market fragmentation is negatively impacting economic growth in some countries in the euro area (Figure 1.7). Market prices represented by the DJ STOXX Europe have recovered from sovereign crisis levels and are moving towards pre 2008 crisis levels. The DJ STOXX Insurance performance is in line with the positive development of the overall equity markets (Figure 1.8).). A sustainability of this good performance of (life) insurance stocks in the current low yield environment is questionable though.

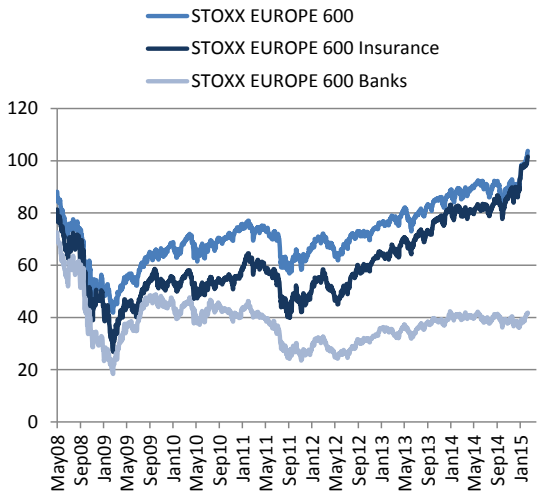
Figure 1.7: Unemployment rate - (in % of the labour force)



Source: Eurostat

Last observation: February 2015

Figure 1.8: Stock market developments (index:2007=100)



Source: Bloomberg

Last Observation: 13 April 2015

The appreciation of the US Dollar and the strengthening of the Swiss Franc following the removal of its minimum exchange rate ceiling to the Euro implies that profits of insurers and eventually their solvency might be affected. This especially applies to large insurance groups whose Swiss business is funded from the Euro area. Similar effects might be seen for the US Dollar, which heavily appreciated against the Euro over the last year. Appropriate hedging strategies, which need to be in place, especially for those insurers who anticipate future growth outside their national boundaries, might be quite costly and will also negatively impact the profitability. At the same time, those groups with a substantial exposure to Swiss assets and liabilities, in particular life insurance companies, additionally need to cope with the impact of zero risk free rates and decreasing Swiss equity markets.

1.3. Credit risk

As a consequence of the QE policy, rebalancing from sovereign bonds into more risky asset classes reduces credit spreads (Figure 1.9). This development applies to the insurance sector (Figure 1.10). Rebalancing of insurers' portfolios will most likely take place in sovereign and corporate bonds with an investment grade rating which will eventually result in higher credit risk and vulnerabilities towards a risk reversal scenario. Some rebalancing towards the US bonds on the expense of the

Euro area bonds might also be seen. Exposures towards emerging markets might also increase to maintain insurers and pension funds profitability.

Figure 1.9: 5-year Credit Default Swaps - Sovereigns

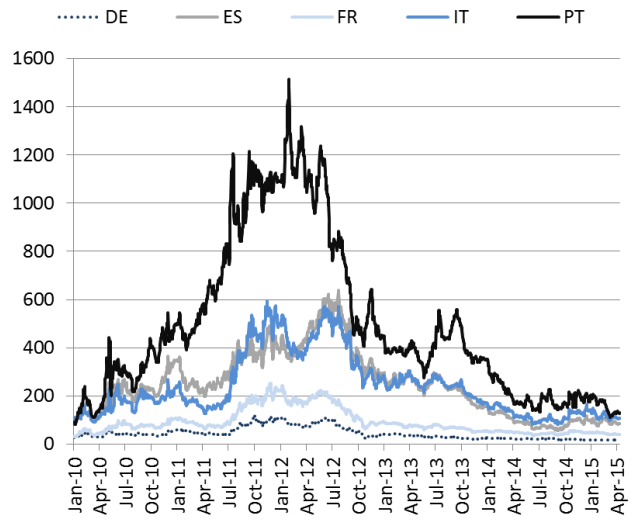
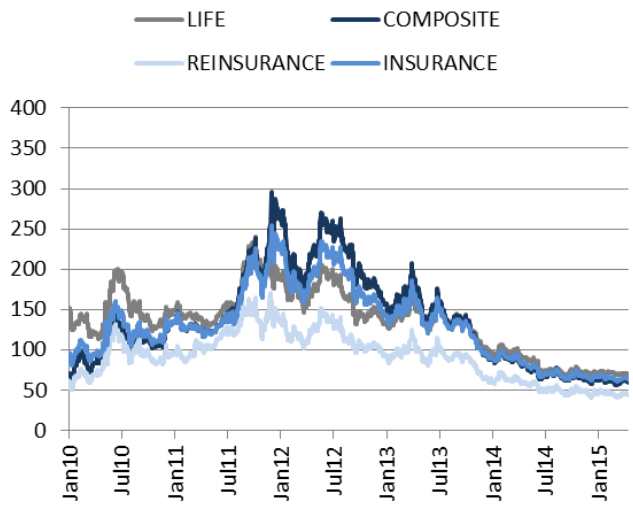


Figure 1.10: 5-year Credit Default Swaps - Insurance sector



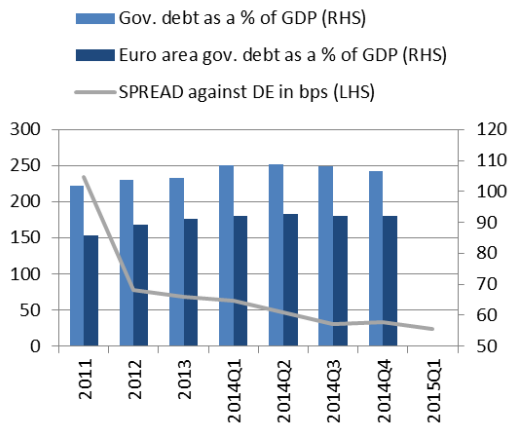
Source: Bloomberg

Last observation: 13 April 2015

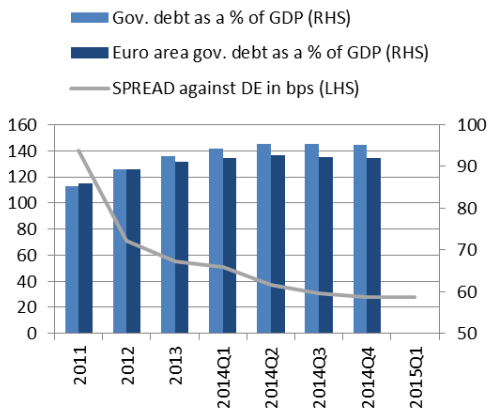
Tightened credit spreads reflecting market future expectations do not seem to be in line with the current economic conditions. A change in the positive market sentiment might be triggered by a re-emergence of concerns about sovereign debt sustainability reflecting high public sector indebtedness, large fiscal deficit and insufficient fiscal consolidation in some countries (Figure 1.11).

Figure 1.11: Government debt against 10-year sovereign bond spreads

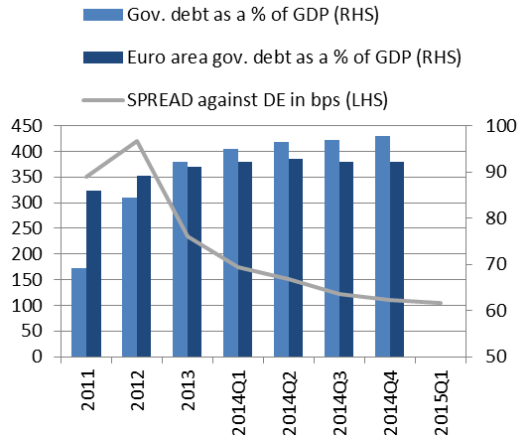
Belgium



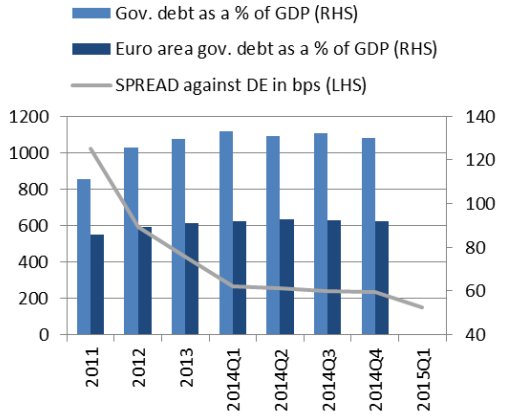
France



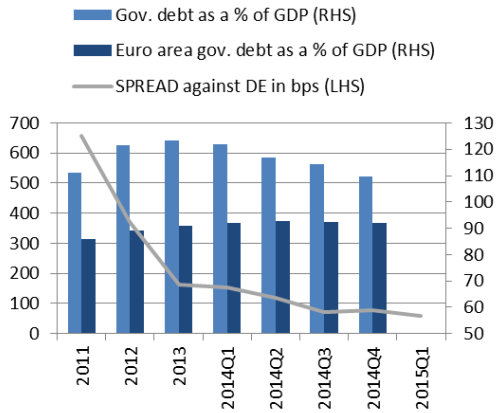
Spain



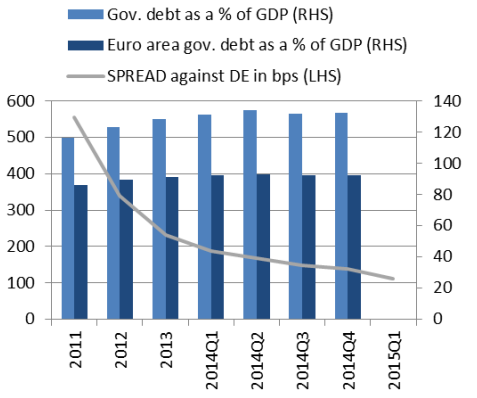
Portugal



Ireland



Italy

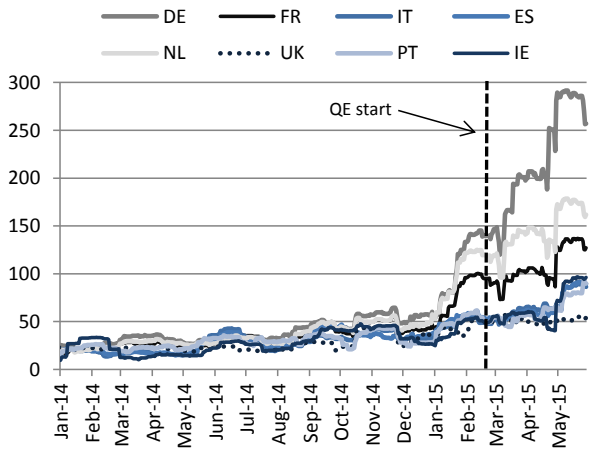


Source: Eurostat and Bloomberg

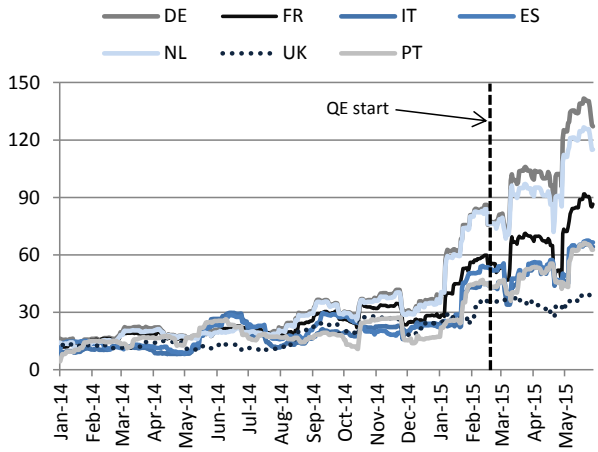
The QE programme substantially reduced market volume for some assets classes which significantly increased volatility of their daily returns. Hence, the liquidity of sovereign bonds used for the QE programme was dramatically reduced which in turn has caused an increase of volatility for their returns (Figure 1.12). In such an environment, a risk reversal scenario could be triggered by a relatively limited market move.

Figure 1.12: Sovereign bonds: 30-day volatility

10-year sovereign volatility



20-year sovereign volatility



Source: Bloomberg - Last observation: 28 May 2015

Increasing geopolitical risks could trigger a risk reversal scenario. The direct exposure of European insurers towards Russia and Ukraine seems to be very limited. Only about 0.2% and 0.05% of the total bank and sovereign exposure have Russian or Ukrainian sovereign and bank exposures respectively. The 90-percentiles, i.e. the decile of insurance groups with the highest exposure towards these two countries are 0.25% and 0.1% for Russia and Ukraine respectively. On the other hand, a further escalation of the conflict between Russia and Europe might have a destabilizing effect on the overall market sentiment. Also, the uncertainty about the situation in Greece might add to this. However, the direct exposure of the European non-Greek insurers towards Greek sovereign and bank bonds is also negligible (0.02% of total assets).

2. The European insurance sector

The development of premiums written continued to be in line with EIOPA (see chapter 5) projections and expectations that anticipate a further improvement of premium growth in 2016 and 2017 (following negative premium growth in 2015 for life insurance). At the same time, long-term interest rates are expected to hover at low levels due to the additional QE.

2.1. Market growth

In the fourth quarter of 2014, some economies provide a positive environment to generate insurance growth, due to economic growth, low unemployment rates, and some increases in wage levels. European markets are in general highly developed, mature and very competitive but divergence in economic performance across the EU is expected to continue. Intense competition in this environment had driven the industry to considerably lower premium rates, particularly in motor insurance. This has resulted in meagre growth rates up until recently, from when the industry implemented premium rate increases in an attempt to avoid any further underwriting losses and to offset decreasing investment returns.

The UK has recently introduced major changes to the retirement market. These have removed the effective requirement for defined contribution pension savers to buy an annuity. Retirees now have the flexibility to take their pension pot as cash (subject to tax at their marginal rate), purchase an annuity or enter into drawdown. These changes are expected to result in a material reduction in the flow of new individual annuity business to life insurers and are likely to result in innovation in alternative products.

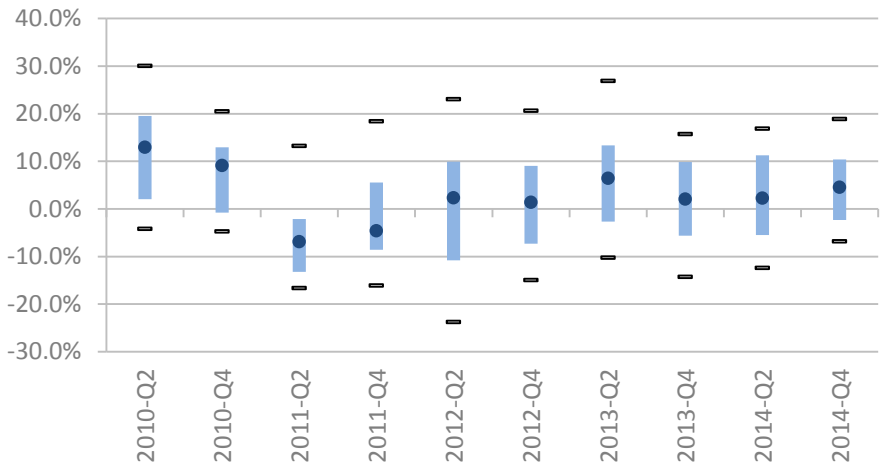
LIFE INSURERS

The life segment showed some recovery in premium income for the median company in 2014 (compared to 2013). Some member states reported growth figures prompted by regulatory changes that for example allow insurers to provide group health cover for employees. In many countries guaranteed products remained the main source for premium income. Moderate growth rates were reported in other countries reflecting disparate movements depending on the country considered, whilst others even reported negative growth rates mainly for investment life products due to changes in legal regulations.

On the one hand, unit-linked business is on average on the rise as in some countries traditional products are currently phased out. On the other hand, it is in decline for many countries as policyholders are simply not willing to carry the investment risk in times of low yields (see Figure 2.1).

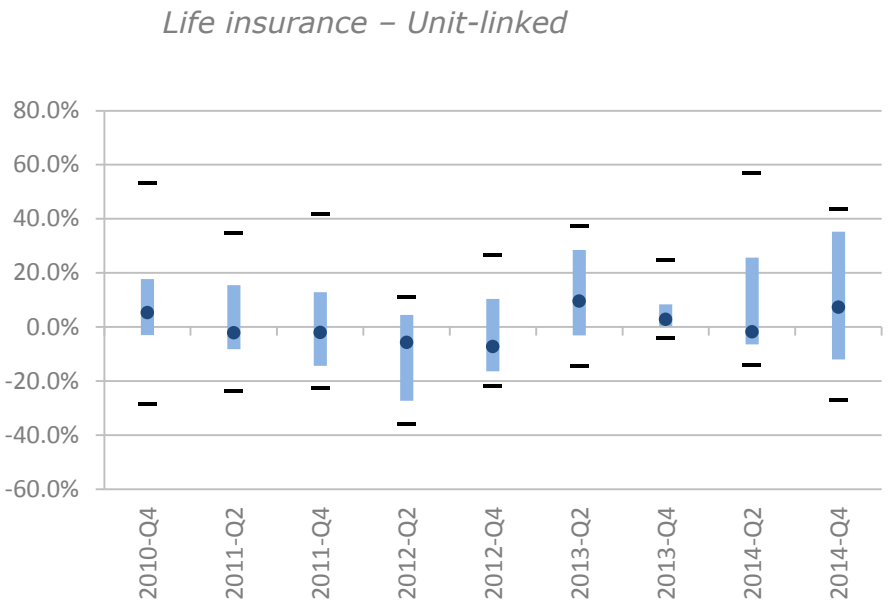
Overall, growth in life premiums remains limited. In fact, the range of growth rates reported has tightened, and some firms are recording negative premium growth. In 2014, a negative 6.8% was reported for the 10th percentile (compared with minus 14.3% in 2013).

Figure 2.1: Year-on-year growth Gross written premiums - Life. Median, interquartile range and 10th and 90th percentile



Source: EIOPA (sample based on large insurance groups in EU and Switzerland)

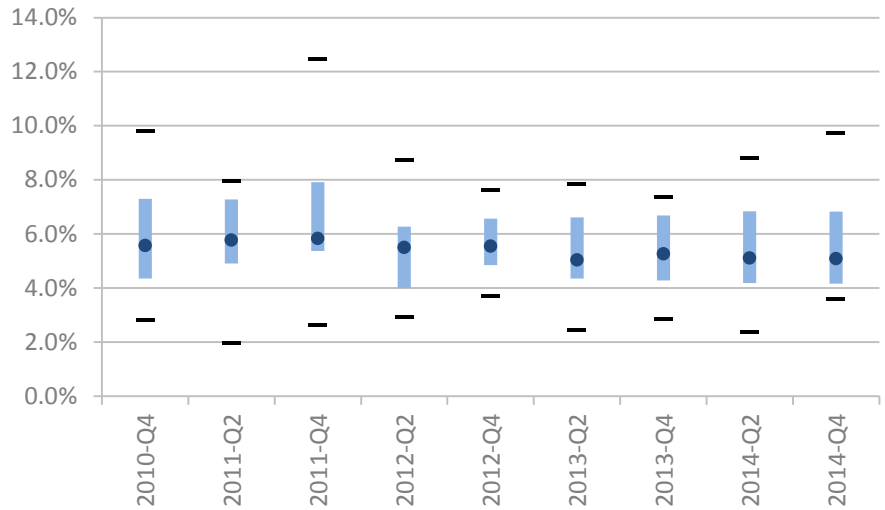
Figure 2.2: Year-on-year growth in gross written premiums, unit-linked. Median, interquartile range and 10th and 90th percentile



Source: EIOPA (sample based on large insurance groups in EU and Switzerland)

Regarding cancellation of policies, some countries report easier cancellation clauses. Prevention against lapsation is the contractual penalty policy holders need to pay in case they lapse. The penalties are not always applied though. In some countries, insurers faced net cash outflows due to high lapse rates after the government had abolished certain tax advantages for life insurance policies. In other countries, the increase of an already existing tax further increased lapsation.

Figure 2.3: Lapse rates – Life. Median, interquartile range and 10th and 90th percentile



Source: EIOPA (sample based on large insurance groups in EU and Switzerland)

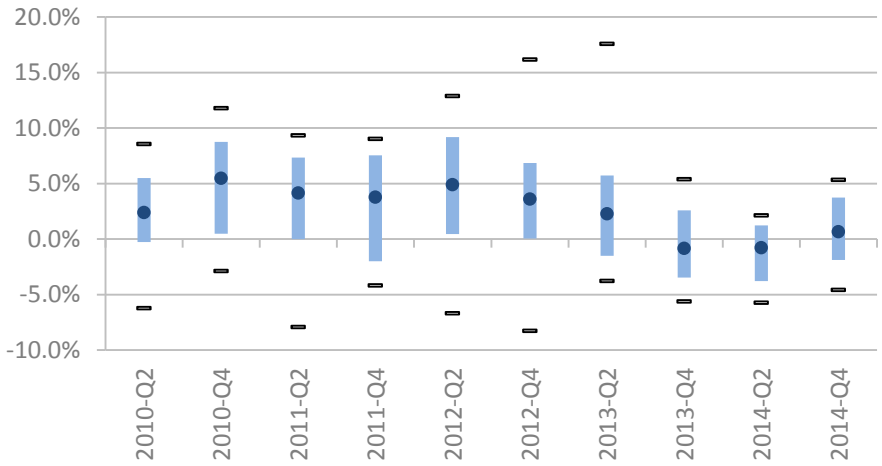
In addition, changes in legislation may also have an impact on life insurance premium growth. In the UK e.g. people will be in a position to take as much or as little as they want from their annuity when they reach the minimum retirement age. This could have far reaching implications for life insurers.

NON-LIFE INSURERS

Most countries indicate only minor growth in premiums in the non-life sector. This is due to compulsory business lines (Figure 2.4). Moreover, in the majority of countries, competition seems to increase. At the same time, claims remain under control as a result of the lower frequency of claims in motor insurance, which is in most countries the dominant class of property and casualty activity. Another factor that contributed to the favourable development of claims was the absence of major natural disasters in 2014.

For the median company, non-life insurance premiums stabilised in 2014 despite the low level. In some countries growth of premium income (Figure 2.4) is slowing due to lower economic growth or because of a very competitive non-life insurance market. The 10th percentile reports an improved but still high negative premium growth figure of minus 4.6% in 2014 (compared to minus 6.2% in 2013). The large drop is mostly due to shrinking demand for motor insurance, with car sales at multi-year lows in some countries. This will eventually put downward pressure on profits although underwriting results are still sound (see profitability section of this report).

Figure 2.4: Year-on-year growth Gross written premiums – Non-Life. Median, interquartile range and 10th and 90th percentile



Source: EIOPA (sample based on large insurance groups in EU and Switzerland)

2.2. Profitability

Profitability challenges remain. To remain competitive, insurers respond to the challenges of the low yield environment with various measures: a reduction of new and more flexible business guarantees and the development of new products with different guarantee structures can be seen. Also, further new guarantee concepts are being introduced, such as savings-type insurance products that guarantee a return only after the contract has been fulfilled rather than an annual return. This way, investment flexibility is increased and the capital costs are reduced as short-term market fluctuations can be absorbed over time.

Yields are at their lowest level ever and offering competitive rates that appeal to policyholders is getting increasingly difficult. Whether these new low guaranteed products will be a true competitor for asset managers or hedge funds in the long run remains to be seen. On the other hand, insurers are reacting by e.g. increasing their premiums or reallocating their portfolios towards more risky assets with higher expected rate of returns. Eventually this might make them even more vulnerable in the event of adverse market developments.

Insurers' earnings will continue to be challenged by the persistent low interest rate environment, which will adversely affect returns and pressure the profitability of products. In countries where life insurers have guaranteed

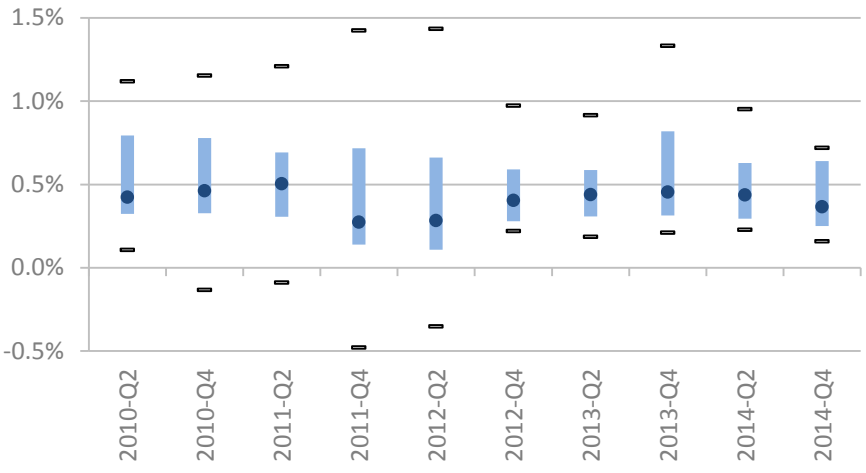
returns, low interest rates reduce the margin between investment returns and the guaranteed rates, potentially opening a gap between the two. This issue has already prompted risk mitigation actions in many countries. Insurers are expected to continue to adapt business and investment strategies to meet the challenges of the current low interest rate environment.

A prolonged period of poor results will eventually affect insurers' strategies as already noticed through the increased M&A activity that was witnessed in 2014. Insurers will not only alter their product mix, but also their investment mix by taking on riskier or alternative activities or by international expansion in an attempt to maintain profits. The move into non-traditional bank-like activities through non-conventional lending arrangements can be the natural response in some cases.

LIFE INSURERS

Return on assets (ROA) continues to be low. Based on the reported data, the average return on assets (as a percentage of total assets) is relatively stable (Figure 2.5). The ROA for the median company was 0.4% in 2014. Low bond yields have not yet resulted in a sharply decreasing ROA in the past year. The main drivers for this trend have been positive stock market developments along with some gains from derivative positions in some countries.

Figure 2.5: ROA – Total. Median, interquartile range and 10th and 90th percentile



Source: EIOPA (sample based on large insurance groups in EU and Switzerland)

A clear message emerged from the 2014 EIOPA stress test (based on year-end data of 2013) showing that for most countries the duration of life insurers' liabilities is higher than that of assets. This message came together

with the finding that the average return of the covering assets is also below the average level of the guarantees in many countries (Figure 2.6).

Given the still important stock of guaranteed return contracts in many member states, of which the duration is often longer than that of the covering assets, a renewed decline in long-term interest rates would further weaken insurance companies' capacities to repay relatively high rates of return, that were guaranteed when market rates were considerably higher. Business models are suffering from depressed interest rates as guarantees are in the money and insurance companies are required to match assets and liabilities, hence increasing the cost of managing their investments.

In the current low yield environment the situation described above puts a lot of pressure on the profitability of life insurance companies. As stated in the EIOPA stress test report, problems on sustainability will in general take more time to materialise depending on the current capitalisation level and the potential increased risk incurred due to the search for yield. These findings stand up despite the caveats already acknowledged in the stress test report regarding limitations on data quality and the comparatively lower coverage on the assets' than on the liabilities' side reported cash flows.

Figure 2.7 shows that for a number of jurisdictions the average durations are longer on the liabilities than on the assets side. Figure 2.6 also highlights that, for a number of jurisdictions, the internal rate of return is still higher on the assets than on the liabilities side providing a bit more time before capital might start eroding.

Figure 2.6: Duration mismatch

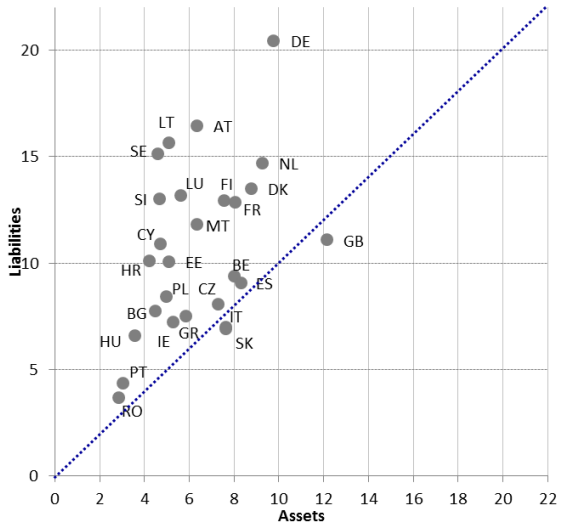
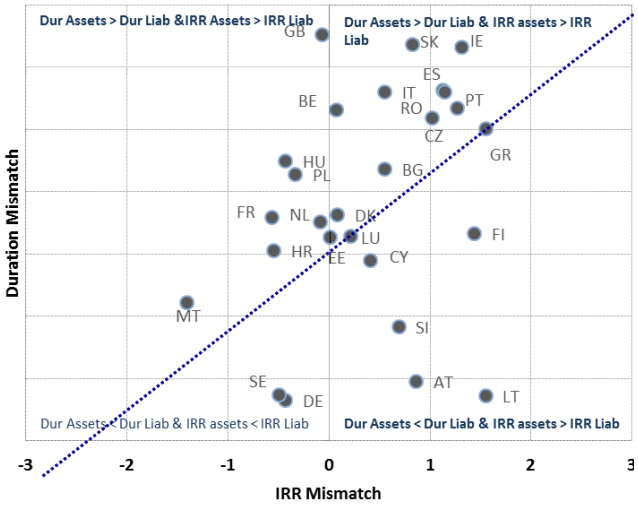


Figure 2.7: Joint mismatch of IRR and duration (assets minus liabilities)



Source: EIOPA Stress test report (2014)

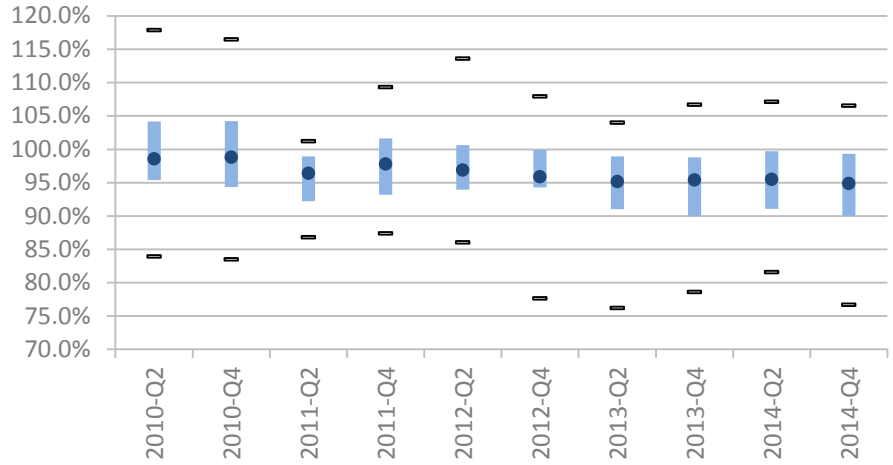
Whilst the upward movement in premium rates somewhat eased the burden on insurance companies, companies still gradually reinvest maturing bonds with higher coupons at the current lower market rates. Insurance companies can manage this risk by lowering the guaranteed returns and by lowering the duration of their contracts. For contracts with more flexible guaranteed returns, adjusting to market conditions for new premium periods, this significantly improves the resilience. However, for contracts with guaranteed returns fixed also for future premiums, the changes to the terms of these contracts only relate to new sales and the total effects will only be visible within a few years. Moreover, in some cases, these new contracts may contain embedded options. For instance, under certain circumstances, policyholders in some countries are now allowed to renew their contracts during the year.

As already pointed out, the duration of life insurers' liabilities is in many countries considerably longer than that of their assets, resulting in a significant asset-liability-mismatch risk. In Germany and Austria, e.g. maximum guaranteed interest rates were cut to 1.25% and 1.5% respectively (from 1.75%) as of January 2015. This should allow insurers to meet their inforce guarantee commitment, although only over the long term.

NON-LIFE INSURERS

For the median company, the Combined Ratio averaged about 95% in 2014 given the very limited frequency and severity of natural catastrophes over 2014. Pressure still arises in loss-making business lines such as motor insurance (Figure 2.8).

Figure 2.8: Combined Ratio – Non-Life. Median, interquartile range and 10th and 90th percentile

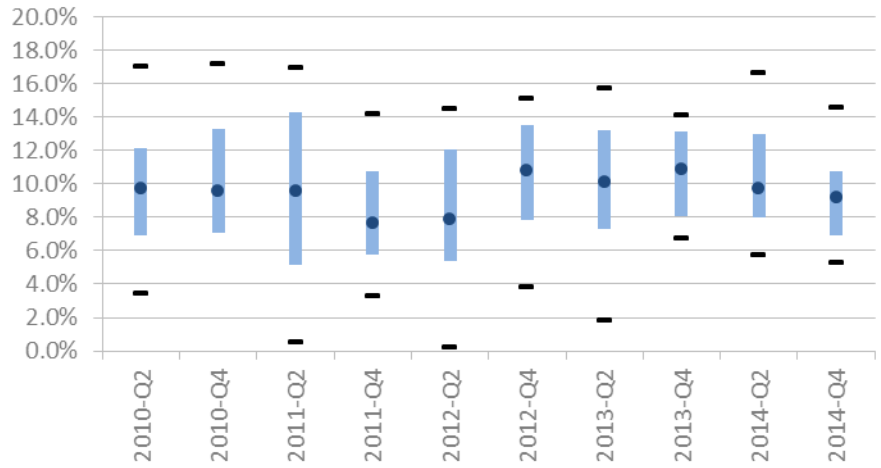


Source: EIOPA (sample based on large insurance groups in EU and Switzerland)

LIFE AND NON-LIFE INSURERS

The return on equity (ROE) has dropped in 2014. The ROE for the median company is 9.2% at the end of 2014. Due to competitive pricing and weak investment returns over the past year, ROE (Figure 2.9) has dropped by 1.7 percentage point in 2014 though (with ROE to be down from 10.9% in 2013). Non-life companies operate typically with lower fixed income asset durations than their life counterparts. Thus, their returns typically adjust more quickly to the current low yield environment. Claims growth has also remained benign.

Figure 2.9: ROE – Total, Median, interquartile range and 10th and 90th percentile

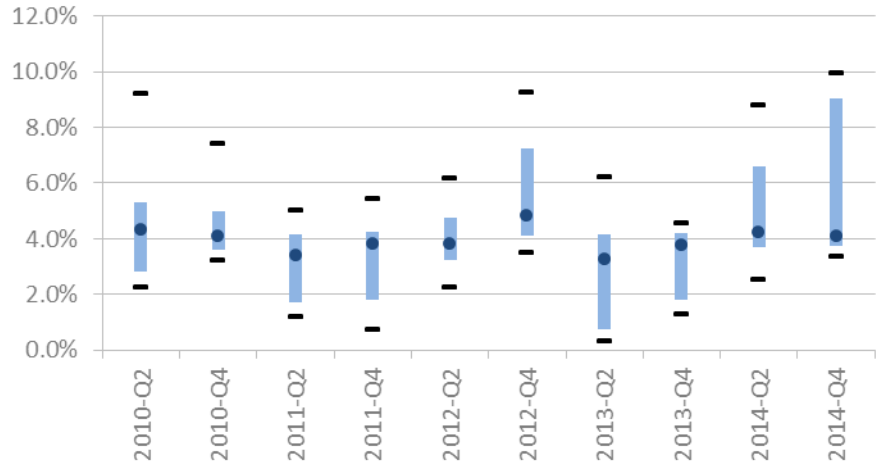


Source: EIOPA (sample based on large insurance groups in EU and Switzerland)

Also the investment returns weakened slightly in 2014, albeit to a much lesser extent. The median investment return (Figure 2.10) is still a strong 4.1% (compared with 4.2% in 2013) despite the fall in bond yields (after a short-lived recovery in 2013) and maturing investments being reinvested at lower yields.

The overall investment environment remains challenging and it is still far from certain that the investment return will remain at this level in the future. Over the course of 2014, risk free rates have decreased and credit spreads have tightened throughout the Eurozone. Bond yields will remain low until at least 2016, given that further monetary easing by the European Central Bank is expected. The fall in yields might eventually have a further negative impact on the ROE. At the same time, continuous losses in some business lines, especially motor, will decrease returns further, inevitably leading to increased rates for many insurance companies.

Figure 2.10: Return on Investment – Total. Median, interquartile range and 10th and 90th percentile



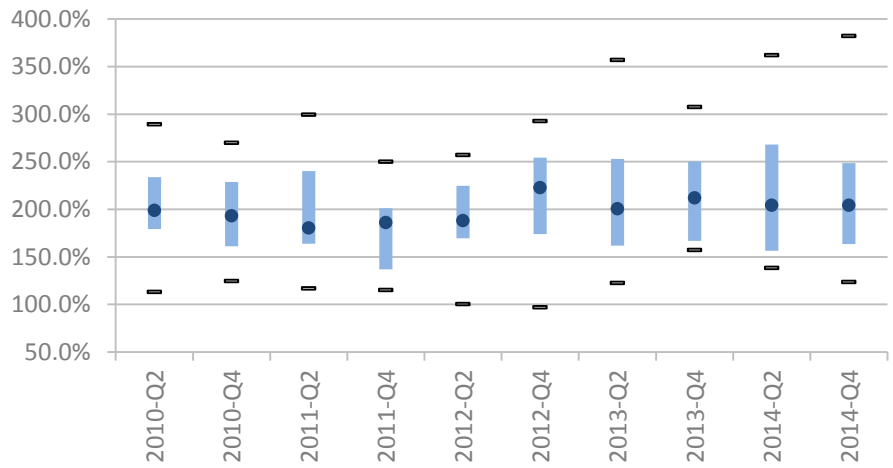
Source: EIOPA (sample based on large insurance groups in EU and Switzerland)

2.3. Solvency

The Solvency I ratio has remained adequate for the whole European insurance sector. For life insurers it has dropped slightly (due to the link between solvency margin and the life insurance liabilities, with the latter increased due to low interest rates in some jurisdictions), whilst it improved for non-life insurers. Figure 2.11 and Figure 2.12 show the required minimum margin for life and non-life companies.

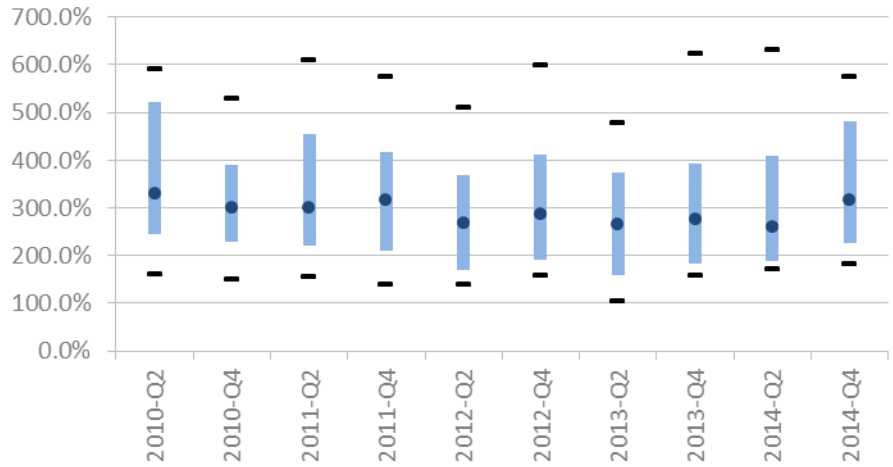
Significant changes lie ahead for Europe's insurers. The implementation of Solvency II is little more than 6 months away. For insurers, it is a critical period moving from Solvency I to Solvency II regulatory regimes.

Figure 2.11: Solvency I Ratio - Life. Median, interquartile range and 10th and 90th percentile



Source: EIOPA (sample based on large insurance groups in EU and Switzerland)

Figure 2.12: Solvency I Ratio, Non-Life. Median, interquartile range and 10th and 90th percentile



Source: EIOPA (sample based on large insurance groups in EU and Switzerland)

The start of Solvency II next year marks a major step forward in modernizing and harmonizing European insurance regulation. Solvency II applies a common risk-sensitive and market consistent regime to European insurers. It replaces Solvency I, a relatively risk-insensitive framework, under which a patchwork of

different regulatory regimes has been developed. Given the micro- and macro-prudential benefits of a harmonized, market consistent and risk-sensitive regime, a quick and efficient implementation of Solvency II is essential.

With regards to Solvency II, the recent EIOPA stress test found that 14% of the core stress[1] participants (representing 3% of total assets in the sample) would have a Solvency Capital Requirement ratio below 100% (when calculated on a Solvency II basis using only the standard formula taking into account the optional use of long-term-guarantee measures and the impossibility of using undertaking-specific parameters). However, the use of internal (or partially internal) models and transitional measures might mitigate this impact.

The risk sensitiveness introduced in Solvency II capital requirements will increase undertaking's awareness on their exposure to products with long term guarantees, especially in low yield environments like the current one. As a response to that they will likely adapt their business models or their ALM strategies or both.

2.4. Regulatory developments

Following the publication of the Delegated Regulation by the EU Commission in January 2015, remarkable regulatory developments have been achieved for the completion of the Solvency II framework and relevant steps have been taken towards its effective implementation.

A first set of guidelines issued by EIOPA in order to ensure a consistent and uniform implementation of Solvency II was officially published in February 2015. These guidelines are aimed to provide the necessary level of detail for a consistent approach across the European insurance sector in areas such as the calculation of technical provisions, solvency capital requirements or own funds.

[1] The EIOPA stress test comprises two completely independent main blocks, based on different assumptions and sample of participants: a) core module assessing separately the impact of market and insurance stresses to the sample including Insurance Groups and Solos with a view to revealing the possible effects on the main sector vulnerabilities. For this purpose EIOPA developed two hypothetic market stress scenarios jointly with the ESRB and (separately) the participants who were also requested to test a set of single risk factor tests (i.e. life and non-life stresses) and b) low yield module investigating the size, timing and scope of the vulnerability implied by the current low interest rate environment to the most potentially exposed solo insurance undertakings by testing two hypothetical risk-free rate discount curves.

Based on the draft proposals submitted by EIOPA, the EU Commission published in March 2015 the implementing technical standards on the approval of the matching adjustment, ancillary own funds, undertaking-specific parameters, special purpose vehicles, internal models and joint decision processes for group internal models. From 1st April 2015 insurers can formally seek for the approval by their supervisors of the application of those particular and relevant elements of the new prudential framework.

Also in March 2015 EIOPA published a technical advice to the EU Commission on the recovery plans and finance schemes to be provided by insurers in case of non-compliance with the new capital requirements under Solvency II and the supervisory measures that can be taken by supervisors in case of deteriorating financial conditions, taking due care to avoid pro-cyclical effects.

The publication of a second set of guidelines and implementing technical standards, expected between June and October 2015, will be a further and ultimate step before the first day of enforcement of Solvency II.

Furthermore, during the first quarter of 2015 EIOPA started the regular publication of important inputs to be used by insurance companies for the Solvency II calculations. In particular, these are relevant risk free interest rate term structures for the calculation of technical provisions and the technical information on the symmetric adjustment of the equity capital charge under Solvency II. Both are key elements for the assessment of the insurance companies' solvency and financial position. The risk-free interest rate structure and its adjustments determine the value of the liabilities of the undertakings and, to a large degree, the amount of capital which European insurers need to hold against their liabilities. The symmetric adjustment of the equity capital charge (also referred as equity dampener) aims to mitigate undue potential pro-cyclical effects of the financial system and avoid a situation in which insurance companies are unduly forced to raise additional capital or sell their investments as a result of adverse movements in financial markets.

The technical information published by EIOPA mentioned in the paragraph above is instrumental for the annual reporting by undertakings under the Solvency II Preparatory Phase with reference to 31 December 2014 that is expected by the first week of June 2015 (mid-July for groups) and the quarterly reporting with reference to 30 September 2015 that is envisaged by the last week of November 2015 (first week of January 2016 for groups). For these purposes insurance undertakings will make use of harmonised EU-wide reporting formats which are crucial to ensure a consistent implementation of European regulatory and supervisory frameworks to support

EIOPA's goal to improve the efficiency and consistency of the supervision of financial institutions across Europe.

Insurance undertakings, national supervisory authorities and EIOPA are preparing for Solvency II implementation and complementary to these preparatory guidelines. EIOPA issued in December 2014 general recommendations for NSAs based on the findings of the last EU-wide insurance stress test. Among other, EIOPA recommended NSAs to engage in a rigorous assessment of the preparedness of insurance undertakings to implement Solvency II, to engage with troubled firms assessing their planning of capital, balance sheet management and their capacity to utilise all available features of the Solvency II framework and finally to report by September 30 on the number, size and market significance of those undertakings that are not expected to meet the capital requirements of Solvency II from 1 January 2016. Moreover, these recommendations should also be viewed as fulfilling the commitments set out in the EIOPA Opinion on the supervisory response to a prolonged period of low interest rates.

3. The global reinsurance sector

3.1. Market growth

The reinsurance premiums have been pressurised because reinsurers face continuing competition from non-traditional resources. The weaknesses of the global economy and soft market conditions have negatively affected reinsurance premium growth rates.[2] Still, global life and non-life reinsurance premiums have been expanding in 2014, albeit to a lower extent for life reinsurance. This positive trend is supposed to continue, also for life reinsurance only.[3]

2014 was very benign in terms of losses and fatalities, not only in comparison with the already mild previous year, but also with the average of the last 10 years. Overall losses from natural catastrophes totalled USD 110bn (2013: USD 140bn), of which roughly USD 31bn (2013: USD 39bn) was insured.[4] Both the overall losses and the insured losses were considerable below the inflation-adjusted long-term average of the last 10 years (USD 190bn, USD 58bn).

Table 1: The five largest natural catastrophes in 2014, ranked by insured losses (in USDbn)

Date	Event	Region	Fatalities	Overall losses	Insured losses
7-16.2.2014	Winter damage	Japan	37	5.9	3.1
18-23.5.2014	Severe storms	USA	0	3.9	2.9
7-10.6.2014	Severe storm, hailstorm	Western Europe	6	4.5	2.5
5-8.1.2014	Winter damage	USA, Canada	0	2.5	1.7
3-5.6.2014	Severe storms	USA	0	1.6	1.3

Source: Munich Re, NatCatSERVICE

The year 2014 was characterised by weather-related events, which caused 92% of the loss-related natural catastrophes. Losses stemmed especially from

[2] IAIS (2014): GIMAR, December, p.16.

[3] According to Swiss Re, global life reinsurance premiums have expanded by 0.8% in 2014, after shrinking 0.3% in 2013. Modest growth of less than 0.5% is expected in 2015 and 2016. Global non-life reinsurance premiums have increased to 3.5% in 2014 from 1.7% in 2013. Real premium growth in the non-life reinsurance sector is expected to be weak in 2015 (minus-1%) and 2016 (1.1%).

[4] Munich Re: NatCatSERVICE

a harsh winter in Asia and North America. In February two snowstorms hit Tokyo and central Japan resulting in high losses. Extremely cold temperatures and heavy snowfalls hit also North America, with a severe negative impact on business, as companies were forced to stop production. The most single severe event in Europe was a storm front in June that passed over France, Belgium and western Germany.

3.2. Profitability

Even if profitability currently remains strong, the pressure related to the risks arising from the low yield environment foreseen in the coming years may lead the reinsurance industry to consolidate. The combined ratio is about 86-88% (compared to 91.9% on a five year average), and ROE remains reasonable at 12% (compared to a 14% five year average) in 2014.[5] These results benefited from benign catastrophe losses. This situation might deteriorate in the coming years if the supply of reinsurance capacity continues to exceed the demand of insurers for upcoming renewals in most global regions resulting in a continuing decreasing reinsurance price level. During the January 2015 renewal season, prices were reported to have fallen by 10%-15% across most business lines and regions.[6]

Furthermore, the recent trade in global M&A highlights the reinsurers' need for scale to compete in the current market. This market consolidation can foster more efficient use of underwriting capacity and reduce undeployed capital. However, a meaningful decline in the number of reinsurers could also reduce cedents' ability to diversify risk exposures.[7] From a financial stability perspective, a further decline in the number of insurers also increases concentration risk in the reinsurance market.

3.3. Solvency

Whereas the reinsurance capacity continues to increase the reinsurance demand is still subdued. The reinsurers´ capital reached a new all-time high of USD 575bn (USD 540bn in 2013), because of below average catastrophe losses, unrealised investment gains and a continued influx of capital.[8] This corresponds to an annual increase of 6% in 2014 following growth of 7% in 2013. The insurers' capital basis rose along with the reinsurers' due to the benign catastrophe activity in 2014 and in

[5] S&P (2015): RatingsDirect, Reinsurers'shopping spree won't slow down falling rates, 16 February, p.6.

[6] S&P (2015): RatingsDirect, Reinsurers'shopping spree won't slow down falling rates, 16 February, p.3.

[7] Fitch Ratings (2015): Global Reinsurance Guide.

[8] AON Benfield (2015): Reinsurance Market Outlook, January, page 4.

the previous year. Thus, overall, the reinsurance market saw softening prices in 2014. Only lines of business affected by major losses were exempted from that trend. Along with price reductions also the terms and conditions for reinsurance placements improved, e.g. expanded hours clause[9], broadened terrorism coverage and improved reinstatement provisions.[10]

3.4. Alternative capital vehicles

Alternative sources of capital push the sector's capitalization levels higher and pressure pricing. The rise of alternative capital (AC) is a key risk for the traditional reinsurance market, as it has contributed to lower rates and increased competition. Capital market investors, as hedge funds and pension funds, are increasingly involved in the reinsurance sector through non-equity participations. According to AON Benfield, AC inflows into the reinsurance market totalled to USD 61.9bn by the end of 2014 which represents an increase of almost 25% over 2013. AC representing 12% of traditional reinsurer capital is substantially deployed in property catastrophe risks (40 to 50%).[11] Overall, all AC vehicles including sidecars and Insurance-Linked Securities (ILS)[12] now represent 18% of global catastrophe capacity.[13] 2014 marked a new record for annual property catastrophe bond issuance with a total issuance of USD 8.2bn.[14] This increase in the supply of catastrophe protection has pushed prices down. As a consequence, reinsurers are more and more looking at other regions and lines of business to deploy their capital and diversify their exposures.

Against the background of the ongoing finance and debt crisis the diversifying nature of catastrophe-exposed business attracts investors who are searching for uncorrelated investments. Low corporate and sovereign debt

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[9] The colloquial term which limits the time period during which claims resulting from a given occurrence may be included as part of the loss subject to the cover. The time period is usually measured in consecutive hours and most often applies to property reinsurance, e.g., a windstorm, conflagration, or earthquake, and less frequently in occupational disease and other aspects of casualty.

[10] AON Benfield (2014): Reinsurance Market Outlook, September, page 9.

[11] AON Benfield (2015): Reinsurance Market Outlook, January, page 3-4.

[12] The total outstanding ILS amounted to unprecedented USD 24.1bn in 2014 (+20% over 2013), with a record of USD 8.3bn in terms of the issuance of new ILS.

[13] S&P (2015): RatingsDirect, Reinsurers' shopping spree won't slow down falling rates, 16 February, p.4.

[14] As of December 31, 2014, total catastrophe bonds on-risk stood at USD 24.3bn, representing an 18% increase over the prior year period.

yields are likely to continue to produce more capacity for catastrophe and other reinsured risks. While the non-traditional capital is mainly going into the non-proportional catastrophe business, this new capital seems to spill over into other reinsurance lines. Furthermore, the investor´s acceptance of indemnity-based triggers has increased and along with that the spreads have tightened between indemnity and other trigger types. This will raise the attractiveness of ILS further for sponsors both new and repeat sponsors, which are expected to issue into the ILS market not only for diversification and complement of overall reinsurance purchases but also due to the alternative market's competitive pricing and broadening indemnity coverage[15].

[15] Guy Carpenter (2014): Capital Markets Report, September.

4. The European pension fund sector[16]

The ongoing macroeconomic environment generates increasing challenges to the European occupational pension fund sector. Interest rates, which declined even more in the course of 2014 kept the pressure on pension fund liabilities. Traditional Defined Benefit plans (DB), 75% of the sector in 2014 in terms of assets, with guaranteed pensions based on a predefined formula, are directly adversely affected by those developments. DB funds are long term investors, for which the liabilities have a longer duration than the assets, leading to an asset-liability mismatch that is even greater than in the insurance sector. Consequently, lower interest rates can have a substantial negative effect on funding ratios. However, due to the non-existence of a harmonised market-based valuation reporting regime for pension fund liabilities, the impact on schemes based on national valuation regimes is not possible to asses across countries on a consistent basis. In those cases, when national prudential regimes are not sensitive to market price changes, the risk might be significantly underestimated.

By contrast, in Defined Contribution plans (DC), risks are transferred to the individual members instead of remaining with the individual funds or their sponsors. DC plans are always in 'balance' since the cover ratios always equal 100%. However, a material drop in plan members' future benefits driven by lower long-term expected returns could have systemic implications to the real economy since it might involve significantly lower pension benefits than expected for a significant part of the population with a potentially direct negative impact on aggregate demand[17] in the future. Significantly lower pension benefits, than expected, could have a negative impact on the aggregate demand for pension savings in the future with members choosing alternative forms of retirement provision. Members may choose to pay higher contributions over the accumulation phase or work longer to maintain their living standards and expect pension benefits.

DB plans continue to pose affordability challenges for employers. Due to fact that the cover ratios for technical provisions are not directly comparable and there is currently no consistent measure of the affordability of employers, the overall effect has not been quantified for the pension sector. The triggering of a risk reversal scenario such as the one described in chapter 1 (low risk free rates with increased

[16] All data employed in this section refer to IORPs pension funds.

[17] Aggregate demand refers to the total demand for final goods and services in an economy.

credit risk premiums), could potentially impact the pension sector even harder than the insurance sector which would already be severely affected as confirmed by the EIOPA Insurance Stress Test 2014.[18]

The risk that DB funds would become underfunded (or subject to increased underfunding) in the short to medium future remains high through increasing pension liabilities. This could have an impact on the risk of possible future solvency of the sponsor; however this would depend on the structure and flexibility of the national regulatory framework in allowing for the sustainable growth of sponsors. Also, how the market changes affect the financial position of the employer itself can vary, e.g. lower yields could imply lower borrowing costs.

New types of hybrid (HY) schemes have emerged to deal with the current challenging macroeconomic environment. Despite a clear trend towards DC schemes in many countries, DB schemes still represent the largest part of the sector. In order to increase available options, in some countries new types of HY schemes have emerged. HY schemes combine elements of both DB and DC types but currently represent just 1% (in terms of assets) of the EU pension market. However, it should be noted that in a few countries, the DB type of scheme could include many types of schemes where risks can be shared by employers, members and beneficiaries.

During 2014 many regulatory changes took place in the European occupational fund market. The UK 2014 Budget abolished the effective requirement to buy an annuity with DC pensions' pots. From April 2015, the tax rules were simplified to give people unrestricted access to their pension savings from age 55. Drawdown of pension income under the new, more flexible arrangements will be taxed at marginal income tax rates rather than the current rate of 55% for full withdrawals. The tax-free lump sum will continue to be available. Individuals will have access to free and impartial guidance, to help them make the choices that best suit their needs in retirement. This is likely to have a negative impact on demand for individual lifetime annuities but may increase demand for other retirement products.

[18] Pension funds are long term investors implying possible asset-liability mismatches greater than in the insurance sector. This could be translated into more severe impact of a risk reversal scenario.

4.1 Market growth

Total assets owed by occupational pension funds increased by 11% in 2014 following a more moderate growth of 3% in 2013 (Figure 4.1). This can be partly attributed to the drop in interest rates as well as to the outstanding performance of the equity markets over 2014 compared to the year before as described in chapter 1 (see Figure 1.8). Two countries, the UK and the Netherlands, account for most of the European occupational pensions sector (87% per cent of the total assets, see Table 1). Cross-country differences are mainly driven by the relative share of private and public provision of pensions based on countries' legislations and state supports. Pension funds under Pillar I are not covered by this chapter.

Table 4.1: Total assets per country as a share of total assets reported for 2014

UK	NL	DE	IT	IE	ES	NO	IS	AT	SE	PT
55.89%	30.67%	4.46%	2.76%	2.39%	0.92%	0.79%	0.51%	0.49%	0.46%	0.42%
LI	LU	SK	SI	PL	LV	RO	HR	BG	HU	Total
0.12%	0.05%	0.04%	0.01%	0.011%	0.007%	0.006%	0.003%	0.00012%	0.00011%	100.00%

Source: EIOPA

Note: For a few countries 2014 figures are preliminary and subject to major revisions.

The penetration rate of the occupational pension fund sector increased somewhat in 2014 compared to the previous year. This ratio is calculated as the total size of assets over GDP and gives an indication of the relative wealth accumulated by the sector (Figure 4.2). In 2014 the un-weighted average of the penetration rate across the countries of the sample increased by 3% compared to 2013 (the weighted average by total assets increased by 14% in 2014). In most of the countries penetration rates did not significantly change. The increase in the weighted-EU average was mainly driven by the increase in the Netherlands.

Figure 4.1: Total Assets

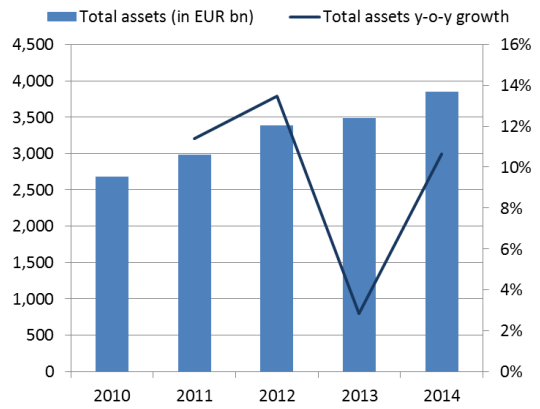
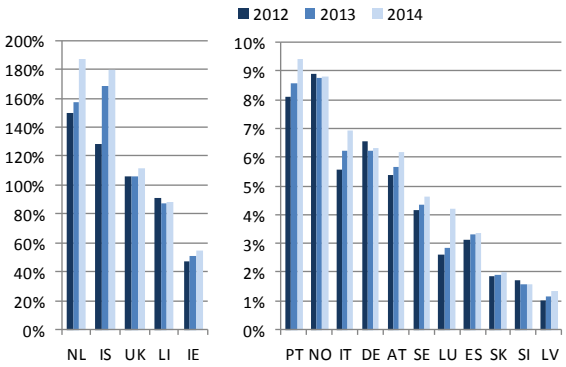


Figure 4.2: Penetration rates (total assets as % of GDP)



Source: EIOPA

Note: For many countries 2014 figures are preliminary and subject to major revisions. Penetration rates for HR, RO, PL, HU and BG are lower than 1%.

4.2 Performance and Funding

Overall, the investment allocation of pension funds has remained broadly unchanged in 2014 (Figures 4.3 and 4.4) Debt and fixed income securities account for the highest share in the portfolio investment allocation of pension funds. The total exposure to sovereign, financial and other bonds added up to 47% per cent in 2014. Due to the long-term horizon of pension funds, equity generally represents a much higher share of investments in the pension fund sector than in the insurance sector (approximately 35 per cent for the countries of the sample in 2014).

This investment mix is relatively constant over time and across countries also due to strict legal or contractual obligations for pension funds that aim to maintain stability over time. A shift towards fixed income securities and away from equities has been reported by the UK (derisking). A few other countries reported changes in the asset allocation of the pension funds. In this respect two major trends were identified: (1) The increase of DC-scheme investment allocation to equity (2) Given the low returns on bonds, some first signs of 'search for yield' to more 'risky' and 'higher yielding' investments was reported (currently very low in volumes). Both trends require caution and close monitoring.

Figure 4.3: Investment Allocation (in %)

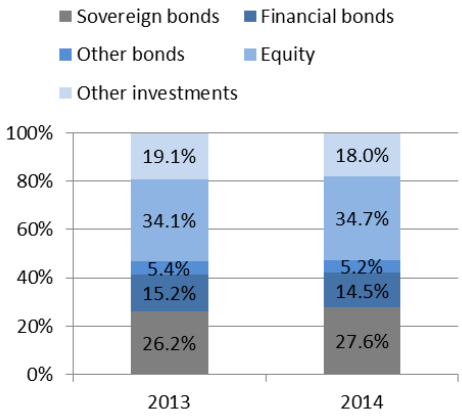
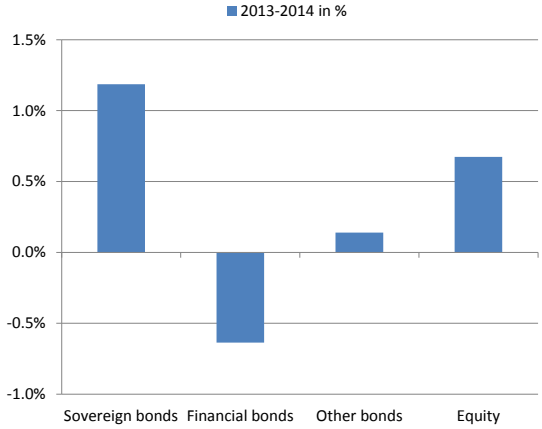


Figure 4.4: Change in investment allocation in 2014 (in %)

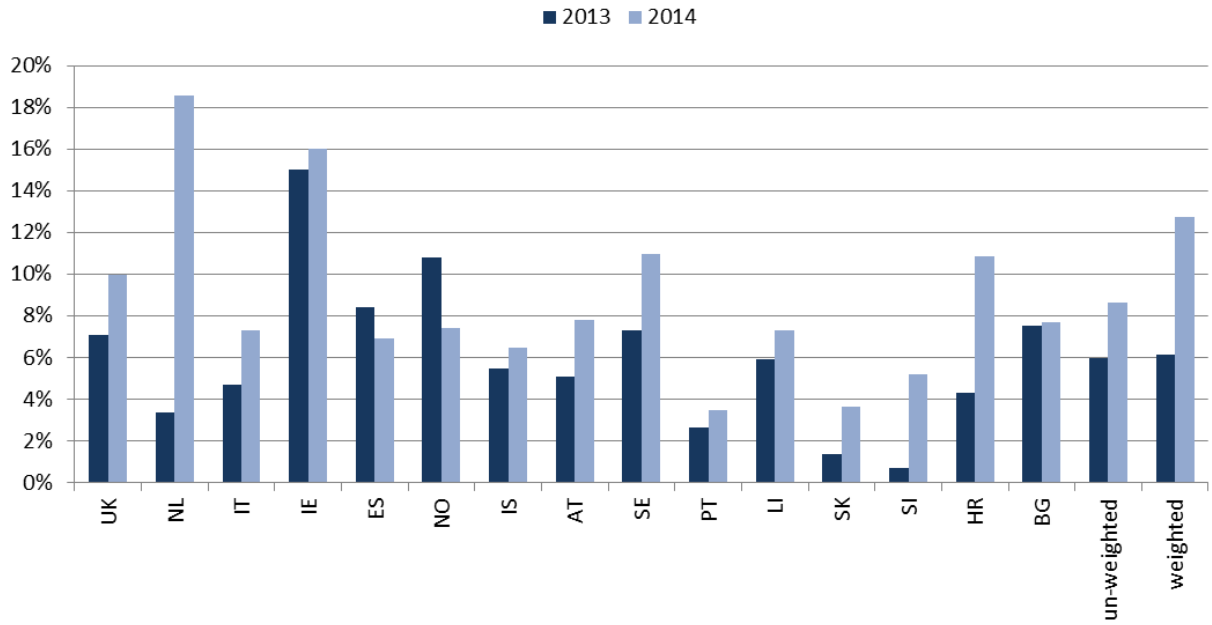


Source: EIOPA

Note: The UK figure used for the calculations of these figures relates only to DB and HY schemes.

The current low yield environment puts some pressure on the overall performance of occupational pension funds. However, the average rate of return slightly increased during 2014. The average ROA (Figure 4.5) in 2014 (un-weighted 8.6%, weighted 12.6%) was higher compared to 2013 (un-weighted 6.0%, weighted 6.1%). This can be attributed to the exceptionally good performance of the equity and fixed income markets during 2014.

Figure 4.5: Rate of return on assets (ROA)



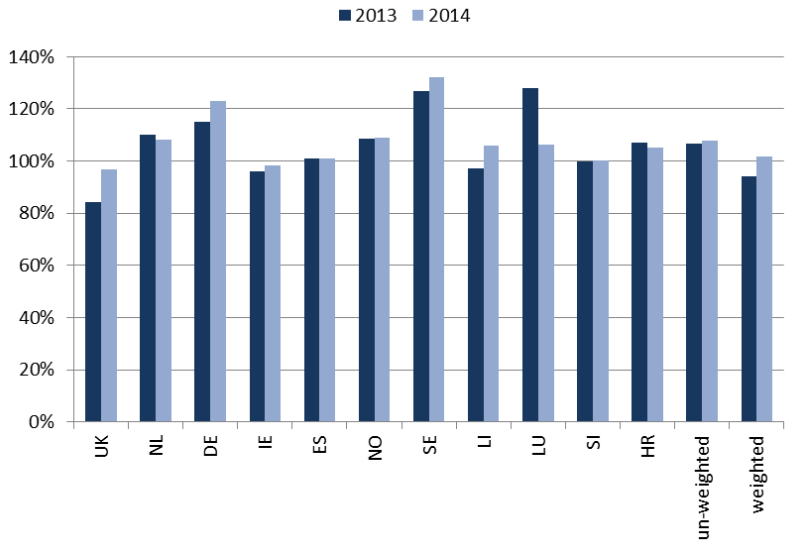
Source: EIOPA

Note: Both the weighted and un-weighted averages for ROA were calculated on the basis of the 15 countries that provided data and are depicted in the chart. The weighting was based on total assets. For many countries data are preliminary and subject to major revisions.

Cover ratios for DB schemes have increased but remain a big concern for a number of countries.[19] Overall, the average cover ratio slightly increased in 2014. The weighted average cover ratio increased from 94% in 2013 to 102% in 2014 whereas the un-weighted average cover ratio increased from 107% to 108% for the same period (Figure 4.6). Cover ratios below 100% are a great concern for the future of the sector given the existing low interest rate environment. In a few cases there is full sponsor support as well as existence of guarantees. However, an extreme adverse scenario may strain the ability of the sponsors to deal with the potential cost increases. In some countries, e.g. DE, sponsor support is complemented by additional mechanism which might provide necessarily support in case of sponsor default. In other cases benefit adjustment mechanisms may apply meaning that underfunding can be (partially) addressed through a reduction of current and expected future benefits for members.

[19] Cover ratio is defined as net assets covering technical provisions divided by technical provisions.

Figure 4.6: Cover ratio (in per cent)



Source: EIOPA

Notes:

(1) Cover ratios refer to DB schemes. Pure DC schemes present in IT, AT, SK, PL, BG and HU are not included in the chart and in the average calculations.

(2) Both the weighted and un-weighted averages for the cover ratio were calculated on the basis of the 11 countries depicted in the chart. The weighting was based on total assets.

(3) Due to different calculation methods and legislation, the reported cover ratios are not fully comparable across jurisdictions.

5. Risk assessment

This chapter assesses the risks that were identified and elaborated in the earlier chapters of this report.

5.1. Qualitative risk assessment

Qualitative risk assessment is an important part of the overall financial stability framework. EIOPA conducts regular bottom-up surveys among national supervisors to rank the key risks to financial stability for the insurance, as well as for the occupational pension sector. This chapter summarizes the main findings revealed from the survey.

Figure 5.1: Risk assessment for the insurance sector

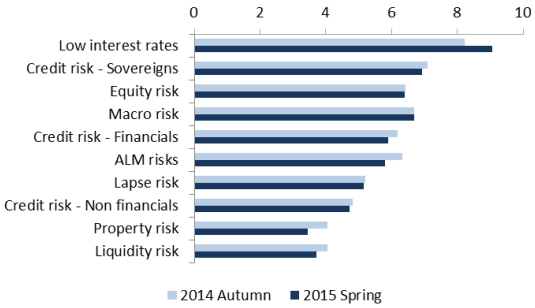
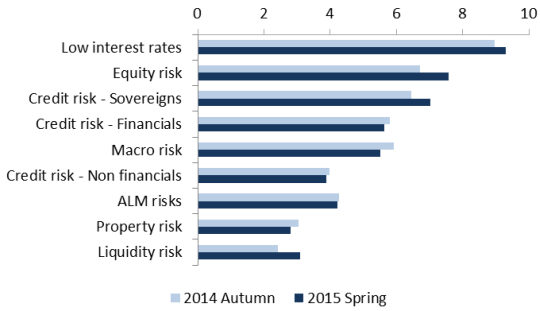


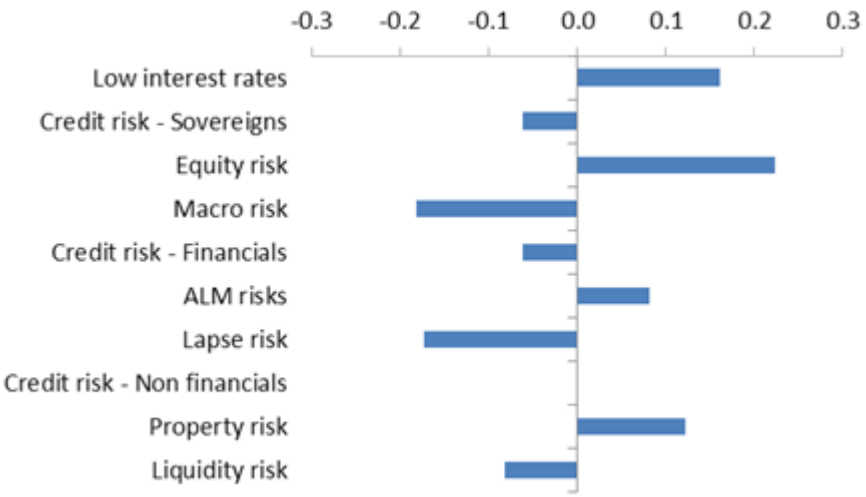
Figure 5.2: Risk assessment for the pension funds sector



Source: EIOPA

Note: Risks are ranked according to probability of materialisation (from 1 indicating low probability to 4 indicating high probability) and the impact (1 indicating low impact and 4 indicating high impact). The figure shows the aggregation (i.e. probability times impact) of the average scores assigned to each risk.

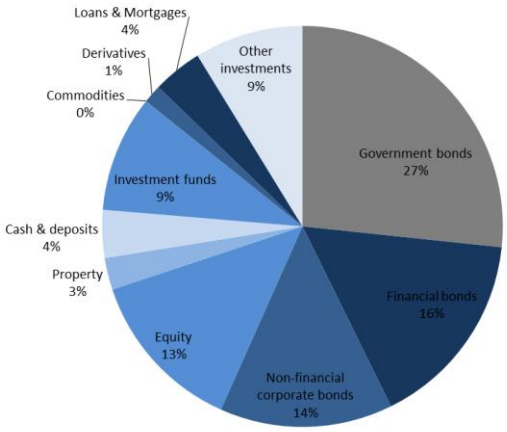
Figure 5.3. Supervisory risk assessment for insurance and pension funds - expected future development



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.

In particular, the low interest rate environment continues to impact both the pension and the insurance sector alike. This is likely to continue to put pressure on earnings, especially for contracts promising guarantees. As a result, evolving investment strategies seeking higher returns are likely to lead to increased capital requirements for asset risks. Hence, common vulnerabilities to the low interest rates may eventually also lead to solvency problems with potential financial stability implications. The EIOPA insurance stress test report 2014 reveals indeed that the low interest rate environment will become an urgent problem for life insurers. Liquidity pressure due to lapses could increase the scale of disruption. Asset allocation in risky investments could also add to this. Investments in equity continue to increase. Although on average this increase is still small and there is no clear trend yet of an investment shift, equity markets in Europe might come under pressure given the overall macro-economic situation causing an adverse impact for insurers invested in this asset category.

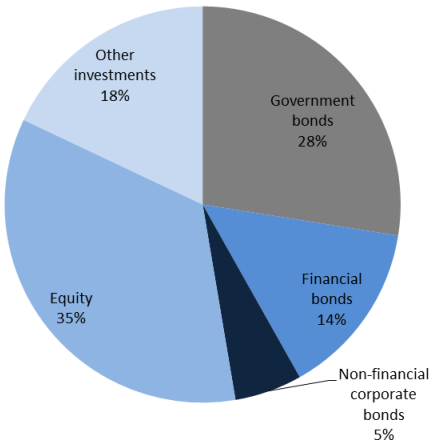
Figure 5.4: Average composition of the investment portfolio of the insurance sector 2014



Source: EIOPA

Note: Estimation based on a sample of 32 large insurers

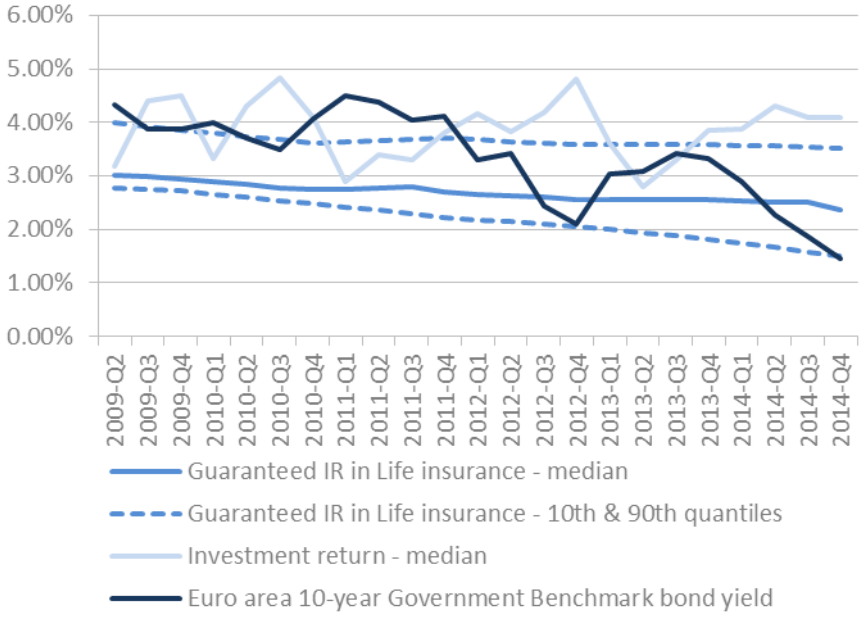
Figure 5.5: Average composition of the investment portfolio of the pension sector 2014



Note: Estimation based on a sample of 21 pension companies. For a few countries 2014 figures are preliminary and subject to major revisions

Now that average interest rate guarantees have been reduced again (but still account for 2.7% for the median company), life insurance might become even more attractive compared to other savings products that offer much lower returns in comparison. For new business, however, these high rates cannot be achieved anymore. Sovereign bond yields have fallen significantly in recent times. In fact they have been below the average interest rate guarantee.

Figure 5.6: Guaranteed interest rate in life insurance vs. investment return, Euro area 10-year government bond:



Source: EIOPA (sample based on a sample of 32 large insurance groups in EU and Switzerland) and ECB

Note: the figures represent annual guaranteed rates for businesses where such guarantees are applied

5.2. Quantitative risk assessment

The key risks identified in the previous chapters are assessed in more detail in the following sections as part of a quantitative financial stability framework that EIOPA is developing for the insurance sector. First, growth in written premiums – a key insurance variable – is projected. Second, the scale and the drivers behind the expansion of insurers in emerging markets are tested empirically. Finally, some results from the recent stress test are used to assess risks mentioned earlier in the report.

Market growth for both life and non-life insurers is expected to be positive in 2016 and 2017. The latest EIOPA estimates suggest some slowdown for non-life growth in 2015 reflecting a current difficult market environment. Life insurance growth is still expected to be marginally negative in 2015 due to the persistently high level of unemployment as well as outstanding guarantees. However, market growth is projected to be positive for both life and non-life insurance in 2016 and 2017 benefitting from an expected economic recovery. Moreover, non-life insurance is less volatile because of compulsory business lines (Figure 5.7).

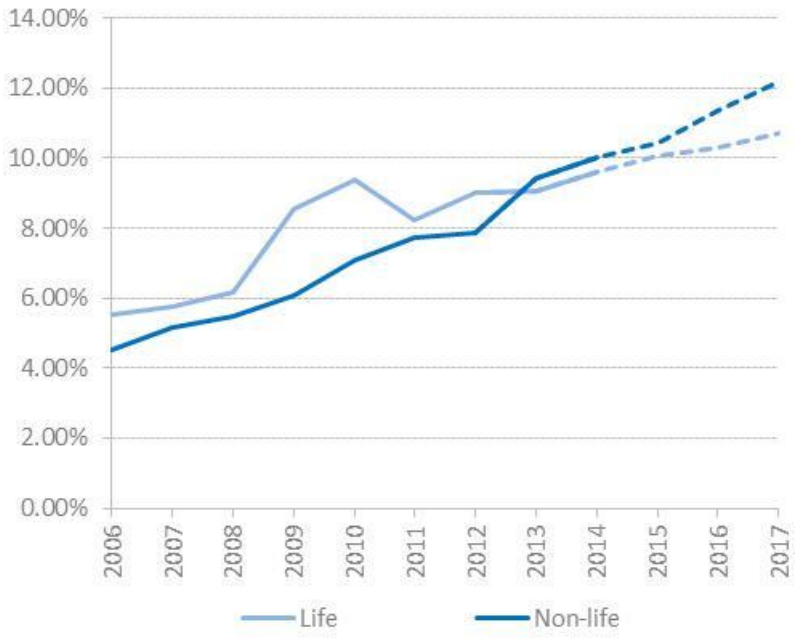
Figure 5.7: Gross Written premiums (GWP) projection for the Eurozone

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

Note: Data corresponds to aggregates for the Eurozone, dashed lines represent the EIOPA projection using macro scenarios based on ECB SPF.

Insurance companies continue to expand outside their national boundaries in a search for new growth opportunities. The low yield environment and relatively limited growth opportunities in saturated European markets contribute to this trend. EIOPA data confirms the continuous expansion of insurers into new markets. Indeed, the latest projection suggests that insurers' cross-border activities will expand further as economic development and living standards in emerging markets increase (Figure 5.8). However, main risks in these countries remain on the geopolitical side.

Figure 5.8: Share of Gross Written Premium (GWP) abroad



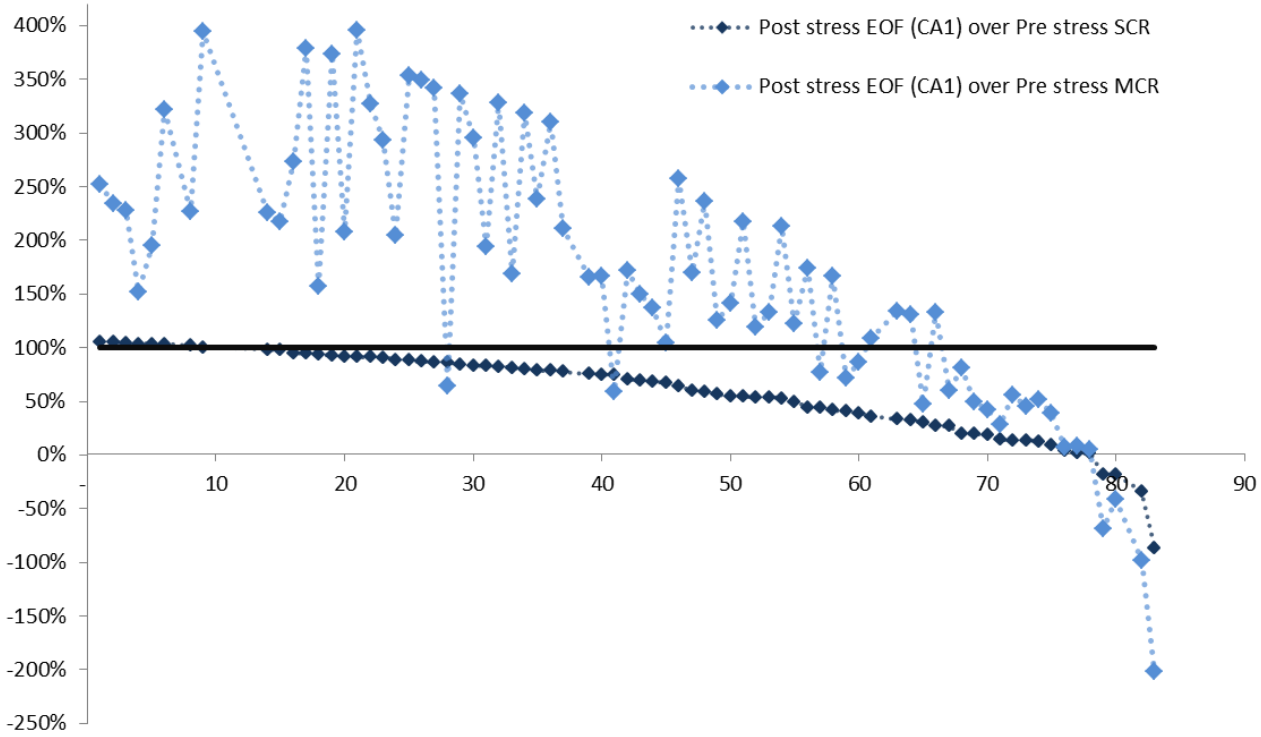
Source: EIOPA

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 2014.

The EIOPA insurance stress test 2014 revealed that a double hit scenario would have a harmful impact on the insurance sector. Based on the current macroeconomic conditions, the risk reversal scenario cannot be ruled out. Although the gradual increase of interest rate might have a positive impact on the stability of the insurance and pension sector, increasing risk premiums whilst simultaneously keeping risk free rates low would create a completely different picture: this so-called double hit scenario was tested by the EIOPA insurance stress test 2014. It clearly showed that 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% (Figure 5.9).

Figure 5.9: Impact of the double hit scenario

Y-axis: Solvency ratios in %, X-axis: Number of insurance groups

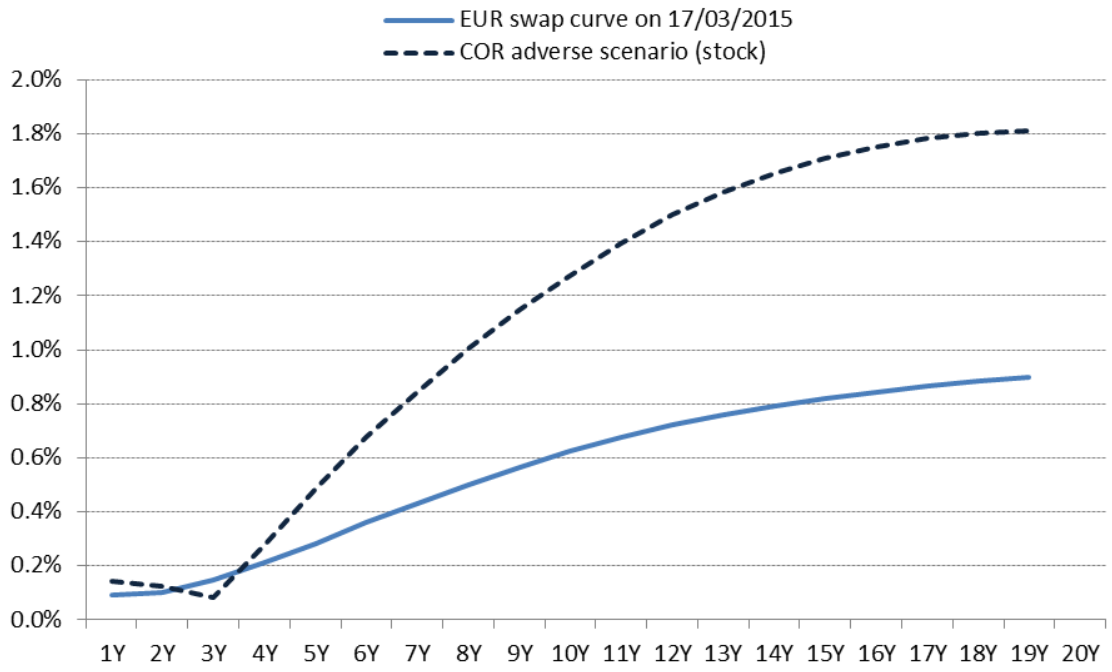


Source: EIOPA Insurance Stress Test 2014

Note: Subsample was selected from the core participants of the EIOPA Insurance Stress Test 2014 which had a SCR ratio <=105% after the CA1 scenario. Eligible own funds (EOF) to cover SCR is taken for both the SCR and MCR Ratio, participants which did not report MCR figures were deleted from the sample.

The yields are compressed to historical minimums negatively impacting the solvency positions of insurers. Interest rates are substantially lower compared to the time when the insurance stress test 2014 was conducted; the stressed interest rate curve in the most severe scenario conducted for insurance groups' balance sheets data assuming a further decline in interest rates is still more favourable compared to the current reality (see Figure 5.10).

Figure 5.10: EUR swap curves vs. adverse scenario curve



Note: The adverse scenario does not include adjustments of the Long term guarantee package. No credit adjustment has been applied to the EUR swap curve.

A holistic view of recovery options needs to be prepared. Complexity and interrelations between insurance groups need to be assessed to avoid a potential herding behaviour with negative destabilizing implications for the whole sector. The commonalities in recovery options considered, although relevant for a firm specific event, pose doubts whether their implementation is feasible by all firms at the same time in case of a systemic event. Hence, a harmonised approach for the European insurance sector needs to be in place.

5.3. Conclusion

Despite a challenging macro-economic environment and persistently low interest rates, insurance premium growth is expected to be positive in 2016 and 2017. However, the current QE policy in Europe compressing yields further down puts significant pressure on insurance and pension funds profitability. As a consequence, their investment portfolios might be rebalanced towards more risky asset classes, whilst also further new growth opportunities in emerging markets are expected. The

ongoing difficult environment deteriorates the solvency position of insurers. This was confirmed by the EIOPA Insurance Stress Test 2014 that revealed substantial vulnerabilities for some insurance companies. The risk reversal scenario that was tested in this context also supports this view. Yields are at their lowest level ever reflecting the growing concern for the maintenance of the solvency position. A harmonised approach for recovery options for the European insurance sector should not be forgotten to avoid negative implications for the sector.

PART II

Thematic Articles

Insurance Sector Profitability and the Macroeconomic Environment

Cristina Dorofti[20] and Petr Jakubik[21,22]

Abstract

Profitability is one of the most important determinants of insurers' performance and healthiness. This article empirically investigates the link between the macroeconomic environment and insurers' profitability using cross-country European aggregate data. Our empirical results suggest that low interest rates along with limited economic growth, poor equity market performance and high inflation has a negative impact on insurance profitability. The conducted empirical analysis allows regulators to better understand and roughly quantify those effects which might support discussion with insurers resulting in some mitigating actions. Further research needs to be done to develop top-down stress test methodologies to fully assess the impact of the low yield environment in combination with a sharp increase of risk premiums (the so called double hit scenario), on insurers' profitability as well as solvency positions.

1. Introduction

The insurance sector plays an important role in the financial services industry, contributing to economic growth, efficient resource allocation, reduction of transaction costs, creation of liquidity, facilitation of economics of scale in investment, and spread of financial losses (Haiss and Sümegi, 2008). Although insurers have generally not been seen as being a significant potential source of systemic risk and they are regarded as relatively stable segments of the financial system, the interaction between insurers, financial markets, banks, pension funds and other financial intermediaries has been growing considerably over time.[23] Hence, they can be important for financial stability due to their size, interconnectedness and the economic function of insurance. The aim of this article is to find suitable models that

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[21] European Insurance and Occupational Pensions Authority (EIOPA).

[22] The authors would like to thank to Silke Brocks (EIOPA) for useful comments.

[23] However, we have seen some cases when distress of insurance companies impacted financial market significantly.

explain the role of macroeconomic development in insurance companies' profitability over economic cycles.

A lot of macroeconomic indicators are usually considered as determinants of profitability. The most frequent drivers mentioned in the literature are GDP growth, inflation and interest rates (Staikouras and Wood, 2004; Macit, 2012; Ameur and Mhiri, 2013, Goddard, Molyneux, and Wilson, 2004). Each of these authors found at least one significant relation between banks profit ratios and a macroeconomic factor. Moreover, Bekeris (2012) studied the correlation between macro factors and corporate profitability of small and medium-sized enterprises of Lithuania. His findings reveal that interbank interest rate changes and unemployment have the strongest impact on profitability. Empirical analysis of Christophersen and Jakubik (2014) revealed a strong link between insurance companies' premiums, on one side, and economic growth and unemployment on the other. Nissim (2010) also argues that the overall economic activity affects insurance carriers' growth, because the demand for their products is affected by the available income. Further, he underlines that the investment income is highly sensitive to interest rates, both on the short and on the long run. D'Arcy and Gorvett (2000) argue that inflation heavily affects the liability side of property-liability insurers' balance sheets. Feyen et al (2011) and Beck & Webb (2003) investigate three types of determinants for insurance growth using penetration ratios as dependent variables to proxy insurance demand. With respect to economic ones they both find a significant positive correlation with GDP and income per capita, but a negative one with inflation. Also the second study finds a positive impact of real interest rates on life savings products demand. However, this is only a segment of life insurance business, so the actual effect of interest rates level is rather ambiguous.

The remainder of the article is structured as follows. Section 2 provides a description of the dataset and some descriptive statistics on the profitability development in EU member states. Section 3 focuses on the econometric methodology which is applied for quantifying the relationship between profitability and the macroeconomic environment. On this basis, section 4 presents the results of the applied econometric models which quantify this relationship. The last section concludes.

2. Data, Stylized Facts and Hypotheses

The dataset for this study is constructed by a combination of firm-level information with country level indicators. The initial dataset contains 30 European countries over eight years' long time series (2005-2012) with an annual frequency. The information

about aggregated figures of enterprises by country is regularly published by EIOPA and information on macro variables was available on Eurostat databases.

In the light of available literature discussed above, we consider the following macroeconomic variables as explanatory variables: real gross domestic product, long term interest rates (Maastricht criterion), inflation, unemployment rates and stock market index. The empirical analysis of complete panel data consisting of 25 countries for non-life insurance and 24 countries for life insurance for the period 2005-2012 is used to estimate the coefficients and the significance of each input factor.[24]

Unlike many other industries, life insurance is a long term business, by means of the products and services it provides. Accordingly, it would only be fitting to look at its performance through a long lens, as current cash flows display a partial picture of value creation and the net outcome of a life insurance policy can be precisely appraised at the termination date of the contract. Unfortunately there is no such universal measure that would provide a complete picture of profitability. Nonetheless, there are the generally accepted, accounting-based performance metrics like return on assets and return on equity. The advantage of using such indicators stands in the fact that they are readily accessible, rely on public data and are calculated in accordance to strict, prudent accounting rules. Also there is a wide range of users from senior management to analysts and investors that resort to such indicators when assessing the financial strength of a company. Thus ROA and ROE are to be treated as dependent variables in this study. Each of the explanatory parameters' influence is discussed in greater detail below.

A key indicator of a healthy economy is reflected through its GDP growth. In general, the insurance industry is considered to be procyclical, so it is expected that the performance of insurance companies will go hand in hand with the overall development of the country (e.g. Haiss and Salmegi, 2008). The subdued economic growth of the last few years has had a direct impact on the disposable income of individuals, which was translated into less money flowing towards the insurance sector among others. Also, if a country's economy does not grow it can be argued that a large or increasing number of insurance carriers would intensify the competition, resulting in reduced profits per unit.

The high unemployment rate undermines insurer's growth prospects (e.g. Beenstock et al., 1988). It makes it more difficult for insurance companies to grow as households

[24] Some countries have to be excluded from the original sample due data incompleteness.

are more reluctant to use the limited income they earn for non-life as well as life insurance or annuities. Moreover, elevated unemployment figures make policyholders more sensitive to prices and less capable to buy new properties and goods which typically need some insurance coverage. This constrains demand for insurance. Hence, it might also negatively affect the overall profitability.

Perhaps the biggest threat insurers are facing is an unsteady and sluggish economic recovery that constrains policymakers to continually cut interest rates in order to support the entire economy. Since the financial crisis in 2007 emerged, the European Central Bank has steadily decreased the base rates to the near zero bound and the long term curve is being dragged further down along. This puts pressure especially on life insurers. On the asset side, the investment income is reduced to the level of the guaranteed rates that were offered on previous policies, making it impossible for the company to issue more similar contracts, narrowing the extent of its sales and dragging down the profitability. On the other side, liabilities inflate as future payments are discounted at lower rates encumbering the burden of meeting the contracting obligations towards the policyholder. Moreover, insurers suffer problems not only from the high guaranteed returns that are on their balance sheets, but also because of the duration mismatch between their long-term liabilities and their shorter term investments. Considering the long tail of the life business the impact of the interest rates is expected to be significant, negative and persistent in time. In relation to the non-life business the overall structure of the investment portfolio is similar to those of life entities. Nevertheless the liabilities of property-casualty insurers differ significantly both in terms of duration and content. There are three major balance sheet liability items that could be subject to interest rates changes: the loss reserve, the loss adjustment expense reserve, and the unearned premium reserve (D'Arcy and Gorvett, 2000). The estimates of the first two items are usually based on historical patterns which are affected by historical economic variables like inflation and interest rates. Therefore, the value of loss and loss adjustment expense reserves calculated now depends on how those factors behaved in prior years. Although the nominal values of claims that are established already and are supposed to be covered by these reserves should not change, its economic value does, as the future cash flow will be discounted by a different rate. Another important aspect of the non-life liabilities is that some losses are fixed, but there are also intangible damages, the valuation of which takes time and money, as it puts the entire loss reserve under the pressure of future inflationary changes. Ergo, the response of non-life profitability to interest rates is inclined to be delayed.

Although market rates are used as a tool to cope with macroeconomic threats their effect is not immediate, so it is worth examining the influence of inflation on insurance business, as it erodes both households and companies' financial resources. This can be achieved either by employing these rates as a new explanatory variable or by integrating them with the long term interest rates, thus determining the real interest rates using the Fisher equation. Currently there are concerns about deflation given the low inflation environment, which combined with low interest rates can severely affect investment returns, asset valuations and future insurance liabilities. For non-life insurers, inflation alters mostly long-tailed business by increasing the value of future claims. For life insurers, both inflation and deflation are key risks that interfere with the demand for insurance products and with the benefits they entail.

Last but not least, the stock market index performance is directly linked to the asset side of the insurance companies' balance sheets as equities are always an important part of the total investments. An analysis of trends in life insurance earnings' based on accounting data determined that profitability suffers when financial market conditions weaken (Sigma Re No.1, 2012). Volatility of indices' performance amplifies the risk of earning the promised return for holders of both traditional and unit linked contracts. Consequently, a direct positive relation between the stock market index and the company's profitability ratio is anticipated. More than that, the effect is more likely to be prompt rather than delayed.

The following table provide the list of all variables and their transformations employed in our empirical analysis.

Table 1: Variables description and transformations:

ROA_l / ROA_nl	**Annual ROA of life and non-life enterprises.**	**Stationary**	**Source**
ROE_l/ ROE_nl	Annual ROE of life and non-life enterprises.	Stationary	EIOPA
IR	Annual interest rates - Maastricht criterion bond yields are long-term interest rates, used as a convergence criterion for the European Monetary Union.	First- differenced	Eurostat
U	Annual unemployment rate	First- differenced	Eurostat

GDP	Real GDP year on year growth rate	Stationary	Eurostat
Inflation	HICP - inflation rate - annual average rate of change.	Stationary	ECB
SMI	National stock market indices (share prices).	Log first-differenced	Eurostat

3. Methodology

The panel data approach is used in this section to empirically investigate the relationship between insurance profitability and the macroeconomic environment. Considering the scarcity of insurance companies' data, using a panel approach instead of several short time series seems to be the best way of estimating and testing the mentioned link. The upside of a panel data regression is that it allows for the observation of differences across subjects and within them over time, while controlling for the effects of unobserved or missing variables.

Although, a static model provides us with insight of the individual behaviour in a repetitive scenario, it does not consider the possibility that both the dependent and the explanatory variables can have a contemporaneous impact on each other, which is a preferable feature particularly when using low frequency data. Hence, a dynamic panel approach is more suitable in our situation. It enables to adjust the model for deviations from long run equilibrium as well as to investigate the effect of lagged explanatory variables and deal with omitted variables' bias. In this case, the ordinary least square (OLS), fixed effects (FE), random effects (RE) and general least squares (GLS) estimates are biased and inconsistent, due to endogeneity. Using Generalized Method of Moments as proposed by Arellano and Bond (1991) would lead to consistent and unbiased estimators. More specifically, we address these issues following Blundell and Bond's (1998) methodology, also known as system GMM estimator. This estimator is designed for datasets with many panels, but few periods which is exactly the case of the hereby available dataset. Compared to a differenced GMM estimator, a system GMM assumes that there are weak correlations between the current and lagged levels of all variables. Blundell and Bond showed that these biases could be reduced by incorporating more informative moment conditions that are valid under quite reasonable stationarity restrictions on the initial conditions process. Basically, this method uses lagged first-differences as instruments for equations in

levels, besides the usual lagged levels of the series that are only weakly correlated with subsequent first differences. Because we cannot assume strict exogeneity, we can declare the independent variables as being predetermined, if we believe that the error term has some feedback on the subsequent realizations of it. In other words using past realizations that are not correlated with current errors, as instruments for our suspected endogeneous variables is more plausible than looking for new variables.

All in all, this method assumes that there is no autocorrelation in the idiosyncratic errors and requires the initial condition that the panel-level effects are uncorrelated with the first difference of the first observation of the dependent variable. The Arellano and Bond test for autocorrelation has a null hypothesis of no autocorrelation and is applied to the differenced residuals. However, we are more interested in the test for autoregressive model of order 2 - AR(2), because it detects autocorrelation in terms of levels. So if AR(1) yields a p-value smaller than 0.05 it does not mean that the model is misspecified, whereas this cannot hold for AR(2). The validity of the instrumental variables is confirmed using the postestimation Sargan test of over-identifying restrictions. Overall, this technique is the most appropriate one in generating consistent estimations of the parameters.

Consequently we use dynamic panel estimation to investigate selected determinants of life insurance profitability in 24 European countries and those of non-life in 25 countries, during the period 2005-2012.

We consider the following general model.

$$Y_{it} = \alpha_{0i} + \alpha_2 X_{it} + \varepsilon_{it} \quad (1)$$

Where Y_{it} is ROA, respectively ROE of country *i* in year *t*, X_{it} is the vector of macroeconomic variables that includes real GDP growth, unemployment rates, the stock market index, long-term interest rates, inflation rates and alternatively real interest rates calculated by the Fisher equation. We are interested in the consistent estimation of the parameters α_2 when the number of panels is large N, and the time periods are fixed T. We consider that the vector of the explanatory variables is potentially correlated with the error term. For that reason we construct a dynamic representation of that model as follows:

$$Y_{it} = \alpha_{0i} + \alpha_1 Y_{it-1} + \alpha_2 X_{it} + \alpha_3 X_{it-1} + \varepsilon_{it} \quad (2)$$

The first differences are taken for unemployment rates, natural logarithm of stock market indices, long-term interest rates and real interest rates in order to ensure their stationarity (see Table 4 in Annex for summary statistics). Considering the short time

series and the applied transformations, only one lags are allowed for all variables. Blundell and Bond (1998) also argue that further lagged differences are redundant if all available moment conditions in first differences are exploited.

4. Empirical results

Return on equity as a profitability metric is more suitable for non-life business than for life, because this unit is mostly affected by claims where the amount and timing is often under great uncertainty. Hence, there is the necessity of holding more capital. However, both indicators are commonly used by investors, therefore we have modelled both measures by macroeconomic factors. Hence, the preliminary tests indicated a high degree of correlation between the unemployment rate and GDP. We decided to keep only GDP among potential regressors as the better proxy from the overall macroeconomic environment.

4.1 Non-life insurance models

Profitability for non-life insurance business seems to be clearly linked to the macroeconomic environment. The following table 2 provides the obtained empirical results.

Table 2: Model of non-life insurance profitability

	Model 1 robust	**Model 2 robust**	**Model 3 robust**	**Model 4 robust**	**Model 5 robust**	**Model 6 GMM**
Variable	ROE_nl	ROE_nl	ROA_nl	ROA_nl	ROA_nl	ROA_nl
ROE/ ROA_nlt-1	0.072 (0.121)	0.0513 (0.131)	0.096 (0.080)	0.090 (0.087)	0.150* (0.080)	0.134** (0.068)
GDPt	-0.108 (0.297)		0.037 (0.079)		0.101 (0.091)	
GDPt-1	0.831** (0.372)	0.476** (0.243)	0.218** (0.090)	0.207** (0.088)	0.222** (0.101)	0.207*** (0.055)
SMIt	7.564** (3.235)	6.080*** (2.300)	2.188***	2.593*** 0.987***	2.516*** (0.811)	3.132*** (0.686)

			0.734			
SMIt-1	-8.829 (5.360)		-2.507* (1.306)	-2.419** (1.210)	-2.843** (1.271)	-2.483*** (0.765)
IRt	0.392 (0.414)	0.815** (0.328)	0.247** (0.098)	0.207** (0.088)		
IRt-1	0.672 (0.456)	0.948** (0.418)	0.242** (0.133)	0.204** (0.092)		
Inflationt	-0.225 (0.276)	-0.820** (0.382)	-0.081 (0.092)			
Inflationt-1	-0.199 (0.529)		-0.300 (0.154)			
RIRt					0.210*** (0.075)	
RIRt-1					0.020 (0.088)	0.112** (0.052)
Constant	7.278*** (1.854)	9.110*** (1.893)	1.864*** (0.439)	1.635*** (0.417)	1.437*** (0.471)	1.611*** (0.248)
Number of obs.	139	139	139	139	140	140

Model 1 provides estimates for profitability of non-life insurance measured by ROE considering one lag for all regressors. In the next stage we eliminated the first lags in case that there were not significant and re-estimated the original model. Finally, we re-estimated models only for the regressors with significant coefficients at least at 10% confidence level (model 2). We further tried to replace nominal interest rates and inflation by real interest rates. However, real interest rates turned to be insignificant. Hence, we report only model 2 as our preferred model for modelling ROE in non-life insurance. Furthermore, model 3 provides estimates for profitability of non-life insurance measured by ROA considering one lag for all regressors. In the next step we

eliminated the insignificant first lags and later all insignificant coefficients to obtain model 4. Finally, we replaced nominal interest rates and inflation by real interest rates and continued the same process using two alternative methods to obtain standard errors of the coefficients (model 5, 6).

From the outcomes we can see that one year lagged GDP has a positive impact on ROE as well as ROA (all models), confirming that this industry is slower at adjusting price lists and business plans to economic changes. On the other hand, this sector has direct and close connection to the overall macro environment. So, whenever an improvement is forecasted, it induces an encouraging market sentiment and contributes to non-life companies' performance. Furthermore, we find that contemporaneous stock market development has a highly significant positive impact on companies' performance. On the contrary, one lagged positive development of a stock market has rather negative or mitigating effect on non-life insurance profitability reflecting the fact that a high performance in the past might rather imply lower performance in the future. However, the overall effect of equity market development is positive (model 2, 4, 6). All in all, it indicates that financial markets' movements should be monitored as they are closely linked to non-life firms either directly through return provided by its investments in equity securities or indirectly due to net flows (earned premiums and claim payouts).

As insurers typically invest in high quality bonds they suffer from the low interest rates environment. This is confirmed by the positive and significant coefficients for nominal interest rate (models 2, 3 and 4). Basically, only the investment income that is in excess of the interest rates used for pricing goes to shareholders. However, falling yields translate only slowly into declining profits, such that the majority of income stems from previous years' investments. Because short term policies are backed by 1 year bonds, low interest rates impact profitability also with some lag. Hence, one might argue that only a cumulative effect captures the whole negative impact on ROE. It is only after the underwriting result is declared deficient that the investment income is expected to ameliorate profitability levels. And when even that is not enough, it does not only cause losses but forces shareholders to contribute with additional capital in order to support the business. Although non-life policies are usually short lived there are lines of business (casualty) where the uncertainty of the insured event is high and it might take several years between the premium is cashed in and the claim is paid out. For this situation non-life insurers need, to the best of their ability, match their liabilities with suitable assets. A potential mismatch and an unfavourable interest rate environment could result in lower profits. Another

important aspect to be acknowledged is that non-life insurers that carry short term activities are more preoccupied by the combined ratio rather than the investment income.

The combined ratio measures the performance of non-life carriers in their daily operations. It is more a matter of minimizing costs and losses, and maximizing earned premiums. When the latter is reluctant to happen, as in practice, non-life insurers proved to be slower at reacting to declining interest rates, vastly due to competitive pressures.

Apart from interest rate risk, non-life insurers are greatly exposed to inflationary pressures that reduce both companies' and households' financial resources. High and protracted inflation period increases the value of claims, especially of those emerging from long tailed business, as reserves might prove insufficient in the long run. Its adverse effect is suggested for the ROE model by regression 2 suggesting that inflation is a real threat that affects the profitability by compromising the demand for new business, rising level of firms' expenses and diminishing the return from certain assets.

Unlike the first four models regressions 5 and 6 deliver estimates of real interest rates' (RIR) effects on ROA rather than the previous separate measurement for long term rates and inflation. Coefficients are significantly positive as we would expect, since this variable accounts for the actual return a company gets on its investments. We can see that this effect is lagged by one year (model 6).

4.2 Life Business Models

The link between profitability for life insurance business and macroeconomic indicators is less clear from our empirical results compared to non-life business, especially when using ROA as a proxy for the dependent variable. It might be driven by the fact that the investigated link might be more difficult to capture in the long term by relatively short time series. The following table 3 provides the obtained empirical results.

Table 3: Model of life insurance profitability

	Model 1 GMM	**Model 2 GMM**	**Model 3 GMM**	**Model 4 robust**	**Model 5 robust**	**Model 6 GMM**
Variable	ROE_l	ROE_l	ROE_l	ROA_l	ROA_nl	ROA_nl
ROE/ ROA_lt-1	0.402*** (0.075)	0.397*** (0.069)	-0.339*** (0.059)	-0.187 (0.196)	-0.092 (0.188)	-0.122 (0.177)
GDPt	1.486* (0.810)			0.052 (0.083)		-0.052 (0.093)
GDPt-1	-0.707 (0.544)			0.075 (0.054)		0.101* (0.057)
SMIt	10.884 (8.644)	20.058*** (5.228)	21.677** (4.312)	3.754* (2.244)		4.003* (2.286)
SMIt-1	-0.312 (7.322)			-2.308*** (0.673)	-1.599** (0.619)	-3.261*** (1.141)
IRt	3.785*** (1.122)	3.078*** (1.069)		-0.136 (0.116)	-0.282* (0.147)	
IRt-1	1.844* (1.016)	2.015** (0.896)		-0.227* (0.135)	-0.227** (0.111)	
Inflationt	-1.754* (0.957)	-1.381** (0.654)		-0.105 (0.137)		
Inflationt-1	2.544** (1.005)			0.485** (0.216)	0.2365** (0.113)	
RIRt			2.124***			0.034 (0.089)

			(0.420)			
RIRt-1						-0.150 (0.124)
Constant	8.680** (3.791)	16.076*** (2.644)	11.890*** (1.556)	-0.088 (0.505)	0.090 (0.314)	0.985** (0.438)
Number of obs.	139	139	162	139	140	139

Unlike non-life units, life insurance companies hold a smaller portion of capital (equity), since the claims and payments are more predictable, Hence their reserves do not face a great magnitude of volatility. Still, ROE does provide a useful and necessary insight of how effectively a company's management handles investors' money. Additionally, ROA reveals a clearer picture of the firm's financial health, now that its assets mainly consist of investments the return on which is responsible for a smooth operating activity.

The results of models using ROE as a dependent variable are in line with the expectations corresponding with the results for non-life insurance (models 1, 2, 3). Our estimates are robust to different specifications showing the negative impact of the low interest rates on insurance profitability. On the other hand, the impact of stock market performance is by far the largest and strongest in all models using ROE as dependent variable. Life insurance companies relate to this variable by means of its investments in equities and contracted unit-linked policies that became more popular since the market rates started declining.

The results of the models for ROA (models 4, 5, 6) are a bit mixed not allowing a conclusion. However, it is quite clear that there are probably other factors not captured in our models which might drive the results. Further empirical analysis would be needed to make some clear conclusion.

Lastly, all final regressions have been tested for over-identification restrictions and for serial correlation in the first-differenced errors. A p-value higher than 0.05 for the Sargan test suggests that employed instruments are valid, and for the AR(2) test – that there is no correlation in the errors of higher order than one, therefore the models are not misspecified.

Conclusion

The current low yield environment and prevailing macroeconomic imbalances in Europe impose extremely challenging conditions for the profitability of insurance firms. Due to the current European quantitative easing policy, the low yield environment is very unlikely to be changed in the short to medium run. Hence, it is extremely important for regulators to be able to analyse and assess the potential impact of the persistent low yield environment. This thematic article contributes to this work by providing econometrical models linking macroeconomic environment including interest rates to insurance firms' profitability.

This thematic article employs panel data of the European Union countries to investigate the impact of interest rates along with economic growth, inflation and equity market developments on insurance firms' profitability. Our results clearly revealed the important role of interest rates on profitability of both life and non-life insurance business. Low nominal as well as real interest rates negatively affect insurance profitability via lower investment income. Similarly, high inflation, low economic growth and poor equity market performance has a negative impact on the performance of insures. These links are empirically revealed for both life and non-life insurers when using the rentability on equity as a proxy for profitability robust to different model specifications. The results for rentability on assets are a bit mixed and don't clearly confirm similar conclusions for life insurance business. It might be related to the fact that life business is much more long-term and some of the mentioned effects might be revealed when using longer time series. Despite, some further research needs to be done, this study clearly points out the sensitivities of insurers to the macroeconomic environment.

Although the impact of low interest rates and other macroeconomic variables might be quite complicated depending on the applied business models and further microeconomic variables, the estimated models can provide a first insight into the assessment of the low yield environment on insurers' profitability. It can serve as a rough estimate of the potential impact of some adverse macroeconomic scenarios on insurance sectors. However, for a more precise estimate, more elaborated models using companies' data would need to be applied. The comprehensive stress testing framework would need to be applied to assess the overall effect of different adverse market scenarios.

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Annex

Table 4: Summary statistics of transform variables

	Mean	Std. Dev.	Median	10%-q	90%-q	Max	Min
ROE non-life	8.545	9.002	9.246	-1.143	17.644	30.430	-32.562
ROA non-life	2.264	2.652	2.458	-0.300	5.563	9.181	-11.102
ROE life	8.342	18.955	8.023	-4.690	21.831	186.705	-83.747
ROA life	0.908	2.878	0.633	-0.407	2.970	-15.842	26.421
GDP	1.850	4.045	1.595	-3.700	6.300	-17.700	11.00
SMI	-0.046	0.304	-0.020	-0.394	0.275	0.751	-1.373
IR	0.148	1.546	0.090	-0.960	1.140	-8.430	8.390
Inflation	2.906	2.129	2.500	0.900	5.500	15.300	-1.700
RIR	0.148	2.835	-0.187	-2.311	2.810	16.464	-10.040

Macroprudential Objectives and Instruments for Insurance – An Initial Discussion

Casper Christophersen and Juan Zschiesche[25]

Abstract

This article seeks to contribute to the ongoing debate on the objectives of macroprudential policies and the interaction between micro- and macroprudential policy in insurance. We consider two channels through which the insurance sector could influence economic growth and link these considerations to the ongoing discussions on possible macroprudential concerns in the insurance sector. While we discuss some potential macroprudential objectives and instruments, they are put forward merely for discussion and illustration, and do not constitute, and should not be seen as, EIOPA policy proposals.

1. Introduction and motivation

The recent financial crisis exposed important shortcomings in financial supervision, in particular supervision and oversight of the financial system as a whole. Both academia and the supervisory community have therefore explored various macroprudential policies which address system-wide build-up of risk.

So far, discussions on macroprudential policy have focused on the banking sector due to its prominent role in the recent financial crisis. However, the thinking and policies explored for that sector are also strongly influencing the debate as it is starting to arise in other parts of the financial system, such as in the insurance sector. It is therefore important that any extension of this debate to the insurance sector reflects the specific nature and features of the insurance business.

This article seeks to contribute to the discussion of possible macroprudential strategies for insurance and briefly discusses how the policies and instruments frequently applied in the banking sector could be considered in the insurance sector.[26] It should be stressed, however, that there is currently no firm evidence on the need to

[25] European Insurance and Occupational Pensions Authority (EIOPA). We are grateful for the comments received from Mara Aquilani, Gabriel Bernardino, Alexander Boll, Petr Jakubik, Andrew Mawdsley and other EIOPA and FSC colleagues on earlier versions of this paper.

[26] This topic is currently being discussed at different ESRB groups, where EIOPA is actively participating. The views expressed in this article, however, do not necessarily reflect the position of these groups.

have a banking-type macroprudential approach for the insurance sector, and more research in this field is clearly needed. Moreover, while Solvency II was not initially designed as a macroprudential framework, it does contain elements with a certain macroprudential dimension which we briefly highlight in this article. We consider that this interaction between micro- and macro-based regulatory regimes needs to be fully understood to avoid a situation where macroprudential instruments simply end up becoming add-ons to the micro-prudential regime.

The remainder of the article is structured as follows. Section 2 provides an overview of the currently policy discussions regarding systemic risk in insurance and its effects on the real economy. Section 3 presents a description of the framework and potential intermediate objectives of a macroprudential policy framework for insurance. Section 4, in turn, presents a set of instruments that macroprudential authorities could use to achieve the intermediate objectives. The last section concludes. A comprehensive overview of the framework described in this note can be found in Annex 1.

2. Systemic risk in insurance and its effects on the real economy

While it is generally accepted that systemic risk is inherent in the banking sector, the issue is more controversial in the case of insurance.[27] This paper does not go into the details of the debate, but briefly considers two aspects in order to set the scene for the discussion on possible macroprudential objectives and instruments. First, it explores how any failure of the sector to provide insurance services would have relevance for the real economy, i.e. how the insurance sector could be systemic in its own right. Secondly, it discusses how the insurance sector might be systemic due to its interlinkages and activities in financial markets.

The insurance sector could be systemic if a failure of the sector to provide insurance services would lead to serious negative consequences for the real economy. The extent of this would depend on the relationship between insurance provision and economic growth.

From a theoretical point of view, the provision of insurance by specialist undertakings may contribute to growth by taking on non-commercial risk, or by reducing the need for detailed and expensive contractual arrangements (e.g. bankruptcy procedures) in

[27] In the context of this article, systemic risk is considered "a risk of disruption in the financial system with the potential to have serious negative consequences for the internal market and the real economy", see article 2 of Regulation (EU) No. 1092/2010 on European Union macro-prudential oversight of the financial system and establishing a European Systemic Risk Board.

case an enterprise is affected by an insurable shock. Insurance therefore may facilitate trade and funding of others, and insurers may act as information hubs on the price of risk, improving overall resource allocation. Furthermore, as part of the financial system, insurers are important in enhancing financial intermediation and in pooling and mobilizing savings to provide funding for longer-term projects.

A number of empirical studies have tried to determine the economic importance of this link by estimating the relationship between the availability of insurance and real GDP growth. Arena (2006), for instance, uses data for 56 countries between 1976 and 2004 to show that both life and non-life insurance have a positive and significant effect on economic growth. Similarly, Lee *et al.* (2013) finds a long-run equilibrium relationship between real GDP and real life insurance premiums, based on a data set for 41 countries covering the years 1979 to 2007.

Despite this empirical link between the development of the insurance sector and economic growth, it is difficult to establish one-directional, causal relationships. Part of the reason is technical – identifying casual links empirically is challenging both in terms of model set up and in terms of the availability of suitable variables. In addition, some of the benefit of insurance provision may not lead to higher measured GDP, but instead provide welfare benefits in the terms of lower disutility of risk. There is, however, a certain amount of empirical literature seeking to more accurately assess the causal relationship, such as in Kugler and Ofoghi (2005) which do seem to point to a long-run positive causal relationship between insurance sector market size and economic growth. Moreover, a relatively recent study by Han *et al* (2010) provides evidence that that insurance development contributes to economic growth, but the relationship seems to be more significant for non-life insurance than for life insurance.

Overall, the available theoretical and empirical evidence seems to point to the existence of a causal link between insurance availability and economic growth. Such a relationship could support the argument that the sector as a whole may be systemic. With this interpretation, and provided that the link is found to be both empirically and economically significant, systemic risk in insurance would relate to the adverse probability that the sector as a whole becomes unable to provide certain lines of insurance (e.g. trade credit insurance) at reasonable prices.

The second channel via which insurers could be systemic is through its interlinkages and activities in financial markets. Compared to banks, however, the traditional business model of insurers does not rely on maturity transformation and generally involves very limited financial leverage as premiums are paid up-front. Liquidity risks

are also of a substantially lower magnitude in insurance, and there is no intra-insurance market comparable to the interbank market through which contagion can spread (CEA, 2010).

Moreover, while there are interlinkages between the insurance sector and other segments of the financial system by different means, e.g. holding intra-financial assets and liabilities, reinsurance or the use of derivatives, these links are usually limited by comparison with banks and some other financial institutions.

These factors contribute to the relative stability of the insurance sector.[28] Still, the work of the International Association of Insurance Supervision (IAIS) to identify individual globally systemic insurers is useful to understand potential sources of systemic risk in insurance.[29] The IAIS finds that insurance groups and conglomerates that deviate from their traditional business and carried out non-traditional or non-insurance activities (NTNI) were more vulnerable to financial market developments and more likely to amplify, or contribute to systemic risk (IAIS, 2011), and are more likely to be systemic.[30]

The particular way in which insurers may exert systemic significance as well as the differences in the transmission channels compared to banking, makes it challenging to consider a macroprudential policy that is relevant for insurers. If the IAIS measures for global systemically important insurers are considered to be mainly micro-prudential and target risk build-up within individual institutions to ensure that such institutions face incentives which are in line with potential societal costs of a failure, it is possible that any macroprudential concerns for insurers are also efficiently dealt with at the micro level. It seems, therefore, that the interplay between macro and micro regulation needs be carefully considered.

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[28] The lack of systemic relevance of traditional or main insurance activities is also widely accepted in the economic literature. See, for example, Geneva Association (2010).

[29] The current article starts from the work carried out by the IAIS when developing a macroprudential policy strategy for insurance. We are aware, however, that there are controversies around this idea.

[30] Against this background, the IAIS, under the auspices of the Financial Stability Board and the G20, developed an initial assessment methodology to explain the systemic relevance of insurance on the basis of their size, global activity, interconnectedness, NTNI activities and substitutability (IAIS, 2013a) and proposed a list of nine Global Systemically Important Insurers that will be subject to an integrated set of policy measures (IAIS, 2013b).

Macroprudential policy and its objectives

2.1 The interaction between micro- and macroprudential policy

Traditional micro-prudential supervision seeks to ensure stability at firm level, which is a necessary but not always sufficient condition for systemic stability. In contrast, the macroprudential approach calls for a system-wide perspective where the risks are assessed for the system as a whole and, on that basis, deriving policies for individual institutions within it (cf. Borio, 2011). The ultimate goal of a macroprudential policy is to achieve financial stability and avoid the negative consequences of financial distress on the real economy.

Although both policies are conceptually supplementary, a potential for policy conflict could arise. As explained by Mawdsley (2014) the conflict may take place in case of common instruments that can be used to achieve both microprudential and macroprudential objectives, which creates a coordination challenge for the competent authorities concerned.

In practical terms, this conflict, if unresolved, could generate a deadweight loss whereby requirements such as capital charges could be inefficiently accumulated creating an excessive burden for companies and resulting in an inefficient allocation of resources.

As pointed out by Osiński, Seal, and Hoogduin (2013), tensions are more likely to occur during the downturn phase of the cycle and at crucial turning points. These authors show that conflicts resulting from this interaction can be reduced by clarifying the different mandates, objectives, functions and toolkits. Information sharing, joint analysis of risks, and general dialogue between authorities can –among other things– also be helpful to reduce potential tensions, together with a certain institutional mechanisms to enhance policy cooperation and coordination.

In the context of insurance, the risk of emerging conflicts adopts an additional dimension. As there is no strong evidence on the need to develop a banking-type macroprudential approach for the insurance sector, policymakers need to develop a clear case and examine existing regulatory frameworks before considering a specific macroprudential framework in insurance. In this context, it is important to assess all aspects of regulation, not only capital requirements.[31]

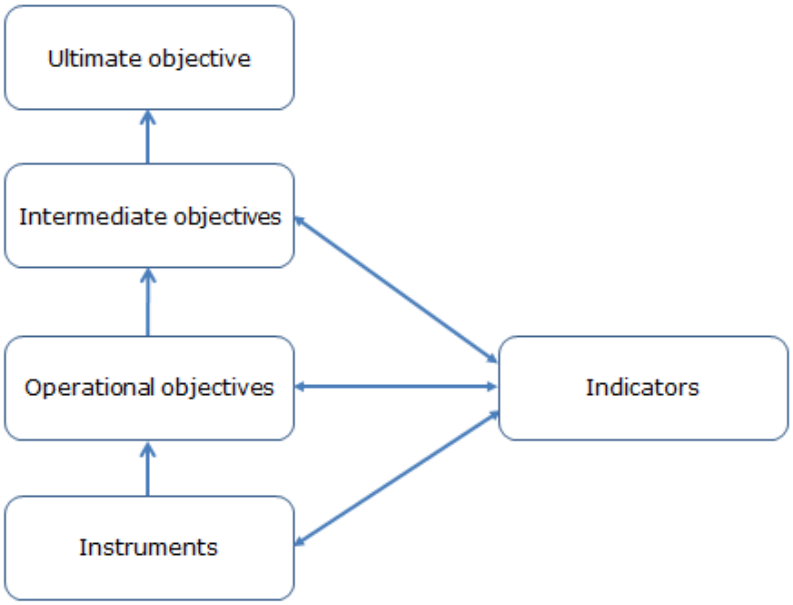
[31] In Solvency II terms, this would mean that all the three pillars of Solvency II would need to be considered.

Against this background, however, the next section presents a framework for thinking about macroprudential policy in insurance in order to stimulate further discussion on the possible objectives such policies could have for the sector.

2.2 A macroprudential framework

In order to establish a macroprudential framework for insurance, we consider an approach that draws on the existing literature[32] with a set of intermediate objectives, operational objectives and instruments as given in Figure 1.

Figure 1: A framework for macroprudential policy in insurance



In such a framework, the ultimate objective is financial stability and, by extension, economic growth. In order to achieve this, macroprudential authorities may want to focus on a set of intermediate objectives, which can be defined more clearly. Subsequently, macroprudential authorities may seek to influence these intermediate objectives by specifying certain operational objectives that can be more directly achieved by means of implementing or adjusting a set of properly calibrated instruments.

Finally, indicators play a crucial role in the macroprudential strategy as they allow an assessment of the extent of which the intermediate and operational objectives are

[32] See especially ESRB (2014a,b).

being met. Furthermore, they provide essential information for the calibration of the instruments.

The rest of this section covers the intermediate and operational objectives, while Section 3 considers a set of possible macroprudential instruments.

2.3 Potential intermediate and operational objectives for insurance

Intermediate objectives are typically linked to the ultimate objective, but more precisely formulated. For insurance, it would be natural to consider two simple intermediary objectives with a clear basis in current risk management practices: a) mitigating the likelihood of a systemic crisis to occur; and b) mitigating the negative impact in case such a crisis finally materialises. Both objectives represent a breakdown of the final objective.

The operational objectives usually exert their impact on both likelihood and impact of systemic risk. The extent, however, differs from objective to objective. Below, we will briefly discuss five potential operational objectives.

a) Ensure sufficient loss absorption capacity and reserving

Insurance is essentially a business concerned with taking on and managing risk. Insurers' technical provisions are designed to account for future claims arising from insured events. They reflect the best estimate of future claims and a risk margin intended to ensure that insurers are able to fully pay the claim of the last policyholder.

Losses which, for some reason, exceed the provisioning (including the risk margin) would need to be covered by capital in the form of own funds, so that even in an adverse scenario, insurers' obligations to policyholders continue to be met. Insurers are therefore required to hold a certain amount of capital (e.g. the Solvency Capital Requirement in Solvency II) in the form of eligible own funds.

As explained by Plantin and Rochet (2007), insufficient reserving or lack of adequate capital would lead to insurance defaults in adverse scenarios. Under-reserving or under-capitalisation therefore increases the likelihood of a default in a single institution or in several institutions in case of shocks that affects the whole insurance sector. Furthermore, systematically insufficient loss absorbency capacity and reserving for insurance risk would increase risks of contagion and therefore the impact of a systemic crisis.

b) Avoid negative interconnections and excessive concentration

Interconnections are inherent to the functioning of the financial system. Insurers are financial intermediaries which operate actively in the financial markets and use infrastructures such as payment and settlement systems. Furthermore, they may be part of groups that include other financial institutions and banks.

For example, Billio *et al.* (2012) and Nyholm (2012) present evidence for the existence of relevant interlinkages between the insurance sector and other segments of the financial system by different means, e.g. holding intra-financial assets and liabilities, reinsurance or the use of derivatives. The more interconnected insurance is, the more likely is that an endogenous shock spills over to other segments of the financial system, and that an exogenous shock ends up affecting the insurance sector. At the same time, interconnections may also be beneficial to financial stability as networks of connected entities may disperse shocks and allow them to be absorbed by several entities instead of in a single entity.

Excessive concentration may occur if insurers increase their interconnection with other segments of the financial system. Insurers and, in particular life insurers are large institutional investors. Insurers in general often exhibit a conservative investment profile, focusing on certain asset classes such as government bonds, corporate bonds and, to a lesser extent, shares and other variable income products. This investment profile might, however, lead to excessive concentrations in certain asset classes or towards certain issuers. For example, insurers typically invest in local government bonds and in financial bonds. A recent ESRB report (2015) shows the existence of a significant home bias, which is explained by the fact that in 18 of the 28 EU countries, more than 50% of the domestic and euro area sovereign debt holdings of the insurance companies covered in the study are accounted for by domestic sovereign debt.

The higher the concentration towards certain issuers, or certain segments of a market, the more likely it is that financial distress in one counterpart or in one sector will spill over to insurers. Moreover, losses due to one failed counterpart would be larger the higher the concentration. Substantial concentration in investments therefore increases the likelihood of a systemic crisis and its impact.

c) Avoid excessive Non-traditional and Non-insurance risk taking

A key issue is when the natural interconnection becomes a negative interconnection for insurers. The answer to this question probably lies with the nature of the interconnections. In line with the IAIS work, one could consider that the negative interlinkages start from the moment in which insurers engage in NTNI activities. As stressed by IAIS (2011), insurance groups and conglomerates that deviated from their traditional business and carried out non-traditional or non-insurance activities (NTNI) were more vulnerable to financial market developments and more likely to amplify, or contribute to systemic risk.

d) Limit procyclicality

The potential procyclical effects of the insurance sector are usually considered to arise due to insurers' role as large institutional investors. At least in principle, potential herding behaviors and fire sales by insurers may exacerbate market price movements. In a recent discussion paper, the Bank of England (2014) investigated the issue of procyclicality of investments by insurance companies and pensions funds in the UK. They found some evidence of procyclical investment behaviour by insurance companies both internationally and in the UK.[33] For the Netherlands, Houben and van Voorden (2014) analyze the data on the trading activities and the asset mix of insurance companies during the financial crisis, concluding that there was a certain procyclical investment behavior that not only undermines the insurers' returns and accentuates swings in financial markets in a self-reinforcing manner. 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.

e) Avoid moral hazard

Moral hazard relates to the discussion that is commonly framed in the context of being "too big to fail". As stressed by the ESRB (2014a,b), misaligned incentives and moral hazard include risks associated with systemically important financial institutions and the role of implicit government guarantees. The expectations that systemic institutions will be rescued in case of non-viability to avoid a disruption of the financial

[33] However, the authors note that while there is some evidence of procyclical shifts in asset allocation following the dotcom crash of the early 2000s, and to a lesser extent during the recent financial crisis, there are also structural shifts in asset allocation occurring during this period, which make identifying procyclical behaviour more difficult.

system may generate an excessive risk-taking behavior by those institutions. Although the case is stronger in banking due to the systemic implications of a bank failure, the issue could also apply to insurers. Claessens *et al.* (2012) are of the view that the policy decision to protect creditors that were taken in the recent financial crisis have amplified the overall cost, perpetuated the "too big to fail" problem and increased moral hazard in the financial system. While implicit and explicit government guarantees may provide a useful loss backstop and increase confidence in a financial institution (and possibly reduce the likelihood of a systemic crisis), excessive risk taking as a consequence of moral hazard would increase both the likelihood and the impact of systemic crisis.

3. Macroprudential instruments

The operational objectives listed above would influence both the likelihood of a problem occurring and the impact should a stress occur. Macroprudential authorities would need to complement these high-level operational objectives with a set of properly calibrated macro-prudential instruments relevant for insurance. This section discusses the types of instruments which may be explored for this purpose and provides a first assessment of the possible transmission mechanisms.

3.1 Loss absorption capacity and adequate reserving

Instruments usually considered in this field aim at increasing the resistance of institutions to withstand expected and unexpected losses, or to avoid fire sales. Such instruments could either be applied across-the-board or focus on certain institutions, such as the global or domestic systemically important insurers. It could also be tailored to specific risks, such as the low yield environment.

- Adjust the quantity and/or quality of the loss absorption capacity or regulatory capital requirements for macroprudential purposes. In general, such adjustments may be formed by additional risk bearing capacity compared to that required from a microprudential point of view (as this may be calibrated based on the risks faced by the insurer only), to make sure that undertakings internalize the social costs any failure would have on other stakeholders than policy holders. This approach has been taken in the banking sector as countercyclical capital buffers. However, such instruments need to be carefully calibrated and adapted to the microprudential regime in place (e.g. Solvency II in Europe) to avoid a situation where capital charges are improperly accumulated resulting in an inefficient allocation of resources. Alternatively, it might also be possible to consider an effective reduction

in required regulatory capital levels during stress to tackle macroprudential concerns of e.g. fire sales. This could, however, leave insurers vulnerable to further shocks.

- Increase the risk margin over best estimates for macroprudential purposes. As stressed above, in a market valuation environment, technical provisions are usually calculated on the basis of a best estimate and a risk margin. In Solvency II for instance, the risk margin 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. This ensures that the value of the technical provisions properly reflects the amount that insurance undertaking would be expected to require in order to take over and meet the obligations. However, from a macroprudential point of view, a buffer on this risk margin which was allowed to fluctuate countercyclically could also be considered. Such a buffer would then be partly linked to the riskiness of the insurers as the risk margin is linked to the SCR. There are, however, clear drawbacks to such an approach, a main concern being that it would severely obscure the valuation of technical provisions.
- Set up a leverage ratio. In principle, a leverage ratio is a simple instrument that could help preventing excessive leverage of institutions, thereby increasing their resilience. However, leverage is often defined as total assets to equity, which is arguably not the most relevant measure in insurance considering that it includes the "leverage" stemming from the fact that premiums are paid up-front. A leverage ratio in insurance would need to be tailored to exactly the type of leverage which is considered harmful, which could for instance be excessive leverage in the form of issued debt over equity. Currently, however, this is not a problem in insurance as leverage is not a major part of most insurers' balance sheet.

3.2 Interconnectedness and excessive concentration

While interconnections, and certainly reinsurance interconnections may help stabilize a system and distribute losses, negative interconnections especially stemming from NTNI activities may require a certain macroprudential response. This may especially be true if they increase intra-sector (i.e. intra-financial) interconnectedness. The following instruments are typically considered to deal with negative interconnections:

- Establishing limits, capital requirements or otherwise provide disincentives for excessive concentrations, by counterparty type:
  - Intra-financial concentration: Although intra-financial liabilities also increase interconnectedness, it would be difficult to limit the liability side since i) borrowing

–although rather exceptional in insurance– is mainly possible from financial institutions, and ii) the issuer of debt securities is generally not in the position to influence the identity of the ultimate holder of its debt. Therefore, disincentives to interconnections would most likely work at an aggregate level on the sum of lending to financial institutions and holdings of securities. However, as significant diversification is possible within the European or global financial sector, the relevant perimeter for such disincentives would need to be carefully considered (e.g. separating between different national markets).

▪ Government bonds: Sovereign debt has traditionally been considered as a relatively "risk-free" investment and often benefits from a preferential treatment in terms of capital requirements.[34] This fact, together with the –usually– high liquidity of these financial assets and their long-term maturity, leads to a high concentration by insurance companies, which may create systemic risk for the sector as a whole as the risk-free assumption is not likely to hold true. Macroprudential authorities should therefore consider the merits of incentivising insurers to diversify their portfolio and include government bonds from other jurisdictions.[35]

▪ Corporate bonds: a similar approach to the one described above could also be taken for corporate bonds. Large single exposures to certain corporate bonds considered as semi risk-free may also generate systemic risk under certain circumstances.

▪ Variable income instruments: inherently riskier than the previous asset classes, variable income instruments may provide diversification benefits in the portfolio of insurers, while achieving higher yields. Macroprudential authorities may, however, consider establishing limits on these asset classes to avoid a certain "search for yield" behaviour, especially to what refers to assets covering technical provisions.

▪ Bank deposits: insurers may hold significant amount of cash deposits in a given time. The funds collected by means of the premiums, together with the amount expected to be paid to claimants in the short term, may lead to a high single exposure to particular banking institutions. These exposures need to be assessed together with other exposures insures may have, such as equity or bonds.

[34] Note, however, that EIOPA has issued an opinion requesting NCAs to require that the risks related to Sovereign Exposures are appropriately taken into account in internal models (see EIOPA, 2015).

[35] This is discussed in extensive detail in ESRB (2015).

Macroprudential authorities may want to consider certain restrictions or ratios or other disincentives to avoid an excessive concentration in single banking institutions. [36]

- Separation of NTNI activities. Notwithstanding the aggregate limits on intra-financial exposures, separate regimes could be envisaged for NTNI activities such as repo transactions, securities lending and derivatives. However, as derivate holdings might be used for hedging purposes and risk-reduction, a distinction between such holdings and holdings for non-hedging purposes would need to be made.

Under Solvency II, some risks of excessive concentrations will be limited by concentration risk charges for single-name exposures (but not for sectoral exposures) which would help limit excessive concentrations and exposures. It is supplemented by 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. When considering any potential macroprudential tools in this space, it is important to note that Solvency II, by policy design, does not include limits on concentrations, but instead rely on capital charges to adjust the incentive structure. Any predefined limits would enforce a very rigid structure that would limit firms' room to manage their balance sheets, and would need to be substantially justified if considered.

3.3 Non-traditional and non-insurance activities

NTNI activities have proven to contribute or amplify systemic risk associated to insurance. The IAIS has therefore developed a comprehensive framework trying to understand and categorize NTNI activities.37 Based on this work, three macroprudential instruments could be defined:

- Requesting higher (quantity and/or quality) loss absorption capacity to ensure that companies engaging in NTNI activities should hold an amount of capital that is in line with the risk they introduce into the financial system.

[36] Such restrictions are already imposed in some jurisdictions.

[37] This part draws on IAIS (2011) and, particularly, (2013a,b).

- Separating traditional from non-traditional activities to help in preventing the spill-over of detrimental effect caused by distress from NTNI activities on the traditional parts of the business.[38]
- Restricting/prohibiting NTNI activities (e.g. engaging in derivatives for non-hedging purposes or repo transactions and securities lending that go beyond the need for an efficient cash management).

We note, however, that NTNI activities are not always clear-cut (as noted above, derivatives are also used for risk-reduction purposes) and depend on the existing traditions and habits in the different jurisdiction. As such, we agree with the IAIS that the judgment of the relevant authority is very important. This has obviously an impact in the definition of relevant macroprudential instruments in each jurisdiction. In this line, any restriction or ban on certain activities and products should be carefully assessed. Moreover, before any proposals on limiting certain activities or investments can be made, the effectiveness of Solvency II to mitigate such risks must be carefully assessed. For instance, the credit risk charges will ensure that more capital will need to be held against more risky investments.

3.4 Procyclicality

Procyclicality in insurance generally relates to the asset side of insurers' balance sheet as insurers, being large investors, may contribute to price bubbles or collapses. This is different to banking, where procyclicality also stems from banks' contribution to the credit cycle. This difference means that any countercyclical instruments in insurance should relate to the investment behavior of insurers, in particular with a view to limiting potential fire-sales.

Although Solvency II is mainly concerned with micro-prudential supervision, there are several elements in the regulation which can be considered macroprudential, or which would have macroprudential effects. In particular, the volatility adjuster and the extension of the recovery period would work to limit procyclicality. The equity dampener also has some countercyclical elements as the capital charge increases (as a share of held equity) when equity prices are above a certain historical average.

However, while some of these elements are targeted towards limiting procyclicality, they are often considered to mainly apply in stress and work to reduce effective

[38] We are aware, however, that the concept of "effective separation" of activities is not easy from an operational and supervisory perspective.

capital requirements.[39] This may initially seem to contrast with the banking sector where the macroprudential tools also increase capital requirements in upturns. However, macroprudential instruments for the banking sector are also targeted towards the credit cycle, which might not be relevant for insurers.

Besides the instruments already in Solvency II, the following instruments are therefore likely to be considered in a debate on macroprudential tools:

- Allow regulatory capital requirements to fluctuate over the cycle: In a market-valuation environment, insurers may be relatively capital-endowed in good economic times (with high asset prices), and more capital constrained in distressed times (with lower asset prices and lower risk free rate). Macroprudential authorities could therefore require insurers to hold more capital compared to liabilities in economic upswings, and explicitly allowing for its discharge during distress. It is, however, important to note that it is far from certain that any countercyclical capital requirements in insurance should come in addition to micro-prudentially determined levels of capital. Macroprudential authorities would therefore also need to consider if countercyclical requirements could take the form of formal capital relief in distressed times, e.g. to avoid fire-sales.
- Extend the existing recovery periods: Insurers failing to meet supervisory capital requirements may be forced to sell assets to improve their capital position (especially in risk-based regimes). This could lead to pressures for fire-sales and procyclical behavior in economic downturns. Therefore, if the breach of capital requirements can be seen as temporary and the underlying business is deemed sound, an extension in the recovery period may be preferred compared to resorting to bankruptcy or fire-sales. Although this is mainly a microprudential tool intended to allow a degree of flexibility in determining how to best meet policyholder claims towards the insurer, it may also limit procyclicality and therefore could be seen in the domain of macroprudential policy as well.

3.5 Moral hazard

Misaligned incentives and the issue of moral hazard are probably less significant in insurance compared to banks, due to its less systemic relevance. However, examples of insurance bail-outs exist.

[39] The equity balancer being a possible exception.

The instruments proposed by the ESRB (2014a,b) to deal with the issue of misaligned incentives and moral hazard could, in principle, also be adequate for insurance. These are basically the setup of additional buffers that should reflect the potential losses to society of systemic risk from large and interconnected institutions. Enhancing the market discipline could also work to avoid moral hazard. As such, the following instruments could be considered:

- Additional reporting and disclosure requirements. Macroprudential authorities may want to increase the reporting and disclosure requirements to achieve a greater market discipline, which imposes incentives to undertakings to behave in a safe and sound manner.
- Request additional capital buffers such as systemic risk buffers and countercyclical capital buffers. Some buffers could be applied to certain institutions, such as global and/or domestic systemically important insurers, while others could be considered across the board.
- Request additional risk bearing capacity, for example systemic or countercyclical risk buffers.

As stressed above, a key issue is how to calibrate these buffers to reflect the real threat to society that insurance can pose in terms of systemic risk. A cost-benefit analysis might therefore discourage the use of such tools. Moreover, robust analysis and detailed estimations of the systemic risk posed by insurance companies remains elusive.

Finally, reporting and public disclosure may also be considered tools to mitigate some risks of moral hazard. Solvency II introduces extensive reporting and public disclosure from 2016.

4. Conclusions

This article seeks to contribute to the ongoing debate on the objectives of macroprudential policies. We find that while there might be indications that the size of the insurance sector may influence economic growth both directly and indirectly (through links with other parts of the financial sector), more work needs to be undertaken to assess the economic relevance of this link, and the systemicness of the insurance sector in general. We also find that understanding the interaction between micro- and macroprudential policy in insurance, as well as full coordination between national and regional authorities is essential when considering any macro-prudential strategies for the sector.

Against this background, we present a stylized framework for macroprudential policy in the insurance sector which decomposes the final objective of financial stability into two intermediate objectives: a) mitigating the likelihood of a systemic crisis to occur; and b) mitigating the negative impact in case such a crisis materialises. These intermediate objectives can be achieved through a set of operational objectives and potential macroprudential instruments. This discussion highlights the extensive room for further discussion which remains in insurance, and that it is crucial to consider the nature of this business and its specific features and avoid attempts at simply extending the banking framework to insurance. Moreover, when considering macroprudential instruments, it is necessary to strike a proper balance between maintaining the stability of the financial system and avoiding an overreaction that could be harmful for the sector and economy as a whole in the long run. Further research is clearly needed in this field.

We finally note that as Solvency II is primarily a microprudential regime, the basic calibration of risk charges, the Long Term Guarantee package, the own risk and solvency assessment (ORSA) and general risk management provided for in Solvency II mainly concern the risks posed to the insurer and not risks the insurers may pose to the financial system as a whole. A macroprudential framework in insurance could be justified in cases where there is a risk that the (collective) behaviour of insurers, or their failure, would have wider effects on the real economy. Only in this context would a macroprudential framework contribute to ensuring that these costs (externalities) are internalized by insurers themselves.

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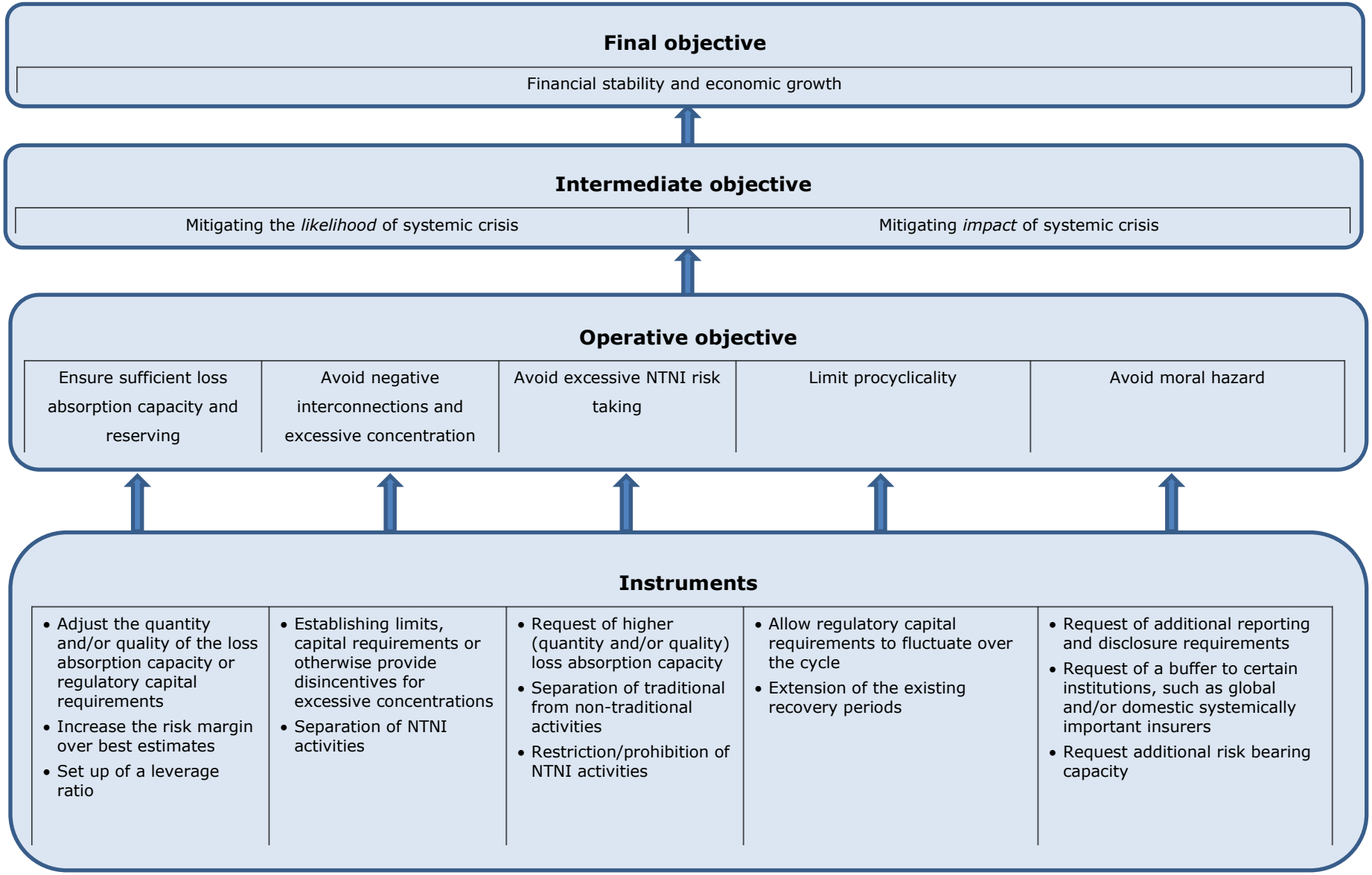
Annex 1: Overview of macroprudential objectives and instruments discussed



Appendix

Data coverage and disclaimer - The insurance sector

EIOPA collects consolidated figures from 32 large insurance groups.[1] The data is provided by undertakings through the national supervisory authorities on a best effort basis. This means that the data is not subject to internal or external audit. Although effort is made to keep the sample for each indicator as representative as possible, the sample may vary slightly over time. As data is provided on an anonymous basis, it is not possible to track the developments on a consistent sample. EIOPA also collects EU/EEA-wide statistics on country level. This data is collected annually and published as statistical annexes together with the Financial Stability Report. The data is used in figures which present developments in individual countries.

Data coverage and disclaimer - The reinsurance sector

The section is based on information released in the annual and quarterly reports of the largest European reinsurance groups. The global and European market overview is based on publicly available reports, forecasts and quarterly updates of rating agencies and other research and consulting studies.

Data coverage and disclaimer – The pension fund sector

The section on pension funds highlights the main developments that occurred in the European occupational pension fund sector, based on feedback provided by EIOPA Members. Not all EU countries are covered, in some of them IORPs (i.e. occupational pension funds falling under the scope of the EU IORPs Directive) are still non-existent or are just starting to be established. Furthermore, in other countries the main part of occupational retirement provisions is treated as a line of insurance business respectively held by life insurers, and is therefore also not covered. The country coverage is 67% (21 out of 31 countries).[2]

Data collected for 2014 was provided to EIOPA with an approximate view of the financial position of IORPs during the covered period. Several countries are in the process of collecting data and in some cases 2014 figures are incomplete or based on estimates which may be subject to major revisions in the coming months. In addition, the main valuation method applied by each country varies due to different accounting principles applied across the EU. Moreover, data availability varies substantially among the various Member States which hampers a thorough analysis and comparison of the pension market developments between Member States.

[1] The list of insurance groups is available in the background notes for the risk dashboard published on https://eiopa.europa.eu/publications/financial-stability/index.html.
[2] Countries that participated in the survey: AT, BG, HR, DE, ES, HU, IE, IS, IT, LI, LU, LV, NL, NO, PL, PT, RO, SE, SI, SK and the UK.

Country abbreviations

AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IS	Iceland
IT	Italy
LI	Liechtenstein
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom
CH	Switzerland