INTERNATIONAL ASSOCIATION OF INSURANCE SUPERVISORS

Macroprudential Surveillance and (Re)Insurance

Global Reinsurance Market Report
Mid-year edition

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This document was prepared by the Reinsurance Transparency Subgroup and the Reinsurance and Other Forms of Risk Transfer Subcommittee.

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It is our pleasure to introduce the second mid-year edition of the Global Reinsurance Market Report (GRMR). The issue at hand focuses on *macroprudential surveillance and (re)insurance.* Mid-year editions work as an extension and enhancement of the longstanding efforts of the Reinsurance Transparency Subgroup (RTG) in publishing the ongoing year-end edition of the GRMR. Last year, the inaugural mid-year report discussed developments in (re)insurance securitisation, with an eye on contributing to macroprudential surveillance through issue identification and knowledge development. This year, we tackle macroprudential surveillance head on.

It is widely agreed that macroprudential surveillance involves at least market-wide data analysis and synthesis, early warning systems of potential financial instability, and supervisory cooperation via global and multi-national forums. The IAIS is committed to furthering the understanding of macroprudential surveillance as a part of effective supervision and to suggesting possible tools and methods for carrying it thoughtfully forward.

We are pleased to present this RTG work. With macroprudential surveillance, we are grappling with something which is still unfolding on the worldwide stage, as supervisory regimes evolve to meet the market complexities brought to the fore by the financial crisis. We meet our commitment to market transparency by discussing the current macroprudential surveillance practices of (re)insurance supervisors and the challenges supervisors face, and by openly exploring possible solutions and global coordination mechanisms, grounded in the lessons learned from the financial crisis.

Last but not least, we would like to acknowledge the efforts of the IAIS economists and publication team led by Dr. Sebastian von Dahlen (IAIS) and Dr. Marcelo Ramella (office of the RTG Chair) in taking up this work and to all of the contributors from other areas in financial sector governance - a tremendous collective endeavour.

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Executive Summary

- This report discusses the issue of macroprudential surveillance in insurance and reinsurance, looking at current issues and debates on the meaning, scope and value of macroprudential surveillance, at current macroprudential surveillance practices among insurance supervisors, and at recent work on conducting insurance specific macroprudential surveillance at a global level.

- Macroprudential surveillance encompasses a set of activities carried out with the goal of identifying, assessing and monitoring risks to the financial system. These activities include analysis of macroeconomic and financial market information, and of how these data interact with each other. Macroprudential surveillance operates alongside microprudential –or entity-level– surveillance, in assisting supervisors in their efforts to prevent or mitigate the detrimental effects of the risks identified.
  The current global financial crisis has highlighted the importance of surveillance of risks beyond the level of the individual firm. On the other hand, it has brought to the fore the complexities inherent in capturing and making sense of risks that evolve rapidly in time, and cut across geographical boundaries and financial sectors.

- Empirical findings from a survey on macroprudential surveillance practices among insurance supervisors conducted in the first half 2010 show that:
  - Although most supervisory authorities do not have a formalised definition of macroprudential surveillance, nearly all of them carry out macroprudential surveillance activities. The breadth, reach and frequency of activities varies, often substantively, from supervisor to supervisor
  - The two most prevalent macroprudential surveillance activities are insurance market analysis and analysis of the impact of macroeconomic variables on the insurance market. In both instances, the focus tends to be on the analysis of domestic data, with international data analysis receiving comparatively less attention
  - Insurance-specific macroprudential surveillance activities evenly cover property & casualty insurance, and life insurance
  - Under 50% of supervisors carry out insurance market-wide stress testing; however, approximately 20% of those who do not stress test their markets have plans in place do so within the next 12 months
  - Macroprudential surveillance activities appear to assist supervisors in:
    - Identifying and assessing relevant changes in insurance markets as well as macroeconomic factors affecting these markets
    - Providing early warning signals of emerging risks, and enabling prompt action
    - Providing value-adding information for forward-looking monitoring
    - Identifying futures issues that may affect the insurance market

- There is limited information available on insurance-specific macroprudential surveillance activities at the global level collected and compiled by insurance supervisors. One example of such effort is the 'Global Reinsurance Market Report' that the IAIS Reinsurance Transparency Subgroup (RTG) has been publishing since 2004. The study, which is limited to the reinsurance market, gathers data of a very granular nature (i.e. entity level) and aggregates and analyzes it at a global level.

- The IAIS, through its Financial Stability Committee, is currently engaged in strengthening global-level efforts to promote financial stability. These efforts include contributing to the development of macroprudential surveillance data and tools relevant to the insurance sector.

Introduction

1. The recent financial crisis has highlighted the importance of making the financial system more resilient and the real economy more stable. Macroprudential surveillance, defined as a set of instruments that monitor the vulnerability of the financial system with respect to (economic) shocks, is seen as a valuable tool to reduce the likelihood and the effects of financial crises.

2. On the other hand, there is a lack of knowledge on the issue of macroprudential surveillance in the insurance sector. First, at the conceptual level, the bulk of the existing literature has focused its attention on macroprudential surveillance within banking; much less work has been done in relation to insurance-specific macroprudential surveillance. Second, at the empirical level, little is known about the extent to which insurance supervisors engage in macroprudential surveillance activities, how these are carried out in practice, what the outputs and outcomes of these activites are, and critically, what areas are in need of renewed attention or development . Last but not least, there is a critical knowledge gap with respect to insurance-specific macroprudential surveillance of a global nature, an area virtually unexplored in the literature.

3. This report aims to address these three gaps. First, it explores and discusses the conceptual debate currently in place in relation to macroprudential surveillance, placing emphasis on insurance-specific issues in the debate (Chapter 1). Second, via a detailed discussion of findings from a world-wide survey among supervisors, it maps out the current landscape of insurance-specific macroprudential surveillance practices, identifying pockets of good parctice as well as areas in need of development. This analysis is complemented by accounts of macroprudential surveillance activities in selected locations in the Americas, Asia and Europe (Chapter 2). Third, the paper analyses the issue of insurance-specific macrorudential surveillance at a global level by looking at work done in this respect in the reinsurance sector. Specific attention is placed on analysis of the reinsurance sector performance during the current global financial crisis (Chapter 3).

4. Macroprudential surveillance is currently experiencing a wealth of attention by multilateral bodies as well as national authorities (central banks as much as supervisory authorities). This report aims to contribute to this trend, and in particular, it aims to articulate the perspective of the insurance sector, as a key player in the global financial arena.

1. Macroprudential surveillance as part of a macroprudential approach to insurance and reinsurance supervision

5. The term macroprudential is not new. Its origins can be traced back to the late 1970s[1] . However, only recently efforts have been made to clarify what macroprudential means. Macroprudential is defined with respect to its antonym microprudential[2].

6. The Committee on the Global Financial System (CGFS) has summarized the recent debates[3].The common points in the definition of macroprudential analysis are:

- Protection of the financial system from (economic) shocks
- Containment of the risks inherent in systemic financial distress

[1] Maes (2009), Clement (2010).
[2] Crockett (2000); Borio (2003, 2009a, 2009b); Venkataraman *et al.* (2002).
[3] CGFS (2010).

- Prevention of spillover effects to the real economy
- Reduction of the financial system's amplification of the economic cycle
- Financial system risks are different to the sum of individual risks incurred by a financial institution (e.g. bank, insurer)
- Common exposures faced by financial institutions and interconnections between financial institutions are critical, since they represent an important transmission link of an (economic) shock

7. Macroprudential surveillance and regulation aim to i) identify systemic risk (including shocks, interlinkages and feedback effects), ii) reduce the likelihood of systemic risk, and iii) mitigate spillover effects within the financial system and into the real economy.

8. Microprudential surveillance and regulation aim to prevent financial distress affecting an individual financial institution. The implications for the financial system and the real economy are neglected. The focus of the analysis is set on the individual institution. Hence, only the financial structure (exposures and correlations among the portfolio) of the individual institution are important, but not their interaction with the economic system.

9. Systemic risk refers to the risk of a breakdown in the financial system, caused by interdependencies between institutions and common exposures faced by institutions. The effects on the real economy are disruptive. IMF, FSB and BIS define systemic risk as "the risk of disruption to financial services that is (i) caused by an impairment of all or parts of the financial system and (ii) has the potential to have serious consequences for the real economy"[4]. In a systemic crisis some financial services may be unavailable or be available only at (extremely) high cost. Systemic risk is not restricted to the financial system, in fact it is ubiquitous. Prominent examples are pandemics. However, the probability of systemic financial system risk is considered to be higher and the effects more severe.

10. One source of systemic risk is systemically important financial institutions (SIFIs). SIFIs fulfil one or more systemic functions and cannot be replaced by other institutions within a reasonable period of time. Their failure would cause widespread distress on the financial markets, either directly or through contagion effects. The assessment of systemic functions depends on the particular structure of the economy.

11. The IMF, FSB and BIS propose to assess the systemic importance of institutions for the banking sector on the basis of three criteria: 1) size, 2) lack of substitutability and 3) interconnectedness. The IAIS adds the criterion of timing for the insurance sector (time dimension)[5]. Based on the size criterion an SIFI may be categorised as either too big to fail (TBTF), if a failure would lead to financial instability and/or too big to rescue (TBTR), if a bail-out would exceed the financial capabilities of the government.

12. An effective way of making sense of the notion of macroprudential approach is by contrasting it to the firm-level, i.e. microprudential, approach[6]. As summarised by the table below, while a macroprudential approach is concerned with the soundness of the overall system, the microprudential looks at the individual firm. Most importantly, while from the microprudential perspective, the environment is conceived as exogenous to the firm and correlations among firms appear irrelevant, the macroprudential approach focuses on collective behaviours (i.e. the environment as influenced by the way firms operate

[4] IMF/BIS/FSB (2009).
[5] IAIS (2010a).
[6] Borio (2009, 2003).

collectively), paying special attention to correlations and common exposures across institutions.

Figure 1.1 – Macro- and micro-prudential approaches

	Macroprudential	Microprudential
Proximate objective	Limit financial system-wide distress	Limit distress of individual institutions
Ultimate objective	Avoid output (GDP) costs	Consumer (investor/depositor) protection
Characterisation of risk	Seen as dependent on collective behaviour ("endogenous")	Seen as independent of individual agents' behaviour ("exogenous")
Correlations and common exposures across institutions	Important	Irrelevant
Calibration of prudential controls	In terms of system-wide risk; top-down	In terms of risks of individual institutions; bottom-up

13. Although the macroprudential level refers to the ***financial sector as a whole*** while the microprudential level, on the other hand, refers to the ***individual financial institution***, the two perspectives are not in opposition to each other. Instead, macro- and micro-prudential approaches should be conceived as complementary approaches[7].

14. Looking at the macroprudential approach in more detail, a key analytical distinction should be made between the 'surveillance' and the 'regulatory and supervisory' elements of the approach. In a nutshell, while the former is focussed on the identification, assessment and monitoring of risks, the latter is concerned with the regulatory and supervisory actions taken to prevent and/or mitigate the identified risks, and in so doing, to contribute to the soundness of the financial system[8]. More often than not, the boundaries between 'surveillance' and 'regulatory/supervisory' elements of the macroprudential approach appear blurred in practice.

15. Macroprudential surveillance seeks to detect emerging patterns of financial instability in advance and to gauge their gravity when they occur. Further, this is done by observing the overall pattern of economic and financial developments in a judgmental manner. Moreover, judgement should, in turn, be informed by events of the past that have entailed systemic risks, as well as by a conceptual framework derived from theory to identify appropriate danger signals.

16. A key challenge in carrying out the macroprudential approach in general and in conducting macroprudential surveillance in particular, is presented by the porosity of the definition of the boundaries of the system under consideration. Put simply: what do we mean by "macro"? While there is a reasonable degree of consensus behind the meaning of "micro", that is, the firm-level to regulation and supervision, defining the system-level is not straightforward.

[7] Brunnermeier *et al.* (2009).
[8] CGFS (2010), Davis and Karim (2009), Davis (1999).

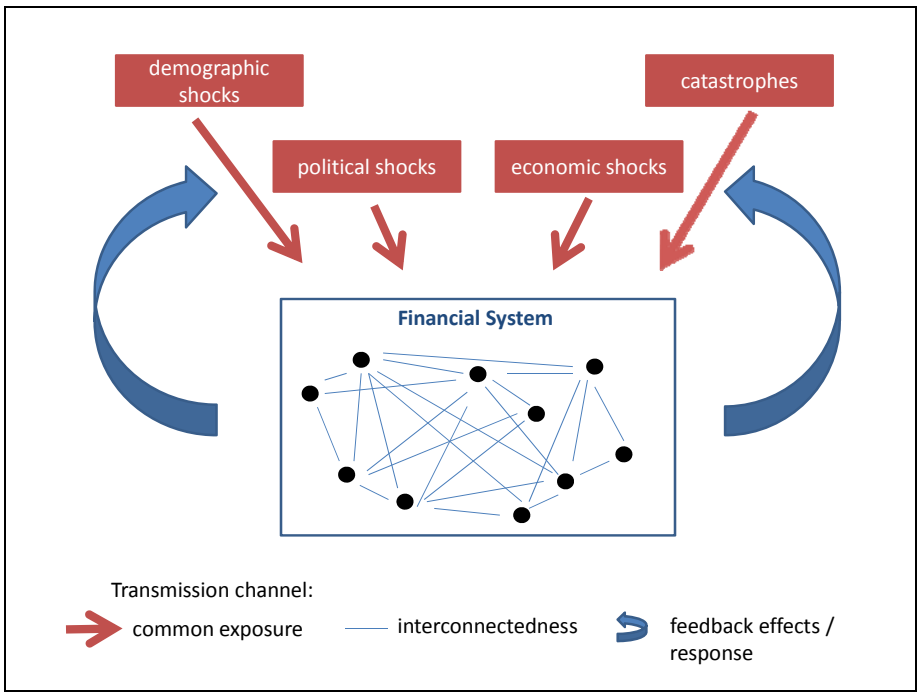
17. In making sense of the meaning of the term 'macro', there are at least two aspects that need to be addressed[9]. A first aspect has to do with the institutional coverage, the so-called "perimeter". A systemic approach would need to take account of the risks generated by all financial institutions that are capable, on their own and as a group, of causing material system-wide damage. This is so regardless of the legal form of the financial institution. It follows that regulated and unregulated firms may fall under the umbrella of the macro. Further, firms regulated by different regulatory agencies may be involved, as the macro is likely to cut across financial sectors.

18. The second aspect has to do with geographical coverage, i.e. the cross-border dimension. In thinking beyond the firm level, should the approach be applied at a domestic level or at an internationally one? Often, the precise answer appears dependent, among other things, on the extent of the interconnectedness across financial institutions, and on the degree of co-operation among regulatory jurisdictions. To date, the debates on the unregulated-regulated divide as well as cross-sectoral and cross-border dimensions to macroprudential surveillance appear far from being exhausted both in theory as much as in practice.

1.1. Macroprudential Surveillance Approach (MPS)

Macroprudential surveillance consists of a set of instruments designed to monitor financial stability. Sources of systemic financial distress are mainly macroeconomic shocks, as well as demographic and political developments or catastrophes. Shocks are transmitted to the financial system through i) common risk exposure and, ii) interconnectedness within the system. The response of the financial system to the crisis (e.g. fire sales of securities) prompts feedback effects to the real economy. Figure 1.2 illustrates the concept. Macroprudential policy refers to the set of measures necessary to ensure the resilience of the financial system as a whole.

Figure 1.2 – Concept of systemic financial distress



[9] Tarashev *et al.* (2009).

19. Macroprudential policy may be thought to lie between monetary and microprudential policy with the objectives closer to a macroeconomic view (i.e. to ensure the stability of the economy) but instruments mainly adapted from the microprudential framework[10].

20. Shocks in macroeconomic variables that may potentially lead to financial instability are: 1) GDP shocks: recessions, 2) price shocks: inflation / deflation, 3) interest rate shocks, 4) exchange-rate shocks, 5) asset bubbles, 6) sovereign defaults. These six events are widely recognised as major crisis originators. The role of exemplary shocks in the MPS for the insurance sector will be explored in Section 5. Other shocks include : demographic shocks (e.g. pandemic) natural catastrophes like earthquakes, hurricances and flood as well as political shocks.

21. Common risk exposures are the critical link between (economic) shocks and financial stability. Common exposures are likely to vary across the credit cycle, with a tendency to overexposure in expansion phases and the opposite reaction - underexposure, excessive risk aversion - in downturns. Herding behaviours amplify this effect. Interactions between institutions (interconnectedness) within the financial sector constitute another transmission channel of (economic) shocks within the financial system. Examples of interactions are cross-ownerships, payment system interactions and explicit risk transfer operations (reinsurance, derivatives).

22. The response of the system to the crisis may amplify financial instability. Synchronised individual actions and herding behaviour may lead to negative systemic effects in the financial markets. Financial institutions that, for example, are forced to liquidate assets will put further pressure on prices. Depending on the extent of the crisis the feedback to the real economy may be sizeable and exacerbate financial instability.

23. Systemically important institutions are not, in our view, at the centre of the MPS approach. However, they play an important role since the failure of a systemically important institution will damage financial stability more than the failure of small institutions and will have severe effects on the real economy.

1.2. The insurance business model

24. Unlike banks, which act as intermediaries for capital flows, insurers organise risks. Professor Alfred Manes defined insurance as the mutual cover of random but estimable monetary requirements of a large number of business entities exposed to the same type of risk[11]. Insurance is based on the law of large numbers. Bundling risks together to form a risk collective is essential for calculating premiums. The more similar risks are insured and the larger the portfolio, the more balanced it is. Risk diversification is further improved when a primary insurer or reinsurer broadens its portfolio by expanding geographical coverage (geographical risk diversification) and when it breaks down risks with reinsurance and/or retrocession and securitisation.

25. A further special feature of insurance is the funding model. Insurance premiums have to be paid in advance, but benefits are only owed in the event of a claim. Insurers create suitable reserves for this purpose. Insurance contracts are often written covering several years, in the case of savings policies several decades. Early termination (cancellation) is time-consuming and involves processing fees. Payouts are also always linked to an insured

[10] Saporta (2009).
[11] Manes (1930).

event (the objective trigger). This means that a run on an insurance company is not possible in the same way as a run on a bank. These stabilising factors encourage regular inflows. Insurers therefore depend on a smoothly-running payment transfer system. Were this to fail it would have consequences for the whole economy, not just the company concerned, as insurers would no longer to be able to meet their contractual obligations.

26. Insurers invest primarily in bonds, but also in equities. Matching durations and currencies are key here.

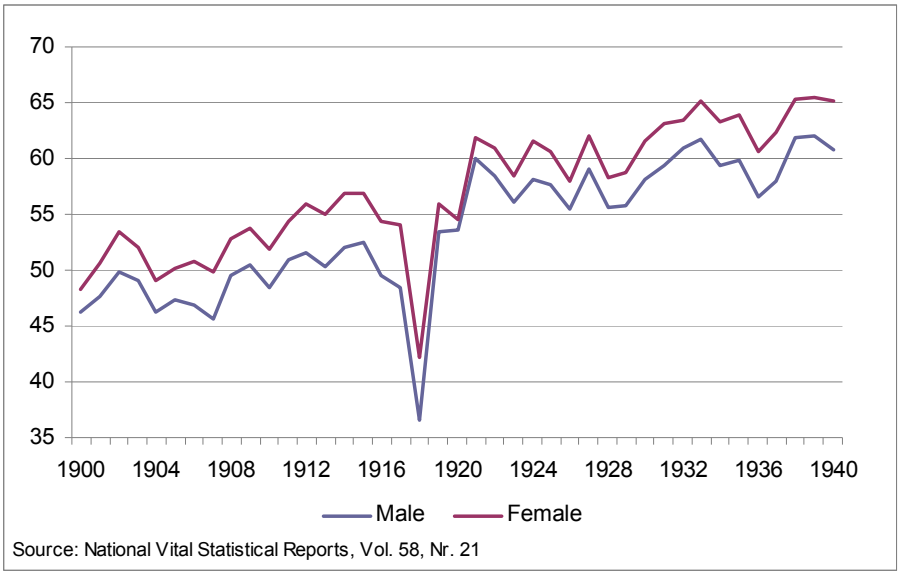
1.3. Specifics of the insurance sector for Macroprudential Surveillance

27. Three shocks are discussed below in terms of how they would impact the insurance industry. The aim of the discussion is two-fold. On the one hand, the distinct nature of insurance is highlighted as the impact of the shocks on the insurance sector are explored. On the other hand, the specific elements of the shocks are discussed in order to better understand how the insurance sector is affected by these. Importantly, these three insurance-specific shocks should be distinguished from other shocks affecting other financial sectors (or the real economy) and impacting –albeit indirectly- on the insurance sector.

1.3.1. Demographic shocks – a core risk for the life insurance industry

28. Mortality shocks can have a tremendous temporary impact, particularly on the life insurance industry. More precisely companies focusing on mortality risks would record a negative impact, whereas companies focusing on longevity risks would benefit in the short term.

Figure 1.3 – U.S. Male and Female Life Expectancy at Birth 1900-1940



29. While shocks do not change the underlying trend, they heavily effect mortality rates and short term pay-outs. As a result, such risks have to be handled properly by the industry. In the context of recent fears and discussions about a pandemic, the flu pandemic of 1918 (Spanish flu) regained some recognition since it was one of the largest mortality shocks in the 20th century. Given the increased availability of medical supplies today, as well as the impact of globalisation, it is however difficult to draw conclusions as to what such an event could mean in today's environment. Nevertheless, the impacts would clearly be beyond the life insurance industry.

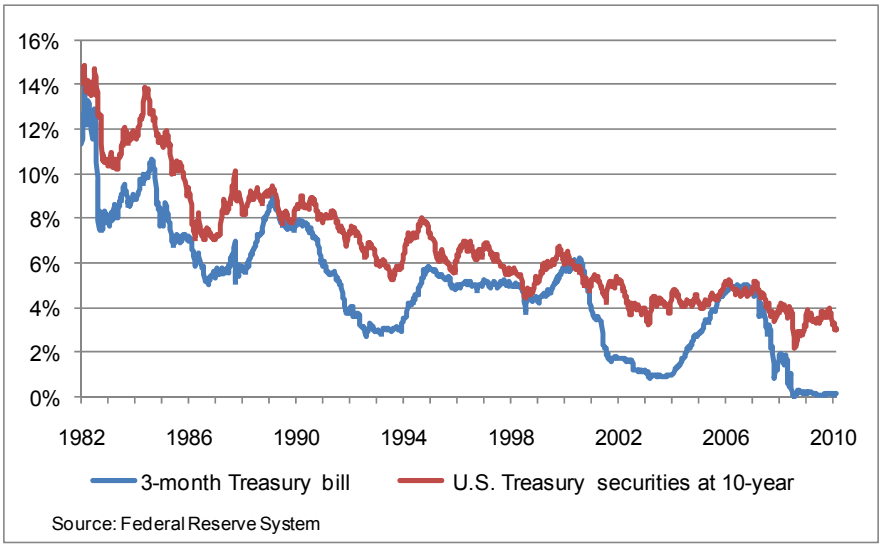
30. The mortality shocks would obviously lead to claims above normal levels. The settlement of the claims would increase liquidity requirements across the market. Given the importance of insurers as institutional investors and the necessity to liquidate investments in the short term, price levels would deteriorate – at least in the short term and that could impact the whole economy.

31. Supervisors have to be aware that:

- Companies have the risk capacity to absorb losses and events with conservative return periods and such events are included in capital and liquidity risk management;
- Companies closely monitor accumulations risks, especially in countries with high population densities;
- There is limited capacity and appetite to provide catastrophe life cover from the reinsurance market and therefore life securitisation of catastrophe risks might be an important channel to provide additional capacity.

1.3.2. Economic shocks - Rising interest rates

Figure 1.4 – US 3-month Treasury bill and 10-year Treasury securities interest rates



32. In the medium term rising interest rates seem a very likely scenario given their current very low levels. Because of the importance of capital in today's society, interest rate changes will impact the whole economy and the insurance industry would be immediately affected, e.g. in the following ways:

- The value of fixed-income investments would be negatively affected. Provided that the duration is matched with the technical provisions, this effect would be neutralised and as such not impact shareholder equity. However, current accounting principles have a valuation asymmetry between assets and liabilities. Assets are largely recorded at market values; whereas technical provisions do not reflect market movements. Since traditional solvency instruments are to some extent still based on accounting figures this effect does lead to an artificial impact on the solvency margin. The company and groups might be tempted to this artificial risk, leading to unnecessary transaction costs and inefficiencies.
- Life insurance companies, as traditionally very large institutional investors in fixed-income business, would also be exposed to the above-mentioned impact. Their business model promising long-term returns above current interest rates to policyholders is challenged by the low-yield environment. Even if rates credited to policyholders can be adjusted over time, they can lag behind reality for competitive

reasons so that the returns achieved with the investments are not sufficient to ensure a return in line with their cost of capital. All else being equal higher interest rates would increase the future profitability of life insurance companies.

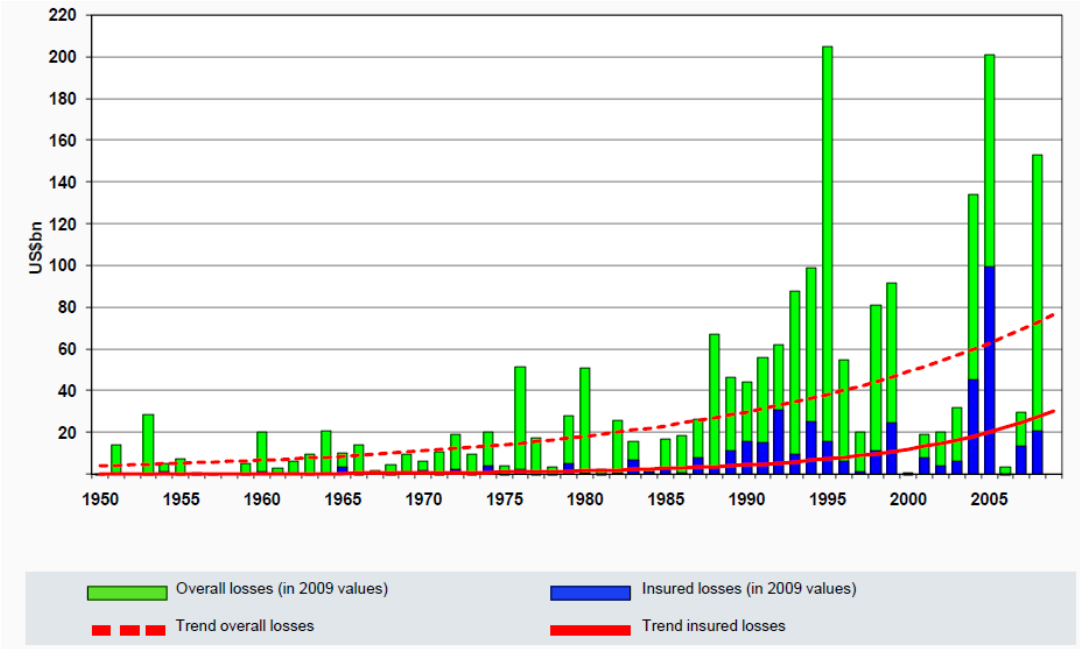
33. It is key for supervisors to

- Quickly adopt and introduce risk-based solvency measures as described in IAIS's Insurance Core Principle # 14[12].
- Make sure the changeover is properly managed, i.e. no conflicting requirements and no incentives for uneconomical measures.
- Estimate the consequence of a mismatch assuming infrequent and extremely unfavourable conditions.

1.3.3. Catastrophe shocks - Natural & human-made catastrophes and reinsurance

34. With reference to the law of large numbers insurance companies basically seek to build the largest possible portfolio. It is inevitable that risks will accumulate in some regions (e.g. the San Andreas Fault, in the case of plate tectonics). If a natural catastrophe were to occur in this region, the cost of claims for the insurer would be exceptionally high. Insurance companies use commercially available models to attempt to simulate and estimate the possible cost of claims. Such models are also often used by reinsurers offering cover against natural catastrophes. These models are based on historic claims and are constantly updated. Nevertheless, there is a fundamental model risk. As there are only very few models used by very many market players, there is also the danger that the model risks affect all relevant market players simultaneously.

Figure 1.5 – Natural catastrophes and reinsurance



(Source: Munich Re, NatCat SERVICE)

35. Solvency models only allow for natural catastrophes up to a certain, limited frequency. Any event beyond that would place insurers' solvency in danger.

[12] IAIS (2003).

36. It is key for supervisors to
- Find an approach to quantify inherent model risks.
- Understand potential weaknesses in the process related to cat risk assessment.
- Consider the findings of the IAIS Global Reinsurance Market Report (GRMR) on an ongoing basis

2 The current landscape of (re-)insurance-specific macroprudential surveillance practices

37. This section moves the discussion from the conceptual to the empirical and looks at insurance-specific macroprudential practices among national insurance supervisors, and regional and multilateral bodies. First, it presents and discuses findings from a survey on the topic of macroprudential surveillance conducted by the IAIS among its member organisations. Second, it looks in detail at specific examples of macroprudential surveillance in the USA and in India. Finally, it discusses macroprudential surveillance approaches in the European Union and the IMF/World Bank.

2.1. A survey of macroprudential surveillance practices at the national level

38. Over the last few years financial supervisors have needed to respond, sometimes urgently, on matters relevant to financial stability and, in order to do so, have needed to ensure that they have a sound broad understanding of how individual financial institutions fit into the bigger picture of both national and international financial systems. This is one of the significant supervisory lessons to be learned from the financial crisis.

39. Supervisory focus has generally been on an institutional (micro-prudential) level. What has been demonstrated is that it also needs to have a broader industry and financial system wide focus (macro-prudential). Some examples of descriptions used to date are set out in the above introduction.

40. The IAIS itself has previously developed a working definition of macro-prudential surveillance as: Macro-prudential surveillance involves market analysis including data acquisition, data analysis, early warning systems and it may also include market wide stress testing.

41. In order to assist IAIS Members with considering issues associated with developing a clearer focus on macro-prudential issues, a survey of IAIS Members was undertaken in the first half of 2010. The responses to the survey were from a wide range of Members representing both a wide geographic spread and a wide range of different jurisdictions. Responses were received from supervisors in jurisdictions which collectively represent approximately 85% of global premium income[13].

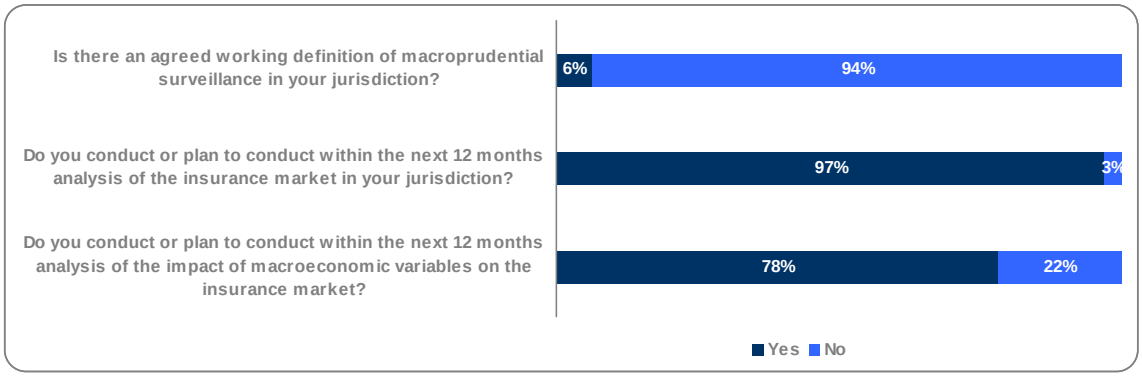
42. This chapter presents and discusses a summary of responses to the key areas of survey. It is clear from the responses that IAIS Members have turned their mind to the question of either developing, or enhancing, their work in this important area. It is also clear, however, that different jurisdictions are focusing on different issues and are at different

[13] A total of 37 responses from insurance supervisors were received. The geographical coverage has been wide. From each of the following regions three or more jurisdictions have provided an answer to the IAIS survey: Africa, Asia and Oceania; Caribbean, South and Central America; Europe; North America. Please note that this exercise counts the United States of America as one amid the fact that the USA includes more than 50 jurisdictions.

stages of this development. Publishing the results of the survey will assist Members in their awareness of good practices and developments elsewhere and thus assist them to enhance their own processes and procedures.

43. Figure 2.1 summarises a couple of key points. While it seems that, as noted above, many jurisdictions have not formally defined the term 'macro-prudential surveillance', nearly all are committed to the continuation of undertaking ongoing market analysis. In addition, the majority also plan to consider how macro-economic conditions will affect their insurance markets.

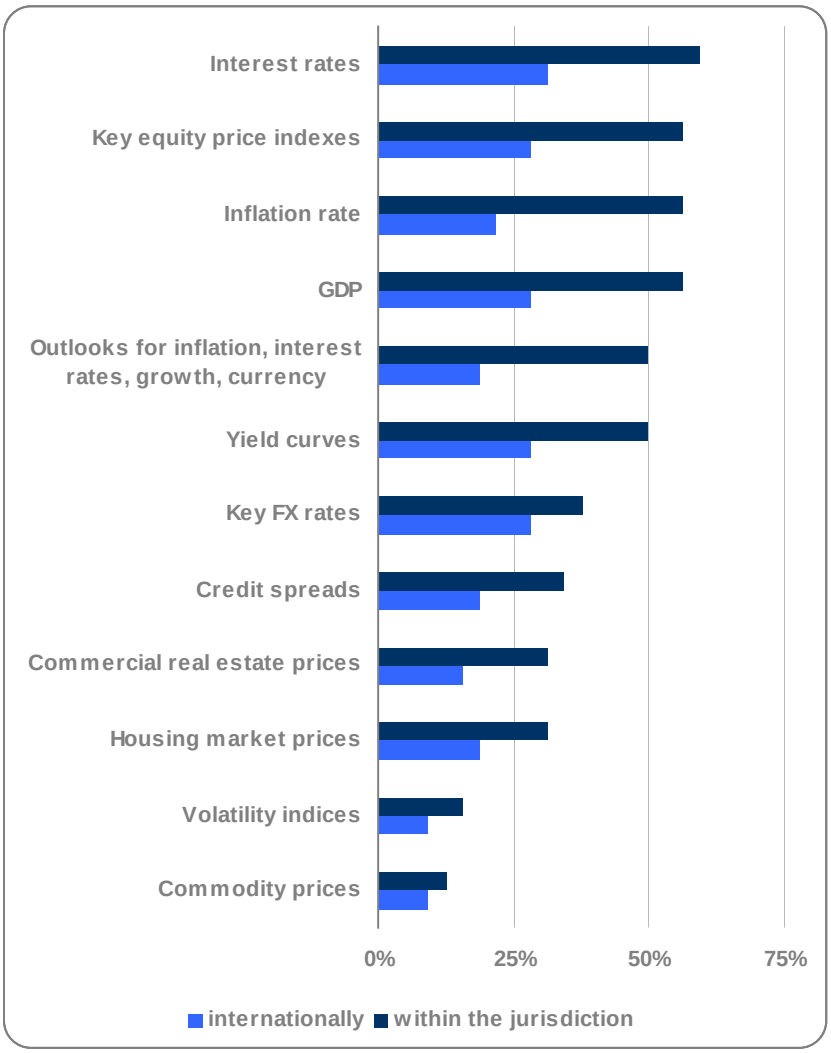
Figure 2.1 – Macroprudential surveillance and macroeconomic & insurance market analysis



44. Looking at common macro-economic factors that are analysed in relation to the potential build-up of risks that may impact the insurance market, data in Figure 2.2 show there is a wide range of variables currently being tracked by insurance supervisors. Not surprisingly, interest rates, equity prices and inflation are the most prevalent, with over 50% of respondents reporting conducting analysis on these.

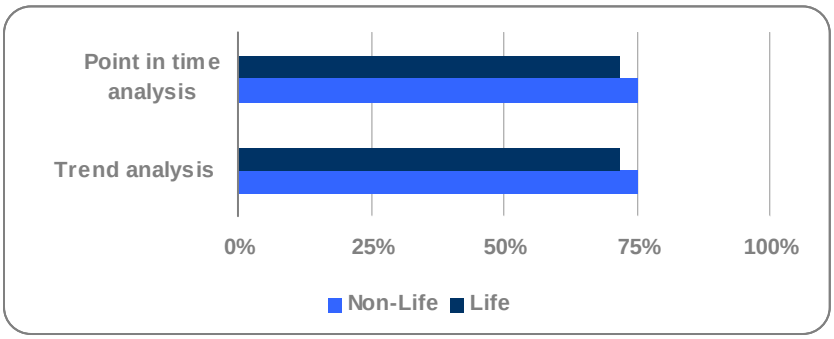
45. Importantly, the data also show that to date there has been a much greater emphasis on considering such factors within a jurisdiction rather than internationally. This is not unexpected as many insurers only operate in domestic markets. The IAIS is undertaking some significant initiatives to look further at the appropriate measures to put in place to develop stronger and more consistent supervision for internationally active insurance groups.

Figure 2.2 – Macroeconomic and other financial variables regularly monitored



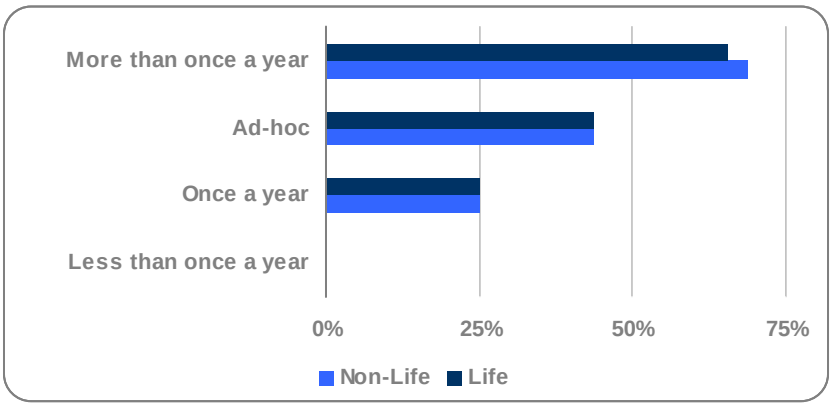
46. With respect to the kind and frequency of analysis conducted by insurance supervisors in relation to the variables tracked the following picture emerges from the survey data. In relation to the kind of analysis conducted, supervisors appear to carry out both point in time and trend analysis, with over 75% of respondents stating so, as Figure 2.3 illustrates.

Figure 2.3 – Kind of analysis of macroeconomic variables



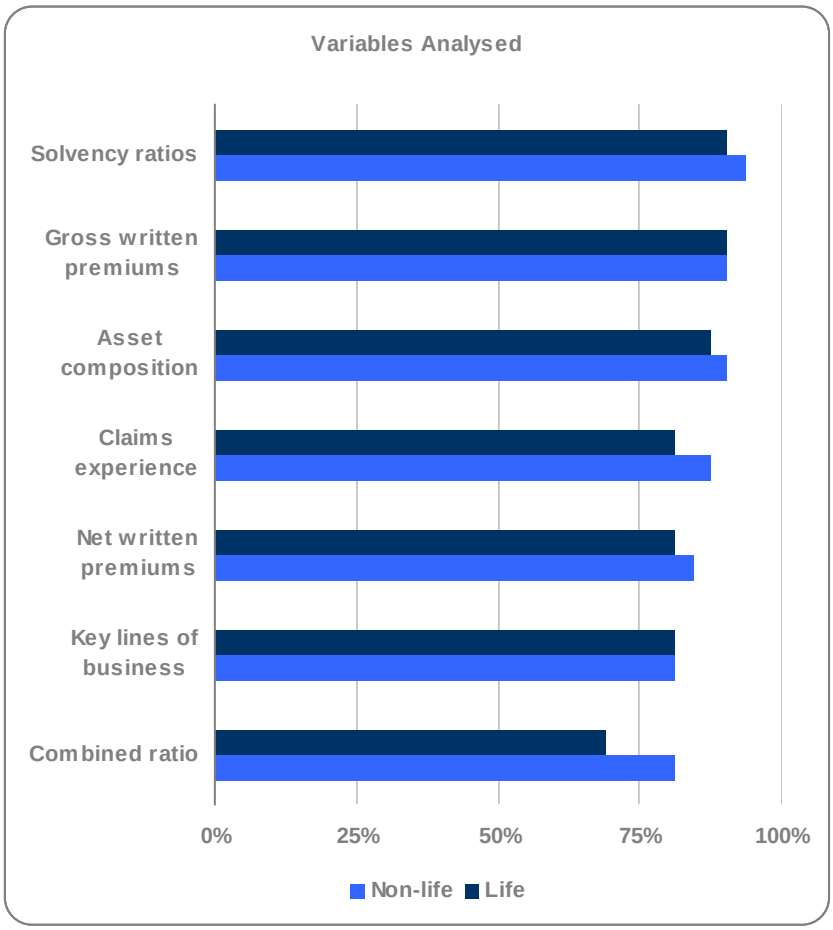
47. With respect to the frequency of analysis conducted, Figure 2.4 shows that there are a range of practices currently in place. This is likely to reflect the importance of ensuring that analytical processes have regard to the nature of risks. The robustness of the kind of analyses and range in frequency appear to be encouraging findings as, for example, ad-hoc analysis is a powerful tool to examine the effect of new and emerging risks and issues in a timely fashion as well as to how persistent risks may be and therefore considering trends as well as point in time analysis.

Figure 2.4 – Frequency of analysis



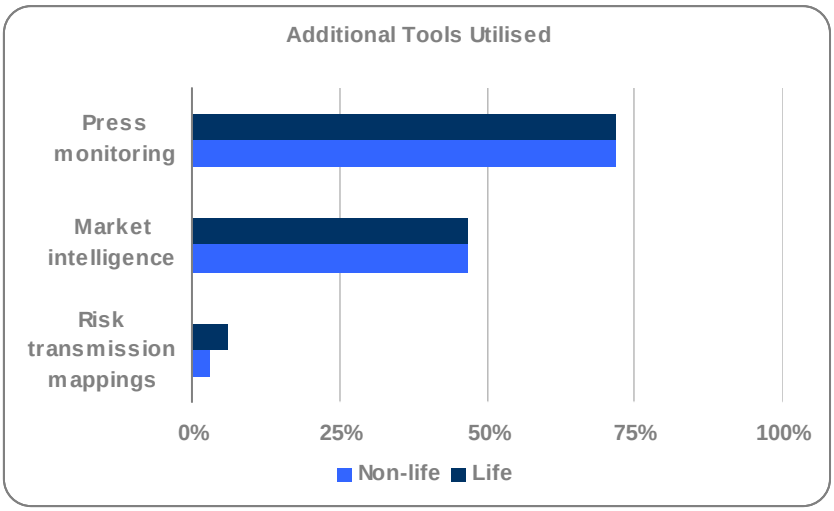
48. Looking at responses in relation to the variables analysed when conducting macroprudential surveillance of the insurance markets, Figure 2.5 shows that over 75% of respondents report dedicating their attention to the key indicators of the insurance business, both in the balance sheet (e.g. solvency, asset composition) and income statement (e.g. premiums –gross and net, claims, combined ratios).

Figure 2.5 – Insurance-specific indicators



49. In addition, as conveyed in Figure 2.6, insurance supervisors report complementing their surveillance activities with additional sources of information. In this respect, nearly 3 in 4 repondents report tracking news emanating from the press, while just under half of respondents analyses such third-party reports and other market intelligence data. On the other hand, the use of tools like risk mappings appears marginal.

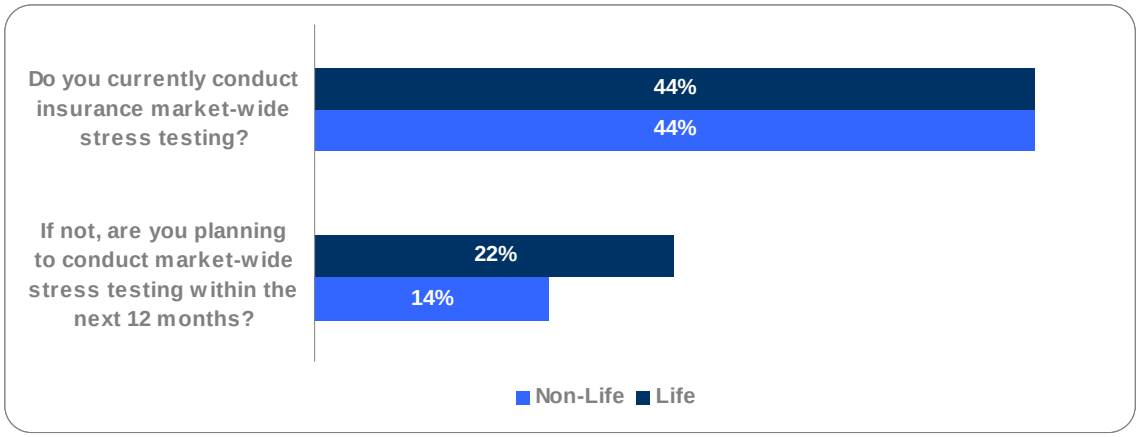
Figure 2.6 – Additional tools



50. An important, and growing, area of macro-prudential surveillance is the use of **stress testing analysis**. This can either be done by a supervisor from data and information provided by insurers, or the supervisor may require insurers to undertake their own stress testing based on common parameters specified by the supervisor. Both approaches may, of course, also be applied.

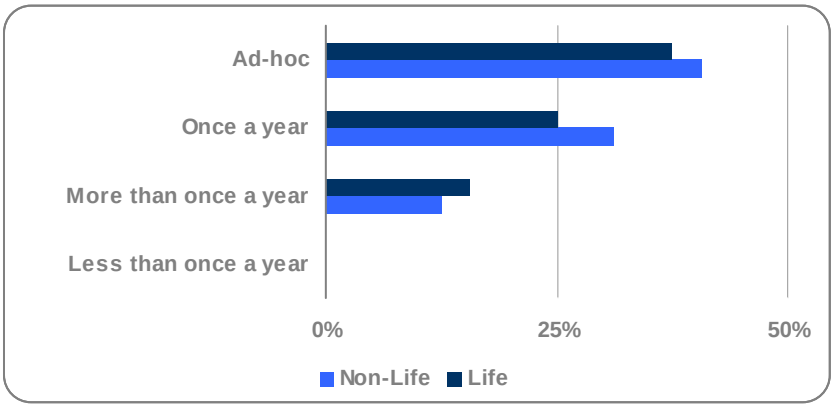
51. As is shown in Figure 2.7, there has been less focus put on market wide stress testing that on market wide analysis (Figures 2.1 to 2.6). This is an area that will probably develop further over coming years and, indeed, this is shown by Figure 2.7 with the intentions of a significant number of additional supervisors to commence market wide stress testing in the next 12 months.

Figure 2.7 – Stress testing activities



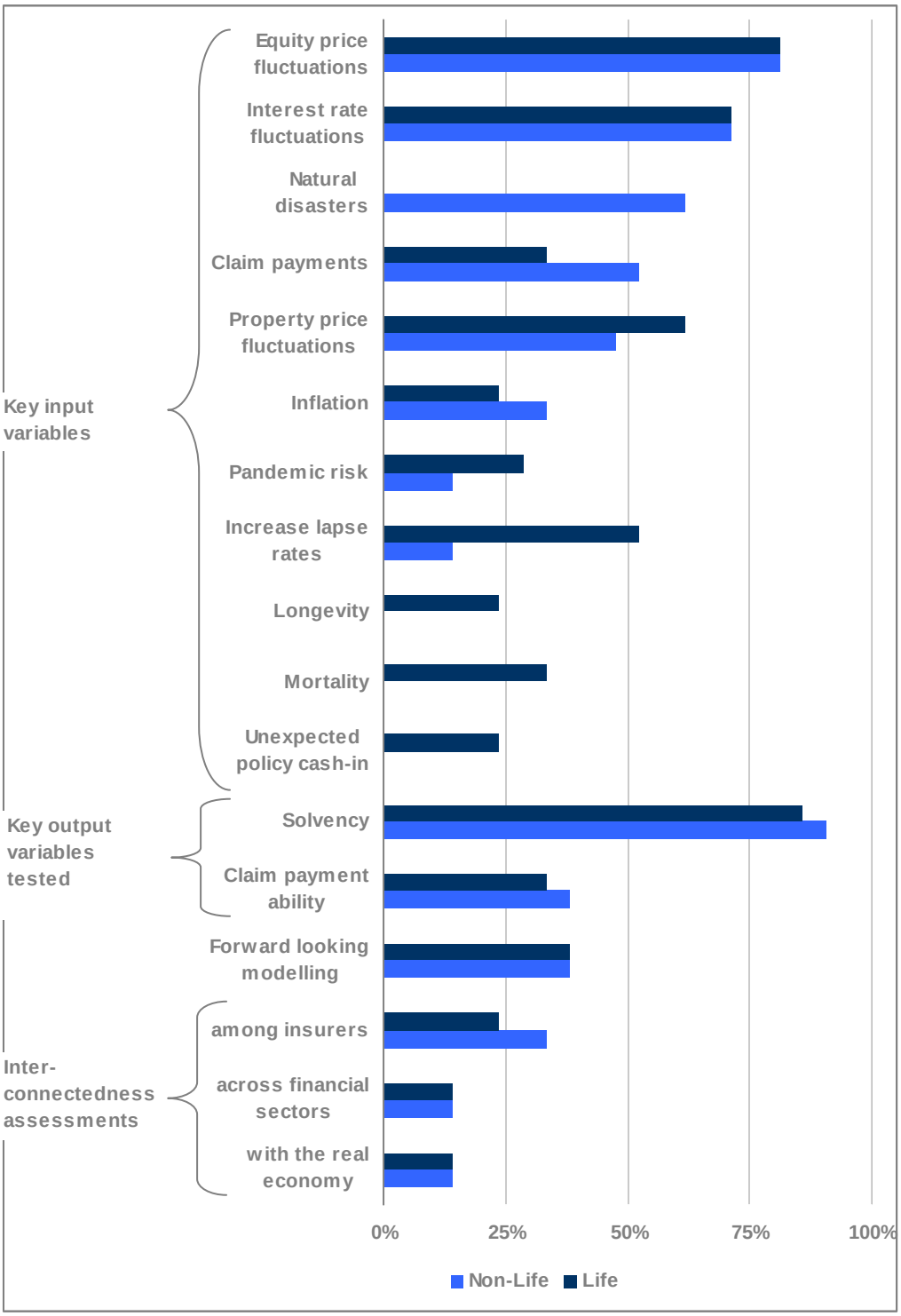
52. Interestingly, survey responses (Figure 2.8) show that market wide stress testing is more likely to be done on an irregular basis than is industry wide analysis (Figure 2.4).

Figure 2.8 – Frequency of stress testing activities



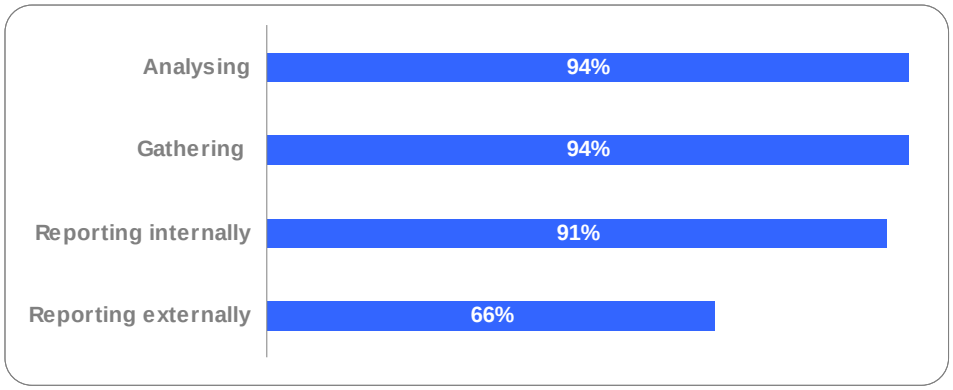
53. Where stress testing is undertaken, Figure 2.9 shows that there is a reasonable degree of consistency between key variables tested for both life and non-life insurers. Differences obviously apply in sector specific areas such as natural disasters, lapses, longevity and mortality, but on the asset side of the balance sheet (equities, fixed interest investments, property) there is a high degree of commonality. On the other hand, the prevalence of interconnectedness analysis is minimal.

Figure 2.9 – Stress testing in insurance markets – Variables analysed



54. In relation to process issues with respect to conducting insurance-specific macroprudential surveillance, the survey included a set of questions aimed at understanding arrangements in place among supervisors. As Figure 2.10 demonstrates an overwhelming number of supervisory authorities are involved in gathering and analysing information for macro-prudential surveillance activities. Importantly, the proportion drops when the focus becomes reporting the results of the surveillance process outside the walls of the supervisory authority.

Figure 2.10 – Process issues in conducting macroprudential surveillance



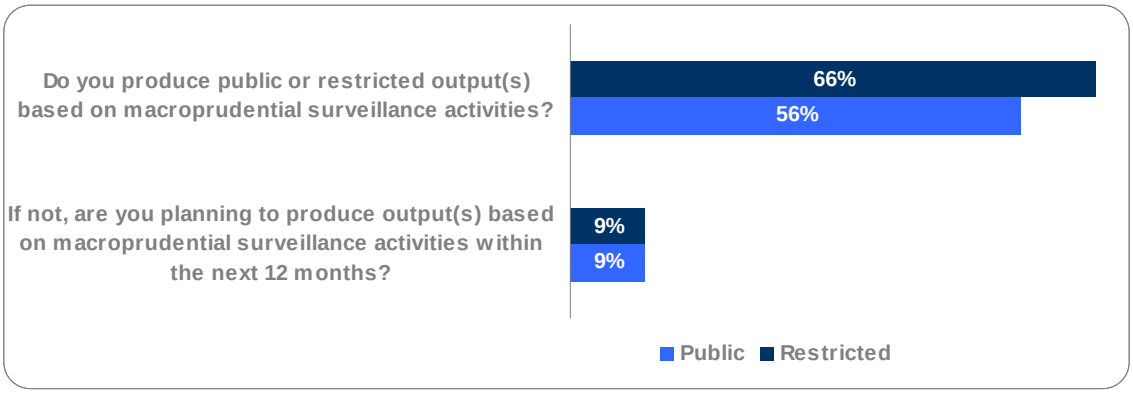
55. Within supervisory agencies there are different structures adopted for gathering, analysing and reporting on information. As Figure 2.11 shows, there is not a common theme which runs through the survey responses. Different models can have different benefits – often information which is useful for macro-prudential purposes is collected by individual supervisory units who carry out micro-prudential (i.e. insurer by insurer) supervision – in other cases there may be a centralised data collection unit. The dispersion in the results might be an indication of the stage of development of macroprudential surveillance within a supervisory setting. Further, it may also be related to the capillarity favoured by supervisory authorities when picking up – often very soft signals indicating areas of risk or concern for them.

Figure 2.11 – Institutional settings for macroprudential surveillance

Institutional setting applied to gathering, analysing or reporting macroprudential surveillance related information				
	Gathering	Analysis	Reporting Internally	Reporting Externally
By cross sectoral units	53%	63%	56%	31%
By a variety of individuals and units	53%	47%	44%	25%
By a dedicated, insurance specific unit	28%	34%	38%	22%
Key		= Highest level responses		
		= Medium level responses		
		= Lowest level responses		

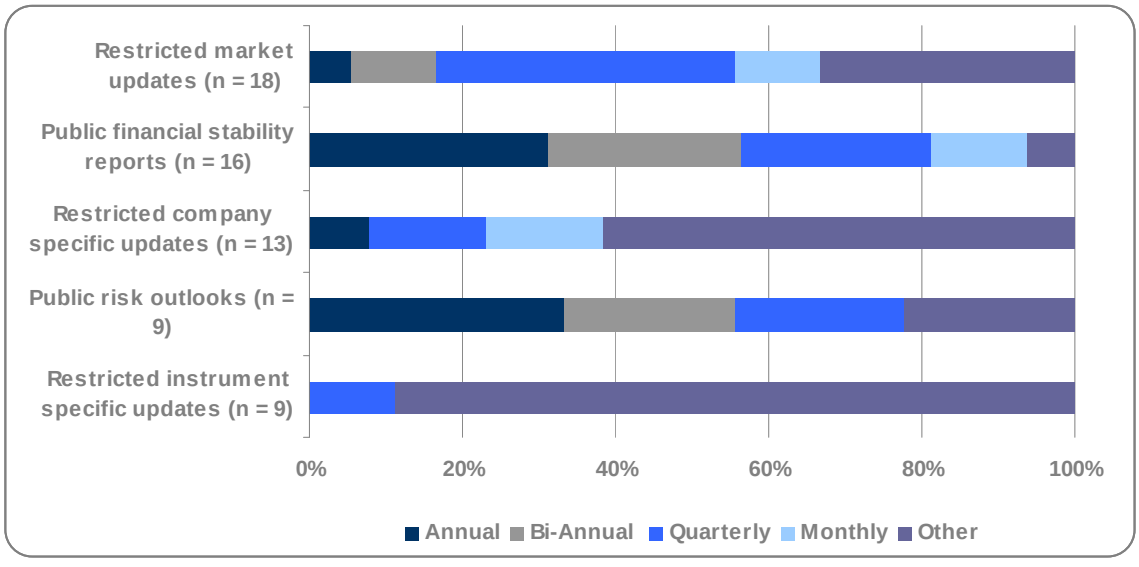
56. It would be expected that supervisors would be using the outcomes from their macro-prudential work for both their internal supervision purposes and for other regulatory purposes (restricted outputs in Figure 2.12). However, there are also a considerable number of respondents who use the analysis and outputs for public messages. This is a useful means of ensuring that key messages and outcomes from the analysis are made broadly available and therefore can help to 'guide' the market generally on possible areas of risk and concern.

Figure 2.12 – Macroprudential surveillance outputs



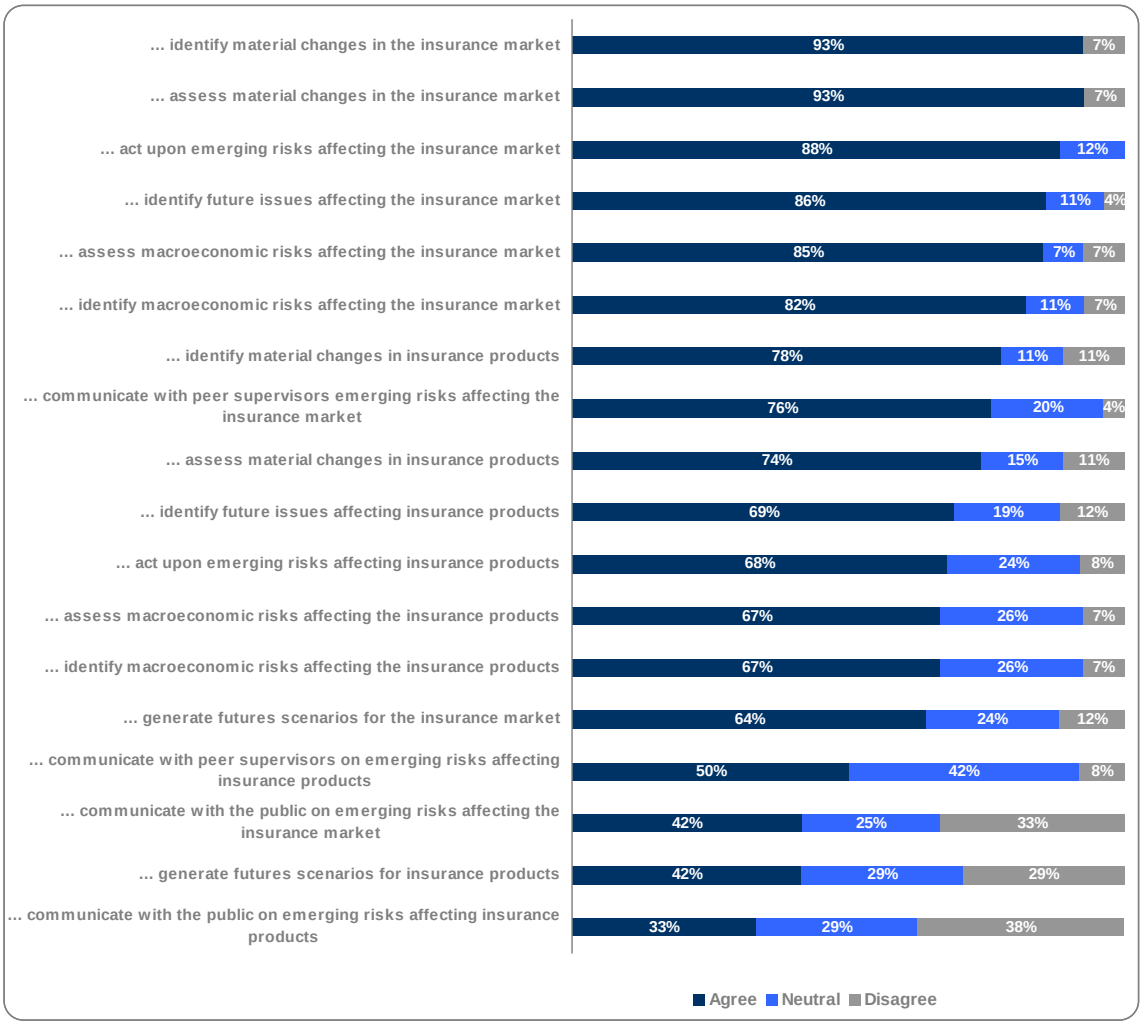
57. Where both restricted and public reports on the outcomes of the analysis are produced, there are a range of different timings for these. As is shown in Figure 2.13, restricted reports are likely to be produced more regularly than public reports – this is likely to, at least partially, reflect the use and importance of the analysis for ongoing and regular supervision of insurers as well as the necessary disciplines which would accompany public releases (making their more likely to be less regular).

Figure 2.13 – Publicity of outputs



58. Having discussed findings on input, process and output issues related to insurance specific macroprudential surveillance practices among supervisors, attention is now given to outcomes of macroprudential surveillance. Respondents were asked to assess the value of the macroprudential surveillance activities conducted in their jurisdictions. For this purpose a closed list of outcome statements was provided and research participants were asked the extent to which they agreed with these. Figure 2.14 below summarises the responses obtained.

Figure 2.14 14 - Macroprudential surveillance outcomes



59. The data show that insurance supervisors attach widely varying degrees of value to the macroprudential surveillance activities conducted in their jurisdictions. For example, regarding the identification and assessment of material changes in insurance markets and products, while there is overwhelming consensus that surveillance activities assist supervisors in identifying and assessing changes in the insurance market (i.e. 93% of respondents), about 75% of respondents feel that macroprudential surveillance helps them identify and assess changes in insurance products. Further, supervisors attach substantial value to macroprudential surveillance activities in the identification and assessment of macroeconomic risks affecting insurance markets and products, with over 80% of

[14] Note that responses “strongly agree” and “partially agree” grouped as “agree”; “not agree nor disagree” grouped as “neutral”; “partially disagree” and “strongly disagree” as “disagree”.

respondents stating so in relation to insurance markets and 67% with respect to insurance products.

60. With respect to the effectiveness of macroprudential surveillance activities in acting upon emerging risks affecting insurance markets and products, responses show a similar pattern to that identified in relation to material changes and macroeconomic risks. First, surveillance activities are deemed of help to supervisors in acting upon market and product issues. Second, while 88% of respondents supporting the former (i.e. acting upon markets) and 68% supporting the latter (i.e. acting upon products). Importantly, despite the 20-percentage point difference, responses seem to indicate a high degree of value of macroprudential surveillance in supporting supervisory actions. In short, responses provide empirical evidence to the 'early warning' value of macroprudential surveillance.

61. In relation to the forward looking value of macroprudential surveillance, there seems to be strong support from supervisors in this respect. Just over 85% of respondents feel that macroprudential surveillance activities have helped them in effectively identifying future issues affecting insurance markets. Importantly, and in line with what is discussed above, under 70% (i.e. 69%) feel so in relation to insurance products.

62. With respect to communication issues, the data show strong support to the claim that macroprudential surveillance activities have effectively helped supervisors communicate with peers emerging risks affecting the insurance market, with 76% of respondents stating so. Importantly, 50% of responses stated so in relation to communicating with peers emerging risks affecting insurance products. Further, when asked about the value of surveillance activities in communicating risks to the public, supervisors showed the highest levels of disagreement, with over one in three respondents feeling that surveillance activities were not effective in public communication endeavours.

63. Summing up, there is overall consensus among supervisors on the value added by insurance specific macroprudential surveillance activities to their supervisory efforts. First, macroprudential surveillance assists supervisors in identifying and assessing changes in the insurance market as such as well as changes in the macroeconomic environment that affect the insurance market. Albeit to a lesser extent, macroprudential surveillance activities also appear to assist supervisors in identifying and assessing changes in insurance products as much as macroeconomic changes affecting products. The drop in the effectiveness on products of the surveillance activities conducted could be related to a variety of issues, from the pace of innovation of insurance products to the developmental stage of surveillance tools. Second, insurance specific macroprudential surveillance activities appear to act as effective early warning systems for supervisors, and to have helped them in forward looking efforts. Last but not least, there is evidence of the value of macroprudential surveillance activities in supervisor-to-supervisor communication. Finally, evidence is weaker in support of the value of surveillance activities for public communications uses by supervisors.

64. The exploration of the reponses by insurance supervisors in relation to macroprudential surveillance practices have yielded some important messages. First, although macroprudential surveillance does not seem to enjoy a high degree of formalisation or institutionalisation within supervisory authorities, macroprudential surveillance activities are widespread. Supervisors conduct frequent and robust analysis of macroeconomic variables with potential impact on the insurance sector as well as insurance sector analysis. These activites appear more prevalent in relation to the domestic market than to the international one. Second, the analyses carried out appear to reach the life as much as the non-life insurance sectors. Third, market-wide stress testing, a key macroprudential surveillance tool, emerges as a practice gaining in importance among insurance supervisors. Although it

is so far limited to about half of the supervisory community, there are plans in place among an additional 30% of supervisors to incorporate this tool in the near future. Last but not least, there is strong consensus on the value added by macroprudential surveillance activities to the everyday work of insurance supervisors.

2.2. Macroprudential surveillance activities – A snapshot of practices in selected locations worldwide

65. While the previous section privileged breadth over depth, as baseline data from a sample of supervisors around the world was analysed and discussed, this section does the opposite and focuses on depth instead of breadth. The goal here is to explore in detail current macroprudential surveillance activities in three locations worldwide, that is, the United States of America, the European Union and India. These snapshots have the aim of helping the reader add flesh and meaning to the bones discussed so far.

2.2.1. A perspective from the Americas - Macroprudential Surveillance in the US Insurance Sector: Role of the NAIC

66. The NAIC is the association of state insurance commissioners in the United States. Its 56 Members oversee insurance markets that collectively represent approximately 40% of the world's insurance market. US state insurance regulators oversee the financial soundness of all individual insurers within their authority, and in doing so consider not only the potential impact of insolvency on consumers, but also the impact on the insurance marketplace for consumers. The NAIC facilitates the oversight process by allowing state regulators to more effectively monitor macroprudential issues impacting the US insurance market in order for appropriate responses to be considered at a microprudential level. The NAIC further facilitates regulatory responses which may necessitate market-wide approaches. With respect to certain aspects of the US insurance supervisory system, the high quality of the US insurance supervisory system was recognized by the recently completed assessment under the International Monetary Fund/World Bank FSAP program.

67. The purpose of this section is to highlight some of the activities and tools developed by the NAIC and utilized by US state insurance regulators in order to illustrate how supervisors in a multi-jurisdictional setting benefit from such activities[15].

2.2.1.1. NAIC Data Collection and Analysis

68. Standardized quarterly and annual statements filed by all US insurers are the primary vehicles that enable the compilation of data that ultimately populates the NAIC Financial Data Repository (FDR) database. The FDR facilitates the regular review of market conditions and assessment of market exposure by US state insurance regulators through various reports, publications (public and non-public), and automated financial regulatory tools. Figure 2.15 below exemplifies several of the key financial and qualitative indicators collected by the NAIC.

[15] At the time of writing this GRMR mid-year edition 2010 the United States Congress adopted updated financial markets legislation. The GRMR end-year edition 2010 will provide further information on the expected results and implications in a more comprehensive way.

Figure 2.15 – NAIC Indicators

NAIC Key Indicators	
Quantitative Indicators	**Qualitative Indicators**
Premium Written/Earned Losses Incurred Aggregate Totals Market Shares Loss Ratios Investment Mix Product Mix	Complaints Complaint Trends Number of new Receiverships Past regulatory actions taken

69. In addition to the above, the NAIC Insurance Analysis & Information Services Department utilizes the FDR to perform quarterly analyses. As a result, industry snapshots and commentaries are produced shortly after the financial statement date and distributed to the Commissioners and Chief Financial Regulators in each of the states. These reports summarize the operating performance of each of the major insurance sectors. Other market analyses are performed by the Department as needed to identify more long-term trends that may be of interest to regulators (e.g. trends with certain lines of business, accumulation of certain assets, use of debt, etc.), which is provided to the Financial Analysis Working Group (FAWG).

70. Supervisors in a multi-jurisdictional setting may benefit significantly from the aggregation and analysis of industry data. Such analyses facilitate the identification of macro-level risks and enhance each supervisor's ability to consider an appropriate response to risks at a microprudential level. In order to ensure the comparability and reliability of collected data, the importance of a common reporting platform, common definitions and quality assurance processes cannot be overstated. The absence of these critical elements poses significant challenges to the process and raises questions with respect to what extent data can be aggregated and analyzed in a meaningful way.

2.2.1.2. NAIC FAWG

71. For over a decade state insurance financial regulators have shared information and ideas by informal means through FAWG. The Working Group creates a peer review environment for state insurance regulators to:

- Analyze nationally significant insurers and groups that exhibit characteristics of trending toward or being financially troubled and determine if appropriate action is being taken.
- Interact with domiciliary regulators and lead states to assist and advise as to what may be the most appropriate regulatory strategies, methods, and action(s).
- Support, encourage, promote and coordinate multi-state efforts in addressing solvency problems, including identifying adverse industry trends.

72. FAWG meets on a routine basis in confidential sessions with the intent of adding further strength to the States' financial monitoring system. FAWG enhances the States' process by sharing ideas, experience and strategies on how to assist the state of domicile. This often occurs when the state of domicile shares information with FAWG on how the state and/or the insurer are addressing a particular issue. In addition, the discussions that take place

between FAWG and the state of domicile are open to the other states where the insurer is licensed.

73. The activities of FAWG are not limited to individual insurers. FAWG also reviews and considers trends occurring within the industry to concentrate their efforts on more specific issues, such as a particular segment of the market, product, exposure or other problem that has the potential of impacting the solvency of the industry. In some cases, these discussions lead to more focused discussions by specific states, as well as the Working Group's encouragement of the domiciliary regulator(s) to facilitate discussions with other functional regulators or regulators of other insurers in other countries. This is an example of macroprudential issues being applied at a microprudential level.

2.2.1.3. NAIC Stress Testing: Investment and Capital Markets

74. In 2009, the NAIC utilized the standardized statutory financial statement and risk-based capital (RBC) data in the FDR to perform top-down stress testing of the US insurance industry. The RBC formula inputs were modified for various stress scenarios to generate the new Total Adjusted Capital (TAC) and the Authorized Control Level RBC (the denominator in the commonly used RBC ratio).

75. As an initial pass shortly after receipt of the 2008 statutory annual statements, the NAIC performed a simple 40% equity drop in the TAC of the companies and reviewed the results for the entire life, property/casualty and health industries. The results of this initial, high level stress test focused subsequent efforts on the life insurance industry.

76. As a means of addressing time constraints while still generating valuable feedback, the top 30 life insurance entities were selected for more detailed stress testing. These entities account for approximately 68% of the US life insurance premium volume.

77. The more detailed stress testing mostly focused on asset stresses in the life RBC formula. Investments are reported to the NAIC in detail, by CUSIP if applicable, in the USstatutory annual statements, as well as by various categories. For example, commercial mortgage-backed securities (CMBS) are reported separately from residential mortgage-backed securities (RMBS) and other asset-backed securities. This information from the investment schedule tables within the FDR was supplemented by additional analytical information to establish breakout categories for: RMBS Subprime, RMBS Subprime-Like, CMBS Senior, CMBS Mezzanine, CMBS Subordinate, and the remaining bonds – industrial and miscellaneous. The RBC charges assessed against bonds increase as the credit quality designation moves from the highest quality down through to the lowest quality.

78. Because of this dynamic, all bonds were subjected to a downward migration schedule. The RMBS and CMBS migration percentages were based upon actual downward migrations experienced in 2008 as the stress scenario. The remaining industrial and miscellaneous bonds used an ARO moderate stress scenario. Thus, this results in larger numbers of bonds falling into higher RBC charge categories. In addition, the following specific asset stresses were performed:

- RMBS Subprime = 28% loss scenario (reduced TAC and the amount in the ACL RBC calc)
- RMBS Subprime-Like = 13% loss scenario
- CMBS Senior = 5% loss scenario
- CMBS Mezzanine = 25% loss scenario
- CMBS Subordinate = 50% loss scenario
- Unaffiliated Common Stock = 40% loss scenario

- Affiliated Common Stock = 30% loss scenario
- Preferred Stock = 5% loss scenario
- Real Estate = 30% loss scenario
- Mortgage Loans = 5% loss scenario – [analysts view US insurers as not materially subject to the reduced underwriting standards issue that has caused problems for many other institutions]
- All Other Long-Term Assets = 20% loss scenario

79. Since the variable annuity writers were of particular concern this cycle, it was determined that a liability stress impact should be incorporated for these entities. To do this, the NAIC recognized that 2008 resulted in significant reserve increases due to a regulatory requirement that variable annuity writers must conduct a standalone asset adequacy analysis on the variable annuity blocks of business; thus the reserves reflected the increased liability caused by the downturn in the market. Although, a majority of the reserve correction had already occurred, to further stress these entities, another 10% increase in the reserves was assumed by reducing TAC by 10% of the 2008 reserve amounts for these products[16].

80. Additional stress testing was conducted in 2010. The global economic weakness over the last few years has exacerbated and exposed significant economic problems and substantial budgetary shortfalls within countries, and concerns over certain countries reached a peak in the last few months. NAIC staff has analyzed the exposure of the US insurance industry to investments in a certain number of these countries, both sovereign debt, as well as debt and equity exposure in companies domiciled in those countries and potentially impacted by domestic economic problems. The results of this analysis are the basis of ongoing discussion within FAWG.

2.2.1.4. Risk Focused Surveillance Approach

81. Another area that can significantly add to macroprudential surveillance derives from the risk focused approach by US state regulators with assistance from the NAIC. Using existing NAIC Forums (FAWG, Chief Regulator Forum, Examination Oversight Task Force), prospective risks can be identified through the risk focused analysis and examination process and tracked as applicable to Life, P&C and Health insurers. Macroprudential risks are able to be collected on risk focused analysis and examinations and shared among regulators. Larger companies understand their risks and should have a mitigation strategy. The risk focused process has extensive guidance to the executive-level interview process which will include information about macroprudential or systemic risks. The NAIC risk focused process is a good example to share with other regulators as they perform their regularly scheduled analysis, examinations or audits.

2.2.1.5. Key messages from the NAIC experience

82. The activities and tools described herein illustrate the abilities afforded to a multijurisdictional system such as the United States. Robust, reliable data and related analytical tools built around the needs of the member system offer significant benefits. In particular, it offers a common platform in which regulators of different jurisdictions can share information and perform analysis on a company or group of companies that are of common interest with the intent of being used to challenge the company and/or its operations through the domiciliary regulator. Although all regulators should strive for such a process, there are

[16] Variable annuity writers include companies that that only write that business as well as companies that are multi-writers.

challenges and limitations with the development of an international system, the least of which is the ability to develop comparable, accurate and reliable data.

2.2.2. A perspective from Asia – A snapshot of macroprudential surveillance in India

83. The Insurance Regulatory and Development Authority (IRDA) has been setup to protect the interest of the policyholders and to ensure the orderly growth of insurance in the country. In that context the IRDA is an insurance sector regulator with primary focus on policyholders. Since insurance is a part of the overall financial sector the IRDA has been entrusted with additional responsibilities of also ensuring orderly growth of the sector keeping in mind the overall stability of the financial system.

84. On the issues specific to the insurance sector the IRDA uses three major methods as macroprudential indicators to predict the future, namely: i) trend analysis; ii) early warning systems and iii) stress analysis. The trend analysis is simple and entails a linear projection on a short to medium term basis to predict the future of the insurance industry. The early warning system is comparatively more complex and compares the performance of an individual company to the industry average. Any significant deviation raises the warning signals making the regulatory body to drill down further and to understand the rationale behind the company's behaviour. Lastly the stress testing is undertaken on a more selective basis and applied on the company. The variables included in the stress testing include equity price fluctuation, interest rate fluctuation, natural disasters, adverse claims development, inflation, increase in lapse rates, and premium reduction due to competition and change in mortality. The impact is studied and remedial measures suggested by the regulatory authority to the company.

85. The financial sector approach to macroprudential surveillance is based on an integrated and coordinated response to the risks facing the sector. Foremost amongst them includes setting up of a high level Coordination Committee that has been functioning since 1993 with participation from SEBI (the securities market regulator), IRDA (the insurance sector regulator) and RBI (the central bank and banking sector regulator). The Committee's term of reference include the following:

- To provide an inter agency forum to review developments in the financial sector with a view to identify unusual developments
- To decide on sharing of information with investigative/intelligence agencies in case of suspected market misconduct
- To develop benchmarks for parameters that may serve as early warning signals of any emerging irregularities
- To coordinate action between regulators based on the early warning system developed by the Committee
- To discuss policy matter of wider interest requiring inter-regulatory coordination

86. The Financial Conglomerate Supervisory Framework was adopted in India in June 2004 for the monitoring of systematically important financial intermediaries.

- A Financial Conglomerate (FC) has been defined as a cluster of companies belonging to a Group which has significant presence in at least two financial market segments (from within Banking, Insurance, Mutual Fund, deposit taking and non-deposit taking Non Banking Financial Corporations). Significant presence in the respective financial market segment has been appropriately defined.

- One of the regulators (Banking, Capital Markets, Insurance, Housing, Pension funds) is assigned as a principal regulator for the FC depending upon the significant activities of the FC.
- The main instruments of the FC monitoring framework include an off-site monitoring framework through a quarterly FC return and dialogue with the CEOs of the designated entities of the identified Financial Conglomerates. The same is done through half yearly meeting organized by the Principal regulator in consultation with the other regulators for the designated entities of the FC.
- The focus of the FC Return is mainly on intra-group transactions and exposures (ITEs) amongst the group entities. The FC reporting framework aims at tracking the following:
    - Identifying Specified Financial Intermediaries (SFIs) with deteriorating financials and large risk concentrations;
    - Large intra-group transactions and risk concentrations manifesting in major markets viz. equity, loan, debt, repo, inter-bank, call money, derivatives, etc. carried out for any purpose (trading or investment);
    - Build up of any disproportionate exposure (both fund based as well as non fund based) of any SFI to group entities;
    - Any group level concentration of exposure to various financial market segments and counterparties outside the group;
    - Information on adverse events such as fraud, penalty / strictures etc levied / passed by regulators / courts / administrative agencies; and
    - Information available with any supervisor regarding an entity coming under its jurisdiction that may have a group wide bearing.
- In addition the insurance sector has a system of an appointed actuary for the insurance company who acts as the eyes and ears of the Regulatory Authority in the insurance companies. The Regulatory Authority has put in place a system of Peer Review that evaluates the task performed by the appointed actuary of the company. This helps in getting an insight into the functioning of the insurance company. Such an approach could be considered as being part of the macro-prudential surveillance system put in place by the Regulatory Authority to oversee the functioning of the insurers.

2.2.2.1. India's Approach to Financial Stability

87. In contrast to the minimalist formula of 'single objective, single instrument', the conduct of monetary policy by the Central Bank has been guided by multiple objectives and multiple instruments. In general, our three main objectives have been price stability, growth and financial stability, with the inter se priority among the objectives shifting from time to time depending on the macroeconomic circumstances.

88. Some of the specific features of the system that have contributed to financial stability are:

- Banks are required to hold a minimum percentage of their liabilities in risk free government securities under the statutory liquidity ratio (SLR) system. This stipulation ensures that banks are buffered by liquidity in times of stress.
- The capital account is being managed actively.
- Through pre-emptive countercyclical provisioning and a differentiated risk weight stipulation for 'sensitive sectors', the adverse impact of high credit growth in some sectors and asset price fluctuations on banks' balance sheets could be contained.
- Regulation and oversight have been extended to systemically important non-deposit taking, non-banking finance companies, and this has limited leverage and space for regulatory arbitrage.

- Systemic interconnectedness has been addressed by bringing banks' exposures to non-bank finance companies within the prudential framework.

89. In order to pay increasing attention to financial stability and to improve regulators skills in this area, a multi-disciplinary Financial Stability Unit is being set-up in IRDA. The IRDA will coordinate with the Central Bank to present an overall unified assessment of the health of the financial system with a focus on identification and analysis of potential risks to systemic stability.

2.2.2.2. Challenges Ahead: First Challenge: How to Define & Measure Financial Stability

90. From a macro-prudential perspective, financial stability can be defined as a situation where the financial sector functions without any discontinuity. Some critical elements of any financial stability framework, aspects that need to inform the definition of financial stability, are the following:

- Excessive volatility of macro-variables such as interest rates and exchange rates which have direct impact on the real economy;
- Build-up of significant leverage in financial, corporate and household sector balance sheets;
- The moral hazard risks posed by institutions that have become 'too-big-to-fail' or too interconnected or complex to resolve;
- Internal systemic buffers within the financial sector, both at the institution and systemic levels, to counter potential shocks to the economy;
- Strong policy and institutional mechanisms to lean against the wind even as "the music is playing";
- Prevalence of unregulated nodes in the financial sector which, through their interconnectedness with the formal regulated system, can breed systemic vulnerabilities.

2.2.2.3. Second Challenge: Financial Stability - Exclusive or Shared Responsibility?

91. The crisis has triggered an active discussion on an appropriate regulatory structure that is best suited to safeguard financial stability. There are several regulatory models around including those where the central bank is a pure monetary authority with bank regulation and supervision vested with another agency. Post-crisis, the emerging view is that the crisis was caused, at least in part, by the lack of coordination and communication between the separate bodies and that it is optimal, in the interest of financial stability, to entrust the function of regulation of banks and non-banks also to central banks. The argument is that only the monetary authority, as the lender of last resort, can provide emergency liquidity support. Also, being the regulator, the monetary authority gets a better sense of the market conditions and can therefore manage liquidity more efficiently.

2.2.2.4. Third Challenge: Growth and Financial Stability - Managing the Trade-offs

92. In order to safeguard financial stability, we have traditionally used a variety of prudential measures such as specifying exposure norms and pre-emptive tightening of risk weights and provisioning requirements. But these measures are not always costless. For instance, tightening of risk weights arguably tempers the flow of credit to certain sectors, but excessive, premature or unnecessary tightening could blunt growth. Similarly, exposure norms offer protection against concentration risks; however, such limits could restrict the availability of credit for important growth sectors. This is a live issue in our country in the context of the immense needs of infrastructure financing. Thus, as in the case of price

stability, central banks face the challenge of managing the trade off between financial stability and growth.

2.2.2.5. Fourth Challenge: Reforming Regulatory Architecture

93. As the lessons of the crisis emerge, central banks are vigorously reinventing themselves and almost all countries are reviewing their regulatory architectures. Two key lessons are driving this change: first that the responsibility for financial stability cannot be fragmented across several regulators; it has to rest unambiguously with a single regulator, and that single regulator optimally is the central bank. And second, that there is need for coordination across regulators on a regular basis and for developing a protocol for responding to a crisis situation.

94. In India, there are a host of regulators in the financial sector - RBI, SEBI, IRDA and PFRDA. In order to facilitate coordination between them, there is a High Level Coordination Committee on Financial Markets (HLCC-FM) comprising all the regulators and the Finance Secretary. While the Governor of the Central Bank chairs the HLCC-FM, the Ministry of Finance provides the secretariat. The hallmark of the HLCC meetings, and one that adds most value to them, is that the meetings are informal and there is free exchange of positions, views and opinions. There is a view that the HLCC-FM should be given a formal structure. While a formal structure will have the merit of enforcing accountability, the flip side is that it may make the forum excessively bureaucratic and detract from its other value adding features. This is an issue that we must debate further. One area where the HLCCFM could have a more defined role relates to oversight of large financial conglomerates.

95. Currently, the arrangement for regulation of financial markets is as follows. Apart from banks, NBFCs and other financial institutions, the Central Bank regulates the money market, the government securities market, the credit market and the foreign exchange market and the derivatives thereon. In respect of OTC derivatives, only those derivatives where one party to the transaction is a Central Bank regulated entity have legal validity. In respect of products traded on the exchanges, procedures for trade execution fall within the regulatory purview of SEBI. Therefore, unlike many countries, India has established procedures for regulation of OTC derivatives.

96. By far the most important reason why the present arrangement should continue has to do with preserving financial stability. Unlike equity prices, interest rates and exchange rate are key macroeconomic variables with implications for monetary policy and overall macroeconomic stability. In addition, banks dominate the interest and exchange rate markets. By also being the regulator of these markets, the Central Bank is in a position to exercise oversight of institutions, markets and products, to monitor market developments, sense impending developments, take advance action, prevent excessive volatility and maintain financial stability at the systemic level. This is an arrangement that has stood the test of time, and it has protected India’s financial stability even in the face of some severe onslaughts. This arrangement cannot be jettisoned lightly in quest of a unified market regulator.

2.2.3. A perspective from Europe - Recent developments in the European Union in the area of macroprudential surveillance

97. This section is to highlight some of the developments and the efforts within the European Union (EU) and the European Economic Area (EEA) to increase macroprudential surveillance and to illustrate how supervisors benefit from these activities. Furthermore it is intended to suggest some aspects of how individual jurisdictions or economic areas, and specifically insurance supervisors, could benefit from IAIS contributions to macroprudential surveillance.

98. Analyses of the trigger of the recent financial crises have shown that there is a wide consensus for the need of increasing macroprudential surveillance. Furthermore the large amounts of public money which have been committed to stabilise financial institutions through various forms of intervention is seen as the main rationale for setting up a special macroprudential policy framework. Therefore macroprudential surveillance became one of the most discussed topics for enhancing the stability of the financial markets worldwide. Although there is no common and final worldwide perspective of which concrete measures should be undertaken to ensure a prudent macroprudential surveillance, it seems to be a worldwide consensus that it should in particular aim to

- limit the distress to entire financial systems rather than distress to individual market players
- avoid macroeconomic costs rather than necessarily protect the beneficiaries or policyholder of an individual insurance company or depositors of an individual bank
- identify the risks which are faced by the financial system and not by individual market players
- examine risks that arise from the interaction of all individual market players rather than on the interaction of insurance and reinsurance companies or on a bank by bank basis.

99. Even in the EU and the EEA which represents a worldwide market share of 40% in life-insurance and 34% in non-life-insurance markets, the need for increasing financial supervision has been focused. Therefore in October 2008 the EU-Commission mandated a High Level Group chaired by the former Managing Director of the International Monetary Fund (IMF) Jacques de Larosière to give advice on the future of European financial regulation and supervision.

100. The key recommendations of the de Larosière group are:

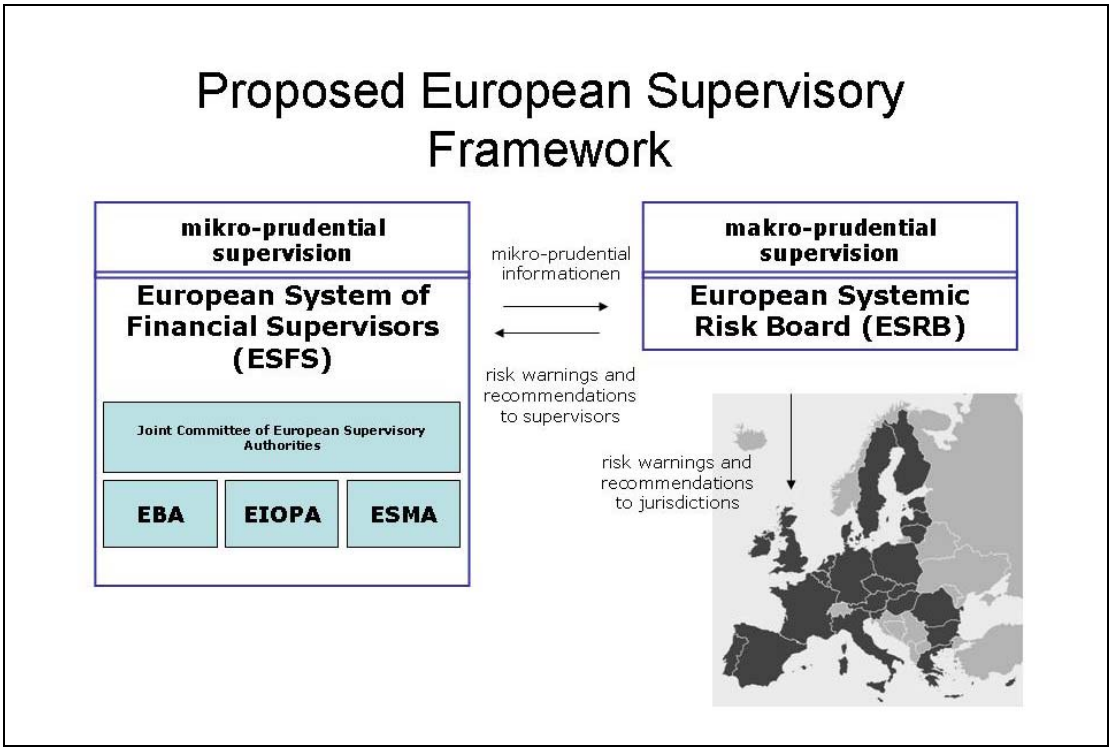
- Establishing a European System of Financial Supervisors (ESFS), consisting of a network of national financial supervisors working in tandem with new European Supervisory Authorities (ESAs), created by the transformation of existing European supervisory committees in a European Banking Authority (EBA), a European Securities and Markets Authority (ESMA), and a European Insurance and Occupational Pensions Authority (EIOPA). The ESFS should be built on shared and mutually-reinforcing responsibilities, combining nationally-based supervision of firms with specific tasks at the European level. The ESFS would also foster harmonised rules and coherent supervisory practice and enforcement.
- Establishing a European Systemic Risk Board (ESRB) that would be responsible for macro-prudential oversight of the financial system within the Community in order to prevent or mitigate systemic risks, to avoid episodes of widespread financial distress, contribute to a smooth functioning of the Internal Market and ensure a sustainable contribution of the financial sector to economic growth.

101. The Group presented its report[17] on 25 February 2009 and its recommendations were endorsed by the Commission in its Communication to the Spring European Council of March 2009.

2.2.3.1. Proposals of the EU-Commission

102. As mentioned above due to the recommendations of the so called "Larosière-Report" the EU-Commission published "Proposals for a regulation establishing a European Banking Authority (EBA), a European Insurance and Occupational Pensions Authority (EIOPA) and a European Markets and Securities Authority (ESMA). In addition the "Proposal for a Regulation of the European Parliament and of the Council on Community macro prudential oversight of the financial system and establishing a European Systemic Risk Board (ESRB)" was published in October 2009.

Figure 2.16 – Proposed European Supervisory Framework



[17] de Larosière Group (2009).

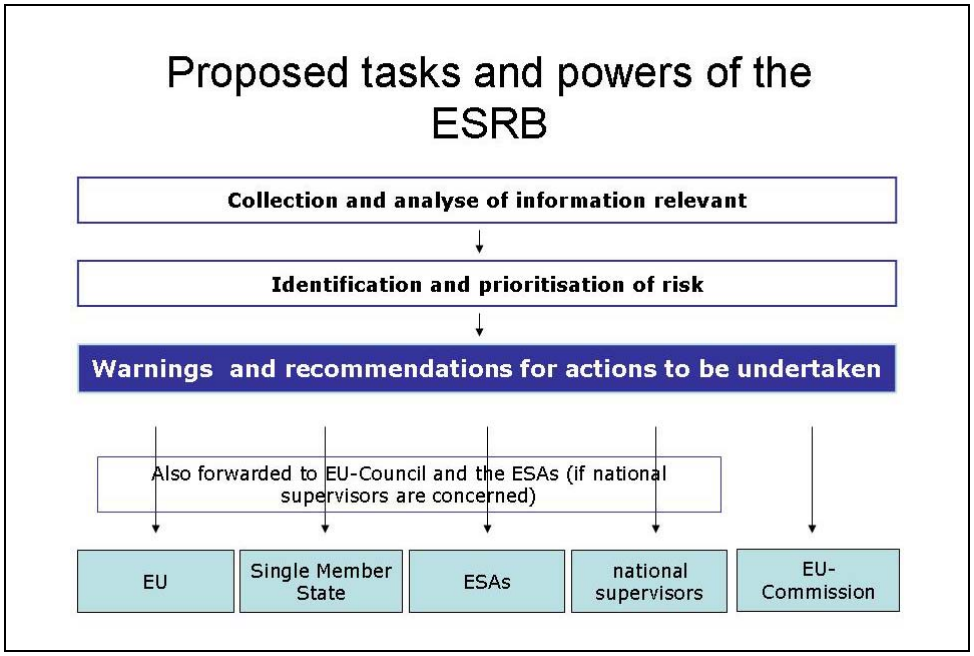
2.2.3.2. European Systemic Risk Board

103. The content of one of the proposals mentioned above focused on is the establishment of the ESRB as a new independent European body for macro-prudential oversight. The ESRB shall be in responsible for:

- developing a European macro-prudential perspective to address the problem of fragmented individual risk analyses at national level;
- enhancing the effectiveness of early warning mechanisms by improving the interaction between micro- and macro-prudential analysis.
- allowing risk assessments to be translated into action by relevant authorities.

104. It is intended that the ESRB will play an essential role to identify risks with a systemic dimension and prevent or mitigate their impact on the financial system within the EU. Therefore the ESRB will be able to issue risk warnings and recommend specific actions to the EU as a whole, one or more Member States , one or more European Supervisory Authorities, and one or more national supervisory authorities.

Figure 2.17 – Proposed tasks and powers of the European Systemic risk Board

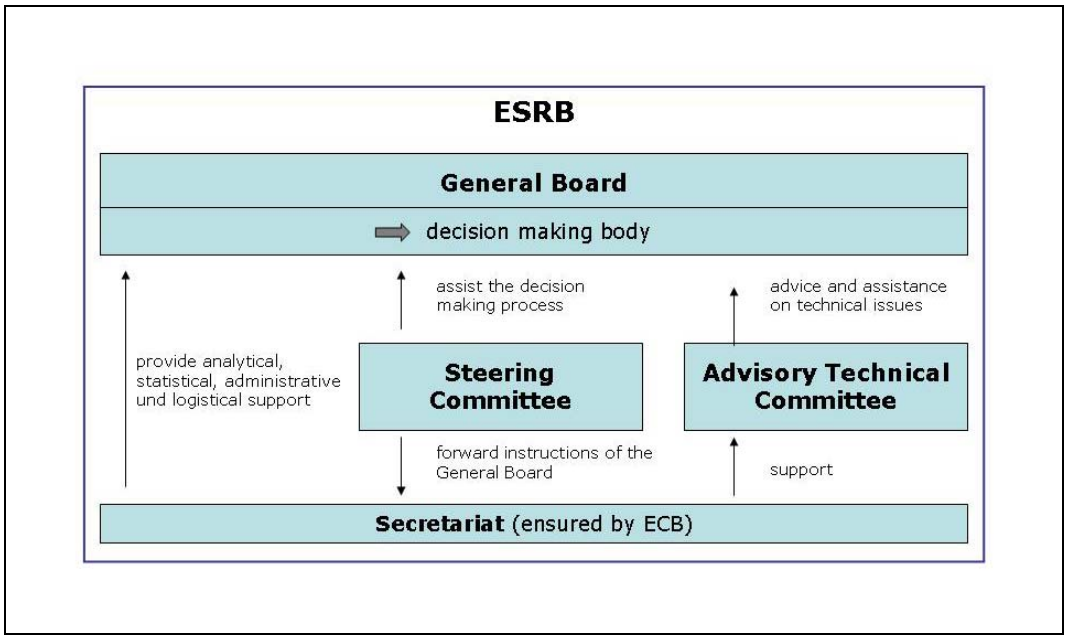


105. Risk warnings and recommendations of the ESRB will be in particular based on risk analyses taking into account but not limited to data provided by the Eurosystem by the ECB on Monetary and Financial Institutions , the ESA`s in summary or collective form, national supervisors, national central banks or other authorities of Member States.

106. It is intended to establish a General Board which will have 33 full members with voting rights (27 EU central bank Governors, the ECB President and Vice-President, a EU-Commission member and the three Chairs of the new European Supervisory Authorities). To ensure close cooperation with supervisors, representatives from national supervisory authority may attend on a case by case basis the meetings of the ESRB, but will have no

voting rights. In addition, the President of the Economic and Financial Committee (EFC) will participate, but will also have no voting rights.

Figure 2.18 – Decision making at the European Systemic riskBoard



2.2.4. World-wide macroprudential surveillance - The World Bank & International Monetary Fund approach

107. Since 2000, the World Bank (WB) and the International Monetary Fund (IMF) have been jointly running a programme aimed at assessing the overall stability and development needs of financial systems in individual countries[18]. This initiative, the Financial Sector Assessment Programme (FSAP), includes the assessment of the individual countries' efforts to carry out macroprudential surveillance.

108. Within this context, for the WB/IMF "macroprudential surveillance tries to assess the health of the financial system and its vulnerability to potential shocks."[19]

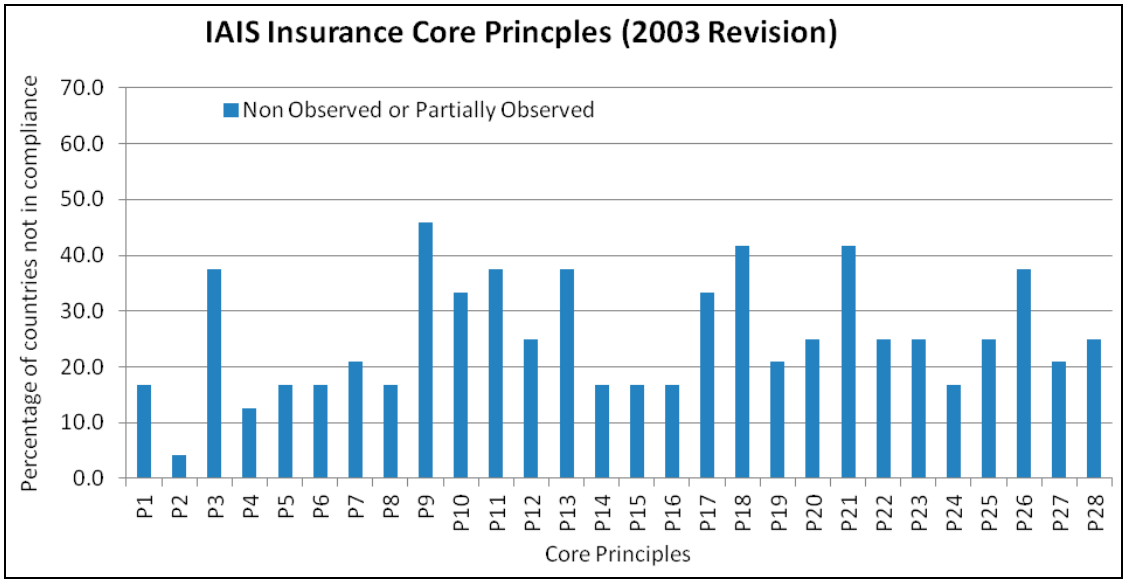
109. The WB/IMF FSAP approach to macroprudential surveillance combines qualitative and quantitative methods. Regarding the former, the focus is placed on understanding the quality of the legal, judicial and regulatory framework, and also governance practices in the financial sector and its supervision. The latter includes a combination of indicators and techniques, largely statistical ones, aimed at summarising the soundness and resilience of the financial system.

110. In relation to the qualitative elements of macroprudential surveillance, the WB/IMF FSAP relies, among other things, on the assessment of compliance with the principles for the supervision of the various financial sectors. With specific reference to insurance, compliance assessment is carried out against the Insurance Core Principles (ICPs)

[18] WB/IMF (2005).
[19] WB/IMF (2005:36).

established by the IAIS. Figure 2.19 below summarises the aggregate degree of compliance with ICPs by the jurisdictions assessed by the WB/IMF FSAP[20].

Figure 2.19 – Degree of observance of IAIS ICPs



111. Looking into the macroprudential surveillance tools used to carry out quantitative assessments, the WB/IMF FSAP identifies two key instruments:

- Financial Soundness Indicators (FSIs)[21]
- Stress testing

112. FSIs are indicators of the current financial health and soundness of the financial institutions in a country, and of their corporate and household counterparts. FSIs include both aggregated individual institution data and indicators that are representative of the markets in which the financial institutions operate[22]. FSIs are used to monitor the financial system's vulnerability to shocks and its capacity to absorb the resulting losses.

113. With respect to the insurance sector, the IMF has developed two sets of FSIs: a core set and an encouraged set[23]. The ***core set*** of insurance FSIs, which is reproduced in the table below, follows the CAMELS methodology (i.e. Capital adequacy, Asset quality, Management soundness, Earnings and profitability, Liquidity and Sensitivity to market risk) developed for the banking sector. In addition, the core set of insurance FSIs includes an insurance specific sub-group of FSIs that looks at reinsurance and actuarial issues.

[20] Viñals and Fiechter (2010).
[21] Earlier work by the IMF on the matter, referred to FSIs as 'Macroprudential Indicators' (Evans *et al.* 2000); later work used both terms interchangeably (IMF 2001a).
[22] IMF (2006).
[23] Das *et al.* (2003).

Figure 2.20 – Insurance FSIs Core Set

Insurance Financial Soundness Indicators: Core Set			
Category	*Indicator*	*Non-life*	*Life*
Capital adequacy	Net premium/capital	X	
	Capital/total assets	X	
	Capital/technical reserves		X
Asset quality	(Real estate + unquoted equities + debtors)/total assets	X	X
	Receivables/(gross premium + reinsurance recoveries)	X	X
	Equities/total assets	X	X
	Nonperforming loans to total gross loans		X
Reinsurance and actuarial issues	Risk retention ratio (net premium/gross premium)	X	X
	Net technical reserves/average of net claims paid in last three years	X	
	Net technical reserves/average of net premium received in last three years		X
Management soundness	Gross premium/number of employees	X	X
	Assets per employee (total assets/number of employees)	X	X
Earnings and profitability	Loss ratio (net claims/net premium)	X	
	Expense ratio (expense/net premium)	X	X
	Combined ratio = loss ratio + expense ratio	X	
	Revisions to technical reserves/technical reserves		X
	Investment income/net premium	X	
	Investment income/investment assets		X
	Return on equity (ROE)	X	X
Liquidity	Liquid assets/current liabilities	X	X
Sensitivity to market risk	Net open foreign exchange position/capital	X	X
	Duration of assets and liabilities		X

114. Regarding the ***encouraged set*** of insurance specific FSIs, the IMF goal has been to aim to obtain important additional information regarding the soundness of the insurance sector but taking into consideration operational limitations and stage of development of the sector. Encouraged FSIs, reproduced in the table below, include information on groups, on geographical and sectoral distribution of asset exposures and underwriting risks, as well as data on capital, management, profitability, and liquidity.

Figure 2.21 – Insurance FSIs Encouraged Set

Insurance Financial Soundness Indicators: Encouraged Set			
Category	*Indicator*	*Non-life*	*Life*
Capital adequacy	Cover of solvency margin	X	X
	Risk-based capital adequacy ratios	X	X
Asset quality	Asset/liability in financial derivatives to total capital	X	X
	Investments: geographical distribution	X	X
	Investments: sector distribution	X	X
Reinsurance and actuarial issues	Underwritten business: geographical distribution	X	X
	Underwritten business: sector distribution	X	X
	Underwritten business: distribution by main business lines	X	X
Management soundness	Operating expenses/gross premiums	X	X
	Personnel expenses/gross premiums	X	X
Earnings and profitability	Earnings per employee (net profit/number of employees)	X	X
	Return on assets (ROA)	X	X
	Return on revenue (net income/total revenues)	X	
Liquidity	Liquid assets/total assets	X	X
	Liquid liabilities/total liabilities		X
Market-based indicators	Market/book value	X	X
	Price/earnings (P/E) ratio	X	X
	Price/gross premiums	X	X
Group exposures	Group debtors/ total assets	X	X
	Group (premium + claims)/total (premiums + claims)	X	X

115. The second key instrument identified in the WB/IMF FSAP approach to macroprudential surveillance is ***stress testing***. The FSAP treats stress testing as a tool for assessing resilience to extreme events, which can be applied to determine the stability of a given system, or a insurer or insurance group'[24]. Stress testing involves testing beyond normal operational capacity, often to a breaking point, in order to observe the results.

116. Importantly, the WB/IMF FSAP acknowledges that stress testing of insurers has not reached the level of developments attained in the stress testing of banks. Further, WB/IMF contend that insurance firms "are generally considered to represent a lower level of systemic risk than banks, mainly because of the different character of their liabilities, which often have a longer duration than banks"[25]. However, they note that distress in the insurance sector can nonetheless have important systemic implications.

[24] WB/IMF (2005), IMF (2001b).
[25] WB/IMF (2005:401).

117. In addressing stress testing within insurers the WB/IMF FSAP warns that unique challenges emerge from the different balance-sheet structure of insurance firms, compared to banks. While on the asset side, insurers appear more or less similar to banks, and so stress testing techniques developed for the banking industry can be adapted to be applied to insurance, on the liability side, different types of shocks and methods of analysis are needed. The list below describes a range of risks that are susceptible to stress-testing methodologies, singling out the ones that are insurance-specific and those that are common to banks and insurance firms[26]:

Specific to insurance firms

- Underwriting risk - This includes risks associated with rapid growth or decline in the volume of the underwriting portfolio, uncertainty of the claims experience, length of tail of the claims development, dependence on intermediaries, possibility of reinsurance rates increasing substantially, effects of a high level of uncertainty in pricing in new or emerging underwriting markets, geographical mix of the portfolio, and tolerance for variations in expenses
- Catastrophe risk - This risk reflects the ability of the insurer to withstand catastrophic events, increases in unexpected exposures, latent claims or aggregation of claims, or the possible exhaustion of reinsurance arrangements, and the appropriateness of the catastrophe models and underlying assumptions used
- Deterioration of technical provisions - This includes the adequacy and uncertainty of the technical claims provisions, the adequacy of other underwriting provisions, the frequency and size of large claims, possible outcomes relating to any disputed claims, particularly where the outcome is subject to legal proceedings, the effects of inflation, the effects of increasing longevity on pension products, the guarantees and options in policy terms, the risks of early policy termination which can be linked to variations in interest rates, social changes resulting in an increase in the propensity to claim or to sue, other social, economic, legislative and technological changes

Common to insurance firms and banks

- Market risk - This reflects adverse movement in the value of an insurer's assets and liabilities affected by market movement.
- Credit risk - This involves the failure of counterparties (debtors, brokers, policyholders, reinsurers, guarantors) to perform on obligations.
- Liquidity risk - This relates to the possibility that an insurer will be unable to realize assets to fund its obligations as and when they fall due.
- Other risks - These include operational risk, group risk, and systemic risk (e.g., impact of failures/downgrades in other insurers or banks).

[26] Čihák (2007).

3 A case study in global-level insurance-specific macroprudential surveillance: the reinsurance sector and the global financial crisis

3.1. Background

118. The events of September 11, 2001, and the global equity markets downturn of 2001-02 generated questions regarding the erosion of reinsurance capacity. A deterioration in reinsurers' capacity could, in turn, adversely affect the capacity of primary carriers, as reinsurers' main goal is to provide coverage to insurers[27]. In addition, in late 2002 the Financial Stability Forum (FSF) raised concerns regarding the growing involvement by the reinsurance industry in credit risk transfer activities, both as investors and as sellers of credit protection, leading to worries that such involvement increased the risk that reinsurers' difficulties could have wider implications in the financial system[28].

119. The FSF considered the emerging concerns regarding the reinsurance sector in its September 2002 meeting in Toronto, Canada. In particular, although the FSF 'noted that the reinsurance industry had performed well in the face of recent shocks', it found that the absence of adequate information at the time made it difficult to assess the knock-on effects of potential difficulties in the sector on primary insurance and on other areas of the financial system. As a result, the FSF encouraged the IAIS to shed light on these issues[29].

120. In addressing the FSF request, in November 2002 the IAIS created the 'Task Force on Enhancing Transparency and Disclosure in the Reinsurance Sector' (Task Force Re). Task Force Re was mandated, among other things, to develop a framework to enhance the transparency of the global reinsurance market. Importantly, a key goal of such framework was to ***regularly generate and publish meaningful and timely data that could be used to shed light on potential systemic concerns***[30]. In other words, Task Force Re was charged with conducting global-level (re)insurance-specific macroprudential surveillance.

121. Task Force Re was made up of representatives of the regulatory authorities of the largest reinsurance jurisdictions, as well as representatives from the reinsurance industry, the FSF, the Basel Committee Transparency Group, and the Joint Forum Multidisciplinary Working Group on Enhanced Disclosure.

122. Task Force Re discussed the issue of monitoring the global reinsurance market for a period of over 12 months. The outcome was agreement on four streams of surveillance of exposures and financial connectedness:

- The role played by reinsurers as insurers of insurers
- Investments and borrowing activities by reinsurers in capital markets
- Participation by reinsurers in the credit risk transfer market, in particular as sellers of credit risk protection
- The impact of consolidation on the reinsurance industry

123. In order to carry out global-level surveillance of the reinsurance market, Task Force Re agreed on the collection of quantitative and qualitative data. Regarding the former the following data needs were determined:

- Size and structure of the global reinsurance market

[27] Ferguson (2006).
[28] Crockett (2002); FSF (2002a).
[29] FSF (2002b).
[30] IAIS (2004a).

- Structure and profile of reinsurance risk assumed
- Derivative financial instruments and credit risk transfer activity
- Counterparty risk and linkages to other sectors
- Investments, profitability and capital adequacy

124. Importantly, and with respect to the procedures for data gathering, Task Force Re agreed to handle three levels of aggregation: firm level, jurisdiction level and global level. Moreover, in the process of making data collection and data aggregation decisions, issues such as differences in accounting and reporting systems, the advantages and disadvantages of firm-level versus group-level data, etc. were analysed. Regarding this latter point, Task Force Re decided to collect data at a firm-level, and to do it on a yearly basis. Finally, the implementation of the surveillance framework designed by Task Force Re was mandated by the IAIS to the Reinsurance Transparency Group (RTG), an IAIS working party which evolved from Task Force Re.

125. The RTG has been gathering, analysis and publishing its findings on the global reinsurance market since 2004, under the 'Global Reinsurance Market Report' (GRMR). The primary data gathered by the RTG contributes to addressing gaps in global-level information on key areas of financial services interconnectedness, both intra-sectoral (e.g. reinsurance provided to primary carriers) and cross-sectoral (e.g. credit risk transferred between banks and reinsurers).

126. To date there has been six editions of the GRMR. Findings discussed in the GRMRs feed the surveillance needs of, amongst others: the Financial Stability Board (former FSF), the IMF, supervisory authorities, rating agencies and industry analysts. GRMRs have been of particular value in years in which the reinsurance industry was tested by challenging events such as the 2005 USA hurricane season or the global financial crisis that started in 2007.

127. Since 2009, and in light of the additional data needs generated by the global financial crisis, the RTG expanded its work and started a mid-year edition of the GRMR. This edition is intended to focus on topical issues relating to the global reinsurance market in particular but also cover issues affecting the insurance market. The first edition of the midyear GRMR was dedicated to regulatory and supervisory developments regarding insurance securitisations.

128. The following sections discuss selected findings presented in these reports. Particular attention is dedicated to understanding key elements of conducting macroprudential surveillance that is insurance-specific and that is carried out at a global level.

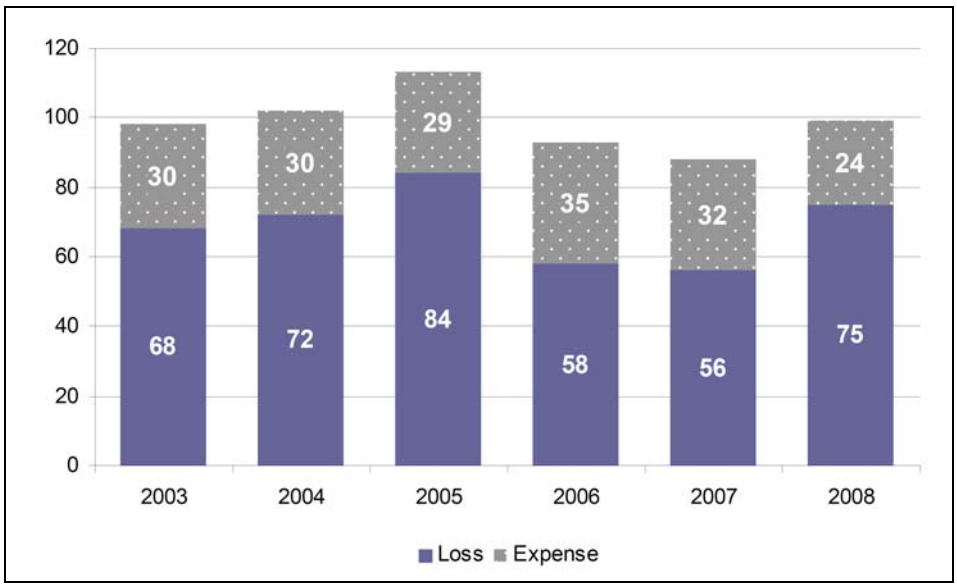
3.2. Macroprudential surveillance of the global reinsurance market

129. Since its first GRMR in 2004, the RTG has been gathering and analysing primary data from over 50 reinsurers worldwide covering approximately 80% of the global reinsurance market, and secondary data on the reinsurance and other financial markets market, as well as data on the world economy. In a nutshell, the RTG monitors both the impact on the reinsurance sector of key world economy variables (e.g. GDP, stock markets, FX, etc.) as well as the reinsurance market as such via analysis of reinsurers' balance sheets and income statements. The focus has been on analysing data in order to identify any potential risks emerging at global level.

130. A key risk repeatedly raised in the literature is the potential harm that reinsurers can cause to primary carriers were reinsurers unable to honour their obligations for coverage

sold to insurers. In this respect, among the variables tracked by the RTG is the analysis of the combined ratio for the global reinsurance market. This is, in turn, broken down between the loss ratio and the expense ratio. Figure 3.1 below summarises RTG findings with respect to trends in the combined ratio at global level for the period 2003 – 2008[31].

Figure 3.1 – Global Reinsurance Market: Combined Ratio for the period 2003 - 2008



131. As it can be seen from the graph above, during the period under observation the combined ratio exceeded the 100% threshold only once, in 2005. Sustained periods of combined ratios below 100% contribute to strengthening the ability of the global reinsurance market to remain resilient when large catastrophes occur.

132. In relation to the 113% combined ratio in 2005, the GRMR noted that underpinning this event was the USA hurricane season which proved to be extremely harsh both in terms of severity and frequency. Moreover, the capital depletion generated by this season triggered a wave of innovation in relation to alternative forms of risk transfer. These are discussed later in this section.

133. As mentioned in the Background section above, a key macroprudential surveillance goal of the RTG is the monitoring of credit risk transfer on the reinsurers' books, in particular, in light of the steep growth experienced by the Credit Default Swap market. In this respect, since 2003 the RTG has been tracking trends on protection sold (and bought) by reinsurers under CDS arrangements. Figure 3.2 below summarises RTG findings with respect to trends in CDSs at global level for the period 2003 – 2008[32].

[31] IAIS (2009a).
[32] IAIS (2004b, 2005, 2006, 2007, 2008 and 2009a).

Figure 3.2– Tracking CDSs in reinsurers' books

	Credit Default Swaps (CDS) (notional amount, in USD m)					
	2003	**2004**	**2005**	**2006**	**2007**	**2008**
Protection bought	4,200	3,895	3,124	1,218	3,303	2,050
Protection sold	20,288	18,603	10,276	10,445	8,836	7,188

134. A first key message from the data above is that, consistently, reinsurers have been net sellers of protection in relation to CDSs. Further, data show a downward trend in the nominal amount of protection sold, from over USD20bn in 2003 to just above UDS7bn in 2008. Importantly, when compared to data on the global market of CDSs, reinsurers appear to hold a minor share of the market, which by end-2007 reached the USD33tn mark[33].

135. In addition to quantitative elements of macroprudential surveillance of the global reinsurance market, some of which were discussed above, the RTG paid attention to a wide range of qualitative matters affecting global reinsurers. Examples of these span from analysis of frequent reforms to the architecture of reinsurance supervision, to monitoring trends in catastrophic events, and the emergence of new products serving the reinsurance industry.

136. A prime example of RTG work in relation to the surveillance of qualitative elements is the monitoring of trends in catastrophic events and the extent to which these impact on the reinsurance sector, in particular on their ability to withstand losses emerging from insured catastrophes. Figure 3.3. below provides an illustration of the kind of data gathered and analysed[34].

Figure 3.3 – Insured Losses (>USD 5 billion insured loss events)

Year	Event	Region	Ins. losses
2005	Hurricane Katrina	USA	61.6
1992	Hurricane Andrew	USA	17.0
1994	Earthquake Northridge	USA	15.3
2008	Hurricane Ike	USA	15.0
2004	Hurricane Ivan	USA, Caribbean	13.8
2005	Hurricane Wilma	USA, Caribbean, Mexico	12.4
2005	Hurricane Rita	USA	12.0
2004	Hurricane Charley	USA, Caribbean	8.0
1991	Typhoon Mireille	Japan	7.0
1999	Winter Storm Lothar	Europe	5.9
2007	Winter Storm Kyrill	Europe	5.8
2004	Hurricane Frances	USA, Caribbean	5.4
1990	Winter Storm Daria	Europe	5.1

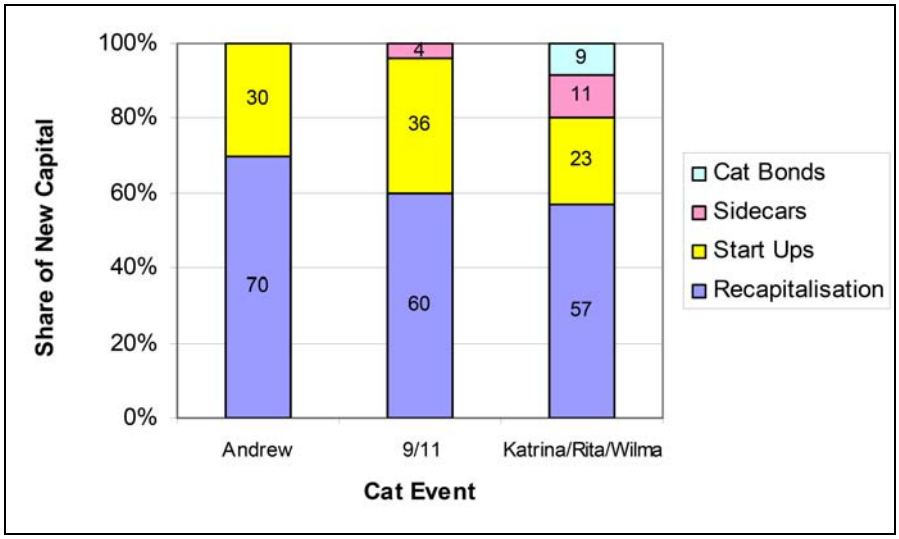
[33] BIS (2008).
[34] IAIS (2008).

137. The table above provides a list of natural catastrophes with insured losses exceeding USD5bn. The data convey the enormous loss potential for catastrophe reinsurers, especially those underwriting hurricane risks. Moreover, while events with losses of USD10bn were still the exception just a few years ago, there has been almost a quantum leap in losses since then: eight out of the 13 costliest insurance losses occurred in the last five years.

138. A further key qualitative element tracked by the RTG has been innovation within reinsurance market. Under this banner, RTG has been looking at new reinsurance products as well as efforts by supervisory authorities to adjust their regulatory and supervisory frameworks in order to accommodate to the -often rapidly- changing landscapes.

139. Within reinsurance, cross sectoral transfer of insurance risk on to the capital markets has be a field that has experienced a substantial amount of change, in particular in the aftermath of the 2005 USA hurricane season. Further, change has taken place in relation to the quantity of risk transferred and the types of risk transfer arrangements (e.g. cat bonds, sidecars, etc.). Figure 3.4 below provides an illustration of the quantity and quality of change[35].

Figure 3.4 – New Capital Following Large Catastrophes



140. The data above shows the make up of the new capital reaching the reinsurance industry in the aftermath of significant catastrophes. Looking at the replenishment of capital that took place in 2003, after hurricane Andrew, the graph shows that there were two sources of new capital, that is, recapitalisation of existing reinsurers and formation of new reinsurance firms (i.e. 'start-ups'). Moving on to 2001, and looking at the post 9/11 landscape, a new kind of vehicle emerges, the reinsurance sidecar[36], which makes up 4% of the new capital flowing to the reinsurance industry directly from the capital markets. Finally, recapitalisation of reinsurers after Katrina/Rita/Wilma (i.e. 2005 USA hurricane season) sees

[35] IAIS (2009b).

[36] "Sidecars are reinsurance companies that, unlike traditional reinsurers, are attached to one single client -the sponsor - by, usually, one quota share contract, covering catastrophic risks, and doing so for a limited period of time (i.e. not exceeding 36 months). Sidecars allow sponsors and capital markets investors to tailor-make the terms and conditions of the company and the risks it takes, and to do so in an extraordinarily short period of time. Usually, sidecars´ liabilities are fully collateralised and are set at an aggregate limit, although in some cases these are calculated at a multiple of the probable maximum loss (PML) or to a loss ratio cap" (IAIS 2008:47-8) .

20% of all new capital reaching reinsurers via alternative risk transfer mechanisms (i.e. cat bonds and sidecars).

141. To sum up, the examples selected and discussed in this section provide an illustration of the analyses carried out by the RTG as a means of conducting macroprudential surveillance on the global reinsurance market. Surveillance is aimed at identifying, assessing and monitoring the build-up of risks which may have an impact of systemic relevance. Risks could be of a quantitative nature, such as a disproportionate growth of CDS protection sold by reinsurers, or of a qualitative nature, like the growing share of innovative alternative risk transfer arrangements in the recapitalisation of reinsurers following a large catastrophic event. The RTG's monitoring efforts have yielded positive outcomes as no systemic risks have so far been identified, the growing unpredictability and convergence of financial markets make the work of the RTG ever more relevant as well as complex. In this respect, the following section focuses on RTG's macroprudential surveillance efforts in the context of the global financial crisis.

142. Of critical value, is the ability of the RTG exercise to connect firm-level data, at the disposal of national supervisors with highly aggregated macro-level data on the global reinsurance market. In doing so, individual supervisors are in a position to frame and make sense of the relation between the data they possess on the firms under their supervision and the overall global picture. Critically, this relation works both ways, helping supervisors understand the impact on the environment on the firm as well as the extent to which firms contribute to shaping the environment.

3.3. The global reinsurance market and the financial crisis

143. As many commentators have repeatedly stated, the global financial crisis that started in 2007 has been of an unprecedented nature. Importantly, it has cut across financial sectors and geographical boundaries in a manner not experienced in the past. Moreover, the crisis appears to have gone through different phases, stressing different areas of the financial sector, like exposures to sub-prime mortgage based securities or exposures to sovereign debt.

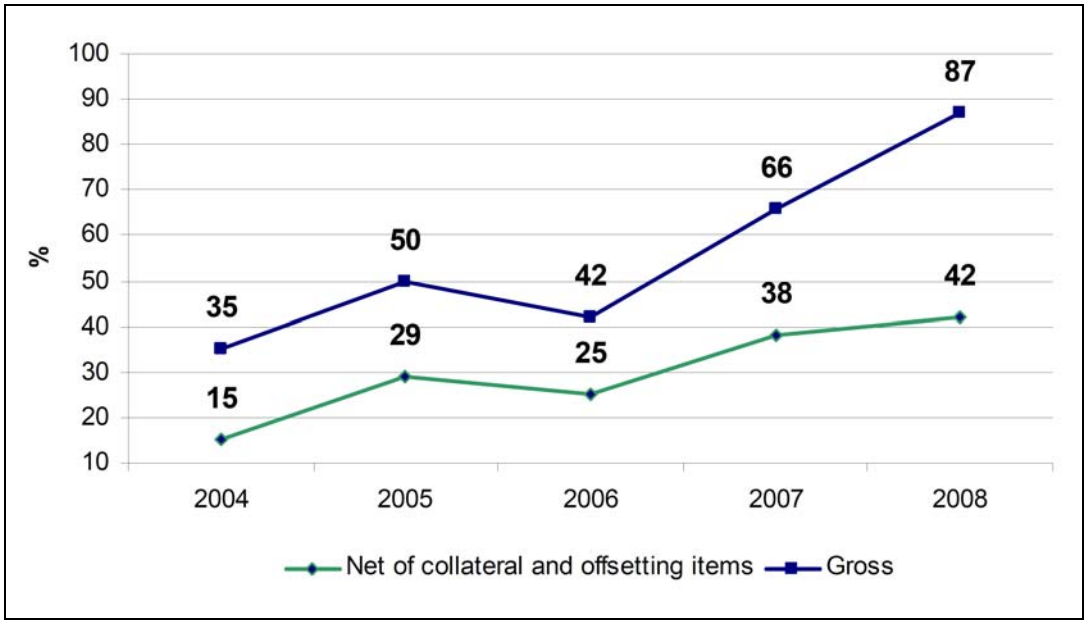
144. As part-and-parcel of the financial sector, the reinsurance market was also affected by the crisis. Since the first signs of distress were detected in 2007, the RTG has been dedicating special surveillance attention to the performance of the global reinsurance market, and to the extent to which the distress emerging in other parts of the financial sector or in the macro economy have impacted on global reinsurers. In addition, the RTG has been looking at any potential signs of distress emerging from the reinsurance sector and affecting other financial sector or the overall economy (e.g. withdrawal of capacity). The paragraphs below provide some illustrations of the efforts made by the RTG in carrying out surveillance of the reinsurance market within a crisis context.

145. RTG's analyses focused on both sides of the reinsurers' balance sheet as well as on their income statements. Regarding the asset side of global reinsurers, the RTG has been tracking for example, exposures to distressed assets (e.g. sub-prime mortgage based securities), and trends in the composition of the overall portfolio of assets. During 2008 RTG conducted a dedicated survey looking in detail into the impact on the reinsurance industry of the 'sub-prime phase' of the crisis.

146. On the liability side of the balance sheet of reinsurers, the RTG has been tracking developments on losses emerging from financial risks underwritten by reinsurers as well as developments on certain liability lines, like Directors & Officers, or Errors & Omissions.

147. Importantly, during 2008/9. RTG paid dedicated attention to the combined effect on reinsurers of a particularly severe catastrophe period and the crisis-related distress. Figure 3.5 below provides an illustration of some of the data gathered and analysed in this respect[37].

Figure 3.5 – Global Reinsurance Market: Gearing Ratios for the period 2003 – 2008



148. As shown in the graph, 2008 saw a gross gearing ratio of 87% and a gearing ratio net of collateral and offsetting items of 42%, each representing 6-year highs. Gearing ratios for 2008 reflected the overall capital impairment related in part to the combined effect of the global financial crisis and the active catastrophe year. Gearing ratios measure reinsurers' dependency on reinsurance (for direct business) and retrocession (for assumed reinsurance business) by taking recoverables compared to total available capital. In 2008, this movement was directly related to the reduced capital position, as recoverables from reinsurance and retrocession – in both gross and net terms – remained relatively level from 2007.

149. The RTG has also looked at the impact of the global financial crisis on innovative forms of alternative risk transfer. In particular it provided analysis of the regulatory and supervisory dimensions of the breakdown experienced by the insurance securitisation market in the aftermath of the bankruptcy of the Lehman Brothers financial conglomerate[38]. In this respect, RTG's work highlighted key lessons to be learnt by insurance supervisors in relation to the interconnectedness of financial markets (e.g. the collapse of a bank triggered the termination of credit enhancement arrangements. i.e. Total Return Swaps, that were fundamental to the smooth operation of cat bond structures), and the overall complexity of innovative cross-sectoral risk transfer structures.

[37] IAIS (2009a).
[38] IAIS (2009b).

150. Having provided a brief account of the macroprudential surveillance work done by the RTG in relation to of the global reinsurance market during the current global financial crisis, the next section revisits the matter but from the perspective of the global reinsurance industry.

3.4. Reinsurance Industry and the Financial Crisis – Macroprudential surveillance from the perspective of the reinsurance industry

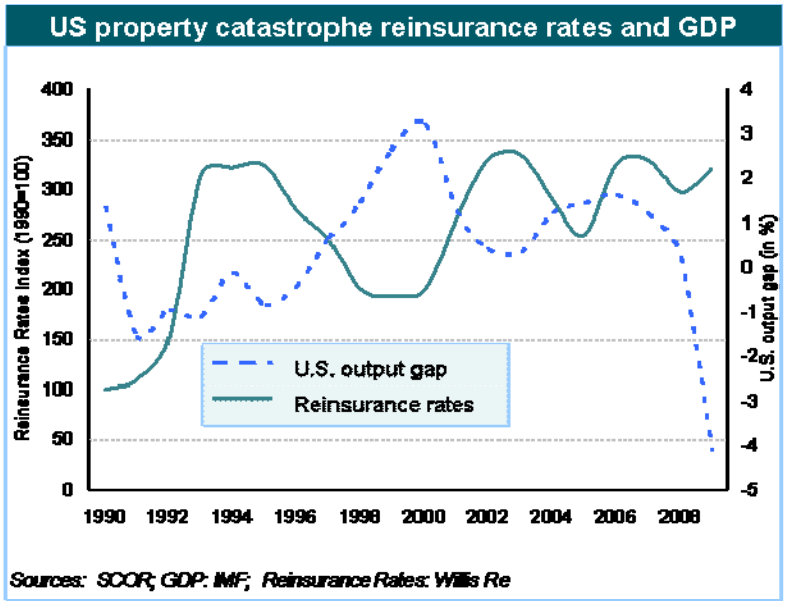
3.4.1. Introduction

151. This section provides an overview of how the reinsurance industry experienced the financial crisis 2007-09.[39] It is divided into five parts. The first deals with the status of the reinsurance industry at the end of 2007, i.e. before the crisis began. The second part describes the developments through 2008, while the third considers the situation at the end of 2008, the time when the majority of the reinsurance treaties were being renewed. The fourth part analyses the developments throughout 2009, and the fifth focuses on the current year and provides an outlook for 2011.

3.4.2. The situation before the crisis

152. Although the reinsurance industry is traditionally known as inversely correlated with the economic cycle, as illustrated in the chart below, the sector was impacted by the financial crisis.

Figure 3.6 – US property catastrophe reinsurance rates and GDP

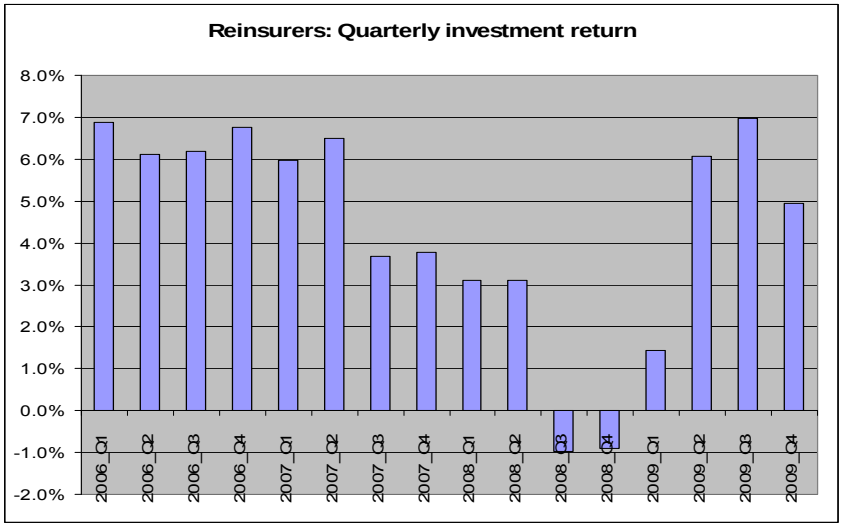


153. The collapse of the so-called sub-prime industry in February and March 2007 generated, among other things, widespread losses to investors holding sub-prime related securities, including banks, hedge funds, insurers, reinsurers and other institutional

[39] The performance figures of the reinsurance industry discussed in the text are based on an aggregate of over 20 leading reinsurers. The data is extracted from disclosed quarterly financial statements and put together by Swiss Re, Economic Research & Consulting.

investors.[40] Looking specifically at the reinsurance industry, data at Figure 3.7 show that annualised investment returns in the second half of 2007 declined from around 6% to below 4%, as companies registered mark-to-market losses mostly related to securitised sub-prime mortgages and structured assets more generally.

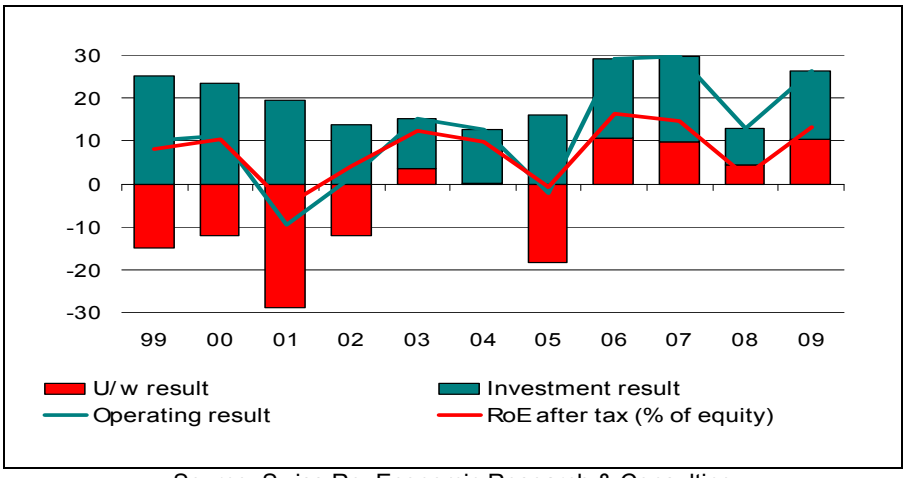
Figure 3.7 – Quarterly investment return of reinsurers, Q1/06–Q4/09



Source: Swiss Re, Economic Research & Consulting

154. Despite the decline in investment returns and the associated capital losses, reinsurers' earnings in 2007 remained largely unchanged when compared to 2006. The overall profitability of the industry reached pre-tax operating margins of around 30%, supported by robust results from both the underwriting and investment sides of the business. As illustrated in Figure 3.8, investment returns held up, despite the plunge during the second half of 2007. In addition, underwriting results showed an average industry combined ratios of 87% for 2006 and 88% for 2007.

Figure 3.8 – Performance of the reinsurance industry, 1999-2009 in % of premiums (except for ROE)

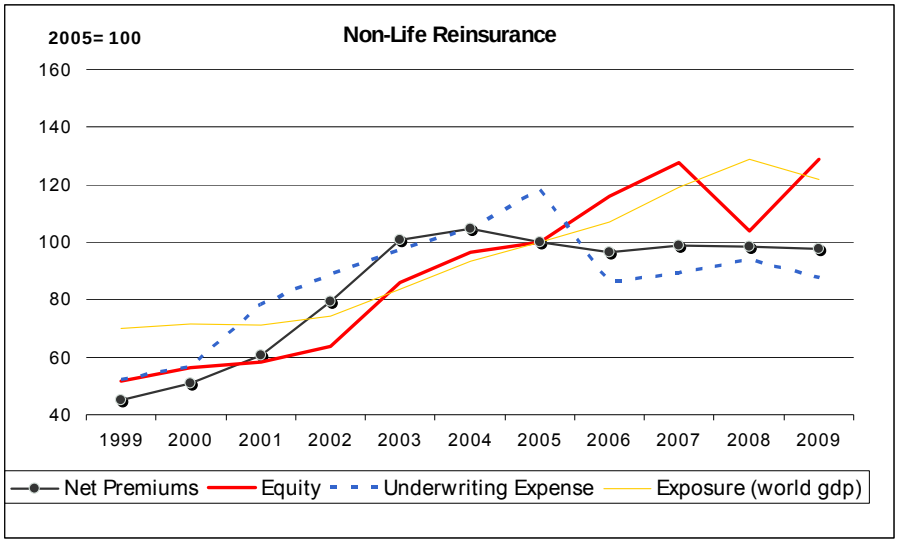


Source: Swiss Re, Economic Research & Consulting

[40] For a detailed timeline of the crisis, see The Geneva Association, Systemic Risk in Insurance – an analysis of insurance and financial stability, Special Report of The Geneva Association Systemic Risk Working Group, March 2010, p.77.

155. In 2006 and 2007, the reinsurance industry achieved ROE of 15% and 16%. Retained earnings and, in some cases, capital raising led to a substantial increase in capitalisation. At the same time, premium income growth was flat. As a result when the crisis struck at the end of 2007, the solvency of the reinsurance industry was particularly strong.

Figure 3.9 – Capital, premiums and exposure of the reinsurance industry, 1999-2009



Source: Swiss Re, Economic Research & Consulting

3.4.3. Developments in 2008: from the sub-prime crisis to a global banking crisis

156. While the 2008 underwriting results were worse than 2007, the insurance side of the business remained profitable, with an industry-average combined ratio of 95%. Apart from a gradual decline in underwriting profitability due to the general softening of rates, the 2008 results were impacted by:

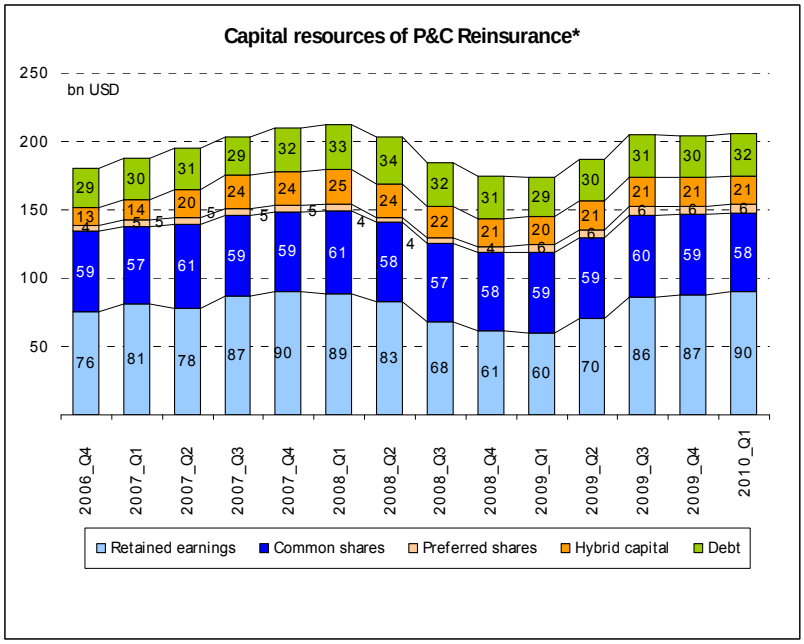
- higher property natural catastrophe losses, most notably hurricanes Gustav and Ike. An unusually high share of the losses were carried by primary insurance companies as a result of their high retentions; nevertheless, there was a significant burden of loss on reinsurers' books,
- a number of costly man-made disasters totalling USD 5 billion; and
- mounting losses in financial guarantee and credit reinsurance due to the financial crisis.

157. The investment performance of reinsurers during the first half of 2008 already reflected the increasingly unstable situation in the global financial markets. Investment returns remained subdued, averaging around 3% for the industry. However, unrealised capital losses due to bearish equity markets and widening credit spreads, eroded even this small gain.

158. After 1% increase in the first quarter of 2008, reinsurers shareholders' equity declined 6% during the second quarter due to a combination of lower operating earnings, capital losses (realised and unrealised), dividend payments[41], and share buy-backs. Figure 3.10 illustrates this point.

[41] European companies pay their annual dividend payments for the previous year's results during the second quarter, while US and Bermuda companies pay quarterly dividends. Excluding this effect, the surplus of the global reinsurers declined by 4% year-to-date.

Figure 3.10 – Capital resources of P&C Reinsurers



Source: Swiss Re, Economic Research & Consulting

159. Like other investors, reinsurers were significantly impacted by the sharp downturn in the financial markets, in their role as asset managers and buyers of financial assets. Investment returns were negative in both quarters, with an annualised -1% in each quarter. More importantly, unrealised losses suffered further from the decline in value of corporate bonds and asset-backed securities. Equity exposure, which was already low before the crisis began, was further decreased or hedged. During the third quarter the value of investments declined by 7%, and shareholders equity decreased by 10%. While credit-risk exposed positions declined further in the fourth quarter, the impact was partly offset by a rally on government bonds.

3.4.4. The situation at the beginning of 2009

160. The January 2009 renewals took place under a normally functioning reinsurance market, with pricing of new reinsurance contracts remaining almost stable. The previously predominant softening of rates was stopped. Only one category of reinsurance covers became somewhat more expensive: catastrophe covers for large risks such as European-wide windstorms or US-wide national hurricanes or earthquakes. Demand for ordinary reinsurance treaties rose only slightly, but there was a high need for capital relief deals for distressed primary insurance companies. Life insurance companies were generally more severely affected by the sharp drop in asset value, as they were more leveraged than non-life insurers.

3.4.5. Developments in 2009

161. Capital markets continued to be fragile and volatile during the first months of 2009. However, Government intervention contributed to providing some stability and the investment performance, and consequently the capital position of reinsurers, showed improvements . While the first quarter of 2009 was only marginally positive, the industry again achieved positive investment returns for the remaining quarters of 2009. Additionally

as credit spreads narrowed, reinsurers registered unrealised capital gains. By the end of 2009, capitalisation of the industry was almost at the same level again as 2007.

3.4.6. 2010 and outlook for 2011

162. Although, there are signs that may lead to conclude that the worst of the financial crisis is behind, the full effects of the economic crisis are not entirely clear. For example, the vast amount of liquidity injected by central banks has created a potential inflation risk, although deflation might be striking in the short term. Altogether, the universe of risks appears to have expanded, putting insurers and reinsurers in a stochastic world of increased uncertainty. Those risks arise from multiple sources on various issues:

- interest rates movement (stability or increase)
- Sovereign debt crisis
- Instability of the euro zone and exchange rates' volatility
- Potential social and political unrest
- Risks of international and geo-political crises
- Impact of new regulation

3.4.7. Summary

163. In short, although the reinsurance was –like other financial sectors- impacted by the current crisis, it fared comparatively well. As with the whole economy, the reinsurance industry also benefited from the massive governmental intervention. However the industry proved to be strong in terms of capitalisation and solvency, in particular as the as the crisis peaked. Summing up:

- Reinsurers' losses were mainly related to the fall in the value of investments due to the asset deterioration in financial markets.
- Reinsurers remained solvent throughout the crisis. Cover was always provided both in insurance and reinsurance, and claims were paid -as usual- during that period. Prices remained stable.
- No diversified reinsurer failed and no run on reinsurers was observed.
- Problems arose from monoline insurers involved in financial guarantee business and also in a few insurers with important other quasi-banking businesses.
- Although the worst of the crisis seems to be behind, reinsurers remain defensively positioned to absorb potential shocks

Conclusions

164. The long exploration of the issue of macroprudential surveillance that is insurance specific has uncovered some important facts and challenges. The paragraphs below attempt to draw together the main messages that emerge from this report

165. First, macroprudential surveillance, as a kind of systematic observation placed halfway between the micro- or firm-level and the macroeconomic level constitutes a critical, -often missing- link, in the chain of tools at the disposal of supervisors. The macroprudential level, and its ability to link-up the granularity of firm data with the 'birds eye view' of macroeconomic data adds value to much needed information for prompt and targeted supervisory action. Events of the current global financial crisis underscore the need for this type of information.

166. On the other hand, the many challenges -both conceptual and practical- discussed in the paper highlight the difficulties associated in conducting macroprudential surveillance. Boundary definition, data generation resources, analytical complexities, legal and jurisdictional constraints, to name a few, populate the long list of obstacles in the way of effective macroprudential surveillance, especially that of a global nature.

167. Despite the challenges and limitations, the paper has provided sound evidence of good practice among insurance supervisors in conducting macroprudential surveillance. In particular, the empirical findings discussed in chapter 2 show that:

- Although most supervisory authorities do not have a formalised definition of macroprudential surveillance, nearly all of them carry out macroprudential surveillance activities. The breadth, reach and frequency of activities varies, often substantively, from supervisor to supervisor
- The two most prevalent macroprudential surveillance activities are insurance market analysis and analysis of the impact of macroeconomic variables on the insurance market. In both instances, the focus tends to be on the analysis of domestic data, with international data analysis receiving comparatively less attention
- Insurance-specific macroprudential surveillance activities cover evenly property & casualty insurance, and life insurance
- Under 50% of supervisors carry out insurance market-wide stress testing; however, approximately 20% of those who do not stress test their markets have planes in place do so within the next 12 months
- Macroprudential surveillance activities appear to assist supervisors in:
  - Identifying and assessing changes in insurance markets as much as macroeconomic changes affecting these markets
  - Providing early warning signals of emerging risks, and enabling prompt action
  - Providing value-adding information for forward-looking decision-making
  - Identifying futures issues affecting the insurance market

168. Above all, the paper has provided support to the claim that insurance-specific macroprudential surveillance, while immensely benefiting from the work done on the matter by central bankers and banking regulators, has its own distinct features, which respond to insurance-specific needs, in particular to the identification, assessment and monitoring of risks relevant to the insurance sector. The examples of mortality risks, or catastrophe risks are compelling evidence of this point.

169. The study has also highlighted the current 'work-in-progress' status of macroprudential surveillance among supervisory authorities. For example, key tools like market-wide stress testing are not as prevalent as other tools like macroeconomic analysis.

170. In this respect, the current work of the International Association of Insurance Supervisors, in particular, that of the IAIS Financial Stability Committee is positively contributing towards:

- advancing conceptual clarity in respect to the meaning and reach of insurance specific macroprudential surveillance
- supporting the efforts of national-level supervisors in strengthening their own macroprudential surveillance capabilities
- providing leadership on macroprudential surveillance needs at a global level

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