Macroprudential supervision in insurance. Theoretical and practical aspects

Jan Monkiewicz, Marian Malecki (eds)

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## Institutional Structures for Macroprudential Supervision

### 13. Responsible institution for Financial Stability

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<td>ABCP</td>
<td>Asset-Backed Commercial Paper</td>
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<td>ABS</td>
<td>Asset Backed Security</td>
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<td>AFM</td>
<td>Autoriteit Financiële Markten</td>
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<tr>
<td>AIG</td>
<td>American International Group</td>
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<tr>
<td>ART</td>
<td>alternative risk transfer</td>
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<td>ATC</td>
<td>Advisory Technical Committee</td>
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<tr>
<td>ATC</td>
<td>Advisory Technical Committee</td>
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<tr>
<td>BCBS</td>
<td>Basel Committee on Banking Supervision</td>
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<tr>
<td>BCR</td>
<td>basic capital requirement</td>
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<tr>
<td>BF</td>
<td>bureaucratic dominance of the central bank as over powerful agency</td>
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<tr>
<td>BIS</td>
<td>Bank for International Settlements</td>
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<td>BMA</td>
<td>Bermuda Monetary Authority</td>
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<td>BoE</td>
<td>Bank of England</td>
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<td>CAR</td>
<td>Capital Adequacy Ratio</td>
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<td>CBI</td>
<td>Central Bank Independence</td>
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<td>CBIMS</td>
<td>central bank involvement in the insurance macro supervision</td>
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<td>CBSS</td>
<td>Central Bank Supervisor Share</td>
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<tr>
<td>CCA</td>
<td>Contingent Claims Analysis</td>
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<tr>
<td>CCC</td>
<td>Central Clearing Counterparty</td>
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<td>CCP</td>
<td>Central Clearing Party</td>
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<tr>
<td>CDO</td>
<td>Collateralized Debt Obligation</td>
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<tr>
<td>CDS</td>
<td>Credit Default Swap</td>
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<tr>
<td>CEIOPS</td>
<td>Committee of European Insurance and Occupational Pensions Supervisors</td>
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<td>CGFS</td>
<td>Committee on the Global Financial System</td>
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<tr>
<td>CMG</td>
<td>Crisis Management Group</td>
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<tr>
<td>ComFrame</td>
<td>Common Framework for the Supervision of Internationally Active Insurance Groups</td>
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<td>CPI</td>
<td>Consumer Price Index</td>
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<td>CRD IV</td>
<td>Capital Requirement Directive IV (Directive 2013/36/EU)</td>
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<td>CRO Forum</td>
<td>Chief Risk Officers Forum</td>
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<td>CRR</td>
<td>Capital Requirement Regulation (Regulation 575/2013/EU)</td>
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<td>DNB</td>
<td>De Nederlandsche Bank</td>
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<td>DSGE</td>
<td>Dynamic Stochastic General Equilibrium</td>
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<tr>
<td>D-SIB</td>
<td>domestic systemically important bank</td>
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<td>D-SIFI</td>
<td>Domestic SIFI</td>
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<tr>
<td>DTI</td>
<td>Debt-To-Income ratio</td>
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<td>EBA</td>
<td>European Banking Authority</td>
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<td>EC</td>
<td>European Commission</td>
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<td>ECB</td>
<td>European Central Bank</td>
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<td>EFC</td>
<td>Economic and Financial Committee</td>
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<td>EIOPA</td>
<td>European Insurance and Occupational Pensions Authority</td>
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<td>ESA</td>
<td>European Supervisory Authorities</td>
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ESMA  European Securities Markets Authority
ESRB  European Systemic Risk Board
EU  European Union
EVT  Extreme Value Theory
FCA  Financial Conduct Authority
FCP  Financial Policy Committee
FED:  Federal Reserve System
FMA  Oestreichische Finanzmarkaufsicht
FSA  Financial Services Authority
FSB  Financial Stability Board
FSHH  Financial Supervision Herfindahl Hirschman
FSOC  Financial Stability Oversight Council
FX  foreign exchange

G20  The Group of Twenty, major advanced and emerging economies: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Russia, Saudi Arabia
GDP  Gross Domestic Product
GFSR  Global Financial Stability Report
GIIPS  Greece, Ireland, Italy, Portugal, Spain
GMT  Grilli-Masciandaro-Tabellini
GPD  Generalized Pareto Distribution
GSEs  Government-Sponsored Enterprises
G-SIB  global systemically important bank
G-SIFIs  Global Systemically Important Financial Institution
G-SII  Global Systemically Important Insurer
HLA  Higher Loss Absorbency requirements
IAIG  Internationally Active Insurance Group
IAIS  International Association of Insurance Supervisors
IBNR  Incurred But Not Reported
ICP  Insurance Core Principle (of the IAIS)
ICS  Insurance Capital Standard
IFRS  International Financial Reporting Standards
IIF  International Institute of Finance
IMF  International Monetary Fund
IOSCO  International Organisation of Securities Commissions
IRB  Internal Ratings-Based
IRIS  Insurance Regulatory Information System
KAs  Key Attributes of Effective Resolution Regimes for Financial Institutions
LCR  Liquidity Coverage Ratio
LGD  Loss Given Default
LSE  London School of Economics and Political Science
LTI  Loan-to-Income/debt (service)-to-income requirements
LTV  Loan-To-Value ratio
MBS  Mortgage Backed Securities
MES  Marginal Expected Shortfall
MPSCC  Macroeprudential Policy and Surveillance Subcommittee
NAIC  National Association of Insurance Commissioners
The development of a macro-prudential policy framework is a challenging task, because it can be a part of significant policy redesign that might be compared to the emergence of modern macroeconomic policy in the 20th century. The Great Depression of the 1930s became a trigger for a revolution in thinking on the economy and macroeconomic policy. The recent global financial crisis
may have an equally significant impact on policymakers’ assessment of the financial system, including its pivotal role in the economy and the policies that affect the behavior of the system as whole. This systemic, or macro-prudential, approach marks a departure from the traditional focus on the role of individual financial institutions. The crisis has shown that the health of individual firms may not necessarily mean that the system as a whole is inherently stable. Given that the development of a macro-prudential policy is at an early stage, one can only make limited predictions about the potential effectiveness of the new policy and its operational framework.

Macroprudential policies is not a purely new idea. Well before the recent crisis, there were discussions and ideas about new systemic approaches to the financial sector, but such policies have never been fully developed and operationalized. The first-ever mention of the term “macro-prudential” can be found in the minutes of a Cook Committee meeting in 1979. It subsequently appeared in documents prepared by the Bank for International Settlements (BIS) and its related committees. The first IMF report that used the term “macro-prudential” in the context of bank supervision was published in 1998. While aspects of macro-prudential policy have occasionally been discussed on a national and international level, a coherent framework has yet to emerge.

The recent financial crisis has underscored the need to develop a conceptual framework for macro-prudential policy. The lessons from the recent crisis suggest that there has been indeed a gap in the public policy framework: although national authorities were using both micro-prudential and macroeconomic policy tools, they obviously failed to monitor and mitigate system-wide risks in the financial sector. This policy failure may be seen as one of the main causes of the financial crisis. Developing an effective macro-prudential policy framework has become a key policy challenge. It also sparked debates among both policymakers and academics in lots of areas. Here, I’d like to touch upon just three such issues in macroprudential policymaking: (i) the need for a true *system-wide approach*; (ii) the concept of the *systemic diversity*; and (iii) the practical challenges related to the financial system *complexity*. 
System-wide approach needed. There seems to be a well-established definition of the macroprudential policies which is currently used by different international bodies. This definition stresses the need for a system-wide approach. However, in practice, data gaps and conceptual challenges cause that key focus in surveillance is still banking-centric. There is a progress, but we should not stop here. It is especially true because one can expect that after proliferation of the macroprudential measures, regulated entities will modify their behaviors shifting more costly activities to less regulated areas (shadow banking) and innovate financial products. The macroprudential policymakers have to be prepared for these processes by strengthening their market surveillance abilities. But this is not enough. One has to develop measures to limit systemic risk in such areas. Again, the fact is that the most developed thinking about operationalization of the macroprudential policies concerns banking sector. This may even create an impression that there are separate sectoral macroprudential policies – in banking or insurance or securities markets. This is supported by the fact that majority of regulations is still sectoral in nature, as well as by the fact that supervision is still primarily sectoral. Nothing could be more wrong. It is true that financial institutions and markets differ, but lots of financial products and functions are substitutes or are complementary in creating long intermediation chains. System wide approach is needed to make the policies effective taking into account all interactions within financial sector as well as interactions and feedbacks between financial sectors and the economy. System-wide approach should be present in analysis, while macroprudential measures limiting risks should be both system-wide and sectoral reflecting its specificity. In order to stress the difference between macroprudential, system wide approach in monitoring (surveillance) and designing the policies (regulations) and their sectoral enforcement (supervision), we should rethink the use of the term “macroprudential supervision” – “macroprudential policy” seems better reflecting this public policy concept.

5. Systemic diversity seek. The advantages of diversification can be derived from modern portfolio theory applied to an individual portfolios or institutions. However, the more diversification is applied to all institutions in a financial system, the less diverse the financial system may become. A less diverse financial system may have more common exposures and may be more vulnerable to common
shocks. Experiences from other scientific disciplines – e.g. maritime biology – prove that the system is the most resilient when it is diversified, not when its parts are the strongest\(^8\). This has serious consequences for macroprudential policymaking. Basic dilemma is whether to allow specialized financial institutions to enter other areas of finance meaning more stable revenues but also facing new risks (e.g. universal banks, *Allfinanz*) or is it better to reach diversity on the system level by having larger number of more specialized, complementary and substitute, firms (Glass-Steagall type diversity)? Good example of such practical dilemmas is insurance. Traditionally, insurance companies can act as systemic “amortizer” for markets and through this to the financial system as a whole – they are not procyclical and not subject to liquidity runs. However recently, there were some examples of insurance companies entering bank-like areas and accepting liquidity risks – resulting in bank-like runs on some insurance institutions in Singapore\(^9\). Another example of procyclical behaviors and structural risk contributions was the activity of American International Group (AIG). These dilemmas concern regulations: establishing different rules of the game for different types of institutions to preserve systemic diversity or aiming for level-playing field. The same can be found on the global level. In order to proliferate high standards and reduce regulatory arbitrage Basel Committee standards in banking are implemented globally and countries are assessed whether they meet these standards\(^{10}\). However, this can contribute adversely to global stability by limiting diversity of reactions stabilizing the whole system. These are difficult conceptual and policy questions.

**Complexity to be addressed.** Financial systems became more and more complex. This tendency has important regulatory and macroprudential policy implications. Andrew Haldane\(^{11}\) has presented them nicely in 2012. In complex environment, complexity of responses to systemic risk may not be the best approach. Complex rules may lead to suboptimal policy responses, especially with short data series e.g. in the period of fast financial innovations. In such situations applying simpler rules may bring better results. However there is a catch – simple rules are the outcomes of the experience. But how to establish them if macroprudential policy has not been used before or only to the limited
extent? In such a situation we should rely on all available (world-wide) experiences – there is a need for exchanging information, seeking and studying experience of other countries and actively assessing to what extent they are applicable in local environment. Organizing such cooperation by international institutions – regional (ESRB, ECB) or global (IMF, BIS, FSB) is of a key importance. Another important consequence is a need for macroprudential policymakers and generally regulators to hire and preserve highly qualified staff to establish such rules - it can affect the policy outcomes heavily. This will be challenging for countries’ authorities as this is precisely the type of people market institutions, advisory ones, as well as growing number of international regulatory and supervisory bodies (like e.g. ECB) will seek to employ. But in complex world well qualified, reliable staff with long experience can be a key for avoiding very costly systemic event.

Another issue related to complexity is whether policymakers should treat growing complexity of the environment in which macroprudential policy operates as given or, maybe, they should try to impose a limit on its level? The latter require a measure of the complexity and good justification on where to establish the limit. Do we have them? Not necessary. Till now there were attempts to address the complexity within financial organizations by imposing systemic charge for complex systemic financial institutions (G-SIBs, D-SIBs), implementing structural measures (Volcker rule, Vickers and Liikanen reports’ proposals), as well as require preparation of recovery and resolution plans. These measures create an incentive for simplification of structures and business models. But, the complexity of interactions between organizations is more difficult to address, because of the opposing forces of shock absorption and shock diffusion in financial networks. On the one hand, linkages may act as channels to propagate shocks to the whole system, that is, they act as “shock transmitters.” On the other hand, through these linkages, shocks can be shared and absorbed by others, that is, financial linkages may act as “shock absorbers.” Increasing the degree (which measures the number of connection between nodes) of the interbank network generates an M-shaped graph. At low levels of connectivity, an increase in interconnectedness raises the likelihood of contagion; at higher levels of connectivity, the resilience of the system improves, declines; and then improves again as the network reaches completeness. Because current models do not offer practical guidance to identify optimal
targets for interconnectedness, the emphasis has been not on limiting excess complexity (interconnectedness), but on enhancing the resilience of the financial system. Only in some cases, the network analysis and market-based tools have been proposed as a guide to calibrate macroprudential tools to mitigate systemic risks related to the interconnectedness and system complexity. But we have a long way to go.

The pre-crisis thinking about the role of central banks with regard to the financial stability issues concentrated mostly on the financial stability as a precondition for the efficient functioning of the monetary transmission mechanism. The recent crisis made us to rethink the role of central banks in the area of financial stability. The revision of the previous position moved substantially the mindset of central banks – they adopted a more proactive stance in this area, going much beyond the traditional regulation and supervision activities. This change has been already widely accepted. However, ways and means for implementation of this new consensus are not settled yet. In particular, how to combine the traditional tools of monetary policy with new set of tools of macroprudential policy and how to include segments other than banking of financial sector to be covered by new responsibilities of central banks are still rather subjects of heated and prolonged debates. The latter factor is the reason why I am so glad to see this book taking its final shape and I welcome the new stage of discussion it will hopefully trigger as I do hope it will bring me – and all central bankers – some clear and comprehensive answers to the questions we face.

Marek Belka

2 The forerunner of the present Basle Committee on Banking Supervision

3 E.g. Euro-currency Standing Committee (the forerunner of the present Committee on the Global Financial System)

4 *Toward a framework for financial stability*, IMF, 1998

5 Clement P., *The term “macroprudential”: origins and evolution* BIS Quarterly Review, March 2010


10 *The Financial Sector Assessment Program After Ten Years: Experience and Reforms for the Next Decade*, IMF/World Bank, 2009


Acknowledgements

The inspiration for the book came out from the discussions held with Patrick Liedke, the former Secretary General of the Geneva Association for the Study of Insurance Economics. Soon after the global financial crisis has broken out he realized the importance of the financial stability and systemic risk for the future regulatory approaches in the insurance industry. His constant support and advice has been invaluable in the start off phase of the book. Words of appreciation go also to Aerdt Houben from Dutch National Bank for his advice in the selection process of the contributing authors. In formatting the final draft we benefitted substantially from the comments provided by Dr Nikolaus von Bomhard, Chairman of the Geneva Association in 2010-2013, and the Chairman of the Board of Management of Munich Re. Finally we would like to extend our gratitude to Professor Marek Belka, Governor of the National Bank of Poland and a member of the Steering Committee of the European Systemic Risk Board, for his stimulating observations and thought provoking comments which he offered in the preface to the book.
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changing landscape”, published by The Geneva Association. He is also a recognised author of textbooks on insurance. His recent accomplishment in this area is “Ubezpieczenia. Podręcznik akademicki”/Insurance. An academic textbook/ which he co-authored with Jerzy Handschke. It was published in Polish by Poltext in 2010. Since 2011 he is adviser to the President of the National Bank of Poland.

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INTRODUCTION

Macroprudential Supervision in Insurance: Setting the Scene

Jan Monkiewicz

A characteristic feature of the current socio economic reality is the ever expanding role of the State into the regulatory arena. This has gone so far to give a ground for the observation that we are witnessing today the rise of the new model of the State. In contrast to its former “positive” version it is referred to as a “regulatory State” (Majone, 1997; Surdej, 2006). The contemporary State is no longer substantially involved into the direct economic activities but increasingly so into the indirect ones. It has undoubtedly turned into an ever growing regulatory machine. It is estimated for example that the US federal agencies alone issue each year between 3000 and 4000 final rules. (Copeland, 2011, p. 3) Expanded regulatory role of the State brings along not only potential societal benefits but find its effects in the dark side of the growing volume of regulatory costs as well. These costs are affecting both the public sector (e.g. legislative outlays, enforcement costs, binding interpretation costs, etc) and the private one. They affect both the citizens and the companies (e.g. financial costs, compliance costs, administrative costs, etc). Some of them are public and overt, the others however are hidden and not captured by the existing statistics (e.g. reporting costs, approval costs, testing costs, inspection costs, etc.) (Klosiewicz et al, 2009). In end effect they are very difficult to measure in practice. For these
reasons there are very limited empirical studies in this regard. In a recent attempt undertaken at the request of the Office of Advocacy of the US Small Business Administration in 2011, the total regulatory costs of the US federal regulations in the economic area in 2008 have been estimated for around 10% of the US GDP or $1.2 trillion. Additionally it has been estimated that these costs have increased between 2004 and 2008 by nearly 110% (Copeland 2011, p. 18)

Increased penetration of the State holds also true with regard to the financial sector. The principal transmission mechanisms of this involvement nowadays are financial market interventions (monetary policy, foreign exchange policy, open market operations, etc) and regulatory prescriptions. Additionally here the contemporary State is however to a growing degree both the regulating and the regulated entity and thus exposed to a moral hazard effect. This may lead, in case of a poor separation of the two roles, to the misuse of its powers, regulatory failures and the erosion of its reputation. Recent global financial crisis provides several examples in this regard, the most publicised of them is the inadequate risk pricing of the sovereign bonds for regulatory purposes. The State underpricing its own credit risk provides for the financial institutions strong regulatory incentives to help finance its budgetary expenses. At the same time though it creates an improper recognition of the credit risk in their balance sheets which at a time may lead to financial failures.

Financial regulation and supervision represent the two powerful instruments of a contemporary State for shaping financial systems and ensuring financial stability. They coexist with the direct financial market interventions by the State. Their principal role is to bring into the ways and means commercial institutions are operated public assessment and publicly desired properties. Generally speaking the need for public regulation and supervision of finance is justified by the market failures. Most prominent representation of them are negative externalities, asymmetric information, adverse selection, unfair competition, market incompleteness and monopolistic set up. Therefore public perception of the costs and benefits of the financial activities is different than the private one. It is precisely the role of the financial regulation and supervision to bring these into the alignment and a proper balance. While delivering its role public regulation and supervision create new problems such as moral hazard, regulatory capture, regulatory and supervisory arbitrage, biased incentives, etc. Therefore they need to be continuously monitored and subject to the accountability. Once run together
from a single central point in the State machinery since the end of the last century they are becoming increasingly separated and delegated to different agencies within the governmental structures.

Regulation which is about standards setting is naturally closely tied to lawmaking and thus heavily exposed to the political and market pressures. It is by its very nature faced with the unavoidable danger of the regulatory capture to the benefit of selected interest groups within the financial industry or also outside of it to the benefit of some competitors, customers, suppliers, etc. (Posner, 1974).

In the aftermath of the global financial crisis we are faced with the increased regulatory penetration of the finance and insurance industry and the further expansion of the regulation culture. For insurance alone it is worth to mention the wave of recently debated or already introduced standards on solvency, corporate governance, fit and proper, internal controls, transparency, financial conglomerates, insurance groups, own risk control governance, etc. On the other hand regulatory standards have been expanded to previously largely non-regulated activities – intermediation, reinsurance or personal claims advisors. Additionally the role of self-regulation has been largely marginalized.

Supervision in contrast to regulation is in principle only slightly involved in the standards setting activities which, if take place, are generally located at the grass root level. By and large it takes the form of the regulatory interpretations and supervisory recommendations which are operationalizing existing laws.

The main focus of supervision remains the enforcement of regulatory requirements into practice, i.e. their implantation into the supervised financial institutions or market at large. Hence it is closer to the technical side of the business and focused more on micro than macro dimension. This classical feature of the supervision has been challenged however by the recent global financial crisis. As a result, apart from microprudential supervision, we witness the new macroprudential pillar quickly coming to existence.

Because of its technical nature supervision is less endangered by the capture phenomena and outside pressure. Presumably this was one of the fundamental reason of its separation from the regulatory activities. It is however in turn exposed to supervisory forbearance, i.e. the tendency for inaction resulting from a “do not harm” approach. In its pivotal working paper released in 2011 IMF concludes
that the current regulatory reforms have not fully considered supervisory forbearance and its negative effects (Espinosa-Vega, et al, 2011). It stresses inter alia that supervisors have natural tendency towards some form of forbearance. This is particularly true if supervision is charged with the task of promoting financial sector international competitiveness. To counter this factor IMF specifically called for the removal of such task from the existing national legislation. It cannot resolve the issue however when such a mandate is only informally implied and the political independence of the supervisory authority is not ensured.

To ensure further supervisory objectivity and avoid its potential capture it is increasingly recommended to ring face its operation both from the influence of politics as well as from the undue impact of commerce (IAIS, 2012). The currently emerging reality however seems to contradict this requirement. As indicated in a recent empirical research by Stavros Gadinis a marked increase in the influence of elected politicians worldwide over banking has taken place recently. Their new powers extend both over emergencies and crisis management, which may be understandable, as well as over normal operational activities of the banks. This presumably affects likewise other financial industries, including insurance (Gadinis, 2013).

In spite of these fundamental differences between the regulation and supervision they are in practical dimension like the twin brothers-they depend very much on each other. Regulation without the enforcement mechanism is just armless. Supervision on the other hand requires for its operation a legal framework provided mainly by regulation. On the other hand supervision being placed at the forefront of the market and maintaining daily contact to the market institutions is well positioned to provide important alerting signals and regulatory inputs into the regulatory process. In short regulatory models, rules and standards affect supervisory set up, the limits of supervisory powers on the other hand preempt regulatory choices.

Regulatory and supervisory models in insurance are undergoing in recent time fundamental overhaul. New standards, tools and approaches are introduced, heavily affecting the insurance industry and insurance institutions.

There are at least four drivers of regulatory and supervisory change to mention:

1. increased globalisation of the industry
2. growing integration of the financial sector and therefore the need for regulatory convergence
3. change of the regulatory and supervisory paradigm
4. lessons of the recent global financial crisis

Of the four drivers mentioned the most profound impact comes from the ideational shift of the financial market regulatory paradigm which preempts the overall regulatory architecture in financial sector at large and its constituents, including insurance (Baker, 2013). As a result of the developments during the last global financial crisis and the lessons learned the entire old regulatory and supervisory paradigm has been questioned. The whole of this “Washington consensus”, supported by IMF and surrounding institutions’ recommendations and policies, was based on the efficient market orthodoxy. It has been dominating in the financial regulatory domain over the last 25 years or so and has rapidly fallen apart in effect of the last global financial crisis (Helleiner, 2010). Its essence relied on unconditional faith in the efficiency and rationality of the financial markets. It has been assumed that the financial markets are in principle efficient though with the tendency to short term volatility. Their proper functioning required basically only adequate access to the market information and market discipline (for a good review of the theoretical foundations of this paradigm see Pistor K, 2012). These markets should have not been overburdened with the regulatory discipline but should have been left to the operation of the market forces. “Washington consensus” has been basically assuming that the financial system is safe with the private risk management executed at the level of individual financial institutions. It believed then consequently that financial innovations like securitisation or derivatives are generically good providing more instruments for private risk management in the financial systems and hence making them safer.

“Washington consensus” focused its attention on the safety and stability of individual financial institutions without paying much attention to their interconnectedness and common exposures and possible contagion channels. Its principal centre of supervision have been therefore microprudential bodies. Generally speaking the heart of this old paradigm was based on a “regulatory trilogy” which encompassed greater transparency, more disclosure and more effective risk management by financial firms (Eatwell, 2009).
A new “Basel consensus” which has been endorsed quickly between 2008-2009 by the global financial regulatory networking institutions centered mostly around the city of Basel (and hence the term “Basel consensus”) is providing fundamentally different approach. Its point of departure is an assumption that the financial markets are inherently unstable and procyclical with the tendency to herd behaviour. Their instability can be additionally affected by the undue complexity of the financial systems and individual institutions, their business models applied and financial innovations in use. These implies that in order to maintain safety of the financial markets and financial systems public intervention might be necessary, including possible prohibition of some activities or instruments. It implies also that the role of the financial sector and financial markets may be put on hold if their growth is socially unjustified.

The heart of the new “Basel consensus” is a “macroprudential” approach and with this a demand for the public management of the risks of the financial system. Its important feature is introduction of the special regulatory standards for the systemically important financial institutions, both at global as well as domestic levels. The new consensus promotes additionally new supervisory perimeter for the micro prudential supervisors which should focus their attention not only on “solo” companies but entire financial groups and their internal risk management systems. New consensus clearly elevates the role of regulatory discipline which should be placed ahead of the market one. This includes even questioning of the fundamental property rights and granting special resolution powers to the public bodies. Management boards and shareholders are under the new rules clearly much less trustworthy to control market excesses than it used to be in the past.

The emerging regulatory and supervisory model in insurance is characterised additionally by the globalisation of the regulatory choices. Recent decisions of the Financial Stability Board regarding designation of Globally Systemic Important Insurers (GSIIs) and of the International Association of Insurance Supervisors, regarding accelerated development of the Comframe including its Insurance Capital Standard (ICS) to be implemented by 2019 by all globally operating Internationally Active Insurance Groups (IAIG) are the most profound indications of this new qualitative development.

The upcoming new regulatory system is growing substantially in complexity in comparison to the one we know. It is evidently introducing a multilayer regulatory architecture which is composed of at least
of four layers: “ordinary” companies layer, IAIGs layer, GSIs layer and “specials” layer (mutuals, captives). We can additionally have Domestically Systemic Insurance Institutions (DSII) layer.

Finally the new regulatory model clearly expands regulatory perimeter by introducing macroprudential pillar to control and mitigate and possible prevent systemic risk.

On the supervisory front we are confronted with the development of the enhanced supervisory penetration and emergence of a multipolar supervisory systems. Classical microprudential bodies are complemented with macroprudential authorities and enhanced consumer protection agencies. Moreover special crisis management arrangements are becoming an important part of the new regulatory and supervisory framework. Their role is to limit potential negative spillovers and secure crisis management plans of action in advance to avoid improvisation (Claessens, Kodes, 2014).

Supervisors are expected to be more holistic and penetrative in their approach to their oversight and assessments. Good example is a development of group wide supervision concept.

Moreover the new supervisory models take into account the need for increased transborder coordination with MMOUs, supervisory colleges and Crises Management Groups as available toolkit.

New supervisory models need additionally to recognize increased role of the shared supervision and supervisory co-decisions. It is also characterised by the implementation of the new forward looking supervisory tools—early warning indicators, scenarios and stress testing. Finally the upcoming supervisory model is under the growing role of the central banks. We are clearly going into bank-based insurance supervision. The joining by the US Federal Reserve Board of the IAIS membership may be taken as a milestone in this direction.

Of all these numerous regulatory and supervisory developments macroprudential regulation and supervision has become the centre of the public policy agenda and concerns in all financial sectors. It has also become in recent years the subject matter of intensive research efforts as its concepts, nature, effects and tools are still poorly recognized and understood. These concerns both the banking sector as well as specially non-banking activities, insurance in particular.

Macroprudential policy is nowadays at the level of understanding which might have been characteristic for the monetary policy in the 1950s and 1960s (ESBC, 2014). To remedy quickly the situation the ECB decided to set up in Spring 2010 the Macroprudential Research Network with the
objective of developing conceptual frameworks, models and/or tools that would provide research support in order to improve macroprudential supervision in the European Union. Until the end 2013 this Network has generated around 150 individual research papers. Parallelly an important role in the promotion of the concept and investigation of various aspects of macroprudential regulation and supervision and its operationalization has been taken by the IMF. It produced in the course of last years several path breaking papers in this regard (Blanchard, Dell Arriccia, Mauro, 2013; De Nicolo, Favara, Ratnovski, 2012; Nier, Osinski, Jacome, Madrid, 2011; Osinski, Seal, Hoogduin, 2013). The only place to continuously work on fundamentals of insurance related aspects of macroprudential policies turned out to be the International Association of Insurance Supervisors. It has recently created Macroprudential Policy and Surveillance Subcommittee to work out necessary recommendations on standards and policies in this regard. On July 2013 it released its first paper “Macroprudential policy and surveillance in insurance” addressing some fundamental issues in this area (IAIS, 2013a). Additionally in 2013 it produced two more policy papers in this domain (IAIS 2013b, IAIS 2013c).

Overwhelming majority of the existing contributions is however banking centered and rarely addresses other segments of the financial sector. The same is true with regard to actual practices. Macroprudential bodies are flourishing around the globe. Their attention again is focusing on the banking relevant issues. Not only because these are more important but also because little is known in this respect with regard to other financial sectors, insurance in particular.

Under such conditions the intention of this book is to fill the existing vacuum and advance our understanding and analytical capacity with regard to macroprudential policy in insurance.

The study attempts to address the following key issues:

- provide a theoretical foundation for safety management in insurance and assess post crisis initiatives in this respect
- provide the explanation and systematization of macroprudential oversight in financial sector
- conceptualize macro prudential supervision in insurance and explain its specificity
- discuss the relationship, interaction and conflicts between macro and microprudential supervision in insurance
-provide the description of the macro prudential supervisory tool kit in insurance
-discuss the implication for macro prudential supervision in insurance resulting from the special role assigned in this regard to the central banks
-address macroprudential framework in the context of Globally Systemic Important Insurers (GSIIs)
-discuss possible global set up for macroprudential supervision in insurance

The book is split into three parts. The first one addresses general and methodological issues. Its aim is to provide a framework for the analysis of the macroprudential policies and supervision in the insurance context. It begins with the study by Marek Monkiewicz who attempts to address the dynamics of the development of the safety net for insurance, its long term trends and challenges. He stresses that the economic safety and well being of the individual States and the global community is increasingly dependent on the safety of their financial systems. And yet safety of the financial system is not a preoccupation actively addressed in a direct way in the current academic debate. It is rather discussed indirectly in the context of the financial stability, systemic risk and the financial crisis - i.e. in the context of extreme situations. Moreover it has a tendency to concentrate largely on the banking perspective. Under such circumstances safety of the financial system has most often been identified as its stability.

He is critically assessing such a narrow approach to the financial safety, particularly with regard to the non banking financial sector including insurance. Relevance of the non banking financial sector to the financial stability and systemic risk is much less clear, less pronounced and defined. In addition safety of the financial system cannot and should not be reduced to its stability. In particular these may include macroeconomic, monetary, fiscal, geopolitical as well as treaty dimension. All of them in group and each of them alone or some constellation may influence safety of the financial system.

He underlines that the safety of the financial system has a gradual nature and may represent various levels resulting, ceteris paribus, from policy measures applied.

Safety of the financial system according to him is depending on several determinants and foremostly on the State and its policies. Particularly relevant are macroeconomic, monetary, fiscal and treaty policies. It also depends on its financial policy and the architecture of the financial market. Particularly relevant are the shape and nature of its participants; their size, complexity, portfolios etc. An
important part of the characteristics is the level of the market discipline. Additionally it depends on the financial knowledge of the market participants and their market behaviour, rules and customs.

Finally safety of the financial system depends on the financial safety nets - the arrangements which are dedicated to this specific task on the stand alone basis.

The second chapter by Martin Eling and David Pankoke, reviews existing research on systemic risk in the insurance sector and outlines potential areas for future research in this field. They discuss inter alia the definition of systemic risk, review the insurance literature with respect to systemic risk and summarize the main results for different lines and activities of the insurance companies. After a discussion of the term ‘systemic risk’ and a review of the available research results on systemic risk in the insurance sector, they focus their attention on the analysis on the implications of this discussion for macroprudential supervision. For this purpose, they assess the relevance of the banking-sector macroprudential instruments to the insurance sector. They argue that the traditional insurance activities neither contribute to systemic risk nor increase insurers’ vulnerability to impairments of the financial system. However the problem is with the nontraditional activities and in particular with CDS and financial guarantees as well as securitization.

Additionally they discuss to what extent systemic risk might be triggered by regulation itself, especially by Solvency II, the forthcoming European-wide regulatory framework for risk-based capital. They stress that in light of the insurance industry’s important economic function, the results of their research indicate that policymakers and regulators need to closely analyse systemic risk and design appropriate macroprudential tools to ensure financial stability.

In the next chapter Aerdt Houben and Hanne van Voorden concentrate their attention on how a macroprudential perspective in insurance supervision can contribute to the financial stability. They stress that one of the important lesson of the recent global financial crisis has been the need to strengthen the supervision of the financial system as a whole. As a complement to microprudential supervision, such a perspective considers potential systemic interactions between the individual institution and the broader financial system. This lesson is of particular relevance for the banking sector, as banks are more likely to be considered systemically important than insurers. By nature, banks are highly interconnected through the interbank money market, play a pivotal role in the
payment system and are exposed to liquidity risk. Nevertheless, contagion channels also exist between the insurance sector and other parts of the financial system, both in theory and practice. They discuss in the chapter in which way macroprudential perspective in insurance supervision can contribute to financial stability. They highlight key transmission channels between the insurance sector and the financial system. They also review both the sector’s stabilizing influence on financial markets by pricing and spreading risk, as well as its potentially destabilizing influence through herd behaviour, fire sales and other market failures. Against this background they lay out a basic macroprudential toolkit for the insurance sector, including instruments such as restrictions on activities and linkages with other financial institutions, requirements for stability-oriented investment policies, and recovery and resolution planning.

Fourth chapter authored by Marcello Ramella and Sebastian von Dahlen aims to contribute to the macroprudential debate by articulating a view on the relation between insurance and macroprudential regulation. With respect to macroprudential regulation as such, it surveys the current ‘work-in-progress’ nature of the enterprise, looking at key conceptual, methodological and institutional issues which are under discussion among academics, policy makers and practitioners. They underline that the concept of macroprudential regulation covers both macroprudential surveillance (i.e. observation) as well as macroprudential supervision (i.e. action).

As a contribution to the debate on the place of insurance within macroprudential regulation the authors revisit key characteristics of insurance activities including the concepts of insurability and insurable interests and examine the relationship between these concepts and systemic risk. They suggest that these relationships have deep implications for current policy and practice work on building a sound macroprudential regulation framework.

The second part of the book is focusing on policy related issues-the essence of macroprudential policy, balance between macro and micro, macroprudential supervisory toolkit and institutional dimension of macro prudential supervision.

The first chapter of the second part prepared by Piotr Szpunar aims to set the general frame and to explain the rationale for macroprudential policy and main challenges ahead. He elaborates on the main mandate of macroprudential policy which he believes to analysis and mitigation of systemic
risk. Its main focus is on the nature of systemic risk and ways how it accumulates and then propagates throughout the financial system. He discusses the mandate of macroprudential policy and indicates several important characteristics of the institutional set up. In particular he is stressing the important role of the central banks in conducting macroprudential policy. Finally he presents principal macroprudential instruments. The theoretical discussion on application of macroprudential tools is supplemented with the description of some practical experience gained so far.

The second chapter in this part is authored by Krzysztof Jajuga. He focuses his attention on the measurement and assessment of systemic risk and the financial stability in insurance and the role of macroprudential policy. He identifies two general approaches in this respect. The first one consists in constructing different indicators with the aim of giving signals as to the level of financial stability to financial supervisors and other interested authorities. He mentions here in particular:

- Financial Soundness Indicators constructed with the use of balance sheets of individual financial institutions
- Financial Condition Indicators constructed with the use of aggregated market data

These indicators are concentrated in the assessment of the financial stability and are not direct measures of systemic risk.

The second approach is based on more advanced econometric models, where the emphasis is on the interconnectedness between different institutions. Most of these methods were proposed in last few years. They were designed however mostly for the needs of the banking sector. In his paper Krzysztof Jajuga presents his own proposal, which can be classified into this second approach.

The third chapter in this part by Rodolfo Wehrhahn, concentrates on the alignment of the micro-and macroprudential supervision in insurance. The author underlines the fact that macroprudential surveillance is only one of the several other tools guarding financial stability. He indicates that there are both interactions and possible conflicting effects of monetary policy and macroprudential and microprudential policies. Therefore he sees the need for proper degree of coordination of the different agencies responsible for different aspects of financial stability. It includes inter alia clear mandates and responsibilities of the authorities concerned, coordinated application of the antagonizing tools as well as constant dialogue among the authorities responsible for the different policies.
Next chapter of the policy related part is authored by Nadege Jassaud and Rodolfo Wehrhahn. Its focus is on macroprudential policies and their toolkit for the insurance sector. They stress the fact that operationalization of the macroprudential policy in insurance remains still in its nascent stage. Global systemic risk considerations in insurance supervision have not been recognized before the 2008 global financial crisis. The systemic risk created by the interconnectedness of the insurance sector with other participants of the financial sector was not in the scope of insurance supervisors before 2008. Moreover, the risk presented by the interconnectedness among insurance participants through reinsurance and retrocessions was only acknowledged after the severe losses suffered by Lloyds in the nineties threatening the collapse of the global reinsurance capacity. Only the 2008 crisis has created the sufficient awareness among supervisors of the systemic risk that insurers engaged in certain business practices could pose. As a result, all tools that aim to target the systemic risk related to interconnectedness of insurers with the financial sector are only now being developed.

In the following chapter Donato Masciandaro and Alessio Volpolicella explore the fundamentally important role of the central banking and its relevance to macroprudential supervision and insurance. Beginning with the review of the recent theoretical models, which address the issue of the central bank involvement in macro supervision, they come to the conclusion that the two important topics are missing so far. The first is the political economy of the macro supervisory architecture design and the second-the role of the insurance interconnectedness. To cope with the issue a principal agent model is used to design a political economy framework. Its role is to explain how the politicians can shape the central bank governance in addressing systemic risks in insurance. Finally, the framework is used to analyse the present institutional set up in 39 countries.

The closing chapter of the second part is written by Andrew Mawdsley who attempts to highlight the macroprudential supervision architecture in EU insurance. He underscores in his analysis that notwithstanding the possibility for insurers to be sources of, or transmission channels for, systemic risks, they are also subject to the impacts of financial instability. He points out that insurers are significant holders of financial assets, with a strong bias towards fixed income investments of various types, with smaller allocations to equities, real estate and other asset classes. As a result, they are open to experience shocks in common with the banking system and thereby add to general propagation
and impact of such shocks. He sees it as unsurprising that not just banking, but insurance and financial market more generally are falling within the purview of macroprudential policy. Both in the EU and the US insurance and other sectors have also been included.

The chapter focuses on the elaboration of the institutional model for macroprudential supervision of the insurance sector in the EU. As such, it touches also on the interactions between macroprudential and microprudential supervision, as well as the interactions between competent authorities at EU and national level.

The third part of the book is concentrating on global level aspects of macro prudential supervision in insurance. It contains four chapters. The first one drafted by Paul Sharma focuses on the framework for globally systemically-important insurers (G-SII) including the way they are identified and the policy measures to be applied to them. The author underscores that this framework is a new, and deeply controversial concept that has arisen in the context of the response of governments, central banks and financial and insurance regulators to the financial crisis. It forms part of the equally-new, and no less controversial, wider framework for globally systemically important financial institutions (SIFI) whether bank, insurance or non-bank. The effect of the SIFI framework is to put in place a regulatory regime for some designated banks, insurers and non-bank financial firms that is both different and more onerous than that which is in place for other banks, insurers or non-bank financial firms. The idea which underlines the framework is that the harm to public policy objectives which follows if a SIFI fails is not only simply larger in scale, comparing to the harm that follows when a non-SIFI fails. It is additionally a different kind of harm that is more dangerous in its extent and more serious and pervasive in its consequences, and therefore requiring a different kind of public policy response. Without that public policy response SIFIs are said to be too big, too complex and too interconnected to be allowed to fail.

The second chapter in this part by Philippe Brahin explores the issue of the role of macroprudential supervision in the context of microprudential mandate and the group wide supervision. He underlines the need for a proper coordination of the functioning of macro-surveillance and existing micro-supervision at the local and group level. He observes in his study that the new macro-prudential institutions enjoy a broad mandate; they sometimes appear to take over the role of group supervisors
by promulgating a view on the risks presented by particular insurance groups and enforcing that view through new policy measures that might conflict with the existing ones. This overlap in regulatory authority is a principal issue which is addressed in this chapter. The author reviews the growing confusion between macro-prudential surveillance and group supervision in three areas: G-SII designation and policy measures, the development of the IAIS Common Framework (ComFrame) and the development of resolution planning.

In the next chapter, Sebastian von Dahlen and Marcelo Ramella discuss relevant institutional developments in the context of macroprudential regulation with a specific view on the insurance sector. In so doing, they provide an insight into the global macroprudential oversight architecture.

The chapter proposes an analysis of the global macroprudential architecture grounded on two distinct angles. First, it examines the role of insurance within current system-wide institutional arrangements (horizontal perspective). Second, it looks at on-going insurance-specific efforts by global, regional, and jurisdictional bodies (vertical perspective).

The paper argues that an analytical focus on two distinct dimensions, i.e. the horizontal and the vertical, sheds light on key current cross-roads faced in the design and implementation of the global macroprudential set-up. These cross-roads span from operational obstacles faced by authorities and industry involved in insurance specific macroprudential oversight practice to the normative content of macroprudential supervision decisions. They argue that these considerations will contribute to a better understanding of the part played by insurance in the global financial system.

The last chapter by Philipp Keller explores the issue of the possible misuse of macroprudential policy for protectionist purposes. (to be expanded).
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Chapter 1

Marek Monkiewicz

Dynamics of the safety net in insurance: trends and challenges

1. Introduction

The size of the global financial system approximated in 2011 370% of the global GDP. If however derivative trade is included this would have pushed the value of the global financial system well above 1200% of the global GDP for 2011. Assets of the banking sector alone represented 480% of GDP in UK, 494% in Switzerland, 311% in Germany and 82% in the US (GFSR, IMF, 2013, statistical annex, p. 12). This dramatic increase in the weight of the financial sector has been accomplished in the course of the last 20 or so years. In UK for example until the end of the 70’s in the XX th century the share of the banking assets represented only 50% of the country’s GDP and rocketed only since the 90’s (Haldane A., 2009).

As a result it has led to the situation in which economic safety and well being of the individual states and the global community is increasingly dependant on the safety of their financial systems. And yet safety of the financial system is not a preoccupation actively addressed in a direct way in the current academic debate. It is rather discussed indirectly in the context of the financial stability, systemic risk and the financial crisis – i.e. in the context of extreme situations. Moreover it has a tendency to concentrate on the banking perspective. Under such circumstances safety of the financial system is largely identified as its stability (Schinasi G. J., 2004, p. 6).

Such a narrow approach to the financial safety is difficult to justify with regard to the non banking financial sector and insurance in particular. Its relevance to the financial stability and systemic risk is much less pronounced and defined. In addition safety of the financial system cannot and should not be reduced to its stability. It is more than that. In particular these may include macroeconomic, monetary, fiscal, geopolitical as well as treaty factors. All of them in group and each of them alone or some constellation may influence safety of the financial system. Current financial and fiscal and economic recession in the EU may serve as a good illustration of this conclusion.
Safety of the financial system has a gradual nature and may represent various levels resulting, ceteris paribus, from policy measures applied.

When one restricts the attention to the private financial systems and markets the safety of the financial system may be defined as the situation with the following attributes (Iwanicz-Drozdowska M., 2008, p. 26; Monkiewicz M., 2013, p. 31):

1. there exist mechanisms and institutions which permit market operation only for selected financial companies
2. market participants are well equipped with relevant information for their adequate risk assessment
3. there exist mechanisms and institutions which permit safety control and monitoring and its repair/fixing whenever necessary including the mechanisms for the protection of the customers
4. there exist mechanisms and institutions for the orderly resolution and market exit of the inefficient companies including their bankruptcy.

Safety of the financial system may be analysed at different levels – national, regional or global. It may also be discussed at the sectoral level for example banking, insurance, securities industry and the like. Safety of the financial system is depending on several determinants. It is foremostly depending on the State and its policies. Particulary relevant are macroeconomic, monetary, fiscal and treaty policies. It also depends on its financial policy and the architecture of the financial market. Particular relevant are the shape and nature of its participants; their size, complexity, portfolios etc. An important part of the characteristics is the level of the market discipline. Additionally it depends on the financial education of the market participants and their market behaviour, rules and customs.

Finally safety of the financial system depends on the financial safety nets – the arrangements which are dedicated to this specific task on the stand alone basis.

The purpose of this article is an analysis of the evolution of this special socio-economic public construct in insurance context. We begin however by providing the framework discussing the nature, functions and building blocks of the financial safety net in the whole financial industry. We also make some remarks on its costs and unintended consequences. With this in hand we turn our attention to the
insurance industry and investigate the relevance of this concept to the insurance world. Finally we complement our discussion with some conclusions. We underline in particular a dynamic nature of the safety net and its growing coverage and complexity.

2. Financial system safety net: conceptual considerations

In spite of the rising popularity of the notion of the “financial safety net” in the context of the financial systems and financial markets its understanding is both far from univocal definition as well as its acceptance (Zaleska M., 2010, p. 172). In one of the first study focusing on this topic produced by The World Bank at the end of the XX century financial safety net was concisely defined as “the whole of financial regulations and institutions that seek to prevent or limit depositor losses in case of a bank failure”. (Demirguc-Kunt A., Huizinga H., 1999, p. 14). Thus the safety net has been viewed in a narrow way covering only banking sector and relating exclusively to the losses of depositors. In this context the use of this notion was, from the today’s perspective, some kind of an abuse. Similarly narrow interpretations of the safety net have been proposed subsequently by some other researchers (Kane E.J., 2009). Somewhat broader interpretation of the financial safety net was offered by Brock, who defined it as “a set of institutions, laws and procedures that strengthen the ability of the financial system to withstand bank run and other systemic disturbances” (Brock P., 1998, p. 2). This definition already applies the concept of the “financial safety net” to the whole of the financial market and not exclusively to the banking industry though banking asymmetry is still prevalent. Additionally “safety net” in this approach is more after failure prevention than crisis management. An important contribution of Brock to the discussion on the safety net issue is his observation that putting in place of a safety net results in the risk transfer from private players to the State with both positive (enhancement of the financial system) and negative (moral hazard) consequences.

New elements in the discussion have been offered by Solarz who defined safety net as “institutions and organizations which aim both to prevent the occurrence of disturbances in the payment system and financial intermediation activities as well as act in the crisis management phase to limit negative consequences of the financial crisis”. (Solarz J.K., 2005, p. 90). Thus he includes for the first time into
the safety net protection of the safety of the payment system and explicitly relates the notion of the “safety net” to all financial intermediaries, including insurance. He underlines at the same time that strategic options for the selection of the safety net architecture are placed in multidimensional space in which cost effectiveness, safety of the system and profitability of the financial institutions intersect. Broader perception of the financial safety net has been subsequently offered by Iwanicz-Drozdowska. She formulates the opinion that “safety net” includes all legal regulations and autoregulations which aim to both preserve the financial stability and to protect the interests of the market participants that use the services of financial intermediaries. It also comprises the whole of institutions which are responsible for the implementation of these standards into the practice” (Iwanicz-Drozdowska M., 2008, p. 23). She includes thus for the first time into the scope of the safety net directly, apart from financial stability, protection of the interests of the financial market customers. Additionally she takes cross-border perspective and includes into the architecture of the safety net both public and private elements. To sum up our deliberations so far there it is faire to say that there is no agreement so far among various researchers on the nature and scope of the financial safety net. There is no agreement either on its building blocks even at high level principles. All these elements however are undergoing substantial changes over time and some common understanding emerges. Initially the concept of the safety net was a narrowly defined banking relevant construct. For this reason its role for the stability of the financial system and combat of the systemic risk has been underlined. With the time this strict limitation began to wane. The concept of the financial safety net becomes the ownership of the entire financial system. It also starts to be expressis verbis recognised in the academic literature not only as the tool for addressing macroeconomic and macroprudential concerns but also to assist in accomplishing microeconomic ones. It reflects thus the growing convergence of the financial market and growing interconnectedness of the financial institutions. It also reflects our better understanding of the changes that have taken place in the financial system. Thus without going into unnecessary details we may conclude that at the general level financial safety net represents the whole of devices, both public and private, which serve for the protection of the safety of the financial markets and their customers. These devices include both private and public elements, both regulations and institutions. Safety net is a public construct and is shaped predominantly by the State. Private elements become a
part of the safety net only ones they are authorized or “accredited” by the State. Contemporary safety nets are focused primarily on the prudential protection of financial intermediaries and their customers with little attention given to the financial products.

The aims of this protection may vary in different jurisdictions and market segments. In some (e.g. banks) macroeconomic and stability concerns prevail, in some other (e.g. insurance) more microeconomic targets are tapped.

At the national level the net is an aggregate of the individual segments of the financial sector with various links and dependencies. At the international level it is an aggregate of national constructions and international layers.

Historically safety nets are a main by-product of the Great Depression 1929-1933. Once mainly implicit and ad hoc they have become by now more and more explicit.

There are two sets of functions that may be allocated to the safety nets:

- preventive, which protects financial systems against the financial shock
- mitigating (crisis management) which aims at limiting the costs of the financial systems failures.

Complex nature of the contemporary nets requires high level of coordination among various functions and institutions. This refers both to national and even more to international dimension. Recent financial crisis has proved the inadequacy of the existing safety net arrangements. For these reasons strong pressure exist to expand these arrangements into new areas and increase their protection level.

This refers in particular to the ability of the public authorities to better identify, assess and mitigate emerging risks in the financial sector. Enhanced micro supervision, group wide approach, prudent risk management is to be supplemented by macro supervision. Critical institutions and interconnectednesses are to be better identified, reinforced and monitored. Finally orderly resolution and limitations to the bail out role of the State are the additional elements of the amendments of the safety net to mention.
3. Size and costs of the safety net

Maintenance of the safety net is not a cost free exercise. The level of the costs involved depends primarily on the overall size of the net. It is however a complex methodological and practical challenge to evaluate its real size. This is well reflected in the fact that there are only few empirical studies available so far on this issue. The two most interesting pieces of research were carried out in the US: in 2002 by Walter J.R. and Weinberg J.A. and in 2010 by Malysheva and Walter (Walter J.R., Weinberg J.A., 2002, p 369-393; Malysheva N., Walter J.R., 2010, p. 273-290). They have used the same methodology and the same perimeter referring to the size of the US federal government financial safety net. Federal financial safety net was simply defined as all explicit and implicit guarantees of the federal government with regard to the liabilities of the deposit taking institutions, some GSEs (Government-sponsored enterprises – Fannie Mae, Freddie Mac, Farm Credit System, Federal Home Loan Banks) and federally insured private employer pension funds. Government guarantees were understood as the commitments of the State to protect the creditors (lenders) from default induced losses. Explicit guarantees were understood as formal commitments of the federal government resulting from the existing laws whereas implicit guarantees cover government commitments resulting from the past practice. According to the estimations of Walter and Weinberg the overall size of the federal financial safety net in 1999 reached the level of 8,4 trillions of USD and covered around 45% of the overall liabilities of the US financial firms in that year. Out of this amount around 5 trillions of USD represented explicit guarantees (Walter J.R., Weinberg J.A., 2002, p. 377). The value of the federal financial safety net was slightly below the vaue of the country’s GDP for that year. According to Malysheva and Walter the value of this safety net seven years later – in 2009 was about 25 trillions of USD. It covered around 59% of the overall liabilities of the US financial firms, by 25% more than in 1999 (Malysheva N., Walter J.R., 2010, p. 276). Its nominal value has well surpassed by 200% country’s GDP for the same year. When analysing these figures we should remember that they are leaving outside calculations non banking sector safety components, insurance in particular. This is because insurance is the responsibility of the individual states and their individual safety nets.
Total costs of the maintenance of the safety net may be split into direct and indirect ones. Direct costs include all direct expenditures for the maintenance of the individual components of the safety net. This covers such costs as the costs of the supervisory authorities, State guarantees, resolution authorities, guarantee funds, etc. Indirect costs embrace on the other hand unintended impact of the safety net on the market players. It is not only moral hazard effect which is most often quoted and which is the natural outcome of any safety measure not adequately priced. It also includes unintended impacts on resource allocation, business models, corporate behaviour and the like which affects economic efficiency.

The costs of the financial safety net are paid both by public authorities (i.e. by all taxpayers) and financial intermediaries (i.e. their customers) in different proportions in different jurisdictions. After a recent crisis there is a tendency however to debit much more private sector companies and individuals and make them responsible for the final bill. Thus for example new capital accord of Basel III is estimated to result in the increase of the share capital of 100 largest global groups by around 600 billions Euro. Solvency II in insurance may demand from the EU insurers three to four times more capital than currently required.

4. Architecture of the safety net in insurance

As indicated before overall safety of the financial system may be viewed as an aggregate of the safety nets of individual financial sectors embracing inter alia banking, insurance and securities safety nets. These fragments of the sector specific safety nets are both in competitive as well as in cooperative relationships. In either case these may lead to the convergence of some elements of the nets. A good example is the default resulting compensation pay out cap which is in most cases today representing similar level across different financial sectors in various jurisdictions. These may also lead to some distortions due to the effect of the regulatory capture. This happens when in the competition for relevant regulatory standards of the sectoral safety nets strongest intellectually and politically sectors are able to implant their own standards across all sectors which may happen not to represent adequate solution for the others. Under current circumstances for example there is a clear danger of extending
banking safety nets relevant elements to other sectoral nets and the entire financial market. It may result in the replacement of the standards which best account for the specificity of non banking financial institutions and non banking sectors.

Safety nets of the insurance sector has its industry specific institutional and structural peculiarity. This reflects in the first place different risk profile of the insurance companies comparing to banks and other financial institutions. In case of the deposit taking institutions up to 80% of their overall risk is represented by the credit risk whereas in insurance major class of risk is market risk (40%) and insurance risk (30%) (SwissRe 2010, p. 6). Moreover the latter one results from the loss events occurred and hence is uncorrelated with the business cycle in contrast to credit or market risk.

**Figure 1.1 Principal pillars of the insurance safety net**

Additionally insurance contracts are frequently of the long life nature and of the long settlement time. It takes for instance on average more than 10 years to settle the claims on general and motor third party liability insurance. Substantial part of life contracts terminate only after twenty to forty years.

An important characteristic of insurance comparing to banking is low exposure of insurers to liquidity risk which is an effect of the peculiarity of the insurance funding model. It makes as a result central bank in contrast to banking normally irrelevant for the safety of the insurance sector. Additionally insurers sectoral interconnectedness remains unlike the banks relatively low with no intense trade among individual agents which scales down sectoral contagion and domino effect.

Considering the design of the insurance safety net from institutional perspective four classical building blocks could be identified: owners’ oversight, debtors’ (public) oversight, market oversight and socio-political oversight. /see Fig.1/

Owners’oversight represents the hard core of the safety net of the entire financial system including insurance. Its minimal standards are concurrently set up by public prudential regulations and prudential supervisory policies. Prudential regulations have come up to the forefront of financial regulations quite late—only at the beginning of the 90’s in the XX century (Vittas D., 1991). They regulate concurrently a growing area of insurance activities. They define among others the principles of undertaking insurance activities, their pursuit, principles of their financing and sound management
as well as the principles of the safe wind down and market exit. They are evolving over time responding to the evolution of the safety perspective and safety models.

Prudential regulations are de facto cutting into the owners’ competences and owners’ oversight. This is a reflection of the lack of the reliability of the latter from the public point of view. The less trusted owners’ oversight is the more public prudential regulations become necessary. This is well grounded theoretically in the agency theory and potential conflicts among the owners (principals) and management (agents). Additionally it is reinforced by the trends in ownership structure and nature who becomes increasingly diluted and concentrated on short term strategic goals. As a result instead of strong owners’ oversight increasingly “quasi owners’ oversight “emerges. It is in fact concentrated in the hands of management and thus relieved of the owners’ incentive structures. This potential for conflict between agents and principals is particularly big in insurance due to the complex insurance finance and business model and long transaction settlement time. Both of these factors increase the danger of manipulation in financial reporting and overall performance and helps hiding real situation from the stakeholders. Hence as a result we come today to the situation in which owners’ oversight is performed in principle on the basis of the binding public standards. Owners’ oversight activities may be specifically dedicated to the needs of public oversight. It has become a common practice for example to exercise by insurance companies cyclical own risk and solvency assessment and sharing its results with the public supervisors. Equally frequent the companies participates in stress tests exercises drafted most often by the supervisors and sharing their results thereafter with them. In this way modern prudential regulations ever stronger integrates owners’ oversight with the public supervision. The reputation of the owners’ oversight has been seriously damaged in the course of the recent financial crisis. Its most illustrative example were remuneration policies for the top management pursued by the financial companies. They have been identified as a serious factor of additional risk generation and thus put under public scrutiny and regulation. Major addressees were banks but insurance companies were affected as well.

Prudential regulations in the insurance sector have been until recently as a matter of principle addressed to the entire population of the insurance companies only with some discounts in case of mutuals and captives. With the designation of an initial list of G-SIIs (Global Systemically Important...
Insurers) by FSB (Financial Stability Board) on July 18, 2013, a new layer of prudential regulation, based on add-ons principle, is emerging. The said G-SIIs including Allianz SE, AIG, Assicurazioni Generali S.p.A, Aviva plc, AXA S.A., MetLife Inc., Ping An Insurance (Group) Company of China Ltd., Prudential Financial Inc. and Prudential plc. and all subsequently designated entities will be subject to a range of additional regulations. They include the recovery and resolution planning requirements as defined by FSB’s Key Attributes of Effective Resolution Regimes, including the requirement of establishing for each entity a CMG (Crisis Management Group) and setting up a RRP (Recovery and Resolution Plan), enhanced group-wide supervision, including the group-wide supervisor to oversee the development and implementation of a SRMP (Systemic Risk Management Plan) and HLA (Higher Loss Absorbency) requirements. Of the measures outlined enhanced supervision is going to commence immediately, the Crisis Management Groups should be established by July 2014 and recovery and resolution plans, including a liquidity risk management plan should be ready by the end of 2014. Implementation details for the HLA are to be finalized by 2015 and be applied in 2019 by all G-SIIs identified in November 2017. Before that however the IAIS (International Association of Insurance Supervisors) is supposed to work out the “ordinary” loss absorbency capacity for the insurance world to be ready by the G-20 Summit in 2014. In July 2014 FSB will additionally designate G-SIIs and appropriate risk mitigating measures for major reinsurers. As in the case for banking, national jurisdictions will be expected to designate domestic systemically important insurers and assign proper risk mitigating measures. This may add to the existing batch of the prudential regulations across the globe (IAIS (1), 2013). This may additionally create new institutions complementing existing safety net. This may be the case for example with regard to the resolution authorities which may be necessary to mitigate risk emanating from systemically important insurers-global or domestic.

Next pillar of the insurance safety net is public prudential supervision. This pillar is essentially responsible for the daily monitoring of the insurance companies, taking remedial actions and ensuring their adequate compliance with regulatory rules and principles. Theoretical basis for the existence of public supervision in insurance is formulated in the theory of representation by Dewatripont and Tirole in 1994 and developed further by Plantin and Rochet in 2007 (Dewatripont M., Tirole J., 1994;
Plantin G., Rochet J. Ch., 2007). According to this theory management of financial intermediaries such as banks and insurers which finance themselves by debt issuance to their customers are under the pressure of their shareholders to take risky actions in order to accomplish extraordinary profits. This is fully rational from their perspective as equity (shareholder capital) in these institutions represents only a small part of their overall financing. Leverage ratio (i.e. assets to equity) which illustrates this phenomenon is these days on average 10 for commercial banks and 3 (P/C) – 10 (Life) for insurance companies (Swissre, 2010, p. 6). Possible losses for the shareholders therefore are small and shared to a large extent with their creditors: depositors and policyholders. On the other hand eventual extraordinary gains become fully appropriated by the shareholders. This natural moral hazard cannot be in case of these institutions tempered by their creditors. Both dispersed depositors and policyholders have neither adequate technical knowledge nor necessary information and competences to perform creditors’ oversight. They are therefore neither in a position to control their principals nor their agents (management). This role is essentially taken by the prudential supervision who according to the theory becomes a trustee of these small lenders. Concurrently due to the dispersion of the shareholding base this prudential supervision takes ever more additionally the role of the representation of small shareholders and defend their interest particularly against their agents, sometimes also against their large shareholders. Apart from the protection of the individual policyholders prudential supervisors may be tasked with other duties including contribution to the market integrity, its efficiency and financial stability.

National supervisory authorities may apply different supervisory models which may vary with regard to the depth of the supervisory intervention, width of the supervisory perimeter and the principal object of the supervisory intervention. (Handschke J., Monkiewicz J., 2010, p. 412-415). Currently the dominant supervisory model is focusing on the financial safety of the insurance companies and their risk management process that creates a basis for this safety.

In the aftermath of the recent financial crisis supervision has begun to apply increasingly prospective supervisory tools in particular scenario analysis and prudential stress tests. Additionally supervisory authorities have begun more often than before apply discretionary powers and principles based
Supervisory authorities may have different institutional arrangements. For quite a time insurance supervision has been performed by autonomous body, parallelly to its banking and securities peers. Since the beginning of the XXI century a clear tendency towards consolidation of these fragmented supervisory authorities has taken place. This had its roots in search for supervisory cost-effectiveness, need to limit supervisory arbitrage and last but not least in search for the alignment with current structure of the financial markets. This consolidation has been predominantly taken place outside of the central banks. Concurrently however these consolidated institutions, particularly in Europe, are coming often back to central banks.

Prudential supervision has been until recently focusing primarily on the safety of individual insurance companies and for this reason is rightly defined as microprudential supervision. In the aftermath of the financial crisis a need for different perspective – a macroprudential supervision – was recognized and generally accepted (Nier E.W., Osiński J., et al, IMF, 2011; Osiński J., Seal K., Hoogduin L., IMF, 2013; Houben A., 2013). Its focus is on market wide perspective and safety of all market participants. Its role is mitigation of systemic risk and maintaining financial stability (IAIS, 2013). Therefore its special task is detecting financial market inter-linkages, identifying common exposures of the insurance companies and possible contagion effect that may be of relevance. As a result the emergence of the two pillar supervisory system takes place adding to the complexity of supervisory arrangements. Leading role in this new supervisory pillar is given to central banks because of their hitherto involvement in the financial stability issues and analytical resources.

The third pillar of the safety net in insurance is made up by market supervision exercised by insurance guaranty schemes. In contrast to banking they are relatively recent innovation in insurance. They have come to existence in the 70’s and 80’s of the last century in the US and subsequently spread into other countries. They are basically an element of crisis management in case of liquidity or solvency failure of the insurance company. They are in most cases special purpose funds created and financed by insurance companies at the public request. They may be pre-funded before the failure happens or post funded when need arises. They become active once specified criteria are met. These specified criteria
are normally either default or loss of liquidity. This is not a rarely phenomena. In 1988-2008 in the US on average there were 33 insolvencies annually in non life sector and 21 insolvencies in life sector (Cummins D., Weiss M., 2010, statistical annex). Altogether in 1996-2010 there were over 320 insurers’ insolvencies in the US and 160 in European Union. (Monkiewicz M., 2013, p. 270)

Insurance guaranty schemes may also be used for other purposes of the insurance sector. Such situation exists in EU where these vehicles are playing inter alia an important compensatory role in the TPL motor insurance compensating the losses caused by uninsured and unknown drivers. The existence of these guaranty schemes is the reflection of the fact that the two first pillars of the safety net discussed and which are of a preventive nature may not be sufficient to protect insurance companies against default. Their principal role therefore is to provide additional protection to the policyholders complementing the level of protection offered by individual companies. In economic terms these schemes are a form of reinsurance contract which come into operation if specified trigger (e.g. default of the insurance companies) takes place (Fig 2).

**Figure 1.2 Guaranty schemes and the protection of policyholders**

Since these institutions are most often privately financed and managed by insurance industry players they may have general inclination to discipline insurance companies and control their risk policies and behaviour to minimise collective expenditures in case of default.

These collective guaranty schemes may in case of insurance industry play two different roles – pay box or risk minimizer. The essence of the pay box role is to pay out to the eligible persons guaranteed compensation amount notwithstanding available resources of the failed company. The difference between available assets and liabilities is financed collectively by remaining healthy insurance companies in proportion to the established criteria, most often the premium income. The kind of the eligible persons and size of the compensation may vary depending on the specific rules adopted in a given jurisdiction. Some policyholders such as large corporations or managers of the failed entity and large shareholders are often excluded from the compensation offer. There are also frequently maximum limits of compensation benefits offered.

Risk minimising role is an innovative and more complex function of insurance guaranty schemes. It is also much less popular in the existing population of schemes. Its essence is to mitigate the default risk
to the insured and to mitigate the adverse effects of the materialisation of the default risk. The guaranty schemes in this role are focusing their attention on the prevention of a failure by monitoring risk taking by their sponsors and offering some financial assistance to overcome transitional difficulties if need arrives. Additionally guaranty schemes may offer run off solutions or be involved in finding portfolio acquirers to protect interests of insureds by continuing existing insurance contracts. In their role as risk minimizers guaranty schemes come close to the activities normally restricted to supervisors and become their important partners. There are good arguments for having assigned this role to the guaranty schemes but there are also weighty counter arguments. Major bonus offered is increased flexibility in selecting best possible solution to the specific problem. The most important malus is additional provision of the moral hazard incentive.

The final remaining pillar of the safety net in insurance is the State/Government/ and public intervention rules into the safety of the market. This is a unique role apart from its regulatory function. The State has emerged during the recent financial crisis as a great reinsurer of the financial sector which appeared after other safety net pillars turned out to be ineffective. This turned out to be fiscally extremely expensive. This has also become unbearable to do it in the future both politically and economically considering continuing financialization of the real economy and rising consolidation of the financial institutions. For these reasons current initiatives are aiming at converting State bail out into the creditors bail in. At the same time current solutions are offering to the States far going administrative powers including shareholders expropriation and taking over and resolving businesses to solve the critical situations. This is for the time being limited in most cases to systemically important institutions however it may be spread into the wider audience.

5. Final remarks

As our analysis indicates safety net of the current insurance market and its operators is a complex construct which has multiple determinants and which tends to evolve over time reflecting current values and believes. It is built of many interrelated elements which must be properly balanced and coordinated. It is a part of the broader category of the financial system safety and its safety net with
which various interconnectednesses exist. This existence gives a possibility also for the appearance of negative externalities i.e. contagion effect.

In the course of the recent financial crisis existing safety net arrangements have been severely stress tested and new life has been put into the vision of the safety net. Washington consensus which dominated global economic thinking for many years and which lauded the small State and the big regulatory role of the market forces in financial area has been quickly replaced by Seoul consensus. The latter one rests on the key role of the State in its regulatory function and new pragmatic approach to the State ownership in the financial sector. Characteristic feature of this new approach towards safety net is well reflected by Houben who recommends to supervisors inter alia to adopt the precautionary principle and err on the side of caution and not otherwise (Houben A., 2013, p. 209).

This emphasizes the importance of willingness to act to mitigate potential risk. As a result new concepts and ideas in relation to the safety net have come up. These new elements include inter alia:

- differentiation of the spectrum of available regulatory standards and creation of special regulatory regimes for systemically important institutions
- creation of special institutions for the purpose of restructuring and resolution of systemically important institutions
- creation of a new supervisory pillar-macroprudential supervision- for the benefit of financial stability and to mitigate systemic risk
- changing the powers and policies of the State for crisis resolution within the financial sector
- assigning special role to the group wide regulation and supervision
- assigning new role for the ownerships’ oversight and interactive risk management process at the insurance company level.

All of these is taking insurance industry into uncharted waters and requires proper responses both from regulatory, supervisory and business community.
Figure 1.1 Principal pillars of the insurance safety net

Source: own compilation

Figure 1.2 Guaranty schemes and the protection of policyholders
Source: own compilation

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1. Introduction

Systemic risk and macroprudential supervision have been two fundamentally important research topics in the financial services sector over the last five years. In the wake of the collapse of Lehman and AIG, and the financial crisis more generally, academics and practitioners both have engaged in a great deal of discussion about the extent of systemic risk and the need for macroprudential supervision in the banking and the insurance sector.

With regard to systemic risk in the financial sector, the literature mainly deals with questions such as: What is systemic risk? How can it be measured? And how can it be reduced? Until now, none of these questions could be answered with any degree of certainty.¹ At this point, however, academics agree that microprudential measures that focus on limiting the distress of a single institution are insufficient to reduce systemic risk. To ensure financial stability, an increasing number of academics and regulators call for macroprudential supervision that focuses on the whole system and the wider economy. Examples are Brunnermeier et al. (2009), Constâncio (2010), and Hannoun (2010).

Most studies on macroprudential supervision focus on the banking industry and neglect the insurance sector. An exception is Acharya et al. (2011), which analyzes U.S. insurance regulation. The authors criticize the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 for not sufficiently considering insurance companies in its provisions. They argue that non-traditional insurance activities increase systemic risk and therefore insurance companies need to be covered by macroprudential regulation as well. Harrington (2011) also discusses the Dodd-Frank Act with regard to insurance companies but argues in the opposite direction. According to this author, in contrast to banking
activities, most insurance activities are not systemically relevant and insurers have more incentive to stay financially healthy. He concludes that the Financial Stability Oversight Council (FSOC) should be cautious about proposing additional regulatory burdens for the insurance sector.\textsuperscript{2} In Europe, the necessity for macroprudential supervision of the insurance industry has been realized as well. Solvency II, the new regulatory regime for insurance companies planned for introduction in 2016, states: “Financial stability and fair and stable markets are other objectives of insurance and reinsurance regulation …” (European Parliament and Council, 2009, Article 16).

With respect to the insurance sector, Eling and Pankoke (2013a) review 43 theoretical and empirical research papers on systemic risk and suggest several other areas of research that would be useful in this field. We build upon and extend the results by Eling and Pankoke (2013a) as follows: After a discussion of the term ‘systemic risk’ and a review of the extant research results on systemic risk in the insurance sector, we analyse the implications of this discussion for macroprudential supervision. For this purpose, we evaluate the relevance of banking-sector macroprudential instruments to the insurance sector. Moreover, we discuss to what extent systemic risk might be triggered by regulation itself, especially by Solvency II, the forthcoming European-wide regulatory framework for risk-based capital. Finally, in the last section we provide a summary of the points made in this chapter.

Our results deepen understanding of systemic risk in the insurance sector and also encourage more research in this field. In light of the insurance industry’s important economic function, our results indicate that policymakers and regulators need to closely analyse systemic risk and design appropriate macroprudential tools to ensure financial stability.

2. Systemic Risk

As pointed out above, there are several definitions of systemic risk and none is without problems. The most common and widely used definition of systemic risk in the financial services sector is based on reports from the Financial Stability Board (FSB).\textsuperscript{3} Systemic risk is defined as “a 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 negative consequences for the real economy”. Crucial to this definition is
the notion that crisis or failures of financial intermediaries, markets, or infrastructure must have an impact on the real economy in order to be labelled systemic as mentioned by FSB (2009) and IAIS (2009). When it comes to classifying systemic risk, three aspects are frequently discussed (see Figure 2.1):

How is the system endangered (types of systemic risk)?
Which institutions or business activities are prone to contribute to systemic risk?
Which parts of the system are especially vulnerable to impairments of the financial system?
In the following, we discuss each of these three aspects in light of the relevant literature. Finally, we discuss the question of how systemic risk can be differentiated from a normal crisis, which is important since these two aspects are often mixed in the discussion.

Figure 2.1  Key aspects in analysing systemic risks

Source: based on De Bandt and Hartmann, 2000; Harrington, 2009, 2011; and Baluch et al. 2011).
2.1 Criteria for Classifying Systemic Risk According to Type of Risk

Systemic risk can be classified according to the type of risk which causes the distress of the financial system. Accumulation risk occurs when one external shock has a negative impact on most financial services companies and, as a consequence, these institutions can no longer offer their full range of services. Contagion risk manifests as the classic domino effect. The process begins when one or a few market participants cannot meet their obligations. As a consequence, direct-contract counterparties may find themselves in distress, which leads to trouble for other parties as well. The greater the number of entities that get into trouble, the more intense the contagion effect becomes, and in the end, the whole financial sector can be affected and a spillover to other parts of the economy can occur. Even very stable companies with a solid business model can then be endangered. It is important to note that contagion can occur indirectly via information as well. If one company is in distress for a certain reason, stakeholders (e.g., shareholders, debt holders, and suppliers) may conclude that that reason affects other institutions also. Thus, companies can be put at risk based merely on changing perceptions as mentioned by Harrington (2009, p. 802) and Cummins et al. (2012). Aligned behaviour by many market participants is a serious risk as well since it can lead to market distortion or failure if, for example, market participants are no longer willing to buy a certain asset.

At the beginning of the financial crisis in 2007, accumulation risk did not play an important role. The slump in housing prices had a direct effect only on a few banks. How this crisis differed from previous real estate crises, however, was that investments were much more interconnected this time around due to securitisation and credit default swaps. So, the first risk to materialise was contagion risk. Later, aligned behaviour by most banks led to the collapse of the interbanking market, which forced the central banks to provide liquidity so as to prevent the breakdown of the whole financial system (see, e.g., Diamond and Rajan, 2009 as well as Gorten and Metrick, 2012). This real-life illustration makes clear that the classic risk categories—market risk, credit risk, and liquidity risk—do not, in themselves, constitute systemic risk as long as they affect only one or a few companies. The situation
changes, however, when these risks have an impact on most market participants or set off a chain reaction.

2.2 Criteria for Identifying Business Activities Contributing to Systemic Risk

Another key aspect when discussing systemic risk is to identify criteria for classifying systemically relevant companies or business activities. The FSB suggests three criteria for evaluating the systemic risk contribution of financial services firms: size, interconnectedness, and substitutability (see FSB, 2009). According to the FSB, these criteria should be applied to companies. However, the scientific discourse suggests that it might be more effective to use the criteria to evaluate business activities instead of whole companies. In most cases, it is not the whole company that contributes to systemic risk, but only certain business units of it. An assessment of systemic risk on a business-activity level enables effective supervision and minimizes the possibility of circumventing regulation. The AIG Financial Services division, for example, was not bound by the tough regulatory framework for insurance companies despite its very risky business model. Only the much less riskier parts of AIG were subject to insurance regulation, and thus the company’s severe contribution to systemic risk was not visible. Also, the size of a company does not necessarily increase the systemic risk contribution if the company is well diversified (see Adrian and Brunnermeier, 2011, Kessler, 2013, p. 9 and IAIS, 2011, p. 32). In fact, the business model of an insurance company is based on the pooling of idiosyncratic risks which are not correlated. As long as the size of a certain business line is not the result of risk concentration, but a utilization of the law of large numbers, there should be no increased potential for systemic risk (see IAIS, 2011 and 2012a).

Interconnectedness refers to the connection between a company or a business activity and the financial system. It captures the degree to which other institutions/activities/markets and products are affected by the business activity. Substitutability means that there are alternatives to a market participant or service. According to IAIS (2012a), high substitutability is a key feature of the insurance industry, at least compared to the banking sector, and therefore is a less important factor in assessing systemic risk for this industry. Another aspect in analysing systemic risk is the speed of contagion in the case of
crisis and how long certain activities can withstand impairment. If contagion takes place slowly, regulators have time to intervene. If this is not the case, however, prevention becomes crucial and the danger of systemic risk is much higher. A computer-based security trading is an example of this type of risk. If the price of a security falls below a certain threshold, a chain reaction can be triggered by automatic selling algorithms, which occurs so quickly that it is difficult, if not impossible to prevent a big slump in prices. In contrast, if a business function can withstand a shock for a relatively long time before becoming impaired, regulators have the chance to intervene.

2.3 Criteria for Increased Vulnerability to Impairments of the Financial System

It is important not only to identify which kinds of infrastructure, entities, or functions contribute to systemic risk, but also to discover which parts of the financial systems are most vulnerable in times of crisis. The FSB proposes four factors for assessing an institution’s resilience in an unfavourable economic environment: leverage, liquidity risk, maturity mismatch, and complexity (see FSB, 2009). Again, all these factors can be applied to institutions and/or activities. That a highly leveraged financial institution has a high risk of insolvency in the event of a cyclical downturn is obvious; although less obvious, the same is true for individual investments. In the case of an adverse price movement, an investor will more quickly close highly leveraged positions than unleveraged ones. Thus, the higher an institution’s leverage and its investments, the faster the assets have to be sold if there is a negative change in prices. Liquidity risks and maturity mismatches are two sides of the same coin and can lead to problems when rolling over the funding of an insurance company. The FSB guidelines can help determine whether an institution should be considered complex. According to the FSB, a complex institution is a financial group that (a) operates diverse types of activities through numerous legal entities; (b) operates across borders with centrally managed capital and liquidity; and/or (c) sells or provides new and complex products that have not been sufficiently tested (see FSB, 2009, p. 13). However, there are no quantitative measures for complexity and so whether an institution is complex or not is, in the end, a judgement call. Also, complexity in itself is not a systemic risk; it is the lack of transparency implied by complexity that poses the risk. In times of crisis it might be
unclear what kind of exposure such an institution has—to regulators, market participants, and maybe even the company itself.7

2.4 Differences Between Systemic Risk and the Risk of a ‘Normal’ Crisis

A question often raised is how to differentiate systemic risk from the one of a ‘normal’ crisis. The difference between the two is that, compared to a ‘normal’ crisis of fairly limited scope, a systemic crisis implies that the financial services sector will be so severely impaired that the rest of the economy will be affected.

In the case of contagion risk the disruption of the financial system is caused by the activities of a small group of market participants or submarkets and spread via contagion throughout the whole economy. According to Harrington (2009, pp. 801–803, 2011) and Park and Xie (2011) this can happen in the following ways:

decrease in asset prices caused by sales of a few institutions which forces other market participants to sell assets as well,

bankruptcy of institutions, which triggers insolvencies of other companies due to unfulfilled commitments,

investor uncertainty, eventually resulting in aligned behaviour, due to the distress of one company combined with non-transparency as to whether other companies are experiencing the same problem, irrationality, and

contracts based on credit ratings.

However, the differentiating aspect to a normal crisis is that there is a serious negative effect on the real economy as well. A cascade of bank bankruptcies would not be a systemic risk if it does not result in negative externalities for the rest of the economy. The same is true for accumulation and aligned behaviour risk. A macroeconomic shock or the aligned behaviour of market participants which has an impact on all financial intermediaries, but does not cause in the aftermath adverse effects on the real
economy, would not be labelled a systemic risk (see, e.g., De Bandt and Hartmann, 2000 and FSB, 2009).

As to business activities, only those that are directly linked to other companies and can influence them negatively are relevant for systemic risk. For example, human resources management and compliance are not systemically risky, since normally they are entirely internal processes.

The differentiation between systemic risk and ‘normal’ risk is important, as is differentiating between contagion-, accumulation- and aligned behaviour-based systemic risk. Each type of risk might implicate a different regulatory response. It makes a difference in the game of dominoes whether the dominoes fall one after the other or all at once. Another important question to answer is whether one should even care that the dominoes fall, much less how they fall.

3 Systemic Risk in the Insurance Sector

In order to discuss the systemic risk in the insurance sector we use the systematic approach introduced in the previous section. Therefore we differentiate between the ‘contribution to systemic risk’ of a certain business activity and/or company and its ‘vulnerability to impairments of the financial system’.

In addition we attribute the various business activities to either traditional or non-traditional insurance activities and to either the underwriting or funding & investing process as shown in Table 2.1. The classification of activities in traditional and non-traditional is loosely based on IAIS (2012b, p. 12). If the underlying risks of a certain activity are (i) idiosyncratic, (ii) not correlated with each other, and (iii) independent from the business cycle, we consider the activity as traditional, otherwise as non-traditional.

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<thead>
<tr>
<th></th>
<th>Traditional</th>
<th>Non-traditional</th>
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<tbody>
<tr>
<td>Underwriting</td>
<td>Life &amp; collective life insurance</td>
<td>Annuities (with guarantees)</td>
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<thead>
<tr>
<th>Funding &amp; Investing</th>
<th>Annuities (without guarantees)</th>
<th>Credit insurance</th>
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</thead>
<tbody>
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<td></td>
<td>Property &amp; casualty insurance</td>
<td>Financial guarantees</td>
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<td></td>
<td>Liability &amp; legal insurance</td>
<td>Financial derivatives issuing</td>
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<td></td>
<td>Health insurance</td>
<td>Insurance-linked securities issuing</td>
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<td></td>
<td>Reinsurance</td>
<td>Industry-loss warranties issuing</td>
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<td></td>
<td>Asset &amp; liability management</td>
<td>Securitization of upfront commission payments and future profits</td>
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<td>Liquidity management</td>
<td>Securities lending</td>
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<td>Credit rating utilization</td>
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<td>Short-term funding via issuing commercial papers</td>
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<td>Liquidity Swaps</td>
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</tbody>
</table>

Table 2.1 Classification of various business activities in insurance

Source: Based on: IAIS, 2012b, p. 12

3.1 Systemic Risk in Traditional Insurance

Life & collective life insurance underwriting can be considered as neither contributing to systemic risk nor to increase the vulnerability of an institution to an impairment of the financial system. The same is true for the annuities business as long as the policy holder bears the investment risk and no guarantees are given by the insurance company. Due to policyholder protection schemes in most countries (see, e.g., Oxera, 2007) and high substitutability of life insurance companies the effect of an impairment of these activities is rather limited (see, e.g., Cummins and Weiss, 2013). Furthermore, even if there was no policyholder protection in place these activities would not contribute to systemic risk, since impairments of life insurance activities have no extraordinary impact on the economy or the financial
system. Also, the vulnerability of these activities to impairments of the financial system is low, because the investment risk bears the policyholder.

Also, neither there is a contribution to systemic risk or an increased vulnerability to impairments of the financial system for property, accident, liability, legal or health insurance. The stability of these activities lies in the fact that there are only cash outflows if a certain loss event takes place, which is mostly independent from the business cycle. Also, claims settlement can take several years and therefore the insurance company, the regulator and the policyholder holder have time to counteract any adverse developments (see, e.g. Trichet, 2005 and Geneva Association, 2010a).

There are two arguments why reinsurance underwriting could both contribute to systemic risk and increase the vulnerability of an insurer to impairments of the financial system. First, since not only primary insurers cede business to reinsurers but also reinsurers themselves, a retrocession spiral could evolve if one reinsurer goes bankrupt. Second, since reinsurance contracts mostly include a clause that the contract can be cancelled if there is a rating downgrade of the underwriting reinsurer, reinsurance can be regarded as highly interconnected. However, scenario analyses show that the reinsurance sector is robust and a retrocession spiral or any other contagion within this industry is unlikely (see Park and Xie, 2011 and Van Lelyveld et al., 2011). Another reason why reinsurers are unlikely to contribute to systemic risk is that both primary and reinsurers highly diversify when ceding parts of their business (see, e.g., Kessler, 2013).

In the funding & investing process of traditional non-life insurance activities upfront collected premiums are used to pay later claims which are contingent on a certain loss event. Therefore, an ‘insurance run’ is not possible in non-life insurance. In life insurance with a savings component policyholders theoretically can cancel their contracts; however, ‘insurance runs’ are unlikely as well, since high lapse fees have to be paid. Also, Baranoff et al. (2013) show that the life insurance industry could even endure the cancellation of large amounts of contracts without starting a fire sale of assets. Alternatively, an asset-maturity mismatch could exist, too, if insurers hold long-term liabilities and
short-term assets. In this case the company would be very vulnerable towards changing interest rates. Fortunately, in practice both in the life and non-life insurance industry this is not the case and insurers match the maturities of their liabilities and assets (see Geneva Association, 2010a, p. 36 and Cummins and Weiss, 2011, p. 18). We conclude that the current asset & liability management neither contribute to systemic risk nor increases the vulnerability of an insurer to financial impairments.

Radice (2010) and Drake and Neale (2011, p. 73) argue that poor liquidity management can increase the vulnerability of an insurance company in times of crisis. On the one hand, in times of crisis a regulator could enforce that liquidity stays within its jurisdiction and cannot be transferred to another jurisdiction where it is needed. On the other hand, as in the AIG case, poor liquidity management could lead to the situation that healthy insurance subsidiaries of a financial group have to pay for non-insurance subsidiaries. Therefore, liquidity management might be a source for increased vulnerability.

We conclude that traditional insurance activities do not contribute to systemic risk. Also, we do not see that traditional insurance activities increase the vulnerability of an institution to impairments of the financial system. Poor liquidity management is an exception which might lead to an increased vulnerability in times of crisis.

3.2 Systemic Risk in Non-Traditional Insurance

Annuities with guarantees do not contribute to systemic risk but do increase the vulnerability of an institution to impairments of the financial system. If a company offering guaranteed annuities becomes distressed, it could be unfortunate for the policyholders if there is no protection scheme in place, but the financial system or the wider economy is not affected. In contrast, if financial markets are in distress and the interest rates deviate largely from the insurer’s calculations, guaranteed annuities might lead to financial distress for the company. This can be the case if a higher return on investment is promised to the policyholders than the company can achieve. This argument is in line with Cummins and Weiss (2013), who empirically show that according to the systemic risk measure
SRISK, especially those companies are systemically risky which provide annuities with options and guarantees

In the case of credit insurance, Baur et al. (2003) and Geneva Association (2010a) argue that both its systemic risk contribution and possibility for increased vulnerability are low. As for traditional non-life insurance contracts, cash outflows occur only if the loss event takes place, i.e., the insured investment is not repaid. However, it must be kept in mind that credit insurance is not independent from the business cycle and in times of crisis increased cash outflows can be expected.

In contrast to credit insurance, financial guarantees can both contribute to systemic risk and increase an insurer’s vulnerability to impairment of the financial system. Within the financial system, financial guarantees increase interconnection and contagion risks since they are valued mark-to-market and therefore losses can quickly spill over to other market participants. Financial guarantees also increase vulnerability because if the rating of the guarantee provider is downgraded, the guarantee contract might force the provider to pose additional collateral or give the guarantee buyer the option to cancel the contract. (see Geneva Association, 2010a, pp. 58-63 and Drake and Nale, 2011).

The conventional wisdom in regard to issuing credit default swaps (CDS) is that this activity contributes to systemic risk. In the event that a CDS underwriting institution goes bankrupt there is a high probability that the CDS buying institutions will become distressed as well, leading to a domino effect. Also, CDS underwriting increases the institution’s vulnerability to impairment of the financial system, since as soon as the institution’s rating is downgraded, it has to provide additional collateral. There is consensus in the literature regarding the increased vulnerability of CDS writing institutions; however, a few authors argue that CDS underwriting does not contribute to systemic risk, since CDS buying entities are normally highly diversified (see Wallison, as reported by Harrington, 2009 and Radice, 2010).
Insurance-linked securities are basically secured underwriting risks. Their contribution to systemic risk or their increase of vulnerability therefore depends mainly on the underwritten risks and thus varies across instruments. Despite that, the securitization itself is more likely to have a stabilizing effect because it helps to further distribute the risks among a wider range of different entities. Studies by Cummins and Weiss (2009) and Weiß et al. (2013) on catastrophe bonds, for example, show that this type of bond does not contribute to systemic risk and does not increase the vulnerability of institutions to impairments of the financial system. In contrast, industry-loss warranties might be relevant to systemic risk, according to IAIS (2012b), because if they are used to hedge underwriting risks, basis and credit risks automatically emerge. However, there is not much research on the systemic risk of either insurance-linked securities or industry-loss warranties, so any systemic risk assessment of these products is fraught with uncertainty.

The same is true for the profit enhancing methods of credit rating utilization and the securitization of upfront commission payments and future profits. For both methods there are no academic studies available. Nevertheless, credit rating utilization, which means increasing debt as much as the current rating allows and investing these additional funds in short-term assets, might contribute to systemic risk. In the event of a financial crisis, the risk of a rating downgrade for an insurance company increases and therefore credit rating utilization must be reduced. On an aggregated level, the sale of short-term assets could put additional pressure on asset prices and further aggravate the crisis. Also, the higher debt level increases the insurer’s liquidity risk and its vulnerability. With regard to the securitization of upfront commission payments and future profits, systemic risk could be increased due to the fact that the investor bears market, operational, interest rate, and underwriting risks. However, according to IAIS (2012b), the market volume of this instrument is neglectable up to now and therefore not systemically relevant.

Securities lending is frequently discussed in the literature and the majority of studies argue that it can contribute to systemic risk as well as increase the vulnerability of an institution to the distress of the financial system.9 Securities lending normally means that long-term securities are lent temporally to
other market participants in return for cash collateral, which is invested in short-term assets. If this activity is poorly managed, e.g., the collateral in invested in long-term or risky assets, high liquidity risk arises for the issuing insurer and a high counterparty risk for the investing institution. In contrast, a few authors, among them Baranoff (2012), are of the opinion that the systemic risk contribution of securities lending is doubtful. The ratio between the value of the lent/borrowed securities and the net provided/received cash collateral varies according to the insolvency risk of the counterparty. For example, AIG lent securities and received 120% of the value of the securities as cash collateral. However, due to its increased risk profile, it had to provide collateral as well in the end. Baranoff (2012) argues that AIG’s counterparties would have experienced only a very limited loss due to the securities lending program because the counterparties could have sold the securities and kept the cash collateral provided by AIG. Therefore, the systemic risk contribution of AIG’s securities lending program was minimal.

Two of the most recent developments in the interaction between banks and insures are collateral upgrade transactions and, in particular, liquidity swaps. To date, there is no academic work on these instruments and only the U.K. regulators are addressing them. The instruments are not as yet very clearly defined but, generally, liquidity swaps describe transactions that give banks access to the liquidity of insurers’ asset portfolios due to the temporary exchange of assets (see FSA, 2011, p. 1). A common transaction would be one where for three to ten years the bank borrows highly liquid U.K. government bonds and provides illiquid assets as collateral, as well as pays interest or a fee (see Davies, 2011). Collateral upgrade transactions are transactions made for the purpose of any risk transformation in general (e.g., credit risk), not only liquidity risk (FSA, 2012). In our opinion, it is very likely that these activities increase the vulnerability of insurers to impairments of the financial system. A high engagement in these activities leads to a substantial liquidity risk for the insurer in times of crisis, since these activities can counteract the advantageous effect of collecting upfront premiums. If most premium income is transformed into illiquid assets, the insurer might not be able to pay claims in disadvantageous market environments. However, in general we would argue that these
activities do not contribute to systemic risk, since in case of an insurer’s bankruptcy, the counterparties are already in possession of the assets they prefer to hold.\textsuperscript{10}

We conclude that most non-traditional insurance activities have the potential to increase the vulnerability of an institution to the impairment of the financial system. Exceptions are a few insurance-linked securities like catastrophe bonds. Also, most non-traditional insurance activities contribute to systemic risk. Again, an exception is the catastrophe bond, along with credit insurance and guaranteed annuities.

\textbf{4 Implications for Macroprudential Supervision}

Microprudential regulation is intended to protect individual policyholders against the threat of insolvency of a single institution. Macroprudential supervision, in contrast, takes a broader macroeconomic perspective and aims to protect the economy against spillover effects and an economic crisis (see Borio, 2003). In short, macroprudential regulation can be thought as a way of reducing systemic risk and ensuring financial stability (see Constâncio, 2010, p. 1; Galati and Moessner, 2013, pp. 848, 864). What implications does the above discussion of systemic risk in the insurance sector have macroprudential regulation?

The existing research indicates that the traditional insurance activities in the life, non-life, and reinsurance sectors neither contribute to systemic risk, nor increase insurers' vulnerability to impairments of the financial system.\textsuperscript{11} However, the industry’s non-traditional activities, such as, e.g., financial guarantees, CDS writing, and securities lending, might increase vulnerability. Moreover, life insurers might be more vulnerable than non-life insurers due to higher leverage. Furthermore, it is especially CDS and financial guarantees in the underwriting process, as well as securitization of business, including guarantees and short-term funding, in the funding and investing process that are likely to contribute to systemic risk.
The first implication from these results is that insurers engaged in only traditional activities do not need macroprudential regulation. For example, for insurers offering only traditional non-life, life, or reinsurance products, as shown on the left side of Table 2.1, there is no need for additional regulatory requirements so as to ensure financial stability. However, the regulator should nevertheless monitor these insurers since small changes in product offerings, e.g., annuities with or without guarantees, can significantly change the insurer’s contribution to systemic risk and/or its vulnerability to financial market distress. Also, additional macroprudential regulation might be necessary if the insurer is part of an insurance group. If there are interrelations with more risky entities of the group or these interrelations are not clear to the financial market, the insurer’s systemic risk contribution and vulnerability might be increased. However, complexity should not be confused with size. In our opinion, the increased size of an insurance company alone does not justify macroprudential regulation since it does not automatically lead to a higher systemic risk contribution (see Section 0).

A second implication, however, is that those insurers engaged in non-traditional activities need to be more closely analysed and regulated,12 most especially when their non-traditional activity involves banking-like products. AIG is the most prominent example—and warning—of this. We propose that regulators use a simple approach to determining when increased surveillance is necessary, such as:

Determine upper limits for non-traditional activities
If non-traditional activities exceed the upper limits, then additional macroprudential regulatory requirements are applied to the institution.

Currently, the International Association of Insurance Supervisors (IAIS) uses an indicator-based approach that takes the size, substitutability, and interconnectedness of the insurer into account; however, 45% of their decisions as to whether an insurer is systemically important are based on whether the insurer is engaged in non-traditional insurance activities (see IAIS, 2013a).13
In light of the above discussion, two questions arise. First, what kinds of instruments are available for macroprudential regulation? Second, are these instruments appropriate for the insurance industry?

Policies to counter systemic risk are not independent from other policies with various other goals. In the following, we focus on macroprudential instruments at the level of the single institution. As stated by Galati and Moessner (2013), Hannoun (2010), and the International Monetary Fund (IMF) (2013), monetary, fiscal, and other policies can be used to ensure financial stability as well. A comparison of micro- and macroprudential instruments can be found in Osiński et al. (2013, p. 23). Currently, the Macroprudential Policy and Surveillance Subcommittee (MPSCC) of the IAIS is working on a toolkit appropriate for the insurance industry (see IAIS, 2013b).

Table 2.2 shows the various macroprudential instruments currently being discussed, mostly for the banking industry. We evaluate the appropriateness of these instruments for the insurance industry.

<table>
<thead>
<tr>
<th>Type of Instrument</th>
<th>Description</th>
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<tbody>
<tr>
<td>1 Accounting standards</td>
<td>Accounting standards could be designed in such a way that procyclical effects are avoided. Provisions could be dynamic and accounting figures for microprudential requirements adjusted according to systemic risk.</td>
</tr>
<tr>
<td>2 Liquidity standards</td>
<td>To counter systemic risk, liquidity surcharges and/or limits to liquidity ratios, depending on the systemic risk contribution of the institution, could be introduced.</td>
</tr>
<tr>
<td>3 Risk concentration limits</td>
<td>The allowed exposure to certain risks could be limited and/or the regulatory requirements be increased according to ratios showing risk concentration. For example, doing business with certain industries or in certain geographical regions could be restricted.</td>
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<tr>
<td>4 Restrictions on activities</td>
<td>Certain activities could be restricted for systemically relevant institutions and/or the joint operation of activities. Examples include a limit on the ratio</td>
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<td>5</td>
<td><strong>Compensation schemes</strong> Performance-oriented remuneration could be long-term oriented in order to provide management with systemic-oriented incentives.</td>
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<tr>
<td>6</td>
<td><strong>Insurance mechanisms</strong> Automatic capital infusions could be introduced based on systemic risk considerations. Also, a pre- or post-funded insurance pool for systemically relevant institutions could be created.</td>
</tr>
<tr>
<td>7</td>
<td><strong>Managing failure and resolution</strong> The regulator could be given the authority to unwind institutions based on systemic risk considerations. The threshold for regulatory action could vary according to the state of the economy. The important point is that the regulator is able to unwind institutions without putting the financial system at risk.</td>
</tr>
<tr>
<td>8</td>
<td><strong>Capital requirements</strong> Capital requirements should take systemic risk into account. Examples are an anticyclical equity dampener, countercyclical capital buffers, and higher capital charges for trades not cleared though central counterparties like exchanges. Also, capital requirements could be rescaled conditional on the probability of default or increased if the institution is part of a group with systemically relevant companies.</td>
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</table>

Table 2.2. Overview of possible macroprudential regulation instruments on the level of individual institutions.

Source: The table is based on Galati and Moessner, 2013. Additional information has been incorporated from IMF, 2011, 2013; Osiński et al. 2013 and IAIS, 2013c. The evaluation for insurance has been added by the authors.

We believe that most of these macroprudential instruments also can be applied to non-traditional insurance activities. At the same time, we believe that regulation needs to take into account the differences between banking and insurance and be wary of non-traditional insurance products, such as
CDS writing, for example, that border very closely on banking activities. In other words, regardless of what a company calls itself, it is its activities that should determine which kind of regulation and instruments are applicable. Otherwise, regulation arbitrage is possible. The principle should be: ‘same business, same risks, same regulation’. Traditional insurers, however, do not need any additional macroprudential regulation since they do not contribute to systemic risk or are vulnerable to an impairment of the financial system.

In general, for both banks and insurance companies we doubt that relaxing accounting standards depending on the state of the economy (procyclical accounting) is a fruitful approach to addressing systemic risk. A major side-effect would be that the goal of accounting standards to ensure an unbiased and comparable picture of the financial health of a company will be impaired. In this context, Ellul et al. (2013) show that mark-to-market accounting standards, which can be deemed as procyclical, have a positive effect on market discipline. Procyclical accounting might thus distort market discipline.

With regard to including liquidity standards in the macroprudential toolset, we argue that the measurement of liquidity might be considered as a monitoring instrument in the insurance context. Introducing limits to liquidity ratios, as is the case for the banking sector, however, does not seem necessary. However, if liquidity transformation via liquidity swaps or other mechanisms is engaged in excessively by certain insurers, the same liquidity standards should apply as for banks. Risk concentration limits can help ensure financial stability. For insurers, however, such restrictions are already incorporated in their regulation. For example, Solvency II explicitly models risk concentration within the market risk module. Considering real-world complexity, we believe that it is important to use simple ‘‘manual’’ management rules (see Eling and Schmeiser, 2010). For example, limits on asset allocation are a very simple and intuitive way of ensuring risk diversification. Another simple instrument that prevents excess risk taking is risk sharing, for example, via retention. Retention is a very effective way to limit moral hazard and adverse selection problems.
If a firm wants to be considered as a traditional insurer and thus not be subject to additional macroprudential regulation, it will need to accept certain restrictions on activities. In principal, the insurer should be free to conduct other (non-traditional business as long as it complies with additional regulation such as, e.g., higher capital standards as planned in IAIS (2013c). Fields et al. (2007), for example, conclude that ‘bancassurance architectural structure for financial firms does offer some benefits and thus may become more prominent in future years’. There are thus good reasons for pooling banking and insurance activities in one company and we believe that this should be permitted, as long as there is an appropriate regulatory architecture in place (which was not the case with AIG). In this context, we also believe that it is very difficult to design compensation schemes that address systemic risk. Systemic crisis are tail events which do not occur in a short frequency. Long-term compensation schemes might be useful to reduce incentives for short-term risk taking, but this does not necessarily address financial stability.

With respect to insurance mechanisms and managing failure and resolution, it can be argued that provisions for a controlled runoff in the insurance industry are needed (see Eling and Schmeiser, 2010). In the financial crisis, defaults were and are partly covered by governments, but such a policy can have deleterious effect on the incentives of a company’s stakeholders. To allow a controlled runoff for insurance companies, an insurance guaranty fund could be an option. In contrast to the way it is done in some countries, risk-adequate premiums, e.g., based on the default put option value, are required for the funds in order to avoid cross-subsidization and incentives for risk taking (see Cummins, 1988; Lee, Mayers and Smith, 1997). Since the creation of such a guaranty fund will, ceteris paribus, lead to an increase in policyholder premiums, it is necessary that all major markets are subject to similar rules, including the banking industry. An insurance guaranty fund with risk-based premiums could create right incentives and substantially lower the need for regulatory action. Also, capital requirements linked to systemic risk and designed to ensure financial stability seem to have a positive impact. Gauthier et al. (2012) show for Canadian banks that capital requirements allocated according to systemic risk can indeed reduce the probability of a financial crisis. In the insurance context, Solvency II appears to be on the right track in this regard. For example, the equity
dampener, which is intended to mitigate procyclical effects of capital requirements in the equity risk model, reduces systemic risk (see Eling and Pankoke, 2013b).

5 New Insurance Regulation as Potential Source of Systemic Risk

Another question related to systemic risk and macroprudential regulation is if regulation itself can contribute to systemic risk. Theoretically, this is possible since flaws within the regulatory framework automatically apply to large parts or the whole industry (see, e.g., Asbhy, 2011). In particular the new European Union insurance regulation Solvency II is the subject of much debate. The main goals of Solvency II are to protect policyholders and create a safe and sound industry. In light of the above discussion on systemic risk, it might be questionable whether Solvency II achieves its macroprudential goals, especially for the following three reasons:

The regulatory standard model and use of market-consistent valuation techniques might trigger aligned behaviour

Regulation might set wrong investment incentives and lead to risk concentration which pose accumulation risks in times of crisis

New regulation might set incentives for regulatory arbitrage

The regulatory standard model, market-consistent valuation, and the risk of aligned behaviour: The use of a regulatory standard model has been the subject of much debate, especially with respect to systemic risk. The usual argument is that uniform use of the regulatory standard model might lead to uniform behaviour which might intensify the run on a market in times of crisis (see, e.g. Eling, Gatzert, and Schmeiser, 2008 and Keller, 2011). Moreover, a regulatory standard model might create disincentives for the use of internal risk models so that management relies on regulatory models for decision making rather than on its own economic models.\textsuperscript{15} The wide application of market-consistent valuation across different regulatory frameworks (e.g., IFRS, Solvency II) might have the same effect. If most market participants use the same valuation techniques, there is a risk of uniform behaviour. Furthermore, short-term variation revealed by market-consistent valuation techniques might lead to less than optimal management decisions when it comes to the long-term planning horizon of life
insurance contracts. Therefore, we believe that from a macroprudential perspective a standard regulatory model which is used in the entire European Union is disadvantageous.

Wrong investment incentives and undiversified investment portfolios: Market participants have already begun to notice that the new market-consistent valuation rules are having a significant impact on asset allocation. Solvency II encourages companies to hold a relatively undiversified portfolio of government bonds, since the required capital for these bonds is very low. This would counteract any macroprudential instruments with the goal to avoid risk concentration as mentioned in Table 2.2. Furthermore, Basel III also favours sovereign debt, so interconnectedness and aligned behaviour between banks and insurers might increase. In addition, investments in low-rated and high-duration private-sector debt become less attractive, which might affect the ability of banks to issue long-term unsecured bonds.\textsuperscript{16} However, whether Solvency II will have an impact on the investing strategies of insurance companies is not yet clear. Capital requirements for a BBB rating from S&P exceed the ones of the market risk module under the standard model of Solvency II. So, under the assumption that life as well as non-life insurers want to maintain a good rating, the influence of Solvency II on investing behaviour may not be as severe as it first appeared (see Höring, 2012 for life insurance companies and a report by Morgan Stanley and Oliver Wyman, 2010 for non-life insurers).

Regulatory arbitrage: New regulation always causes concern regarding regulatory arbitrage. If entities in the financial services industry are regulated according to different principles, less restrictively regulated institutions could obtain a competitive advantage and a run on the least restrictive regulatory environment might take place. Examples are:

Banks vs. Insurers: According to Solvency II, insurance companies must apply the fair value method with regard to assets and liabilities. In contrast, banks can use a hold-to-maturity approach for their banking book, which could be an advantage for the banking industry. However, it is not yet known whether the Solvency II capital requirements will indeed be tighter than those of Basel III and, at any rate, there is no empirical evidence as to what impact such a difference in capital requirements would have on competition.\textsuperscript{17}
Systemically Important Financial Institutions (SIFI) vs. Non-SIFI: As soon as an entity is labelled systemically important, a massive potential for moral hazard is created because such a designation guarantees that the bank or insurance company will receive a government bailout if necessary (see, e.g., Grace, 2011 or Harrington, 2011).

European Insurers vs. Rest of the World Insurers: If capital requirements in the European Union are too strict, risks might be transferred to non-European insurers via reinsurance in order to lower the capital requirements and thus the cost of capital. This will be the case if other supervisory regimens are considered equivalent or capital requirements against the credit risk of institutions in non-equivalent jurisdictions are not appropriately set (see Al-Darwish et al., 2011, pp. 21–53).

Despite the reasoning above, in our opinion the risk of regulation arbitrage is minor from a macroprudential perspective. Regulatory bodies all over the world have realized since the AIG crisis that at least if the financial stability is concerned there should not be any regulatory loopholes (see, e.g., IAIS, 2012c).

While Solvency II is a European example, the question whether new insurance regulation might trigger systemic risk can also been addressed more widely. How looks for instance the ‘Common Framework for the Supervision of Internationally Active Insurance Groups’ (ComFrame) for ‘internationally active insurance groups’ (IAIGs) from a systemic risk perspective? Again, we evaluate this idea according to three above mentioned aspects (aligned behaviour; wrong investment incentives; incentives for regulatory arbitrage)

The regulatory standard model, market-consistent valuation, and the risk of aligned behaviour: If the insurance capital standard (ICS) of ComFrame contains a standard model for defining capital requirements the risk of aligned behaviour becomes even more severe; in contrast to Solvency II, the run in the market would not be limited to Europe, but would be on a global scale. Relying upon a standard model should thus be considered with some caution.
Wrong investment incentives and undiversified investment portfolios: Whether the new model might set wrong incentives in the investment of insurance companies like described above for Solvency II cannot be answered today, given that the details of the model are not known. Definitely, the global model should take a risk based approach and not leave room for politically motivated rules like the treatment of government bonds in Solvency II. In contrast to Solvency II, which favours bonds in the EU, the global model might provide an opportunity also for global diversification on the asset side (by not favouring certain assets above others).

Regulatory arbitrage: In general moving from country specific towards international standards, the possibility for regulatory arbitrage should be reduced. Especially, the incentives to transfer risks from one country to another in order to lower the capital requirements should be affected. It is, however, not clear in how far the global standard also can help to avoid incentives for regulatory arbitrage between banking and insurance. Moreover, as indicated above, implementing the global standard only for international active groups might also trigger non-economic behaviour that carefully should be analysed before implemented a global standard. It also seems that the global standard will not replace the local standards, but rather will be an additional requirement for international active insurance groups. Moreover, the political implications should be evaluated. New international regulations will probably lead to increased regulatory requirements for only certain market participants (e.g. IAIGs or SIFIs). As it is pointed out in comments to the ComFrame Draft this might lead to political actions to replace or weaken current regulatory frameworks in order to mitigate disadvantages for these insurers. If the current regulations work well from a macroprudential perspective, such an outcome would be unfortunate.

It thus seems that single global capital and regulatory standards have pros and cons from a systemic risk point of view. While the risk of aligned behavior might be more problematic, the problem of regulatory arbitrage might be reduced. In general, the trend towards harmonization of the international regulatory landscape seems warranted, but potential problems and disadvantages of the global standard must be carefully analyzed before and after implementation.
6. Conclusion

We consider systemic risk, as does the FSB, as ‘a 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 negative consequences for the real economy’. When assessing the risk of the insurance industry it is important to focus not just on the fact that a certain company calls itself an insurance company, but on the actual activities engaged in by that company. Also, one should distinguish between an activity’s contribution to systemic risk and the vulnerability of an institution or activity to impairments of the financial system. Based on these broad classifications we argue that traditional insurance activities neither contribute to systemic risk nor increase the vulnerability of institutions. However, non-traditional insurance activities, for example, CDS writing, providing financial guarantees, and securities lending, do have a systemically relevant impact.

The goal of macroprudential regulation is to reduce systemic risk and ensure financial stability. Based on our discussion of systemic risk in the insurance industry we conclude that macroprudential regulation is not necessary for independent insurance companies engaged in traditional insurance business. However, insurers engaged in non-traditional insurance activities do need macroprudential regulation. Due to the similarity between some of these non-traditional activities and banking, we are of the opinion that the macroprudential toolkit for banking regulation can be applied to this sort of activity. However, additional research is necessary in order to discover the most effective and efficient macroprudential instruments for the non-traditional insurance industry.

Regulation itself can contribute to systemic risk since the regulatory framework affects many market participants and thus any design flaws in the regulation can have drastic and widespread consequences. Therefore, we believe that a standard model for all insurers in Europe could increase systemic risk. Also, incentives for investing in sovereign debt counteract macroprudential efforts to limit risk.
concentrations. However, regulation arbitrage is unlikely since the issue is recognized and monitored by the International Association of Insurance Supervisors (IAIS).

Notes

1 For an overview of different systemic risk definitions see Eling and Pankoke (2013a) and for a compilation of several systemic risk measures see Bisias et al. (2010). Galati and Moessner (2013) provide a literature review on how to ensure financial stability and to reduce systemic risk from a regulatory perspective.

2 Further studies about insurance regulation which include a macroprudential perspective are Vaughan (2009) and Bach and Nguyen (2012).

3 The FSB is an international organization established by the G-20 in April 2009. Its purpose is to monitor the finance industry and make recommendations about how to address systemic risk.

4 See Geneva Association (2010a) and Cummins and Weiss (2011). Radice (2010) takes an activity-based view also, albeit an indirect one, since he defines a systemic-relevant institute as one with at least one systemic-relevant function. Keller (2011) argues for a consistent regulatory approach for the entire financial sector, based on the idea that if the same risks are regulated differently according to type of company, it will lead to market distortion.


6 See Geneva Association (2010a), IAIS (2009), and Radice (2010).

7 That lack of transparency can be a problem is illustrated by the recent example of FMS Wertmanagement, the ‘bad bank’ of the German company Hypo Real Estate. The company was bailed out and nationalized during the financial crisis. Due to a ‘misunderstanding’, liabilities were overestimated by €55 billion. See Wiesmann (2011).
For an empirical study about systemic risk and financial guarantees see Chen et al. (2013).


For further information see, e.g., Prudential Regulation Authority (2013), Masters (2012) and Woodall (2013).

An exception is the liquidity management in global insurance groups. On the one hand, mismanagement in this regard can lead to a situation in which healthy insurance subsidiaries have substantial cash outflows because of the distress of non-insurance subsidies. On the other hand, political and regulatory action in times of crisis can interfere with the movement of liquidity across jurisdictions.

In this context see Gauthier et al. (2012). They show for Canadian banks that macroprudential regulation indeed can reduce the probability of a systemic crisis measured by $\Delta \text{CoVaR}$ (Adrian and Brunnermeier, 2011) and the Marginal Expected Shortfall (MES) (Acharya et al., 2012).

IAIS (2013a) uses an indicator based approach to identify systemically important insurers. The indicators belong to categories which differ in importance for the assessment. The final score for each insurer is based on the weighting of the categories as follows. Size: 5%, global activity: 5%, interconnectedness: 40%, non-traditional insurance activities: 45% and substitutability: 5%.

E.g., Gordy and Howells (2006) also evaluate the changing of input parameters and accounting figures for capital requirements in the context of Basel II. They also find this approach problematic in order to encounter procyclicality.

Two other aspects of the Solvency II standard model critically discussed in light of potential systemic risk are the Counter Cyclical Premium and the Matching Premium. The idea of the Counter Cyclical Premium is that in times of crisis, the regulator could increase the discount factor for technical provisions and in this way lower the capital required for potential future claims. Then the mechanism for calculating technical
provisions would deviate from the principle of market-consistent pricing and decrease transparency. The mechanism is also not truly countercyclical since it only lowers provisions in times of distress, but does not increase them during economic upswings. For criticism of the Counter Cyclical Premium, see, for example, Keller (2011) and Ayadi et al. (2012). The idea of the Matching Premium is to allow an insurer to increase the discount factor according to a premium generated by an illiquid and risk-free asset portfolio held by the insurer. There might thus be an incentive to invest in illiquid assets because the more illiquid the portfolio, the higher the premium and the lower the technical provisions. In this case the Matching Premium could increase an insurer’s vulnerability in times of crisis. For an overview of the Matching Premium, see Morgan Stanley and Oliver Wyman (2012, pp. 13–21).


17 For another description of the fair value vs. hold-to-maturity valuation argument, see Keller (2011), and for a further discussion of the whole issue of Solvency II vs. Basel III, see Al-Darwish et al. (2011, pp. 42–45).

18 ComFrame by IAIS (2013d) describes international requirements for supervisors and IAIGs. Whereas IAIGs are defined as a) active in at least three jurisdictions, b) at least 10% of the premiums are written outside the home market and c) total assets are above $ 50 billion or yearly premiums are above $ 10 billion (see IAIS, 2013d, M1E1-1-1). Also, the IAIS recently committed to develop by 2016 a global insurance capital standard (ICS) within ComFrame based on IAIS (2013d, M2E5). The implementation of ICS is planned from 2019 onwards after two years of testing and refinement with supervisors and internationally active insurance groups. See IAIS (2013e).

19 See, e.g., the argumentation by the Property Casualty Insurers Association of America (IAIS, 2014, p. 317).
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Chapter 3

**Insuring the financial system against insurers: a macroprudential framework**

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1 **INTRODUCTION**

The global financial crisis brought numerous financial institutions to the brink of collapse and led authorities to take far-reaching measures to safeguard financial stability. The causes of the crisis have been extensively analysed and lessons have been drawn. One lesson stands out: the need to strengthen the supervision of the financial system as a whole, with a macroprudential perspective. As a complement to microprudential supervision, such a perspective considers potential systemic interactions between the individual institution and the broader financial system. This lesson is of particular relevance for the banking sector, as banks are more likely to be considered systemically important than insurers. By nature, banks are highly interconnected through the interbank money market, play a pivotal role in the payment system and are exposed to liquidity risk. Nevertheless, contagion channels also exist between the insurance sector and other parts of the financial system, both in theory and practice.

This article sketches how a macroprudential perspective in insurance supervision can contribute to financial stability. Section 2 highlights key transmission channels between the insurance sector and the financial system. We review both the sector’s inherently stabilizing influence on financial markets by pricing and spreading risk, as well as its potentially destabilizing influence through herd behaviour, fire sales and other market failures. Against this background, section 3 lays out a basic macroprudential toolkit for the insurance sector, including instruments such as restrictions
on activities and linkages with other financial institutions, requirements for stability-oriented investment policies, and recovery and resolution planning.

2 THE SYSTEMICNESS OF INSURANCE

In this article, we define financial stability as the ability of the financial system to allocate resources efficiently between activities and across time, to assess and manage risks, and to absorb shocks (Houben et al., 2004). Conversely, systemic risk refers to the risk of disruption of the financial system, causing financial instability. The role of insurers is reviewed from both viewpoints, building upon the concepts of substitutability, interconnectedness and cyclicality (figure 1). These concepts follow from the initial paper by the IMF, BIS and FSB (2009) on assessing the systemicness of financial institutions, markets and instruments. Together with size, the first two factors are considered primary indicators of systemic importance, whereas cyclicality is considered a contributing factor. Size is not discussed separately in this article, as this is not automatically associated with systemic risk in the case of insurance (IAIS, 2011, 2013a). This is in contrast with banks, where underlying drivers of systemicness increase proportionally with size, for instance through rising exposures in the interbank money market. Substitutability refers to the degree in which activities that are vital to the functioning of the financial system, and therewith to the real economy, can be readily replaced. Interconnectedness relates to counterparty exposures in the financial sector, especially to banks and capital markets. The third factor, cyclicality, indicates the extent to which a financial institution is affected by, and affects, the financial and credit cycle, through procyclical investment or funding behaviour.

While our focus is on the risks that insurance companies may pose to financial stability, this cannot be assessed separately from the premise that these companies inherently contribute to financial stability. The starting point for a balanced assessment is thus the sector’s contribution to
financial stability (figure 1). This is analysed alongside the same dimensions of substitutability, interconnectedness and cyclicality, essentially spelling out their positive flip sides.

### Figure 3.1. Systemicness of insurance

<table>
<thead>
<tr>
<th>Substitutability</th>
<th>Interconnectedness</th>
<th>Cyclicality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing broad access to insurance</td>
<td>Providing resources to other sectors</td>
<td>Dampening the financial cycle through rebalancing and investing with a long-term horizon</td>
</tr>
<tr>
<td>Interruption of insurance services</td>
<td>Contagion through links with other financial institutions (incl. conglomerates), derivative positions and non-core activities</td>
<td>Exacerbating the financial cycle through fire sales and herd behaviour</td>
</tr>
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#### 2.1 Contribution of insurance to financial stability

##### 2.1.1 Substitutability

A key contribution of the insurance sector to the functioning of the financial system is by combining and diversifying a large number of individual, mostly independent but largely homogeneous risks according to the law of large numbers. By transferring risks from the corporate and household sectors, insurers protect these sectors from exposure to unacceptable pre-specified risks of loss, thereby reducing uncertainty, facilitating economic activity and decreasing the need for households and corporates to hold excessive buffers. Insurers also
contribute to risk management within the financial system, notably by providing reinsurance. The importance of insurance is illustrated in figure 2, which shows the total gross premiums of the non-life and life sector in relation to GDP for a selected group of OECD countries. On average almost nine per cent of OECD countries’ GDP is used for buying some form of insurance.

Non-life insurance is vital in industries which are characterized by large investments and potentially devastating losses, such as aviation, manufacturing and trade. The market for trade credit insurance has grown considerably over the last decade. In 2012, private trade credit insurers covered an estimated EUR 1,700 billion of domestic and international trade (CGFS, 2014). The trade-promoting effect of private export credit insurance is studied by Van der Veer (forthcoming), who establishes an average short-term trade multiplier of private export credit insurance of around 1.3. In other words, every euro of insured exports generates more than one euro in total exports.

Life insurance companies enable households to smooth income and consumption over the lifecycle, through savings for retirement or to pay off mortgage debt. Without such insurance products, precautionary savings would have to rise, suppressing consumption and increasing the
need for social safety nets (Impavido and Tower, 2009). Although banks provide a partial substitute in the form of long-term deposits and households can also invest in other financial products for themselves, these alternatives do not include an insurance element such as longevity or mortality protection. If an individual were only to rely on banking or investment products for retirement income, she or he would have to save enough to provide resources for the unlikely event of reaching the age of 100, whereas savings through insurance would only need to cover her or his average life expectancy. Figure 3 shows the relative importance of life insurers and pension funds in total financial assets of households in various countries. In all cases, assets held in life insurance and pension fund reserves form a substantial part of total household financial assets.

2.1.2 Interconnectedness

Life insurance companies have large balance sheets, as they manage financial assets for their clients for extended periods of time. With combined industry assets under management of almost EUR eight trillion, insurance companies play a key role in European financial markets. Indeed, insurers are the largest institutional investors (figure 4), with the bulk of these assets held by the life insurance sector. Insurers invest predominantly in sovereign and financial bonds (table 1). As a result of these investments, insurers provide the fuel to other parts of the financial sector and the wider economy.
2.1.3 Cyclicality
Life insurers run a so-called inverse production cycle: they receive premiums before making disbursements. As a result, they are less dependent on short-term market funding than banks. Furthermore, their liabilities to policyholders typically relate to lifecycle events and are long-term in nature. In principle, this enables life insurers to absorb short-term fluctuations in market prices and to pursue a long-term perspective in their investment strategies. As such, investing in long-term fixed income assets is typically part of an insurer’s prudent asset-liability management. From the perspective of banks and governments, insurance companies are therefore welcome investors. Especially in Europe, where banks are strongly dependent on (volatile) wholesale funding, insurers are providers of stable, long-term financing.

Their long-term investment perspective allows life insurance companies to pursue contrarian investment strategies, for instance by rebalancing the percentage of assets held in various categories in reaction to price fluctuations. This type of behaviour has a dampening effect on price movements in financial markets and thus contributes to financial stability. A study by De Haan and Kakes (2011) on investment behaviour of Dutch insurance companies and pension funds between 1999 and 2005 indeed establishes an anti-cyclical investment behaviour of institutional investors, including life insurance companies.

2.2 Risks from insurance for financial stability

While insurance companies may generally be seen as contributing to the stability of the financial system by spreading risks across sectors and over time, by providing funding to other sectors, and by pursuing long-term investment strategies, they are also vulnerable to shocks in the financial system and the real economy. This holds in particular for the life insurance industry. A simple measure to show that insurers, like banks, are vulnerable to systemic risk is the co-exceedance indicator, which depicts correlations between shocks in these two sectors. Figure 5 illustrates
that in periods of increased stress in financial markets – notably the 2001-2003 stock market downturn and the 2008-2009 worldwide financial crisis – extreme movements in stock prices of insurers and banks become increasingly correlated. This raises the question whether insurance companies may also create or exacerbate financial stability risks. This can again be analysed across the key dimensions of substitutability, interconnectedness and cyclicality (figure 1).

Figure 3.5. Systemic risks of banks and insurers
Co-exceedance of stock prices, in percentages.

Source: Datastream and own calculations. Chart reflects the percentage of banks and insurers that simultaneously show an extreme decline in their stock price.

2.2.1 Substitutability

Interruption of services of an insurance company may have a systemic impact if two conditions are met: first, the company provides services that are important for the functioning of the financial sector and/or the real economy and, second, the company has a large market share or even a monopoly. In general, limited substitutability of individual insurance companies is not an issue, as most insurance subsectors are competitive. There are however certain niche markets that are served by only a small number of insurers, such as trade credit insurance and aviation insurance.
The market for trade credit insurance is highly concentrated, as just three insurance companies (Atradius, Coface and Euler Hermes) cover almost 90 per cent of the world market. If one of these companies were to run into financial distress and, consequently, were to reduce its risk exposure, policyholders would likely find it hard to turn to another supplier in the short term, which would be detrimental to trade activity at large. Such an adverse development was visible after the Lehman Brothers collapse. Given the rapid decline in trade, policymakers around the globe launched a variety of initiatives to support the financing of trade. Several countries implemented state-aid schemes or provided direct support through national export credit agencies (CGFS, 2014). A similar development was visible in the aviation insurance sector after the 9/11 terrorist attacks. The sharp decline in aviation insurance cover forced governments to step in and provide officially sponsored aviation insurance schemes. These public interventions illustrate the vital role played by insurance markets in the functioning of the real economy.

2.2.2 Interconnectedness

Direct and indirect interlinkages with other parts of the financial system increase the systemicness of insurers. Although insurance companies are generally less interconnected among themselves and with other financial institutions than banks, significant links may nonetheless exist.

2.2.2.1 Financial conglomerates

One potential source of direct interconnectedness between insurers and banks is through mutual equity holdings or linkages within a financial conglomerate. Within such a conglomerate, the bank and insurer are exposed to weaknesses in each other through financial, reputational and operational links. Financial risks may manifest themselves through losses in the insurance part that require the bank to provide financing or to upstream dividend. It may also stem from double
leverage, when part of a subsidiary’s equity is financed through external debt at the holding level. Reputational effects may occur when problems at the insurance entity erode the confidence of depositors at the bank. This effect is stronger if both entities operate under the same brand name. Operational risk may similarly stem from integrated IT functions.

Recent examples of contagion within financial conglomerates can be found in the United Kingdom, Belgium and the Netherlands (IAIS, 2011; Stringa and Monks, 2007). In the case of UK bankassurance companies, Lloyd’s and HBOS proved vulnerable to adverse events originating in the insurance sector during the 2001-2003 stock market downturn. In the case of Belgium, the financial conglomerate Fortis did not survive the turbulence following the failure of Lehman Brothers, as losses in both the bank and insurance businesses mounted. In the Netherlands, various financial conglomerates faced capital and liquidity problems in 2008. There were also confidence effects, both within financial conglomerates and to other financial institutions. In the end, the government provided capital support to three financial conglomerates, in order to strengthen financial buffers and restore confidence. A substantial amount of capital was downstreamed to the insurance entities within these groups. In all these countries, the bankassurance model has lost popularity since the crisis, making this contagion channel less relevant. However, an interlinkage between these two parts of the financial sector generally remains, as large life insurers often still have a small bank entity within the group (according to the so-called asymmetric financial conglomerate business model).

2.2.2.2 Derivatives

Insurers are also connected with the rest of the financial system through their positions in derivative markets. In particular, life insurers are large users of interest rate swaps to hedge the duration mismatch on their balance sheet. This may increase systemic risk in two ways. First, it increases counterparty risk with banks and central clearing counterparties (CCPs). Second, it may
be a source of liquidity risk, for instance when a rating downgrade or a change in the value of the collateral triggers margin calls. Increased liquidity risk may subsequently prompt fire sales.

Unfortunately, figures on derivative exposures of the worldwide insurance market are skimpy. Figures for the United States however show that the notional amount of the industry’s investment in derivatives is large and growing: USD 1,700 billion at end-2012, up from USD 1,400 billion at end-2010. Similar to the derivatives market in general, counterparty exposure in the insurance industry is concentrated in a small number of banks. Almost two thirds of these exposures are concentrated in ten of the largest banks worldwide, including Deutsche Bank, Citigroup, and Credit Suisse. Thus, activities of insurance companies in derivative markets form an important link with the banking sector.

2.2.2.3 Non-core insurance activities

Some insurance companies engage in activities that are not directly related to traditional insurance business. One example is underwriting derivative contracts for other purposes than hedging, for instance by selling financial guarantee products like credit default swaps (CDS). The speed of CDS price adjustments and the interconnectedness created by financial guarantee contracts add a systemic dimension to the insurance sector. Other non-core activities include securities lending and liquidity swap agreements; these activities generate additional income for insurance companies, but also increase liquidity risk and linkages with banks.

American International Group (AIG) is the prime example of how an insurance company can run into financial problems and become systemically important by engaging in non-core activities. This institution was brought to the brink of collapse by large commitments in the credit default swap market, most of which provided coverage to other financial institutions. At the peak in
2007, its notional portfolio of CDS commitments amounted to USD 530 billion, or five times its shareholders’ equity. AIG also had a hefty securities lending program, at the time amounting to USD 90 billion. In the event, both activities prompted large-scale liquidity problems for the institution. To avoid the systemic knock-on effects that would have ensued if AIG had defaulted on its CDS obligations, the institution had to be given state support. Amongst the institutions that benefited from this support are systemically important banks like Barclays, Citigroup and Deutsche Bank. By end-2012, the notional outstanding portfolio of AIG’s written CDS protection had shrunk to USD 16 billion (AIG, 2012).

Another example of erstwhile systemic insurers are US monoliners, who became large players in the market for structured finance products (IMF, 2008). Traditionally, these institutions had provided financial guarantees to US municipalities, thereby reducing their borrowing costs. Since the 1990s, fuelled by a search for yield, they gradually expanded their business to guaranteeing other financial products, including asset-backed securities and collateralised debt obligations. At end-2006, monoline insurers supported USD 2.5 trillion of securities, including about USD 800 billion related to structured finance. When conditions in these markets deteriorated, monoliners reported huge losses on their exposures, which consequently triggered rating downgrades. This impacted the broader financial system in two ways. First, their downgrades immediately fed through to downgrades on all securities they guaranteed, thereby impacting the issuers and investors, and, second, the lower ratings implied they could not take on new business. Currently, virtually all monoline insurers are in run-off.

2.2.3 **Cyclicality**

The financial sector has a tendency to assume too much risk in the upswing of the financial cycle and to become excessively risk averse in the downturn. This cyclicality derives from the sector’s
leverage, maturity mismatch, risk concentration and risk appetite (ESRB, 2013). The first two factors tend to be less relevant for insurers, given their relatively high and constant capitalization and their negative duration gap. However, given the size of their investments, adjustments in the composition of their asset mix may have substantive procyclical effects on financial markets. In this respect, insurers may contribute to asset price bubbles by increasing their exposures to certain asset classes during a boom. This may be triggered by a search for yield. Alternatively, once a bubble actually bursts, asset reallocation by insurers may fuel a downward spiral in prices. This may in turn be prompted by a flight to quality, in combination with higher liquidity risk.

The actual impact of changes in the asset mix on financial stability depends on several factors. First, the relative size of insurers in a particular asset market plays a role. As we have seen, insurers indeed play a prominent role in public and corporate bond markets. Second, the effect depends on the liquidity of the market. If selling orders can be absorbed with only limited impact on prices, the procyclical effect will be dampened.

**Figure 3.6. Asset reallocation Dutch insurers equities**

In EUR bln (left axis); Index (right axis).

**Figure 3.7. Exposures of Dutch insurers to GIIPS countries**

In percentages of total euro area investments

Source: Thomson Datastream and DNB. Relates to equities traded on the stock market.
Indications of procyclical behaviour during the recent financial crisis can be derived from data on the trading activities and asset mix of Dutch insurance companies. In particular, between 2007-2009, when worldwide stock markets declined dramatically and risk aversion rose accordingly, Dutch insurance companies actively decreased their exposure to equity markets by net selling of EUR 10 billion (figure 6). The relative importance of equities within their asset mix decreased significantly from almost 25 per cent early-2007 to nine per cent end-2013. Similarly, after the start of the sovereign debt crisis in 2010, insurance companies showed a flight to safety within their exposures to euro area countries. Thus, exposures to GIIPS\(^5\) countries were shifted on a large scale towards countries like Germany, France and the Netherlands (figure 7). In fact, since 2008, total exposure to GIIPS countries more than halved to EUR 11 billion, as a result of active trading and valuation effects.\(^6\) Such procyclical investment behaviour not only undermines the insurers’ returns, it also accentuates swings in financial markets in a self-reinforcing manner.

3 MACROPRUDENTIAL TOOLKIT FOR INSURANCE

3.1 Macroprudential analysis

The activation of macroprudential policy instruments needs to be firmly grounded in macroprudential analysis, which substantiates risks to financial stability. In the field of insurance, such analysis is still in its infancy. A point of departure is gathering comprehensive, granular and timely information on the systemic dimensions. This includes monitoring counterparty exposures, market shares and non-core activities, as well as changes in investment portfolios and search for yield behaviour. The added value of such monitoring is illustrated with three key examples.

3.1.1 Assessment of systemic importance
Given the importance of identifying and safeguarding systemically important insurers, macroprudential supervisors have developed a separate framework for globally active insurers (IAIS, 2013a), which builds on, but is not identical to, the initial systemicness framework provided by the FSB, BIS and IMF (2009). Within this framework, the emphasis is on indicators for interconnectedness and non-traditional or non-insurance activities, such as derivative trading, intra-group commitments and the size of illiquid assets. The size, global activity, and substitutability of an institution is taken into account as well, although to a lesser extent.

Supervisors should implement similar identification frameworks at the national level. In this respect, three aspects deserve special attention. First, sector specific characteristics are key. For instance, the size indicator is given significantly less weight than in the framework for identifying global systemically important banks, because the systemicness of insurers is only weakly related to their size. Second, systemic importance is not a binary concept. Indeed, the varying degree of systemicness of an institution can be taken into account by employing a graduated approach. This allows policy instruments to be stepped up when systemic risks are perceived higher, for instance by increasing supervisory intensity or capital requirements. Third, systemic importance is a dynamic concept that changes over time as an institution evolves, and as the state of the financial system and the real economy changes. Thus, establishing and mitigating systemic risk involves both regular re-assessments and supervisory judgement. In the case of insurance, the dynamic contagion channels stemming from procyclical investment behaviour may be considered a prime example.

3.1.2 Network analysis

Network analysis can be used to identify possible contagion channels within the financial system at an institution-specific level. It can thus be an important analytical input to the identification of
systemically important institutions, by helping to establish critical nodes in the domestic or global financial network. An often used example is that of AIG. With more granular data on bilateral exposures, AIG would have been identified at an early stage as one of the world’s most interconnected financial institutions. This would have prompted mitigating action, such as concentration limits and higher capital relative to outstanding commitments. Links to be analysed are particularly those with the banking sector, given the potential implications for liquidity risk and the payment system. Interconnections between insurers are generally limited because insurers, unlike banks, have no inherent reason to borrow from other financial institutions, given their inverse production cycle. A notable exception relates to links between primary insurers and reinsurers, which may point to concentration risk. While insurers are large-scale holders of bank securities (bonds, hybrids and equity), making them vulnerable to failures in the banking sector, the systemic risks primarily stem from bank vulnerabilities to failures in the insurance sector. These may result from interconnections through OTC derivative contracts, cross holdings of shares and liquidity lines. Network analysis can thus be a valuable analytical tool, but it requires an immense amount of data on counterparties, collateral and instruments, which may be further refined with data on maturities, currencies, sectors and jurisdictions. Such analysis is still in its infancy, although the Bank of International Settlements is setting up a data hub (FSB, 2013).

3.1.3 Stress testing

The depth of the 2008 financial crisis was not foreseen in any of the models of financial institutions and supervisory authorities, which made them ill-prepared for such a systemic event. Risk management functions took tail events insufficiently into account, often relying on limited historical data. Since the crisis, stress testing has become a prominent risk management tool, complementing the more backward looking risk models. Such tests are used to assess institutions’ viability under adverse but still plausible scenarios and to shed light on potential weak spots in
the financial system. For macroprudential policy makers, stress tests can also be modelled to gain insights into feedback loops and contagion channels. Within this context, macroprudential analysis should not only test the impact on solvency, but also on liquidity positions. In the specific case of insurance companies, stress testing can highlight vulnerabilities related to loss of market liquidity or collateral calls for positions in derivative markets.

3.2 Macroprudential instruments

Although macroprudential analysis helps to identify systemic risks within the insurance sector, concrete instruments are needed to consequently mitigate these risks. Three instruments are highlighted.

3.2.1 Concentration limits and activity bans

To limit the risk of intra-financial system exposures becoming systemic, microprudential regulation provides a starting point. Risk-based solvency regimes, like Solvency II, incorporate disincentives to take on such exposures, for instance through weighted capital charges for credit and equity risk. Also, under most supervisory regimes, an insurance entity is not permitted to carry out any business activities other than insurance. Still, this rule does not prevent a financial group that includes one or more insurance entities from engaging in activities that increase financial sector interlinkages. Thus, concentration limits or activity bans at the group level may be considered a desirable supplement to existing microprudential regulation. In the IAIS policy framework for global systemically important insurers, restrictions and prohibitions explicitly feature as potentially important policy tools (IAIS, 2013b). Practical examples of such tools are direct bans on certain systemic activities, such as selling CDS, and limitations or prohibitions on intra-group transactions and double leverage.
3.2.2 Stability-oriented investment policies

To mitigate the risk of procyclical investment behaviour, stability-oriented behavioural rules can be adopted. Examples can be found in the supervisory framework for the Dutch pension fund system. In particular, pension funds with solvency shortages are not obliged to de-risk and are allowed three years to restore their solvency position. During the recent financial crisis, this period was extended to five years to decrease further the risk of fire sales. The European Solvency II accord contains a similar element, as supervisors may extend the standard six month recovery period to a maximum of 7 years in periods of exceptional declines in financial markets. The risk of fire sales can further be diminished by advancing profit sharing and by varying the guaranteed rate of return for policyholders according to the financial position of the insurer.

3.2.3 Recovery & resolution planning

Recovery and resolution plans help prepare financial institutions and supervisors for a next period of financial turbulence. In a recovery plan, financial institutions outline the actions that they can take to withstand a severe crisis. In the Dutch recovery planning framework, insurance groups are requested to consider various scenarios of financial distress, ranging from idiosyncratic shocks to systemic events, and from fast-burning to smouldering crises, and to identify measures that may then sustain the groups’ viability. The recovery plan provides a practical “menu of options”, with an assessment of the feasibility and impact of a range of potential recovery measures. Such measures may include freezes on dividend payments, hedging or reinsurance of specific risks, and asset sales. The prior identification of these options enables institutions to move more quickly in a crisis and hence to reduce the probability of default. In insurance, where problems often build up over a protracted time-horizon, a recovery plan with predetermined triggers helps to counter an inaction bias. Experience in the Netherlands shows that the process of preparing a recovery plan may even prompt an institution to take prudential measures before any sign of a crisis, such as
purchasing interest rate swaptions, limiting double leverage or pre-emptively reducing exposures to certain asset classes. In other words, recovery plans are also valuable for prudent day-to-day risk management.

Resolution plans are related to the stage in which an institutions’ default has become inevitable and describe how an institution can be wound-down, while ensuring the continuation of systemic activities. In this respect, one important advantage of the insurance business model is the option of putting an insurance portfolio into run off by shutting down the writing of new business and using the assets to pay off any current and emerging claims on existing policies. These so-called closed books may then be transferred to another insurance or investment company. Nonetheless, resolution may still be a complex process, especially when an insurance company forms part of a larger, international financial conglomerate. A complex organisational structure, with economic and operational activities that are not organized strictly along the lines of the legal structure, can prove an impediment to orderly resolution. A telling example is AIG, which consisted of some 70 US insurance companies and 175 non-US companies and insurers, conducting business in 130 countries (Harrington, 2009). Detailed information on legal and operational structures are therefore indispensable. But this may not be enough. Effective resolution may require dismantling intragroup guarantees and removing double leverage at the holding level. In practise, these elements impeded a private sector resolution of the failing Dutch financial conglomerate SNS Reaal, eventually necessitating a public rescue in 2013 (Dutch Ministry of Finance, 2013). Thus, a thorough knowledge of all intragroup exposures is necessary, and ex ante restructuring requirements to support effective resolution planning may be called for.
Insurance essentially contributes to financial stability. On the liability side of their business, insurance companies price risk and spread these across individuals, corporates and sectors. On their asset side, these institutions generally perform a stabilizing role by providing long-term funding to other sectors. However, recent history has a number of instances where insurers actually fuelled financial instability. These episodes were typically not caused by the failure of insurance activities per se, but by these institutions’ supporting activities such as their asset management and derivatives hedging, or their non-core activities. These activities increase both the interconnectedness and procyclicality of insurers.

This points to a different macroprudential policy strategy for insurers than for banks. The main goal is not to limit the probability of default – by increasing capital buffers and provisions – but to prevent insurance from being a systemic risk in the first place. This implies focussing these institutions’ activities on insurance proper, rather than on business akin to banks or hedge funds. To this end, restrictions on activities and interlinkages should be put in place, and adequately monitored. Besides this, effective recovery and resolution planning can reduce the systemicness of insurance groups. Nonetheless, while these measurers will undoubtedly lower the systemicness of insurers, the insurance sector will remain a major player in financial markets with a potential for procyclical investment behaviour. Thus, a macroprudential perspective also needs to be embedded in the design of regulation to limit or prevent the scope for such procyclicality.

Notes

1 Director, Financial Stability Department, De Nederlandsche Bank.

2 Supervisor, Insurance Supervisory Department, De Nederlandsche Bank.
To calculate this indicator we first made a distinction between normal and large shocks in stock prices (a shock is considered large if it is beyond the 95th percentile). Next, we measured the percentage of institutions experiencing a large shock occurring on the same day. Simultaneous shocks indicate that multiple insurers or banks are affected by tail events.

See Billio et al. (2012) and Chen et al. (forthcoming) who study statistical relations on market returns for different financial sectors.

Greece, Ireland, Italy, Portugal, Spain.

This procyclical behaviour is further analysed in a paper by Bijlsma and Vermeulen (forthcoming).
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Chapter 4

Insurance and macroprudential regulation: conceptual issues

Marcelo Ramella, Sebastian von Dahlen

Introduction

The macroprudential regulation debate has enjoyed an unprecedented revival in the aftermath of the global financial crisis that started in 2007, engaging within a comparatively short period of time, academics, policy makers and practitioners involved in developing responses to the crisis (see for example, Ramella and von Dahlen (2010) with particular regard to insurance-specific macroprudential surveillance). Following Trichet (2011) we have entered an ‘era of macroprudential oversight’. Suggestively, according to Baker (2013), this macroprudential shift amounts to no less than an “insiders’ coup d’état”. And, as it might have been expected, like with other coup d’états, its legitimacy and soundness have come under critique. An array of dissenting voices has questioned macroprudential regulation, challenging its conceptual validity and political legitimacy as well as its methodological soundness and institutional viability (Mészáros, 2013; Chiu, 2012; Eichengreen, 2010; Pooran, 2009).

This paper aims to contribute to the macroprudential debate by articulating a view on the relation between insurance and reinsurance1, and macroprudential regulation. With respect to macroprudential regulation as such, it surveys the current ‘work-in-progress’ nature of enterprise, looking at key issues under discussion in academic, policy and practice circles. In relation to insurance, it reviews efforts to date to integrate insurance to the macroprudential dimension. As a contribution to the debate on the place of insurance within macroprudential regulation the paper examines and discusses some key characteristics of insurance activities, suggesting that a better understanding of these may help inform current policy and practice work on building a sound
macroprudential regulation framework in particular, and regarding the role of finance in society in general.

Our paper is structured as follows: Section 1 starts with a brief conceptualisation of macroprudential regulation and of current debates on the matter. Section 2 focuses on macroprudential regulation in insurance, discussing it in light of key specificities of insurance. Section 3 draws on the conceptual discussion introduced in Section 2 to offer implications for macroprudential regulation practice. The paper concludes with some general remarks on macroprudential regulation, financial stability and the role of finance in society.

This paper understands the concept of macroprudential regulation to mean the set of rules articulating both macroprudential surveillance (i.e. observation) and macroprudential supervision (i.e. action). The meaning of the term macroprudential will be discussed in Section 1. Further, on the applied side, macroprudential regulation is differentiated into macroprudential policy, i.e. the development of macroprudential surveillance and supervision rules, frameworks and tools, and macroprudential practice, i.e. the conduct of macroprudential surveillance and supervision.

Section 1 – What is macroprudential regulation? Current debates

Efforts to develop a macroprudential approach to financial regulation have been extensive since the onset of the global financial crisis. The work by Borio and his colleagues at the Bank for International Settlements (Arnold et al., 2012; Borio, 2003, 2009, 2011a, 2011b, 2013a) constitutes the most influential conceptual contribution to the debate. At an applied level, and heavily drawing on Borio’s work, a commonly referred to framework is the one proposed by the International Monetary Fund (IMF, 2011). According to these considerations macroprudential
regulation is a complement to microprudential policy that is aimed at limiting system-wide risk within the financial system, using a set of powers and instruments. Its scope of analysis includes the entire financial system, and the relationship and impact with the real economy. The breadth and, above all the speed of the development of the macroprudential approach have triggered a lively and fast evolving debate. Analytically, this discussion can be broadly broken down into three sets of issues: conceptual, methodological and institutional (Ramella, 2011). The remainder of this section highlights key aspects in these three areas.

At a conceptual level, the debate has focused on the lack of consensus on what is meant by systemic risk and financial stability, both central elements of the macroprudential approach. Issues that have proven thorny to conceptualise include: the meaning of ‘stability’ in the term financial stability (Liedtke, 2010; Toulmin 1998; Crockett, 1997; Yellen, 2010), the setting of the ‘system’ boundaries in the definition of systemic risk –in particular in the cross-sectoral and cross-border dimensions (Brady and Markeloff, 2012), the understanding of the complex interconnections within the system and between the system and the environment (Datzi, 2013), and the temporal transformation of the system, in particular in light of the degree of innovation that has characterised the financial sector over the past 40 years (Borio 2013a, 2011a). Borio illustrates some of these difficulties through his description of the “paradox of financial stability”, in which the financial system seems strongest at its weakest point (Borio, 2011b).

With respect to the methodological level, on-going discussions include: the design and implementation of frameworks to carry out macroprudential regulation (FSB/IMF/BIS, 2011; Arnold at al., 2012); the effectiveness -including cost-effectiveness- of the tools used to conduct macroprudential surveillance and macroprudential supervision (CGFS, 2010, 2012; Lim et al., 2011); and the validity, reliability, availability, completeness, timeliness, and comparability of
quantitative and qualitative data needed to carry out surveillance and supervision (Borio, 2013b; Hannoun, 2010; IMF/FSB, 2009).

In relation to the institutional side of the macroprudential debate, an important part of the discussion focuses on understanding at what point governments should intervene (Houben et al, 2012). During the recent financial crisis, for example it became difficult to sound the alarm on the financial system, as regulators were met with resistance. Houben and colleagues mention that the challenge lies in determining what excessive systemic risk is and how much intervention would be necessary to mitigate macroprudential issues. Further, this challenge gets exacerbated by the fact that intervention powers are more often than not scattered in a variety of institutions usually residing cross-border. Moreover, intervention powers are often unclear or incomplete. For this purpose, some authors have argued for a continual blend of both analysis and intervention. Preventative measures are used primarily to avert potential problems, while mitigation is used secondarily to resolve any negative affects to the financial system (Yellen, 2010; Clark and Large, 2011). In short, whether, when and how to act in the macroprudential regulation field are key questions yet searching for a conclusive answer.

The insurance sector, part-and-parcel of the financial sector, has not been isolated from the conceptual, methodological and institutional elements of the macroprudential debate. Importantly, and in contrast to the banking sector, the insurance sector in general, and insurance firms or insurance activities in particular generate, transmit or amplify little systemic risk, although they are recipients of it (IAIS, 2010, 2011 and 2013a). This point will be picked up again later in the paper. Moreover, at the policy and practice levels, the kind of macroprudential regulatory actions -if any- that would contribute to detecting, assessing, monitoring, preventing, mitigating or managing insurance-related systemic risk are discussions that have only recently gathered momentum (IAIS 2013b).
As the brief overview above shows, the macroprudential regulation discussion appears populated with more questions than answers. This is the case within academic as well as policy and practice circles. The paragraph below, which belongs to a joint FSB, IMF and BIS paper, eloquently illustrates the situation:

“First, the identification of systemic risk is a nascent field. No common paradigms as yet exist. Further fundamental and applied research is needed, not least to better inform the collection and analysis of data underway. Second, newly introduced tools will need to be tried out in different circumstances and their performance evaluated against expectations. Finally, many jurisdictions still lack specific institutional arrangements for the conduct of macroprudential policy and those that have recently introduced them will need to gather experience on their performance” (FSB/IMF/BIS, 2011, p.3)

Section 2 – Macroprudential regulation and the concept of insurance

According to the IAIS, “there is little conceptual reason for life and non-life insurance activities to either trigger or amplify systemic risk. The reasons have to do with the specific nature of the insurance business model and in the way insurance liabilities are funded and claims are settled” (IAIS 2011, p.36). Importantly, most research on the matter shares the conclusions arrived at by the IAIS, such as the comprehensive literature review on the issue by Eling and Pankoke (2012) as well as other work (Caruana, 2013; Baranoff et al., 2012) looking at insurance and systemic risk (for a counterargument see, e.g., Bach and Nguyen, 2012).
When discussing the “specific nature of the insurance business”, the IAIS singles out two concepts that are distinct in insurance: insurability and insurable interest. These key concepts appear to play a critical part in the claim that insurance does not pose systemic risk.

With a financial stability aim in mind, this section examines insurability and insurable interest, revisiting them through the lenses of two key ideas widely debated in the social sciences, that is, the concepts of population and on financialisation. The notion of insurability is examined in the light of the concept of population, and its relation to the development of insurance (compare (1) below). The notion of insurable interest is scrutinised from the perspective of the concept of financialisation of the economy, and its impact on insurance (compare (2) below). Moreover, from a methodological perspective, the examination of the relations between insurability and population, and insurable interest and financialisation in carried out following the distinction between ‘external’ and ‘internal’ risk elaborated by Huber (2002). According to this proposal, we can simplify insurance activities by viewing them as consisting of dealing with two types of risks, external and internal. External risks are those events that cause damage to the insured (e.g. a car accident or an earthquake). Internal risks are, on the other hand, all those risks created by the insurer in the process contracting and managing external risks (e.g. pricing or providing coverage for external risks, investing the proceeds of coverage protection, etc.).

(1) With specific reference to insurability, a key feature of the external risks to be insured is the extent to which their materialisation takes place in populations subjected to the ‘law of large numbers’ (IAIS, 2011). In a nutshell, the regularity with which risks materialise (e.g. car accidents, deaths, injuries), increases with the size of the observed population. Critical to the discussion on financial stability, the law of large numbers is of importance in terms of space as well as in terms of time (Vermaat, 1995). In relation to the space dimension, risks materialise in a
manner that is idiosyncratic, random, for the one while regular for the many (i.e. the population). Moreover, in relation to the time dimension, the regularity of the materialization of risks in the population manifests itself in intervals of different length, the size of which provides critical insight to the financial stability discussion. In short, the longer the time the regularity manifests, the more equipped the risk-bearing insurer, the supervisor and the system will be to manage the external risk that has been insured.

A critical aspect to notice is that this space/time regularity is an empirical trait of the population, the latter understood -from a socio-economic angle- as an aggregation of individuals or goods (Foucault, 2005; Lotka, in Véron, 2008). According to this angle, populations show regularities in terms of number of deaths, accidents, etc. Importantly, population regularities can be also understood -from a statistical angle- as aggregations of cases (Bayatrizi, 2008).

The empirical and statistical angles are distinct, and this distinction is key to understanding insurance, and in particular, the development of the business of insurance. The statistical tools developed out of the empirical regularities shown by ‘socio-economic’ populations played a key role in the development of the business of life and non-life insurance (Bayatrizi 2008, O’Malley, 2004, 2009). These statistical tools were subsequently applied to other populations that do not present the empirical regularities seen in socio-economic populations (Clark, 1999). The extent to which insurance activities insure external risks grounded in populations empirically showing time/space regularities influences the profile of the internal risks of the insurers conducting those activities. The example below illustrates this point.
Taking data from the US insurance industry for the period 1970 to 2013, the loss ratio of P&C insurance, a kind of insurance activity providing coverage to external risks grounded on populations empirically showing space/time regularities, has remained stable over a 40 year period, while the loss ratio of mortgage insurance, an insurance grounded on populations showing space but not time regularity, has experienced wide historical variations. Summing up, by understanding the notion of population in its distinct socio-economic and statistical sides, and by examining the treatment given in statistics -and in insurance- to the empirical root of the regularities showed by socio-economic population, we are in a position to identify and assess specific areas of stability (i.e. regularity), to track their origin and to hypothesize their future.

(2) A second key element of value to the macroprudential regulation debate in insurance is provided the theory of financialisation (Epstein, 2005; Palley, 2013; Lapavitsas, 2011). Succinctly, financialisation can be understood as ‘the increasing role of financial motives,
financial markets, financial actors and financial institutions in the operation of the domestic and international economies’ (Epstein, 2005, 3).

According to this view, the financial sector -including insurance- has, among other things, increased their role in, and their influence over, society. This has, in turn, exacerbated risk taking by institutions and individuals, contributing to the current crisis, according to financialisation theorist. Examining the relation between financialisation and insurance appears hence, of critical value. In particular, we claim that financialisation has affected the concept of insurable interest. To look at this issue we examine the relationship between financialisation and insurance in two aspects: (2.i) the impact of financialisation on the external and internal risk metaphors underpinning financial transactions; and (2.ii) the new circuits of financial arrangements making up financial transactions, with specific reference to insurance agreements.

(2.i) To look at the impact of financialisation on the of the risk metaphors underpinning financial transactions we draw on the concept of socio-economic population introduced in (1). In this respect, we follow the literature arguing that the population is in a relation of interdependence with insurance; while insurance has drawn on the regularities shown by populations to develop as a business, it has also contributed to shaping contemporary populations (Ewald 2002; Ewald and Kessler 2000). Moreover, this shaping of the population by insurance is mediated by the concept of risk, which connects one to the other. In this respect, we argue that financialisation has contributed to transforming risk-taking away from the indemnity-driven view of insurable interest (i.e. the restoration -albeit a monetary restoration- of something concrete to someone suffering a loss) towards an opportunity-driven, entrepreneurial view of insurance, not necessarily coinciding with insurable interest. Examples of insurance activities falling under this category are life insurance
combined with investments or financial guarantee insurance (Sigma, 2013; O-Malley, 2009), where the risks linking the insurer and the insured represent future flows of abstract monies which may not materialise. Summing up, financialisation appears to have weakened the link between insurance activity and insurable interest.

(2.ii) With respect to the circuits of finance, financialisation theorists have argued that financial circuits have become more interrelated across sectors, with boundaries between sectors becoming ever more blurred and products becoming more hybrid. These circuits often feed on each other obscuring the understanding of the relationships that they set in motion. Derivative transactions are a prime example of this.

The extent to which insurance has been permeated by other financial circuits is a fertile area for analysing the relation between insurance and macroprudential regulation. Examples like life insurance with an investment components or financial guarantee insurance, where the insurer’s horizon of operation is critically determined by the rating provided by a rating agency and tightly tied to sophisticated financial engineering (e.g. CDSs covered via layers of SPE structures) (The Joint Forum, 2009) show the degree with which an element of financialisation has entered insurance. Critically, it shows the extent to which insurance is interdependent with other financial sectors.

As evidence of this phenomenon, we can contrast the growth in the life and non-life sectors in North America of the period 1970 – 2000. During the 1970s, that is, before the process of financialisation of the economy started1, insurance penetration in life and non-life remained largely flat, with mild growth in the non-life sector, mostly driven by increased penetration in liability lines (Sigma, 2013). On the other hand, during the period 1980 – 2000, insurance penetration for non-life insurance stayed almost constant at approximately 4.5% of GDP, while
life insurance penetration nearly doubled (e.g. from 2.3% in 1980 to of 4.3% in 2000). A key driver behind this trend has been the introduction of investment components in the life insurance contract.

An additional example is provided by the behaviour of financial guarantee insurance during the same period. The sector emerged as a niche one in the 1970s, providing insurance coverage on US Municipal bonds (Rule, 2001). It impressively expanded in the 1990s when it added the provision of insurance protection to other securities like ABSs or CDOs. By 2000, the sector had accumulated and exposure in excess of USD 1 trillion (Schich, 2008).

The matrix below brings together the discussions of insurability and population, and of insurable interest and financialisation. Examples of insurance activities illustrating the analysis articulated above are proposed in order to suggest an understanding of insurance activities that may aide thinking within the context of macroprudential regulation.

<table>
<thead>
<tr>
<th>Empirical time/space population regularity</th>
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<tbody>
<tr>
<td>Degree of financialisation of the insurance activity</td>
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<td>Low</td>
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Insurance activities showing low degree of financialisation influence the population covered in a restorative way, enabling it to recoup loss suffered, to bounce back. In addition, those grounded on empirical space/time population regularities benefit from the certainty generated by long historical series of stable data (top left quadrant). These activities largely correspond to the notion of traditional insurance business elaborated by the IAIS (2011, 2012, 2013a). On the other hand, activities not grounded on space/time population regularities lack the certainty generated by long historical series of stable data. However, their low degree of financialisation makes them more amenable to targeted policy intervention in case of distress, as they are less embedded in financial networks (top right quadrant). These activities largely match semi-traditional insurance business, as proposed by the IAIS (2011, 2012, 2013a).

Insurance activities showing high degree of financialisation relate to the population covered in an entrepreneurial, often speculative way, providing a platform to bet on an unknown future, and in so doing, shaping -and shaking- the very future they are betting on. These activities largely
correspond to IAIS’s non-traditional insurance business (2011, 2012, 2013a). Importantly, those activities grounded in space/time population regularities like life insurance with investment component(s) enjoy the certainties provided by long historical series of stable data (bottom left quadrant). On the other hand, those activities not grounded in space/time population regularities show a compounded problem of lacking these certainties and being embedded in, an entrepreneurial way, in open-ended circuits of financial activities (bottom right quadrant). In short, this latter category appears as the most problematic in terms of financial stability.

As it has been shown empirically, financial guarantee insurance, a prime example of this kind of activities, accounted for the main share of systemic risk generated by insurance in the global financial crisis, and was the sector most affected by crisis, although other sectors suffered from the crisis too (Chen et al., 2013; Karapiperis, 2012; Drake and Neale, 2011; Bergstresser et al., 2010; Webel and Gettel, 2008; Schich, 2008).

To conclude, we argue that the two key specificities of insurance activities examined above, that is, insurability and insurable interest, are of value to better understanding the link between insurance and systemic risk. Most importantly, we argue that these reflections have potential to contribute to the debate on insurance-specific macroprudential regulation. The next section delves deeper into this matter and looks at the policy and practice implications of these reflections.

Section 3 – Implications for insurance-specific macroprudential regulation policy and practice

Macroprudential regulation, as discussed in this paper aims to limit system-wide risk within the financial system. While macroprudential surveillance is focused on the identification, assessment
and monitoring of risks to the system, macroprudential supervision is tasked with preventing, mitigating or managing any systemic risk. Insurance-specific macroprudential regulation is no different. This section draws on the conceptual discussion introduced in Section 2 and elaborates some of the implications for policy and practice of insurance-specific macroprudential regulation.

A first implication relates to the extent to which the nature of the external risks that the insurance sector assumes is understood and captured by the macroprudential regulation framework. For external risks that are anchored in populations showing space and time empirical regularities and that are transformed into insurance activities that show low degree of financialisation (e.g. most P&C insurance and reinsurance activities, and most life and health insurance and reinsurance activities), the macroprudential focus appears better placed on the internal element of the risk, that is, on the manner in which the insurance sector manages the external risks, than on the external risks themselves.

In practice terms, the focus of macroprudential regulation is to monitor external risks (i.e. macroprudential surveillance), and understand and deal with internal risks (i.e. macroprudential supervision). Examples of the latter include risks emerging from the diversification, pricing and reserving of the external risks, or the management of the assets held by the insurance sector to pay for claims and for running the insurance business.

With respect to the macroprudential surveillance of the external risks, dedicated attention is warranted in relation to the extent to which the empirical regularities of the population are themselves subjected to disruption. This is the case of catastrophic events such as pandemics or earthquakes. Importantly, these events themselves show empirical regularities which make them not substantively different from the empirical regularities shown by socio-economic populations. In the case of catastrophes the regularities emerge when the population is broadened
geographically, often encompassing the entire world. Here, the focus of macroprudential regulation is to understand the external risks, and to understand and address the relation between the external and internal risks. An example of this point is the work carried out by the IAIS in relation to the global reinsurance market. This work, which is global in nature, looks both at the external risks (e.g. trends in natural and human-made catastrophes) and the internal risks (e.g. assessment of the soundness of the pricing of risk, systemic issues emerging from concentration of catastrophe modelling technology, etc.) emerging from disruptions in the empirical regularities at the base of the populations generating external risks.

A second implication relates to the ability of the macroprudential regulation framework to identify and assess those insurance activities providing insurance coverage for external risks that are not anchored in populations showing space and time empirical regularities and/or that do not show low degree of financialisation. Some of these activities have been assigned specific microprudential regulation treatment, like financial guarantee insurance or life insurance with large investment components. Macroprudential regulatory treatment on the other hand, spreads to both surveillance and supervision, focusing on understanding and managing external and internal risks emerging from, among other things, the increased interconnectedness derived from financialised circuits (e.g. the linkages between CDSs, financial guarantee insurance and rating agencies), the effects of the entrepreneurial orientation of certain life insurance activities (e.g. activities with little –if any- insurance interest and large investment components), or the relationship between economic cycles and insurance activities not rooted in time-based empirical regularities (e.g. mortgage insurance or trade credit insurance).

Finally, the dynamically evolving nature of the insurance sector results in new insurance activities being permanently developed, new insurance groups or conglomerates created, or new potentially systemic linkages being forged, the risks of which warrant macroprudential regulation
effort. As example of this we may cite the growing interest of the capital markets in assuming insurance risks.

Conclusion

The paper revisited the concept of insurability and insurable interest, two key specificities of insurance activities with the goal of distilling lessons for insurance-specific macroprudential regulation policy and practice. With respect to insurability, it examined the notion of socio-economic population at the root of insurance activities. These populations show empirical regularities spanning across space and time. The regularities of insured events, such as accidents, deaths or illnesses lie at the heart of the external risks that insurers take up. Critical for the systemic risk debate, *empirical regularities, in particular space-and-time ones, are a source of stability for insurance firms and for the insurance sector at large*. This unique trait of insurance is of significant relevance to understanding and assessing systemic risk and, most importantly, to designing and implementing frameworks for limiting such systemic risk.

In relation to insurable interest, the paper looked at how this central concept in insurance has been affected by the process of financialisation of the economy. Financialisation has eroded the notion of insurable interest via two key mechanisms that have altered the risk dimension of insurance activities: the transformation of the insurance activity from one of indemnity to one of investment, and the embedding of insurance activities in broader circuits of finance. Critical to systemic risk and to macroprudential regulation, insurance activities showing comparatively greater degree on financialisation, like life insurance with large investment components, appear more susceptible to systemic risk than insurance activities showing less degree of financialisation. Conversely, *insurance activities showing low degree of financialisation, that is, firmly oriented*
towards indemnifying a loss and not embedded in broader circuits of finance, are a source not only of stability but most importantly of resilience for society, enabling those affected by external risks to bounce back.

Finally, the paper combined the insurability and insurable interest discussions showing that insurance activities that are affected by both, like financial guarantee insurance, are the ones in which the potential for systemic risks is at its highest. Accordingly, the paper suggested, that careful consideration is warranted at the macroprudential regulation level.

The discussion on the relation between insurability, insurable interest and systemic risk appears of particular relevance at a time where addressing systemic risk has gained policy and practice momentum. Moreover, as discussed in the paper, there is a state of uncertainty at the theoretical, methodological and institutional levels. It is precisely at the conceptual level where the paper has aimed to contribute. The development of macroprudential regulation frameworks is work-in-progress where more often than not, easy answers are lacking (Clark and Large, 2011). We hope that the discussion on insurability and insurable interest contributes to focusing the priorities, goals, targets and networks of insurance-specific macroprudential regulation in particular, and of macroprudential regulation in general. As mentioned in the paper, there is consensus on the point that the insurance sector is unlikely to trigger or amplify systemic risk; its role in the current global financial crisis was marginal in relation to that of the banking sector. A better understanding of insurability and insurable interest may contribute to shed light on the different roles played by insurance and banking in the crisis.

Above all, bringing to the fore concepts such as insurability and insurable interest can help re-connect insurance, as a financial activity, to society. As argued by Ewald (2002), western societies, and increasingly non-western societies too, are “insurance societies”, not just drawing
on insurance to function but critically, heavily influenced by insurance. At a time where substantial attempts have been made to feed natural science knowledge into finance (see, for example, the works by Turner (2010) or by Haldane (Erturk et al., 2011)), the paper has joined this cross-fertilisation challenge and proposed instead a social science inspired perspective on insurance-specific macroprudential regulation. Concepts like insurability or insurable interest may hold the key to understanding the role of insurance in macroprudential regulation. Or it may be the case that insurance itself holds the key to shaping macroprudential regulation altogether.

Notes

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1 The remainder of the paper uses the term insurance/insurer to refer to both insurance/insurer and reinsurance/reinsurance; the term reinsurance is used only when making specific reference to reinsurance


3 The variations shown by the mortgage insurance loss ratio follow, at least to an extent, variations experienced in the economy at large.

4 The connection between insurance and population, the latter understood as a target of insurance has a history that goes back to Bernoulli’s *Ars Conjectandi* or, further, to the ‘political arithmetic’ of William Petty of the 1600s (Buck, 1977), and the work by John Graunt on mortality tables in
the XVIIC. and by Edwin Chadwick on mortality accounting in the XIX C. (Bayatrizi, 2008). For a discussion on Ewald’s thinking and intellectual trajectory behind this connection see Behrent (2010).

5 A key quantitative measure indicative of the degree of financialisation of an economy is the ratio of total financial liabilities to GDP. Looking at USA data, this ratio remained between 1.5 and 1.9 during the period 1940 to 1970, raising to almost 5.0 in 2008 (Randall Wray, 2012). An additional indicator is the share of total debt in the economy that is taken up by the financial sector. In this respect, data for the USA show that this figure was 9.7% in 1973, 11.9% in 1979, and 31.9.3% in 2007, decreasing to 26.5% by 2010 (Palley, 2013).

6 See the work carried out by the Reinsurance Transparency Group of the International Association of Insurance Supervisors (please refer to www.iaisweb.org).

7 On the systemic relevance of insurance groups and the related macroprudential regulation framework to deal with those groups deemed to be systemically important refer to chapter by Paul Sharma in this book.

**Bibliography**


Chapter 5

Macroprudential policy: rationale and challenges.

The causes of the crisis – why we strive to know it?

Piotr J. Szpunar

INTRODUCTORY REMARKS

The focus of this chapter is on financial stability, not on consumer protection, nor any broader concept referring to economic well-being or welfare. Financial stability is usually defined as a situation when the financial system performs its functions in a continuous and efficient way, even in case of unexpected and significant shocks or disturbances (Narodowy Bank Polski, 2013, p. 3). Thus, lack of stability or a crisis can be described as a situation when financial system (especially banks, but also other intermediaries) cannot continue its activity without a significant external support. Obviously, the global financial crisis exemplifies this kind of a situation. As a result of the crisis financial institutions and many economies have suffered huge losses. Solely in the EU the public sector was forced to recapitalize banks in an amount corresponding to 2.5 per cent of EU’s GDP (322 billion EUR) (European Commission, 2012, p. 35). This was necessary to avoid dramatic consequences of uncontrolled bankruptcies of significant banks, which would have entailed a dysfunction of money and, thus a meltdown of the market economy. The cost of this would have been unimaginable. At the same time the economic breakdown caused by the crisis reduced the GDP in the Euro area to a level, which is about a dozen percentage points lower than it could have been, if the growth had remained at the pre-crisis pace.

Figure 5.2. Eurozone GDP

(1Q2002=100)
Huge fiscal expenses associated with rescuing banks combined with deep recession and rapid increase in unemployment led public finances of certain countries to the brink of collapse. The increase in public debt levels and associated debt-service burden may constitute a major barrier to their development for many years to come. Thus, the lesson we have learned seems very simple: financial stability is a public good because it constitutes a necessary condition for a sustainable economic growth.

Source: Eurostat, own calculations
No wonder that the giant cost of the current crisis awaked policymakers who started many new regulatory initiatives aiming at preventing similar disasters in the future. The first step should be to understand what went wrong. An in-depth understanding of the causes of the crisis is necessary to shape efficient solutions (naturally providing that the nature of the next crisis would be similar to the current one). The causes of the crisis, however, mentioned in the same breath, usually cover many heterogeneous factors, such as: errors in fiscal policy (cross-subsidization and quasi-guarantees for the real estate market) and monetary policy (too low interest rates for too long), insufficient financial supervision (including lax capital requirements, unlimited leverage, lack of liquidity regulation), negative role of business models (originate and distribute, wholesale funding, concentration), size and complexity of financial institutions and markets, misbehavior of credit rating agencies producing misleading ratings, and finally defective system of remuneration in financial institutions, greed and lack of moral brakes in the conduct of business. The list of reasons seems less controversial than weights and importance assigned to them. This is why, addressing regulatory shortages seems to be a very complex and extremely requiring task. Moreover, most considerations focus on the banking sector, which may lead to overseeing of some important aspects of interconnectedness and systemic risk accumulated in the broader
financial sector and the whole economy. Using a medical metaphor, the question for the causes of the crisis can be compared with the question for the causes of myocardial infarction (or as you wish: a heart attack). The direct cause is usually incontestable: critical narrowing of the coronary artery as a result of atherosclerosis. However, a complex combination of factors leading to atherosclerosis is already not a subject of simple verification. It cannot be excluded that the risk of a heart attack cannot be easily reduced to simple environmental factors, like lifestyle, diet or stress. This risk can come from factors of deeper nature, including genetic ones. Going back to the financial system, it seems that the root of the crisis, a kind of "genetic" contamination, could be narrowed down not only to a faulty system of incentives, but also a strong penchant for increasing profits, which in turn critically influences the functioning and behavior of the financial institutions. This behavior led to an increase in systemic risk reflected in high concentration, interconnectedness, complexity, giant scale of activities and too high leverage. Changing the penchants can be, however, not only difficult, but downright impossible (as one cannot change the genetic equipment of a patient). But, although we cannot change penchants, we may at least try to influence incentives. This would lead to the conclusion that instead striving to change the nature of economic agents we should focus on what is doable. The list consists of:

(1) monitoring and controlling systemic risk accumulating in financial system,

(2) preventing or mitigating formation of systemic risk (as far as possible),

(3) building resilience of financial sector and in the whole economy.

This all still does not give us any comfort nor guarantee that the future crises can be ruled out. And although prevention is obviously better than the cure, wide-range preparations for a possible rescue actions and crisis management seem also necessary. The macroprudential policy is, however, not about crisis management, it is about prevention, so we focus on the three abovementioned areas of: systemic risk control, prevention (or mitigation) and reduction of its potential consequences. Hopefully, proper actions in those three key areas can prevent the next crisis or at least reduce its scale, postpone it and reduce the pain when it hits.
The purpose of this article is to explain the rationale for macroprudential policy and challenges ahead. The structure of the article is as follows. In the second part we elaborate on the main mandate of macroprudential policy which is analyzing and mitigating of systemic risk. The focus is on the nature of systemic risk and ways how it accumulates and then propagates throughout the financial system. In the third part we discuss the mandate of macroprudential policy and indicate several important features of the institutional setup, stressing the important role of central banks in conducting macroprudential policy. Macropurulent instruments are presented in the fourth part. The theoretical discussion on application of macroprudential tools is supplemented with the description of some experience gained so far. In the fifth part we critically analyze the implementation of global standards mostly those set by the Basel Committee in the EU. We conclude with some general reflections on the regulatory changes, nature of crises and prospects of crisis prevention given the so far introduced solutions.

5 SOME OBSERVATIONS ON SYSTEMIC RISKS - THE ROOTS OF THE CRISIS

To control and mitigate systemic risk we should understand its nature. Usually, systemic risk is described as the risk of disruption in the functioning of the financial system, which can trigger serious negative consequences for the real economy spheres (International Monetary Fund, 2011, p. 7). Doubtful if it explains much. Most definitions of systemic risk draw our attention to several aspects of this phenomenon, mainly serious consequences of its materialization. But they hardly cover all important aspects. Obviously, it is very difficult to construct an accurate definition of systemic risk, as it is complex and deeply intuitive concept. To understand what systemic risk is it seems useful to follow how it is generated, through what channels it operates and how it materializes. Crucial is, how it differs from the financial risks we know well from microprudential considerations and supervisory practice, like credit, market and liquidity risk. These three risk areas reflect a potential for losing economic value by affected individual institution, whereas systemic risk is generated via interactions of those institutions with...
each other, with financial markets and with other economic agents in the domestic economy or internationally. This is why, systemic risk can originate not only within the financial system but also outside of it. For example, a high quality and seemingly well-managed loans for enterprises can easily go into default because of excessive cross-border debt of those corporations or their risky exposures to derivative markets. Because there are strong interactions within the system there is also a high potential for propagation and feedback. This is why the systemic risk accumulated in the financial sector tends to be higher than the sum of risks of individual institutions (if anybody could at all quantify it).

Systemic risk usually materializes as a result of a shock or reversal of long-term trends (such as for example the collapse of the price increase of assets, real estate etc.) but it can be also triggered endogenously, without any significant reason. Prior to the crisis the US financial sector accumulated risk related to large exposures in the real estate market (not just the sub-prime), to some extent also in poorly supervised market segments. Those unsupervised entities were, however, strongly related to the banking system (shadow banking). Institutions supervised on the individual basis functioned flawlessly, achieving excellent financial results. But the system as the whole accumulated risks associated with over-indebtedness of households, high leverage and concentration in the real estate financing. When real estate prices in the US begun to drop (due to the high scale of their previous growth, maybe also due to a change in demographic trends) the bubble burst. The crisis of the US financial system spread to other markets through cross-border links of financial institutions, mainly to largely exposed European market.

So, we know what went wrong but how it was possible? To explain this we have to tell a short story of financial liberalization in the US. In 1999, the Congress passed a Gramm-Leach-Bliley Act, also known as the Financial Services Modernization Act, repealing Glass-Steagall Act. It abolished the traditional separation between commercial and investment banking. As a consequence the investment banks started to offer universal services, increased leverage of their balance sheets and took a considerable risk to reach higher returns on capital (Stiglitz, 2011,
p.191). This also incentivized investment banks to enter aggressively on the market of retail finance. Among other things they started to acquire institutions granting mortgages. A numerous mergers and acquisitions in the banking system took place resulting in unprecedented increase in concentration of universal institutions. The share of the top 5 banks in the total assets of the banking system grew steadily. In 2001 the 5 largest banks held 30% of the assets of the American banking system, whereas in 2011 this indicator rose close to 50% (Wheelock, 2012). The high concentration, leverage and overcapacity led to uncontrolled credit expansion, which contributed to the financial crisis.

**Figure 5.4. US domestic credit to private sector (% of GDP)**

![Graph showing US domestic credit to private sector (% of GDP)](image)

Source: World Bank (World Development Indicators), own calculations

One of the innovations that played particularly important role in the formation of imbalances leading to the current crisis were structured bonds, so called collateralized debt obligations (CDOs). The CDOs were issued by special purpose vehicles (SPVs), many of them bank-related but not regulated. The CDOs were products of securitization of debt obligations purchased by SPVs on the secondary market - both from banks and from unregulated loan
originators. SPVs financed their activities by issuance of short-term securities: asset-backed commercial papers (ABCPs). Creating unregulated SPVs and equipping them with very low capital enabled banks to increase their profit margins. Firstly, by creating SPVs banks created new clients as the SPVs used many financial services delivered by banks. Secondly and more importantly, banks shifted a significant part of their business and related risk to SPVs. This of course helped banks to increase the returns on their own equity. By selling loans to the SPVs banks could release the capital involved in those loans which, in turn, allowed them to grant new loans. The CDOs offered by the SPVs to investors were divided into separate tranches with various risk level ascribed. The senior tranches obtained rating grades and were considered as an attractive investment product. The demand for CDOs grew very quickly because they combined high rates of return with high ratings and could be traded on the market (unlike illiquid underlying loans). The scale of the securitization market reached enormous size of ca. 2 trillion USD whereas CDOs solely 0,5 trillion USD by 2007.

The CDO market, however, was not very liquid, since investors mostly purchased CDOs to their investment portfolios. Despite high ratings a lot of CDOs were created as a product of securitization of poor quality loans written by unregulated providers. These loans quickly became an issue and the progressive deterioration of their quality triggered a drop in confidence in the CDO market. This initiated massive sales of CDOs in the rather poorly liquid market which led to a sharp fall in prices. In the first instance investors buying equity tranches have suffered losses, mainly hedge funds. But also banks were exposed as they purchased some parts of the equity and mezzanine tranches as a kind of "marketing" to encourage investors to buy CDOs. SPVs also began to suffer losses which led to a collapse of the ABCP market. To finance their positions the SPVs had to mobilize credit lines from sponsoring banks bringing about a severe lack of liquidity in the interbank market. Only thanks to the interventions of central banks the dramatic consequences of the lack of liquidity on the interbank market could have been avoided. Not for very long, however. It did not help much as the emergence of enormous losses in banks and, in
particular, the bankruptcy of Lehman Brothers quickly transformed into a deep solvency crisis (Sławiński, 2008, p.47). The crisis eventually moved to Europe both via direct exposures of European banks to CDOs and other securitization products as well as via macroeconomic channel as the US recession following the collapse in the financial sector dragged the European economy down. All in all, not a nice story. But very instructive and helpful to understand how the systemic risk is generated, how it materializes and propagates.

**Figure 5.5. Global CDO issuance (in billion USD)**

![Global CDO issuance graph](http://www.sifma.org/research/statistics.aspx)


The US pre-crisis experience indicates very clearly that there are two essential dimensions of systemic risk:

1. a time dimension associated with the collective tendency of the market participants to periodically underestimate risk, which translates into pro-cyclicality and
2. a cross-sectoral dimension, linked to excessive concentration of activities and reciprocal relationships between institutions, financial markets and the real economy,
which is conducive to dissemination and reinforcement of negative effects after risk materializes.

The systemic risk in the US was mostly accumulated in the banking sector and unsupervised shadow banking companies sponsored by banks. The role of the insurance sector during accumulation of the risk was, however, also very prominent, even if less visible. To large extent this role resulted from non-routine operations of insurers, mostly from guarantees for investments in subprime mortgages and corporate bonds as well as from innovative derivatives. AIG is one of the most spectacular examples of insurance companies that expanded the activities way beyond what is considered a core insurance business model. Some insurance companies, especially monoliners, were also very active in providing guarantees to issuers, thus enhancing their credit. Among other unconventional activities some insurance companies started to issue credit default swaps (CDS). In this way those insurers offered investors the protection against loses once the underlying assets went into default. CDSs buyers made regular payments to insurers who, in turn, had to compensate the loss if a default occurred. As the risk of default increased the insurers had to write-down the value of the protection they sold. Some of the US insurers were also directly exposed to the housing market as they run units which were writing mortgage loans or insuring payouts to lenders if a borrower falls out. Many investment banks held tranches of MBSs and CDOs in their own portfolios hedging credit risk through CDSs issued by insurers. This enabled those banks to back the risky exposures only with very little or none of own capital. This of course contributed to an enormous increase in systemic risk and eventually exposing insurers to huge losses. Those activities illustrate that despite a generally stabilizing role of insurers they can also engage in activities that reinforce systemic risk accumulation, allowing other investors to build excessive exposures and fueling speculation. This is why, the regulators and supervisors should pay a very close attention to non-conventional activities of insurers once their scale calls for surveillance.
Figure 5.6. Gross positions in the global CDS market, by counterparty (market value of transactions)

Note: Transactions between reporting dealers are counted only once. “Insurance and financial guaranty firms” category includes reinsurance and pension funds.


Still, although the role of US insurers in the increase in systemic risk prior to the crisis was very important the main risk accumulation took place in the banking system in association with the unregulated shadow-banking industry. This can be considered as rule that systemic risk can be accumulated or at least transmitted mostly by banks. Banks contribute to the financial cycle most because of their specific business model characterized by cyclicality, high leverage and interconnectedness. The stability of the banking system is therefore of particular importance.
for the stability of the whole financial system. Banks play a crucial role in financing of the economy and settling payments. They also perform other important functions, providing investment products and financial services that allow other entities to manage their financial risk (from traditional banking products like guarantees or factoring to complicated derivative structures). They simply let the money operate in the market economy. Therefore, a special emphasis in monitoring of systemic risk must be put on the analysis and assessment of the stability of the banking system.

In contrast, insurance companies may generally be seen as contributors to stability of the financial system rather than problem-makers. They transfer risks across sectors and agents and over time contributing to more professional and cheaper risk management in the economy, thus supporting economic growth. Because of reversed “production cycle” the insurance industry is also in a position to provide long-term financing to banks, sovereigns and real sector companies. This is why, in case of insurers the undisturbed continuity in supply of their services should be considered very important. When an insurance company provides services that are critical for the functioning of the economy its potential failure can pose important risk and incur high economic cost. Particularly, in case of a failure of a significant life insurance company the cost can be similarly spread via wealth effects as in case of a failure of a significant bank. In addition, an important part of funding for banks can cease to exist, thus creating shortages in financing and increasing funding/liquidity risk. A potential disappearance of insurance service in the EU is probably not a very high risk, as most insurance sub-sectors are rather competitive and substitutability of insurance services seems to be high. The number of insurance companies in the EU exceeds 5000 (Insurance Europe, 2014, p. 9). Nevertheless, the impact of a failure on banks and the real economy can be assessed as potentially high. It holds especially for provision of insurance services to banks. Insurance companies facilitate risk mitigation for banks’ business operations, especially in fields like real estate insurance or operational risk insurance. The substitutability in those specialized products seems to be much lower.
Another way, in which “regular” insurance activity can contribute to systemic risk is the propagation or reinforcement of shocks due to their interconnectedness with other subsectors of the financial system. Firstly, the interlinks can go within a financial group (financial holding or conglomerate) where insurance company may be closely related to a bank via capital, funding and reputation channel. This creates potential of intragroup contagion. This is why, once a problem occurs in the insurance company it can easily translate into serious difficulties of the bank, including panic and deposit outflow. Large conglomerates can also create potential moral hazard given the size and interconnectedness of these entities and their complexity that, given potential inconsistency in regulation, can enable regulatory arbitrage. Besides intra-group linkages insurers are also strongly interconnected with the rest of the financial system. Both insurers and banks invest in each other’s equity. Much more important, however, seem the investments by European insurers in banks’ bonds. This constitutes the most important, large link between the two sectors and exemplifies the role of insurers as a source of long-term funding. Another risk results from large covered bonds portfolios held by insurers in some countries. This risk may materialize in case that covered bond issuers default and at the same time the collateral prices go down. Banks also lend money to insurers but to a much lesser extent than the other way round. Given the nature of their business, insurance companies issue less debt than banks and obviously banks hold relatively less bonds than insurers. On the net basis, insurers deposit money with banks which may be a source of loss in case of bank’s failure or resolution. The risks may be also propagated through common exposures, for example both insurers and banks hold large portfolios of government bonds. Insurers engage also in repo and securities lending transactions, mostly with banks. These transactions reinforce the interconnectedness even further, facilitating credit growth, maturity and liquidity transformation by the banking sector. The new potential for interconnectedness between insurers, sponsoring banks and third counterparties opens with Solvency II that creates new possibilities of investing in securitization like asset backed securities or collateralized debt obligation. There are undoubtedly many other ties between banks and
insurance companies that also can be relevant or have potential to become so. Still, the high investment of European insurers in government and corporate bonds of both financial and non-financial sectors constitutes the main channel of potential risk propagation.

Figure 5.7. Euro area insurance companies and pension funds holdings of securities other than shares (billion EUR)

![Chart showing the holdings of securities by insurance companies and pension funds in billion EUR by year]

Source: ECB (Statistical Data Warehouse)

Insurers are also exposed to risks resulting from their transactions in derivatives. Especially life insurers are likely to be net buyers of interest rate derivatives to protect themselves against low interest rates. Insurers are large investors in securities, thus they may be net buyers of credit default swaps to protect themselves against credit risk of the issuer. As derivatives can be traded in the over the counter markets or regulated markets and settled via corresponding banks or through a central clearing party (CCP), the counterparty risk profile may vary. Still, however, it may be a source of liquidity risk when changes in market pricing or risk perception may trigger margin calls. Increased liquidity risk may subsequently prompt fire sales amplifying the downward cycle. A changing composition in assets of insurance companies as a response to market value of different asset classes may reinforce pro-cyclicality of financial markets. It may
potentially contribute to asset price booms and bursts. Insurers searching for yields can add to price increases of assets during a boom phase. Fire sales and flight to quality during the downward trend can accelerate plummeting of asset prices. Given the very large scale of insurers’ activities, their adjustments in balance sheets can cause pricing effects that by no means can be ignored. Those risks can be elevated because of low yields environment, weak macroeconomic climate and credit risk from exposure to sovereigns (EIOPA, 2013, p.1-11).

Figure 5.8. Total assets of Euro area banks and insurance companies (billion EUR)

![Graph showing total assets of Euro area banks and insurance companies](image)

*Source: ECB (Statistical Data Warehouse)*

An in-depth analysis of the interconnectedness and potential market impact of EU insurance sector should provide the basis for an accurate assessment of their systemic risks. A mapping of the interconnectedness requires access to granular data. It can help to understand the scale and channels in which risks can impact the European insurance sector and how the failure or distress of insurance companies can in turn impact the financial stability. The potential influence of insurers on banks as well as on the wider financial system and the economy as a whole seems
one of the keys to understand the systemic risk in the EU. Thus, such an assessment should be a regular task of the European macroprudential watchdog, the European Systemic Risk Board (ESRB).

6 THE MANDATE OF MACROPRUDENTIAL POLICY – THE MISSING LINK

The evidence of the crisis can lead to quite a simple conclusion: the huge systemic risk in the financial system could have been accumulated because nobody was mandated to control, to warn about and to mitigate it. Even when central banks did carry out the relevant analyses of risks in the financial stability reports it was not followed by any action as there was no institution with appropriate mandate and tools (Goodhart, 2011, p. 5). The outbreak of the crisis disclosed an important shortage in the paradigm in which macroeconomic stability was to be ensured by fiscal and monetary policies combined with micro-prudential supervision mandated to target credit and liquidity risk of individual institutions. No one was there to limit systemic risk.

It seems that prior to the crisis there was no sufficient reflection on the interlinkages between macroeconomic and financial stability. Now it becomes clearer that a long-term macroeconomic stability may even promote formation of systemic risk. Optimistic expectations built on sustainable economic growth combined with low inflation and interest rates may contribute to a rise of assets-price bubbles and increase of imbalances in the financial system. Those adverse developments are usually mirrored in the balance sheets of households and/or businesses and, in some cases, also in cross-border exposures. It would be, however, too simplistic to say that the economic cycle does coincide with the financial cycle. The latter one is usually much longer (Borio, 2012, p. 3). Furthermore, not every recession is combined with a financial crisis. Once a balance sheet recession happens, however, the recession is usually deeper and lasts much longer (Borio, 2012, p. 16).

Thus, in the aftermath of the crisis it turned out that there is a strong need for something more than just a supervision of individual institutions (micro-prudential supervision). There is a
need for identification, analysis and mitigation of risks also from the perspective of the whole system – this is the role for macroprudential policy. The identification and analyses of systemic risks is the first necessary step. It was also a well-established practice in many countries prior to the crisis. Central banks had published financial stability reports for many years (the first such report was published by the Bank of England in 1996). Those reports usually identified potential risks relatively well, focusing on the areas like correlations of exposures of individual institutions (including cross-border), excessive reliance on poorly diversified sources of funding, excessive rise in asset prices, high credit growth or vulnerabilities of the banking systems (using stress-testing tools). This was, however, obviously not enough. The lack of a clear mandate to take actions aimed at mitigating or countering systemic risks constituted the most important institutional gap.

What is more, once the risks are identified it may be beneficial not only to try to mitigate them but also to build resilience of the institutions for the case of potential risk materialization. To take efficient preventive actions or to encourage building of buffers it may be sometimes necessary to act in cooperation of many institutions using different types of instruments. Therefore, the effectiveness of the macroprudential policy may critically depend on effective coordination not only with monetary policy but also fiscal policies and microprudential supervisors. To do so, however, macroprudential policy must first start to exist. The three main areas of macroprudential activities should thus cover:

(1) identification, monitoring and control of systemic risks

(2) prevention or mitigation of systemic risks and

(3) building resilience of the financial sector and the economy.

Those main activities may be developed further and should be complemented by analyses of risks of significant institutions and subsectors of the financial system, financial cycle, interconnectedness within the system as well as ties with the real economy, assessments of resilience of the financial system to potential shocks (including stress-testing). Those tasks
require broad access to data as well as sophisticated expertise and research capacity. In response to identified risks the macroprudential supervisor should apply proper instruments aimed at prevention or mitigation of systemic risk. Some of those instruments can also be used to increase resilience of the system.

After having sketched the general tasks of macroprudential policy the immediate question arises who should be entrusted with the macroprudential mandate. This problem has been already tackled in numerous publications, including those of international institutions (see for example Nier et al., 2011). On the back of this literature we can venture to formulate a set of recommendations regarding institutional organization of efficient macroprudential supervision.

- Firstly, the macroprudential policy should be entrusted to an institution or a committee equipped with a strong and formally guaranteed independence. The formal independence is necessary as the macroprudential policymaker is expected to “lean against the wind” by taking unpopular decisions (such as requiring banks to reduce risk in the upward phase of the cycle).
- Secondly, the central bank should have a key role or a significant impact on the conduct of macroprudential policy either through the acquisition of formal responsibility or through a substantial share of votes in the designated collegial body.
- Thirdly, the institution responsible for the macroprudential policy should be given a clear mandate and sufficient powers to implement them.
- Fourthly, the mandate of the macroprudential policy should be combined with the appropriate set of instruments/tools for its implementation. These instruments can be specifically macroprudential or microprudential ones but used for macroprudential purposes. They may be implemented directly or also by other authorities.
- Fifthly, the institution responsible for macroprudential policy must be set in a way which ensures transparency and accountability.
Sixthly, the institution responsible for macroprudential policy should be given access to the information and data necessary to identify the risks for financial stability, including data on individual financial entities.

Finally, the macroprudential institution should also have highly analytical expertise.

In the institutional setup of macroprudential policy the recommendation indicating the key role of the central bank seems to be of a special importance. Central banks are institutions of guaranteed legally and persisted independence. Mandates of most central banks in the EU already include the task of promoting financial stability. The reason behind this is not only a mutual interdependence between monetary and macroprudential policies. For the purposes of implementation of monetary policy central banks have very well-developed analytical tools and staff resources that can also be crucial for efficient macroprudential analyses. The expertise in macroeconomics and presence in financial markets make central banks best natural candidates to analyze and understand systemic risks. What is more, since 1990s central banks have specialized in the analyses of financial stability and prepared financial stability reports. All of these features speak for central banks to play a decisive role in macroprudential policy. The institutional reforms after the crisis also largely follow this recommendation. The creation of the European Systemic Risk Board (ESRB) in 2011 set the standard in this respect. The ESRB is a collegial body with the leading role of the governors of the European central banks.

Taking into account the need for establishing of macroprudential authorities in the EU Member States the ESRB released on 16 January 2012 a Recommendation on macro-prudential mandate of national authorities (ESRB/2011/3) The ESRB recommended that each EU Member State appoints an independent and responsible authority which ensures the stability of the financial system as a whole. The specific shape of such institution was not determined, however, some basic requirements were defined, including assignment of the leading role to the relevant central bank. The key role of the central banks may, however, be also a source of a significant
drawback resulting from the lack of expertise on some other sectors than banks, including insurance. This may especially generate problems when the central bank is not the microprudential supervisor. However, this potential shortage does not need to be overwhelming as the expertise gap could be addressed by close cooperation with relevant microsupervisors. Unfortunately, in some EU Member States there is a tendency to weaken the role of the central banks as macroprudential supervision is entrusted to collegial bodies in which the central bank does not have a key position.

The interactions between macroprudential policy and other policies may be crucial for its effectiveness. Any in-depth analysis of this issue would go far beyond the scope of this article. Let us only focus on two very important aspects.

Firstly, central banks that should play the key role in macroprudential policy are not only responsible for monetary policy. Many of them are also mandated with microprudential supervision or at least banking supervision. The relations between micro- and macroprudential supervision may be particularly complex due to the similar objective as well as due to similar instruments (Osiński et al., 2013) The primary goal of the microprudential policy, however, is to ensure a stable and safe operations (prevention of default) of individual financial institutions. This mandate focuses on protection of depositors (in case of banks) and customers (in case of other financial institutions like insurers or investment companies). The entire risk of the financial system arises from the interaction of financial institutions with each other and with the financial markets and real economy. This risk is, therefore, higher than the sum of the risks of individual institutions. The goal of macroprudential policy is to control and to limit this risk. Thus, both policies are to a significant extent complementary and serve to ensure the stability of the financial system. However, in certain circumstances natural conflicts can occur between those two policies. For example, during the bust the macroprudential authority might recommend loosening of calibrations (such as capital requirements) in order to prevent credit crunch, whereas the microprudential supervisor perceiving high insolvency risk of individual institutions may tend to
act in the opposite way. Therefore, there must be a clear and effective coordination mechanism between those policies. The simplest way would be to equip the macroprudential policy with the prevalent role over the microprudential one. However, some caution and balancing deems to be necessary (Osiński et al., 2013, p. 19-21). All in all, the efficient coordination seems easier when both policies are conducted under one roof of a central bank.

Secondly, much has been already written on the coordination of macroprudential and monetary policy. There is still a controversy if the monetary policy should react to financial cycle (representing the time dimension of systemic risk), especially to a build-up of asset price bubbles. Should monetary policy focus solely on its traditional mandate to stabilize inflation in the medium term or should it also take on board asset prices in a longer horizon? This question remains open. Let us assume for a while that monetary policy should "lean against the wind" and mitigate demand-driven asset price bubbles using interest rate policy even at a cost of a temporary deviation from the inflation target. It seems that even in such a case the monetary policy should be rather complementary to macroprudential policy. One of the arguments says that monetary policy may be to blunt to effectively mitigate asset prices from excessive growth (Crowe et al. 2011, p. 5). Another one indicates extremely high costs of monetary policy. In many cases during the boom phase the level of interest rates needed to stop rapid increase in asset prices would be detrimental to economic activity. In other words, the monetary policy would have to cause deep recession to stop the boom. It was very accurately illustrated for the Spanish case by (Aspachs-Bracons et al., 2011). The authors assumed that Spain remained outside the euro zone and tried to calibrate monetary policy reaction that could have stopped the real estate boom prior to the crisis. They founded that an effective monetary policy action would have triggered a deep recession with the decline in GDP by 4-5%.

But does really monetary policy offer an appropriate instrument to fight asset price bubbles? The rationale of "leaning against the wind" is the idea that higher interest rates can reduce the size of an asset price bubble. This basic assumption that an increase in interest rates
reduces the fundamental price of assets has been recently challenged. The argumentation goes that asset prices consist of two components: the fundamental one and the bubble (speculative) one. The fundamental component of an asset price is determined by the net present value of future payoffs it generates. In contrast to this, the “bubble component” reflects expected return on asset, so the rational expectation would be that it can grow at the level of the current interest rate. The interest rate may work “normally” in normal times, when the “bubble component” is small. But when the “bubble component” is high any rise in interest rate may contribute to a further increase of the “bubble component” and thus also to the price of asset (Gali et al. 2013 p. 1-2). This argument goes further that those indicating extremely high costs of leaning against the wind, which assume “normal” reaction of asset prices to interest rates even in the boom phase. The “cost argument” may be trivialized by saying that, for example, even 10% or 15% level of interest cannot stop speculators expecting 20% or higher increase in asset prices. Obviously, the cost of such a policy for the real economy could be devastating. But if we take the argumentation of (Gali et al, 2013) on board, things get even more difficult. Higher interest rates may not only bring the economy to a brink of collapse but also can fuel further the increase of a bubble until a calamity occurs. If things really work in this way, it would make the case for macroprudential policy even more urgent. Still, some cooperation between monetary and macroprudential policies seems necessary. Needless to say, that such an efficient cooperation may again be easier under one roof of the central bank.

7 INSTRUMENTS OF MACROPRUDENTIAL POLICY – THE TREES AND THE FOREST

The ultimate aim of macroprudential policy is to safeguard financial stability. In order to achieve this objective macroprudential policy strives to constrain the build-up of systemic risk. The powers of macroprudential policy maybe soft or hard. The soft tools like public or
confidential warnings or recommendations based on comply or explain principle may be very useful. When they are not sufficient, however, hard powers must be switched on. Talking about hard powers it is useful to specify further aspects of macroprudential policy and then link them with instruments.

The most general classification of macroprudential instruments can be referred to two dimensions of systemic risk, dividing them into those that (1) limit build-up of financial risk (time dimension) and those that (2) promote financial system resilience (structural dimension) (Committee on the Global Financial System, 2010, p. 2-3). The calibration of the first group of instruments should be adjusted to different phases of the financial cycle with the aim at smoothing it out (Lim et al., 2011, p. 5). The second group of instruments is meant to strengthen the resilience to shocks and to mitigate the consequences of systemic risk materialization.

Macroprudential instruments can also be divided differently taking into account whether they influence bank’s capital, assets or liquidity position (Lim et al., 2011, p. 8). Obviously, the distinction between different categories of instruments is not clear-cut.

One of the possible classifications of macroprudential tools could also be based on grouping specific instruments in relation with the intermediate objectives of macroprudential policy. In 2013 the European Systemic Risk Board (ESRB) issued a *Recommendation on intermediate objectives and instruments of macroprudential policy* (ESRB/2013/1) advocating macroprudential authorities to specify such objectives and match them with concrete instruments. This approach, however, also does not offer any universal solution. While (Houben et. al, 2012, p. 17) indicates only three intermediate objectives, the ESRB points out to five of them. Basing on those approaches let us distinguish four intermediate objectives of macroprudential policy:

- The first objective is related to preventing the excessive credit growth and leverage. Here several instruments might be applied like: countercyclical capital buffer, higher risk weights, caps on leverage ratio, loan-to-value (LTV) and debt-to-income (DIT) ratios.
• The second area is liquidity and funding. The objective here is to prevent episodes of market illiquidity and excessive maturity mismatch. The new Basel liquidity ratios: LCR and NSFR, as well as loan-to-deposit ratio constitute appropriate tools in this area.

• The third objective is connected with constraining excessive concentration of exposures whether direct or indirect. Additional disclosure of information, limits on large exposures or CCP clearing requirements are examples of macroprudential instruments which might be targeted at this problem.

• The forth area of interest of macroprudential policy is strengthening the resilience of financial infrastructures. This might be done by imposing additional capital requirements, including those on systemically important financial institutions (SIFIs), establishing resolution regimes, and preparing resolution plans (which should discourage from excessive risk-taking), as well as deposit guarantee funds financed with ex ante risk-based contributions.

Obviously, the abovementioned classification is also far from being ideal. Furthermore, it has to be noticed that it might change over time due to emergence of new types systemic risks. Therefore, a constant monitoring and up-date is necessary. Another problem, which was already raised above, is the fact that each of the mentioned instruments might have a strong impact also on other areas described as intermediate targets. This requires a thorough analysis by a macroprudential authority prior to application of a particular macroprudential instrument and in-depth knowledge of their transmission channels. Not an easy task, given that the macroprudential policy is essentially in its nascent phase and there is not much experience in this field.

What is apparent from the classification above, is that most of macroprudential instruments have so far been included in the microprudential toolkit. However, in the conduct of macroprudential policy those instruments are used from a systemic perspective, and thus they are also to be calibrated differently. The macroprudential authority should look at the consequences of application of a certain instrument for the whole financial system, not just for an individual
institution. Some of those instruments are known and have already been used, like risk weights or LTV and DTI ratios. Some instruments are completely new and purely macroprudential in nature, like Basel countercyclical capital buffer.

Let us focus for a while on some specific macroprudential tools. Macroprudential measures that are most popular include caps on LTV and DTI which have been used mostly in Asian countries to react to imbalances in property lending (Lim et. al, 2011, p. 64). Restrictions on LTV ratio limit the loan amount relative to the value of the property while caps on DTI ratio aim at constraining debt servicing cost of a borrower relative to their disposable income. Therefore, caps on LTV and DTI impact both the supply of and the demand for property loans. As the restrictions on LTV and DTI translate into lower LGD and PD, they can contribute to the improvement in quality of banks’ property loans portfolio and, in the end, to the banks’ resilience to negative shocks streaming from the real estate sector. An interesting example of a country that actively applied restrictions on LTV and DTI ratios is Korea. Korea has tightened and relaxed LTV and DTI ceilings several times. In 2002, due to the rising house prices, Korea introduced a cap on LTV which was supplemented by the cap on DTI in 2005 (Igan et. al, 2011, p. 8). The exact level of LTV cap depended on the type of property (house or apartment), the location of property (speculative zone or not), loan maturity and collateral value. The DTI ceiling was also not uniform and varied depending on location, loan amount and collateral value. The well-tailored measures undertaken by the Korean authorities contributed to stabilizing house prices and proved to be a very powerful tool to address the adverse developments on the residential property market. The restrictions on LTV and DTI have also been used by a number of other Asian countries, like: Hong Kong, Malaysia, Singapore, Turkey, and several advanced economies like Canada, USA, Norway and Sweden (Lim et al. 2001, p. 64-65).

A completely new instrument designed especially for macroprudential purposes is the countercyclical capital buffer. This buffer is meant to constrain the build-up of systemic risk connected with credit booms. Increase in capital requirements as a consequence of imposition of
this buffer should cause a rise in cost of credit and in that way contribute to decrease in supply of credit. The buffer proposed by the Basel Committee in its standard version varies from 0 to 2.5%. It might be questioned whether the maximum level of this buffer set at 2.5% would be sufficient to prevent credit boom taking into account the differences in economic situation of EU countries. Therefore, to ensure that national authorities might react to the threats arising from excessive credit growth, the CRDIV, which implements Basel III in the EU, allows for a higher buffer rate but this will not be subject to reciprocity rule. This opens the room for regulatory arbitrage. And, obviously, despite intense international debate on countercyclical capital buffer it should not be considered as an universal macroprudential instrument. Should the sources of systemic risk be other than excessive credit growth, the application of this buffer would be neither sufficient nor proportional. The experience with countercyclical buffer is far more modest that with other macroprudential tools. In 2012 Switzerland and in 2013 Norway imposed this buffer on banks in their jurisdictions. In both cases the buffer rate was set at 1%. The outcome of those decisions and the effectiveness of countercyclical buffer is, however, difficult to assess.

Another new instrument also introduced by the Basel Committee is the leverage ratio. The leverage ratio is a ratio of bank’s capital to total non-risk adjusted exposure. The last financial crisis proved that risk-based capital adequacy ratio (CAR) did not signal the build-up of risks within banks. It showed up that banks may at the same time have strong capital ratios and a high leverage making them vulnerable even in case of marginal losses. The breakout of the financial crisis forced banks to deleverage which had destabilizing effect for the financial system and the real economy as banks’ capital position weakened and credit availability deteriorated (Basel Committee on Banking Supervision, 2014, p. 1). Therefore, the basic idea behind introduction of this new measure is to limit the banks’ assets in relation to its capital. It is meant to complement, not substitute, the existing capital ratios which are risk-based. As initially proposed by the Basel Committee the leverage ratio limit should be not lower than 3%, however, its final calibration will be finalized by 2017. Starting from 2018 the ratio shall become a measure
of Pillar 1. The role of the leverage ratio should be, however, clarified. Should it remain fixed as a regulatory minimum or should it be adjustable over the financial cycle as a countercyclical instrument? Whatever the decision will be, its effectiveness and impact on the economy requires further research.

Prior to the financial crisis prudential regulation focused mostly on bank’s capital position. Not enough attention was paid to liquidity issues. At the global level there were no liquidity standards. The financial crisis, however, revealed that problems with liquidity might very soon bring a bank on a verge of collapse. The most known example is the UK bank Northern Rock which financed its activities to large extent using wholesale funding. Only 20% of its liabilities constituted stable retail deposits (Shin, 2011, p. 5-6). Therefore, the Basel Committee decided also to address this regulatory gap. The two new Basel ratios: liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) aim at safeguarding short-term and long-term liquidity of a bank respectively.

The abovementioned examples show that many of the proposed macroprudential instruments have not been tested so far, in particular in the advanced economies. As new measures are developed simultaneously in the EU and the USA, it is impossible to learn from each other’s experiences. Therefore, it seems that the implementation of macroprudential tools should be gradual, in a learning-by-doing mode. What also needs to be decided, is the way in which macroprudential instruments will be activated and deactivated. Several problematic issues can be indicated here.

Firstly, should macroprudential tools be applied discretionally or should they be rule-based? In case of rule-based approach, macroprudential action would be triggered when certain ratios or indicators reach a pre-defined thresholds. The introduction of macroprudential tools would be then automatic. In case of discretionary approach the authorities would decide when and how to act. Naturally, both approaches have their merits and drawbacks. Identification of certain set of indicators that can inform macroprudential authorities might limit the bias towards inaction.
which is inherent to macroprudential policy. However, the measurement of systemic risk is still far from ideal. No model of systemic risk can capture the variety of systemic risk sources and send a signal early enough to give authorities enough time for action (Agur et. al., 2011, p. 8). Discretion enables macroprudential authorities to make their own judgment and to take into account specific features of domestic financial system. However, it can be prone to inaction-bias or susceptible to lobbying.

Secondly, should macroprudential tools be used singly or multiply? The answer to this question depends of course on the source of the systemic risk, the extent of the problem and the transmission of those tools. According to the Tinbergen rule one instrument can serve no more than one objective. Thus, a bunch of tools might serve better a complex risk situation. In addition, an application of multiple instruments might reduce the scope of circumvention. However, possible costs of such a policy could be also higher.

Thirdly, should macroprudential tools be fixed or vary across the cycle? As the macroprudential policy should be countercyclical, the answer seems to be obvious. Some macroprudential tools, especially those categorized as impacting time dimension of systemic risk, should be regularly reviewed and its calibrations should be adjusted to the current financial cycle. Instruments which are aimed at strengthening the resilience of the financial cycle, such as establishing resolution regimes, additional surcharges on SIFIs, are rather fixed and not subject to changes.

8 GLOBAL STANDARDS VS. MACROPRUDENTIAL INSTRUMENTS IN THE EU

The revolutionary proposal of the Basel III Accord to employ specific purely macroprudential instruments into the framework of capital regulations seems to address properly the needs identified in the aftermath of the crisis. The Capital Requirement Directive and Capital Requirement Regulation (so called CRD IV/CRR package), implementing Basel III into the
European legislation, seems to provide a broad set of macroprudential instruments, which potentially could be efficient tools counteracting systemic risk. Unfortunately, the implementation of this idea by the European legislator does not look so attractive once analyzed more in-depth.

Looking more carefully at the regulatory framework one can identify serious weaknesses. The power of capital buffers is narrowed as the reciprocity of their usage is limited. In case of the countercyclical buffer the reciprocity is guaranteed up to 2.5%. The buffer for global systemically important institutions (GSII) will not be applied for many EU countries. The systemic risk buffer may be used up to 3%, above it the complicated decision making procedure requiring involvement of EU institutions will critically restrict its usage. In addition, it needs to be mentioned that an implementation of capital buffers may also lead to some unintended consequences. One of them could be a “consumption” of voluntary capital in case when many institutions following the suggestions of domestic regulators or results of European Banking Authority’s (EBA) stress-tests keep higher than regulatory required capital. Moreover, the capital will be, to certain extent, frozen and will not be flexibly adjusted to real needs of an institution, whereas the buffers should be the cushion for banks’ activity. Thus, an immediate question arises, whether the EU regulatory cushion will be sufficient and could be implemented in proper place and time.

The CRDIV indicates that Pillar II measures may also be applied to counteract systemic risk. The implementation of those measures should be preceded by supervisory review process (SREP) where the risk should be identified. Pillar II may be thus applied only for individual institutions or groups of institutions posing similar risk. The implementation of Pillar II is reserved for competent (microprudential) authorities only. The CRDIV requires that competent authorities should have at least the power to:

- apply higher own funds requirements,
- require institutions to apply a specific provisioning policy or treatment of assets,
restrict or limit the business, operations or network of institutions or to request the divestment of activities that pose excessive risks to the soundness of an institution,

to require institutions to use net profits to strengthen own funds,

to restrict or prohibit distributions or interest payments by an institution to shareholders, members or holders of Additional Tier 1 instruments where the prohibition does not constitute an event of default of the institution,

to impose specific liquidity requirements, including restrictions on maturity mismatches between assets and liabilities.

As the scope of Pillar II is very broad it is by many perceived as an appropriate remedy for macroprudential risk. Nothing could be more misleading. It must be noted that Pillar II measures have to be preceded by a SREP process, which is usually long lasting. It can be only imposed on an individual basis in the form of an administrative decision when a bank is a source of systemic risk for the financial system. In such a case the legal obstacles may appear and the individual decisions may be claimed or appealed to a court. In case of multinational banking groups any increase in capital requirement via Pillar II ought to be discussed within the supervisory college. In case of disagreement the EBA may make the ultimate decision in the frame of binding mediation process. This makes the whole process unduly risky and time-consuming. Moreover, the Pillar II instruments are “in hands” of domestic microprudential authorities who tend to be more interested in the stability of an individual institution than the system as such. Another difficulty may be pure operational. In situation when the systemic risk is generated by numerous and different institutions, the question arises how to set up, for example, higher capital requirements in a reasonable way and at an acceptable pace? Therefore, the Pillar II, in contrary to the expectations, cannot be perceived as a miracle cure for the systemic risk disease.

Article 458 of the CRR defines the list of measures that may be applied in order to limit the systemic risk. These instruments are:

- the level of own funds,
the requirements for large exposures,

- the public disclosure requirements,

- the level of the capital conservation buffer,

- liquidity requirements,

- risk weights for targeting asset bubbles in the residential and commercial property sector,

- intrafinancial sector exposures.

In principle, the competent or designated authority of a Member State is responsible for making the decision on implementation of those macroprudential measures. But the ultimate decision-maker is the European Council, who may *de facto* reject the draft national measures. Before planned implementation of national measures the relevant domestic authority must notify European Parliament, European Commission (EC), European Council (Council), ESRB, EBA and provide appropriate justification. It must be explained why the measures are relevant to counteract the systemic risk and why other CRD IV/CRR measures are not sufficient. Within 1 month since delivery of notification, the ESRB and the EBA shall provide their opinions on a proposal of measures to the EC, the Council and the applying country. The EC takes those opinions into account and may, within 1 month, propose the Council to reject draft measures. If there is no such a proposal of the EC, the country may apply the measures for the period of 2 years. If the EC proposal is submitted, the Council shall make a decision accepting or not the EC proposal within 1 month. Any decision of the Council should be properly explained. If the Council does not make any decision within 1 month since the proposal of EC has been delivered, the country may apply the measures for a period of 2 years. The decision making procedures requiring involvement of many highest-level European institutions make the whole process extremely complicated and discouraging. In addition, as the proponents must explain first why all other measures included in CRD IV/CRR package are not sufficient to tackle the macroprudential problem, the tools of article 458 CRR can be *de facto* described as the “last resort”. Ironically,
while proposed, the article 458 was described as “flexibility package”. In practice, however, both Pillar II, as well as art. 458 of the CRR measures will probably never be used.

Summarizing, complicated procedures, limited reciprocity, difficulty of efficient usage of Pillar II, lack of flexibility in implementation of the measures described in art. 458 of the CRR are the factors explaining why the tools provided by CRD IV/CRR seem by far not to be sufficient to properly and effectively counteract systemic risk arising in the Member States, regions or in the European Union as a whole. In order not to be doomed to failure one has to rely rather on non-harmonized microprudential instruments used for macroprudential purposes. Luckily, some of them, especially those affecting credit in a direct way, as LTV or DTI limits, can still be effectively used.

Moving to the insurance sector it should be noted that insurance companies are important investors which can hold assets subject to different degrees of risk. Their cyclical character has to be taken into account when analyzing and mitigating of systemic risk in the insurance sector. Insurance companies (differently from banks) are characterized by reversed product cycle. Their business model is marked by matching maturity of assets and liabilities. Basic insurance activity is to take and to diversify risks and is financed mostly up-front by insurance premiums. Because of this specific features, the regulations imposed on the insurance companies include adequate level of guarantee capital, solvency margin, insurance provisions, provisions coverage, etc. Insurance sector is regulated and supervised to ensure stability of insurance companies’ clients also in times of distress. The supervisory authorities directly oversee insurance companies and cyclically assess their financial situation (for example by performing stress tests). The currently binding regulatory capital buffer (and more precisely: the solvency margin) for the EU insurance sector amounts to around 4% of insurance provisions in life insurance and about 16-18% of premium written in non-life insurance or about 23-26% of claims (higher of these two figures). The capital requirements both in current regulatory environment and in new standards described in Solvency II allow the supervisors to monitor the level of risk.
Solvency II strives to provide countercyclical mechanisms, like for example volatility adjustment (proposed by the EIOPA in its Technical Findings on the Long Term Guarantee Assessment EIOPA/13/296). Yet, still there are doubts about their effectiveness, as the results they bring might be counterproductive both for individual insurance company as well as for the whole sector. This all shows clearly that the development of macroprudential instruments in insurance is still in its infancy.

It seems that macroprudential policy in insurance sector should mostly rely on the use of microprudential tools. Supervisory measures that might be activated within the macroprudential policy framework could be divided into the following three groups. First, limits on business activity might be imposed. This would prevent the insurance companies from expanding certain areas of activities or even withdraw from them. Second, limits might also be related to investments with the aim of constraining exposure to certain risks. Finally, preparation of recovery and resolution plans might be required. Such plans would include a list of possible actions that might be taken to either weather difficulties or, in case of severe problems, to orderly liquidate the insurance company ensuring its critical functions are maintained.

To sum up, systemic risk in the insurance sector is a relatively new concept which was not under particular scrutiny in the past. Research on systemic risk in the insurance sector is also at the less advanced stage compared with the systemic risk measurement in the banking sector. Therefore, possible macroprudential instruments that might be targeted at risks in the insurance sector are also less sophisticated so far.

9 CAN WE AVOID NEXT CRISES – INSTEAD SUMMARY

The regulatory reforms introduced so far as the response to the global financial crisis may not be sufficient to avoid build-up of new significant systemic risks. This makes the case for
macroprudential policy even stronger. Particularly, there is a prominent role for warnings and recommendations that should serve as a specific tool of macroprudential policy. These soft powers (such as in case of the ESRB) do not need to be ineffective. On contrary, the scope of warnings and recommendations can be wider as they can also be addressed at regulators indicating deficiencies in regulation. Sometimes, however, hard powers are unavoidable. They must step in especially when there is a clear evidence of an asset price boom, which is typically the most frequent driver of crises (Allen, 2010, p. 198).

Unfortunately, even in a clear boom case the macroprudential authorities are prone to inaction bias. First of all, a boom is difficult to identify. Even a sharp increase in asset prices is usually accompanied by factors that seem to justify it, such as persistent disinflation and low interest rates, demographic changes, catching-up etc. Secondly, due to the political cycle there is usually a strong resistance to any attempts to limit credit expansion. Thirdly, it is difficult (when not impossible) to estimate ex ante the balance of costs and benefits of macroprudential action aimed at restricting credit growth. Fourthly, incentives to take costly actions are extremely weak and questionable. A decisive action that really prevents a crisis can easily become a subject of strong criticism as high costs incurred are well-visible while benefits are not (an avoided crisis does not convince critics). Fifthly, if such an action is even taken in a timely fashion, it could prove not to be effective due to a circumvention (Goodhart law) or just a bad luck. This of course is even more prone to criticisms.

Therefore, to avoid the inaction bias the macroprudential policymaker must be independent and political-cycle-proof. A good solution could also be to have some rule-based instruments. This, however, seem not be feasible as every crisis is different and it calls for a lot of discretion in the conduct of macroprudential policy. The influence of the political economy is, unfortunately, clearly visible even at the stage of construction of macroprudential authorities in the EU. The already approved solutions in many European countries create macroprudential committees where central banks do not play the key role. Those authorities will have to work
under prevailing influence of respective governments, thus will easily become unable to lean against the financial cycle. This original sin will adversely affect the effectiveness of macroprudential policies.

There are, unfortunately, more sins. Some of the approved regulatory solutions seem to ignore the lessons we should have learned from the crisis. The watering down of the Liikanen Group recommendations, weak resolution regimes or obsessive promotion of a maximum harmonization principle, all they limit the scope for effective macroprudential policy. And these are only examples. Some of the regulatory changes rather seem to serve the interests of large financial institutions, in many cases treated as national flagships. Amazingly, on the wave of bail-outs and takeovers the leading banks have even grown further in the aftermath of the crisis. It is very doubtful if the additional SIFIs requirements can have any material influence in this respect.

Obviously the future will tell whether we can reduce credit cycles. It seems rather that cycles are forever. As for now, we are probably not in a position to prevent any future crises, even if their nature is similar to the present one. Bad incentives in the system have not been appropriately addressed. What is more, as every crisis is different we usually fight previous wars. Meanwhile, the next crisis may hit from a completely different angle. Systemic risks are not necessarily economic in nature but also operational, what makes the case even more serious. The next crisis may be, for example, generated by a collapse of rapidly developing financial technology. But it can also hit from derivative markets, where enormous risk has been concentrated in central counterparty institutions (CCPs). It should be noted that the CCPs become systemically important risk-centers not due to market forces but due to the regulation. All in all, the regulation itself became so complex, that nobody can follow its interactions nor implications.

There are, however, three good messages. First, some positive regulatory changes have been already made or are in the pipeline as for instance higher quality and quantity of capital requirements imposed by Basel III (the case for Solvency II is less clear). This is by far not enough to prevent the next crisis but hopefully can at least limit the pain. Second, very severe
crises usually occur once in a generation, so not very frequent. Third, though the macroprudential toolkit for insurance industry may be assessed as less developed, it is rather unlikely that the next crisis is to be generated by this sector.

**BIBLIOGRAPHY**


Chapter 6

Systemic risk and financial stability in insurance: macroprudential policy concerns

Krzysztof Jajuga

1. Introduction

Financial crisis is the most significant phenomenon in the economy in last two decades. There are at least two characteristic features of financial crises that have been observed recently. Firstly, financial crisis has much stronger impact on real economy than it used to have in the past. This is due to financialization of the economy, understood as the increasing role of financial motivations, financial markets, financial instruments and financial institutions in the functioning of domestic and international economy.

Secondly, financial crisis that emerges in one sector or one market has very often impact on the global level. This is caused by the increasing systemic risk in financial sector, resulting in the potential financial instability. The natural consequence of growing impact of systemic risk is the introduction of macroprudential regulations.

The growing interest in systemic risk, financial stability and macroprudential regulations can be seen on the one hand among financial practitioners facing the problems of large systemic risk, on the other hand among researchers who try to develop commonly accepted analytical framework.

Systemic risk (Kaufman and Scott, 2003) is risk of breakdowns in an entire system, as opposed to breakdowns in individual parts or components, and is evidenced by comovements (correlation) among most or all the parts of the system.

Financial stability (ECB, 2013) is a condition in which the financial system – intermediaries, markets and market infrastructures – can withstand shocks without major disruption in financial intermediation and in the effective allocation of savings to productive investment. Therefore in the period of stability financial system efficiently performs its key economic functions, such as
allocation resources, managing risk and can do it in the period of shocks and significant structural changes.

Macroprudential regulations (Galati and Moessner, 2011) are the approach used in financial regulations to mitigate the systemic risk. The absence of systemic risk means that the main role is played by microprudential regulations directed towards the entities functioning in the financial system without paying regard to the interconnectedness between these entities.

The terms “systemic risk” and “financial instability” are linked very strongly. Systemic risk can lead to financial instability. On the other hand, it is rather hard to imagine that financial instability is caused by some other type of risk, for example by risk of many not interconnected entities.

The close term is extreme risk. It is defined as risk caused by the events characterized by low probability of occurrence and leading to large losses (the so called Low Frequency High Severity events). Systemic risk very often results from extreme events, for example during last financial crisis in United States.

The dynamic development in the area of macroprudential regulations has led to the discussion about the necessity of macroprudential regulations in insurance industry. It seems that the clue lies in the answer to the question whether there is threat of systemic risk in insurance sector. This problem was analyzed in the report published in March 2010 by Geneva Association Systemic Risk Working Group (The Geneva Association, 2010). The conclusions from this report are rather positive for insurance sector, since the authors do not identify threats of systemic risk in this sector, except for three situations, which we will refer to later.

There has been considerable growth of research and practical applications in the area of systemic risk measurement in XXI century. Generally speaking, two general approaches can be distinguished.
The first approach consists in constructing different indicators with the aim of giving signals as to the level of financial stability to financial supervisors and other interested entities. We can mention here:

- Financial Condition Indicators constructed with the use of aggregated market data (e.g. Illing and Liu, 2006), Nelson and Perli, 2005).

These indicators are concentrated in the assessment of financial stability and are not direct measures of systemic risk.

The second approach is based on more advanced econometric models, where the emphasis is on the interconnectedness between different institutions. Most of these methods were proposed in last few years. They were designed mostly for banking sector. It is worth to mention, among the others, the proposals presented by Brownlees and Engle (2012), Aspachs et al. (2006), Billio et al. (2010), Acharya et al. (2010), Rodriguez-Moreno and Pena (2011).

In this paper we present another proposal, which can be classified into this group.

2. Extreme risk – theoretical background

As it is commonly accepted, risk measurement is very often conducted through an analysis of the distribution of some underlying risk variable. As a rule, insurance sector uses loss as such a variable (downside risk), whereas the other sectors of financial system (for example banking sector) may apply either loss (downside risk) or return (two sided risk) as risk variable.
Extreme risk results from the events that have low probability of occurrence and lead to large losses. This implies that risk measurement should be based on the tail of loss distribution. In the case of extreme risk such distribution has often fat tails to capture possible large losses.

In this paper we adopt risk measure that is used in the analysis of tail of distribution. This measure is called Expected Tail Loss (other names: Expected Shortfall, Conditional Value at Risk), and is defined as:

\[ ETL = E(X|X > u) \] (1)

The formula (1) shows that Expected Tail Loss is the expected loss, given that the loss exceeds the threshold (denoted by \( u \)), therefore it is conditional distribution.

The most common methodology used in the analysis of extreme risk is Extreme Value Theory (EVT). We give short presentation of some insights of this theory. In the following considerations two cases are discussed: univariate EVT, later used in microfinancial approach, and multivariate EVT, later used in macrofinancial approach. In our considerations we choose loss as underlying risk variable.

2.1. Univariate extreme value analysis

Extreme value analysis in univariate case is based on two strongly linked approaches. The first one is the analysis of distribution of extremum. It is simply the analysis of the random variable, defined as maximum (or minimum) of the set of random variables, for example, variable defined as maximal loss in some period.

The second approach, analysis of conditional excess distribution (called also conditional tail distribution), in our opinion should be recommended for assessment of extreme risk. It is simply
distribution of variable, for example loss, given that this variable takes value from the tail. Therefore this approach is related to Expected Tail Loss, chosen above as measure of extreme risk.

Formally, the distribution function of conditional excess distribution can be written as:

$$F_u(y) = P(X - u \leq y | X > u) = \frac{F(u + y) - F(u)}{1 - F(u)}$$

(2)

Where:

- $F$ – distribution function of underlying variable,
- $X$ – loss,
- $u$ – threshold indicating the tail of distribution.

The formula (2) gives the probability that loss exceeds threshold $u$ by less than $y$, given that the loss exceeds this threshold. Of course, this distribution depends on the choice of threshold $u$. It leads to the answer to the following question: “if the loss exceeds some threshold value, how large it can be?”. Clearly this measure can give the assessment of extreme risk of particular institution, including insurance company.

It can be proved (see Embrechts, Klüppelberg, Mikosch, 1997) that the conditional excess distribution can be well approximated by the so-called Generalized Pareto Distribution (GPD). The distribution function of GPD depends on threshold $u$ and is given in the following two formulas:
This distribution has two parameters, namely:

- shape parameter, denoted by $\xi$;
- generalized parameter, denoted by $\beta$, which depends on location (reflected by $\mu$), scale (reflected by $\sigma$) and shape (reflected by $\xi$) of the distribution, as well as on the value of threshold $u$.

The family of Generalized Pareto Distributions contains three types of distributions, they differ with respect to the shape parameter $\xi$. One of them is Pareto distribution, for which the value of shape parameter is positive. The important property is that when the underlying distribution has fat tails, the behavior in the tail is characterized by Pareto distribution. It can be proved that mean of the conditional excess distribution, related to Expected Tail Loss, can be characterized as a linear function of the threshold and of the parameters of GPD. It is given through the following formula:

$$E(X-u|X>u) = \frac{\beta u}{1-\xi} + \frac{\xi}{1-\xi}u, \quad \xi < 1$$  \hspace{1cm} (5)

The formula (5) gives the expected value of loss over threshold. By adding the value of threshold we obtain the Expected Tail Loss.
To summarize: the basic approach in univariate case is to find the loss distribution and then to calculate Expected Tail Loss as a measure of extreme risk in the particular institution.

From the practical point of view, the crucial issue is how to estimate the conditional excess distribution (which leads to determination of Expected Tail Loss). If one uses parametric approach, then the parameters of location, scale and shape of Pareto distribution should be estimated.

The first thought would lead towards an idea of using historical data in the estimation process. This idea, however, brings serious difficulties, since estimation of conditional excess distribution requires using data from the tail, which is data corresponding to extreme events. Such events have however low probability of occurrence, therefore it is not likely that enough data will be available. The second doubt comes from the fact, that conditional excess distribution may not be well fitted by Pareto distribution. Therefore we recommend another approach, which is nonparametric one. This is simulation approach, in which two types of simulation can be used. The first type is Monte Carlo simulation, in which many repetitions are generated according to some model to derive empirical loss distribution. The second type is scenario simulation, where some number of scenarios is derived by experts. In each scenario there are given values of underlying variable as well as probability of this scenario. Then many repetitions are generated to derive empirical loss distribution. In both types of simulation empirical loss distribution obtained through simulation enables to calculate Expected Tail Loss, given that threshold is specified by end user.

2.2. Multivariate extreme value analysis

Since systemic risk is determined for the whole sector, therefore risk analysis should be based on the analysis of loss for all institutions in the sector. To conduct this, one has to assess:
- risk of each institution of the sector;
- relations between these institutions (interconnectedness).

Therefore, one has to analyze the multivariate distribution of losses. This leads to methodological problems, resulting from high dimensionality of the analysis (the number of parameters to analyze grows at higher than linear speed). Some time ago, in many studies, multivariate normal distribution was assumed, due to the well known properties. However, this distribution is not well suited for the analysis of extreme events, since firstly it does not have fat tails for marginal univariate normal distributions, secondly it does not reflect possible high dependence in the tails.

Now we introduce the approach, which has got a lot of attention in last decade for the analysis of multivariate financial and insurance problems. This is the so-called copula function approach. This approach can allow for fat tails of marginal distributions as well as for high dependence in the tails.

The practical usefulness of this approach lies in the fact, that one conducts the analysis of multivariate distributions by separate analysis of marginal univariate distributions and the analysis of dependence between components of the random vector. Therefore the analysis of dependence is somehow “separated” from the analysis of marginal distributions. Speaking in financial terms, this means that the analysis of risk of individual institutions is separated from the analysis of the interconnectedness of these institutions.

One of the most important facts related to copula function is the so-called Sklar theorem (Sklar (1959)), where the multivariate distribution function is represented as a copula function linking the univariate distribution functions, given in the following formula:

\[
H(x_1, \ldots, x_n) = C(F_1(x_1), \ldots, F_n(x_n))
\]

Where:

\[
(6)
\]
$H$ – distribution function of multivariate distribution,

$C$ – copula function,

$F$ – marginal distribution function.

Here copula function reflects the dependence between components of a random vector. Of course, there are very many possible copula functions. The detailed presentation of the copula functions is given for example by Nelsen (2006) and Joe (1999).

In practice one has to fit copula to the data and select the best one. The presentation of this problem is given in the books written by McNeil, Frey and Embrechts (2005) and by Trivedi and Zimmer (2005).

The copula approach can be applied in the determination of the so-called tail dependence coefficients. The objective of tail dependence coefficients is to measure the dependence in tails of distribution. There are two such coefficients, lower tail dependence coefficient and upper tail dependence coefficient. Out interest is on the latter one, defined as:

$$
\lambda_U = \lim_{u \to 1} P(X_2 > G^{-1}(u) | X_1 > F^{-1}(u))
$$

(7)

In these formulas $F$ and $G$ denote the distribution functions.

From (7) it can be concluded that the main idea behind upper tail dependence coefficient is in the calculation of the probability that one variable takes value from the upper tail given that the other variable takes value from the upper tail. The value in the tail is taken as an upper quantile. Speaking in financial terms, upper tail dependence coefficient gives information how likely is that
one institution is facing large loss, given that the other institution is facing large loss. Therefore, it measures interconnectedness of two institutions in the situation of extreme events.

Upper tail dependence coefficient can take values from the interval \([0; 1]\). If tail dependence coefficient is equal to 0, we have asymptotic independence. If tail dependence coefficient is higher than 0, we have asymptotic dependence.

The important property of tail dependence coefficient is that it can be represented through copula functions. This is given in the following formula:

\[
\lambda_{U} = \lim_{u \to 1} \frac{(1 - 2u + C(u, u))}{(1 - u)} \quad (8)
\]

In the multivariate case, we are studying random vector. Since the notion of tail of the distribution is not well defined for multivariate case, we would concentrate here on the tail of the sum of the components of random vector. This reflects the systemic risk, in which one considers the whole sector and loss of this sector.

Unfortunately, in multivariate extreme value analysis there are no general analytical results similar for univariate case, which could give the formula for the conditional excess distribution of the sum of random variables. This will be only case if the conditional excess distribution of sum belongs to the Generalized Pareto family. Therefore in practice it is often the case that parametric approach is not suitable.

Therefore we propose to use simulation approach, either by Monte Carlo simulation or by scenario simulation, similarly like in univariate case. However now one needs to generate repetitions of whole random vector, therefore in addition to the models for single variable (loss of individual institution) one should consider also correlations between them (interconnectedness
between institutions). The good idea in this case would be to use copula functions and apply these copula function which exhibits dependence in the tails (for example Gumbel copula).

3. **Assessment of systemic risk in insurance sector – use of extreme risk concept**

Now we present the proposal of the general framework of the assessment of systemic risk in insurance sector. This framework combines microfinancial approach, suitable for individual institutions, with macrofinancial approach, directed towards whole financial sector. The presented approach is based on two rules:

1. Systemic risk emerges when the individual institutions are exposed to high risk and they are strongly interconnected.
2. Systemic risk emerges mainly from extreme events.

The proposed framework combines the following two parts.

1. Assessment of extreme risk in individual institutions.

In this part extreme risk for individual institutions is measured. The assessment is based on the distribution of loss for individual institution. Since the stress is on extreme events, we will use Expected Tail Loss as risk measure.

2. Assessment of systemic risk for the sector.

In this part extreme risk for whole sector is measured. We regard sector of individual institutions through a portfolio of assets of these institutions. Therefore the distribution of loss of portfolio of assets is being considered. This allows taking into account interconnectedness of the institutions belonging to the sector.
As we indicated, we use Expected Tail Loss as a measure. It is defined as expected value of the conditional distribution of loss of the institution, given that this loss exceeds some determined threshold. As far as loss of insurance institution is concerned, there are at least two possible solutions:

- Loss taken from income statement;
- Loss understood as the decrease of the net market value of assets.

Of course, one needs to specify horizon in which loss is calculated. As a usual rule, annual period can be assumed. The last thing, that needs to be specified, is threshold, exceeding of which is treated as threat to the institution and to the whole sector. As one example, one may adopt Value at Risk as a threshold.

Now we discuss the specific implementation of the proposed approach. In this implementation the distribution of losses is determined by Monte Carlo simulation. As we indicated, this type of approach is recommended when there is not enough historical data to determine the distribution. This is usual case when one is interested in the tail of distribution.

3.1. Assessment of extreme risk of the individual institution

As we indicated, our interest is the distribution of loss, understood for example as the decrease of net assets value, of particular institution. The following procedure is proposed:

1. Decomposition of the components of assets of the institution.
2. Identification of these components that are significantly exposed to risk.
3. Identification of risk factors for these significant components.
5. Simulation of the values of risk factors.
6. Determination of the values of the components of assets of the institution.
Clearly, the first two steps should be performed by the end user. Then the crucial steps in risk assessment are the identification of risk factors and specification of models for risk factors. As an illustration, we consider three activities that were identified in the report prepared by Geneva Association (2010) as systemically relevant.

In this report, the authors analyzed five different areas of insurance institution activities: investment management activities, liability origination activities, risk transfer activities, capital, funding and liquidity management activities and credit protection activities. Among all activities, three of them were identified as potentially systemically relevant. These activities are:

- Derivative activities on non-insurance balance sheets;
- Mismanagement of short term funding raised through commercial paper or securities lending;
- CDS writing.

One has to identify risk factors and models for these factors.

1. Derivative activities on non-insurance balance sheets.

Most of these derivatives belong to three groups: interest rate derivatives, currency derivatives, equity derivatives. Therefore, risk factors are clearly defined and one has to consider the models of interest rates, exchange rates and equity prices. For exchange rates and equity prices one can apply the following models:

- Geometric Brownian motion, with possible inclusion of fat tails in random component;
- Models belonging to GARCH family.

For exchange rates, one can regard also mean reverting models, like Ornstein-Uhlenbeck model. The mentioned models are presented for example in Tsay (2002).

As for models of interest rates, one has to consider term structure of interest rates (yield curve), rather than single rate. Possible models are either Nelson-Siegel model or more advanced models
based on stochastic differential equations. The review of interest rate models is given for example in Brigo and Mercurio (2006).

2. Mismanagement of short term funding raised through commercial paper or securities lending.
Here risk factor is interest rate, therefore, similarly as for interest rate derivatives, one has to consider models of term structure of interest rates, mentioned before.

3. CDS writing.
This type of activity occurred during financial crisis (the main case was of course AIG). CDS writing means taking exposure to credit risk of some underlying institution, since this risk is transferred by other institution to CDS writer. This means that the models for risk factor are credit risk models. It is worth to mention two general groups of models that can be applied for assets that are exposed to credit risk:
- Structural models, in which credit risk is reflected by the value of net assets of entity;
- Intensity models, in which default probability is analyzed for the whole group of entities.
The review of credit risk models is given for example in Blum, Overbeck and Wagner (2010).

The identification of risk factors and specification of models for them is the most important part of risk assessment for individual insurance institution. Then Monte Carlo simulation (many repetitions) can be conducted according to specified models. This leads to many repetitions of possible losses. This process gives empirical loss distribution of individual institution and allows to calculate Expected Tail Loss for individual insurance company, given that threshold is specified. As simple rule, one may take Value at Risk (for the period of one year and for confidence level of 99%).
3.2. Assessment of systemic risk in the sector

The assessment of risk for individual insurance company was the first part. To assess systemic risk one has to evaluate risk of whole insurance sector, paying attention to the size of risk of individual institution and to the interconnectedness. We turn now to these problems.

The proposed procedure for the systemic risk assessment considers as an underlying variable loss for whole sector. This risk variable depends on risk of individual components and interconnectedness of these components. The first part of the proposed methodology, described above, resulted in the determination of risk of individual institution by calculating Expected Tail Loss (obtained through Monte Carlo simulation). Therefore it is appropriate starting point for the assessment of systemic risk.

Using the same argumentation as before, we recommend Expected Tail Loss as risk measure resulting from systemic risk. Now this measure is obtained from the distribution of loss for the whole sector. Therefore one has to consider random variable defined as the sum of losses for individual institutions and to find the distribution of this variable. As far as analytical solution of this problem is concerned, there are only few specific results. The most well known is the one obtained for the case in which the multivariate distribution of losses of all institutions in the sector is multivariate normal distribution (or possibly elliptically symmetric distributions). This case was however previously rejected as the one that does not fit to extreme risk situation.

The lack of analytical solution which expresses Expected Tail Loss for the sector through Expected Tail Losses of individual institutions means that one has to rely again on the simulation tools.

The following procedure for the systemic risk assessment is proposed:

1. Determination of loss distribution for individual institutions.
2. Identification of interconnectedness between institutions.
3. Simulation of the multivariate distribution of losses for all institutions.

The first step in this process is simply taken from the first part of the procedure. Here one can use the empirical loss distribution obtained through Monte Carlo simulation. In order to simplify systemic risk assessment one may take into account such institutions which are:

- Exposed to very high risk, that is when Expected Tail Loss is high in relation to economic capital;
- Highly interconnected.

It gives good link with the second step of the proposed procedure, which is identification of the interconnected institutions.

One of the possible ways to conduct this step is to take into account the so called global systemically important insurers (see International Association of Insurance Supervisors (2013)). There are of course, other possible ways to determine which insurance institutions are interconnected. The simple one is to analyze the dynamics of the correlation of assets for pairs of insurance institutions. Here Dynamic Conditional Correlation (Engle (2002)) is one of the most recommended methods. The other possible method is to analyze bivariate distribution of losses of two institutions through the use of copula functions and determine upper tail dependence coefficient (given in the formula (8)).

The third step of the proposed procedure contains the simulation of multivariate distribution of losses for these insurance institutions that are considered as contributing to systemic risk (exposed to high risk and highly interconnected). Since the marginal distributions of losses are derived in the first part, the main task here is to include interconnectedness in the simulation. We propose here to use the approach based on copula functions.

In this approach one has to simulate multivariate distribution of losses for whole sector by using the decomposition given by formula (6), where one considers marginal loss distributions of
individual insurance companies and copula function exhibiting interconnectedness. As marginal
distributions we propose to use empirical loss distributions obtained in the first part. Then one has
to choose copula function. The suitable solution would be copula that is characterized by tail
dependence, for example Gumbel copula. The detailed presentation of the simulation of
multivariate distribution by copulas is given by Mai and Scherer (2012).

Conducting Monte Carlo simulation according to the presented approach gives many repetitions
of losses of interconnected institutions. Adding these losses gives empirical distribution of losses
for whole sector. This allows to calculate Expected Tail Loss for whole insurance sector, for the
specified threshold.

The proposed procedure results in the assessment of systemic risk of insurance sector. Then
supervisory bodies should decide upon particular regulations.

4. Final remarks

We presented methodology that can be used to evaluate systemic risk of financial institutions,
including insurance sector. The systemic risk measure used in this proposal is Expected Tail Loss,
therefore it shows potential loss given extreme events occur. This proposal links micro and macro
approach.

In the first part the risk of individual institution is assessed. Therefore on the micro level
institutions with too high level of risk can be identified. This is somehow related to the concept
Too Big To Fail, however in the proposed methodology the potential size of loss rather than size
of the institution is considered. One can obviously concentrate on large institutions and indicated
those with high Expected Tail Loss. For such institutions higher capital buffer should be
established.
In the second part the systemic risk is assessed and concentration is on macro level. This is related to the concept Too Interconnected to Fail. Again, here the concentration can be on large institutions, but it is not limited to them.

As it was mentioned, systemic risk assessment results in the decision about possible capital buffer. The straightforward solution in this matter may the one, in which the size of the capital buffer in each institution is related to the contribution of this institution to systemic risk.

We illustrate this problem by considering the problem of portfolio. For simplicity, but without loss of generality, we assume that the system is composed of three institutions; therefore it can be regarded as three component portfolio. We apply standard portfolio theory result:

\[ V_p = w_1^2V_1 + w_2^2V_2 + w_3^2V_3 + 2w_1w_2 \text{cov}_{12} + 2w_1w_3 \text{cov}_{13} + 2w_2w_3 \text{cov}_{23} \quad (9) \]

In the formula risk of whole portfolio is the sum of risks of individual components (first three components on the right hand side of (9)) and sum of risks resulted from the interconnectedness (last three components on the right hand side of (9)). If we split equally these interconnected risks among two institutions, we get the contribution of each institution to risk of whole sector. Using the presented case, the contribution of institution 1 (the first component of the portfolio) is equal to:

\[ \left( w_1^2V_1 + w_1w_2 \text{cov}_{12} + w_1w_3 \text{cov}_{13} \right) / V_p \quad (10) \]

The same way can be used to calculate the contribution of the other institutions.
The implementation of the methodology presented in chapter 3 requires that the decision is made as far some parameters being input to the systemic risk assessment. These are the following parameters:

1. Time horizon.

This parameter reflects the frequency of monitoring. Generally it should be the same in the first part and in the second part of the process. The general rule is that the more activities of insurance companies are conducted in financial market, the shorter time horizon should be imposed.

2. Threshold.

Expected Tail Loss is conditional risk measure, giving potential loss from extreme events. This threshold should be related to the acceptable risk of the whole sector.

3. Frequency of revision.

Any risk assessment system requires revision, which means update of input values (this leads to change of Expected Tail Loss). Clearly, the more frequent risky activities of the institution, the more frequent revision may be needed. On the other hand, too frequent changes are costly and they lead to unnecessary changes, for example the increase of capital buffer.

It is also important that the framework of risk assessment is internally consistent. This means that the input parameters in the first part and in the second part should be consistent.

The Geneva Association (2010) report indicates some measures that should be taken to address the gaps in regulation and industry practice and to strengthen financial stability in insurance industry, namely:

1. Implementation of a comprehensive, integrated and principle-based supervision framework for insurance groups.

2. Strengthening liquidity risk management.

4. Establishment of macro-prudential monitoring with appropriate insurance representation.

5. Strengthening of industry risk management practices.

The proposed methodology is to some extent related to some of these proposed measures, since:

1. The proposed assessment methodology approach is integrated, directed to all types of risk and aimed at whole sector (measure 1).

2. Liquidity risk management can be strengthened by including appropriate model in the determination of Expected Tail Loss and by introducing appropriate capital buffer (measure 2).

3. The proposed methodology is aimed at monitoring insurance sector at macro level, also thanks to the feature of marking to market measurement (measure 4).

4. The methodology can enhance the good practices of risk management, since it is directed to the important step of this process, namely risk measurement (measure 5).

The other feature of this methodology is that it can be well integrated with the approaches used to assess systemic risk in banking sector. This may be important for financial conglomerates, which contain (among others) banks and insurance companies.

**Bibliography**


How to align microprudential and macroprudential supervision in insurance.

Rodolfo Wehrhahn

INTRODUCTION

Financial stability has moved into the center of the attention of governments after experiencing the devastating and costly effects of the 2008 financial crisis threatening the collapse of the global financial sector. Fast paced reaction lead by the G-20 to address the fallacies encountered in regulation and supervision that did not prevent or reduced the impact of the crisis has dictated the work of governments, regulators, standard setters and global institutions, like the IMF in the last years. One area of intensive development has been the macroprudential surveillance of the financial sector\(^1\).

Macroprudential surveillance is only one element to maintain financial stability. It was soon recognized that monetary policy, macroprudential surveillance and microprudential supervision all play an important role in safeguarding financial stability\(^2\). Further, the actions taken under one mandate cannot be isolated from the effects casting over the other areas’ objectives (Figure 1). It is also recognized that the tool applied under each policy if used independently and without proper coordination could harm or at least become ineffective to fulfill their primary purpose: price stability for monetary policy, systemic risk prevention for macroprudential surveillance and entity stability and policyholder’s protection for microprudential supervision.

Figure 7.1: Interplay between microprudential supervision, macroprudential surveillance and monetary policy supporting financial stability
The interaction of monetary, macroprudential and microprudential policy becomes more interrelated under certain market conditions. In a highly concentrated market dominated by a few players, monetary, macroprudential and microprudential policy tend to converge. The failure of one large player could possibly create systemic risk and the interaction of the larger players with other financial sector participants becomes relevant for systemic stability. This situation of high concentrated markets with dominant players tends to blur the boundaries of responsibility and mandates of macroprudential and microprudential supervision.

**INTERACTION OF THE DIFFERENT SURVEILLANCE TOOLS**

The interaction and possible contradictory effects of monetary policy, macroprudential surveillance and microprudential supervision are inherent to their different mandates. A few examples of typical actions taken under the different surveillance mandates that certainly affect the objectives of the other mandates are indicated in Table 1. Also further down the document, examples of the effect that macroprudential actions can have on the microprudential mandate and vice versa are discussed in detail.
TABLE 7.1. Policy Measures

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<tr>
<td>Special accounting rules</td>
<td>Shifting risk back to the policyholders</td>
<td>Cost of capital</td>
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<td>Growth Constrains Mandatory tariffs</td>
<td>Concentration of investments in the less risky asset</td>
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<td>Additional taxes</td>
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<td>Low interest rate environment</td>
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<td>Country risk concentration</td>
</tr>
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</table>

Source: Own compilation

Effects of the tools used under macroprudential policy on the objectives of microprudential supervision

The application of special accounting rules.

The objective of this well established and widely used macroprudential tool can have severe impact affecting resilience of individual insurers and ultimately affecting policyholders. The use of special accounting rules is usually applied in situations of stress to the sector. For instance, in a low interest rate environment that appears to be a transitory situation, the use of market valuation is replaced by valuations that allow to take credit of the value of the assets and liabilities under “normal“ financial conditions. The solvency requirements of individual insurers are thus positively affected, and the vulnerability to the economic conditions is smoothed during the period of stress.
Under certain conditions this measure is a valid option but the vulnerability does not disappear. Such a macroprudential measure, one could argue is reasonable under the assumption that the current economic situation is going to revert, or at least there is an obvious need to allow the sector to adjust to the new conditions without creating alarm under the consumers facing insolvent insurers. The positive impact on the solvency ratios of the insurers created by applying such an accounting measure has however not resolved the underlying issue produced by the economic conditions.

The temporary new accounting rules can delay necessary supervisory measures to address the underlying risks. The new accounting rules in a sense create the image of a more stable insurance sector as a whole, and probably support to avoid “a run to the insurance sector”. However, supervisory interventions are usually postponed and the serious conversations that might be needed to address the underlying issues do not seem to have the same urgency.

Policyholders are usually less protected under the new rules. The application of the new accounting rules certainly leads to a measure of solvency that is different as when the initial accounting rules prevailed resulting in operating institutions that are less resilient to shocks, and thus have a lower probability to honor the insurance promises made. Policyholders are in a sense mislead by the artificial solvency of the sector under the new measurement.

Limiting certain type of assets.

Asset liability mismatching within individual insurers might be exacerbated under a macroeconomic asset type limitation. Under macroprudential surveillance there might be the need to discontinue or limit certain types of assets in the market. For instance issuing long term assets by the government could be limited for macroprudential reasons. Such limitation will affect the ability of the life insurance sector to match the long term liabilities that where originally sold with the assumption of a certain flow of long term assets to match them. Individual companies might thus become mismatched with their assets having a much
shorter duration than the existing liabilities. The demand for long term assets will probably reduce the yield, and thus eventually create negative spreads for some insurers.

Maintaining a low interest rate environment.

The insurance sector as a whole is affected by an economic growth motivated low interest rate environment. From a macroprudential point of view the necessity to boost economic growth might require a low interest rate environment. Such an economic environment is however detrimental of insurers and pension funds offering long term products. Also the nonlife sector is affected under those conditions given the fact that the investment returns will have to be compensated by underwriting results, probably pursued by premium increments. However, premium increments have limits in improving underwriting results since lapses of good risks increase when the premium becomes too expensive for those risks.

FX and capital controls

Funding of insurers can be negatively affected by macroprudential surveillance actions. FX and capital controls are valid and used tools for macroprudential surveillance when the outflow or inflow of foreign assets is seen as excessive for the national economy. The application of those measures however certainly affects the ability to raise foreign capital for individual insures and also the global risk transfer through the foreign participation in the local risks is reduced. The resulting insurers increase their exposure to local market conditions thus ultimately reduces their resilience to local economic and idiosyncratic shocks.

Examples of microprudential actions impacting on the main objective of macroprudential surveillance.

Shifting risk back to policyholders.
The risk transfer mechanism of insurance may lead to a less resilient economy to shocks. Insures in an attempt to reduce risk from their books may decide to shift to products that transfer more and more risk to policyholder. For instance policies having very low or no return guarantees are an example of those products. High deductibles and copayments is another area where risk is shifted to policyholders. Finally the transfer of the longevity risk in the form of defined contribution pension plans shows this trend. Now, while insurers might be in a better position to withstand shocks, policyholder are not; thus the function of insurers to act as a shock absorber in economic downturns or under major claims is reduced and the economy as a whole becomes subject to systemic risk. For instance, the recovery under a major earthquake will last longer if the insured portion of the claim is minimal due to large deductibles.

Designation of risk free assets

Concentration risk can be generated by investment requirements of individual insurers. In every jurisdiction certain types of assets are designated as not having any credit risk, usually those issued by government. Now, from an individual insurer’s point of view and also from the perspective of the microprudential supervisor, the accumulation of those assets is a positive condition. However, a risk free designation usually leads to a high concentration in those types of assets. For instance a high concentration of the sector in government assets certainly creates systemic risk into the economy thus acting against the objectives of macroprudential surveillance.

Assets ring-fencing

Microprudential supervisory protective actions can reduce the resilience to systemic risk of global groups. Assets ring-fencing is a popular microprudential action, especially when the economic situation becomes fragile. From the microprudential supervisor’s point of view having access to the assets of their local insurers is a priority. However such an action weakens global groups by reducing the positive effects of diversification used in running insurance business, in particular when dealing with global insurers. Under
national assets ring-fencing, the ability to transfer money to affected entities from group members located in other jurisdictions is limited and thus as a whole the group becomes less resilient to systemic risk.

**CONCLUSIONS AND RECOMMENDATIONS**

Coordination among the different surveillance authorities becomes necessary. The discussion above illustrates the need for strong coordination of the different measures applied by the surveillance authorities to avoid unintended consequences or reduction of the effectiveness of the measures applied. This coordination can be achieved by the requirements of secondary objectives under each mandate and also by intense dialogue among the authorities.

Supportive secondary mandates in each surveillance mandate could improve effectiveness in the stability efforts of a country. Having as a secondary objective in the macroprudential surveillance mandate the stability of individual institutions would require the macroprudential surveillance authority to choose from all policy measures that could address the macroprudential emergency situation those that will be less severe to the stability of individual insurers. Even so having for the microprudential supervision the secondary objective to be concerned about systemic risk, not only to the insurance sector but to the financial sector as whole, would lead to measures that would try not to increase systemic risk.

Secondary mandates can only work if there is intense dialogue among the authorities but also having an ultimate responsible authority for stability as a whole. Having access to the view of the different authorities involved in financial stability will allow for better understanding the effects of each policy measure on all other mandates. This will lead to an informed decision with respect to stability. It is also important to have a clear established priority on stability of the system with a designated authority. This responsible authority for financial stability should have the power to make fast decisions also in tradeoffs situations affecting certain areas of the different authorities involved in stability.

Summarizing the better conditions for a more effective interaction of the different authorities involved in the financial stability:
• Clear mandates and responsibilities to authorities that allow for transparent, effective and accountable policies.
• Dialogue among responsible of the different policies is key to understand secondary effects.
• Coordinated approach for effective use of antagonizing tools.
• Synergies to limit negative constrains.
• Secondary objectives supporting each policy.
• Designated authority for financial stability with sufficient powers.

Notes

1 See Galati for an overview of the literature on this topic. See also IAIS, Macroprudential Policy and Surveillance in Insurance, 2013 and ; ESRB, recommendation of 4 April 2013 on intermediate objectives and instruments of macro-prudential policy
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Macro prudential Policies: What toolkit for the insurance sector?

Nadege Jassaud, Rodolfo Wehrhahn

As the financial crisis started in the banking sector, the work on macroprudential supervision has primarily focused on banks. Dedicated macroprudential tools for banks emerged in 2010. The countercyclical capital buffer was adopted by the Basel Committee on Banking Supervision (BCBS). Other tools - limits on Loan to Value, Loan to Income, higher risk-weighted assets (RWAs), or capital charges on the use of non-core funding instruments- have become part of a recommended macroprudential toolkit. Since 2011, 29 globally systemically important banks have been identified by the Financial Stability Board (FSB) and are subject to systemic capital surcharges ranging from 1 to 2.5 percent of RWAs, as well as obligations in terms of resolution and contingency plans.

Some segments of the insurance sector also raise systemic risk. The BCBS develops three criteria to identify the systemic importance of financial institutions and markets: size, substitutability (the extent to which financial services can easily be replaced in the event of a failure), and interconnectedness (the linkages to other parts of the financial system). While size and substitutability are more relevant for the banking sector, interconnectedness is a key element of systemic risk in insurance. Non-traditional non-insurance (NTNI) activity, direct
investments of insurers in financial institutions, reinsurance, alternative risk transfer (ART), credit insurance, mortgage insurance and sophisticated insurance guarantees can result in correlated common exposures to the financial and business cycle (Box 1).

A sound macroprudential policy should include the insurance sector. In absence of an equivalent regulatory framework across all parts of the financial sector, risk can move from one sector to the other, shifting systemic risk.

**BOX 8.1**

*Systemic relevance of the various segments of the insurance industry*

Empirical literature on systemic risk tends to distinguish two segments in insurance: the “traditional insurance” and the other “non-traditional and non-insurance” activities.4

Traditional insurance generally is viewed as generating a lower degree of systemic risk.

Traditional insurance includes underwriting life, health, property, accident, liability, and legal risks in the life and non-life sectors. Those activities usually do not give rise to systemic risk, as correlation between loss events is low and claim settlements can take several years.

However, recent studies start casting doubt on this theory. They highlight evidence of increasing interconnectedness between insurance and banks, as stock prices of insurers and banks have become more correlated in recent years.

“Non-traditional and non-insurance” businesses are more prone to be sources of systemic
Insurers have become providers of liquidity and collateral for the rest of the financial system. Both the implementation of the Basel III regime for the banking sector, and the shift of standardized over-the-counter derivatives transactions to Central Clearing Counterparties (CCPs) will increase demand for liquid instruments and stimulate transactions in order to enable banks and others to tap liquidity and collateral held within the balance sheets of insurers. This trend could shift systemic liquidity risk in the insurance sector, with for instance an increasing demand for liquidity swaps.6

Insurers have, additionally, entered a broader scope of activities that extend beyond “insurance”, including non-traditional insurance underwriting activities in the life segment such as annuities for which the insurer bears the investment risk and guarantees a certain payout. Those business activities significantly increase the issuing insurer’s vulnerability to economic downturns. In the non-life segment, non-traditional insurance covers credit insurance, financial guarantees, and financial derivatives (especially credit default swaps (CDS)). In addition, interconnectedness with the financial system is strong due to the counterparty risk exposure with large banks. Also, derivatives react very quickly to market downturns since the securities are valued at Mark-to-Market. Losses or margin calls can spread quickly through the financial services industry.

Other financial risks

Finally, given the significant financial risks to which they are exposed and the need to hedge, insurers actively participate in derivatives markets. With interest rate risk being a dominant risk exposure (for instance in the context of low interest rates), insurers are natural participants in interest rate derivatives markets as well as in the foreign exchange swaps. As a result, banks are the natural swap counterparties, increasing counterparty risk of the insurance sector toward the banking sector.
Pre-crisis tools addressing systemic risk in insurance were primarily microprudential ones. After the London Market Excess of Loss spiral, large insurers were usually requested to calculate their total exposure to any given risk -direct or indirect- and apply concentration limits to bound excessive risk taking. International best practices require concentration limits on single exposure as well as on class of assets. More advanced regimes apply the prudent-person concept.

Post-crisis tools have some macroprudential elements. After the financial crisis, several jurisdictions under the leadership of the G-20, FSB, and IAIS have proposed some new measures to mitigate systemic risk in the insurance sector:

— Introducing early-warning systems that include macroeconomic variables as well as market-wide stress testing under macroeconomic adverse scenarios.

— Preventing from double gearing of capital, and excluding, for solvency purposes, investments in other financial sector participants, regulated or not. By acknowledging the need for independent capital at entity level, it seeks for limiting contagion risk within the financial sector.

— Restricting the use of derivatives and requiring higher transparency.

— Preparing own risk and solvency assessments (ORSAs) that should include all risks faced by the largest insurers, including those emanating from failures of participants of other sectors of the financial system. This measure clearly aims to test resilience of the insurance sector under systemic events.
Implementing liquidity stress testing. Liquidity management requirements have also been strengthening in the new IAIS insurance core principles (ICPs). Modern stress testing will include liquidity shocks in the form of counterparty failures, delays of reinsurance payments and substantial lapses.

In line with FSB recommendations, the IAIS has proposed a set of macroprudential tools for G-SIIs. This set of tools will include the following:

- Enhanced supervision of G-SIIs, which will rely on the IAIS ICPs, ComFrame, and specifically tailored supervisory resources and powers.

- Removal of barriers to orderly resolution. The FSB’s Key Attributes of Effective Resolution Regimes for Financial Institutions (KA) will apply to all G-SIIs, based on the IAIS implementation plan. Specific insurance resolution tools such as portfolio transfers and run off will be important mechanisms to ensure continuation of insurance contracts.

- Higher loss absorption (HLA) capacity for G-SIIs to reflect the greater risks that these institutions pose to the global financial system. Issues to be considered include the absence of a global solvency standard and the possible discrepancies in systemic risk drivers.

- Structural measures to better protect the traditional insurance. Options would include separating legal structures for
traditional and non-traditional/non-insurance activities, restrictions on intragroup transactions, disallowance of diversification benefits for non-insurance activities.

— Restrictions to operate in certain activities. The preference of the IAIS would be for incentive-based measures over prohibitions, but supervisors may choose to limit or prohibit certain activities, depending on their supervisory powers.

**Macroprudential tools for insurance require further development and implementation.**

The creation of an ICP on macroprudential supervision, the establishment of the committees on financial stability and macroprudential supervision at the IAIS, as well as the strong initiatives shown by some jurisdictions through the establishment of macroprudential supervisory infrastructure and policy statements, show an increased focus on macroprudential policies. Several additional tools have been proposed to enrich the macroprudential toolkit for insurers. Those include absolute amounts of capital markets activity, ratios of liquid to illiquid assets, absolute amount of gross negative fair value of derivatives liabilities. Requirements of fungible capital at group level and liquidity sufficiency under stress situations are also being introduced. Finally, discussions on the use of premium volatility adjustment and a symmetric adjustment for the equity risk capital charge are in discussion as possible macroprudential tools in the EU.

**Stress testing and early-warning systems are additional avenues for developing the diagnostic tools needed for effective macroprudential supervision.** While stress testing under the impact of plausible, but unlikely macroeconomic scenarios on individual banks is common, these tests need to be expanded to include other financial sector participants and
incorporate systemic feedback effects looking at the response of the financial system as a whole to an unfavorable macroeconomic scenario. Such stress tests should incorporate systemic feedback effects under macroeconomic scenarios, as well as allowing contagious shocks to spread rapidly through the whole financial sector. Table XX provides some examples of shocks together with selected transmission channels and possible secondary effects or feedback loops.

**Table 8.1, Selected Shocks with possible Systemic Risk Implications**

<table>
<thead>
<tr>
<th>Shock</th>
<th>Transmission Channel</th>
<th>Secondary effects or feedback loops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess of capital</td>
<td>Soft insurance/reinsurance markets</td>
<td>Insufficient rates , cross subsidies, if forbearance present, whole insurance/reinsurance market deteriorates</td>
</tr>
<tr>
<td>Failure of major financial institution</td>
<td>Credit insurance claims, CDS</td>
<td>Capital calls puts additional pressure in the system</td>
</tr>
<tr>
<td>Protracted economic growth</td>
<td>New business stalls , higher lapses, increment of claims/fraud</td>
<td>Fierce competition deteriorates further portfolios</td>
</tr>
<tr>
<td>Major market closes borders</td>
<td>Group capital is trapped</td>
<td>Strong protectionism, triggers further assets ring-fencing</td>
</tr>
<tr>
<td>Major stock exchange closed for a period of time</td>
<td>NTNI activity could create large uncovered positions. Hedges become unavailable for that period of time</td>
<td>Unwinding of positions creates further needs of unavailable hedges.</td>
</tr>
<tr>
<td>Minimum credit rating for important class of admissible assets is breached</td>
<td>Fire sale of those assets</td>
<td>Further downgrading of the assets, asset price drop.</td>
</tr>
</tbody>
</table>
Sharp increment of interest rates  | Lapses of fixed interest rate products. Liquidity concerns. Fixed income assets loss value  | Capital injection needed further increasing cost of capital.
---|---|---
Downgrading of major reinsurers  | Reinsurance capacity dries out. Insurers assume higher risks.  | Reinsurance contracts have to be unwind aggravating the reduced reinsurance capacity.

Source: Authors own production

**Importantly, a macroprudential framework needs to be supported by an unfettered access to information.** In the US the large database maintained by the NAIC is an important element in identifying systemic risk. It provides essential microprudential data for the Insurance Regulatory Information System (IRIS) Financial Ratio Reports, risk-based capital analysis, and other solvency-related reviews of individual companies, including reporting compliance and financial analysis. In other large insurance markets like the EU, access to information in a centralized manner needs improvement. Currently financial stability data are collected by EIOPA from 30 large cross-border insurance groups including three Swiss groups. EIOPA, however, does not receive data on an identifiable individual group level that would be necessary for performing proper systemic risk monitoring. The implementation of the “fast track” and solvency 2 reporting should help enhance data collection at the centralized level.

**Conclusion**

While still being at a nascent stage, macroprudential tools for the insurance sector need to be further developed. While most insurance companies emerged from the financial crisis relatively unscathed, the crisis has demonstrated the critical absence of effective mechanisms to
monitor the growing interconnectedness of financial institutions and assess the cross-border spillovers. Stress testing and early warning systems are promising avenues for further developing the macroprudential toolkit, but will require an effective access to individual information.

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Central Banking, Macro Prudential Supervision and Insurance

Donato Masciandaro* and Alessio Volpicella*

1 Introduction

After the 2008 financial turmoil considerable efforts has been made to draw lessons for the design of the supervisory architectures. One of the main issues, which have been and still are addressed, is how to prevent the instability of the financial system as a whole, building up a macro prudential framework. By definition, the macro prudential framework has to address the cross sectional dimension which characterised any systemic risk distribution. Therefore, two key features of any macro prudential architecture are: on the one side, how to define its governance, that is which authorities have to been involved in order to assign the set of powers and tools that characterised the macro prudential policy, and
on the other hand, how to indentify its perimeter, that is which are boundaries and features of the financial area that has to be supervised.

The governance setting is a cornerstone in the building up of the macro prudential architecture and a crucial challenge in this area is to define the most effective involvement of the central bank, which tends to have a more or less leading role\textsuperscript{1}. Which are the drivers that can explain the position of the central bank into the macro supervisory framework? At the same time, the identification of the leading authorities implies a parallel challenge in understanding how their macro supervisory powers can be applied in the different sectors of the financial industry\textsuperscript{2}, including insurance. The macro prudential supervisor tends to include insurance into the perimeter of his/her responsibilities. How to explain the deepening of the macro supervisory power in the insurance sector?

In this paper, we intertwine the two research questions, offering a positive analysis of the relationships between central banking, macro prudential supervision and insurance. We present three contributions. Firstly, the complete review of the recent theoretical models which directly or indirectly take the issue of the central bank involvement in macro supervision discovers that two relevant topics are missed: the political economy of the macro supervisory architecture design and the role of the insurance interconnectedness. Therefore a principal agent model is used to design a political economy framework, which explains how the politicians can shape the central bank governance in addressing systemic risks in insurance. Finally, the framework is used to analyse the present institutional settings in 39 countries.

2 Central banking, macro prudential supervision and insurance: the state of the art

In this paragraph, we focus on the review of central banking, macro prudential supervision and insurance in the recent economic literature. In order to shed light on these issues, the main models made after the Great Crisis are presented and discussed. Each of the following subparagraphs deals with a model, while the last one concludes and sums up the most important lessons we learn from the current literature. For each model, we analyse the aim, the theoretical framework, the empirical
structure and its results (if any), the policy implications, the role of the central bank, financial and insurance markets (if any).

2.1 Countercyclical macro prudential policies in a supporting role to monetary policy

_Aim_: N’Diaye (2009) studies how macro prudential policies are able to sustain the monetary policy in keeping the output variations under control and maintaining the financial stability. The framework relies on a traditional model of monetary policy with a financial sector. The main outcome is that countercyclical macro prudential policies can be helpful in reducing output movements and drive down the risk of the financial system. In particular, countercyclical prudential measures allow the monetary authority to pursue output and inflation goals with smaller fluctuations in interest rates. Also, countercyclical tools are able to decrease volatility in asset prices and lean against a financial accelerator process, meaning that risks of the system decrease. In a fixed exchange rate regime – countercyclical monetary policy is not possible – macro prudential policies help to reduce a run-up asset prices and support the output stability.

_Theoretical framework_: The framework merges a model including forward-looking indicators of balance sheet risk with a standard multi-country monetary model. In order to capture the role of credit and balance sheets conditions in the transmission of shocks – financial accelerator process –, borrowing costs rely on an external financial premium based on the Contingent Claims Analysis (CCA). The latter means that: (i) the risk is modelled as interactions between balance sheets; (ii) firms and households financial distress impacts on the banks balance sheets that, in turn, affect real economy.

The CCA assumption merges balance sheets information with finance and risk management tools to build market-to-market balance sheets representing the risk better. The bottom line is that
economic players’ – firms, households and banks – liabilities depend on asset values used as collateral. Such values are stochastic. The consequent volatility leads to uncertainty and, as a result, financial distress. In particular, the latter, that is the default, happens if the asset values fall below a certain promised payments – the distress barrier, that is modelled as short term debt, a share of long term debt and one year of interest payments –. It is noteworthy that creditors represent a de facto guarantee, because they are forced to absorb the losses in case of default. The distress risk is computed by using option pricing tools, while the guarantee is a put option on the assets used as collateral, where the exercise price is equal to the value of debt.

The model includes an IS curve, a Philips curve, a version of Okun’s law, a monetary policy rule, a yield curve, a modified uncovered interest parity, a labour income relationship. The supply side variables just follow a stochastic process. The financial side is based on the CCA assumption tailored to firms, households and banks. Note that the model can allow up to four economies. The monetary policy has the goal to pursue the price stability and reduce the output variations; supervisory authority assures financial stability. The monetary tool is the interest rate that impacts on the exchange rate through a modified version of the uncovered interest parity and a short term market rate. The IS curve allows the exchange rate to move the aggregate domestic and foreign demand, while the Philipp curve allows the exchange rate to affect the inflation. Likewise, the short term market rate impacts on long term market rate through the yield curve that, in turn, has influence on the aggregate demand. Fluctuations in the aggregate demand move the output gap that, in turn, impacts on actual and expected inflation.

Variations in monetary policy rate, market interest rates, exchange rates, output, unemployment and inflation impact on balance sheets of local and foreign firms, households and banks. Balance sheets changes affect the spreads – difference between policy and market rates –, that is the cost at which firms, households and bank can borrow. Also, the macroeconomic variables above impact on asset prices.
In the model, supervisory measures are countercyclical and have the objective to limit the leverage of firms, households and banks. In particular, the latter are constrained by capital adequacy ratio – equity over assets –, while firms and households face loan to value ratios. Finally, the model is adaptable to represent a fixed exchange rate regime, wherein monetary policy is constrained.

**Empirical structure:** The model simulates an exogenous increase in domestic demand and analyses how output and asset prices react with and without countercyclical macro prudential policies.

**Empirical results:** First, consider the case where countercyclical measures are not implemented. Following the increase in domestic demand, the banks expand lending and support the increase in asset prices and drive up firms and households collateral.

Second, consider prudential rules. Following the new capital requirements, the banks need to water down bank equity – assets less risky debt – leading to higher borrowing costs for the banks. As a result, financial conditions are tightened and output growth decelerates. Moreover, as output slows and spread increases, the asset prices boom is mitigated relative to the non-prudential rules world. Note that asset prices can also decrease depending on capital requirements calibration. Also, the required raise in monetary policy rate to target the variance in output and inflation is reduced by increase in spreads. In a fixed exchange rate economy, tightening in prudential rules leads to a lower-inflation scenario both in goods and assets markets and lessen output variations. Broadly speaking, empirical outcomes show that countercyclical macro prudential regulation tends to mitigate asset prices boom and stabilise output fluctuations.
Policy implications: The main policy implication is that countercyclical macro prudential measures are able to reduce output movements and decrease the risk of the financial stability. In particular, countercyclical prudential measures allow the monetary policy to reach output and inflation purposes with smaller variations in interest rates. Also, countercyclical tools are able to decrease volatility in asset prices and lean against a financial accelerator process, leading to a risk reduction. In a fixed exchange rate economy, countercyclical macro prudential policies reduce a run-up asset prices and support the output stability.

Role of the Central Bank: In the model, the central bank is the monetary authority, but prudential measures are implemented by another agency. Nevertheless, nor the possible role of the central bank in macro prudential supervision neither cooperation issues are debated. It is noteworthy that countercyclical prudential policies can help the central bank to stabilise output and inflation with smaller variation in interest rates relative to only-monetary policy world. In particular, such effects are evident in an economy wherein central bank is not able to implement restrictive policies – fixed exchange rate regime –.

Financial and Insurance markets: The paper considers the financial system as a whole and does not segment it.

2.2 Monetary and macro prudential policy rules in a model with house price booms

Aim: Kannan, Rabanal, and Scott (2009) show that monetary policy rules that take into account credit and house prices growth can stabilise the economy better than what classical Taylor rule does; they use a DSGE model including housing and banking sector. Also, if macro prudential tools are considered to mitigate financial shocks, stabilisation gains clearly emerge. Nevertheless, under TFP
shocks the optimal policy is not to use the macro prudential tool. As a result, a key factor in implementing the optimal monetary and macro prudential measures is understanding the source of the shocks.

**Theoretical framework:** The framework is a DSGE model with some modifications relative to standard New Keynesian models: the model includes housing and financial markets. There are three main traits of the model. Firstly, households decide how to allocate the wealth in housing and nondurable goods. In particular, housing provides utility and allows wealth accumulation. Secondly, as the model assumes that direct financing is not allowed, financial intermediaries collect money from savers and lend it to borrowers with a spread depending on debtors’ net worth. Also, note that the profits from intermediation are transferred to the depositors. Thirdly, lending rate is a spread over the policy rate and depends on different factors: loan to value ratios, banks mark up, use of macro prudential tool by policymakers. Typical New Keynesians features of the model include: two sectors model (durables and nondurables goods) under monopolistic competition and nominal rigidities; prices are sticky; habit preferences and adjustments costs are implemented to slow down consumption and investments, respectively; given a worker, shifting from production to building houses is costly; durable and nondurable goods production does not require capital and the economy is closed.

Four monetary policy regimes are considered: (i) a classical Taylor rule, wherein central bank minimises both CPI inflation and output gap variance; (ii) an augmented Taylor rule, in which the central bank takes into account the growth rate of nominal credit, aside from output gap and CPI inflation; (iii) an augmented Taylor rule with a macro prudential tool. In particular, macro prudential tool directly affects the lagged nominal credit changes, meaning that macro prudential policymakers can impact on spreads fluctuations; regime (iv) is actually a modified version of (iii), wherein the coefficients of the Taylor rule, including the macro prudential tool, are optimised and function as a
robustness check. In order to rank the monetary regimes, the paper considers a welfare criterion in which the policymaker cares about minimising inflation and output gap.

**Empirical structure:** Calibration is based on matching the standard deviation of the following time series for the US: consumption, residential investment, CPI inflation, nominal house price inflation, short-term deposit rates, spreads between deposit and lending rates, nominal credit growth. All data are quarterly: consumption and residential investment come from the Bureau of Economic Analysis, CPI inflation from the Bureau of Labour Statistics and nominal house prices from the OECD. The short-term deposit rate is the three-month T-bill rate, spreads are equal to the difference between the rate on all mortgage loans closed and the three-month T-bill rate (both from the Haver database). Nominal credit growth relies on household credit market debt data obtained from the Flow of Funds of the Federal Reserve Board. In calibrating real and nominal rigidities, authors follow Iacoviello and Neri (2010); nevertheless, adjustments are implemented to match data second moments.

Finally, in order to test the monetary regimes, three different shocks are simulated: financial shock (relaxation in lending standards), housing demand shock and TFP shock.

**Empirical results:** First, consider a financial shock. In regime (i), the monetary policy simply reacts to increase in output gap and inflation by raising the policy rates. Under scenario (ii), the central bank reacts to credit growth, aside from output gap and inflation. In terms of volatility of macroeconomic variables, case (ii) performs better than (i). Nevertheless, under regime (iii), the outcomes are even better. In that case, since the macro prudential tool allows to act directly against the loosening in the borrowing conditions, then the monetary policy does not need to react strongly, meaning that better stability and less volatility in macroeconomic variables is reached.
Second, suppose that a housing demand shock occurs. Like for the financial shock, regimes (ii) and (iii) turn out to be better than case (i) in terms of stability. By comparing scenarios (ii) and (iii), note that output gap is more stable in case (ii), but inflation volatility is less in regime (iii). As a result, under housing demands shocks, ranking (ii) and (iii) is ambiguous and depends on welfare criteria of the policymaker and the relative weight given to the variance of output gap and inflation.

Third, consider a TFP shock. Among the first three regimes, case (ii) performs better. As a matter of fact, using macro prudential rule – regime (iii) – increases downward pressure on CPI and output gap, leading to a less expansionary monetary policy than cases (i) and (ii) do. As a result, output gap and inflation volatility are greater in regime (iii).

When all shocks are considered, regime (ii) works better; it is not surprising, given that TFP is the most common driver of business fluctuations, unless financial or housing demand shocks turn out to be dominant.

Changing policymaker preferences in the welfare criterion and implementing robustness checks in calibrating the model confirm the results above. In particular, the optimal coefficients of Taylor rule and macro prudential tool – regime (iv) – support the main results of the model.

Policy implications: Given the results of the model, some policy implications arise. First, including credit growth considerations into the monetary policy can help facing financial accelerator. Second, specific macro prudential tools can be useful to smooth credit cycles. In particular, macro prudential measures turn out to be welfare-improving under credit and housing shocks, but are not efficient under TFP shocks. As a result, some policy mistakes can occur: when the source of the shock is the productivity, constraining credit growth using macro prudential tools would drive down welfare, meaning that rigid and inflexible policy responses could lead to suboptimal results. That is particularly true by taking into consideration that TFP shocks usually cover most part of business
cycle fluctuations and how is difficult to understand the actual source of the shocks. Only if policymaker was able to distinguish the shocks source, then a macro prudential tool would be useful, otherwise a monetary police regime including credit growth would be the preferred option. By summing up, the policymaker should be able to manage different reaction functions to face different shocks, instead of acting inflexibly; nevertheless, for the reasons above, such a task is not easy.

Role of the Central Bank: In the model, the central bank is the monetary authority and, if macro prudential measures are implemented, is also in charge of macro supervision. Nevertheless, the paper does not deal with the consequences of unifying the monetary and macro prudential authorities and does not face cooperation issues. As the model shows, central bank should use macro prudential tool only when a financial shock occurs, while under TFP disturbances monetary policy with credit growth considerations is welfare-improving. As shown above, central bankers’ capacity to understand the source of the shocks plays a key role.

Financial and Insurance markets: Financial sector is not segmented. Authors model financial sector as intermediaries that collect money from savers and lend it to borrowers with a spread depending on debtors’ net worth.

2.3 Leaning against boom-bust cycles in credit and housing prices

Aim: Lambertini, Mendicino and Punzi (2011) aim at studying the gains in implementing monetary and macro supervision policies that lean against news-driven boom-busts cycles in credit and housing prices created by expectations of macroeconomic developments. The first outcome is that there is no trade off between the purposes of monetary policy and leaning against boom-bust cycles. Following a policy rate rule that strictly stabilises inflation is not efficient. In opposition to
this, implementing a rule wherein interest rates react to financial variables helps smoothing cycles and increases welfare. Secondly, counter cyclical loan to value (LTV) ratios do not drive up the inflation and are more efficient in keeping the financial system stable than what monetary policy reacting to financial conditions does. Nevertheless, creditors and debtors’ heterogeneity in welfare criterion does not allow to rank the two regimes consistently.

_Theoretical framework:_ The framework is a DSGE model following Iacoviello and Neri (2010) and Lambertini, Mendicino and Punzi (2010). The agents operating in the economy are households, firms producing nondurable goods and housing, retailers and a central bank. The households can be savers or borrowers and both of them work in the production of goods and housing, consume and accumulate housing. In order to produce nondurable goods and housing, firms use capital, land, intermediate inputs and labour supplied by households. As a result, firms provide households and savers with wages and repayment of rented capital, respectively. Savers own retailers who differentiate final goods in a monopolistically competitive market. By following Christiano et al. (2008), the model includes expectations of future macroeconomic developments. As a matter of fact, shocks have two components: an unanticipated part and an anticipated element, meaning that, at time \( t \), agents are provided with a signal about future macroeconomic developments at period \( t+n \). In particular, model includes expectations on productivity, houses supply, cost of transforming output into capital, monetary rate, deviations from inflation goal and inflationary pressures.

The first monetary regime – case (i) – is a typical Taylor rule targeting inflation and output. Secondly, there is a pure and strict anti-inflationary policy – scenario (ii) –, in which central banker focuses only on inflation target and does not deviate from it. Thirdly, in order to smooth financial cycles, the central banker also targets financial variables – case (iii) –: either credit growth or fluctuations in housing prices. Finally, in order to increase credit in busts and decrease it in booms, a
Macro prudential countercyclical LTV ratio is introduced. It is modelled as dependent on GDP growth – case (iv) –, credit variations – scenario (v) – and housing prices changes – case (vi) –.

In order to rank the monetary regimes, authors use a welfare criterion based on conditional expectations of lenders and borrowers’ lifetime utility.

**Empirical structure:** In calibrating the parameters, authors follow Iacoviello and Neri (2010). In opposition to similar studies, the authors do not want to distinguish among different shocks – TFP vs financial shocks – but simulate the economy response to fluctuations, whatever their source is.

**Empirical results:** First, consider case (i) vs. case (ii). The results show that a typical Taylor rule yields much more stability of all macroeconomic variables and, under a merely rigid anti-inflationary monetary policy, both lenders and borrowers decrease their own welfare. In fact, case (ii) delivers greater instability because, in order to pursue strictly the inflation target, the policy rate is extremely volatile. Among other things, note that the simulations show that there is a trade off between the inflation and output variability, meaning that an interest rate rule that targets both output and inflation cannot decrease the inflation and output variability at the same time.

Second case, scenario (iii) vs scenario (i). If the central banker considers also financial variables – case (iii) –, then there are significant gains in terms of macroeconomic stability and both savers and debtors improve their welfare relative to a monetary policy based on a classical Taylor rule – case (i) –. In particular, considering the credit growth as financial measure provides better results than considering housing prices: both agents’ welfare is greater and all macroeconomic variables, aside from inflation, show greater stability. The reason is that some inflation volatility helps flattening the real effects of variations in nominal debt and, as a result, leads to greater stability.
Third, consider the macro prudential countercyclical LTV ratio. This rule is able to reduce output volatility; in particular, LTV ratio dependent on credit growth – scenario (v) – is more effective than LTV ratio dependent on either GDP growth – case (iv) – or housing prices changes – scenario (vi) –. Anyway, the three scenarios show small differences in variability of housing prices, housing investment and inflation. Also, while LTV ratios responding on GDP growth and housing prices changes are not able to reduce the variability of loans and loan-GDP ratio, LTV tool responding on credit growth can do it. The bottom line is that the latter, given a shock, generates moderate responses in LTV ratio, while the response of LTV tool dependent on either GDP growth or housing prices is stronger, leading to more instability relative to LTV ratio based on credit growth. By using the welfare criterion, it is found that only LTV ratio dependent on credit growth improves both agents’ welfare, while the other two LTV tools increase savers’ welfare, but worsen borrowers’ one. The reason is that increasing volatility in credit flows, associated with LTV rules targeting either GDP growth or housing prices, drives up the fluctuations of debtors’ consumption and, as a consequence, decreases their welfare.

Last but not least, using welfare analysis to rank monetary policy based also on financial variables – scenario (iii) – and a macro prudential policy targeting credit growth – scenario (v) – does not provide consistent results: savers maximises their utility under case (iii), while borrowers are better off under scenario (v), wherein credit level is higher, allowing debtors to consume more nondurable goods and housing.

Policy implications: Some policy conclusions emerge. First, a rigid anti-inflationary monetary policy mitigates business cycles fluctuations worst than what a typical Taylor rule does. Second, monetary regime taking into account credit growth drives up macroeconomic stability and improves welfare, meaning that monetary policy goals and business cycles stability do not show any trade off. Third, when macro prudential tools are introduced to fight boom and busts, countercyclical LTV
measures reacting to credit growth are more effective in stabilising the credit cycle than a monetary policy responding to changes in credit aggregates. Anyway, since the former maximises borrowers’ welfare, while the latter improves lenders’ welfare, a consistent rank of the two regimes cannot be defined.

Role of the Central Bank: In the model, the central bank is the monetary authority. It is assumed that the central banker can also implement macro prudential measures. As shown, the model suggests that the central banker should avoid a rigid anti-inflationary measure, while including credit growth considerations in implementing monetary policy helps stabilising the economy and turns out to be welfare improving for both lenders and borrowers. It also means that monetary policy goals and business cycles stability do not show any trade off. If macro prudential tools are introduced, countercyclical LTV measures reacting to credit growth are more effective in stabilising the credit cycle than what a monetary policy responding to changes in credit aggregates does. Anyway, since the former maximises borrowers’ welfare, while the latter improves lenders’ welfare, a consistent rank of the two regimes cannot be defined.

Anyway, authors do not deal with the consequences of unifying the monetary and macro prudential authorities and do not face cooperation issue.


2.4 Macro prudential policy and the conduct of monetary policy

Aim: Beau, Clerc and Mojon (2011) study the interactions between monetary and macro prudential policies and the need of coordination. In order to assess if and how the two policies have
compounding, neutral or conflicting impacts on inflation, a DSGE model including financial frictions, heterogeneous agents and housing is used. The estimation is based on the US and Euro Area data 1985-2010. The authors analyse four different policy regimes relying on: (i) monetary policy goals – if the short term rate includes financial stability by leaning against credit bubbles –; (ii) the existence of a macro prudential agency whose task is guaranteeing the financial stability by implementing supervision policies without impacting on the monetary policy rate. Four main results arise: macro prudential policy usually does not affect price stability; effects on inflation emerge only under financial shocks (shocks to asset prices and credit); under these shocks, an independent monetary policy focused on prices stability and an independent macro prudential authority leaning against the credit growth allow to reach the best outcome in terms of inflation stability; such an outcome is improved if monetary agency takes into consideration the macroeconomic effects deriving from macro prudential policy, meaning that coordination and sharing information on macro prudential policies is crucial to allow the central bank to keep the prices stable.

Finally, given the theoretical framework above, the paper assesses the policy regimes in the US, UK and Euro Area.

Theoretical framework: The framework is based on a DSGE model à la Iacoviello (2005) with residential investments, house prices and loans. The main elements of the model are the following: as in Liu et al. (2009), investment cycle is affected by housing prices; housing and preference shocks impact on agents’ utility functions; impatient households and entrepreneurs are borrowers whose credit constraint is binding in equilibrium, wherein borrowing is limited by the net present discount value of housing wealth; from this viewpoint, a positive financial shock is just a loosening of borrowers’ loan to value ratio (for example, due to an increase in the banking market competition or financial innovation); only impatient households are subject to the marginal utility of housing that, in turn, impacts on housing demand: the point is that, contrary to Iacoviello (2005), the authors are
focused on the interactions between a demand shock and a binding borrowing constraint within a framework of nominal debt indexation.

What about government policies? As usual, the agency in charge of the monetary policy is the central bank, whose tool is the short term nominal interest rate. Central bank is subject to a typical loss function, in which it minimises the variance of inflation, output and interest rate itself. Macro prudential goal is leaning against the financial (credit growth) wind. It means that policymaker in charge of supervision is able to influence the loan to value ratio of borrowers – impatient households and entrepreneurs –. Put it in other way, the macro prudential authority aims at flatting the deviations of credit growth from its steady state.

*Empirical structure:* Data come from Euro Area and the US and cover the period 1985-2010.

Four policy regimes experiments are simulated and analysed:

Plain vanilla Taylor rule: the central bank sets the monetary policy tool – the short term nominal interest rate – by following a traditional Taylor rule. The only goal is the price stability and the interest rate goes up in responding both to inflation and output gap. No macro prudential policy is implemented.

Lean against the financial wind Taylor rule: the central bank leans against the financial wind, meaning that the Taylor rule is augmented to allow interest rate to increase with credit expansion.

Independent macro prudential agency: the central bank and the supervision authority act separately by pursuing their own objectives and no coordination is implemented.

The central bank is modelled as in (two), but there is also an independent macro prudential authority that leans independently against the financial wind.
Some different shocks are considered. Two of them are financial shocks – credit supply and housing preferences shocks –, while the others – time preferences, productivity, investment, monetary policy and cost push shocks – represent the traditional disturbances.

**Empirical results:** By implementing a variance analysis, authors find that typical shocks cover 80 per cent of the variance of the Euro Area inflation and more than 80 per cent in the US.

Also, under the five traditional shocks, inflation response is almost the same across the four different policy regimes. These results confirm that in most fluctuations of business cycles, an independent supervision policy does not affect the price stability. Only under financial shocks, the impact on inflation differs across policy regimes. In both financial shocks, the inflation is more stable under regime (three), where an independent central bank pursuing only price stability goals is combined with an independent macro prudential supervision that leans against credit expansion: for instance, in the case of housing preference shocks, housing prices growth does not turn into a credit boom.

Once authors have estimated and optimised the coefficients of the four policy rules relying on the US and Euro Area data, they analyse the outcomes in terms of variance of inflation, output, interest rate and credit across the policy regimes. The main outcome is that the policy (three) turns out to be the best regime to stabilise inflation, output and interest rate.

Given the results above, cooperation seems to be useless: in order to assess the importance of coordination, the authors try to find the most efficient monetary policy constrained by a given macro prudential policy – policy regime (one) vs policy regime (two) –. In other words, in terms of inflation and interest rate stabilisation, is it efficient for the central bank to take into account the macro prudential policy? The empirical results show that it could be more efficient to optimise the Taylor rule coefficients taking the macro prudential policy as given (case one) rather than incorporating the
macro prudential goals in the monetary policy (case two), meaning that an independent supervision agency pursuing the financial stability does not affect necessarily the goal of price stability.

Policy implications: In terms of central banking, some important policy implications arise. First, under most cases, inflation is not influenced by macro prudential policy; only under credit or asset price shocks, supervision impacts on inflation dynamics and, in such cases, an independent macro prudential agency is very useful to stabilise the inflation. Second, the most efficient regime to keep inflation and output stable is a central bank following the Taylor rule, while adding a supervision agency improves such an outcome under financial shocks. Also, allowing the central bank to use the monetary tool to pursue the financial stability leads to suboptimal results. Third, in order to yield the best outcome in terms of inflation and output stabilisation, the central banker should be fully informed of the policy implemented by the supervision agency. Broadly speaking, the need of separate assignments arises, even if coordination is necessary.

Finally, given the theoretical framework, the paper delivers some policy advices for the FED, ECB and BoE.

First, although the Financial Stability Oversight Council (FSOC) is the institution in charge of macro supervision in the US, the FED has a powerful role in pursuing macro prudential goals: it should be avoided to implement redundant supervision policies (scenario four risk).

The authors argue that the institutional arrangement of the European Systemic Risk Board (ESRB) is separated by the ECB working, but the presence of single members central bankers both in ECB governing council and ESRB is likely to guarantee information sharing.

In the UK, the new Financial Stability Committee works within the BoE, meaning that cooperation is likely to be guaranteed. At the same time, separation from the Monetary Committee should be able to avoid scenario four risk.
Role of the Central Bank: The central bank is modelled in some different ways. Its goals can be traditional – only monetary purposes – by setting the interest rate to keep inflation and output stable (case one). It can be in charge of both monetary and macro prudential goals (case two), by leaning against the credit growth wind. It can focus only on monetary goals and acts independently from a supervision agency (case three). It can be modelled as in case two, but coexists with a macro prudential agency that also leans against credit growth wind (case four).

The most efficient regime to keep inflation and output stable is a central bank focusing on monetary goals, while adding a supervision agency improves such an outcome under financial shocks. Also, allowing the central bank to use the monetary tool to pursue the financial stability leads to suboptimal results, both with and without a supervision agency. Finally, in order to yield the best outcome in terms of inflation and output stabilisation, the central banker should be fully informed of the policy implemented by the supervision agency.

Financial and Insurance markets: The lending sector is not differentiated.

2.5 Monetary and macro prudential policies

Aim: Angelini, Neri and Panetta (2012) use a DSGE model with a stylised banking sector to verify the interaction between monetary and macro prudential policy. Under normal times – the business cycle is supply-driven – macro prudential supervision gains are quite modest. Also, the possible lack of cooperation between the monetary authority (the central bank) and the macro prudential agency could lead to suboptimal results. If financial shocks occur – shocks to supply of loans – macro prudential policy gives more benefits: the more the central bank will cooperate with the macro prudential agency and will broaden its goals beyond the price stability, the more the macro
prudential policy gains are greater in restoring the financial stability. Anyway, by implementing a welfare analysis of the different agents, two main results arise: no regime makes all agents better off and, from this viewpoint, a definitive rank is not possible; solid redistributive effects among agents occur both with supply and financial shocks.

**Theoretical framework:** The theoretical template is based on a DSGE model by Gerali et al. (2010) with a stylized banking sector. The agents of the economy are entrepreneurs, (patient and impatient) households and banks. Patients households are savers who deposit their money in the banks. Impatient households and entrepreneurs borrow from the banks and face a binding credit constraint. Entrepreneurs produce consumer and investment goods using capital and labour supplied by households. Note that households are monopolistic in supplying the labour and nominal wages are assumed to be set by unions.

Banks are monopolistically competitive and loans to impatient households and firms are banks’ assets, while liabilities are deposits and capital. Monopoly power allows the banks to set the interest rates on loans and deposits. Bank rates are sticky because some adjustment costs occur when they move loan and deposit rates. According to the balance sheet identity, loans are equal to deposits plus capital. Banks want to keep their capital-asset ratio close to an exogenous target $v_t$ representing a capital requirement imposed by the regulator – the macro prudential tool of the model –. From this point of view, two main elements are noteworthy: first, the total loans are the sum of the risk-weighted loans to entrepreneurs and households; second, banks capital can increase only through retained earnings. The equilibrium conditions show that if loans go up, the capital-asset ratio could turn out to be lower than the threshold $v_t$, leading the banks to increase the lending rate. Of course, this drives down the credit demand and, in turn, decreases consumption and investment. In the model, monetary and macro prudential policy are independent and implemented by the central bank and a supervision authority, respectively: $R_t$ is the monetary policy rate (monetary policy tool) and affects
both lending and deposit rates, while $v_t$ (macro prudential policy tool) impacts only on lending rates. It means that different effects on savers and borrowers could arise.

The monetary policy rate follows a standard version of Taylor rule and the central bank uses a loss function to minimise the variance of inflation, output and interest rate itself.

The macro prudential tool $v_t$ is set by taking into account the output growth and choosing a countercyclical policy: capital-asset ratio increases in good times and goes down in a bust. The macro prudential authority uses a loss function to minimise the variance of loans to output ratio, output and $v_t$ itself.

**Empirical structure:** The model calibration follows the prevalent literature for central banking, such as Ozlale (2003), Ilbas (2012), Ehrmann and Smets (2003). Anyway, robustness checks are implemented by setting alternative values for the two loss functions and for the macro prudential policy rule - $v_t$ - : results keep unchanged.

The empirical analysis is based on three cases: (i) first, the macro prudential and monetary authorities are completely coordinated, meaning that the two policies are chosen jointly by a single policymaker with two tools (interest rate $R_t$ and capital requirement $v_t$), whose goal is minimising the variance of inflation, output, the loans to output ratio, and the changes in the tools themselves – the two loss functions are merged –. (ii) Second, no cooperation is assumed: the central bank minimises its own loss function and takes as given the macro prudential policy rule, while the macro prudential authority minimises its own loss function and takes as given the monetary policy rate. (iii) Third, macro prudential supervision is absent and there is only the monetary policy. Finally, both cases are studied by simulating technology – normal times – and financial shocks – shocks to credit supply.
**Empirical results:** First, a technology shock is considered. Under cooperation case, the macro prudential policy is countercyclical, because the more the output growth, the more the capital requirement is tightened. Under non cooperation scenario, the macro prudential policy turns out to be procyclical, while monetary policy is strongly countercyclical. The sum of loss functions is worst than scenario (i). In particular, under (ii), the variability of interest rate is 22 times greater and that of capital requirements is twice as great. It means that non cooperative case could lead to suboptimal results because of coordination problems – monetary policy is countercyclical, while macro prudential supervision is not –. Under non cooperation scenario, if a negative technology shock occurs, as the loans to output ratio goes up, the macro prudential agency tightens the capital requirements and worsens the recession. Note that loans to output ratio increases because bank credit decreases less than output, given that the impact on households and entrepreneurs – borrowers – is delayed. As a result, the central bank acts aggressively and, in turn, macro prudential authority keeps tightening. Under case (iii), results are better: volatility of interest rates and loans to output ratio declines strongly, meaning that under supply shocks macro prudential policy is not so useful.

Second, a financial shock is taken into account. Under cooperation case, both monetary and macro prudential policy are strongly countercyclical. By analysing the loss functions, it is found that the central bank loses and macro prudential authority gains. The volatility of output, loans to output ratio and capital requirement decreases, while the cost is a slight increase in the variability of inflation and monetary policy rate: the related interpretation is that central bank can deviate from its goal to support the financial stability. Under scenario (ii), macro prudential policy is still countercyclical, but the monetary policy reaction is weaker and the fluctuations of macro prudential variables are slightly greater than scenario (i). With respect to technology shock, there is no conflict because fluctuations in output and loan to output ratio are in the same direction. Under case (iii), the results worsen.
The authors also implement a welfare analysis of each category of agents. Given the technology shock case, borrowers are better off under the cooperation regime. Savers are better off under non cooperative scheme. When a financial shock is considered, no regime makes all agents better off: savers reach the highest utility under cooperation, while borrowers do it under pure monetary policy regime.

*Policy implications:* The model structure tries to capture some important policy aspects: first, the role of bank capital and credit supply in the financial crisis is represented; second, the capital-asset ratio is a good example of countercyclical capital buffer introduced by Basel Three; last but not least, a micro prudential regulator could be likely to require an undercapitalised bank to increase the capital-asset ratio, regardless of the adjustment is focused on reduction in asset or capital increasing. The former means that a micro prudential regulator could damage the economy: by following Hanson, Kashyap and Stein (2010) ‘…one can characterise the macro prudential approach to capital regulation as an effort to control the social costs associated with excessive balance-sheet shrinkage on the part of multiple financial institutions hit with a common shock’, the model captures how the risk of assets shrinkage can be mitigated by the macro prudential policy.

In normal times, the benefits of macro prudential policy are modest. In order to avoid suboptimal outcomes, cooperation between central bank and macro prudential agency should be guaranteed, even if monetary policy alone can do a better job in reaching both monetary and supervision purposes. The suboptimal result under (ii) depends on the fact that two independent authority have different goals: the central bank is focused on output and inflation stabilisation, while the financial supervisor aims at keeping the credit supply stable. This is why conflicting policies can arise.

If financial shocks are important factors in the economy, the benefits of implementing a macro prudential policy are substantial. The cooperation between monetary and macro prudential authority
leads to a greater stability of macroeconomic variables: the cost is a very active monetary policy and bigger variability of inflation, meaning that central bank should deviate from its own objectives to support the financial stability.

The welfare analysis shows that no regime makes all agents better off. From a welfare viewpoint, it means that the optimal monetary and macro prudential policy depends on which kind of agent the policymaker wants to please.

**Role of the Central Bank:** In the model, the central bank has only monetary objectives – keep output and inflation stable – and does not deal with supervision purposes. It is independent from the macro prudential authority. Nevertheless, cooperation between central bank and macro prudential agency is a key factor: in normal times, coordination allows to avoid suboptimal results, even if monetary policy alone can do a better job in reaching both monetary and supervision purposes. Under financial shocks, the central bank should deviate from its own objectives to support the financial stability.

**Financial and Insurance markets:** There is only a banking sector, wherein banks are monopolistically competitive and set the lending and borrowing rates.

2 The missing points

Financial crisis in 2008 triggered the call for macro prudential policies. From this viewpoint, the literature shows some clear trends and three interesting results.

Theoretically, DSGE models are implemented to analyse the interaction between macro prudential and monetary policy. Most of these models present a stylised banking sector to verify the
interaction between monetary and macro prudential policy. The literature is coherent in admitting that under normal times – the business cycle is supply-driven – macro prudential supervision gains are quite modest (some simulations find losses in implementing macro prudential policies during traditional shocks), while, under financial disturbances, macro prudential policy gives more benefits. Why? As it has been correctly argued, the point is that a financial shock tends to move the objectives of monetary and macro prudential policy (for instance, output and loan to output ratio, respectively) in the same direction, while the traditional shocks do the opposite.

As a result, a key factor in implementing the optimal monetary and macro prudential measures is understanding the source of the shocks: in order to implement effective macro prudential policies, the policymaker should be able to distinguish between financial and real shocks. Consequently, the more the central bank as liquidity manager gains information advantages, the more its leading role in the definition and implementation of the macro supervision has to be established.

However, at the same time the literature highlighted that welfare analysis provides ambiguous results, that is no monetary/macro prudential regime makes all agents better off. From this viewpoint, a definitive rank is not possible; solid redistributive effects among agents occur both with real and financial shocks. It means that the optimal monetary and macro prudential policy depends on which kind of agent the policymaker wants to please. Therefore we need to enrich the economic analysis adopting a political economy approach.

Last but not least, to the best of our knowledge, the DSGE models do not face explicitly the issue of macro prudential policy in the insurance sector. The reason is quite simple: most models and studies consider the financial industry as a whole and, as a result, they cannot explain if and how macro prudential policy differently affects the financial subsectors – banking sector, financial markets, insurance industry –.
So far there are a few studies dealing with interconnectedness and systemic risk in the insurance sector\textsuperscript{7}: the main point is whether and how insurance industry can create a potential systemic risk for the economy as a whole.

Swiss Re (2003) concludes that the systemic risk is not relevant in the (re)insurance sector, but admits that credit derivatives are the main tool of interconnection between banking and insurance industry and, as such, represent a potential source of systemic risk.

A work conducted by the Group of Thirty (2006) implements a kind of stress test, presenting what would happen if the equivalent of 20 per cent of the global reinsurance market collapsed. The result is that primary insurers would be likely to be unaffected and the impact on real economy would be limited.

Bell and Keller (2009) find that insurance core activities\textsuperscript{8} are not risky for the system as a whole. As they argue, insurers are unlikely to be ‘too interconnected to fail’. Nevertheless, they conclude that non-core or banking activities can turn out to be a source of systemic risk, meaning that in the insurance sector stronger supervision and capital requirements are needed.

Geneva Association (2010) finds a similar result: insurance companies are unlikely to be a source of systemic risk, but non-core activities are potentially able to trigger a systemic crisis. In particular, the study shows two factors of systemic risk: short-run financing from securities lending or commercial paper and credit derivatives.

Grace (2010) relies on insurers stock prices to find that non-core activities are relevant for the financial stability as a whole, but, broadly speaking, insurance industry is not a source of systemic risk.

Acharya et al. (2010) implement an econometric analysis based on stock price data and conclude that many insurance firms are systematically risky if compared with relevant banks.
Billio et al. (2011) argue that a shock to one financial (sub)sector is likely to have propagation effects on other parts of the financial system, because financial companies are much more interconnected than what they were in the past.

Chen et al. (2012) implement a micro analysis to measure the interconnection between banks and insurance firms. Two main outcomes arise: the systemic impact of banking turmoil on insurers is very strong; vice versa does not hold.

Baluch, Mutenga and Parsons (2011) study the role of the insurance sector in the financial bust. In particular, they focus on European markets. They find out that there is a high interconnection (between banking and insurance industry) that is increased during the turmoil. Although they admit that systemic risk is higher in the banking sector, conclude also that risk in insurance market is increased in the crisis because of: (i) insurance non-core activities are going up; (ii) the interconnection between banking and insurance market is growing.

Cummins and Weiss (2012) focus on the U.S. insurance industry to conclude that core-activities do not represent a risk for the financial system as a whole. In order to assess the impact of non-traditional activities, they compare systemic and non-systemic risk samples. They find that systemic insurers hold more business activities and tend to hold more amounts of credit derivatives, mortgage-backed securities and asset-backed securities.

Cummins and Weiss (2013) use ‘primary factors’ (size, interconnectedness, lack of substitutability) and ‘contributing factors’ (leverage, maturity mismatch, liquidity risk, complexity and government regulation) to evaluate the systemic risk of the insurance industry. According to the prevalent literature, they find that most of traditional activities are not systematically risky. At the same time, some of the core activities, such as group annuities and separate accounts, can turn out to be a source of systemic risk. Non-core activities are confirmed to be risky for the financial stability as a whole. Moreover, the study finds out that in most cases insurance companies are victims rather than
channels of systemic risk propagation\textsuperscript{9}. Finally, the research concludes that intra sector crises – emerging from counterparty credit risk – can hit the insurance sector.

The main lessons from the current literature seem to be the following: the more the insurance market focuses on traditional activities, the less the likely to be source of systemic risk; analysis of single insurance firms, stock price data and derivatives seem to support the idea that the more the insurance industry is interconnected with the banking sector and deals with non-core activities, the more the systemic risk is. Nevertheless, it is not totally clear why and how some kinds of non-traditional activities rather than others are source of systemic risk.

3 Citizens, policymakers and central bank macro prudential role in insurance: a political economy model

Here we go ahead in studying the design of the central bank involvement in the insurance macro supervision (CBIMS) using a delegation framework\textsuperscript{10}. In doing so, we adopt the political economy approach\textsuperscript{11} that argues that the policymaker’s actual choices related to the central bank governance are conditional on the economic and institutional environment existing at a given time, which in turn determines the political weights put on the pros and cons of the CBIMS.

Our framework is based on two hypotheses. First of all, gains and losses of a given central bank setting are variables computed by the incumbent policymaker, who maintains or reforms the central bank regime following his/her own preferences. Secondly, policymakers are politicians, and as such, they are held accountable at elections for how they have managed to please voters. All politicians are career-oriented agents, motivated by the goal of pleasing voters in order to win elections. The main difference among various types of politicians concerns which kinds of voters they wish to please in the first place. Therefore the CBIMS is likely to change over time following the political preferences, which are not automatically coincident with the social ones.
Consider a closed economy with rational expectations and uncertainty. We suppose that the citizens like an effective macro prudential setting, where also the insurance industry is monitored and governed in the best way. The insurance industry can be a potential source of systemic risk, depending on its degree of financial interconnectedness.

The more the macro supervisor is able to set controls on the insurance sector, the more its capacity to prevent and to address any systemic risk coming from the insurance firms will be enlarged. The shortcomings come the more the macro supervisor is not the insurance micro supervisor, given that it is more likely that its policy can produce negative – although unintended – consequences. We suppose that the macro prudential supervisor can be the central bank. Our assumption is founded on the fact that being sources of liquidity and acting as lenders of last resort, central banks are naturally involved in preventing and managing systemic banking crisis\(^{12}\) (macro supervision)\(^{13}\) – in developed, emerging\(^{14}\) and developing countries - in close coordination with government agencies entrusted with responsibility for financial stability\(^{15}\).

On the topic it is possible to disentangle the pros (integration view) and cons (separation view) of including insurance in the central bank perimeter. The central bank high involvement in insurance supervision (integration view) can be supported by arguments related to the informational advantages and economies of scale that derive from bringing all functions under the umbrella of the authority in charge of managing liquidity. The integration view supports high level of CBIMS. The informational gains have to evaluated taking into account the risks of weakening the central bank effectiveness in pursuing the monetary policy goals.

At the same time, it is worth noting that that central bankers completely involved in insurance macro supervision can produce greater policy failure costs (separation view). The crucial argument supporting this point of view is that if the central banker is an outsider regulator, some risks of policy failure can emerge.

The risk of policy failure can be differently motivated, shedding light on the two main sources of the policy failure risk. First of all, the more the supervisor is an outsider regulator, the more likely are the
risks of unintended bad consequences of its policy actions (spillover effect). In fact, notwithstanding the separation between macro and micro supervision can be useful conceptually, it is really difficult that in practice the action of the macro supervisor can avoid to produce externalities – either positive or negative – on the safeness and soundness of the insurance firms, given that, in general, it has been already demonstrated that conflicts may arise also between macro and micro supervisory stance\textsuperscript{16}. In other words, if an outsider supervisor takes on responsibility for regulation of insurers, it is likely that some concerns arise that the outsider supervisor does not understand in an appropriate way the peculiarities of the insurance firms. It is important to highlight that the risk of policy failure is endogenous respect to the distribution of power: it exists only if the supervisor is the central bank, acting as outsider regulator.

Secondly, the overall unification of macro supervision and monetary policy in the hands of the central bank can create an overly powerful bureaucracy with related risks of misconduct (bureaucratic overpower risk). The separation view claims for low level of CBIMS.

In general the CBIMS becomes the possible institutional device to fix the degree of pervasiveness of the macro prudential tools in the insurance industry. The citizens acknowledge that the definition of the optimal level of CBIMS means to exploit the tradeoffs between higher level of macro prudential controls (economic gains), higher risks of unintended consequences on insurance sector and higher risks of an over powerful central bank.

Citizens care about the effectiveness of the CBIMS regime according to a classic well-behaved concave function $u = U(y)$: social welfare increases with the optimal level of CBIMS. Linear preferences are used:

$$U(y) = y$$ \hspace{1cm} (1)

In a democracy, citizens assign to the elected policymaker the task of designing the optimal level of CBIMS, that is the setting that guarantees the insurance macro supervision effectiveness. For the sake of simplicity, we suppose that the elected policymaker represents both the legislative and the executive powers, that is the interests of the majority of the Parliament and of the government in charge are perfectly aligned.
The incumbent policymaker is delegated by society to define and implement the optimal level of CBIMS. The policymaker reward is based on how he/she (hereafter she) carries out her job, that is defining and implementing the level of CBIMS.

Our policymaker is a politician. Here we assume that the policymaker wishes to please the citizens; one more assumption could be that the policymaker aim is to please specific constituencies, that is the lobbies\textsuperscript{17}. We adopt the helping hand view of the policymaker’s type: she wishes to please citizens rather than a particular constituency or lobby (grabbing hand view). Furthermore, the possible redistribution effects – if any – of the central bank involvement in macro supervision is beyond the scope of this model\textsuperscript{18}. It will be interesting to demonstrate that notwithstanding the policymaker wishes to please the citizens, the final outcome – the actual CBIMS – can be different from the social optimal one.

The level $y$ of CBI is determined by the policymaker’s ability $\Omega$ and by her effort $a$.

$$y = a + \Omega \quad (2)$$

Let us describe the delegation framework. The sequence of events is as follows:

- Society chooses to delegate to the policymaker the task of designing the optimal level of CBIMS;
- Next, the policymaker chooses effort $a$, before knowing her ability $\Omega$ in implementing this particular task (building up CBIMS is not an usual nor a day by day operation);
- The policymaker implements the CBIMS regime, revealing her ability $\Omega$;
- Citizens observe the CBIMS level - not the relationship between effort and ability, given that they cannot distinguish innate talent from contingent effort – and reward the policymaker for this task.

Coming back to the policymaker, her utility function $Z_{Hu}$ is defined as:

$$Z_{Hu} = R(U) - C(a) \quad (3)$$
Where $R(U)$ is the reward function and $C(a)$ is the cost function. The political reward is function of the social utility, while the political costs are function of the effort in implementing the task. The policymaker evaluates every task assignment while taking into account the political rewards and costs in doing so. Let us describe the three crucial features of the policymaker:

A) Ability: the ability of the policymaker is a random variable with the usual normal distribution (where $\Omega_{\mu}$ is the mean);

B) Political Reward: The incumbent policymaker wishes to be re-elected. The government needs to provide enough utility to the majority of voters; then her utility function is the social welfare function $U$.

In general, the policymaker wishes to please voters and her goal is the alignment of interest between her and citizens. But then each delegated task – that is each specific alignment - can be more or less convenient from the policymaker’s point of view in terms of political gains. We denote the political value she assigns to fulfil the specific task on CBI with $\beta$ - with $0 \leq \beta \leq 1$. Therefore:

$$R(U) = \beta U$$

The incentives alignment between the policymaker and citizens is a necessary and sufficient condition to find the optimal behaviour of the policymaker. One more step is necessary to find out the effective political reward. The reward will be useful if the citizens’ utility exceeds the minimum threshold of utility $W$ that they expect from an incumbent government (political competition condition).

Citizens compare government performances with the expected performances of outside politicians. The political competition condition can be defined as follows:

$$R_{comp} = \beta \Pr(U \geq W) \quad \text{(4)}$$

Therefore the usefulness of the political reward will depend on condition (4).

C) Political Costs: The policymaker knows that the more the central banker will be the insurance macro supervisor, the more it will be likely that two kinds of costs can arise. On the one side, the economic costs of having an outsider regulator acting on the insurance sector can have to be considered; the more the central bank is an outsider regulator, the more unintended but negative effects of her action
can arise. One the other side, the more the central bank is a powerful bureaucracy, the more the incumbent government will face a veto player in implementing its economic policies.

In other words, we assume that from the policymaker’s point of view the political costs of implementing a CBIMS regime will depend on her expectations of facing at least one of two different public failures: policy failures of the central bank as outsider regulator (PF); bureaucratic dominance of the central bank as over powerful agency (BF). Both failures can produce social costs. From the citizen point of view, the government can be a natural scapegoat; in both cases the government is likely to be blamed; political costs will arise.

Therefore the policymaker cost function can assume the following simple specification:

$$C(a) = ca^2$$

(5)

Where \( c = c_0 + c_1(probPF + probBF) \) and each probability is between zero and one.

The political cost of the effort in establishing CBIMS depends on how the incumbent government is blamed when the shocks occurred, that is on the size of reputation losses.

When a public failure occurs, citizens can be more or less sensitive. From the government’s point of view, the failure likelihood per se is not relevant, but its political cost effects her reputation. The reputation factor is represented by the parameter \( c_1 \). For the sake of simplicity, we assume a) that the negative effect on the government’s reputation is the same irrespective of the type of failure; and b) the failures are independently distributed.

We will see that the size of the political costs can determine the difference between the optimal CBIMS and the actual one.

Establishing the CBIMS is a two step process: defining the policymaker effort; evaluating the CBIMS level. In defining her optimal effort \( a \), the policymaker maximises her objective function. Then her ability \( \Omega_{mu} \) becomes evident, the level of CBIMS can be evaluated using the CBIMS equation (2) and her final political reward can be calculated using the political competition equation (4). It follows that the policymaker maximises social welfare net of costs of executing the task:
\[
\max Z_{\text{mut}} = \max \left[ R(U) - c(a_1) \right]
\]

\[
R(U) - c(a_1) = \beta(U) - c(a_1)
\]

Given that the level of social utility is equal to the level of CBIMS, which is function of the policymaker effort, it is evident that both the rewards and the costs depend on the effort:

\[
\beta(a_1 + \Omega) - ca_1^2
\]

From the first order condition, the optimal effort will be:

\[
\frac{\delta Z_{\text{mut}}}{\delta a_1} = \beta - 2c_1a = 0
\]

\[
a_1 = \frac{\beta}{2c_1}
\]

Given \(a_1\), the effective political reward of the policymaker will depend on the condition of political competition (4):

\[
R_{\text{mut}} = \beta \Pr(U \geq W)
\]

Voters are rational. They realise that the alternative to re-electing the incumbent policymaker is to get another politician with average ability. Given their expectations \(a^e\) on effort, it follows that:

\[
W = a^e + \Omega_{AV}
\]

Then:

\[
R_{\text{mut}} = \beta \Pr(\Omega + a_1 \geq \Omega_{AV} + a^e)
\]

\[
R_{\text{mut}} = \beta \Pr(\Omega - \Omega_{AV} \geq a^e - a_1)
\]  \hspace{1cm} (5)

Nature chooses the ability of the incumbent policymaker \(\Omega_{\text{mut}}\). It follows that:

\[
R_{\text{mut}} = \beta \Pr(\Omega_{\text{mut}} - \Omega_{AV} \geq a^e - a_1)
\]  \hspace{1cm} (6)
When expectations are perfectly matched \( \left( a^e = a_1 \right) \), the effective political reward will be positive if the ability of the incumbent policymaker is greater than average:

\[
\left( \Omega_{HH} > \Omega_{AV} \right)
\]

The equilibrium level \( y \) of the CBIMS will be determined by the policymaker’s ability \( \Omega_{HH} \) and by her effort \( a_1 \):

\[
y_{HH} = a_1 + \Omega_{HH} = \frac{\beta}{2c_1} + \Omega_{HH}
\]

Given the exogenous policymaker ability, on one hand, the level of CBIMS depends on how politically relevant it is for the government to build up a central bank regime pleasing the majority of voters, which dislikes the systemic risk situations. In other words, the policymaker’s perception of the social relevance of the CBIMS setting matters. On the other hand, the government takes into account the expected costs of facing the public failures which may arise when a central bank is the insurance macro supervisor.

The parameter \( c_1 \) can be easily used to show under which conditions the actual level of CBIMS is different from the social optimal one. In fact, we can suppose that the citizens acknowledge the existence of risks in having a central bank deeply involved in the insurance macro supervision; therefore the social optimal value of the reaction parameter \( c_{1soc} \) is different from zero: for the sake of simplicity, we can assume that:

\[
c_{1soc} = 1
\]

Now, if the political costs for the government in facing the public failures caused by the central bank as insurance macro supervisor are particularly high, it is likely that \( c_1 > c_{1soc} \). Consequently, the actual level of CBIMS designed by the policymaker will be lower than the social optimal one.

The theoretical framework can be used to identify possible drivers of a CBIMS reform after the 2008 financial meltdown. In general, we assume that gains and losses of a CBIMS regime are variables
computed by the incumbent policymaker, who maintains or reforms the institutional setting, following her preferences. Therefore any situation that influences the policymaker’s gains and costs in changing the regime can produce incentives to modify the CBIMS level.

If the incumbent governments feel that the society aversion against systemic risk is increasing, an institutional reform focused on macro supervision is likely to produce higher political gains. In our model, the value of the parameter $\beta$ increases as well as the level of CBIMS.

At the same time, any situation that changes the policymaker’s political costs $c_i$ in reforming the regime can produce incentives to modify the CBIMS. For example, the policymaker incentives to decrease the CBIMS are likely to increase if the expectations of the incumbent government to face public failures due to the central bank involvement in insurance macro supervision become relevant.

4 Central banks, macro prudential policies and insurance

Now we can wonder if our theoretical setting can be used to shed light on the actual institutional regimes. In order to perform a preliminary and just descriptive analysis on a heterogeneous sample of 39 countries, using the data available in 2012, we need to transform qualitative information in quantitative variables.

For supervisory architectures, we use two indicators that evaluate the two first characteristics highlighted in the model: the central bank involvement in macro supervision; the central bank role as micro supervisor. On the one side, to measure the central bank involvement in supervision, we use the macro prudential index$^{19}$, indicating country by country the role of the central bank in the macro prudential framework. Figure 1 shows the distribution of the central bank involvement in macro supervision. On the other side, to build up the micro supervisory index we perform a two steps procedures.

We start from the Financial Supervision Herfindahl Hirschman (FSHH) Index. The FSHH is a measure of the level of consolidation of the supervisory powers that we derive by applying in this novel
field the classical index proposed by Herfindahl and Hirschman. The robustness of the application of the FSHH to analyse the degree of concentration of power in financial supervision depends on the following three hypotheses.

First of all, it must be possible to define both the geographical and institutional dimension of each supervisory market: therefore in each country (geographical dimension) we can identify different sectors to be supervised (institutional dimension). More precisely, in every country we identify three different sectors – banking, securities and insurance markets – and each financial sector is assumed to form a distinct perimeter for supervision. In our institutional perspective, the three sectors are equally important. It is evident that if we considered the economic dimension of each sector on top, we would have constructed a weighted index, using as weights the relative size, with all methodological and data availability caveat.

Secondly, in each sector we identify the distribution of the supervisory powers among different authorities – that is, if more than one agency is present – and consequently their shares. For each sector, the degree of supervisory consolidation falls with the number of authorities involved in supervision.

Thirdly, we consider the supervision power as a whole, that is given different kinds of supervisory activity – banking supervision, securities markets supervision, insurance supervision – we assume perfect substitutability among them in terms of supervisory power and/or supervisory skills. The supervisory power is a feature of each authority as agency, irrespective of where this supervisory power is exercised (agency dimension).

Therefore, in each country and for each authority, we can sum the share of the supervisory power it enjoys in one sector with the share it owns in another one (if any). For each authority, the degree of supervisory power increases, the greater the number of sectors over which that agency exercises monitoring responsibility. All three dimensions – geographical, institutional and agency – have both legal foundations and economic meaning.

We calculate the FSHH Index by summing up squares of the supervisory shares of all the regulators of a country. For each country, the FSHH Index is equal to:
\[
H = \sum_{i=1}^{n} s_i^2
\]

where \( s_i \) is the share of supervisory power of the authority \( i \) and \( n \) is the total number of authorities in a given country. For each authority \( i \), we consider that in each country there are three main sectors to supervise (each sector has the same importance) and that in each sector we can have more than one authority (each authority has the same importance). We use the following formula:

\[
s_i = \sum_{j=1}^{m} s_{ij}; \quad s_j = \frac{1}{m} \frac{1}{q_j}
\]

where \( m \) reflects the number of sectors where the authority \( i \) is present as supervisor and \( q \) is the number of authorities involved in supervision in each sector \( j \). In other words, if in one sector there is more than one authority, the supervisory power is equally divided among the incumbent supervisors.

Now the adopted methodology can be used to construct the index of central bank involvement in micro supervision: the Central Bank Supervisor Share (CBSS) Index. The intuition is quite simple: central bank involvement in supervision is likely to be at its maximum when the central bank is the unified supervisor in charge, while the involvement is likely to be low the smaller the number of sectors is where the central bank has supervisory responsibilities. The bottom line is that the more the central bank already acting as cross border micro supervisor, the smaller will be the risk that its involvement in insurance macro supervisor will produce negative spillover effects. To construct the CBSS index, we simply have to take the share of the central bank in each country – already calculated to build up the FSHH index - which can range from zero to one. Figure 2 presents the distribution of the central bank involvement as micro supervisor.

As proxy of central bank bureaucratic power, we use its independence. Acknowledging that \textit{de facto} independence can sometimes lead to a different framework from \textit{de jure} independence – particularly in emerging and developing countries\textsuperscript{22} –, we concentrate our analysis on the legal features of
independence. This choice is justified also by the fact that central bank independence cannot be assured without proper legal provisions\textsuperscript{23}, although we acknowledge that the measurement of institutional characteristics is inevitably linked to some degree of subjectivity. As for the choice of the proper index among those proposed in the literature\textsuperscript{24} to capture either the political or operational dimensions of CBI, we use the GMT Index\textsuperscript{25}, mainly for its empirical robustness\textsuperscript{26}.

**TABLE 9.1 CENTRAL BANKING INVOLVEMENT IN MACRO SUPERVISION, MICRO SUPERVISION AND CENTRAL BANK INDEPENDENCE**

<table>
<thead>
<tr>
<th></th>
<th>CBIMS</th>
<th>CBSS</th>
<th>GMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Percentage of countries above average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic Development</td>
<td>Average=0.61</td>
<td>Average=0.32</td>
<td>Average=0.68</td>
</tr>
<tr>
<td>Advanced</td>
<td>8.33</td>
<td>50.00</td>
<td>60.00</td>
</tr>
<tr>
<td>Emerging</td>
<td>18.75</td>
<td>50.00</td>
<td>50.00</td>
</tr>
<tr>
<td>Developing</td>
<td>72.73</td>
<td>90.91</td>
<td>42.86</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.

Table 9.1 provides some more descriptive information and seems to confirm our model predictions. In order to investigate some trends, we breakdown countries sample by economic development\textsuperscript{27}.

Some interesting patterns arise. First of all, the central bank involvement in macro supervision seems to be negatively correlated with the degree of economic development. In particular, column (a)
shows that developing and secondly emerging countries central banks are much more involved in macro prudential supervision than central bankers in advanced economies. According to our political economy model, two different, but not mutually exclusive explanations, can emerge: first, emerging and developing countries central banks are already more involved in micro supervision – meaning that the risk of negative spillovers in involving the central bank in macro prudential supervision is lower – than central bankers in advanced economies; second, in advanced countries the central bank independence is bigger, meaning that in those economies the bureaucratic overpower risk is greater and suggests the policymaker to implement lower levels of central banking involvement in macro prudential supervision. Table 9.1 shows that both effects seem to occur: emerging and developing countries are much more involved in micro supervision (column b) and have a lower degree of central bank independence (column c).

The following question could be: what is the single impact of each factor? Which of them is more relevant? By comparing advanced and emerging economies, we find that the main driver in allowing emerging countries to have greater CBIMS is the lower central bank independence, given that the micro supervision is the same across the two groups of countries. In other words, the fear to have a too powerful central bank seems to be the dominant factor. In opposition to this, developing countries seem to have a greater CBIMS than emerging economies because of much higher level of micro involvement, meaning that lower likely to face negative spillovers seems to be the main driver in explaining the differences in CBIMS between emerging and developing countries.

Finally, Figure 9.3 shows the distribution of the central bank independence. Putting together the three selected indexes (Figures 9.4 and 9.5), the descriptive associations seem to be consistent with our framework: the central bank involvement in macro supervision is positively associated with the central bank involvement in supervision and negatively associated with its bureaucratic powerfulness.

Anyway, we acknowledge that our results are not definitive and represent an introduction to further research.
5 Conclusion

In this paper, we studied the relationships between central banking, macro supervision and insurance. The review of the existing theoretical literature showed that so far the analysis overlooked the role of the political costs and benefits as well as the explicit consideration of the role of insurance in exploring the evolution of the macro prudential frameworks. We tried to fill the gap, proposing a simple political economy model.

Our theoretical model links the actual degree of central bank involvement in insurance macro supervision to two factors: the nature of the central bank as an outsider supervisor respect to the insurance sector; the powerfulness of the central bank as bureaucracy. Therefore the CBIMS is positively associated, at the same time, with higher level of expertise of the central bank as micro supervisor \textit{tout court} and with lower level of bureaucratic powers. A comparative description did not reject our results.

However, given the preliminary and partial state of our institutional analysis, it is too early at this stage to use our descriptive results to conclude that we have definitively found out consistent and robust indicators to capture the theoretical drivers that we studied in the theoretical analysis. Our findings can just form the basis for further research.
FIGURES

FIGURE 9.1 CENTRAL BANKS AS MACRO SUPERVISORS

FIGURE 9.2 CENTRAL BANKS AS MICRO SUPERVISORS
FIGURE 9.3 CENTRAL BANK INDEPENDENCE

FIGURE 9.4 CENTRAL BANKS AS MACRO AND MICRO SUPERVISOR
7 NOTES

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1 International Monetary Fund (2011).

2 Lim et al. (2011)., IMF (2011) and (2013).

3 Angelini, Neri and Panetta (2012) find similar outcomes.
As shown, see N’Diaye (2009), Kannan, Rabanal and Scott (2009), Lambertini, Mendicino and Punzi (2011), Beau, Clerc and Mojon (2011) and Angelini, Neri and Panetta (2012).

Angelini, Neri and Panetta (2012).

See Lambertini, Mendicino and Punzi (2011) and Angelini, Neri and Panetta (2012).

In the review of this branch of literature, we follow Cummins and Weiss (2013).

For more details on core and non-core insurance activities, see Cummins and Weiss (2013). Core activities include claims settlement, reinsurance, underwriting, reserving. Non-core activities count on asset lending, provision of financial guarantees, complex structured securities, CDS and other forms of short-run financing.

This result is somehow similar to Chen et al. (2012).

The framework has been introduced in Masciandaro (2009).


Gersbach (2011) claims that macro prudential supervision should be outside the central bank responsibilities, in order to avoid time inconsistency in pursuing the monetary policy goals.

Kawai and Morgan (2012).


Cordella and Pienknagura (2013).

See Masciandaro (2009).

For a voting model on the relationship between central bank involvement in micro supervision and its independence through redistributive effects, see Masciandaro and Passarelli (2014).
Lim et al. (2013). In our analysis the index is normalized to facilitate its use with other institutional indexes.

Hirschman (1964).

Masciandaro and Quintyn (2011).

Cukierman (2008).


For a survey see Ahsan et al. (2006).

The index was constructed by Grilli, Masciandaro and Tabellini (1991) and recently updated by Arnone et al. (2009).

Maslowska (2008).

Out of 39 economies, we have 12 advanced countries, 16 emerging economies and 11 developing nations. Note that for GMT Index there are some missing values. As a result, for that index we just obtain 31 countries, including ten advanced countries, 14 emerging economies and seven developing nations.

Among advanced countries, only New Zealand has a central bank involvement in macro prudential supervision greater than sample average.

According to the prevalent literature, the main reason is that in the 1990s most of emerging and developing countries faced deep financial crisis, that forced central banks to play a fundamental role in regulating banking industry.

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Architecture of Macroprudential Supervision in the EU - Regional Model

Andrew Mawdsley

1. Context

In the aftermath of the global financial crisis that erupted in 2008, an expert group under the chairmanship of Jacques de Larosiere, a former Banque de France Governor and International Monetary Fund (IMF) Managing Director, was mandated by the European Commission to advise on the future of financial regulation and supervision. In its report, the “de Larosiere Report” (2009), this group identified a range of weaknesses in the EU regulatory and supervisory structure that were laid bare by the crisis. A key finding was that financial supervisors were generally charged with the single objective of safeguarding the specific elements of the financial system within their remit. In short, their focus was on specific institutions or markets within their scope of responsibility. This micro-prudential supervisory approach was not focused on the health or stability of the system as a whole. There was to some extent a fallacy of composition whereby regulators and supervisors believed that by focusing on the health individual firms, systemic stability would be ensured. This approach of course ignored the externalities associated with some activities and how apparently rational behaviour on the part of the individual firm may collectively create unsustainable conditions in the market as a whole. In short, the system did not pay due attention to macro-prudential supervision and the maintenance of systemic stability.

The classic example that is often quoted in this context is the concentration of lending by banks to a given economic sector, e.g., commercial real estate. In this case, if the individual banks in question had adequate capital and provisioning buffers this would not raise significant concerns if only a few banks were concerned. If a greater proportion of banks were to lend extensively to the same sector then concentration risk would become an issue for the whole sector in terms of exposure to the risk of
a common shock. These common risk exposures or **systemic risks** were not properly identified and dealt with through macro-prudential supervision in the years running up to the crisis, with the result that **financial stability** was eventually lost.

Although the analysis of the causes and effects of the 2008 crisis focuses very much on banks and securities markets, the insurance sector was not spared scrutiny. The fact that an insurance-led financial conglomerate, AIG Inc., was one of the most high profile casualties of the crisis focused attention on the mechanisms by which insurers can have systemic importance and impact. In the case of AIG, its failure was precipitated by the failure of one of its non-insurance subsidiaries operating in the financial derivatives area and exacerbated by the network of intra-group transactions with company. Monoline insurers also featured in the analysis of the causes of the crisis and were also casualties. Their concentrated business model, focused as it was on providing bond guarantees for public and private bond issues, left them exposed to the underlying instability of the credit boom. In seeking to understand the significance of the insurance sector in contributing to systemic risk it is these “non-insurance, non-traditional” activities that were focused upon by bodies such as the G-20, Financial Stability Board and International Association of Insurance Supervisors. This analysis was not uncontroversial, with industry bodies and the Geneva Association arguing that the insurance sector is not as systemically important as assessed by the international institutions. Nevertheless, after the development and application of an identification methodology by the International Association of Insurance Supervisors (IAIS), the Financial Stability Board (FSB) designated a number of financial groups and firms as being globally systemically important. In the insurance space the designation method was based on identifying those activities that make insurers more systemically important, namely non-traditional, non-insurance activities. In total 9, insurance groups were designated by the FSB in 2013 as being Global Systemically Important Insurers (G-SII).

Notwithstanding the possibility for insurers to be sources of, or transmission channels for, systemic risks, they are also subject to the impacts of financial instability. Insurers are significant holders of financial assets to cover their technical reserves, with a strong bias towards fixed income investments
of various types, and smaller allocations to equities, real estate and other asset classes. As a result, they are open to experience shocks in common with the banking system and thereby add to the general propagation and impact of such shocks by virtue of how they react to them.

Taking account of this analysis it is unsurprising that not just banking, but insurance and financial markets more generally can be considered to fall within the purview of macroprudential policy. In the EU and the US for example, while the primary focus of macroprudential policy and supervision has been on banking, insurance and other sectors have also been included. We will see this clearly in the next section which deals with the EU institutional structure for macro-prudential supervision. This chapter focuses on the institutional model for macroprudential supervision of the insurance sector in the EU. As such, it touches on the interactions between macroprudential and microprudential supervision, as well as the interactions between competent authorities at EU and national level.

2. Macrorudential policy framework in EU

Macroprudential policy and, more specifically, the development of an appropriate organizing framework to exercise this policy became a focus for policymakers in the aftermath of the 2008 crisis - see Bank of England (2009), Galati & Moessner (2011) and IMF (2011) for examples. This work focused on both the objectives and design of macroprudential policy, but also on the institutional structures that would be required to operate such policy. In particular, the interactions with other policies and policy objectives were explored in considering possible institutional designs. In the EU, proposals for a new institutional structure were drawn up based on the de Larosière Report and a new overarching European supervisory structure commenced operation on 1 January 2011. This new framework sought to be encompassing and comprised two main pillars, namely micro prudential supervision covered by three European Supervisory Authorities (ESAs) and macro prudential supervision covered by the European Systemic Risk Board (ESRB). The new institutional framework is known as the European System of Financial Supervision (ESFS).
2.1 Microprudential supervision

The first pillar addressed micro prudential supervision and built upon the previously existing committees of European supervisors to develop a structure designed to improve coordination, and to ensure consistency and convergence in supervision. This resulted in the creation of three European Supervisory Authorities: the European Insurance and Occupational Pensions Authority (EIOPA), the European Banking Authority (EBA) and the European Securities Markets Authority (ESMA). These authorities focus respectively on the insurance, banking and securities and markets sectors. In order to facilitate cross-sectoral coordination a permanent body called the Joint Committee was created to bring these authorities together.

In addition to their responsibilities in terms of fostering consistency and convergence in regulation and supervision across the EU and on a cross-sectoral basis, the ESA’s have an explicit role in relation to:

- The identification of adverse developments that jeopardise the stability of the financial system and/or the integrity of the market in the EU;
- Facilitating coordination of, or coordinating, action by competent supervisory authorities to deal with such developments;
- Identifying and measuring systemic risk, as well as maintaining a standing capability. This latter responsibility being discharged in consultation with the ESRB; and
- Ensuring adequate follow-up to ESRB warnings and recommendations.

These responsibilities give the activities of the three European Supervisory Authorities (ESAs) a systemic focus and bring them into the sphere of influence of the ESRB, a topic that is explored later.

Table 10.1 - European System of Financial Supervision
In terms of institutional structure the ESAs are identical and comprise a Board of Supervisors made up of the heads of national micro prudential supervisory authorities. These are supplemented by observers from the European Commission and the ESRB, with senior staff from the ESAs also attending each other’s Boards as observers. This cross membership underpins coordination across sectors and with the ESRB.

**Source: Dierick et al (2012), Author**
In terms of scope for action and specific tools available to the ESAs for dealing with adverse developments and emergency situations, the primary reliance is on facilitation and coordination of actions taken by national competent authorities. As such, the ESAs act through the national authorities, who in turn sit in the decision making bodies of the ESAs (the Board of Supervisors). Other more formalised tools available include, in order of enforceability: the issuance of Opinions on specific topics, the issuance of Recommendations to National Competent Authorities (NCAs) in the wake of stress tests; the issuance of Technical Standards and Guidelines; and, in highly exceptional situations where national authorities have failed to act according to the law, the ESAs can act directly in relation to financial market providers. Enforceability varies across the tools from voluntary compliance by NCAs for Opinions, through to “comply or explain” mechanisms for Recommendations, and judicial enforcement for other instruments.

A more recent development has been the creation of the Single Supervisory Mechanism (SSM) for Eurozone banks as part of the European Central Bank. The SSM has been given explicit macroprudential supervision powers in specific cases set out in the SSM legislation. These powers relate to credit institutions and give the ECB scope to increase capital buffers where necessary. The SSM is not explored more fully here as its role is focused on banking sector and supervision of credit institutions.

2.2 Macro prudential supervision at EU level

Objectives and Purpose
The second pillar, addresses macro prudential supervision with the creation of a framework under the European Systemic Risk Board (ESRB). The primary purpose of the ESRB is to engage in macroprudential oversight in order to contribute to the prevention and mitigation of systemic risks to the EU’s financial system. In addition, the ESRB is charged with contributing to the smooth functioning of the internal market and ensuring that the financial sector contributes to economic
growth. In essence, it is charged with maintaining a stable financial system as an underpinning for economic activity, meaning that a core part of its mandate is to avoid the emergence of widespread financial distress.

The operational aspects of the ESRB are described in detail in Dierick, Lennartsdotter and del Favero (2012) and are summarised here. The core activities of the ESRB can be categorised in terms of:

**Risk monitoring**, information is gathered and analysed, for example through the use of financial stability indicators or early warning indicators. See ESRB (2013b);

**Risk assessment**, the most relevant risks are identified and prioritised by assessing the potential implications of their crystallisation using judgment and, where available, analytical techniques such as network analysis and stress testing; and

**Policy response** to the risk analysis, the ESRB may adopt warnings and recommendations. Examples of actual policy responses include the ESRB recommendations on lending in foreign currencies and funding of credit institutions published in 2011 and 2012 respectively.

As noted earlier, the ESRB does not have direct policy instruments that it can activate by itself, but has the power to issue warnings and/or recommendations to cause other entities to act to mitigate the risk of financial instability. The potential addressees of ESRB recommendations and warnings are the

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**Excerpt from EU Regulation 1092/2010 creating the ESRB**

“The ESRB shall be responsible for the macro-prudential oversight of the financial system within the Union in order to contribute to the prevention or mitigation of systemic risks to financial stability in the Union that arise from developments within the financial system and taking into account macroeconomic developments, so as to avoid periods of widespread financial distress. It shall contribute to the smooth functioning of the internal market and thereby ensure a sustainable contribution of the financial sector to economic growth.”

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ECB, the European Commission, the ESAs and National Competent Authorities. These warnings and recommendations can be public or private, in the latter case it being possible to target specific national authorities. Moreover, the possibility of having private warnings and recommendations allows the ESRB to act without fear of causing instability by virtue of its actions affecting the behaviour markets and financial market participants.

There are two fundamental differences between warnings and recommendations. Warnings are designed to raise the awareness of the addressees of the existence of a given risk or threat. They do not call for specific action and have no enforcement powers attached to them and, in essence, they rely on moral suasion. Recommendations, by contrast suggest a specific response from addressees to risks or threats that have been identified. In this case, addresses who can be competent authorities or financial market participants must comply or formally explain why they have not complied. As such, recommendations are not legally binding and rely primarily on the power of “naming and shaming” to be effective. In short, the ESRB acts by proxy and is reliant on the compliance and responsiveness of addressees to be effective.

For their part, the EU institutions to which the ESRB can address warnings and recommendations are required by their own statutes to address matters raised by the ESRB. In contrast, national supervisory authorities may not face this legal requirement to act.

Structures
In structural terms, the ESRB brings together both macroprudential and microprudential supervisors thereby capturing the interplay between macro and micro policy objectives and actions. The ESRB operates a committee system, supported by a central Secretariat, with the ESRB General Board as the key decision-making body. This is reflected in the composition of the General Board, which brings together the central bank governors and high-level representatives of the financial supervisory authorities of all EU Member States. Other members include the President and Vice-President of the European Central Bank (ECB), a member of the European Commission and the chairs of three ESAs.
The President of the Economic and Financial Committee (EFC) is also a member and represents the interests of ministries of finance. In terms of decision making, the General Board has 65 members, of which 37 are voting members mostly drawn from the central bank and ESA members. Decisions are adopted by majority voting, with each voting member having one vote.

The General Board is chaired by the President of the ECB and, given its large and diverse membership, its meetings are prepared by a smaller Steering Committee and the Secretariat. The ESRB also includes two advisory committees, the Advisory Technical Committee and the Advisory Scientific Committee. These committees provide advice to the General Board at the request of the Chair of the ESRB.

The Advisory Technical Committee (ATC) draws its membership from the authorities represented in the ESRB General Board, but at Head of Department level from financial stability and/or supervisory departments. The Advisory Scientific Committee (ASC) is a smaller body consisting mainly of independent academics with a research background in financial sector issues. The aim of the ASC is to open the work of the ESRB to perspectives beyond those of central bankers and supervisors, thereby adding to the quality of debate and analysis.
3. Macro prudential supervision at national level

In practical terms, the ESRB is supported by a dedicated Secretariat made up of financial stability experts from a range of backgrounds. The Secretariat provides risk assessment, policy advice and administrative support to the ESRB. Even though the ESRB and ECB are institutionally separate organisations, the ESRB is housed at the ECB and has the ability to draw on its financial stability experts for technical support.

Structures

Prior to the 2008 crisis, responsibility for macroprudential policy was typically not well defined or allocated to a specific institution in EU Member States. In most jurisdictions, no single authority had clear responsibility for maintaining the stability of the financial system as a whole. Rather, Finance
Ministries, Central Banks and National Supervisory Authorities each concerned themselves with specific elements of financial policy and supervision with limited coordination in terms of financial stability overall. Such coordination as existed in relation to financial stability focused primarily on the banking sector and financial markets, with limited focus on insurance matters. Over recent years this lacuna has been addressed across the globe with more specific allocation of responsibility for macroprudential policy being clearly allocated to specific national institutions. There is currently no international agreement on the optimal institutional structure for macroprudential supervision or exactly where to allocate responsibility for macroprudential supervision, save for agreement that there should be clear allocation and an institutional structure that allows macroprudential supervision to be carried out efficiently.

As outlined in IMF (2011) there are different models that could be applied. For example responsibility could be allocated to a single entity, such as a central bank, especially where this entity has responsibility for monetary policy and macro-prudential supervision. Alternatively, responsibility could be vested in a committee comprising relevant competent authorities but where the power to use specific instruments rests with an individual authority. In both cases, the question of coordinating between policy objectives arises with the first model internalising the challenge within a single entity and the second model requiring a coordination agreement to resolve potential institutional conflicts.

Equally, there is an ongoing debate as to where the perimeters of macroprudential supervision should lie. There is general agreement that a clear perimeter is required but where to draw it is moot and this is driven by the focus on banking that has been a feature of macroprudential analysis to date. Extension to other areas of the financial sector has focused on significance of the shadow banking system and the extent of interconnectedness within the financial system – see Bank of England (2009) and IMF (2011).

In the EU, the ESRB has developed a set of key features that would be expected in a national macroprudential framework and has expressed these in a Recommendation. It has used its recommendation
powers to ensure that each EU member state designates a macroprudential authority within its jurisdiction. In December 2011, the ESRB issued Recommendation ESRB/2011/3 on the macroprudential mandate of national authorities which comprised four key elements:

**Recommendation A on Objectives** recommending that Member States:

- specify the objective of macroprudential policy in terms of maintaining financial stability as a contributor to economic stability and growth;

- ensure that macro-prudential policies can be pursued at national level upon the initiative of the national macro-prudential authority, or as a follow-up to recommendations or warnings from the ESRB.

**Recommendation B on Institutions** recommending that Member States:

- designate a macroprudential authority in national legislation, with explicit powers to carry out macroprudential policy, respond to ESRB recommendations and coordinate with relevant authorities nationally and internationally

**Recommendation C on Powers, Tasks and Instruments** recommending that Member States:

- provide that national macroprudential authorities have clearly specified tasks and the necessary powers to discharge those tasks.

**Recommendation D on Transparency and Accountability** recommending that Member States:

- provide that macroprudential decisions and their decisions are made public, that the macroprudential authority be accountable to the national parliament and that the macroprudential authority is afforded legal protection.

**Recommendation E on Independence** recommending that Member States:
• ensure that the macroprudential authority, at a minimum, is operationally independent and that financing and resourcing arrangements do not compromise its independence.

Posch and Van der Molen (2012) explore the institutional structures that have been put in place across EU Member States. In terms of implementation, Member States were given a deadline of mid-2012 to indicate to the ESRB whether a macroprudential authority had been designated in line with the recommendation or when it is envisaged that such designation will be implemented. Member States have been making legislative changes to put in place the necessary institutional structures and powers. Some examples are set out in Table 2 to provide an overview of the types of structures that are possible and whether the mandate extends to insurance.

<table>
<thead>
<tr>
<th>Country</th>
<th>Institutional Form</th>
<th>Members</th>
<th>Instruments</th>
<th>Insurance Covered?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Financial Market Stability Board</td>
<td>Ministry of Finance, Fiscal Advisory Council, OeNB, FMA</td>
<td>Recommendations that can be issued to the FMA</td>
<td>Yes</td>
</tr>
<tr>
<td>Belgium</td>
<td>Central Bank has responsibility for macro and micro prudential supervision</td>
<td>NBB – central bank and integrated supervisor</td>
<td>Powers to oppose decisions of firms that threaten financial stability</td>
<td>Yes</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Financial Stability Committee</td>
<td>DNB, AFM</td>
<td>Recommendations to DNB and AFM to take action for</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Two broad types of institutional model have emerged, with a significant number of jurisdictions opting to create national “financial stability councils” of various forms. In some cases they are standalone organisations, while in others they are vested within an existing institution such as the central bank. The other model places macroprudential policy responsibility with a single institution, such as the central bank. This works best where the central bank is also an integrated supervisor and so internalises any coordination problems.

Where council type models are utilised, then central banks and supervisory authorities, both prudential and conduct of business where relevant, are always included. Membership may also extend

| UK       | Financial Policy Committee (integral part of the Bank of England) | Bank of England, Prudential Regulation Authority, Financial Conduct Authority | Recommendations to PRA and/or FCA Directions to PRA and/or FCA to deploy specific macroprudential tools prescribed by Treasury and approved by Parliament | Yes |

*Source: Liebig and Trachte (2013), Tucker (2013), Financial Stability Committee Netherlands, Posch and Van der Molen (2012)*

Two broad types of institutional model have emerged, with a significant number of jurisdictions opting to create national “financial stability councils” of various forms. In some cases they are standalone organisations, while in others they are vested within an existing institution such as the central bank. The other model places macroprudential policy responsibility with a single institution, such as the central bank. This works best where the central bank is also an integrated supervisor and so internalises any coordination problems.

Where council type models are utilised, then central banks and supervisory authorities, both prudential and conduct of business where relevant, are always included. Membership may also extend
to Ministries of Finance, but their participation varies across national models. For example, in one case the Ministry of Finance has the power to prescribe specific macroprudential instruments for use.

Insurance is typically included within the ambit of the macroprudential authority, since the scope usually extends to whole financial system. In some cases, the mandate also explicitly requires that interconnectedness and contagion within the financial system be addressed by the macroprudential authority.

In terms of instruments, where financial stability councils are used they are often given powers to issue recommendations to national supervisory authorities to address identified risks and mirrors the powers allocated to the ESRB. In one case, the power for the financial stability council to issue directions to the supervisory authorities is provided for. This structure neatly internalises coordination of the use of instruments for micro and macro purposes within the supervisory authority removing the issue of inter-authority coordination. It remains, however, that decisions on macro and micro policy coordination still have to be made.

**Tools**

At the same time that Member States have been working on the development of legislation to designate or create macroprudential authorities, the ESRB has been working on the development of a framework for the identification, calibration and use of macroprudential instruments. This work culminated in the publication of Recommendation ESRB/2013/1 on intermediate objectives and instruments of macroprudential policy. In addition to following up on Recommendation ESRB/2011/3, the later recommendation was complementary to the requirements of the then newly updated frameworks for banking supervision (namely CRD IV and CRR). As a result, the recommendation has a primarily banking focus, although this may to some extent reflect the comparative ease with which banking related macroprudential instruments can be identified, which has not proved to be so straightforward in the case of insurance. This recommendation sets out an
organising structure encompassing a full framework from ultimate objectives through to macroprudential instruments. This organising structure is set out in Diagram 2.

**Figure 10.2 – Macroprudential Objectives and Instruments**

- **Ultimate Macroprudential Objective**
  - Recommendation ESRB/2013/3
  - Financial Stability
  - Mitigation of systemic risk

- **Intermediate Macroprudential Objective**
  - Should support achievement of the ultimate objective
  - Suggestions are provided, e.g. limiting credit growth
  - Intermediate objectives should be kept under

- **Macroprudential Instruments**
  - Calibrated to Intermediate Objectives
  - E.g. LTV Ratio limits

*Source: ESRB (2013b), Author*

Recommendation ESRB/2013/1 highlights a crucial fact about macroprudential policy instruments, namely that in many cases they are microprudential instruments that are calibrated to achieve macroprudential objectives. A classic example of this is the use of Loan to Value ratio rules in order to achieve the intermediate objective of limiting credit growth and the build-up of excessive leverage across the system at large and the economy. Equally, microprudential supervisors also utilise LTV ratio rules as a means of ensuring that credit risk is managed appropriately at bank level and that credit underwriting standards are maintained. This usefully demonstrates the fact that macroprudential
policy sits at the intersection of macroeconomic policy and microeconomic policy. This overlap of activities and use of common instruments presents a significant coordination challenge to ensure that financial market participants do not face conflicting signals from supervisory and macroprudential authorities, as well as avoiding a clash of policy objectives. These and other coordination issues are explored in the next section.

4. Macroprudential Instruments and Co-ordination Challenges

A consistent thread in the literature on macroprudential supervision is the potential for policy conflicts to arise, in terms of the common instruments that can be utilized to achieve both microprudential and macroprudential objectives. This generates a coordination challenge for the competent authorities concerned, where some means of achieving agreement on the use of tools is required. Schoenmaker and Wierts (2011) make a strong point that this requires a clear hierarchy of policy objectives to be set out and they propose that macroprudential concerns should take precedence.

In the EU, the institutional structures that have been put in place provide a means of dealing with the coordination problems by virtue of their design and membership. Looking specifically at insurance, there are three key areas in which coordination challenges could arise in relation to the operation of macroprudential policy in the EU. Two are common operational challenges that arise in the context of macroprudential policy overall, while the third relates to the identification of insurance within the organizing framework developed by the ESRB for the identification and selection of macroprudential instruments. These issues are discussed in turn below.

“Acting by proxy”

As currently configured the EU system of macroprudential supervision comprises an EU-level authority, in the form of the ESRB, and a set of national authorities, as proposed in Recommendation ESRB/2011/3. The national macroprudential authorities have the right of independent action in a national context, as well being required to respond to ESRB recommendations. In addition, EIOPA is
required by regulation to consider the appropriate action to take in response to a warning or recommendation addressed to it by the ESRB.

This framework generates three coordination problems in the form of:

- Scope for some national authorities to comply with an ESRB Recommendation, whereas others could choose to “explain” their non-compliance. In practical terms there is scope for partial or inconsistent application of EU-wide macroprudential policies, with all that entails in terms of cross-border competition and arbitrage;

- Scope for national authorities to take a differentiated approach to a given intermediate macroprudential objective across national authorities and with reference to the ESRB. Again, this creates the potential for inconsistent application of EU-wide macroprudential policies, with all that entails in terms of cross-border competition and arbitrage; and

- Scope for EIOPA to respond in a different way again to a warning or recommendation by issuing warnings or recommendations of its own.

This risk is mitigated to a large extent by the institutional make-up of the ESRB, where the national entities with responsibility for macroprudential supervision are members of the ESRB General Board (main decision making body), along with other competent authorities including EIOPA. The notable exception to this is Finance Ministries, who are not individually represented in the ESRB, but who may be part of Financial Stability Councils in a number of EU jurisdictions. The presence of other Financial Stability Council members in the ESRB provides a counterbalance to this and allows the views of those Financial Stability Councils to be brought to bear on ESRB discussions and decision-making.

This institutional set-up is complemented by the ESRB’s ability to pursue a formalized comply or explain procedure in relation to recommendations. Such a procedure can be specified to capture
whether a recommendation has achieved its goals and the extent to which it may affect other policy objectives.

Although the ESRB does not have the power to take policy measures directly to deal with macroprudential risks and must act by proxy through the addressees of its Recommendations, there are mechanisms in place to ensure that all policy positions are brought into consideration and that scope for inconsistency of action across the EU is limited.

“Two hands on the wheel”

The organizing framework for macroprudential supervision set out in an ESRB Recommendation, ESRB (2011a), highlights a coordination problem between macro and micro prudential supervision. As might be expected, the framework focuses on the identification of intermediate objectives whose achievement supports the achievement of the ultimate objective of macroprudential policy. As this stage, the intermediate objectives identified by the ESRB have focused on the banking-related failures and weaknesses highlighted by the 2008 crisis and focus on mitigating risks identified in the analysis such as:

- to mitigate and prevent excessive credit growth and leverage;
- to mitigate and prevent excessive maturity mismatch and market illiquidity;
- to limit direct and indirect exposure concentrations;
- to limit the systemic impact of misaligned incentives with a view to reducing moral hazard; and
- to strengthen the resilience of financial infrastructures.

Taking the first objective as an example, the ESRB Recommendation identifies a number of possible instruments:
- Counter-cyclical capital buffer
- Macro-prudential leverage ratio
- Sectoral capital requirements (including intra-financial system)
- Loan-to-value requirements (LTV)
- Loan-to-income/debt (service)-to-income requirements (LTI)

In the case of the last three instruments, these are requirements that could be used for both micro prudential and macro prudential purposes. In the case of the former, microprudential supervisors could use such requirements in order to achieve their goals in terms of ensuring that credit risk is properly managed and that underwriting standards are maintained at appropriate levels. In addition, such limits may also serve to ensure that consumer protection goals are met by limiting the extent to which borrowers may expose themselves financially. The limits would be calibrated to match prudential supervision and/or consumer protection goals. Moreover, different jurisdictions have traditionally taken different philosophically approaches to regulation with more or less inclination to impose such requirements and different appetites in terms of how much to control the behaviour of financial market participants and/or consumers.

The use of these instruments for prudential supervision or consumer protection complicates their use for macroprudential purposes in terms the appropriate calibration and uniformity across EU jurisdictions. It is not inconceivable that requirements could be put in place at local level, with further slightly different requirements being put in place at EU level. This raises the simple question of which policy objective, national or EU, macro or micro, takes precedence?

Again, the presence of national supervisory authorities in the ESRB General Board allows a broad range of opinions and perspectives to be brought to bear on the ESRB’s decision making, thereby providing a means of limiting the impact of policy competition. Moreover, the ESRB has at its
disposal a very wide pool of expertise on which to draw in developing recommendations in relation to macroprudential instruments to ensure that that are calibrated in an optimal way. There is also a standing arrangement for national supervisory authorities to inform the ESRB when they take macroprudential actions, again this provides for coordination of action.

5. Macroprudential Significance of Insurance

A continual challenge in designing and calibrating macroprudential instruments to deal with insurance, lies in the analysis of the systemic importance of (re)insurance and the extent to which it is relevant for the intermediate objectives of macroprudential policy as outlined by the ESRB.

Traditionally, concepts like financial stability, systemic risk and macroprudential policy have been viewed through the lens of banking based analysis. This reflected the fact that the banking sector has so often been the source and propagator of instability in the wider financial and economic systems. More often than not the analysis has focused on credit risk and the existence of key nodes in the financial network that are banks or bank related. The analysis of the recent crisis has highlighted a number of areas where the (re)insurance sector could be identified as being, at least, involved in the propagation of risks within the financial system or supporting the build-up of large risk concentrations. This is the analysis underlying the FSB and IAIS identification of Globally Systemically Important Insurers (GSII), which is based on the measurement of a number of key factors that represent the systemic importance of insurers. These factors are set out in the following excerpt from IAIS (2013b):

“Size: The importance of a single component for the working of the financial system generally increases with the amount of financial services that the component provides. It should be recognised, however, that in an insurance context size is a prerequisite for the effective pooling and diversification of risks.”
Global Activity: The methodology is aimed at identifying components of the financial system whose failure can have large negative externalities on a global scale.

Interconnectedness: Systemic risk can arise through direct and indirect inter-linkages between the components of the financial system so that individual failure or distress has repercussions around the financial system, leading to a reduction in the aggregate amount of services.

Non-traditional and non-insurance activities: As described in Insurance and Financial Stability, non-traditional insurance activities and non-insurance financial activities are potential drivers of the systemic importance of insurers and thus have the greatest impact upon failure.

Substitutability: The systemic importance of a single component increases in cases where it is difficult for the components of the system to provide the same or similar services in the event of failure.

The factor denoted as Non-Traditional Non-Insurance (NTNI) activity captures the type of activities by insurers that could support the build-up of excessive leverage in the economy or would support long chains of intermediation. Some of these activities were highlighted in the analysis of shadow banking initiated by the Financial Stability Board and in practical terms would include activities like bond insurance. The Non-Insurance activities are exactly that and reflect the problems that arose at AIG in the US, where the group’s financial derivatives business was sufficiently large to make AIG a significant node in the US financial system.

It is recognized on the whole, however, that core insurance activity does not represent a prime propagation mechanism for systemic risk in terms of building up excessive leverage in the economy, generating long chains of intermediation or acting as a nodal intermediary in the financial system. Rather, the insurance sector is seen as more likely to feel the impact of problems elsewhere in the financial system rather than to be a source of such problems or a propagation channel. In fact, there are situations where the sector could serve as a stabilizing force within financial markets.
If this analysis is accepted then the challenges in mapping the intermediate objectives in the ESRB framework to sector-wide instruments for the insurance sector are obvious. Taking the intermediate objective “to mitigate and prevent excessive credit growth and leverage” as an example would require that the precise contribution of the insurance sector to promoting excessive credit growth and leverage be well understood in order to calibrate a sector-wide measure. For example, measures could be conceived in terms of broad underwriting rules to be applied to bond underwriting or else in terms of measures to limit the available insurance capacity as a means to limit the amount of bonds that could be underwritten. Regardless, these are non-trivial decisions for which robust empirical evidence and analysis will be required to properly calibrate any prospective macroprudential instruments so as to be effective. At present, this level of analysis is some distance off when viewed in the light of the literature on the systemic significance on insurance, IAIS (2011) and Geneva Association (2010).

6. Conclusion and Summary

Over the course of the last three years the institutional structures for macroprudential supervision of insurance have undergone significant development. Notwithstanding that authorities’ understanding of the systemic significance of the insurance sector continues to develop, the analysis to date has allowed the designation of nine GSIIIs on the basis of a set of factors describing their systemic significance.

In the EU, a two-tier structure for macroprudential supervision has been put in place with the creation of a pan-EU body in the form of the ESRB alongside national macroprudential authorities. The framework is still being constructed but its primary features can be characterized as follows:

- Two-tier, EU and national structure;
- National authorities have statutory powers to act, while the ESRB can only act through other competent authorities;
ESRB has developed a clear, implementable operating framework setting out intermediate objectives for macroprudential policy that can be directly mapped to policy instruments;

ESRB has a wide membership comprising national supervisory authorities and central banks, so that its decisions should be representative and implementable across jurisdictions; and

There are mechanisms in place to ensure that there is robust follow-up on recommendations which generate an incentive for consistent action.

The structure does give rise to coordination challenges across the EU, both in terms of even application of EU policy recommendations and consistent policy stances across national authorities. As a coordinating mechanism, the wide membership of the ESRB should serve as means to achieve a high degree of consistency and to address coordination challenges. This, however, will only be truly tested when difficult decisions need to be taken to rein in financial activity that is supporting buoyant economic activity.

79 The views expressed are those of the author and should not be taken to reflect those of EIOPA. The author would like to thank Patrick Hoedjes and Dimitris Zafeiris for their comments on the paper. Any errors are the responsibility of the author.
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Chapter 11

G-SIIIs and the Framework for Macro-Prudential Supervision: Strengthening G-SIIIs and Reducing the Systemic Risks They Pose

Paul Sharma

Introduction

This chapter focuses on the framework for globally systemically-important insurers (G-SII) including how they are identified and the policy measures to be applied to them. This framework is a new, and deeply controversial, concept that has arisen in the context of the response of governments, central banks and financial and insurance regulators to the financial crisis. It forms part of the equally-new, and no less controversial, wider framework for globally systemically important financial institutions (SIFI) whether bank, insurance or non-bank. The effect of the SIFI framework is to put in place a regulatory regime for some banks, insurers and non-bank financial firms that is both different and
more onerous than that which is in place for other banks, insurers or non-bank financial firms. The idea which underlies the framework is that the harm to public policy objectives which follows if a SIFI fails is not simply larger in scale, but otherwise comparable with, the harm that follows when a non-SIFI fails: it is a different kind of harm that is more dangerous in its extent and more serious and pervasive in its consequences, and therefore requiring a different kind of public policy response. Without that public policy response SIFIs are said to be too big, too complex and too interconnected to be allowed to fail.

Too big, too complex and too interconnected to fail

The 2007 - 2012 global financial crisis – and especially the 2008 failure of Lehman Brothers – focused attention on financial institutions whose failure would seriously disrupt the stability of a national, or even the global, financial system. This is the so-called “too big to fail” problem, which perhaps would be better described as the “too-big, too-complex and too-interconnected to fail” problem. The consequences of the Lehman failure flowed not only to those who had a direct relationship with it – shareholders, customers and counterparties – but more widely to the financial systems of the nations in which it had significant activities and thence to the global financial system, and then in turn to the global real economy. Direct loss arose when Lehman Brothers, due to its insolvency, failed to perform on its contractual promises to customers and counterparties, and disappointed the expectations of its shareholders. Indirect loss arose due to the contagious loss of confidence that the Lehman Brothers failure occasioned. That loss of confidence caused shareholders, customers and counterparties of other financial institutions (even if those institutions had no significant connection to Lehman Brothers) to change their behaviour to become more risk averse. This in turn – especially for banks reliant on short-term funding that was withdrawn – caused widespread loss and, but for state-funded bailouts, would have caused numerous bank failures. Lehman Brothers was too big, too complex and too interconnected – too systemically important – safely to be allowed to fail.

Other financial institutions who were no less systemically important also came to the point of failure – both before and after the Lehman Brothers failure – but were saved by government-sourced new capital or guarantees. This largely, although not fully, obviated indirect loss, but it also largely
obviated direct loss to customers – even non-retail customers – and to counterparties, and sometimes even reduced loss to shareholders. This gave rise to the political and economic problem that those who had benefited from a systemically-important financial institution’s (SIFI’s) risk taking during good times were being protected from those same risks during bad times. The political critique was that SIFIs were “privatising profits but socialising losses”. The economic (moral hazard) critique was that those non-retail customers, counterparties and shareholders lessen their scrutiny of risk-taking by the SIFIs with whom they have dealings, and favour dealings with SIFIs rather than non-SIFIs.

In 2009, addressing the economic and political critiques of SIFIs, the Heads of Government of the Group of Twenty, major advanced and emerging economies (G20) called on the Financial Stability Board (FSB) to take action, specifically on resolution, intensive supervision and additional capital liquidity and other prudential requirements. Their motivation appeared to be to mitigate the disruption of SIFI failures, to reduce the moral hazard, and to set prudential requirements for SIFIs commensurate with the costs of their failure.

In response to the G20 request the FSB created three work streams respectively for bank SIFIs (SIBs), for insurance SIFIs (SIIs) and for non-bank, non-insurance SIFIs (NBI SIFIs). The FSB whilst reserving to itself final decision-taking mandated the Basel Committee on Banking Supervision (BCBS) to carry out the work on SIBs and the International Association of Insurance Supervisors (IAIS) to carry out the work on SIIs. The FSB itself is directly undertaking the NBI work, but assisted by the International Organisation of Securities Commissioners (IOSCO). For each work stream a distinction is drawn between those financial institutions whose systemic importance has global reach, G-SIFIs (G-SIBs, G-SIIs and NBI G-SIFIs) and those who are systemically important to their home nation or a host nation in which they have business activities, (Domestic) D-SIFIs. A financial institution may be a G-SIFI and also a D-SIFI for one or more nations. However there are many more D-SIFIs who are not G-SIFIs. The aim of the work streams was to create policy frameworks for G-SIFIs comprising, (1) a published methodology for their identification, (2) annual publication by the FSB of lists of G-SIFIs, and (3) publication of the policy measures (resolution, supervision, prudential etc.) that are to be applied by national supervisors to those G-SIFIs. For D-
SIFIs the intention was only to provide a broad policy framework which national supervisors would then implement.

The three work streams have not proceeded at the same pace. Work on SIBs is most advanced, with that on SIIs next and that on NBNI SIFIs least advanced. The FSB published its first list of G-SIBs in 2011\(^3\), and then revised lists in 2012 and 2013. In November 2011 the BCBS published the methodology for identifying G-SIBs and the policy measures to be applied to them\(^4\). The first list of G-SIIs, the methodology and the policy measures were published in 2013 – see below for a fuller descriptions.\(^5\) The NBNI work stream has not yet published either a list or policy measures. Only a draft assessment methodology that is still subject to consultation has been published\(^6\). Relative to the G-SIB work, more time was needed for the G-SII work and for the NBNI G-SIFI work due to the greater geographical and product diversity within each of these sectors and to the more controversial nature of the question of the extent of the systemic relevance within these sectors. It is to this controversy in respect of the insurance sector which we now turn.

**The policy rationale for identifying G-SIIs**

In order to lay the ground work for discussion of this subject it is necessary first to consider two preliminary questions.

1. How does action in respect of systemic firms fit into the wider context of action to reduce risks of instability in the financial services system?

2. How, if at all, might insurance activities or the non-insurance activities of insurance groups pose risks of instability?

Both questions are deeply controversial, and especially the second question.

**How does action in respect of systemic firms fit into the wider context of action to reduce risks of instability in the financial services system?**

The essence of this first question is to what extent, if at all, do we need particular policy measures that apply to only some financial firms on account of their size, complexity and interconnectedness? Prior
to the global financial crisis regulatory standards tended to apply either to all, or nearly all, firms within the same financial services sector, or sometimes, especially for global standards, to all internationally-active firms. These generic standards therefore achieved (at least the appearance of) a level playing field within each sector or market.

Actually there is a very plausible argument that this was more appearance than reality, and that the generic standards whilst in a formal sense being the same for small and simple financial institutions as for large and complex financial institutions in fact tended to penalise the former and favour the latter. The generic standards typically allowed financial institutions to make a trade-off between prudence and accuracy. Financial institutions were typically given some degree of choice as to how to calculate the amount and adequacy of their capital, liquidity and other financial resources. Small financial institutions tended to use calculation methods that required less granular data and were computationally simpler, but were required to calibrate these methods more prudently. Large financial institutions tended to use calculation methods that due to their computational complexity and their intense use of data were thought to be more accurate, and were allowed to apply a less rigorous standard of prudence. For example they might be allowed to claim credit for a diversification benefit calculated using these computationally-complex and data-intensive methods. Sometimes these computationally-complex and data-intensive methods were called internal models (e.g. VaR or IRB models in banking) and sometimes they were not (e.g. IBNR calculations for liability insurance or option-pricing models for life insurance). Some of these methods did indeed achieve greater accuracy, but many did not. Even where they did, and especially where they did not, this approach tended to tilt the competitive playing field toward the large, complex, interconnected firms, and so towards the SIFIs.

The response to the global financial crisis has seen ongoing efforts to raise, recalibrate and widen these generic standards. Within banking we have seen both Basel 3 (an overall raising of standards and also a recalibration of the relative prudence of internal models as compared to non-modelled approaches) and action on shadow banking (a widening of standards). Within insurance we are seeing the ComFrame initiative.
However in addition to this generic action, specific additional standards are being set for particular firms that have been identified as systemically important. The policy rationale for this action rests on three (controversial) steps.

1. Some species of the financial services are vitally important to the real economy activity, either directly (such as credit provision) or indirectly (such as the inter-bank lending market) as disruption would in turn disrupt an activity that is vital to the real economy (e.g. credit provision by banks).

2. For at least some of those important financial services a sudden or unexpected contraction of supply by some providers could not easily be substituted by other (existing or new-entrant) suppliers. For example this might be because supply relies on private information about, or established relationships with, customers or because there are significant technological or regulatory delays or costs both to new entrants and to existing firms expanding rapidly.

3. Sudden or unexpected contractions of supply may occur for an idiosyncratic firm-specific reason. A concentration of such activity within a single financial group therefore presents an additional risk of a large sudden or unexpected withdrawal of supply over and above the risk that would be present if that supply were spread across multiple unrelated groups.

All three steps suggest possible generic policy measures as a response. At step 1, for example, one might argue for a greater diversity of financial services provision (e.g. credit supply from a range of different types of financial intermediaries and via financial disintermediation), and for reduced interconnectedness within the financial system. And, for example, at step 2 one might argue for ways of making the supply of financial services less reliant on private information or relationships, and of making that private information or those relationships transferable. One might also argue for reduction in regulatory barriers to new entrants and to expansion. The question which then remains is whether these generic policy measures alone are a sufficient response, or whether additional measures are needed for those financial groups which have a concentrated idiosyncratic risk.
Even for typical banking activities such as maturity transformation and credit intermediation, governments, central banks, regulators, regulated firms and academics across the world have debated the extent to which the logic of steps 1 to 3 above apply, the sufficiency of generic policy measures alone as a remedy, and the possible adverse consequences of additional measures only for some firms. For banks some degree of consensus has now been reached in the standards issued by the Basel Committee of Banking Supervision for globally and domestically systemic banks, and in the annual publication of lists of globally-systemic banks by the Financial Stability Board. For insurance the debate has been even more intense.

**How, if at all, might insurance activities or the non-insurance activities of insurance groups pose risks of instability?**

Few commentators have doubted that insurance is important to the functioning of the real economy (step 1). There is debate as to the extent to which insurance, and especially reinsurance, is substitutable (step 2). And there is even more intense debate as to the balance of advantage and disadvantage in identifying specific firms as systemically important and applying additional policy measures to them.

Insurance performs two main economic functions: protection (allowing the pooling and diversification of property, casualty and demographic risks), and savings (transforming savings into investments). Other (i.e. non-insurance) financial intermediaries also transform savings into investments, but insurance performs this transformation in a way that is not typical for other financial intermediaries. All financial intermediaries transform one type of promise they receive from their investments into a different type of promise they give to their investors, and in so doing accept a mismatch between their assets and their liabilities. Banks typically do this by giving promises of short-term liquidity to their depositors, but investing by advancing long-duration loans. Life insurance companies typically do this by giving long-duration performance promises to their policyholders, which (due to insufficiently available, sufficiently long-duration investments) they match with shorter duration investments. Both the protection and long-term savings roles of insurance are important to the functioning of the real economy, but as the three step argument set out above makes clear, that does not necessarily
mean that any particular firm carrying out those functions is systemically important. At the level of
the global financial system, and global real economy, both the insurance industry and the insurance
regulators agree that direct protection insurance is readily substitutable, with any delay or hiatus in the
substitution unlikely to have a significant effect on the global real economy. The insurance industry is
also strongly of the view that this applies also to protection reinsurance, but the insurance regulators
have yet to form a consensus view on this.

Insurance regulators (in the International Association of Insurance Supervisors) also argue that at least
at the global level “traditional” insurance in its savings role is substitutable. That is any delay or
hiatus in the substitution would be unlikely to have a significant effect on the global real economy. 8
The label “traditional” (which perhaps is a bit of a misnomer) was intended to signal that the extent of
promise-transformation that occurs is crucial to the judgement that the activity is substitutable. Life
insurance companies typically give long-duration performance promises to their policyholders.
Promise transformation occurs because the promises that are given to policyholders go beyond those
that are capable of being immediately matched with a buy-and-hold portfolio of investments.
Typically – and “traditionally” – the promise to the policyholders is of longer duration than that
received from the investments.
The IAIS has identified two main examples in which the savings promise given to policyholders may
become non-traditional. Both examples involve the insurer simultaneously giving the same
policyholder the better of two promises.

1. The first example occurs where an insurer gives a long-term performance promise, but also a
   short-term liquidity promise. That is the policyholder may have the right to withdraw his or
   her investment with no or low penalty and with no or only a short notice period.

2. The second example occurs where an insurer gives a long-term performance promise that is
   the better of (i) the actual performance of the assets invested to match the notional value of
   the policy, and (ii) a strong nominal performance promise. What is being aimed at here are a
   combination of promises that give the policyholder the economic equivalent of owning a
   basket of investments, plus holding a long-duration put option on that basket of investments.
Here the promise becomes even more exotic – and therefore further away from the “traditional” – where the policyholder has some discretion over the choice of investments in the basket.

The IAIS argue that steps 1 to 3 of the argument presented above potentially apply to such “non-traditional” insurance business. For the first type of double-promise (a long-term performance promise combined with a short-term liquidity promise) the argument is that this is maturity transformation, and therefore a form of shadow banking. Maturity transformation by banks – and therefore it is argued by shadow banks – is economically important, non-substitutable (at least in a financial crisis), and where such activity is concentrated in a particular banking or shadow banking group prone to supply interruptions due to the idiosyncratic failure of that group. Further, experience from the (admittedly non-insurance) shadow banking sectors during the crisis was that maturity transformation undertaken by shadow banking groups, which typically do not have access to the ordinary liquidity operations of central banks, was more prone to sudden disruption in the continuity of supply than maturity transformation from banks. The insurance industry’s counter-argument to this is twofold. First, the industry argues that such apparent maturity-transformation in life insurance products is not economically important. Policyholders do not see their life insurance policies as a source of liquidity, and therefore if they were suddenly to find that they could not as promised withdraw their funds (either immediately or in the short term) this would not be an economically important liquidity shock in the way that depositors suddenly finding their deposits were illiquid would be. Second the insurance industry argues that during times of stress policyholder proneness to withdraw funds is far less apparent than depositor proneness to withdraw deposits. Therefore maturity transformation in life insurance is less real than it might at first appear. Insurance regulators would not disagree with these arguments, but see them as going to the issue of where to draw the boundary between “traditional” and “non-traditional” – which they admit still needs further work – than being knock-out arguments against the need to have such a boundary.
The second type of double-promise occurs where a life insurance policy in effect gives a policyholder “ownership” – and possibly even partial control of – a basket of investments with a long-duration put-option on the basket. The insurer typically seeks dynamically to hedge this long-duration put-option promise it has given to the policyholder by holding and rolling over shorter duration equity puts or swaps it has purchased either on-market or off-market from financial firms. Arguably this activity is both important and fragile for two main reasons. Firstly it enables policyholders to invest in equities with only limited downside, and therefore motivates more such investment than might otherwise occur. However during periods of equity market falls, and especially of high equity market volatility, the cost of the short term hedges increases. This encourages the insurer to reduce the quantity of equities held in the policyholder’s basket, and so making the holding of equities potentially procyclical. Secondly the use of hedging derivatives potentially makes the insurer an important participant in the equity-derivatives markets. The argument here distinguishes between end-users and intermediaries in the derivatives markets. An intermediary typically holds only a small net position as compared to its gross notional positions, which often typically comprises of residual basis risk when matching similar but not identical derivatives positions. If the intermediary is removed from the market its counterparties still have the economic need to match their trades with each other, and this (arguably) will motivate another intermediary to step into the space vacated to enable this to happen. It is far less clear that the sudden exit of an end-user would be substituted by the entry of a new end-user. Here the insurer is an end-user, and although its usage might appear very small when compared to the aggregate gross notional volume of the equity-derivatives market, that aggregate number consists near entirely of intra-financial system trades between two financial intermediaries. The insurer potentially is the source of a far more significant proportion of the end-user trades within the market.

Some, but not all, forms of variable annuity products in the USA and elsewhere fall within this second type of “non-traditional” double-promise, as do some, but not all, forms of unit-linked products with strong performance guarantees in the EU elsewhere. Here also insurance regulators will admit that
more work is needed on the definition of where the boundary between “non-traditional” and “traditional” should be set.

In addition to the question of the systemic relevance of any “non-traditional” insurance activities, there is the question of the systemic relevance of the non-insurance financial activities carried on within insurance groups. An insurance group typically includes both at least one licenced insurer and also companies that are not insurers. A licensed insurer typically is prohibited by its local regulator from undertaking any financial activity that is not closely related to its insurance business. However (depending on local rules) that might still leave significant scope for activities such as stock lending and borrowing, repo and reverse repo transactions, and transacting on and off-market derivative currency, interest risk and equity risk derivative contracts either to hedge risk on other investments or even to assume investment risk to help match promises of investment return given to policyholders. An entity within an insurance group that is not itself a licenced insurer typically will have even greater freedom to engage in non-insurance financial activities including, for example, active derivatives market-making and position taking. In assessing the potential systemic relevance of non-insurance financial activities insurance regulators typically follow the lead of the banking regulators, and focus on activities such as maturity transformation, leveraged credit provision and speculative (non-hedging) or market-making derivative activities.

**How are G-SIIs identified?**

The decision as to whom to designate as a G-SIIs is taken by the FSB and by the relevant national regulators, but this decision is informed by the analysis carried out by the IAIS. The first such decision was taken in July 2013, and will thereafter be repeated annually in the future with the possibility of insurance groups being added to or removed from the list of G-SIIs.9

There are three stages to the IAIS analysis.10 First, based on public information, an initial population of insurance groups for further consideration is identified. Second confidential data is requested via the relevant national regulators from those insurance groups, and on the basis of that information a
sub-set of the original population is identified. Third, there are confidential bilateral (IAIS working group and national regulator) and trilateral (IAIS working group, national regulator and senior management of the insurance group) conversations for each insurance group in that sub-set. In the 2012 / 13 analysis the initial population was about 50 insurance groups, which was then reduced to a sub-set of about 20.

Based on the confidential data the IAIS has developed a methodology which attempts to score the relative systemic importance of insurance groups. This quantitative method does not purport to quantify all information that might be relevant to the question of whether or not to designate an insurance group as a G-SII. In addition to the scores from the methodology, the IAIS provides the FSB with relevant information it has gathered from the bilateral and trilateral discussions, especially where that information tends to suggest that the systemic relevance of a particular insurance group is under or overstated by its crude score arising from the methodology.

The IAIS’s scoring methodology is based on five categories of data, which are size, global activity, non-traditional insurance and non-insurance activity (NTNI), interconnectedness, and substitutability. However nearly all (85%) of the score arises from two categories: NTNI (45%) and interconnectedness (40%). The “NTNI” category is an attempt to quantify the two kinds of systemically relevant (double-promise) non-traditional insurance activities already described above as well as any systemically relevant non-insurance financial business. The “interconnectedness” category is not intended to measure those categories of activity that are inherently systemic in the sense of the three-step (important, not easily substitutable and concentrated) argument put above. Those activities are measured by the NTNI activities. Rather “interconnectedness” measures other sources of connection between the insurance group and the financial system. These activities if they were merely carried on alone would not give rise to significant systemic relevant, but when combined with the inherently systemic NTNI activities have the potential to make those NTNI activities even more systemic.

The interconnections between the insurance group and the financial system provide additional ways in which any financial harm and disruption arising from the inherently systemic NTNI may be transmitted to the wider financial system. One might take as a (hypothetical) example a speculative
derivatives-trading activity embedded within a wider reinsurance group. The speculative derivatives-trading activity would be an inherently systemic NTNI activity. The reinsurance activity (arguably) is not inherently systemic. However, so the argument goes, a derivatives-trading activity that is embedded within a wider reinsurance group has more potential to cause systemic harm than a free-standing derivatives-trading business. That is because a sudden disruption to the derivatives-trading activity both has the direct effect on the financial system that it would have had even if it had been a free-standing activity, but also has the further consequence of disrupting the reinsurance business with any additional consequences that may then as a result flow to the real economy.

A key issue in the design of the IAIS’s scoring methodology, is that it is intended solely to capture the systemic impact that might occur if the normal business activity of an insurance group were to cease, or be severely disrupted, due to its financial distress. The likelihood that financial distress will occur is not measured. The policy measures which are to be applied to an insurance group that is designated as a G-SII aim both to reduce the probability of financial distress, and to reduce the systemic impact that might arise upon financial distress. A lesson from the global financial crisis is that no financial institution can be made so safe that the possibility of its financial failure does not need to be planned for.

The 2013 list

The FSB published the first annual list of G-SIIs in July 2013. The names on the list (with head office state in brackets) were Allianz (Germany), American International Group (US), Assicurazioni Generali (Italy), Aviva (UK), Axa (France), MetLife (US), Ping An (China), Prudential Financial (US) and Prudential (UK)\(^1\).\(^1\)

As explained more fully above, the FSB decision was informed by the results of the IAIS scoring methodology, which was based on data largely not visible from public sources. Five data sets were used: size (5%), global activity (5%), interconnectedness (40%), NTNI (45%) and substitutability (5%). The percentages in brackets refer to the contribution of that data set to the overall scoring. The inputs to the interconnectedness category were (1) intra-financial-system assets, (2) intra-financial-system liabilities, (3) reinsurance, (4) derivatives, (5) large exposures, (6) turnover of intra-financial-system assets and liabilities, and (7) level 3 assets. The inputs to the NTNI category are (1) non-
insurance liabilities and revenues, (2) CDS protection sold, (3) short-term funding, (4) financial guarantees, (5) guaranteed variable life insurance\textsuperscript{12}, (4) intra-group commitments, and (5) liquidity of insurance liabilities\textsuperscript{13}.

Of the above data sets only really size, intra-financial assets, intra-financial liabilities, level 3 assets and derivative use are accessible from public sources – and sometimes only partially accessible. In order to illustrate the range of data one might look at Axa, the largest insurer, and Prudential UK, Aviva and Generali as the smaller insurers in the G-SII list. On size, the range appears to be Euro 762bn\textsuperscript{14} to Euro 378bn for gross balance sheet assets, and Euro 120bn to Euro 53bn for gross revenues. On intra-financial-system assets the range appears to be Euro 640bn to Euro 345 bn. Level 3 assets ranged from Euro 16bn to Euro 3bn, although the larger figure comes from a smaller insurer!

Attempts have been made to compare the data for G-SII to that for the G-SIBs but these do not progress very far as nearly all the key data which drove both the designation choices for both lists are not available from public sources. On size, intra-financial-system assets, intra-financial-system liabilities, and level 3 assets nearly all of the G-SIBs score more highly than all of the G-SIIs. However some G-SIBs score below all of the G-SIIs. Insurers gross use of derivatives tends to be orders of magnitude below that of the banks. However the way in which they use derivatives is different. Banks tend to hold large volumes of derivatives that net against each other to relatively small net positions. Insurers tend to be large end-users of derivatives with their net positions not being much smaller than their gross positions. Almost no public data is available on the net derivative positions of banks and insurers.

The Policy Measures

Insurance groups that are identified as G-SII then become subject to four basic policy measures, which are analogous to those applied to G-SIBs and are based on the G20 leader’s original 2009 declaration.\textsuperscript{15}

1. Intensive supervision.
2. A systemic risk management plan (SRMP).\textsuperscript{16}


4. Additional loss absorbency.

Each policy measure has a transitional implementation timetable. Intensive supervision in theory may be applied immediately but progressively upon designation of an insurance group as a G-SII, either in the initial 2013 list or in the subsequent annual revisions to that list. The SRMP is to be in place within 12 months, and be implemented in time for the following year’s reappraisal of the list of G-SIIs. The recovery and resolution planning are to be developed within 18 months, meaning for those on the initial 2013 list the target date is end-2014. The additional loss absorbency is to be applied only from the 2017 G-SII list onwards. For G-SIIs on the 2017 list (which is expected to be published in November 2017) it will apply from January 2019 onwards, and a similar circa 13 month delay will apply to the application of higher loss absorbency to the subsequent annual lists.

**Intensive Supervision**

The Financial Stability Board has developed key recommendations for the implementation of intensive supervision with respect to:

1. Supervisors’ mandates, independence and resources. Here the focus is “active early intervention”, and recognition that supervisors’ actions should “reflect a higher degree of conservatism”. They therefore will often be “a source of conflict” with a G-SII’s own risk appetite.

2. Full suite of supervisory powers. This is to include stress-testing.

3. Improved standards and methods, including a focus on the outcomes of a G-SII’s governance and business processes, detailed assessments of sources of profits and financial data, and more intense interaction with a G-SII’s board and senior management.

4. Stricter assessment regime. A “higher bar” should be set by supervisors for the internal control environment in a G-SII, including a strong risk culture.
5. Group wide supervision. All of a G-SII’s group activities, including non-regulated entities, parents, and other affiliates, need to be in scope of the supervision.

6. Risk aggregation. The focus is on “timely and fulsome” data processing.

The SRMP

The SRMP is a plan of action prepared by G-SII in consultation with its supervisors. The group-wide supervisors and all relevant local supervisors cooperate in the formulation and execution of the SRMP. It sets out the actions the G-SII proposes to take to address the systemic risk to the financial system and real economy which led to its designation as a G-SII.

There is no closed list of actions that are to be included within a SRMP. The actions chosen need to reflect the policy choices of the jurisdictions within which the G-SII operates. The most basic policy choice is probably whether to accept but mitigate the activities which gave rise to the designation as a G-SII, or whether to limit or even prohibit those activities. Here we may note some difference in emphasis when contrasting insurance supervisors’ typical response to G-SIIs to banking supervisors’ to Globally-Systemically Important Banking (G-SIB) groups. A banking group typically becomes a G-SIB because of its core banking activities. An insurance group typically becomes a G-SII in spite of its core insurance business, but because of non-core NTNI activities. There are of course exceptions to this. In the typical case, there is therefore a policy choice available significantly to reduce the non-core NTNI activity, perhaps even sufficiently so that the group no longer falls to be designated as a G-SII in the next annual list. Any planned course of reduction in the NTNI activities is to be set out in the SRMP.

Where the NTNI activity is to be continued the SRMP needs to set out how the systemic consequences are to be mitigated. This may, or may not, include the separation of the NTNI activities from the core traditional insurance activities of the G-SII so that financial distress arising from the
NTNI does not threaten the continuity of the core insurance activities. Also it should include a description of how liquidity risks arising from the NTNI activities are to be managed.

**Recovery and Resolution Planning**

Recovery plans are prepared by the G-SII itself, and set out the measures it will take, in cooperation with its supervisors to recover the G-SII if it were to enter a period of financial difficulty. Resolution plans are prepared by, and executed by, the resolution authorities in the jurisdictions in which the G-SII is situated. Resolution only commences after the G-SII has reached a point of non-viability. The purpose of resolution is to mitigate the systemic disruption that might otherwise follow if a disorderly failure of a G-SII were allowed to occur, and to do so without increasing taxpayers’ exposure to loss. The FSB has set out Key Attributes for recovery and resolution that are to be applied to all systemic firms including all G-SIIs. These include an annex that deals with the peculiarities of insurance business.17

**Additional Loss Absorbency**

Additional loss absorbency refers to a capital-requirement standard that goes beyond the generic capital standard that is intended to apply to all, or perhaps all internationally-active, insurance groups. It may be explained as both an attempt to set a lower tolerance for the risk of its failure by a G-SII, and as an incentive for it to reduce its systemic activities.

The IAIS has yet to finalise the precise design of the additional loss absorbency, but the following points are clear.

1. Its preferred approach would be to apply additional loss absorbency to the NTNI activities and not to the traditional insurance activities.

2. This would mean that for NTNI activities sited within licenced insurers, the additional loss absorbency would take as a base capital requirement a “simple backstop capital requirement” to be designed by the IAIS. To this would be added an uplift that in part could depend on the interconnectedness score under the IAIS’s scoring system.
3. For NTNI activities that are not sited within licenced insurers, the normal Basel 3 capital rules are to be applied, and the additional loss absorbency is to be an extra 1% of risk-weighted assets as calculated under those Basel 3 rules. This achieves the same additional loss absorbency as applies to lowest-ranked globally-systemic banks.

The need for additional loss absorbency is deeply controversial with industry views typically being strongly opposed.

**Final remarks**

The 2009 G20 leaders’ declaration set central banks and regulators the task of solving the too-big, too-complex, too-interconnected to fail problem. Initially the focus of the work was on banks. Few doubted that the consequences of systemic bank failures – as exemplified during the global financial crisis – were unacceptable, but that did not mean that all agreed with the creation of a special regulatory framework for systemic banks additional to that also applied to all banks (systemic and non-systemic). The existence, extent, and content of that framework remains controversial. For insurers the starting point was even less clear. Due (thankfully) to the absence of actual recent examples, the possible consequences of failure of the very largest global insurers are less clear. Some quite large insurers have failed without, except perhaps very short duration, serious disruption to the financial system or real economy. The insurance industry argue that this experience may be extrapolated to very largest insurers. Some regulators agree, but others are less sure arguing both on a precautionary basis and by drawing analogies with other financial institutions. Such disagreements delayed but did not prevent the work which eventually led to the publication in 2013 of the first annual list of (direct insurance) G-SIIs. The challenge now for public-policy makers is to determine whether and how to extend that list to reinsurers, and to define more precisely the extra regulatory obligations which will be placed on G-SIIs.

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1 The final communiqué from the (G20) Pittsburgh summit in their September 2009.

2 The working groups in the BCBS and in the IAIS which executed these mandates were each at various times chaired by the author of this chapter.
3 Financial Stability Board (November 2011). "List of Systemically Important Financial Institutions"

4 BCBS (November 2011). "Global systemically important banks: Assessment methodology and the additional loss absorbency."

5 International Association of Insurance Supervisors (18 July 2013) “Final initial assessment methodology”

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7 International Association of Insurance Supervisors (17 October 2013) “Common Framework for the Supervision of Internationally Active Insurance Groups For Consultation”

8 For a full account of prevailing regulatory views on this see: International Association of Insurance Supervisors (November 2011) “Insurance and financial stability”

9 Financial Stability Board (18 July 2013) “Global systemically important insurers (G-SIIs) and the policy measures that will apply to them”

10 International Association of Insurance Supervisors (18 July 2013) “Final initial assessment methodology”

11 Prudential Financial and Prudential are not related to one another. The similarity in name is a historical coincidence.

12 E.g. some forms of variable annuity products and some guaranteed unit-linked life insurance.

13 The potential for an “insurance run” to occur because the liabilities are more exposed to being “on demand” than traditional insurance liabilities

14 All data given here is from the end-2012 financial statements. The IAIS scored off the 2011 financial statements as the 2012 data was not then fully available.

15 International Association of Insurance Supervisors (18 July 2013) “Final G-SIIs policy measures”
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Over recent years, the regulatory landscape has become increasingly complex. New policies regularly appear, accompanied by numerous consultations – all with the aim of further translating the G20 agenda into rules and regulations that have direct impact on the insurance sector; (IAIS, 2010, 2013) these initiatives include the designation of globally systemically important insurers (G-SIIs) and the introduction of related policy measures; the Financial Stability Board (FSB) policy recommendations on shadow banking – particularly in the areas of repos, securities lending and securitization – and FSB consultation on effective resolution of insurance companies, to mention a few. These reforms are going forward in a still-fragile macroeconomic environment and a political climate that remains volatile five and a half years after the collapse of Lehman Brothers.
The insurance industry has expressed a range of ongoing concerns about the reform process, including its cumulative, pro-cyclical, and cross-sectoral impacts. The implications for capital requirements, investment decisions, and structural changes remain unclear in the absence any cumulative quantitative assessment. Moreover, there are serious risks of duplication and confusion in the current regulatory and supervisory framework (EC, 2012; IMF, 2011-2013; The Geneva Association, 2011). Various industry publications from the Geneva Association and International Institute of Finance (IIF) elaborate on these concerns. Multiple industry events have also taken place to actively debate these concerns with policymakers.

Particularly, the insurance industry is faced with a multiplicity of new institutions charged with macro-prudential surveillance or existing institutions enlarging their mandate to incorporate macro-prudential risks. These changes have appeared in response to a genuine need, and many industry players (including Swiss Re) welcomed the creation of new bodies such as the European Systemic Risk Board (ESRB) in Europe and the Financial Stability Oversight Council (FSOC) in the US. Nevertheless, there remain three clear challenges to any new overseers in the insurance regulatory landscape: first, they must clearly define their roles and responsibilities; second, they must ensure proper coordination between the bodies; and third, they must understand the specificities of the insurance sector. In addition, the fourth most challenging and controversial development is for these institutions to demonstrate their value added and their ambition to introduce new prudential tools in insurance.

The new bodies are, to a degree, rising to these four challenges. The industry is starting to be heard through a series of important research papers and consultations on the implications of regulatory and accounting changes on long-term products and on insurers’ and reinsurers’ investment horizon. The IMF, BIS, OECD and European Commission published important
papers in 2012 and 2013 acknowledging such risks (Financial Stability Paper 2011; European Financial Services Round Table, October 2013; Sigma, 2010).

There remains one critical and unaddressed point, however: the separation between micro-supervision and macro-surveillance. Macro-surveillance properly operates above and beyond existing micro-supervision at the local and group level. The new macro-prudential institutions, however, enjoy a broad mandate; they sometimes appear to take over the role of group supervisors by promulgating a view on the risks presented by particular groups and enforcing that view through new policy measures that may at the end conflict with existing ones: (IIF, 2010; The Geneva Association, 2011, Considerations) one example is the designation of insurance groups as G-SIFI based on limited data points, while groups are subject to comprehensive and extensive supervision with active Colleges; another example would be the introduction of new global capital standards not properly reflecting the benefits of diversification and/or risk mitigation techniques.

This overlap in regulatory authority is the topic of this article. After analysing key considerations for macro-prudential surveillance (Section 1), I will review the growing confusion between macro-prudential surveillance and group supervision in three areas: G-SII designation and policy measures (Section 2); the development of the IAIS Common Framework (ComFrame) (Section 3); and the development of resolution planning (Section 4). I will follow this by some cross-sectoral considerations (Section 5).

**Section 1 – Key considerations for macro-prudential surveillance**

In the wake of the financial crisis, policymakers naturally focused on establishing macro-prudential bodies so that they could gain a comprehensive and cross-sectoral overview of the
financial services sector. This was a laudable initiative, but it opened the way for a blurring of the distinction between micro and macro, as well as between supervision and surveillance – a blurring that is generating growing concerns, confusion and frictional costs in the insurance industry (The Geneva Association, 2011, Considerations; European Financial Services Round Table, 2014).

Macro-prudential surveillance is currently being conducted by a wide range of entities, including new regional authorities such as the FSOC in the US or the ESRB in Europe; international standard setters, such as the IAIS; and international institutions, such as the IMF and FSB. Pan-European authorities such as EIOPA also conduct macro-prudential studies and aim to provide necessary links between micro and macro prudential levels; these functions are intended to complement the micro-prudential supervision of individual (“solo”) insurance entities or group supervision of insurance groups and identify potential risks and vulnerabilities stemming from the micro-prudential level, across borders and sectors.

Macro-prudential surveillance – be it national, regional or global – is expected to have a specific and focused mandate and not overlapping with supervisory authorities. It should focus on interdependencies within the financial system – taking into account the macro-economic developments –, identifying, assessing and monitoring potential systemic risks and ensuring stable functioning of the economy. In simple terms, the objective of macro-prudential surveillance should be to develop a holistic view of risks in the financial system and thereby provide early warnings to solo and group supervisors, who can then take action to restore stability and ensure resilience.

Macro-prudential surveillance should not include a direct supervision of market participants, whether at the solo or group level. In European, insurance companies are already subject to comprehensive micro-prudential supervision, including group supervision; duplication of
supervisory tasks and reporting requirements should be avoided, as should potential conflicts and confusion between different levels of surveillance. When supervisory gaps exist in other parts of the world, they should be addressed and mitigated by insurance supervisors who have the experience and expertise of insurance supervision and insurance business models, and not by macro-prudential authorities who are bank minded and critically lack insurance expertise.

Where international institutions conduct macro-prudential surveillance and collect data on multinational insurance groups, this should not take powers away from the group supervisors, who – in the case of a G-SII (global systemically important insurer) or an IAIG (internationally active insurance group) – already use prudential tools to assess the interconnectedness of the particular group to other market participants, such as counter-party credit risk analysis or accumulation risk reporting requirements. Global players in the insurance industry have long supported comprehensive group supervision as the best primary measure to ensure the financial stability and soundness of individual financial institutions; in this regard, the industry has broadly endorsed the IAIS’s ComFrame initiative for supervision of IAIGs as a step toward common standards for effective group supervision. Global macro-prudential surveillance can certainly inform such supervision, but should not replace it; and vice versa, solo or group supervisors can inform the macro-prudential surveillance but not replace it, as the 2008 financial crisis demonstrated.

The proliferation of macro-prudential bodies (either new ones or existing ones enlarging their mandates) comes primarily from banking and capital markets concerns, which had been under-estimated and under-monitored in the past. Comprehensive insurance group supervision is the appropriate policy measure to identify non-insurance risks and mitigate financial stability concerns in insurance.
Research by the Geneva Association, the Institute of International Finance, Insurance Europe and other organisations has amply demonstrated the significant structural and financial differences between the banking and insurance sectors and their implications to financial stability (The Geneva Association, 2012, “Insurance; European Financial Services Round Table, October 2013; Swiss Re / IIF, 2013, Strengthening). It is essential, therefore, that macro-prudential surveillance over the insurance sector should be conducted by insurance experts – who have the necessary understanding of the insurance business model and can analyse accurately the correlations between the insurance sector and other financial sectors. The recent FSB, BIS and IMF discussions about the effects of low interest rates shows clearly how the macro-prudential consequences were evaluated almost entirely from a banking perspective: the detrimental impact on life insurers was practically ignored at the beginning of such macro policies, or at best accepted as an unavoidable side effect (IIF, 2010; The Geneva Association, 2011, “Considerations). To be properly balanced, macro-prudential surveillance needs to assess cross-sectorial effects and take full account of the specificity of the insurance sector, while still taking care not to overlap with micro-prudential supervision.

Section 2 – Designation of G-SIIs and new policy measures

The year 2013 saw important announcements from the IAIS and FSB – announcements that sharply illustrate the growing confusion between macro-prudential surveillance and group supervision. In essence, these introduced a new shape to current work on systemic risk, with deep implications for the insurance industry:

- In July, the IAIS and FSB published a list identifying nine G-SIIs. The designation of any reinsurers as G-SIIs was delayed until 2014, awaiting further work on the interconnectedness and substitutability of major global reinsurers (IAIS, 2013).
• Along with the list of G-SIIs, the IAIS published its methodology for identifying G-SIIs and determining the policy measures that apply to them. As in banking, these policy measures consist of: enhanced supervision; improved resolvability; and higher loss absorbency capacity (HLA). A simple basic capital requirement (BCR) for G-SIIs, which will serve as a basis for calculating the HLA, will also be introduced by the end of 2014. This one-size-fits-all approach, applying the concepts of banking to the realities of insurance, is a matter of deep concern for the insurance industry (Swiss Re, 2010 – 2013; IIF, 2010, "Systemic").

• In October, the IAIS confirmed its commitment to develop a global insurance capital standard (ICS) by the end of 2016, to be fully implemented in 2019. The ICS will form part of IAIS framework for group supervision (so-called ComFrame) and will apply to all international insurance groups, so-called IAIGs (IAIS, 2013, Global Systematically).

The thrust of these announcements illustrate a more direct involvement in insurance regulation by the FSB, which appears unsatisfied with the speed and scope of reforms in the insurance sector and concerned about the insurance supervisors’ ability to meet the G20’s expectations. The global debate on capital standards is also influenced by domestic developments: in the US, these have to do with the new role of the US Federal Reserve in insurance supervision under the terms of Dodd-Frank; in Europe, they concern the finalisation of the Solvency II Directive.

As the industry has pointed out on more than one occasion, there are several basic problems inherent in the G-SII designation, with further difficulties that follow on from the policy measures applicable to G-SIIs (The Geneva Association, 2011, Considerations; European Financial Services Round Table, March 2014). The main concerns regarding the designation and related policy measures remain these:
i. It effectively over-rules the risk assessment of group supervisors and members of the respective supervisory colleges, focusing excessively on groups’ size and interconnectedness rather than their risk-management and supervisory regimes;

ii. It is expected to introduced excessive non adequately risk-based capital requirements, which may undermine existing and tested solvency regimes;

iii. It seeks to encourage the separation of non-traditional and/or non-insurance activities (NTNI) without providing (for the time being) a proper definition of what NTNI activities are, and without recognizing internal risk governance practices of groups to manage such NTNI activities;

iv. It is not expected to properly take into account diversification and risk pooling (particularly in the context of the BCR), the benefits of which are fundamental to the global insurance and reinsurance business model;

v. It opens the door to additional protectionist and extra-territorial measures by national jurisdictions, over and beyond global standards; such gold-plating trend has been observed in the banking sector and is likely to occur in insurance;

vi. It may require duplicative reporting requirements, particularly if host supervisors do not rely on regulatory reports provided to the group lead supervisor; and

vii. It may apply inappropriate banking-based metrics to insurers, such as a leverage ratio.

Moreover, the additional delayed review of systemic relevance among major reinsurers risks disconnecting the policy measures from that of direct insurers, thereby potentially introducing additional, reinsurance-specific indicators and measures that could be detrimental to the whole reinsurance industry’s business model. This delay reflects the political process of the potential designation of major reinsurers while the IAIS has been conducting a global
reinsurance market report for more than 5 years and concluded in July 2012 that traditional reinsurance is unlikely to cause, or amplify, systemic risk.

At the beginning of 2013, the IAIS work on capital standards was at an early stage, but FSB pressure has dictated an ambitious completion schedule – leading to several areas of uncertainty. The IAIS started its work with the introduction of a basic capital requirement (BCR) in order to achieve comparability in the industry and define a basis to introduce higher loss absorption (HLA) capacity on G-SIIs. The BCR is expected to be completed by the end of 2015 and the HLA by the end of 2015. The next step of the IAIS project will be the development of a more advanced risk-sensitive and group-wide global insurance capital standard (ICS), to be completed by the end of 2016. The BCR is expected to inform the development of the ICS.

The BCR may or may not apply to international insurance groups (or IAIGs), for example, depending on the outcome of the initiative. The implications of these global standards for national jurisdictions are not clear. While it is expected that the BCR and ICS would be used to compare and benchmark local regulatory regimes, their interactions with such existing risk-based solvency requirements as Solvency II and the Swiss Solvency Test (SST) have not been clarified. Once again, the risk of confusion between micro supervisory tools (such as an advanced risk and economic based solvency regime like the SST) and global macro prudential tools (such as a generic HLA) is a source of concern.

Section 3 – IAIS ComFrame

Given the twin dangers of duplication and fragmentation of supervisory powers over internationally active insurance groups (IAIGs), the industry has long called for global harmonisation of group supervision regimes – especially as some jurisdictions (such as Switzerland, the EU and Australia) have made great strides in the area, while others (such as
the US, China and Japan) have initiated important reforms. ComFrame is a key IAIS initiative to improve supervisory cooperation and increase global convergence in supervisory practices. It aims to facilitate recognition between the supervisory regimes of different jurisdictions, promote the role of a single group lead supervisor, and ultimately should increase clarity between micro-supervision and macro-surveillance. It should also establish clarity with regard to crisis management, recovery, and resolution planning, which should help insurers anticipate regulatory behaviour.

The IAIS has been working on ComFrame since 2010 and refined its structure and content throughout 2013. ComFrame builds on the IAIS insurance core principles (ICPs) and is composed of three modules: first module on the criteria and process for the identification of insurance groups or IAIGs; second module on the expected qualitative and quantitative requirements of groups; the third one on the process of supervision and role of the group-wide supervisor.

There has been considerable progress on defining the initiative’s scope and the methodology for identifying IAIGs (i.e. module 1 of the initiative). Module 3 – covering the broader issues of group supervision, supervisory cooperation, crisis management, and resolution – has also advanced significantly. More work remains to be done on Module 2, which deals with group governance, ERM, structure and strategy, capital standard, financial condition, and reporting.

The ComFrame initiative has been shaken, however, by the FSB’s announcement of July 2013, which requested the IAIS to develop a basic capital requirement for G-SIIs by late 2014 (Reference 15). This has accelerated ComFrame’s implementation schedule, so that the first qualitative and quantitative impact assessments will be conducted in 2014. As well as developing a capital measure for IAIGs and G-SIIs, the IAIS will field-test the basic capital requirement (BCR) and insurance capital standard (ICS), while simultaneously progressing its work on valuation.
The IAIS also agreed in October 2013 to develop a risk-based global capital standard and to include it in ComFrame. (IAIS, 2013, “Global..., Policy). Many supervisors see ComFrame as a means to harmonize the principles of economic risk management in group supervision, as developed in such regimes as Solvency II and the Swiss Solvency Test. Other regulators, despite the FSB’s call for a global capital standard, question the need for a quantitative group-wide capital framework.

It is exactly these sorts of disparities in approach that ComFrame is intended to bridge. The initiative should be taken as an opportunity to improve cooperation between solo and group supervisors, address existing gaps in insurance supervision and foster convergence of prudential measures. If insurance regulators do not seize this challenge, they could open the door for macro-prudential bodies (such as the FSB and its members) to fill those gaps with ill-conceived measures that attempt to address insurance issues using banking criteria.

Overall, the industry is supportive of ComFrame, although many concerns have been raised about how prescriptive the framework might be, how it could interact with local regulatory and legal requirements without adding a new supervisory layer, and how it would handle group capital, solvency, and valuation issues without undermining existing comprehensive and tested standards (European Financial Services Round Table, March 2014). These concerns should be addressed during the ComFrame field-testing, along with calibration of solvency and actuarial measures – which is one of the most critical elements for making ComFrame effective. Many groups (including Swiss Re) will be participating in the testing, both to support the IAIS and to ensure that capital measures are aligned within economic risk-based regimes that reflects the experience of the most currently advanced and tested jurisdictions.
A unified supervisory framework depends on prompt and wide-spread implementation. Piecemeal adoption of ComFrame once it is finalised would only increase the likelihood of intervention by macro-prudential bodies, further aggravating the confusion of their roles with those of the micro-prudential supervisors.

**Section 4 – Recovery and resolution planning**

Discussions on recovery and resolution planning have been accelerated in Europe and the US by the global debate on treatment of G-SIIs. In July 2013, the FSB published a consultation document, "Application of the Key Attributes of Effective Resolution Regimes to Non-Bank Financial Institutions," dealing generally with the resolution of financial market participants, and specifically with the protection of client asset in resolution of insurers.

The Key Attributes (KAs) describe a resolution regime that seeks to avoid severe systemic disruption and losses to taxpayers while protecting vital economic functions. These KAs were developed with the banking sector in mind and were approved as the international standard for resolution regimes by the G20 in November 2011. During consultation it was proposed that similar regimes in line with the KAs be implemented for insurers (FSB, 2013, Application; European Financial Services Round Table, March 2014). The FSB has also consulted on a process to assess the performance of national authorities measured against these and other FSB guidelines.

The principal reasons given for applying resolution regimes to insurers (particularly those designated as G-SIIs) are the entities’ complexity, size and engagement in non-traditional insurance and/or non-insurance activities. The FSB has additionally stated, however, that any traditional insurance activity that is "critical to the economy" and cannot be rapidly transferred or replaced should also be subject to resolution regimes. This is not the view of the insurance
industry or of many insurance supervisors, but it sharply illustrates a potential competition for power between macro and micro prudential bodies.

The FSB’s consultation paper (FSB, 2013, Application..) on KAs proposes tailoring the attributes to the insurance sector through guidelines that set out particular objectives and criteria for identifying when an insurer should enter resolution. It assumes powers for the resolution authority that go well beyond traditional run-off and portfolio transfer to include bridge institutions, restructuring of liabilities, bail-in, and the power to suspend policyholders’ surrender rights – including the rights of reinsurers to terminate coverage for periods after resolution.

It also lays further planning and reporting obligations on supervisors and insurers, including resolvability assessments by resolution authorities in coordination with supervisors; recovery and resolution planning requirements for all insurers (at a minimum, all G-SIIs); and resolution strategies to be developed by the Crisis Management Group of supervisors, resolution authorities, and other stakeholders. At the same time, the paper’s lack of clarity about the responsibilities of insurers or the level of detail required in satisfying the various assessment and planning guidelines makes it difficult for insurers to prepare adequately for the future.

What is clear is that the broad applicability of these FSB guidelines makes it likely that insurance entities and groups will be subject to extensive prescriptive demands for recovery and resolution planning, irrespective of the supervisory practice and powers of the group supervisor. This represents a real concern for the insurance industry and it is therefore questioning many FSB’s recommendations.

If agreed, the final guidelines emerging from the consultation process will supply a framework for legislative proposals in many countries, particularly in Europe at EU and national level, to bring regulation in line with this international standard. The proposals already represent a strong pressure on local regulators to introduce similar measures. This means that, in the absence of EU-level regulation to implement the KAs for insurers,
national requirements and interpretations are likely to diverge from each other. As an example, the Bank of England’s Prudential Regulation Authority has already described resolvability as a condition of approval for all firms and as a key part of its approach to insurance supervision.

The insurance industry’s response to this macro approach to resolution is straightforward: any measures taken should recognise the appropriateness of existing regulatory capital and insolvency frameworks for insurance where these already provide the appropriate risk-management incentives and supervisory powers to deal with stress conditions (CRO Forum, 2012). Supervisors and managers need the flexibility to react effectively to specific circumstances. The basis for applying a resolution regime should be that all powers available under existing regulatory frameworks have been exhausted – since the nature of the insurance business model makes time available for these powers to be used.

The focus of resolution measures should be on those activities whose interruption could cause a systemic impact if they were not put into a adequate resolution regime. Identifying those activities requires an objective methodology, which should also take into account the scale of the activity in relation to its relevant market. Detailed pre-scripted recovery and resolution plans are a disproportionate response to risk and are likely to prove ineffective in an actual winding-down scenario. Instead, recovery and resolution plans would be best built onto existing risk management structures developed under existing regimes, such as ORSA. If, moreover, legal barriers to cross-border resolution were removed (which is in the hands of governments and regulators), allowing the group supervisor to lead in cooperation and coordination with other relevant supervisors, then duplication and potential conflict of responsibility could be avoided without the need for another layer of regulatory oversight.

**Section 5 – Importance of cross-sectoral implications**
In June 2012, the G20 endorsed the work of the Basel Committee on Banking Supervision, which has now finalised the core elements of the Basel III framework and is focusing increasingly on implementation, which began on 1 January 2013 and will extend until 1 January 2019. Important developments included the risk weighted assets (RWA) comparability study, which examined the credibility of the risk-based large exposures framework that complements that for risk-based capital standards, and revisions to the Basel III securitisations framework (European Financial Services Round Table, October 2013, 2014).

Of the 27 jurisdictions that comprise the Basel Committee, 25 – including the EU and the US – have now issued the final set of Basel III based capital regulations; 11 of these are legally in force. A number of members are also progressing regulations for liquidity and leverage ratios, as well as the specific requirements that should apply to firms designated as global systemically important banks (G-SIBs) and domestic systemically important banks (D-SIBs). The agreed start date for disclosing banks’ leverage ratios and the phase-in of the Liquidity Coverage Ratio is 1 January 2015. The phase-in of the G-SIB and D-SIB requirements starts on 1 January 2016 (FSB, 2010).

The methodology for assessing G-SIBs, including the corresponding 1%-3.5% capital surcharges, has been finalised. This is complemented by standards and guidance documents for resolution regimes and recommendations for increasing the intensity and effectiveness of G-SIB supervision. Only two member jurisdictions (Switzerland and Canada) have so far issued final regulatory rules and begun to enforce them.

The implementation process brings up three sensitive points for the insurance industry. The first is how insurance holdings will be treated when assessing banks’ regulatory capital. Under the accord, bancassurers will have until 2018 to reduce any investments in financial
institutions beyond the threshold set for common equity Tier 1 capital (Swiss Re/IIF, 2013, "Strengthening...; Sigma, 2010, "Insurance...")

During the transition period, however, these investments will remain subject to existing national treatment and could therefore generate possible distortions.

The second issue is the scope and process of statutory bail-in regimes. As institutional investors, insurers strongly argue that bail-in should be used as resolution tool, and not for recovery. The assessment of the bail-in should be based on objective, transparent, and quantifiable criteria. Finally, bail-in should apply only to bank debt issued following the entry into force of new regimes, such as the EU’s proposed framework on bank recovery and resolution.

The third concern is investment: the Basel III/CRD IV Directives take a different approach to setting capital charges on certain asset classes than does Solvency II. Regulatory differences that create disincentives for particular asset types, such as securitisations, could adversely affect insurers’ traditional role as long-term investors. EIOPA is conducting an ongoing review of the assessment of high-quality securitisation assets; this should ultimately help to better reflect market realities in the regulatory treatment. In general, the differential valuation of assets classes (including sovereign debt and corporate bonds) under Basel III/CRD IV and Solvency II raises risk management concerns and needs to be coordinated between the banking and insurance sectors.

The recurring and overarching theme in the industry’s responses (Reference 24 & 29) is that regulations for banks are being applied wholesale to insurance without consideration of its particularities. If not appropriately tailored to the insurance business model, banking regulations have the potential to significantly harm insurers and reinsurers, particularly as
long-term institutional investors. In the current economic environment with extremely low interest rates, insurers might have to shift to higher income generating assets to achieve adequate returns, but this in turn is likely to require higher capital levels. As yet, there has been no comprehensive and cumulative study of the reforms’ cross-sectoral impact; conducting such an assessment would be the ideal role for macro-prudential bodies such as the FSB or IMF.

**Conclusion**

Global firms continue to urge the G20 to maintain its commitment to regulatory and supervisory harmonisation. Consistency in developing international regulatory standards is essential to avoid confusion between micro-supervision and macro-surveillance. Unfortunately, there remains a possibility that this confusion will lead to unilateral, protectionist, or extra-territorial regulatory measures – which would themselves deepen the confusion in a vicious spiral.

There also remains the critically important risk of pro-cyclicality in the design and implementation of regulatory reforms; this will need to be addressed at both the macro and micro levels. The insurance industry has emphasised in its consultation responses to the FSB, OECD, and European Commission that the framing and timing of new regulations should not undermine the fragile recovery of the global economy or restrict the long-term investment capability of the insurance industry.

Recent developments in the EU and US gives cause for concern: the proliferation of new authorities and variant approaches to group supervision suggests a potential rise in regulatory duplication, fragmentation, and protectionism. Against this background, the insurance
industry strongly supports international initiatives designed to foster convergence, achieve mutual recognition of supervisory regimes, and avoid the confusion between micro and macro.

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Chapter 13

Global macroprudential setup in insurance: who is in charge?

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Introduction
While the institutional perspective of macroprudential deliberations is an important element, comprehensive institutional considerations from a worldwide perspective are almost unavailable to date. This is in particular the case with respect to the global macroprudential set up in insurance. Among the key questions are: Who is in charge? Where is a point of contact if an interested jurisdiction and/or a relevant (re)insurance company would have contributions to and/or complaints about macroprudential considerations and measures? Which international bodies are involved? How is a best possible cooperation between relevant international, regional and national bodies ensured? In relation to the last question, data is of specific importance. In particular, if it comes to the question: How to avoid both gaps and unnecessary duplications within the various macroprudential data collection exercises?

This paper aims to contribute to the macroprudential debate by putting the global macroprudential set up in insurance into perspective and by providing some answers to the above raised questions. The more institutional perspective of this paper comes in addition to the often prevailing focus on conceptual and methodological considerations. In so doing, our paper in parts draws heavily on work carried out by the International Association of Insurance Supervisors (IAIS)\(^1\) and other relevant bodies, i.e. the Bank for International Settlements (BIS), International Monetary Fund (IMF), World Bank, European Insurance and Occupational Pensions Authority (EIOPA), and the National Association of Insurance Commissioners (NAIC).

In addition to looking into the role and activities of relevant public sector bodies, this paper also considers the role of contributions by private\(^2\) sector bodies to the global macroprudential set-up in insurance. For example, some insurers and reinsurers such as Swiss Re, (see, for example, Sigma (2013)), and Munich Re (e.g. Munich Re (2012)), as well as brokers, including AON and Guy Carpenter, provide in-depth assessments regarding the impact of specific market developments, or with respect to the impact of man-made and natural insured catastrophes. Furthermore, bodies such as the Geneva Association provide their own macroprudential considerations.
Our paper is structured as follows. Section 1 places the institutional set up debate within the broader context of current debated on macroprudential regulation, considering the questions on whether and how these debates shape the actual institutional environment. Section 2 then looks at the specific institutional set-ups for macroprudential regulation, with specific focus on the insurance sector and how it relates to the horizontal, i.e. cross-sectoral, and vertical, i.e. cross-border, dimensions. This is followed by Section 3 which discusses some of the key issues emerging from the attempts by various international, regional and national bodies to provide an institutional shape to macroprudential regulation. Section 4 concludes by providing some preliminary policy recommendations.

Section 1 – Current macroprudential debates – do they shape the institutional environment?

Efforts to develop a macroprudential approach to financial regulation have been extensive since the onset of the global financial crisis. The work by Borio and his colleagues at the Bank for International Settlements (Arnold et al., 2012; Borio, 2003, 2009, 2011a, 2011b, 2013a, 2013b) constitutes the most influential conceptual contribution to the debate. At an applied level, and heavily drawing on Borio’s work, a commonly referred to framework is the one proposed by the International Monetary Fund (IMF, 2011). According to these considerations macroprudential regulation is a complement to microprudential policy that is aimed at limiting system-wide risk within the financial system, using a set of powers and instruments. Its scope of analysis includes the entire financial system, and the relationship and impact with the real economy.

The breadth and, above all the speed of the development of the macroprudential approach have triggered a lively and fast evolving debate. Hand in hand with discussions about the institutional side of macroprudential regulation, there has also been debate on its conceptual underpinnings well as methodological challenges. Although in practice institutional, conceptual and methodological elements overlap with each other, discussions on these matters tend to handle these three elements
separately (Ramella, 2011). In the following paragraphs we first develop a brief review the main themes around the conceptual (1) and methodological (2) debates that is followed by a more detailed discussion on institutional ones (3).

(1) At a conceptual level, the debate has focused on the lack of consensus on what is meant by systemic risk and financial stability, both central elements of the macroprudential approach. Issues that have proven thorny to conceptualise include: the meaning of ‘stability’ in the term financial stability (Liedtke, 2010; Toulmin 1998; Crockett, 1997; Yellen, 2010), the setting of the ‘system’ boundaries in the definition of systemic risk –in particular in the cross-sectoral and cross-border dimensions (Brady and Markeloff, 2012), the understanding of the complex interconnections within the system and between the system and the environment (Datz, 2013), and the temporal transformation of the system, in particular in light of the degree of innovation that has characterised the financial sector over the past 40 years (Borio 2013a, 2011a). Borio illustrates some of these difficulties through his description of the “paradox of financial stability”, in which the financial system seems strongest at its weakest point (Borio, 2011b).

(2) With respect to the methodological level, on-going discussions include: the design and implementation of frameworks to carry out macroprudential regulation (FSB/IMF/BIS, 2011; Arnold et al., 2012); the effectiveness -including cost-effectiveness- of the tools used to conduct macroprudential surveillance and macroprudential supervision (CGFS, 2010, 2012; Lim et al., 2011); and the validity, reliability, availability, completeness, timeliness, and comparability of quantitative and qualitative data needed to carry out surveillance and supervision (Borio, 2013b; Hannoun, 2010; IMF/FSB, 2009).

(3) In relation to the institutional side of the macroprudential debate, a key part of the discussion focuses on understanding at what point governments should intervene (Houben et al, 2012). During the recent financial crisis, for example it became difficult to sound the alarm on the financial system, as regulators were met with resistance. In short, questions on whether to act, and if so, when to act
were addressed with no definitive answers. Houben and colleagues mention that the challenge lies in determining what excessive systemic risk is and how much intervention would be necessary to mitigate macroprudential issues.

Further, the timing challenge gets exacerbated by the fact that intervention powers are more often than not scattered in a variety of institutions usually residing cross-border. Moreover, intervention powers are often unclear or incomplete. In other words, at an institutional level, questions around “who does what?” have met with an array of often inconsistent answers. For this purpose, some authors have argued for a continual blend of both analysis and intervention. Preventative measures are used primarily to avert potential problems, while mitigation is used secondarily to resolve any negative affects to the financial system (Yellen, 2010; Clark and Large, 2011).

Furthermore, as highlighted by the IMF (2013), the combination of the timing of a macroprudential decision with the reach of the decision may generate arbitrage-driven reactions by financial sector players which may shift across sectors or across borders the risks that one institution is seeking to prevent or mitigate at a given point in time. Additionally, a decision taken by an institution in one country or sector may have a negative impact in another country or sector. In this respect, the IMF highlights the critical value of coordinated inter-agency responses both at cross-sectoral and cross-border levels.

To summarise, whether and when to act as well as what to do or how to do it in the macroprudential regulation field are key questions yet searching for a conclusive answer.

The insurance sector, part-and-parcel of the financial sector, has not been isolated from the conceptual, methodological and institutional elements of the macroprudential debate. Importantly, and in contrast to the banking sector, the insurance sector in general, and insurance firms or insurance activities in particular generate, transmit or amplify little systemic risk, although they are recipients of it (IAIS, 2010a, 2011a and 2012, 2013a). This point will be picked up again later in the paper.
Moreover, at the policy and practice levels, the kind of macroprudential regulatory actions—if any—that would contribute to detecting, assessing, monitoring, preventing, mitigating or managing insurance-related systemic risk are discussions that have only recently gathered momentum (IAIS 2013b).

As the brief overview above shows, at the institutional level as well as at the conceptual and methodological levels, the macroprudential regulation discussion appears populated with more questions than answers. This is the case within academic as well as policy and practice circles. The paragraph below, which belongs to a joint FSB, IMF and BIS paper, eloquently illustrates the situation:

“First, the identification of systemic risk is a nascent field. No common paradigms as yet exist. Further fundamental and applied research is needed, not least to better inform the collection and analysis of data underway. Second, newly introduced tools will need to be tried out in different circumstances and their performance evaluated against expectations. Finally, many jurisdictions still lack specific institutional arrangements for the conduct of macroprudential policy and those that have recently introduced them will need to gather experience on their performance”

(FSB/IMF/BIS, 2011, p.3)

In the next section we concentrate our efforts on the institutional debate on macroprudential regulation looking at recent policy and practice experience at national, regional and global levels in respect to addressing the questions introduced above. Although the focus of our analysis is the insurance sector, the critical value of better understanding institutional solutions developed to address cross-sectoral matters takes us into examining work done in other financial sectors like banking or securities.
Section 2 – The institutional set-ups for macroprudential regulation

Institutional set-up and governance are critical to the design and implementation of macroprudential regulation and will determine the effectiveness of efforts aimed at mitigating systemic risk (IAIS, 2013b). Questions to address with respect to the set-up relate to (i) mandate, powers, and instruments, (ii) information and resources, (iii) accountability and transparency, (iv) composition of the decision-making body, and (v) national and international policy coordination (IMF, 2013; Nier et al., 2011).

With specific reference to insurance, the IAIS conducted a survey of macroprudential surveillance practices at a national level that covered jurisdictions collectively representing approximately 85% of global premium income (IAIS, 2010b). The survey showed that insurance supervisory agencies were already in the process of either developing or enhancing their insurance-specific macroprudential surveillance (IAIS, 2010b; Ramella and von Dahlen, 2010). Although nearly all respondents (94%) said that they had no agreed working definition of macroprudential surveillance, the vast majority (97%) stated that they were conducting, or planning to conduct, an analysis of the insurance market within the next 12 months. At the same time, 78% of the respondents indicated that they were about to conduct an analysis of the impact of macroeconomic and other financial variables on the insurance market. Thus, it appears that insurance supervisors were ready to at least tackle the practical challenges of macroprudential surveillance in relation to any potential systemic risk emerging from the insurance sector or affecting it.

Staying within national boundaries, but moving along the horizontal dimension, the institutional picture becomes more complex when macroprudential regulation is aimed at reaching financial sectors beyond insurance. In it important to highlight that the cross-sectoral focus of macroprudential regulation gained momentum in recent years, largely driven by the Global Financial Crises and the cross-sectoral contagion that it generated. Recent work by the IMF has identified three types of model that try to bring together the various financial sectors when it comes to macroprudential regulation matters (IMF, 2013):
• **Model 1**: The macroprudential mandate is assigned to the central bank, with macroprudential decisions ultimately made by its Board

• **Model 2**: The macroprudential mandate is assigned to a dedicated committee within the central bank structure

• **Model 3**: The macroprudential mandate is assigned to a committee outside the central bank, with the central bank participating on the macroprudential committee

As it can be gauged, IMF’s indication points towards central banks as the institution in charge of macroprudential regulation. Importantly, at an empirical level, and with specific reference to experiences among Asian countries, the central bank approach identified by the IMF appears to be the most prevalent (Lim *et al.*, 2013), as indicated in the table below:

**Table 13.1 Responsible institution for Financial Stability**

<table>
<thead>
<tr>
<th>Country</th>
<th>Responsible institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Central Bank; Integrated Financial Regulator</td>
</tr>
<tr>
<td>China</td>
<td>Central Bank</td>
</tr>
<tr>
<td>Hong Kong, SAR</td>
<td>Central Bank; Insurance Regulator; Securities Regulator; Ministry of Finance</td>
</tr>
<tr>
<td>India</td>
<td>Central Bank; Financial Stability Committee</td>
</tr>
</tbody>
</table>
An important conclusion from the table above is that with the exception of those institutional arrangements where the insurance supervisor is involved in financial stability – either as stand-alone institution (e.g. Hong Kong) or as part of an integrated supervisor (e.g. Australia or Korea), insurance appears removed from the core of the financial stability debate. This appears to be the case for insurance as much as for other financial sectors. Importantly, the matter has already been given attention in the literature. For example, following Borio, there would be “a premium on closer cooperation between supervisory authorities and the central bank” (Borio, 2003). IMF staff note that one of the first issues to address “involves a rethink of the appropriate institutional boundaries between central banks and financial regulatory agencies” and that “the central bank should play an important role in macroprudential policymaking.” (Nier et al., 2011). Differences between insurance
and banking (IAIS 2011a, 2012) would point towards the importance of insurance supervisor’s participation at the macroprudential policy design table for insurance entities.

Moving from the national dimension to the international one, i.e. along the vertical dimension, the work by the IMF, and in most recent years by the FSB, constitute the leading examples of global level institutional arrangements for macroprudential regulation. Importantly, in relation to sector-specific matters, the three leading standard setting bodies, that is, the BCBS, the IAIS and IOSCO, are full members of FSB. In a nutshell, global level institutional arrangements have focused mostly on identifying and assessing emerging global-level matters, ensuring the development of international standards, facilitating cooperation among countries, and championing timely and consistent implementation on the agreed standards. This has been the case for macroprudential regulation as much as for other financial supervision matters. In addition, the three lead standards setting bodies have been involved in, horizontal, global-level cross-sectoral macroprudential regulation debate via the Joint Forum.

The orientation towards issue identification, standard development, cross-border and cross-sectoral cooperation and implementation championing appears to be part-and-parcel of an emerging trend on the role of international bodies charged with enacting global governance while lacking the classical rule making and enforcement powers of national governments (or regional ones, in the case of the European Union). We revisit this point in the next section.

With specific reference to insurance, the IAIS has spearheaded an array of developments, most of which have been driven by the Global Financial Crisis. The sole exception to this has been the global reinsurance sector, on which the IAIS has been carrying out macroprudential surveillance for nearly 10 years. IAIS’s efforts towards advancing knowledge and policy in the area have included:
• Creating working groups addressing policy and practice in relation to macroprudential regulation (e.g. the Financial Stability Committee and the Macroprudential Policy and Surveillance Working Group)

• Producing papers discussing the issue of insurance and financial stability (IAIS, 2010a, 2011a and 2012)

• Developing new standards dedicated to macroprudential regulation, i.e. Insurance Core Principle 24 (ICP 24) “Macroprudential Surveillance and Insurance Supervision” (IAIS, 2011b)

• Developing a methodology for the identification of global systemically important insurers (G-SII) and a set of policy measures to apply to G-SII (IAIS 2013a)

• Developing frameworks and tools to carry out macroprudential surveillance (IAIS, 2013b)

• Conducting empirical work on macroprudential surveillance practices among national and regional insurance supervision authorities (IAIS, 2010a)

Although it is beyond the scope of this paper to examine in detail the full extent of the work carried out by the IAIS in relation to macroprudential regulation, there is one key aspect that warrants highlighting. The IAIS has focused most of its macroprudential regulation attention on macroprudential surveillance (e.g. identifying the changing nature of risks, discerning emerging interconnectedness, and detecting cross-sectoral arbitrage) as opposed to macroprudential supervision. The work carried out on the reinsurance market, the content of ICP 24, the main outputs of the Macroprudential Policy and Surveillance Working Group, or the focus of the empirical work carried on practices by national and regional authorities gives testimony of this fact. The main exception to this trend has been the work carried out by the IAIS on Global Systemically Important Insurers under the leadership of the Financial Stability Board (FSB 2010), a relatively new institution, created in 2009 under the auspices of the G20, and on which we focus next.

Despite its recent history, literature on the FSB is not scarce (see for example: Moschella, 2013; Hüpkes, 2012; Helleiner, 2010; Persaud, 2010; Griffith-Jones et al., 2010; Douglas and Arner, 2009).
The FSB concentrates under one umbrella both the horizontal and vertical dimensions. It reaches across financial sectors as much as across borders. Most importantly, be it across sectors or across borders, the FSB’s key role is that of a coordinator. With specific reference to macroprudential regulation, in addition to coordinating national and regional efforts, the FSB conducts global level surveillance, some of which takes place in collaboration with the IMF. With specific reference to global-level insurance sector macroprudential regulation, the most significant FSB project to date has been the championing of the identification of Global Systemically Important Insurers mentioned above, which took place in mid-2013.

Section 3 - Macroprudential regulation and insurance from a global perspective: issues
underpinning institutional set ups

Drawing on the notions of the horizontal and vertical dimensions, we have introduced some key developments on the place of insurance-specific macroprudential regulation within current cross-sectoral and cross-border institutional set ups. Importantly, we have shown the most of these developments have a short history, indicating among other things, that work on evaluating the effectiveness or the unintended consequences of these solutions has been scares. Although a comprehensive assessment of the institutional makeup of current macroprudential regulation is beyond the scope of this paper, in the following paragraphs we raise three issues which appear of relevance to the current discussion on insurance and macroprudential regulation.

Central banks and financial regulators

In Section 2 we discussed recent development, which appear to be pointing towards a trend of central bank lead in relation to the institutional set up for financial stability policy. Supervisory agencies appear to have been relegated to a largely supporting role. There should be little, if any, disagreement that cooperation and a robust dialogue between central banks and supervisors would be beneficial. In their role, central banks develop and have access to a wealth of information about broad economic and
market factors. Economic and broad market considerations are very important aspects of macroprudential surveillance by financial supervisors overall, including insurance supervisors, and can substantively inform the development of macroprudential policies. However, while there is a substantive overlap in certain areas, an approach that places central banks in a lead role with insurance supervisors providing simple technical support has the potential to lead to inappropriate results.

First, the central bank’s macroprudential mandate is by default geared toward the banking sector, even in those places where central banks do not have primary responsibility for the supervision of banks. Insurance products are different from banking products and insurance supervision entails substantively different requirements to properly address those differences. It is not clear what technical competence a central bank may have for the development and application of an insurance-focused toolkit to a business model that is quite different from the banking model.

Second, the distinction between micro and macroprudential surveillance and risks in the insurance context is often not easily distinguishable. Insurance supervisors have a stronger background in the macro issues that impact insurance entities and policyholders, and should consequently be closely involved in the development of macroprudential surveillance tools and policy making.

Third, putting the central bank in the lead and demanding that it should have access to all relevant data and information could give central banks data collection rights that are above and beyond current confidentiality arrangements. For example, access to data and the preservation of confidentiality appear to have been addressed so far only in a small number of countries, and more universal solutions have yet to be developed. For these reasons, and in order to ensure effective and efficient use of resources and overcome an inaction bias with respect to potential macroprudential policy interventions, macroprudential policy activity requires close cooperation between central banks and insurance supervisors. To accomplish this will require an on-going and regular dialogue and a sharing of macroprudential ideas, which will be beneficial to both central banks and insurance supervisors, but which for insurance entities should be led by insurance supervisors.
**Public and private sector interaction**

Current deliberations on the macroprudential set-up focus on the involvement of and on the cooperation between various public sector bodies, for example on the links between central banks and insurance supervisors. Here, we consider the role of bodies with different degrees of private sector involvement, such as public-private partnerships, in supporting for example macroprudential surveillance. However, during our background talks with a large number of public sector experts from different organisations and continents we learned about the suspicion that private sector bodies could be tempted, at least under certain circumstances, to downplay macroeconomic threats, if any. On the other hand, the majority of consulted public sector experts see a clear role for both private sector and public-private sector bodies regarding macroprudential considerations.

*First, private sector bodies:* Following the financial crisis private sector bodies, i.e. insurer and reinsurer, increasingly submit data as requested by the regulatory authorities. In addition to that some private sector bodies, including insurance brokers, provide data and analysis on subjects which may matter in the context of macroprudential deliberations. Among the insurance brokers, which often offer such additional insights by way of their publications are, for example, AON and Willis (compare AON Benfield 2014 and Willis 2013). We learned during our contextual talks that a number of insurance supervisors and regulators frequently use such specific private sector information as part of their macroprudential approach.

*Second, public-private bodies:* With a view to providing reliable data to support macroprudential considerations public-private partnerships could have an increasing role. An existing example is the cooperation on natural catastrophe related data. For example, large reinsurance companies provide academia and international bodies, such as the UN and the IAIS, with specific reinsurance and catastrophe related data on a voluntary basis.
Such specific data on natural catastrophes is also the basis for on-going analysis on the macroeconomic impact of natural catastrophes and on whether available insurance and reinsurance protection have a (positive) impact on the otherwise adverse macroeconomic effects on a country in the aftermath of a natural catastrophe (for an in-depth analysis, compare von Peter, von Dahlen and Saxena 2012).

*Governance, the vertical and horizontal dimensions*

In Section 2 we looked at the global-level institutional set-up for macroprudential regulation, describing it as a four-pronged orientation towards issue identification, standard development, cross-border and cross-sectoral cooperation, and implementation championing. Importantly, and with specific respect to the FSB, we highlighted the cooperation focus of the institution. Indeed, the FSB does not have the powers (‘hard law’) to enforce its proposal, which have to be adopted at national level in order to become mandatory; the FSB relies on ‘soft law’ as a means of influencing sovereign nations in enacting its resolutions (Arner and Taylor, 2009). Underpinning the lack of hard law powers, and despite the support by the G20, is the fact that the FSB lacks democratic legitimacy (Hüpkes, 2012). This lack of legitimacy has been interpreted as the price the FSB has to pay to remain small and able to act speedily. This latter aspect appears to be part-and-parcel of an emerging trend among international bodies that are charged with enacting global governance while lacking the classical rule making and enforcement powers of national governments (Enroth, 2014).

The legitimacy gap or democratic deficit issue affecting the FSB has received plenty of attention in the literature. Indeed, FSB governance was under debate almost concurrently with the creation on the FSB itself. A key example of this point is the High-Level Panel convened by The Brookings Institution to examine the matter and make recommendations⁷ (The Brookings Institution, 2011). Importantly, some of the recommendations, like the creation of Regional Consultative Groups that intergrade non FSB members have since been adopted by the FSB. On the other hand, and of key value to the insurance sector, the while the legitimacy gap has been widely discussed along the
vertical dimension, no such a level of discussion has taken place in relation to the horizontal dimension. In other words, the cross-sectoral element in FSB appears to lack in balance.

Section 4 – Some preliminary policy recommendations

In advancing toward preliminary policy recommendations this section also draws on recent findings published by the IAIS. Within its July 2013 paper on “Macroprudential Policy and Surveillance in Insurance”, the IAIS offers specific insights on how to establish macroprudential surveillance (IAIS 2013, pp. 40-41): "The surveillance element of MPS is based on combining the conceptual framework for the specification of risk indicators (conditional on their varying risk transmission channels) with the identified vulnerabilities in the insurance sector in order to support the design and implementation of macroprudential surveillance. In particular, this includes the operationalization of early warning systems and vulnerability exercises that:

First, identify vulnerabilities and map out risk scenarios sufficiently in advance so that corrective policies can be implemented ("flag raising"). In this regard, the focus is not on predicting the timing of stress, but on identifying the underlying vulnerabilities, i.e., the predisposition to shocks as well as transmission channels and knock-on effects within the insurance sector and its implications for the real economy; and

Second, help prioritise policy and supervisory responses and the formulation of contingency plans based on probability and potential impact while recognising that vulnerabilities are still relevant even in benign times.

In this way, surveillance is not limited to monitoring trends and developments of prudential compliance and macro-financial risks. It informs also the formulation of macro-prudential policy in assessing the resilience of the financial system and the insurance sector in order to develop a suitable
approach aimed at mitigating the impact of systemic risks and reducing the cyclical impact of systemic risk as well as enhancing the system-wide resilience to macro-financial shocks. And it does so by establishing suitable defences capable of containing the severity and duration of adverse effects within the insurance sector and potential knock-on effects on other financial sector participants and the real economy."

With respect to macroprudential policy instruments in insurance and regarding the necessary supervisory coordination, this paper endorses the main conclusions provided by the IAIS (IAIS, 2013b); In particular:

- Instruments already available from microprudential supervision can be adapted to become macroprudential instruments;
- An institutional framework which promotes an efficient and effective coordination among relevant national, regional and international bodies will help to ensure that any macroprudential measures for the insurance sector are part of an integrated framework.

To conclude, macroprudential regulation is an emerging subject with potentially very wide implications on the way finance is carried out, including insurance. While much has been done to address the issue of identifying and dealing with systemic risk, plenty still appears to lie ahead. Among the issues still facing daunting questions is the institutional element. Importantly, this issue has to be looked at both from its cross-border (vertical) and cross-sectoral (horizontal) dimensions.

With specific reference to insurance, questions appear to be more pressing within the horizontal as opposed to the vertical dimension. The current trend seems to point towards a central bank driven macroprudential regulation set up. This places challenges for insurance as to how best take part in and influence the discussions on the matter. Moreover, while weaknesses in the vertical dimension have enjoyed a degree of public debate that has yielded some rebalancing actions like the creation by the FSB of the Regional Consultative Groups, the horizontal dimension disparities appear to be in a problem posing stage. The institutional set up of macroprudential regulation is still a piece of work in
progress. Its soundness will be determined, among other things, by the ability of financial sectors as much as countries to meaningfully take part in it. In turn, the soundness of the institutional set up will significantly influence the ability of finance, including insurance, to play a meaningful role in society.

Notes

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The presented views are those of the authors and do not necessarily represent the views of the BIS, the IAIS, the BMA or any other member organisation.

1 IAIS publications are available at www.iaisweb.org

2 In addition, this paper also considers relevant public-private partnerships.

3 For a discussion on some examples in which the insurance sector was part of this web of cross-sectoral contagion please refer to IAIS (2011a).

4 For IAIS work on the macroprudential surveillance of the global reinsurance sector please refer to the publications of the IAIS Reinsurance Transparency Group (RTG), in particular RTG’s Global Reinsurance Market Reports (all available at www.iaisweb.org).

5 See paper by Sharma in this volume.

6 There are important precedents on public – private cooperation on regulatory matters, for example in relation to accounting standards or credit ratings; see, for example, De Bellis (2011) for a discussion on the matter.

7 Background papers and recommendations are available at www.brookings.edu.
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**Chapter 14**

*Misuse of macroprudential regulations for protectionistic purposes. A real danger?*

Philipp Keller,

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