

On the Systemic Relevance of the Insurance Industry: Is a Macroprudential Insurance Regulation Necessary?

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Abstract

The paper examines whether there is an economic justification for a macroprudential approach to insurance regulation based on the normative theory of regulation. First, the paper elaborates some basic foundations, such as the characterisation of a macroprudential approach to financial regulation as well as an explanation of the functions the insurance industry contributes to the financial system and the real economy. Then it addresses the research question by analysing whether the requirements are fulfilled for a normative theory-compliant macroprudential regulatory foundation. Contrary to the prevailing opinion, the paper finds that the insurance industry is of systemic relevance, at least in terms of the efficient functioning of the financial system as a whole and the potential costs in case of failure or malfunction. Furthermore, it identifies the fundamental

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ingredients needed for a theory-based justification of a macroprudential insurance regulation. The value of this paper is in clarifying terms and in systemizing the rationales for a macroprudential regulation with respect to the insurance industry. Both are of importance for the classification of arguments in the current political discussion. The paper also provides the basic groundwork useful for further research on systemic risk and macroprudential regulation.

JEL classification numbers: G01, G22, G28

Keywords: insurance, macroprudential regulation, systemic risk, normative theory

1 Introduction

In response to the most recent financial crisis, a number of regulatory initiatives have been launched in order to prevent such crises in the future [1]. One of them aims to establish a macroprudential regulation and supervision of the financial sector. This is intended to cover not only banks, but all areas of the financial sector, including insurances. The institutionalisation of the European Systemic Risk Board at the end of 2010 marks a concrete step in this direction [2].

In a competition- and autonomy-based market economy, regulatory intervention in market processes needs basically to be legitimated. From the perspective of the normative theory, regulation is justified if the market outcomes generated by free competition are sub-optimal and if those objectives representing the public interest could be better met by means of a state intervention. Welfare economics in conjunction with the microeconomic theory of market failure build the theoretical foundation for such a regulatory justification. Based on this foundation, regulation in the insurance sector is justified by the existence of external effects and asymmetric information. Actually, the regulation derived from

this theory in practice is primarily microprudential, i.e. it primarily seeks to reduce the risk of financial distress at the level of the individual institutions. Other goals such as the limitation of systemic risk and the stability of the financial system as a whole are, however, rarely considered [3]. This coincides with the consensus built by insurance professionals, that insurers' activities would not cause any systemic risk and thus a macroprudential approach to insurance regulation would not be justifiable [4, 5].

This analysis addresses the question of whether from a theory-based, normative-economic perspective this position can be maintained or whether a systemic oriented approach to insurance regulation would in fact be more reasonable with respect to the theory of regulation. To this end we elaborate some introductory foundations, such as the characterisation of a macroprudential approach to financial regulation (Section 2) as well as an explanation of the functions the insurance industry contributes to the financial system (Section 3). Following these preliminary considerations the main part of this paper examines whether there exist some economic reasons for a system-oriented insurance regulation on the basis of the normative theory of regulation (Section 4). The bottom line is summarised in the final conclusion (Section 5).

2 Macroprudential regulation and supervision

2.1 Conception

For the purposes of this paper, the term regulation is to be taken for both the rules established in order to achieve a given purpose as well as for the supervision over the rules compliance. Furthermore, regulation only addresses the rules and supervisory practices that specifically concern the insurance industry. Unless its effect direction is of a preventive nature, it is also called 'prudential' regulation. In the banking and insurance sector, prudential regulation (the so-called financial

supervision) traditionally adopts a microeconomic perspective. Its main focus is on the financial soundness of each single entity (microprudential regulation). However, as the recent financial crisis has confirmed, the stability of the entire system cannot be reliably preserved through a regulation aimed at ensuring stable individual institutions [6, 7]. This is exactly the problem addressed by the macroprudential regulation when it makes the systemic dimension of risk and stability its subject matter.

The term ‘macroprudential’ has become a buzz word in the course of the recent financial crisis. Its origins can be traced back to the 1970’s [8]. An easily understandable explanation comes from Crockett and Borio who characterise macroprudential as compared to its microprudential counterpart [9, 10]. Based on this approach the following table compares some essential characteristics of these two regulatory perspectives:

Table 1: Macro- and microprudential approaches to financial regulation

		Perspectives of Regulation	
		<i>Macroprudential</i>	<i>Microprudential</i>
Characteristics	<i>Purpose</i>	Ensuring stability of the financial system as a whole	Ensuring stability of an individual financial institution
	<i>Risk Factors</i>	Endogenous (basically)	Exogenous (predominantly)
	<i>Risk Interdependencies and Diversification</i>	Within the whole system	Within an individual institution

A literature review on macroprudential policy is provided by Galati and Moessner [11].

2.2 Purpose of the macroprudential approach to regulation

The literature lacks a clear consensus on the purpose of macroprudential regulation. Common to most concepts is that they link this regulatory approach to ensuring the stability of the financial system, often called financial stability in a short form (indirect regulatory purpose). Still, there is more than one definition of financial stability [12, 13]. This paper follows the approaches which define financial stability in terms of proper functioning of the financial system as a whole. This understanding is not geared to the technical-operational aspects, but to those functions of the financial system which are of importance for the efficiency of the real economy [14]. Macroprudential tools, therefore, must be suited to identify and constrain risks that jeopardise financial stability (immediate regulatory purpose). Hence, macroprudential regulation focuses on systemic risk - it refers to the risk of a malfunction of the financial system to an extent big enough to affect economic growth and welfare [15, 16, 17].

The safeguarding of the system-related functions can be identified as the essential regulatory motive from the macroprudential perspective, whereas the microprudential approach to financial regulation is all about ensuring the survival of individual institutions. Possible effects on the overall (macro-) economy are not taken into consideration while pursuing this microprudential objective. Actually, ensuring the institution's survival in the regulatory practice is used, last but not least, as a means of pursuing the real purpose of financial regulation, consumer or policyholder protection, respectively [3].

2.3 Perception of risk factors

Micro- and macroprudential approaches to regulation differ with respect to their underlying risk perception. From the microprudential perspective risk factors such as market prices or counterparty creditworthiness are considered to be

exogenous: their impact is assumed to be limited to individual institutions without triggering behavioural responses of market participants within the system which could have an influence on these factors in turn (idiosyncratic risk). Interconnectedness with other parts of the financial system play a role only in so far as they are direct exposures due to contractual relations (in the sense of counterparty risk).

Risk perception from the macroprudential point of view is different: systemic risk is largely driven by endogenous factors. Collective behaviour, as an example, is one of those major risk factors (herd behaviour, often procyclical). If a sufficiently large number of financial actors behave in the same way their actions may influence real economic variables, such as prices. Changes of macroeconomic parameters are in turn likely to exert an influence on the behaviour of financial market actors and on the financial system itself. The so called 'asset fire sales' are a well known example where such feedback is triggered between the financial system and the real economy. These are distress sales of securities which have come under price pressure. Many investors acting similarly and selling assets causes additional pressure on the prices of these assets. This again affects more investors, who now in turn repel the assets affected by falling prices. The result is a self-reinforcing price spiral with adverse feedback effects on the financial system and, depending on the extent, on the entire economy.

On top of such dynamic reinforcement/amplification processes, the systemic risk factors also include the so called contagion and propagation mechanisms. This is about transmission channels through which an original singular shock event of limited range of influence can spread to a system-wide crisis. One prominent example of this kind of propagation is the run on a single bank which sprawls via direct or indirect pathways to a system-wide banking crisis. Contagion and feedback effects most notably emerge in situations where many actors are equally or similarly exposed to the same risks [10]. For an empirical investigation of contagion effects in the banking and the insurance see Prokopczuk [18].

2.4 Risk interdependencies and risk diversification

From a system view, similar portfolios or homogeneous behaviour are essential sources of risk interdependencies (risk correlation). A purely microprudential approach to regulation only cares about risk interdependencies within each individual institution. In contrast to that, a system-oriented regulatory approach must place emphasis particularly on risk interdependencies across institutional borders. Such cross-company risk dependencies can result from both counterparty business relationships and similar exposure exposition to specific risks, e. g. by investments in the same asset classes [19].

However, the two regulatory perspectives also differ significantly with respect to how to limit the dangers of risk interdependencies. According to Markowitz's portfolio theory, at the institutional level risk mitigation can be achieved by diversification (risk distribution). However, at the system level diversification does not necessarily contribute to more stability. This is because from a system's perspective diversification in this sense only means reallocation of risks. Furthermore, this kind of risk shifting is often accompanied by the negative side-effect of tending to align the risk exposures among the different members of the system [20].

After the most important characteristics of a macroprudential approach to financial regulation have been described there is still the need for a brief look at the insurance companies' functions in the financial system. These are addressed in the following section.

3 The insurers' role in the financial system

3.1 Parts and functions of the financial system

The term financial system is not uniformly used in the economics literature. According to Rose, it is to stand here for all markets, institutions, laws, regulations

and techniques, by which financial instruments are being traded, interest rates are being determined as well as payment facilities and financial services are being provided [21]. As far as the institutional part of the financial system is concerned, this is called the financial sector of an economy. It comprises all financial markets and intermediaries as well as certain sovereign institutions, such as central banks and supervisory authorities.

According to the literature on financial markets and financial intermediation, the allocation of resources across time and space under uncertainty is the main function of the financial system. This main function can be further specified in:

- Allocation function: Allocation of resources to their most productive use. Within the framework of the allocation process, the financial system also performs some information, financing and oversight functions.
- Mobilising and pooling of financial resources: Mobilising and pooling of small savings due to the funding/financing of bigger investments (such as the funding of manufacturing processes on an economically efficient scale).
- Risk management: Managing risks by risk redistribution among the market participants or by financial arrangements.
- Functions of money: Provision of payment facilities as a unit of value, a medium of exchange and as a store of value.

The financial system performs these functions in two ways: On the one hand it uses the financial markets. Here, the original suppliers and consumers come into direct contact with each other, trade some financial contracts and establish claims on current or future payments. On the other hand, specialised companies have emerged - the aforementioned financial intermediaries. They step in between the potential original parties by concluding such financial contracts on their own account. In principle, financial intermediaries fulfil similar functions to those of the financial markets. They justify their existence by being able to reduce some existing market imperfections, such as transaction costs and asymmetric information. In doing so they make the transaction process more efficient

(transaction function).

Financial intermediaries, in addition, provide some special qualitative transformation services (transformation function). These include:

- Liquidity transformation,
- Convenience denomination,
- Maturity transformation,
- Risk transformation.

3.2 Functions performed by insurers in the financial system

Insurers, together with credit institutions, are one of the two prototypes of financial intermediaries. In order to identify their contribution to the financial system as well as the macroeconomic effects resulting from their activities, one can refer to various concepts of the phenomenon 'insurance' [22, 23]. They assign to the activities of insurers - sometimes more, sometimes less pronounced - a participation in almost all the functions of a financial system:

- Allocation: Insurers assume some risks from other economic agents, carry the remaining risk after the use of risk management tools (e.g. reinsurance) and provide compensation when an insured event occurs. By offering differentiated premiums they encourage loss prevention efforts, which reduce the overall volume of economic losses. In doing so, insurers contribute to an efficient allocation of risks and economic resources. During the insurance process information is provided and exchanged (such as risk assessment) and incentives are offered that motivate the surveillance of corporate behaviour (e.g. risk mitigating behaviour).
- Pooling of financial resources and financing: Since premium payments are prior to claims payments, the purchase of insurances regularly leads to the accumulation of large amounts of capital. In life insurance, an additional capital mobilisation effect occurs by stimulating the savings activity. By

investing these funds, e.g. in sovereign and corporate bonds, insurers contribute significantly to the financing of public and private households. The refinancing of credit institutions in the form of investments in bank bonds, covered bonds and asset backed securities represents roughly two thirds of the German life insurers' financial assets [24]. This type of medium to long-term funding is a prerequisite for the banking sector's capability to master smoothly its role as a financial intermediary to the real economy. This is true in particular with respect to an adequate supply of funds to the economy. Any disruption to this funding role of the insurance industry, e.g. by the lack of continuous inflows of liquidity or incorrectly set regulatory incentives, therefore represents a threat to the proper functioning of the financial system with macroeconomic relevance [25]. This is by definition a systemic risk (see subsection 2.2).

- Risk management: Shifting the negative economic consequences of an event from the policyholder to an insurance company by paying a fixed premium could be an efficient way of managing risks. Whereas, from a microeconomic perspective, this involves a hedging function, from the macro viewpoint it represents a stabilisation function.

However, in addition to the pure risk transfer, there exists one most characteristic function of insurers, which is the so-called risk transformation/ risk pooling [22]. By properly arranging risk portfolios and at the same time using some other risk policy tools, insurers manage to bear the total insured loss at lower costs compared to self risk bearing at the same safety level (pooling-of-risk-effect). This function justifies the existence of insurers as institutional entities. It also results in economic efficiency.

Insurers also perform some bank-typical transformation services, such as convenience denomination and maturity transformation. And yet, if the economic importance of the insurance industry is to be highlighted, then in particular the

functions of ‘Production of safety’ and the ‘Increase of risk tolerance’ should be exposed in the literature. Risk-averse agents are prepared to take advantage of the opportunities of nature and technology only under the protection of insurance. In this way insurers promote innovation, growth and economic wealth.

4 Justification of a macroprudential approach to insurance regulation

With these prior considerations completed, the following section addresses the question of whether a macroprudential approach to insurance regulation can be justified. The answer will be given from two different perspectives. Firstly, the insurance industries’ view towards this issue will be briefly outlined. The second perspective addresses the actual research question: Is there an economical justification for a system-oriented approach to insurance regulation based on the normative theory of regulation?

4.1 The industry’s view

The insurance industry’s view towards the macroprudential approach to regulation may be summarised as follows: The insurance industry is an important part of the global financial system [26]. By accepting and pooling risks from policyholders as well as providing long-term funding to banks and the public sector, insurers’ activities are crucial for the proper functioning of modern economies [27]. While insurers and banks are both financial intermediaries, their roles in the economy and their business models would differ substantially. Characteristic features for the insurance business model are:

- up-front financed, not relying on wholesale funding,

- long-term business relations, with controlled cash-outflows,
- slow pace of insurance failure, with the possibility of an orderly wind-up procedure,
- less dependence on economic cycles.

Due to these features the core business of insurers – unlike that of banks – cannot be considered systemically relevant and it could not pose a systemic risk (neither generate it nor amplify it) [28, 29, 30]. As a consequence there would be neither the need for a macroprudential insurance regulation (supervision) nor the legitimising of any additional regulatory burdens on specific insurers [4, 31].

It should be noted that these positions are largely derived from empirical analysis on the systemic importance of the main activities of insurers and of the functions of the insurance sector respectively. The Financial Stability Board's and the International Association of Insurance Supervisors' definitions on systemic risk and systemic importance are the basic foundations of these analyses together with some observations of actual phenomena, such as past crisis events or existing regulatory regimes [15, 16]. Naturally, since opposite opinions are also expressed, it would be worthwhile to challenge the industry's view on systemic importance and macroprudential regulation in more depth. However, as the actual research perspective is not empirical, but rather scientific-theoretical, this will not be done within this paper.

4.2 A theory based foundation

To ask for an explicit theoretical foundation of a regulation may seem an effort to ensure rational political decision processes and to limit arbitrary state power. At least it might be helpful in clarifying the reasons and the purpose of a state intervention. In this regard the normative theory of regulation in particular draws on efficiency considerations in order to economically justify industry regulation. For this purpose the situation in a given market is judged against the

social welfare maximising conditions for perfect competition. According to the theory, regulation is reasonable if the outcomes of the given market are less desirable compared to those of the reference market of perfect competition and the regulatory intervention is welfare enhancing. The underlying basic assumption is that the regulator has sufficient information and enforcement powers to unselfishly pursue some regulatory objectives which correspond to the public interest [32]. Moreover, there are some other fundamental requirements which need to be fulfilled for regulatory foundation compliant with the normative theory of regulation. These will be discussed in the following sections.

4.2.1 Function worth protecting

A particular regulation is legitimate if, first of all, an industry's characteristic function exists which could not be provided as efficiently by the market itself or by other agents. If only this is met, this function might be worth protecting and justifying as an industry-specific regulation.

As already highlighted, the combination of risk transfer and orderly risk pooling represents the insurance industry's characteristic function *sui generis* - the risk transformation function. It is not performed in a comparable way by any other financial market actor and it has proved to be superior to the direct risk transfer between individual agents using the pure market coordination processes. As a consequence, risk transformation is the insurance industry's original function within the financial system. It is integral to an efficient functioning of the financial system as a whole and it generates welfare-economic added value. In this respect, it is a function of the insurance industry worth protecting in the above mentioned sense.

4.2.2 Public interest

A regulatory intervention in the market processes – according to the

normative theory of regulation – is also justified when a regulation is aligned with the general interest of the society, the so-called public interest (public interest paradigm). The public interest theory assumes that regulatory intervention, in terms of reallocation of resources, is required whenever there is a public interest in such a regulation that outweighs the corresponding disadvantages of reducing the freedom of action of the economic agents [33]. Since the arguments here are only economics-related, this public interest must therefore be of an economic nature too.

Avoiding the negative consequences of a market failure represents a respective regulatory motive which meets both the conditions. According to the normative theory of regulation, the assessment of whether there is a market failure is made on the basis of the model of perfect competition (also called the ‘perfect market’). Within this theory skeleton, deviations from the model’s assumptions represent significant cases of market failure which can justify government intervention in a particular market. However, real markets regularly do not meet the extreme assumptions of a perfect market. Just as market players are not fully informed, so the prices evolve in free competition do not reflect all the costs linked with the production or the consumption of goods or services (social costs). Thus, as measured by the model of perfect competition a regulatory intervention could be justifiable nearly everywhere and always (Nirwana Fallacy). This seems inappropriate. Taking this into account, an alternative understanding of market failure will be used here. Hence, a failure is whenever there is a disruption or a breakdown of the substantial functions of the markets or of competition. These functions above all comprise the coordination and allocation function of markets and the competition processes, which promote efficiency-oriented selection and innovation.

The insurance-scientific literature offers numerous studies of the potential causes of market failure in the insurance industry. For the purposes of this analysis, only their most relevant findings will be summarised and supplemented by such

aspects, which are of interest to the given research question:

a) Natural monopoly/ ruinous competition/ public good

A natural monopoly generally refers to a situation where one single supplier is able to produce some products or render some services at lower costs than this could be done by two or more suppliers. In our economy, natural monopolies are of course particularly common in areas where high economies of scale are achievable. Most typical examples come from industries whose product or service distribution relies on a network configuration (such as pipes, rails, etc.) -- providers of railway services, electricity or gas. Also in the insurance industry there exists an inherent tendency towards the formation of a natural monopoly. This is because of the law of large numbers which induces declining production costs of insurance coverage as the number of independent risks insured increases. Under a monopoly, the monopolist might choose to realise the so called Cournot point (in terms of price and quantity combination). However, from an economic welfare perspective the Cournot price-quantity-combination in general does not represent a social optimum.

The exit of non-competitive agents from the market is a typical feature of the market economy. Taken as such, this still does not constitute a market failure, which is why up to this point it cannot be called ruinous competition. To use this term rather requires the capital and labour of the former competitors to remain in the market, because there is no other use for them. For instance, this could happen if some skilled workers are highly specialised or if some capital goods can be used only in a specific industry segment. In a situation like this, the suppliers might tend to squeeze their competitors out of the market by offering the lowest prices. As far as the insurance industry is concerned there exists neither convincing theoretical reasoning nor empirical evidence for market failure as a result of a natural monopoly or of ruinous competition. Similarly, insurance products do not have the characteristics of a public good, so this also cannot justify an insurance-specific market failure.

b) Information failure

Things are different when it comes to information-related market failures in the insurance sector. Incomplete information or disproportionately high costs related to the provision of information in combination with the time lag between premium and insurance payments are major causes of information asymmetries and uncertainties. Basically, they may cause draw-backs for each of the two parties: Ex ante policyholders' lack of information about the insurance quality (e.g. in terms of the insurer's financial strength) may lead to a process of adverse selection: insurers of poor creditworthiness squeeze financially sound competitors out of the market. In an extreme case, the market for high quality insurance is running dry (similar to Akerlof's Market for Lemons [34]). On the other hand, information asymmetries which are to the disadvantage of the insurer are also possible. For instance, this may arise due to a lack of information about the policyholder's actual risk profile. As a consequence this could lead to a risk inadequate high pricing, followed by a pareto-inefficient low level of insurance entries. While in the first case there is a failure of competition in terms of non-functional selection processes, in the second example the market fails with respect to its coordination function.

c) Externalities

Insurance markets are known to face some other types of information deficiency which are not to be addressed here. More interesting are alleged types of insurance market failures due to adverse external effects. In general, they arise when an economic transaction imposes costs (or benefits) on individuals who are not party to the transaction. In the insurance context, avoiding negative externalities resulting from an insurer's failure is the main rationale to justify the prevailing microprudential insurance solvency regulation. One example is the failure of a life insurer which could negatively affect the retirement income of a life or an annuity insurance beneficiary. In the worst case, this would have to be compensated by social benefits at the expense of the public [35]. In addition, the failure of an

insurer is sometimes considered to be conceivably the cause of a loss of trust towards the entire insurance industry. Adverse effects with respect to the lapse rate and the willingness to conclude new insurance contracts might be some potential consequences.

Even if one disregards discrepancies between the externalities of an insurer's failure and the above mentioned definition of a market failure, from a normative perspective other issues remain valid, making this regulatory rationale appear highly questionable. Firstly, the externalities of corporate failures are not restricted to the insurance sector. They may also result from failures of any other industry corporations. In this respect, such externalities are not insurance-specific and therefore cannot justify an insurance-specific regulation. On the other hand, to avoid the negative external effects of an insurer's insolvency is not least motivated by the interests of consumer protection. However, consumer protection is not - as here required - an economical regulatory rationale, but a social one.

The theory of market failure also examines externalities caused by insufficiently enforceable property rights. This issue is known as the tragedy of the commons. It arises whenever it is impossible to exclude someone from consuming a good, but nevertheless there is some rivalry between actors in its use. This bears the risk of a (social) dilemma: acting individually and rationally by following one's own self-interest, from a social point of view turns out to be irrational and leads to suboptimal results.

This phenomenon, known in game theory as the Prisoners' Dilemma, is applicable to the good "well-functioning of the insurance industry". To illustrate this, the example of the already mentioned asset fire sales can be used (see subsection 2.3). If a sufficiently large number of insurers, each of them acting in its individual best interest, simultaneously sell parts of their security holdings, these sales at the macro-level could collectively trigger a downward spiral of declining asset values. As a consequence, the risk-bearing capacity of all the insurance companies operating in the market would shrink. A reduction or the

total disappearance of insurance capacity would be the likely outcome. That means the insurance industry would no longer, or would only to a limited extent, fulfil its core function within the financial system - risk transfer and risk pooling. Thus, what is described in economic theory as the "tragedy of the commons" can cause a serious dysfunction of real insurance markets.

It has to be mentioned that the specific nature of insurance production as a compound production of risk pooling and asset management is one essential element in this causal chain. Furthermore, some other factors such as the orientation on short-term profit targets, the transition to a comprehensive fair value accounting, or the formation of large financial conglomerates with uniform policy guidelines, contribute to a tendency for aligning the entities' individual risk exposures. Thus, particularly in times of an adverse economic environment, acting individually and rationally, from a social point of view, more often turns out to be crisis reinforcing herd behaviour.

At this point one must add a general remark: according to the normative theory of regulation, any market failure is a necessary, but not a sufficient condition to consider regulation to be justified. First of all, it always has to be checked whether any other market-consistent solution exists. Even if there is no such market solution, regulatory interference is justified if it results in an improved outcome compared to pure market coordination.

5 Conclusion

The existing prudential insurance regulation focuses predominantly on the institutional level by aiming to safeguard each individual entity's solvency. This microprudential approach is said to be justifiable by information-related market failures and negative externalities of an insurance insolvency. At the same time, some industry representatives claim that the insurers' core activities – unlike those

of banks – are not systemically relevant and do not pose any systemic risk. Thus, it is concluded that there would be no need for a system-oriented regulatory approach with respect to insurance.

However, as our considerations have shown, the insurance industry is crucial for the efficient functioning of the financial system as a whole. Thus insurers' activities in general are very much of systemic relevance in terms of potential economic costs in the case of failure or malfunction. Furthermore, it could be shown that insurance regulation aimed at safeguarding the function of risk transformation is of public interest as well as justifiable with regard to a potential market failure. Safeguarding this function as the very purpose of regulation means ensuring the availability of a sufficiently large insurance capacity. To this end, not only is an individual insurance company required, but rather the survival of the insurance industry as a whole. This finding implies a regulatory focus, which also includes the system level.

Thus, from a theoretical regulatory perspective some important ingredients for the justification of a macroprudential insurance regulation can be identified. The answer to the question of whether a micro- or macroprudential approach to insurance regulation is an adequate one largely depends on the purpose of the regulation pursued. In the context of normative economics, in this regard system related motives dominate, so here a macroprudential approach to regulation would be justified.

References

- [1] European Commission, Regulating financial services for sustainable growth, (June 2010), 1-11.
http://ec.europa.eu/internal_market/finances/docs/general/com2010_en.pdf

- [2] European Systemic Risk Board, 16 December 2010 – European Systemic Risk Board established, Press Release.
http://www.esrb.europa.eu/news/pr/2010/html/pr101216_3.en.html
- [3] Basel Committee on Banking Supervision, Review of the Differentiated Nature and Scope of Financial Regulation, Bank for International Settlements, (January 2010). <http://www.bis.org/publ/joint24.pdf>
- [4] Swiss Re, Regulatory issues in insurance, *sigma*, No **3/2010**, (July 2010), 2.
<http://www.swissre.com/sigma/>
- [5] S.E. Harrington, The Financial Crisis, Systemic Risk, and the Future of Insurance Regulation, *Issue Analysis Policy Papers*, NAMIC, (September 2009), 9. http://www.naic.org/documents/topics_white_paper_namic.pdf
- [6] M. Brunnermeier, A. Crocket, C. Goodhart, D. Persaud and H. Shin, The Fundamental Principles of Financial Regulation, *Geneva Reports on the World Economy* **11**, (January 2009).
<http://www.princeton.edu/~makus/research/papers/Geneva11.pdf>
- [7] S. Morris and H. Shin, Financial Regulation in a System Context, *Brookings Papers on economic activity*, (September 2008), 4.
http://www.brookings.edu/economics/bpea/~media/Files/Programs/ES/BPEA/2008_fall_bpea_papers/2008_fall_bpea_morris_shin.pdf
- [8] P. Clement, The Term ‘Macroprudential’: Origins and Evolution, *BIS Quarterly Review*, (March 2010), 59-67.
http://www.bis.org/publ/qtrpdf/r_qt1003h.pdf
- [9] A. Crockett, Marrying the micro- and macroprudential dimensions of financial stability, *BIS Speeches*, (September 2000).
<http://www.bis.org/review/rr000921b.pdf>
- [10] C. Borio, Towards a Macroprudential Framework for Financial Supervision and Regulation?, *BIS Working Paper* No **128**, Bank for International Settlements, (February 2003). <http://www.bis.org/publ/work128.pdf>

- [11] G. Galati and R. Moessner, Macroprudential policy – a literature review, *BIS Working Papers* No **337**, Bank for International Settlements, (February 2010).
<http://www.bis.org/publ/work337.pdf>
- [12] Bank for International Settlements, Macroprudential Instruments and Frame-work: Stocktaking of Issues and Experiences, *CGFS Papers* No **38**, Committee on the Global Financial System, (May 2010).
<http://www.bis.org/publ/cgfs38.pdf>
- [13] C. Goodhart, A Framework for Assessing Financial Stability, *Journal of Banking & Finance*, **30**, (2006), 3414-3422.
- [14] Bank of England, The role of macroprudential policy, *Discussion Paper*, (November 2009).
<http://www.bankofengland.co.uk/publications/other/financialstability/roleofmacroprudentialpolicy091121.pdf>
- [15] Financial Stability Board, Bank for International Settlements, International Monetary Fund, Guidance to Assess the Systemic Importance of Financial Institutions, Markets and Instruments: Initial Considerations, *Report on the G-20 Finance Ministers and Central Bank Governors*, (October 2009).
<http://www.imf.org/external/np/g20/pdf/100109a.pdf>
- [16] International Association of Insurance Supervisors, Systemic risk and the insurance sector, (October 2009). http://www.iaisweb.org/__temp/Note_on_systemic_risk_and_the_insurance_sector.pdf
- [17] European Central Bank, Financial Stability Review, (December 2009), 134-142. <http://www.ecb.int/pub/pdf/other/financialstabilityreview200912en.pdf>
- [18] M. Prokopczuk, Intra-Industry Contagion Effects of Earnings Surprises in the Banking Sector, *Essays on Systemic Risk*, (2009), 63-90.
http://madoc.bib.uni-mannheim.de/madoc/volltexte/2009/2286/pdf/Prokopczuk_FinalVersion2.pdf
- [19] C. Borio, Implementing the Macroprudential Approach to Financial Regulation and Supervision, Banque de France, *Financial Stability Review*, **13**, (September 2009).

- http://www.banque-france.fr/gb/publications/telechar/rsf/2009/etude04_rsf_0909.pdf
- [20] W. Wagner, *Diversification at Financial Institutions and Systemic Crisis, Discussion Paper, 2006-71*, University of Cambridge and Tilburg University, (2006).
- [21] P.S. Rose, *Money and Capital Markets: The Financial System in an Increasingly Global Economy*, 5th ed., Richard D. Irwin Inc., Illinois, 1994.
- [22] P. Albrecht, *Zur Risikotransformationstheorie der Versicherung: Grundlagen und ökonomische Konsequenzen*, Karlsruhe, 1992.
- [23] P. Zweifel and R. Eisen, *Versicherungsökonomie*, 2. Auflage, Berlin et al, (2003).
- [24] M. Wolgast, *Die Auswirkungen der Finanz- und Wirtschaftskrise auf die Versicherungswirtschaft, 8th. Annual conference Mannheimer Forschungsinstitut für Ökonomie und Demographischer Wandel*, University Mannheim (MEA), (November 2009).
http://www.mea.uni-mannheim.de/fileadmin/files/events/konferenz2009/Wolgast_2009.pdf
- [25] Committee on the Global Financial System, *Fixed income strategies of insurance companies and pension funds, CGFS Papers, 44*, Bank for International Settlements, (June 2011). <http://www.bis.org/publ/cgfs44.pdf>
- [26] International Association of Insurance Supervisors, *Position statement on key financial stability issues*, (June 2010).
http://www.iaisweb.org/_temp/IAIS_Position_Statement_on_Key_Financial_Stability_Issues.pdf
- [27] P.M. Liedtke, *Insurance Activity as a Regulatory Object: Trends and Developments and their Appreciation in the Context of Post-Crisis Global Markets*, in Liedtke, P. M., Monkiewicz, J. (Ed.), *Regulation and Supervision – A Global Perspective*, Palgrave Macmillan, Houndmills, UK, (2011), 7-22.
- [28] German Insurance Association, *The Positions of German insurers*, 2011, (May 2011).

[https://secure.gdv.de/gdv-veroeffentlichungen/user/control.php?EVENT=category
&ACTION=showOffers&catID=5](https://secure.gdv.de/gdv-veroeffentlichungen/user/control.php?EVENT=category&ACTION=showOffers&catID=5)

- [29] Committee European d' Assurance, Insurance: a unique sector – Why insurers differ from banks, (June 2010).
http://www.cea.eu/uploads/Modules/Publications/1277383780_cea-report-insurance-a-unique-sector.pdf
- [30] The Geneva Association, No Systemic Risk from Insurance Core Activities -Findings of The Geneva Association Special Report on Systemic Risk in Insurance, *Press Release 1-10*, The Geneva Association, (February 2010).
http://www.genevaassociation.org/pdf/Extras/Press_Release_1-10.pdf
- [31] The Geneva Association, Systemic Risk in Insurance, *Special Report of The Geneva Association Systemic Risk Working Group*, (March 2010).
http://www.genevaassociation.org/PDF/BookandMonographs/Geneva_Association_Systemic_Risk_in_Insurance_Report_March2010.pdf
- [32] J. den Hertog, Review of economic theories of regulation, *Discussion Paper, 10-18*, Tjalling C. Koopmans Research Institute, Utrecht School of Economics, Utrecht University, Utrecht, (2010).
http://www.uu.nl/SiteCollectionDocuments/REBO/REBO_USE/REBO_USE_OZZ/10-18.pdf
- [33] M.B. Adams and G.D. Tower, Theories of Regulation: Some Reflections on the Statutory Supervision of Insurance Companies in Anglo-American Countries, *The Geneva Papers on Risk and Insurance*, **19**(71), (1994), 156-177.
- [34] G.A. Akerlof, The Market for „Lemons“: Quality Uncertainty and the Market Mechanism, *Quarterly Journal of Economics*, **83**(3), (1970), 488-500.
- [35] S. Schuckmann, The Impact of Solvency II on Insurance Market Competition - An Economic Assessment, *Working Paper Series in Finance*, **58**, Institute of Insurance Economics, University of St. Gallen, (August 2007).
[http://www.finance.unisg.ch/org/finance/web.nsf/syswebresources/wp58/\\$file/wp58.pdf](http://www.finance.unisg.ch/org/finance/web.nsf/syswebresources/wp58/$file/wp58.pdf)