

# Agenda

## Advancing economics in business

### How systemically important are insurers? Empirical evidence and policy implications

Due to concerns about insurance companies posing systemic risk during financial crises, some of the largest global insurers have been classified as systemically important, alongside the banking sector, and are subject to additional prudential regulation. But how systemically important are they, and what is the appropriate regulatory approach? Professor Dr Christoph Kaserer, Technische Universität München and Oxera Associate, and Christian Klein, Technische Universität München, have explored these issues and identified important policy implications for the insurance sector

During the financial crisis of 2007–09, many banks were on the brink of failure, but so was at least one major insurer. Fears of further market dislocation if US-based insurer, American International Group (AIG), were to fail ultimately triggered unprecedented government intervention. Following the events of the financial crisis, global regulators scrutinised the issue of potential systemic risk in the insurance sector. In 2013, the Financial Stability Board published a list of global systemically important insurers (G-SIIs) based on an initial assessment methodology developed by the International Association of Insurance Supervisors (IAIS). The November 2016 update of the list comprises nine firms, including UK-based Aviva and Prudential, and Germany-based Allianz. These insurers are required to adhere to higher capital standards, as well as to implement recovery and resolution plans. Notably, no reinsurer has been designated as systemically important to date.

#### Comparing the banking and insurance industries

The question of whether insurers pose a notable systemic risk for the wider financial system has given rise to much controversy. Tracing that debate, we first examine the analogy between the insurance sector and the banking sector. Banks pose systemic risks for three main reasons.

- **Bank runs.** Banks engage in liquidity and maturity transformation.<sup>1</sup> This exposes them to liquidity problems during times of financial turmoil, when customers may withdraw their short-term deposits.
- **Contagion.** Banks are highly interconnected via the interbank and derivatives markets. The impairment

of a particular bank may thus spread to other, initially unaffected, institutions.

- **Negative externalities.** In a state of crisis, banks are likely to reduce their lending activities. This slump in financial intermediation may trigger a severe economic downturn as corporations find themselves unable to finance their operations.

It is not always clear whether these arguments also hold for the insurance sector. On the one hand, the insurance balance sheet lacks many of the characteristics associated with systemic risk in banks. Insurers have less liquid and much more long-term liabilities than banks. A run on insurers thus seems much less likely than a bank run and, if one did occur, it would be likely to primarily affect the life insurance sector. Lapse and surrender charges, however, can reasonably be expected to limit policyholder action. Furthermore, insurers are arguably also less interconnected than banks. Direct linkages among insurers should be limited to the use of reinsurance and to derivatives contracts. Derivatives usage is likely to be most prevalent in the bond and mortgage insurance sector.

On the other hand, a possible negative externality caused by a crisis in the insurance sector cannot easily be dismissed. Most importantly, such externalities arise among those insurers that play an important role in financing the real economy, such as life insurers, bond and mortgage insurers, and, to a certain extent, reinsurers. In this regard, it is of secondary importance whether the insurance sector is directly connected to the real economy, by buying instruments of corporate issuers in the bond and stock markets, or indirectly, by financing banks and sovereigns. Over recent decades, the distinction between

the banking sector and the insurance sector has blurred. As a consequence of this ongoing convergence, the financing of the real economy by insurers has gained in importance.

## Measuring systemic risk in financial markets

Overall, these theoretical considerations show that there are good reasons to consider the insurance sector as less systemically risky than the banking sector. At the same time, however, systemic risk in insurance cannot be denied completely. Ultimately, it is an empirical judgement whether the insurance sector is systemically risky, and if so, to what extent and why. These issues have appeared on capital market researchers' agendas, and empirical approaches have emerged.

An array of systemic risk measures have been proposed in the academic literature, most of which have been developed to assess systemic risk in the banking sector.<sup>2</sup> An important strand of the literature on systemic risk in insurance adapts these methodologies to assess the role of insurers. Importantly, systemic risk in insurance should not be considered in isolation, but needs to be measured relative to the systemic risk of the financial system as a whole. Naturally, banks provide a benchmark for insurers.

When assessing systemic risk, regulators and researchers alike are interested in the likelihood of financial crises and the losses caused by financial turmoil. Given that there is no universal definition of systemic risk, and that this risk is unlikely to be captured by any single measure, empirical assessments should be based on a range of diverse systemic risk indicators. We outline a set of systemic risk measures below, and then use them to look at systemic risk in insurance.

The first measure we consider is the distress insurance premium (DIP),<sup>3</sup> a condensed measure of the likelihood and severity of financial crises. Intuitively, this measure reports the premium that the financial system would have to pay for a hypothetical insurance policy that covered the losses that financial crises inflict on depositors, policyholders, investors, and other creditors of financial institutions. The contribution of an individual financial institution to aggregate systemic risk can then be determined as the part of the insurance premium that the firm would have to pay.

To fully appreciate systemic risk in insurance, we also consider two complementary firm-level risk measures. These isolate the probability of distress events, and can be implemented seamlessly and meaningfully in the DIP framework.<sup>4</sup> The first is the conditional probability of default (CoPD), which evaluates the likelihood that an individual firm will fail during a systemic crisis. The second is the conditional probability of systemic distress (CoPSD). Reversing the conditioning, this measure evaluates the likelihood that a systemic crisis will take place if a given firm experiences severe distress. The CoPD thus captures a

firm's vulnerability to financial turmoil, whereas the CoPSD captures the firm's potentially destabilising effect on the financial system as a whole. In that sense, the CoPD relates to *microprudential* regulation. Regulatory actions guided by this measure will aim at sheltering the firm against exogenous shocks. The ultimate goal is to protect the firm's depositors, policyholders, investors and other creditors. The CoPSD, on the other hand, relates to *macroprudential* regulation. Interventions that aim to manage this measure will try to reduce the firm's destabilising effect on the wider financial system. The ultimate goal is to limit economic costs in terms of aggregate output.

The aggregate and firm-level systemic risk measures discussed above can be computed using credit default swaps (CDSs).<sup>5</sup> The spreads of these credit derivatives reflect not only the default risk of an individual financial institution, but also its interdependency with the financial sector as a whole. Estimating the systemic risk measures from CDS spreads offers several advantages. CDS spreads account for all information available to financial markets. They reflect a forward-looking assessment of a firm's credit risk, rather than the backward-looking assessment delivered by financial statements. Moreover, a body of research has revealed that CDS spreads incorporate new information in a more timely fashion than, say, bond spreads or credit ratings, and that the CDS market is a better indicator of systemic risk than the stock market.<sup>6</sup>

## Empirical evidence on systemic risk in insurance

In an empirical study<sup>7</sup> based on this methodology, we highlight an important ambiguity between the systemic risk of the insurance sector as a whole and the systemic importance of individual insurance companies. Indeed, we find that the insurance sector as a whole accounted for less than a tenth of the global financial system's aggregate systemic risk, even during the financial crisis and the ensuing European sovereign debt crisis. This contribution is driven mostly by the multi-line and life insurance sectors.

While the insurance sector as such is not a major contributor to systemic risk, we identify a limited number of insurance companies that individually still appear to be systemically important. Among the financial institutions with the highest marginal DIP—that is, the highest individual contributions to aggregate systemic risk—we classify numerous banks, and some large insurers from the multi-line insurance and life insurance segments. These insurers, as well as some reinsurers, also have a potentially destabilising effect on the financial system as a whole, as measured by the CoPSD. Property & casualty insurers and bond and mortgage insurers come in low in either ranking, and therefore do not appear to be systemically important. However, in our simulations these insurers differ substantially in terms of vulnerability to financial crises, as measured by the CoPD. Property & casualty insurers appear to be resilient to systemic shocks. Bond and mortgage insurers, however,

rank among the most distressed financial institutions when a systemic event strikes.

Our empirical findings are consistent with the previous theoretical argument that systemic risk in insurance is not obvious. For many of the insurers' traditional business activities, such as property & casualty insurance, systemic risk is not expected. This may well be the reason why the systemic risk contribution of the insurance sector as a whole is rather limited. Nonetheless, business activities that entail high interconnectedness and large externalities, such as life insurance and reinsurance, may well indicate an elevated level of systemic risk.

## Policy implications

These results have implications for the regulation of systemic risk in financial markets. On the one hand, the insurance sector's contribution to aggregate systemic risk is relatively contained. Our results therefore do not support a tighter regulation of the insurance sector in general. Rather, we advocate that the majority of the regulatory effort to enhance financial stability should be directed towards the banking sector. The insurance sector's contribution to aggregate systemic risk should still be monitored closely to provide an early warning signal should the risk increase in the future.

On the other hand, some individual insurers appear to be as risky as systemically important banks. Selectively stricter regulation of systemic risk in insurance may therefore be justified. Importantly, insurers' systemic importance appears to cluster by business activity. A differentiating regulatory approach should thus focus less on insurance entities than on the different business activities that these entities undertake. Under such an activity-based approach, activities that are not systemically risky should not be targeted with additional regulation. Regulatory action may, however, be taken for activities that indicate systemic risk. The full regulatory toolkit should be considered when deciding how to target those activities.

One way of regulating certain systemically risky business activities in insurance might be through additional capital requirements that scale with the activities' contribution to systemic risk. Other activities may be better targeted through enhanced reporting standards, the requirement to create recovery and resolution plans, or caps on business volume. Overall, a well-designed activity-based regulation of systemic risk would provide insurers with clear incentives to curtail those activities that contribute most to systemic risk. In particular, it would provide a clear indication of how insurers with a high share of such activities could shed their implicit systemic risk tag. If activity-based regulation were applied more broadly across financial sectors, it would further effectively prevent regulatory arbitrage—that is, the shifting of systemically risky business activities to less regulated parts of the financial system.

## Concluding remarks

Having reviewed the current regulatory approach against our policy recommendations, we endorse the recent announcement that the IAIS intends to investigate an activities-based approach towards systemic risk in insurance. The current institution-based approach of the Financial Stability Board, however, which focuses on nine G-SIIs, does not seem convincing.

When designing future methodologies to monitor and regulate systemic risk in insurance, regulators need to take into account ongoing changes in the insurance business model, as well as new risks faced by insurance companies. Whereas in the past property & casualty insurers focused on insuring idiosyncratic risks, and did not appear in our study to be systemically risky, the industry has recently seen increasing demand for insuring cyber risk, which may be systemic by its very nature. Even though this is an operational risk, it would be important to better understand the financial market ramifications of such an event. Unfortunately, we currently do not know much about it, but it should become a much more important topic in future research.

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The views in this article are those of the authors alone.

<sup>1</sup> Banks typically have assets that are less liquid and of longer duration than their liabilities. For example, banks typically borrow short-term from depositors, while lending longer-term to borrowers, such as through mortgages.

<sup>2</sup> For example, see Lehar, A. (2005), 'Measuring systemic risk: A risk management approach', *Journal of Banking & Finance*, **29**, pp. 2577–603; Adrian, T. and Brunnermeier, M. (2008), 'CoVaR', Federal Reserve Bank of New York Staff Reports, **348**, pp. 1–8; and Huang, X., Zhou, H. and Zhu, H. (2009), 'A Framework for Assessing the Systemic Risk of Major Financial Institutions', *Journal of Banking & Finance*, **33**:11, pp. 2036–49.

<sup>3</sup> Huang, X., Zhou, H. and Zhu, H. (2009), 'A Framework for Assessing the Systemic Risk of Major Financial Institutions', *Journal of Banking & Finance*, **33**:11, pp. 2036–49.

<sup>4</sup> To be precise, we implement the two risk measures discussed below as measures of the risk-neutral probability of the underlying events. The measures therefore not only capture physical default probabilities, but also incorporate a risk premium component that reflects market participants' risk preferences. They are thus best thought of as risk-adjusted likelihood indicators.

<sup>5</sup> A CDS is a derivative designed to transfer the credit exposure of fixed income products (such as corporate bonds or government bonds) between two or more parties.

<sup>6</sup> For example, see Norden, L. and Wagner, W. (2008), 'Credit Derivatives and Loan Pricing', *Journal of Banking & Finance*, **32**:12, pp. 2560–9; or Rodríguez-Moreno, M. and Peña, J.I. (2013), 'Systemic Risk Measures: The Simpler the Better?', *Journal of Banking & Finance*, **37**:6, pp. 1817–31.

<sup>7</sup> Kaserer, C. and Klein, C. (2016), 'Systemic Risk in Financial Markets: How Systemically Important Are Insurers?', Working Paper, Technical University of Munich, <https://ssrn.com/abstract=2786947>.