



Topics Nr. 18

Systemic Risk in Insurance

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To promote the international exchange of scientific ideas through the development of and collaboration in joint research projects in insurance science, Gen Re has instituted a visiting professorship in insurance science. Once a year, Gen Re will invite an internationally renowned, top-class scientist in this field to come to the University of Cologne as a visiting professor. The first visiting professor, Dr. Mary A. Weiss from the Fox School of Business, Temple University, Philadelphia, offered a course entitled, "Actuarial Applications in Risk Management and Insurance". In July 2010, she gave a lecture to clients and colleagues from Gen Re on "Systemic Risks," as part of the first Industry Lecture Day.

The financial literature contains many definitions of systemic risk. For the purposes of this article, systemic risk is defined as "the risk of adverse consequences that reverberate across a large segment of the financial sector as a whole, posing a potentially grave effect on the economy." Systemic risk may arise from interconnectedness among financial institutions that cascades

throughout the financial system (like a domino effect) or from a significant common shock to which many financial firms have a large exposure. A systemic crisis typically leads to an increase in the cost and reduction in the availability of capital. These affect demand and supply in the economy for an extended period, so, e.g., the gross domestic product goes down.

Primary factors associated with systemic risk

■ Contagion/interconnectedness/correlation

The classic case of an unfolding systemic crisis is a run on the bank. Bank runs can occur if depositors or counterparties lose confidence in the banking system as a whole – similar to the Great Depression – customers recognize that a bank may be weak and rush to withdraw their funds. Since banks only hold fractional reserves, they will be unable to meet all withdrawal demands and may become bankrupt.

But according to academic research: “There is little if any empirical evidence that ... bank depositors run on economically solvent banks very often or that, when they do, they drive these banks into insolvency ... Banks fail because of exposure to a common shock such as a depression in agriculture, real estate or oil prices, not because of direct spillover from other banks without themselves being exposed to the shock.”¹

And this appears to be the case in the current crisis. It was precipitated by the bursting of the housing price bubble, which exposed guarantees to loss where no loss had been expected. Thus the root cause of most systemic crises can be found in a major market shock rather than the failure of one or a few institutions due to idiosyncratic factors. What happened in the current crisis was not so much of a bank run as

a freezing up of the inter-bank loan market. Banks regularly borrow and loan money to each other. After the bursting of the housing bubble, banks didn't know how affected other banks were and tended to hoard their cash rather than lend it out. This disrupted basic banking operations.

But what would happen if a run on an insurer occurred? In this case there would likely be no spillover effects to other financial institutions either within or outside of the insurance sector. It is true that insurers hold a significant amount of banks and securities firms' bonds or borrowed money, but these are not major sources of financing for these institutions.

As far as insurance internationally is concerned, the Geneva report² indicates that insurers' exposures to other financial institutions are in line with industry weights in equity and debt indices, thus insurers would not transmit a systemic shock to other parts of the financial system or even amplify systemic risk because of their investments.

There are some types of losses that are correlated, with most notable examples being for natural catastrophes or pandemics. But these risks can be dealt with through reinsurance. It is worth noting that even though correlation in losses exists, neither credit markets were frozen nor were there major spillover effects into the general economy in the U.S. Further, even though catastrophic events can sometimes entail extremely large losses, they are typically small in comparison to the failure of a major bank. The losses of USD 73 billion from Hurricane Katrina were spread over several insurers and reinsurers, and this loss is not so large when you consider that when Lehman Brothers went bankrupt, its outstanding debt was USD 155 billion.

Internationally insurers' and reinsurers' aggregate capital is sufficient to cover even huge potential catastrophes – even enough to cover three times the worst year in catastrophic losses combined with a pandemic of historic proportions in the same year.³

In conclusion, the risk of interconnectedness or correlation in insurance causing a systemic crisis in the U.S. is negligible.

■ Substitutability

Problems can occur when a vital product is removed from the market. If other market participants cannot step in quickly with a substitute financial product, market disruption may spill over into the general economy.

There are some types of insurance that are required by law. If these products were to become unavailable for some reason, the disruption should be very short, as new capacity through reinsurance can come into the market, and surplus lines insurance might be used to fill a void. Surplus lines insurers are insurers that are not licensed to operate in the state but are allowed to offer coverage because of a shortage of capacity for some types of insurance.

It is true that some types of insurance may become unavailable at least for a certain period of time. For example, after 9/11 there was a shortage of most types of commercial property and liability insurance in the U.S. The reason for this was that insurers assessed terrorism risk to be uninsurable. Some people would say as a result of this that insurance is systemically risky. It is difficult to understand how failing to underwrite a risk that might de-stabilize the industry is evidence of systemic risk. In fact, by not writing the risk, solvency is enhanced; this would reduce any systemic risk in the industry.

■ Concentration

Concentration may be related to substitutability, if there is significant concentration in some type of critically important type of financial product.



Significant concentration in this case means that an important type of coverage could become scarce. For example, if only one or two insurers sell some important type of product, a failure of one of them could cause a big problem. But concentration can occur in other places as well. In the current crisis, concentration of investments in subprime mortgages led to extreme losses among many financial institutions.



In insurance, concentration in investments needs to be assessed as well as concentration within insurance groups. Insurers' investments tend to be conservative in nature; and to the extent possible they match the maturity of assets with liabilities. Internationally, insurers have a strong tradition of enterprise risk management and highly regulated balance sheets. Both of these serve to limit the proportion of assets at risk.

systemic risk. As noted earlier, disruptions in the U.S. product market for some type of insurance product most likely would be mitigated through reinsurance and/or surplus lines.

■ *Infrastructure*

Infrastructure refers to critical resources required for an activity. Financial distress at institutions that are part of

elimination of bank runs comes at a cost: The presence of federal deposit insurance removes market discipline;⁵ demand depositors do not have an incentive to monitor the bank for riskiness and safety, and bank deposit insurance is usually underpriced for banks, creating a moral hazard problem, as their premiums do not go up if they become riskier.

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As an industry, insurance is concentrated in a relatively small number of groups. But it is misleading to assess concentration purely on group statistics. Insurance companies are regulated at the state level, and if one or more insurers in a group exhibit signs of financial distress, state regulators act to “ring-fence”⁴ the assets of the remaining insurers in the group. This protects the other insurers in the group from the spread of financial distress. The insurance industry may be somewhat susceptible to concentration, but concentration is just one factor associated with

the financial or payment infrastructure can have spillover effects on the general economy. Banks are part of the payment system so that large-scale bank failures can have a significant effect on the payment system and the economy. The U.S. insurance industry, however, is not part of the financial or payment infrastructure and does not impose any risk in this regard.

■ *Regulation and government policy*

Government insurance protection has a large bearing on whether depositor-led bank runs occur. But the

With respect to regulation and the current U.S. crisis, Harrington notes: “Banking regulation permitted and probably encouraged high leverage, aggressive investment strategies, inadequate capital requirements for risky loans and securitizations, and complex off-balance sheet vehicles, often financed by commercial paper, all taking place within the framework of government deposit insurance and TBTF [too big to fail] policy.”⁶

Regulation that may benefit the solvency of the regulated financial institution can exacerbate a crisis. For example, bank capital requirements help to promote bank solvency. But if capital is depleted by a systemic crisis, then just at the time when credit would be most needed in the economy, financial institutions would be less able to make loans (or extend credit).

As in banking, some moral hazard in the operation of insurance guaranty funds exists, as guaranty fund premiums are not risk based. This feature of guaranty funds can lead to excessive risk-taking in insurers.



Offsetting this fact, however, is that insurance company guaranty funds have claim payment limits. Therefore, there is an incentive to monitor insurers by policyholders. In other words, there is more market discipline in insurance than for banks.

Secondary factors associated with systemic risk

■ Leverage

Leverage is usually defined in terms of the relative amount of a firm's debt versus equity. It can also be created through options, buying securities on margin or through some financial instruments. Leverage is related to systemic risk because when a shock or run on the bank hits a financial firm, the ability of the firm to absorb its effect is determined by how much debt it has relative to equity. Firms with higher leverage have relatively less equity to absorb shocks and, thus, are more likely to experience financial distress. This financial distress, in turn, can affect counterparties. Volatility is associated with systemic crises, and more highly leveraged firms are also less likely to withstand the market volatility associated with systemic events.

Property/casualty insurers are less highly leveraged than life/health insurers. On average, equity capital

accounts for 35% of assets for property/casualty insurers, and the U.S. life insurers are more highly leveraged; it is on a par with banks with an equity capital approximately 10% of assets. It would seem that life/health insurers would be much more susceptible to a systemic event than property/casualty insurers. As they are so highly leveraged, their ability to sustain a large market shock may be limited.

■ Size

The size of a firm is typically associated with the term "too big to fail, TBTF." Size may be important if it is associated with large spillover effects, i.e., it is reasonably possible that a large financial institution may be engaged in significant transactions with other financial institutions, which might result in potential spillover effects into the general economy if the large firm failed.

A lesson learned from the current financial crisis is that size measured by assets may not capture the impact an institution can have on the market or economy. This is the reason why I don't include size among the primary factors for systemic risk. Meanwhile the term TBTF is being replaced with Systemically Important Financial Institution (SIFI) in recognition that size is not an adequate proxy for spillover effects.

The insolvency of a large insurer in the U.S. is unlikely to cause a systemic crisis. An insurer simply doesn't hold a significant amount of total market credit debt or equities to cause a shock in these markets. Even if you look only at corporate credit market debt, the assets of the largest life and nonlife insurance groups accounted for less than 3% of total corporate debt outstanding. This means that the insolvency of one of the largest insurance groups would not have a significant impact on credit markets in terms of credit market debt outstanding.

Further, using size (e.g., total assets) as a measure for systemic risk for insurers is misleading. Insurers typically have a large amount of assets on hand when they become insolvent, because premiums are collected in advance of loss payments. For example, in life insurance in the U.S., when insolvency occurs, the shortfall in assets relative to liabilities is usually in the range of 5% to 10%. And this shortfall is typically not payable immediately when the insolvency occurs. Rather, the insurer is put into run-off so that funds to pay for the shortfall may not be needed until years in the future.

Moreover, merely using size does not take into account how diversified an institution is. Size can indicate an

institution is systemically risky when its exposures are concentrated in one area. However, when size is associated with diversification, it may indicate reduced systemic risk. Insurers are diversified institutions both with respect to their assets and liabilities.

■ Liquidity

In the event of a run on the bank or an unexpected demand for cash to settle contracts (for example, after a downgrade) the liquidity of the institution is important. Liquidation of relatively illiquid assets (such as long-term assets) at an inopportune time can create losses or even failure for a financial institution. Securities lending is a case in point in the most recent financial crisis. As the market dropped, counterparties that had provided collateral in exchange for the ability to hold loaned securities from other institutions demanded the return of their cash collateral. In the meantime the lender had invested the cash collateral from these securities lending transactions in other assets, which had fallen in value – in many cases significantly. Typically, the lender would sell these investments to meet the cash collateral demands, but during the current crisis the prospect of significant losses prevented this, creating a liquidity problem for the security lender. If many firms experience liquidity problems at the same time, asset prices in the capital markets can be (further) affected adversely if massive sales of assets are required to meet claims. This in turn can affect the investment values of otherwise solvent firms, potentially placing them in financial distress.

Liquidity problems can arise for insurers if a run on an insurer occurs. The probability of this happening varies by life and nonlife. A run on a nonlife insurer is unlikely. Insurers provide coverage for exogenous events such as property damage and liabilities, so policyholders cannot withdraw these funds on demand. They are entitled to a return of premiums for coverage not yet provided if they cancel their insurance. In this case the insurer merely returns the prepaid premiums to policyholders – U.S. property/casualty insurers usually hold

some liquid assets so cancellation of insurance policies should not be a problem.

Some life insurance products, however, involve asset accumulation and also allow for the policyholder to withdraw cash values whenever he wants. Life insurers do hold some illiquid assets – they search for favorable credit spreads and invest in some of the complicated illiquid investments that banks invest in. Therefore, in principle, a run on a life insurer could be a problem. In particular, some policies' performance is tied to the market so that in times of extreme market swings, there can be demand for cash values. So life insurers can add to some market disruptions once a systemic event occurs. But premature surrender of a life policy usually entails severe penalties to the policyholder so that he takes a severe haircut and there is usually a delay in receiving payment. These make premature withdrawal of funds undesirable for policyholders. Furthermore, the presence of guaranty funds also makes cancellation of life insurance policies less likely.

Historically speaking, lapse rates may not be much of an issue for life insurers. For example, during the recent crisis, lapse rates apparently did not increase much for Germany. Even in the event of negative media reports about an insurer's safety, lapse rates appear to remain stable.

Internationally, insurers did not suffer from a systemic liquidity shock in the current crisis. In part this is due to the fact that they are prefunded by a steady stream of predictable premium cash flows and they practice careful liquidity management. Insurers are cash flow positive. Therefore, overall, the cancellation threat for life insurers is considered to be small.

Conclusion

Overall, insurers are not instigators or causes of systemic risk. They are already well regulated for solvency purposes. As a result, in the U.S., direct regulation of insurers for systemic risk is not necessary. Instead, regulation should be focused on forestalling systemic market shocks. It would not be fruitful to focus on institutions that are considered too big to fail, if market shocks are really the problem.

This does not mean that insurance regulation cannot be improved – especially with respect to group supervision.

As insurers are important financial intermediaries, they are susceptible to systemic crises once they occur. This gives insurance regulators an inherent interest in any systemic risk regulation that is put in place.

¹ George G. Kaufman, Kenneth E. Scott, What Is Systemic Risk, and Do Bank Regulators Retard or Contribute to It? 2003, 377.

² A copy of the Systemic Risk in Insurance report is available on www.genevaassociation.org/Portals/0/Geneva_Association_Systemic_Risk_in_Insurance_Report_March2010.pdf.

³ Ibid.

⁴ To make sure that money intended for a particular purpose is not used for anything else; www.macmillandictionary.com.

⁵ Deposit insurance is a measure implemented in many countries to protect bank depositors, in full or in part, from losses caused by a bank's inability to pay its debts when due; www.wikipedia.org.

⁶ Scott E. Harrington, The Financial Crisis, Systemic Risk, and the Future of Insurance Regulation, Issue Analysis, September 2009, 16.





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