



# Growing Risk in the Insurance Sector

*Developing risk in the life insurance industry requires prudent policy response to prevent broader economic damage*

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### Introduction

The financial crisis of 2008 exposed important vulnerabilities in the banking sector. In its aftermath, considerable academic effort has been devoted to better understanding banking risks, and policymakers around the world are developing new regulations to contain those risks.

Our recent and ongoing work shows that there are also important risks in the insurance sector. Although these risks have been growing rapidly over the past 15 years, they have received relatively little attention from academics and regulators. If unaddressed, these risks could cause severe problems. Insurance is a large share of the financial sector. For example, U.S. life insurance liabilities amounted to \$4.1 trillion in 2012, compared to \$7 trillion in U.S. savings deposits. Moreover, as the largest institutional investors in the corporate bond market, insurance companies serve an important role in real investment and economic activity.

We begin this note by describing the growing risks and highlight some early symptoms, based on evidence during the financial crisis. We follow with

a discussion of possible economic consequences of trouble in the insurance sector. Finally, we highlight points of attention for policymakers and discuss recent developments in global insurance markets.

### Two sources of risk in the life insurance sector

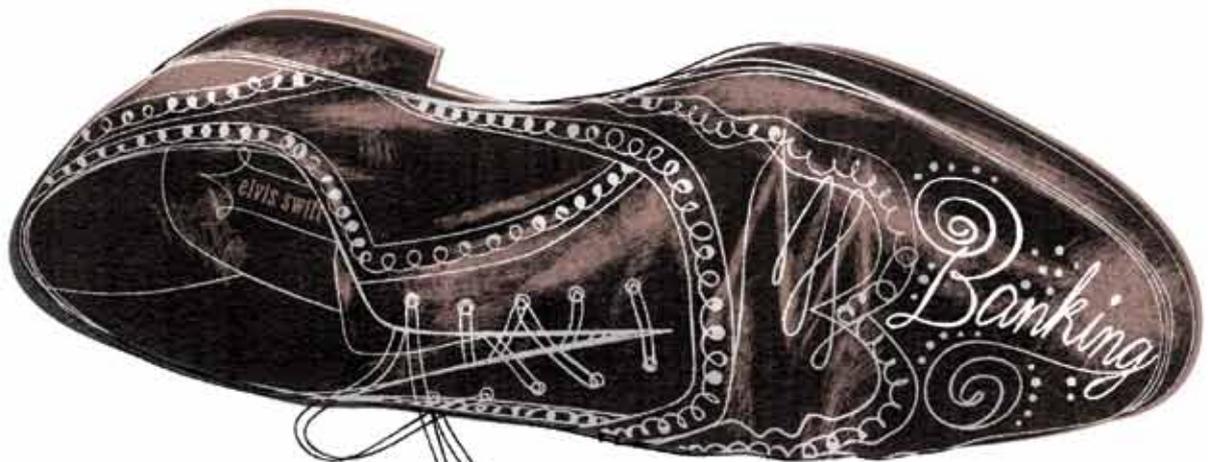
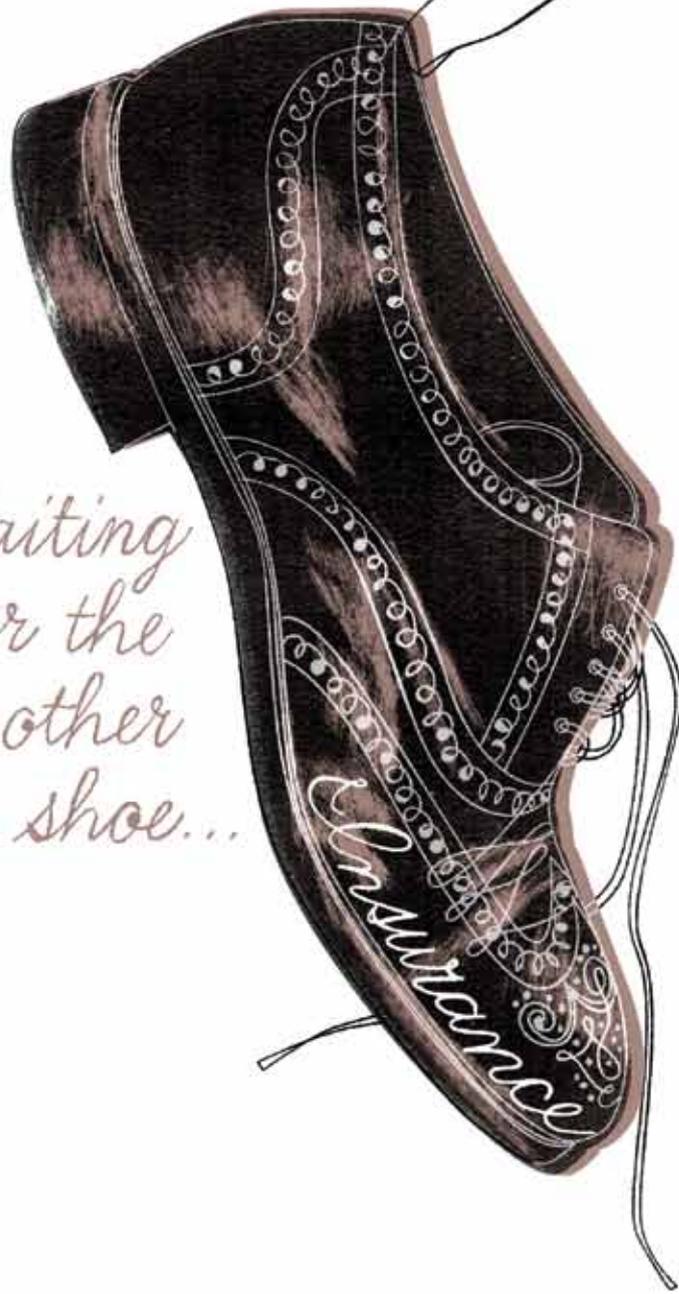
Two developments over the past 15 years have fundamentally changed the risk profile of U.S. life insurers. The first is growing demand for minimum-return guarantees in variable annuity products, due to the shift from defined-benefit to defined-contribution plans. The second is the increasing use of “captive reinsurance,” which was triggered by tighter capital requirements for life insurance policies after 2000.

Variable annuities are long-term savings products whose underlying assets are invested in traditional mutual funds. In exchange for additional fees, life insurers guarantee a minimum rate of return on the mutual funds. In 2012, assets under management in U.S. variable annuity accounts amounted to \$1.6 trillion.

The long-term nature of these guarantees presents significant challenges for both valuation and risk management. The combination of a low-interest-rate environment and poor risk management generated large losses during the financial crisis. Some companies responded by closing existing accounts to new investment and reducing the generosity of newly offered guarantees. Other companies, such as Hartford and John Hancock,

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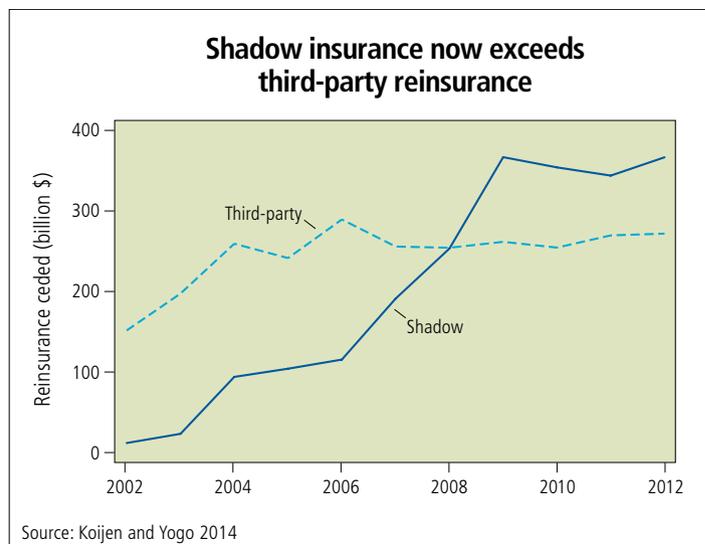
We find that liabilities moved to “shadow reinsurers,” a subset of captives that are the least regulated and are unrated by the A.M. Best Company, grew from \$11 billion in 2002 to \$364 billion in 2012. Total shadow insurance now exceeds total third-party reinsurance, which is \$270 billion.

exited from the market entirely. Since insurance liabilities are not “marked to market” (i.e., regularly reevaluated at fair market value), worse losses could yet occur, especially if the low-interest-rate environment continues.

Captive reinsurance is a second area of the insurance sector where risk has increased over the past 15 years. New regulations (known as Regulations XXX and AXXX) forced life insurers to hold more capital against life insurance policies issued after 2000. In response, states like South Carolina and Vermont passed laws that allow life insurers to set up off-balance-sheet entities, known as “captives,” subject to more advantageous accounting standards and capital regulation. By moving liabilities from operating companies that sell policies to captives, a holding company as a whole can reduce its required capital and increase leverage.

We find that liabilities moved to “shadow reinsurers,” a subset of captives that are the least regulated and are unrated by the A.M. Best Company, grew from \$11 billion in 2002 to \$364 billion in 2012.<sup>1</sup> Total shadow insurance now exceeds total third-party reinsurance, which is \$270 billion (see the accompanying chart). Companies using shadow insurance, which tend to be the industry’s largest, capturing half the market share, moved 25 cents of every dollar insured to shadow reinsurers in 2012, up from 2 cents in 2002.

Although we can estimate the size of the shadow insurance sector based on publicly available data, its risks are much more difficult to estimate. In 2013, the New York State Department of Financial Services raised several important concerns regarding the financial structure of captives, based on regulatory data not available to us.<sup>2</sup> Among them is the fact that conditional letters of credit, which are ultimately backed by the parent instead of



an outside financial institution, are often used as collateral. This raises concerns that captives could be underfunded and that they are exposed to the same sources of risk as the parent.

### The insurance sector during the financial crisis

AIG immediately comes to mind as an example of an insurance company that failed during the financial crisis. On a smaller scale, Hartford and Lincoln National also received support from the U.S. Treasury through the Troubled Asset Relief Program (TARP). Many more (e.g., Allstate, Genworth Financial, Protective Life and Prudential Financial) applied for TARP but were ultimately rejected or withdrew their applications. Companies like AIG had banking as part of their holdings, but others had only insurance. Hence, the conventional wisdom that the core insurance business is unaffected by macroeconomic shocks is far from true, especially in light of the two risks just discussed.

We find further evidence for financial constraints in the life insurance industry, based on the pricing of their policies in the retail market.<sup>3</sup> In normal times, life insurers price annuities and life insurance at a markup profit of 6 percent to 10 percent relative to actuarial value. During the financial crisis, they reduced the price of these policies and sold them at large losses (-19 percent for annuities and -57 percent for life insurance).

This extraordinary pricing behavior was due

to financial constraints and perverse incentives created by regulation. During the financial crisis, life insurers were able to record their newly issued policies at far below market value, due to an arcane regulation known as Standard Valuation Law. This created an incentive for life insurers, particularly those that were constrained, to sell products that lost money in reality but created accounting profits. Both rating agencies and state regulators assess insurance companies based on accounting equity, which made accounting profits valuable during the financial crisis.

For a brief period around November 2008, we find an enormous shadow cost of 96 cents per dollar of statutory capital. That is, the average insurance company was willing to reduce economic profits by 96 cents to raise a dollar of accounting equity. This cost varies considerably across insurance companies and was as high as \$5.53 per dollar of statutory capital. The insurance subsidiaries appear to have been constrained because their parents (applying for TARP) were also constrained and because regulation prevented efficient movement of capital within a holding company.

### **Possible consequences of trouble in the insurance sector**

What are the possible economic consequences of trouble in the insurance sector? Without the luxury of historical experience and hindsight, we speculate on three potential channels by which trouble in the insurance sector could spread to the rest of the economy.

First, insurance companies are interconnected to banks through their funding arrangements in reinsurance transactions. Banks issue letters of credit to collateralize reinsurance between an insurance company and a captive. Hence, a systemic shock to the insurance sector could trigger a sudden demand for credit that constrains the banking sector. Second, even the perception that insurance companies are at risk could suddenly reduce the demand for insurance products. Households would be forced to bear additional risk, which has important consequences for precautionary savings and welfare.<sup>4</sup>

Finally, insurance companies are the largest institutional holders of corporate bonds. If insurance companies were forced to shrink their balance

sheets, the demand for some types of bonds would decline. If firms were unable to seamlessly substitute into other sources of funding, there could be an important impact on real investment and economic activity.

### **Implications for insurance regulation**

A common theme of our work is that regulation has major effects on all important functions of the industry, including pricing, underwriting, reinsurance, product design and investment activity. Therefore, regulation is not only important for our understanding of insurance markets; it must be

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properly designed to ensure both efficient function and future stability of the sector. Two institutional features of the insurance sector introduce unique challenges to its regulation.

First, insurance companies can take significant risk on the liability side, as demonstrated by the rapid growth of variable annuities and captive reinsurance over the past 15 years. These risks developed due to accounting standards and capital regulation that are less developed and more inconsistent than the asset side of the balance sheet. Much improvement is necessary with respect to accounting standards and capital regulation for guaranteed investment products and captive reinsurance.

Second, life insurance liabilities are not prone to runs in most countries. Therefore, capital requirements that apply to banks, especially short-term risk constraints designed to prevent runs, may not be appropriate for insurance companies. In fact, short-term risk constraints can actually increase the long-term risk of insurance companies, if asset markets are mean reverting (i.e., high returns follow low returns, on average). We believe that insurance companies should be evaluated based on long-term value-at-risk measures that are extensions of short-term measures for banks.

Of course, measurement of long-term risk is challenging and potentially sensitive to reasonable variation in modeling assumptions. A fundamental problem with the insurance industry is that no one knows the market value of liabilities, and the data necessary for doing such a calculation are far from complete in the public financial statements. We see the recent trend toward captive reinsurance as a step in the wrong direction. Complete and transparent financial statements are essential for rating agencies, investors and academics.

Finally, we would like to see more active discussion between academics and regulators on the costs and benefits of regulation. Tighter capital regulation reduces the likelihood of failure, but it also raises prices and shrinks the size of consumer financial markets. These effects can be large. For example, we estimate that in the absence of shadow insurance, life insurance prices would rise by 18 percent and the life insurance market would shrink by 23 percent (Kojien and Yogo 2014). We hope that our findings will contribute to the current policy debate on whether to ban shadow insurance as well as impose new capital requirements for systemically important insurance companies under the Dodd-Frank Act.

### Implications for global insurance markets

The same risk factors that we have identified in the United States are present in other countries. Life insurers in continental Europe (e.g., Germany and Italy) and Japan have sold large amounts of guaranteed investment products. The low-interest-rate environment poses a severe challenge for these life insurers.<sup>5</sup> Since their liabilities are not marked to market, neither the existing losses nor future risks are immediately transparent.

The European reinsurance market is large, but the data necessary for measuring the size of the

shadow insurance sector are not publicly available. Under the 2005 Reinsurance Directive, reinsurers can domicile anywhere in the European Union and can assume reinsurance from any other country. For capital and tax reasons, many reinsurers are domiciled in Luxembourg and Ireland. It is not yet clear how Solvency II, the new European regulation planned for 2016, will address potential loopholes in capital regulation.

Our work (Kojien and Yogo 2013) also has important implications for discount rates that would be used for insurance liabilities under Solvency II. One proposal would allow insurance companies to increase the discount rate during bad times, essentially implementing procyclical capital requirements. The experience from similar regulation in the United States suggests that this proposal would distort both the pricing of insurance policies and the size of insurance markets. ■

### Endnotes

<sup>1</sup> Kojien, Ralph S., and Motohiro Yogo. 2014. Shadow Insurance. Available at [ssrn.com/abstract=2320921](http://ssrn.com/abstract=2320921).

<sup>2</sup> Lawskey, Benjamin M. 2013. Shining a Light on Shadow Insurance: A Little-Known Loophole that Puts Insurance Policyholders and Taxpayers at Greater Risk. Available at [dfs.ny.gov/reportpub/shadow\\_insurance\\_report\\_2013.pdf](http://dfs.ny.gov/reportpub/shadow_insurance_report_2013.pdf).

<sup>3</sup> Kojien, Ralph S., and Motohiro Yogo. 2013. The Cost of Financial Frictions for Life Insurers. Available at [ssrn.com/abstract=2031993](http://ssrn.com/abstract=2031993).

<sup>4</sup> Kojien, Ralph S., Stijn Van Nieuwerburgh and Motohiro Yogo. 2013. Health and Mortality Delta: Assessing the Welfare Cost of Household Insurance Choice. Available at [ssrn.com/abstract=1714491](http://ssrn.com/abstract=1714491).

<sup>5</sup> European Insurance and Occupational Pensions Authority. 2013. Financial Stability Report: Second Half-Year. December.



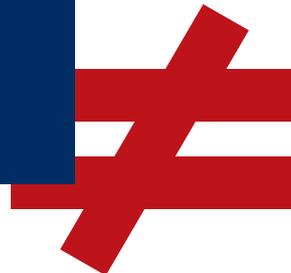
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