

# Chicago Fed Letter

## What do U.S. life insurers invest in?

by Robert McMenamin, senior research analyst, Anna Paulson, vice president and director of financial research, Thanases Plestis, associate economist, and Richard Rosen, senior financial economist

Researchers at the Chicago Fed Insurance Initiative are analyzing the role that the insurance industry plays in financial markets and the economy as a whole. This article presents an overview of life insurers' financial asset holdings, the industries they invest in, and how the value of their investments would change if there was a large negative shock to asset values.

**U.S.** life insurance companies own more than \$5.5 trillion dollars in real and financial assets and provide funding to other sectors of the economy through their investment activities. For example, life insurers own 6.0% of all outstanding credit market instruments in the U.S.<sup>1</sup>

Life insurers invest premiums that they receive from customers. They generally choose assets with features that are aligned with the characteristics of the insurance products that they sell. For example, proceeds from a long-term insurance product would be invested in a long-duration asset. This means that the risks from insurance liabilities will generally be balanced by the risks insurers assume through their investment activities.

At a fundamental level, life insurance companies sell products to satisfy two types of long-term demand. Some customers want protection from adverse financial consequences resulting from loss of life (life insurance) or from the exhaustion of financial resources over time (annuities). Other customers seek to earn a return on their premiums that can be withdrawn in the future (annuities meet this demand). Because customers often make claims on and withdrawals from their policies years after they have been issued, life insurers face the challenge of investing customer payments to ensure they will have sufficient funds

available to satisfy claims and withdrawals in the distant future. This generally leads life insurers to invest in a collection of long-term assets.

### Life insurance company asset holdings

Figure 1 presents a breakdown of the assets held by the life insurance industry. As the figure shows, life insurers segregate their assets (and, by extension, their liabilities) into two independent "accounts" on their balance sheets—the general account and the separate account. General-account assets support liabilities that feature guaranteed returns to customers from the insurer. In contrast, separate-account assets support "pass-through" products, in which investment gains and losses are passed on to the customer and no more than a minimum return may be guaranteed.<sup>2</sup> Typical general-account products include term life insurance, whole life insurance, fixed annuities, and disability insurance. Products whose payouts fluctuate based on the investment environment include variable annuities and variable life insurance. The assets that back these products are recorded on the separate account. The industry's aggregate general account held \$3.53 trillion in assets at the end of 2011, roughly double the \$1.84 trillion in assets held in the separate account (see figure 1). The assets held in the two accounts were very different.

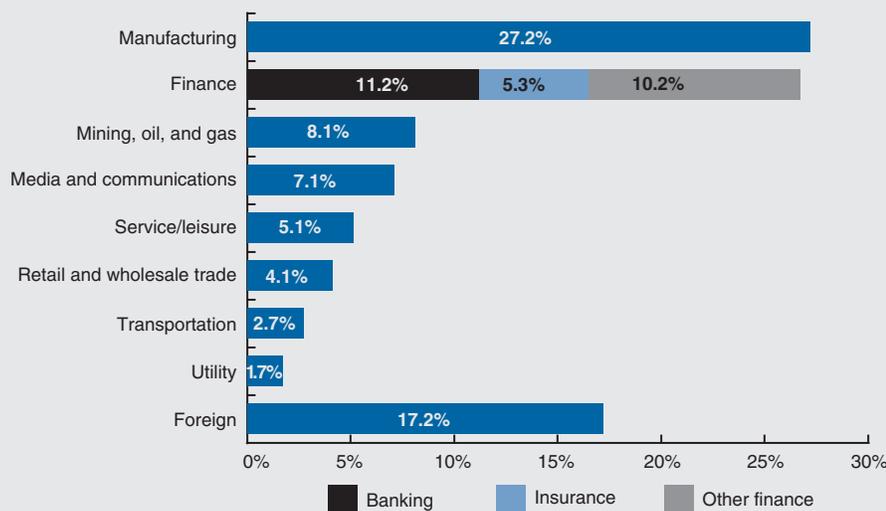
For more information about the Insurance Initiative, visit [www.chicagofed.org/webpages/markets/insurance\\_initiative.cfm](http://www.chicagofed.org/webpages/markets/insurance_initiative.cfm)

## 1. Life insurance industry aggregate assets

	General-account (GA) assets		Separate-account (SA) assets	
	Dollars in billions	% of GA investments	Dollars in billions	% of SA investments
Bonds	2,536.3	75.5	257.9	14.3
Corporate and foreign bonds	1,546.2	46.0	–	–
Nonagency MBS	247.9	7.4	–	–
ABS	171.5	5.1	–	–
Treasury and federal government bonds	263.6	7.8	–	–
Agency MBS	249.5	7.4	–	–
State and municipal bonds	38.7	1.2	–	–
Affiliated bonds	18.8	0.6	–	–
Mortgage loans	323.1	9.6	9.6	0.5
Policy loans	126.0	3.7	0.5	0.0
Cash and short-term investments	96.5	2.9	18.4	1.0
Equities	78.4	2.3	1,448.9	80.1
Derivatives	44.4	1.3	1.0	0.1
Real estate	20.6	0.6	6.7	0.4
Other investments	135.3	4.0	65.7	3.6
<b>Total invested assets</b>	<b>3,360.5</b>	<b>100.0</b>	<b>1,808.7</b>	<b>100.0</b>
<b>Total assets</b>	<b>3,534.4</b>	–	<b>1,835.6</b>	–

SOURCE: Authors' calculations based on 2011:Q4 data from SNL Financial.

## 2. Life insurance corporate bond holdings by industry



NOTES: Data are as of 2012:Q3. Bonds that are missing an industry classification are excluded.

SOURCES: Authors' calculations based on statutory data from SNL Financial, Mergent Financial, and Standard & Poor's.

In the general account, fixed-income assets like bonds and mortgages constituted the largest share of invested assets, at 75.5% and 9.6%, respectively. Separate-account assets comprised primarily equities. Only 14.3% of separate-account invested assets were bonds, and mortgages made up only 0.5%. We focus our attention on general-account assets because life insurers typically do not pass investment gains and losses on these

assets to their customers, so they must manage the associated valuation risk.

Corporate bonds make up the largest share of general-account assets. Insurers had \$1.5 trillion of corporate bonds at the end of 2011, and corporate bonds accounted for 46.0% of all general-account invested assets (see figure 1). As a major corporate bond investor, the life insurance industry represents an important source of funding for U.S. corporations.<sup>3</sup>

Corporate bonds issued by industrial and manufacturing firms and financial firms each comprised about 27% of all corporate bonds held by insurers (see figure 2). No other industry accounted for more than 10% of insurer corporate bond holdings.

The recent global financial crisis was characterized by problems with financial firms and real estate. To measure the life insurance industry's exposure to these areas, we compare their holdings with the total credit market instruments outstanding in these sectors. Overall, 29.6% of corporate bonds in 2011 were issued by financial firms.<sup>4</sup> This share is comparable to the sector's share of insurers' holdings at 26.7%.

Insurers' exposure to real estate comes through mortgage-backed securities (MBS) (14.8% of insurers' invested assets), mortgage loans (9.6%), and real estate owned (0.6%).<sup>5</sup> Therefore, we look at real estate as a share of total credit market instruments. The 25.0% of total real-estate-related holdings on insurers' general account is somewhat less than the sector's 38.7% share of all outstanding credit market instruments.<sup>6</sup> This suggests that insurers are not overexposed to this market sector. However, it is important to keep in mind that different real-estate-related investments have different risk profiles. For example, mortgage loans have direct to real estate risk, whereas MBS investments have indirect exposure. MBS issued by government-sponsored agencies, such as Fannie Mae or Freddie Mac, or guaranteed by Ginnie Mae, are guaranteed against defaults, so they are subject to prepayment risk (the risk that loans are paid off early). Nonagency MBS have default risk as well as prepayment risk.

### Asset-valuation risk

The financial crisis provided a powerful demonstration that asset values can decline quickly. Some of the asset classes heavily favored by insurers, especially nonagency MBS, experienced major losses during the crisis. We estimate the potential decrease in the value of insurer assets from an extreme downturn in asset markets using data on market prices for a variety of financial instruments

### 3. Estimated one-month-in-60 loss by asset class

	Loss that occurs one month in every 60 months (percent)
Bonds	6.5
Corporate and foreign bonds	6.9
Nonagency MBS	28.2
ABS	8.0
Treasury and federal government bonds	5.7
Agency MBS	2.6
State and municipal bonds	4.2
Affiliated bonds	17.5
Mortgage loans	28.2
Policy loans	0.0
Cash and short-term investments	0.0
Equities	10.0
Derivatives	17.5
Real estate	28.2
Other investments	17.5
<b>Total invested assets</b>	<b>7.8</b>

SOURCES: Authors' calculations based on statutory data from SNL Financial, Haver Analytics, and Bloomberg Financial. For specific indexes, see box A.

over the period from October 2002 through December 2012.<sup>7</sup>

We use the distribution of life insurer investments in combination with data on price fluctuations to estimate the potential downside risk from changes in asset prices. To do this, we match asset classes to price indexes that are likely to track the value of those assets closely and use the performance of the index to estimate the performance of the matched asset class (see box A for details on the matching process). For each day in the sample period, we calculate the change in each price index over the past month. We also calculate the past-month change for a weighted average of the indexes, where the weights are the shares of the matched asset classes from the aggregate life insurance balance sheet. We then compute the standard deviations of these changes and estimate the loss in value that occurs with a particular frequency. We focus on a loss that would occur one month in every 60 months, or once in five years. This corresponds to a 2.13 standard deviation price change. It is important to note that we are estimating a loss in market value, not in book value. Much of the change in market value for fixed-income assets, such as bonds, is due to changes in interest rates.

The once-in-five-years losses vary across asset categories (see figure 3). At the high end, nonagency MBS are estimated to

lose 28.2% in market value. In contrast, the corporate bond portfolio is estimated to lose 6.9%. The once-in-five-years loss for life insurance assets as a whole is estimated to be 7.8%, reflecting some benefits from diversification. Note that the historical period that we analyze includes the financial crisis, so the estimates of potential losses may somewhat overstate the risk going forward. Then again, the period leading up to the crisis, which is also in-

cluded in the data, was a period of unusual calm in financial markets.

Our back-of-the-envelope calculations suggest that a severe shock to asset prices could reduce the value of the industry's investments by 7.8%, or \$280 billion, using third-quarter 2012 data. This corresponds to an 86% loss in total industry equity, which is \$325 billion.<sup>8</sup> However, because insurers make investments to match liabilities, these losses would be partially offset by gains on insurance liabilities. To gauge the extent to which losses would be offset, we calculate a once-in-five-year loss in life insurance equity using the SNL Life Insurance stock index over the 2002 to 2012 period. This loss is 22.8%, suggesting that 74% of the hypothetical loss in assets from a severe price shock would be offset by gains on insurance liabilities.<sup>9</sup> Of course, this industry perspective may mask considerable variation at the individual firm level. Some insurance companies will have greater exposure to riskier asset classes and others will have less. Firms will also vary in the extent to which their liability gains would offset their losses on investments. Similarly, equity cushions differ across firms.

### Conclusion

We have shown that life insurers invest in a wide variety of financial assets. Corporate bonds make up the largest share of their assets. Although insurers invest

in a diverse set of industries, they have significant investments in industrial and manufacturing firms, financial firms, and real-estate-related securities. A severe shock to asset prices would reduce the value of life insurers' asset holdings considerably. However, our calculations suggest that a significant portion of the losses on assets would be offset by gains on liabilities.

<sup>1</sup> Based on 2012:Q3 data from the Board of Governors of the Federal Reserve System, 2012, *Flow of Funds Accounts of the United States*, statistical release, Washington, DC, December 6, available at [www.federalreserve.gov/releases/z1/Current/z1.pdf](http://www.federalreserve.gov/releases/z1/Current/z1.pdf). Examples of credit market instruments include Treasury securities, mortgage-backed securities and mortgages, municipal securities, corporate and foreign bonds, consumer credit, and depository institution loans.

<sup>2</sup> Not all gains and losses on separate-account assets are necessarily passed on to customers. Separate-account liabilities often include embedded guarantees. These guarantees are claims against the general account, and are therefore supported by general-account assets. These guarantees are more likely to be triggered when interest rates have declined sharply and when equity returns are very low. We do not address potential risks from embedded guarantees in this article.

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<sup>3</sup> According to the Board of Governors of the Federal Reserve System (2012), life insurers owned 17.8% of all corporate and foreign bonds as of 2012:Q3. (Note that this source classifies nonagency mortgage-backed securities as corporate bonds while we do not.)

<sup>4</sup> Board of Governors of the Federal Reserve System (2012). Financial firms exclude

asset-backed securities and real estate investment trusts.

<sup>5</sup> MBS includes nonagency MBS and agency MBS, as reported in figure 1.

<sup>6</sup> Board of Governors of the Federal Reserve System (2012).

<sup>7</sup> Insurance companies do a much more extensive set of stress tests that examine the

sensitivity of their capital to shocks in asset and interest rate markets, among other scenarios. In our example, we examine one particular stress at the industry (rather than firm) level.

<sup>8</sup> According to 2012:Q3 data from SNL Financial and authors' calculations.

<sup>9</sup> See note 8.

## Box A. Details on estimating asset risk

### Indexes used

Corporate bonds:	Bank of America, Merrill Lynch, U.S. corporate bond yields. A, BBB, BB, B, CCC, and lower-rated indexes are matched to similarly rated bonds.
Nonagency MBS:	Morgan Stanley, U.S. fixed rate, CMBS conduit five-year spread. AAA, AA, A, and BBB are matched to similarly rated MBS.
ABS:	Bank of America, Merrill Lynch, U.S. bond yields, asset-backed securities fixed-rate index.
Agency MBS:	Equal-weighted blend of Merrill Lynch mortgage-backed securities, Ginnie Mae, Fannie Mae, and Freddie Mac indexes.
Treasury bonds:	One-, three-, six-month and one-, two-, three-, five-, seven-, ten-, 20-, and 30-year Treasury yields for similar-maturity bonds.
Municipal bonds:	Bank of America, Merrill Lynch, U.S. bond yields, municipals (tax-exempt) master index.
Equities:	S&P 500 index for common stock and S&P preferred stock index for preferred stock.

Index values were provided by Haver Analytics and Bloomberg. When necessary, we convert yields to prices assuming a par value of 100, coupon rate as a one-month lag of the yield, and a ten-year average maturity if no maturity is disclosed for the index. When multiple indexes are listed for a category, we weight by the share of each item on the aggregate life insurance industry balance sheet except as noted.

In addition:

- We assume that the returns for corporate bonds and foreign bonds are similar, since we do not have a foreign bond index.
- We assume that standard deviations of returns for each ratings class of private corporate bonds are 1 percentage point higher than the corresponding returns for public corporate bonds, since we do not have a private corporate bond index.
- We assume that the returns for nonagency commercial mortgage-backed securities (CMBS) and nonagency residential mortgage-backed securities (RMBS) are similar, since we do not have a nonagency RMBS index.
- We assume that affiliated bonds have returns equal to the smallest daily return across the other categories of bonds.
- We assume that the returns for mortgage loans and real estate are similar to the returns for CMBS.
- We assume that policy loans and cash retain 100% of their value at all times. Policy loans are loans originated to policyholders that are financed by cash that has accrued in their policies. They do not depreciate in value because failure to repay a policy loan results in termination of the policy.
- We assume that derivatives and other investments have returns equal to the smallest daily return across the other categories of assets.