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How liquid are U.S. life insurance liabilities?

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This article describes the liquidity of various life insurance products and provides a measure that can be used to characterize the liquidity of the liabilities of the industry as a whole or of a particular firm.

Life insurance companies make up a substantial share of the U.S. financial sector. At the end of 2011, they held $5.3 trillion in assets, which is about one-third the size of the $14.6 trillion banking sector.[1] Life insurance companies play an important role in financing corporations, holding 18% of all outstanding corporate and foreign bonds in the U.S.[2] Due to the size and importance of this segment of the financial sector, researchers at the Chicago Fed Insurance Initiative are analyzing the role the life insurance sector plays in the economy. (More details are available at www.chicagofed.org/webpages/markets/insurance_initiative.cfm.) This *Chicago Fed Letter* presents our analysis relating to one specific characteristic, the liquidity of life insurer liabilities. The recent financial crisis and subsequent global recession have highlighted the vital role of liquidity in the health of financial institutions and markets.

1. Bank and life insurance balance sheets

	Banks	Life insurance companies
Primary assets	Loans (52% of total assets)	Bonds and stocks (81% of total assets)
	Relatively illiquid	More liquid than loans
Primary liabilities/ funding	Customer deposits (83% of total liabilities)	Policyholder liabilities (90% of total liabilities)
	Very liquid	Less liquid in general

SOURCES: Authors' calculations based on fourth quarter, 2011, data from Federal Deposit Insurance Corporation, *Statistics on Depository Institutions*, and SNL Financial.

We start with a brief description of the life insurance industry. We then compare life insurers' balance sheets with banks' balance sheets, focusing on the liquidity of both assets and liabilities. Next, we describe the liquidity characteristics of various life insurance products and provide a liquidity profile of the industry's liabilities.

Description of life insurance companies

Life insurance companies sell both protection and savings/investment services (see box A on last page). Protection services are what we traditionally think of as insurance—protection against loss. Some insurance products, e.g., term life, are pure protection products. Others, such as universal life insurance, can be viewed as primarily protection with a savings element. Annuities, which offer some protection against the risk of outliving one's assets, are largely savings vehicles.

Typically, insurers collect premiums from customers before, and in some cases well before, they have to pay out funds. For example, a customer may pay premiums for many years on a life insurance policy before there is a claim on the policy. To account for the possibility that an insurance or annuity policy might have to pay out funds, insurers set aside reserves. Reserves appear as a liability on the insurers' balance sheets. Insurance companies invest reserves in assets such as corporate bonds. As we discuss below, their objective is to increase profit while retaining liquidity to meet potential payouts.

The key liabilities of life insurers are reserves against policy claims, including insurance, annuity, and deposit-type contracts. Because premiums can be paid in long before a payout event occurs,

2. Categorizing liquidity of life insurer liabilities

Liability bucket	Bucket description	Product examples
Zero liquidity	Liabilities with no redemption rights	Immediate annuities Disability insurance
Low liquidity	Stable redemption profile	Whole life
Moderate liquidity	Redeemable at book value with significant penalties	Deferred annuities Universal life
High liquidity	Retail liabilities with little impediment to surrender; redeemable/putable institutional liabilities	Deferred annuities; GICs; funding agreements

SOURCE: Authors' calculations based on information from Joel Levine, 2010, "Special report: Moody's global liquidity stress test for life insurance operating companies," report, No. 121220, Moody's Investor Services, March.

insurers often invest in long-term assets so that the duration of assets matches that of liabilities. Over half of life insurers' assets are invested in corporate, foreign, and government bonds; and another 6% of assets are invested in commercial mortgages.[3] Most of these fixed-income investments have long durations, reflecting the long duration of insurance liabilities.

Liquidity of banks and life insurers

The liquidity of a particular investment measures the extent to which the asset can be bought or sold without affecting its price. At the firm level, liquidity risk is the risk that a firm will have to take a loss when it is forced to raise cash quickly. For insurers, liquidity risk is most likely to occur when they have to pay customers an unexpectedly large amount. To do so, an insurer might have to liquidate assets. If assets are illiquid, this can involve selling at a loss (a so-called fire sale). So, liquidity risk is present when liabilities are liquid (making unexpected payouts more likely) and when assets are illiquid (making fire-sale losses more likely). In extreme cases, liquidity risk can lead to runs. Runs occur when many liability holders rush to withdraw their funds from an institution because they fear the money will run out.[4] This rush to withdraw funds can cause solvent institutions to turn insolvent because of fire-sale losses. This idea of a run is a familiar concept in banking, where a loss of confidence in a particular institution can lead to scenes of customers crowding into their bank to demand immediate withdrawals.

Overall, life insurers have less liquid liabilities than banks do. Banks fund themselves with highly liquid demand deposits, which make up over 80% of banks' liabilities (see figure 1).[5] While life insurers have some demand deposit-like products, many of their products have limitations on withdrawals. Some of the life insurance products described in box A, such as term life and immediate annuities, cannot be withdrawn; other products, such as deferred annuities, have a cash value that can be withdrawn by customers but only with a penalty. The reserves supporting insurance and annuity contracts comprise 90% of life insurers' liabilities (see figure 1).[6] We explore the withdrawal profiles of reserves below, but in general, life insurance liabilities are more difficult to withdraw than bank deposits, which means that they are less liquid.

In the event of a drawdown of liabilities by depositors or policyholders, a firm's ability to respond will depend on the assets the firm is holding and, in particular, on the liquidity characteristics of the assets. Looking at bank assets, over half are in the form of loans (see figure 1). Should a bank be forced to sell its loans quickly, it would most likely have to take significant losses because loans are relatively illiquid. Life insurers, however, have a large share of more liquid assets like bonds and equities that can typically be sold quickly with relatively small losses. This combination of a lower likelihood of liabilities being withdrawn (lower liability liquidity) and potentially smaller losses from selling assets quickly (higher asset liquidity) indicates that life insurers are less exposed to liquidity risk than banks.

Categorizing liabilities by liquidity

Although insurance companies have less liquidity risk than banks, they do have liquidity risk. Indeed, there have been runs on insurance companies. For example, in 1999, there was a run on General American Life Insurance Company (GA Life).[7] GA Life had issued funding agreements[8] with a clause that gave customers the option to withdraw the value of their investments with seven days notice. When rating downgrades induced investors to withdraw their funds, GA Life could not satisfy their demands and the company was placed under supervision by the Missouri Insurance Department. The GA Life example illustrates that liquidity risk at insurance companies is a function of liability holders' ability to withdraw liabilities. In addition, liability holders must exercise this option to withdraw funds.

We can begin to quantify the liquidity characteristics of the life insurance sector by characterizing the liquidity of different types of life insurance products. This analysis combines information about a product's contractual liquidity with information about a policyholder's cost of withdrawing funds. We begin by dividing life insurance company liabilities into four buckets based on their liquidity risk (see figure 2).[9] In assigning life insurer reserves to liquidity buckets, we consider whether a product can be cashed in, the cost of doing so from the policyholder's perspective, and the likelihood that the need to satisfy surrenders would lead to unexpected cash outflows from the insurer.[10]

Zero liquidity

On one end of the spectrum, life insurance product reserves with almost no liquidity risk to insurers include those backing products with no provisions for policyholders to extract cash immediately or to surrender their policy for a cash value. These include reserves for annuities that are already paying out (payout annuities), for term life insurance (which has no savings component), and for disability insurance.

Low liquidity

Low-liquidity liabilities are primarily made up of reserves that back products with some cash value, but where policyholders are likely to face high costs to replace them. Reserves supporting products like whole life, also known as ordinary life insurance, fall into this category. Low-liquidity products are primarily protection products, although they may have some savings/investment elements tied to them. These contracts may allow the

3. Liquidity profile of life insurance industry liabilities

	2007	2008	2009	2010	2011
Zero liquidity	20.1	23.6	19.5	19.1	18.8
Low liquidity	29.2	28.1	28.9	26.8	27.0
Moderate liquidity	41.6	37.8	41.6	44.0	43.1
High liquidity	9.1	10.6	10.0	10.0	11.1
Composite score	4.66	4.51	4.74	4.83	4.89

NOTE: Numbers indicate percent of total, except composite score.
SOURCE: Authors' calculations based on data from SNL Financial.

savings portion to be withdrawn at the policyholder's discretion, but historically these contracts have had relatively low and predictable redemption rates. The costs of replacing the policies and the losses on extracting value mean policyholders are unlikely to withdraw funds en masse.

Moderate liquidity

Moderate-liquidity liabilities are made up of reserves that back products with contract terms that allow for some liquidity, but restrict the timing of withdrawals or impose surrender charges (penalties) on withdrawals. Deferred annuities and universal life policies are examples of products that may have these features. These products have contractual provisions that allow policyholders to withdraw a certain amount of the policy's built-up value under specific conditions. In addition to providing protection and savings, these products also provide liquidity. Policies with higher surrender charges are less liquid because accessing liquidity is more costly for the policyholder.

High liquidity

High-liquidity liabilities are reserves that back products that impose few limitations on or penalties for early withdrawal. These highly liquid liabilities include guaranteed investment contract (GICs) and funding agreements (which played a major role in GA Life's downfall). In addition, reserves against deferred annuities where surrender penalties are very low and the policyholder has the ability to determine the timing of withdrawals are classified as high liquidity. In general, the most highly liquid life insurance liabilities are those associated with products that are easily redeemable with low penalties and products sold to institutional investors. These products are particularly liquid when they contain contract provisions that allow them to be withdrawn at will and at par, similar to bank demand deposits.

Quantifying liability liquidity

To quantify these liability buckets, we examine insurers' statutory filings, which report the reserves held against various product categories. We supplement this with statutory information on the likely contractual terms of these products, such as the cost to withdraw funds. Zero-liquidity liabilities consist of accident and health (A&H) reserves, plus annuity and deposit-type liabilities that do not allow discretionary withdrawals. Low-liquidity liabilities consist of life contract reserves, or the reserves that do not back annuities, deposit-type contracts, or A&H. The moderate-liquidity bucket contains annuity and deposit contracts that allow discretionary withdrawals with penalties or withdrawals at fair value. Finally, the high-liquidity bucket is made up of reserves for annuity and deposit contracts that allow discretionary withdrawals at book value. This method classifies liabilities based on common characteristics across the product groups, rather than aggregating product-level information.

Our analysis of the data indicates that life insurers had about 46% of liabilities in the zero- to low-liquidity categories and 54% in the moderate- to high-liquidity categories at the end of 2011 (see figure 3). This shows a slight shift toward more liquid liabilities since 2007, when zero- and low-liquidity liabilities represented about 49% of the total. Looking at the riskiest bucket, high liquidity, we see a rise to an 11% share in 2011 from 9% in 2007. These aggregate data mask considerable firm-level heterogeneity. For example, two of the largest ten life insurers, by assets, have more than 20% of liabilities in the high-liquidity category.

To facilitate comparisons across firms and over time, we created a composite score, which is the weighted sum of the share of liabilities in each bucket. Zero-liquidity liabilities get a weight of 0, low-liquidity liabilities get a weight of 3.33, moderate-liquidity liabilities get a weight of 6.67, and high-liquidity liabilities get a weight of 10. From 2007 to 2011, the industry average composite liquidity score rose from 4.66 to 4.89, indicating a slight increase in liquidity (see figure 3).

We view the liquidity measures that we have created as indicative approximations for the liquidity of the reserves of insurers. These measures have important limitations. As mentioned earlier, we are not looking directly at product liabilities when assessing liquidity risk. We use aggregate data about withdrawal characteristics of certain products to classify the risk, which masks some information about the true risk of the liabilities.

In addition, this is a measure of the liquidity of liabilities only, not of the firm or the industry itself. The liquidity of the assets supporting the liabilities would be an important component of a more complete look at liquidity. It may be that as these companies have taken on more liquidity risk in their liabilities, they have offset some or all of that by holding more liquid assets.

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Box A. Life insurance products and their typical characteristics

Product	Payment structure	Maturity	Option to withdraw before maturity	Protection element	Savings element (rate earned)
Term life	Fixed premium paid periodically	Set number of years (contract will specify fixed number of years, e.g., 10, 15, or 20 years)	None	Pays if death occurs within a set number of years	None
Disability insurance	Group (institutional) annual premium, adjusted for experience	Renewed annually	None	Pays monthly benefit if disability occurs before normal retirement	None
Whole life	Fixed premium paid periodically	Age 100	Cash surrender value (increases over time)	Pays regardless of when death occurs	Low fixed rate
Universal life	Flexible premium paid periodically	Age 95 or older	Cash surrender value (increases over time)	Pays regardless of when death occurs	Current interest rate with guaranteed minimum
Immediate annuity	Single premium paid upfront	Later of term certain or death	None	Pays fixed amount per month during remaining lifetime	None
Deferred annuity	Most commonly single premium paid upfront	Flexible (contract may specify fixed age, e.g., 80)	Account value with penalty that decreases over time	Pays full account value on death	Current interest rate or index return with guaranteed minimum
Funding agreement/ guaranteed investment contracts (GICs)	Institutional product, single premium paid upfront	Three to seven years	Account value with possible adjustment	None	Guaranteed fixed rate

NOTE: The information in the box is meant to be illustrative and capture the important differences across product types; however, there is variation in contract terms within life insurance product categories that is not described here.

Conclusion

Life insurers are financial institutions that invest policyholder funds in return for providing protection against life's risks as well as savings/investment services. This business model involves some level of liquidity risk. Although life insurers generally have less liquidity risk than banks, they are not immune from runs. By examining the liabilities of life insurers, we can move toward quantifying liquidity risk and track changes in risk levels over time and across firms.

[1] Based on data from the Board of Governors of the Federal Reserve System, 2012, *Flow of Funds Accounts of the United States*, statistical release, June 7, available at www.federalreserve.gov/releases/z1/Current/z1.pdf.

[2] Based on data from the Board of Governors of the Federal Reserve System, 2012.

[3] SNL Financial.

[4] Douglas W. Diamond and Philip H. Dybvig, 1983, "Bank runs, deposit insurance, and liquidity," *Journal of Political Economy*, Vol. 91, No. 3, June, pp. 401–419.

[5] Based on Federal Deposit Insurance Corporation, 2011, *Statistics on Depository Institutions*, report for all institutions, Washington, DC, December 31, available at www2.fdic.gov/sdi/.

[6] SNL Financial.

[7] See www.moodys.com/credit-ratings/General-American-Life-Insurance-Company-credit-rating-339600 (registration required) or Moody's, 1999, "General American: A case study in liquidity risk," August.

[8] Funding agreements are similar to bank certificates of deposit.

[9] Joel Levine, 2010, "Special report: Moody's global liquidity stress test for life insurance operating companies," report, No. 121220, Moody's Investor Services, March.

[10] While this is similar to the Moody's methodology, Moody's assigns higher liquidity risk than we do to expected cash outflows that are projected to occur in the near term.