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International Comparison of Life Insurers: Evolving Business Models and Financial Stability Issues

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Life insurers manage long-term assets to fulfill long-term insurance contracts. While this fundamental function is common to life insurers worldwide, their product offerings and the assets they manage vary widely. The changing environment, including adaptation to regulations since the global financial crisis, growing post-retirement funding needs due to increasing longevity, the prolonged low interest rate environment that persisted until the COVID-19 pandemic, and the subsequent period of high inflation, has prompted life insurers to expand their product offerings and diversify their investment portfolios, including into alternative investments. More recently, the use of asset-intensive reinsurance (AIR) to enhance investment yields has been on the rise. This paper provides an international comparison of changes in the composition and scale of life insurer balance sheets in Japan, Germany, the United Kingdom, and the United States. It also examines key financial stability issues, including trends in AIR and the growing interconnectedness between life insurers and private funds.

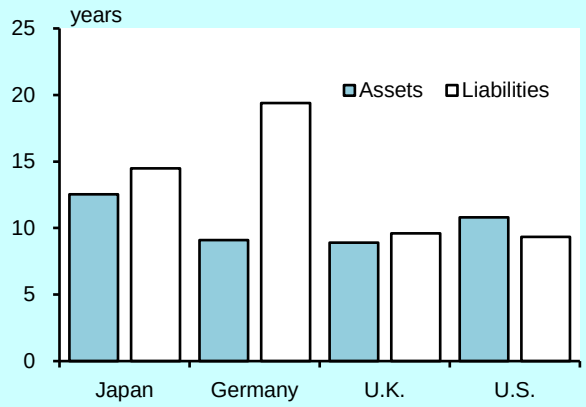
Introduction

Life insurers' balance sheets generally comprise long-term assets and liabilities. The liability side consists of insurance products designed to hedge the long-term economic risks faced by households, such as death benefits to address mortality risk and survival benefits to address longevity risk. On the asset side, their balance sheets consist of assets held with a view to long-term investment to fulfill the obligations under long-term insurance contracts.

The functions performed by life insurers are broadly similar across countries. However, the specific insurance products they offer and the financial assets they manage vary considerably. An international comparison of asset duration (the investment period of assets under management) and liability duration (the period until insurance claims are paid) shows that both are generally long. In Japan and Germany, where savings-oriented products with long contractual periods, such as whole life insurance and endowment insurance, have been prevalent, liability durations exceed 10 years. In contrast, in the United Kingdom and the United States, investment-oriented products linked to returns of investment funds, such as unit-linked products and variable annuities, are more common. As a result, liability durations are relatively short, at just under 10 years (Chart 1).[1]

Among the external factors affecting life insurers, one major issue attracting significant attention is the secular demographic changes taking place across major countries. In particular, the increasing longevity risk has led to growing post-retirement funding needs. Another issue is the ongoing implementation of economic value-based solvency margin ratio (ESR) regulations. This reflects the recognition, following the global financial crisis, that book value-based solvency regulations do not always measure risk adequately.[2] Additionally, the effects of the prolonged low-interest-rate environment that major countries faced after the global financial crisis, including the shift toward more aggressive risk-taking by life insurers, continue to

[Chart 1] Duration of Assets and Liabilities



Note: Data as of end-FY 2024 for Japan (median for four major insurers for which disclosure data is available), end-2018 for Germany and the U.K., and end-2024 for the U.S. (assets: aggregated figures; liabilities: median for four insurers for which disclosure data is available).

Source: ACLI; EIOPA; Published accounts of individual firms.

attract considerable attention even in the current environment of high inflation following the COVID-19 pandemic.

Against this backdrop, life insurers across countries have been pursuing business model transformation, including revising and expanding their product lineups and diversifying their investment assets. More recently, the use of asset-intensive reinsurance (AIR) to enhance investment yields has led to an increase in risk transfers to offshore reinsurers, particularly those based in Bermuda.

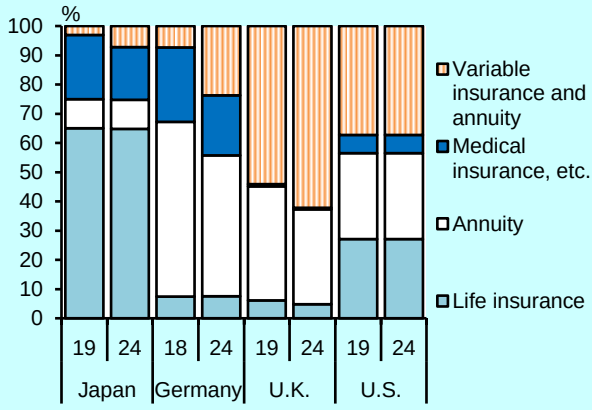
From a financial system stability perspective, life insurers represent a significant presence both in Japan and globally, given the scale of their assets. Recent developments include changes in the composition of life insurers' investment assets, growing interconnectedness with other non-bank financial intermediaries (NBFIs), such as private equity (PE) funds, and an increase in cross-border transactions through AIR. For this reason, it is important for financial authorities worldwide to conduct continued monitoring and analyze appropriately the financial stability risk of these trends. This includes assessing the transmission channels and amplification mechanisms of stress that could arise during periods of market stress. [3] Motivated by these concerns, this paper undertakes an international comparison of the scale and composition of life insurer balance sheets in Japan, Germany, the United Kingdom, and the United States, examining the differences in their business models and how those models have evolved. It also examines the current state of financial stability issues.[4]

Changes in Balance-Sheet Composition

Composition of Insurance Product Offerings

Comparing the composition of insurance product offerings across countries before and after the pandemic, while differences across countries remain considerable, a common trend has been a shift from savings-oriented products to investment-oriented products (shown as "Variable insurance and annuity" in Chart 2), where policyholders bear the investment risk (Chart 2). It has been suggested that the decline in assumed interest rates (minimum guaranteed rates) during the prolonged low-interest-rate environment preceding the pandemic dampened household demand for savings-oriented products. Additionally, in Germany, for example, compliance with ESR regulations has driven a shift from guaranteed-yield savings products to unit-linked products, which carry no principal guarantee and are subject to relatively lower capital charges.[5] In Japan as well, life insurers have expanded their lineup of variable products and foreign currency-denominated insurance products to meet diverse customer needs, including post-retirement funding needs. Life insurers have also increased their focus on third-sector products, such as those related to nursing care and health promotion. Meanwhile, in the United States and the United Kingdom, where variable products have traditionally been the mainstay, no notable changes in product composition have been observed. That said, in the United Kingdom, life insurers have become increasingly active in transactions involving the assumption of corporate defined benefit pension obligations, driven by growing post-retirement funding needs due to increasing longevity.[6]

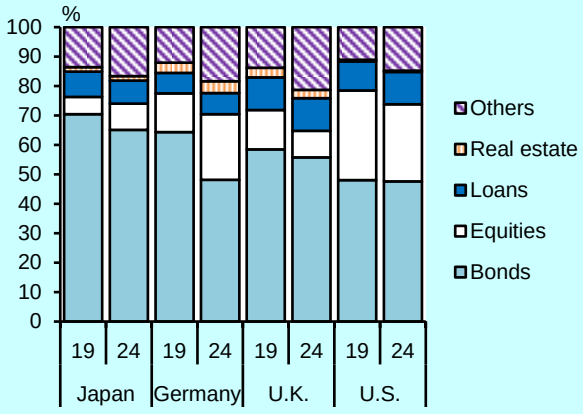
[Chart 2] Composition of Insurance Products



Note: Data for Japan are based on the amounts of policies in force, data for Germany are based on insurance premiums, and data for the U.K. and U.S. are based on policy reserves. Data are as of fiscal year-end for Japan and as of year-end for the others.

Source: ACLI; BOE; GDV; Life Insurance Association of Japan.

[Chart 3] Composition of Investment Assets



Note: Data are on a total account basis; those for Japan and the U.S. include separate accounts, while those for Germany and the U.K. include unit-linked products. Data are as of fiscal year-end for Japan and as of year-end for the others.

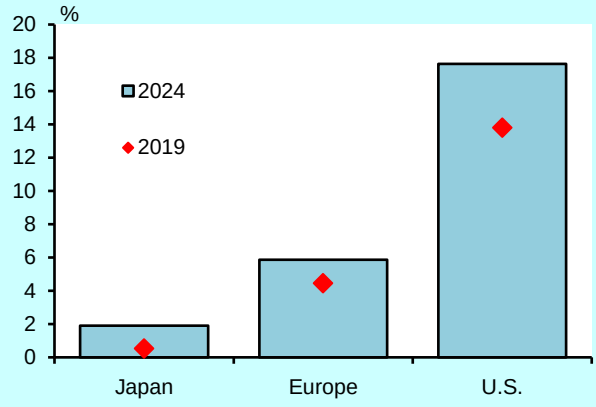
Source: ACLI; BOE; EIOPA; Life Insurance Association of Japan.

Composition of Investment Assets

Turning to changes in the composition of life insurers' investment assets, a common feature across all countries is a high proportion of bonds, although this share has declined somewhat compared with the pre-pandemic period (Chart 3).[7]

In contrast, the share of alternative investments (included in "Others" in Chart 3), which are characterized by a low correlation with traditional assets and relatively stable expected returns, has increased across all countries, and the share of illiquid assets has broadly expanded. In particular, the share of PE and private debt (PD) investments has been rising, especially in Europe and the United States. This seems to reflect the fact that PE and PD investments, as long-term investment instruments, are well suited to asset-liability management (ALM) for the long-term insurance obligations that life insurers carry (Chart 4). As for Japanese life insurers, while PE and PD investments have trended upward, their scale remains considerably more modest compared with Europe and the United States.

[Chart 4] Share of PE and PD Investments among Investment Assets



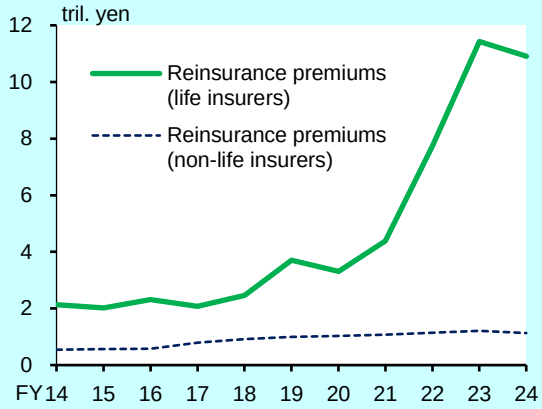
Note: Data are as of fiscal year-end for Japan (four insurers for which disclosure data is available) and as of year-end for Europe and the U.S. The definitions of PD are not necessarily consistent.

Source: Chicago Fed; EIOPA; NAIC; Published accounts of individual firms.

Leveraging of AIR

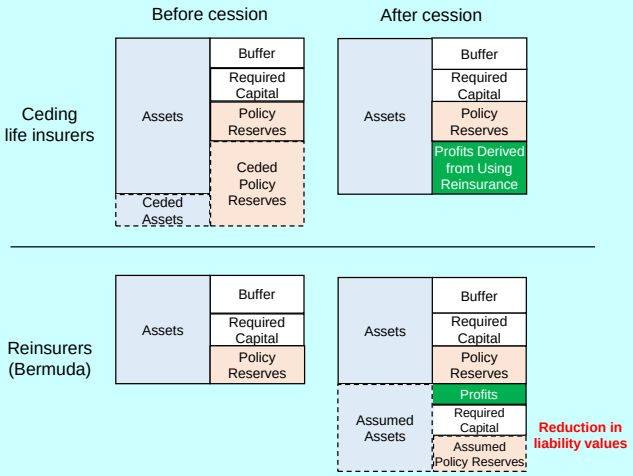
In addition to the balance sheet changes described above, life insurers across countries have been making increasing use of AIR in recent years to enhance investment yields and improve capital efficiency (for the history and background of reinsurance, see Box). The use of AIR has also been on the rise among Japanese life insurers in recent years (Chart 5). This section explains the mechanics and objectives of AIR and provides an overview of life insurers' practices across countries.

[Chart 5] Reinsurance Premiums Ceded by Japanese Insurers



Source: Life Insurance Association of Japan; The General Insurance Association of Japan.

[Chart 6] Image of AIR



Note: The example is intended to illustrate a case where the ceding life insurer generates "profits from reinsurance" through block reinsurance of in-force business.

Basic Mechanism and Purpose of Use

AIR involves transferring to reinsurers not only the risks associated with insurance contracts but also investment risks. In some cases, this can reduce capital charges under solvency regulations, and by delegating asset management to reinsurers (particularly PE-affiliated reinsurers with strong investment expertise), ceding insurers can expect to achieve higher investment yields.[8]

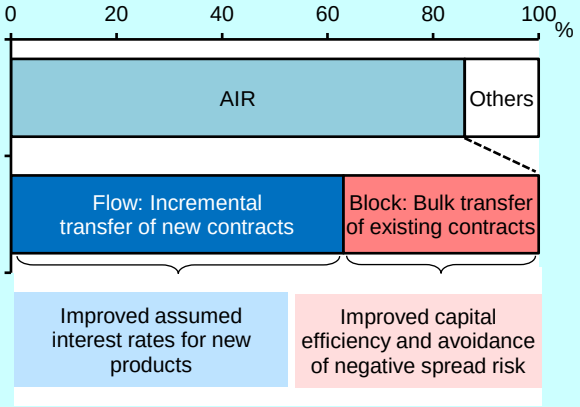
In many cases, offshore reinsurers domiciled in Bermuda are used as reinsurance counterparties. Bermuda's insurance supervisory framework has been recognized as equivalent in standard to those of Europe and the United States, and the Bermuda Monetary Authority (BMA) has also strengthened its supervisory oversight.[9] One noted advantage of AIR cessions to Bermuda is that higher discount rates can be applied

when valuing policy reserves (the funds set aside to meet insurance liabilities), which in some cases allows the value of those liabilities to be reduced (Chart 6).[10]

In these cases, the ceding life insurers can remove a larger amount of policy reserves from the liability side of their balance sheets compared to the scale of assets removed from the asset side, due to differences in discount rates. The resulting difference represents the profit generated through the use of reinsurance.[11]

According to the "Annual Report on Insurance Monitoring" by the Financial Services Agency (FSA) (summary available in English), as of the end of fiscal 2023, AIR accounted for over 80 percent of life reinsurance undertaken by Japanese life insurers on a stock basis (Chart 7). In terms of transaction structure, AIR can be divided into "flow reinsurance," where new contracts are transferred incrementally, and "block reinsurance," where existing contracts are transferred in bulk. In general, flow reinsurance is used to improve the assumed interest rates on new products by leveraging the investment capabilities of reinsurers, while block reinsurance is more commonly used to improve capital efficiency or avoid negative spread risk.[12]

[Chart 7] Breakdown of Reinsurance by Japanese Life Insurers

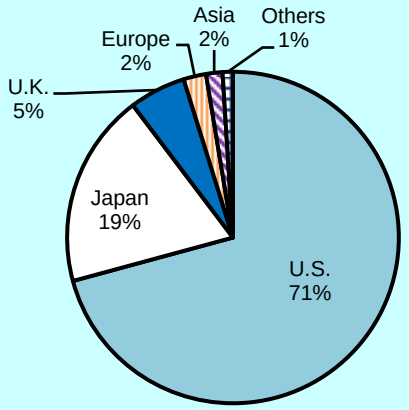


Note: As of end-FY 2023.
Source: FSA.

International Comparison of AIR Activity

Although publicly available data on AIR is limited internationally, data from the BMA on the breakdown of reinsurance cessions by country of origin shows that the United States accounts for the largest share, followed by Japan and the United Kingdom, while Europe, including Germany, accounts for a relatively small share (Chart 8).

[Chart 8] Reinsurance Contracts of Bermuda-Based Reinsurers: Share by Cedent Country



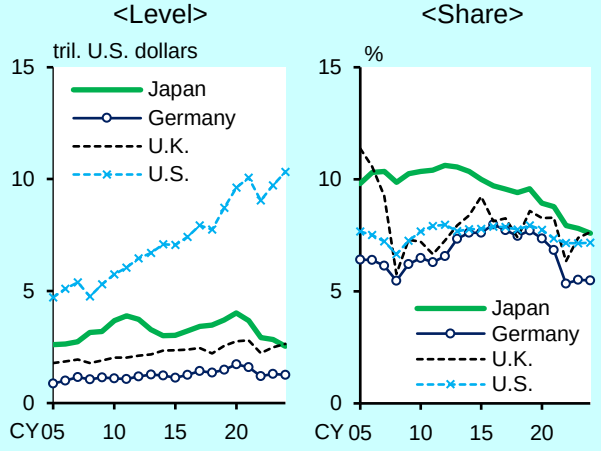
Note: As of end-2024.
Source: BMA.

Implications for Financial Stability

Looking at the share of financial assets held by life insurers within the domestic financial sectors across the countries examined, a gradual declining trend has been observed in recent years amid the expansion of assets in the non-traditional NBFI sector, particularly investment funds (Chart 9).[13] Nonetheless, along with pension funds, insurance companies are recognized as traditional NBFIs, and maintain a considerable presence in the financial system and bond markets alongside banks and investment funds (Charts 10 and 11).[14]

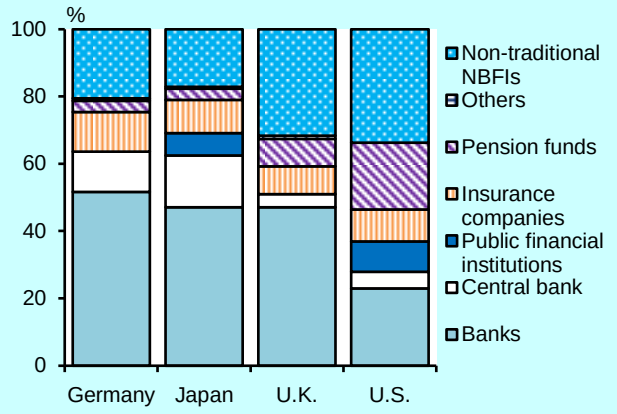
One of the risks traditionally associated with life insurers is the search for yield observed in the aftermath of the global financial crisis; in other words, a more aggressive risk-taking stance. Specifically, under the

[Chart 9] Financial Assets of Life Insurers



Note: Share represents the proportion of assets held by life insurers within the domestic financial sector. Latest data are as of 2024.
Source: BOE; Bundesbank; FRB; FSB; BOJ.

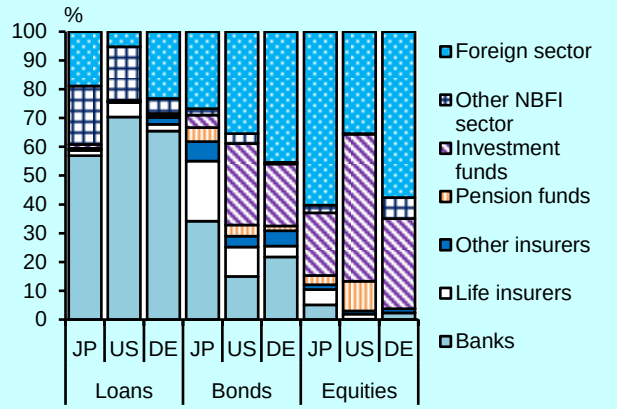
[Chart 10] Financial Asset Shares within the Domestic Financial Sector



Note: As of end-2024. Non-traditional NBFIs refers to NBFIs other than insurance companies and pension funds.

Source: FSB.

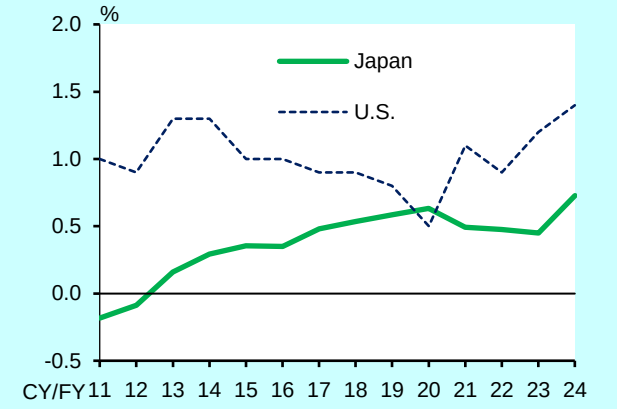
[Chart 11] Share of Asset Holdings by Sector



Note: Inward investment and loans by the domestic financial sector and the foreign sector. Germany's "foreign sector" includes intra-European transactions. As of end-2024.

Source: Bundesbank; FRB; BOJ.

[Chart 12] Interest Rate Margins of Life Insurers



Note: Interest rate margin refers to the difference between the investment yield and the average assumed interest rate. Data for Japan are estimated based on the three major life insurers.

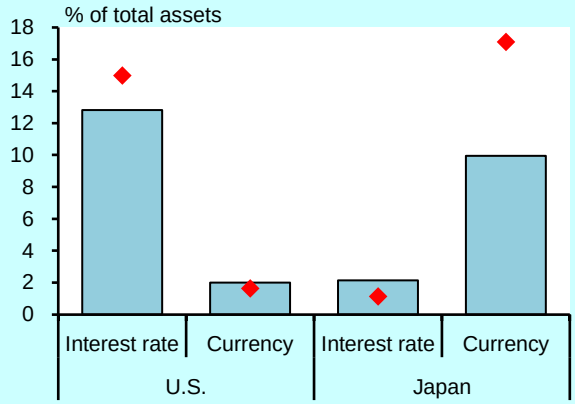
Source: NAIC; Published accounts of individual firms.

prolonged low-interest-rate environment, Japan and Germany, where yield-guaranteed insurance contracts have been relatively prevalent, saw increased investment in high-yield credit assets and foreign currency-denominated assets. Under these conditions, the interest rate margins of Japanese life insurers have been on an improving trend (Chart 12).

In addition, although still limited, the growing investment in illiquid assets has given rise to concerns that global stress events could impair the assets held by life insurers, potentially triggering "fire sales" and amplifying market volatility. In this regard, as life insurers, particularly in Japan and Europe, increasingly incorporate bonds from other jurisdictions into their portfolios, there are concerns that such interconnectedness could allow the effects of market stress to spread across borders.[15] That said, while progress is also being made in adapting to ESR regulations and strengthening risk management frameworks,[16] many of these are investment grade assets, and it is widely believed that any tilt toward greater credit risk has been broadly contained.[17]

The increasing use of derivatives to hedge interest rate and foreign exchange risks has also given rise to concerns about the potential impact of additional margin calls during periods of market stress (Chart 13).[18]

[Chart 13] Notional Principal Amounts of Derivatives



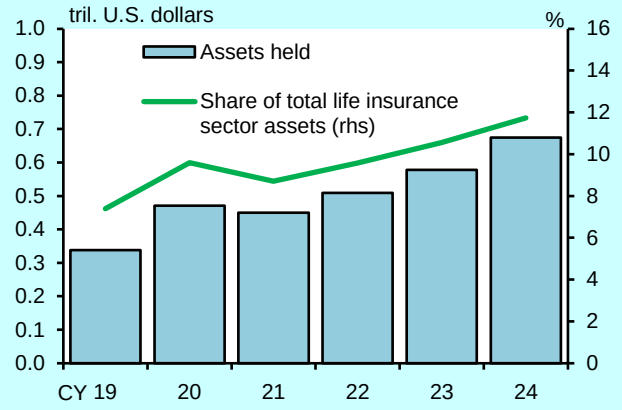
Note: As of end-2021 for the U.S. and end-FY 2024 for Japan (markers represent end-2015 for the U.S. and end-FY 2019 for Japan). Data for Japan are estimated based on nine major insurers. Interest rate derivatives include interest rate swaps and similar instruments; currency derivatives include forward exchange contracts, currency swaps, and other related instruments.

Source: NAIC; Published accounts of individual firms.

A further risk on the asset side of life insurer balance sheets is the growing interconnectedness with PE and PD. As noted earlier, major life insurers, particularly in the United States, have been increasing their investments in private funds. In the United States,

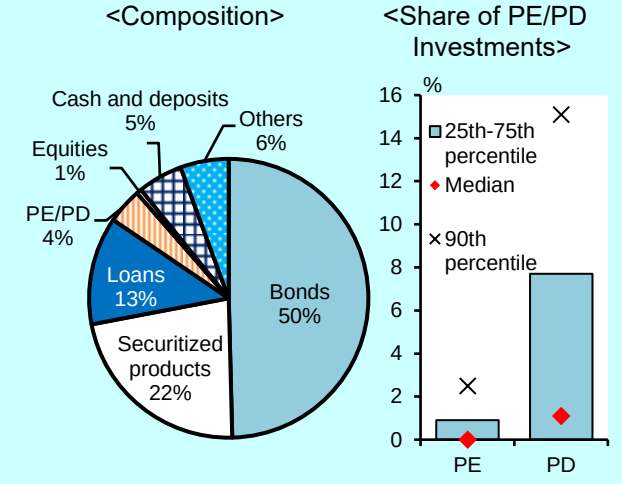
acquisitions of life insurers by PE funds and capital alliances have increased, with PE-affiliated life insurers now accounting for approximately 10 percent of total assets under management (Chart 14). It has been noted that life insurers under PE ownership tend to increase their allocations to funds managed by the same asset manager, such as PE and PD funds. In the context of AIR, it is also known that nearly half of Bermuda-based reinsurers are sponsored by PE funds. Furthermore, the investment asset composition of Bermuda-based reinsurers shows that the share of PE and PD investments is relatively high among certain reinsurers (the 90th percentile in Chart 15).[19]

[Chart 14] Investment Assets of U.S. PE-Affiliated Life Insurers



Source: NAIC.

[Chart 15] Investment Assets of Bermuda-Based Reinsurers



Note: As of end-2023.

Source: BMA.

PE and PD investments are themselves subject to potential risks, including sectoral concentration in their underlying portfolios and valuation uncertainty.[20] From the perspective of global financial system stability, concerns have been raised about the growing interconnectedness between life insurers and PE and PD. These concerns include the risk that conflicts of interest in the asset management and investment decisions of life insurers might arise, the risk that stress might reciprocally spread between life insurers and PE and PD through their interconnectedness, and the risk that such stress may further spill over to the banking sector, which has exposures to PE and PD.[21]

As noted earlier, the increase in alternative investments and the use of AIR are expected to contribute to more sophisticated ALM through investment diversification. On the other hand, potential risks have been identified, including concentration risk arising from offshore reinsurance contracts, particularly with Bermuda-based reinsurers, as well as recapture risk (that is, the obligation on ceding insurers to reassume the assets and risks transferred under a reinsurance contract if that contract is terminated).

Concluding Remarks

This paper has provided an international comparison of changes in the business models of life insurers, including their use of reinsurance, across Japan, Germany, the United Kingdom, and the United States, and has examined the key financial stability implications. The main findings can be summarized as follows:

First, in response to the changing environment since the global financial crisis, including adaptation to various regulations, growing post-retirement funding needs, the prolonged low-interest-rate environment that persisted until the pandemic, and the subsequent period of high inflation, life insurers across countries have pursued business model transformation, including expanding their product lineups and diversifying their investment assets. In this context, although the degree varies across countries, life insurers have been expanding their exposure to alternative assets, including those related to private funds, and other illiquid assets.

Second, the use of AIR by life insurers has been increasing in recent years, with the aim of enhancing investment yields, among other objectives. Reinsurance counterparties have included PE-affiliated reinsurers based in Bermuda to some extent. As a result, in addition to direct PE and PD investments, such strengthening of indirect linkages appears to have further deepened the interconnectedness between life insurers and private funds across the countries examined.

Life insurers have traditionally been significant

participants in the global financial system, with a considerable presence. From a financial system stability perspective, it is important to continue monitoring changes in the scale and composition of life insurer balance sheets, encompassing both the asset and liability sides. Furthermore, as interconnectedness among financial institutions, including NBFIs, becomes increasingly complex globally, it is considered important to continue not only tracking where risks reside among economic entities, but also analyzing the transmission channels through which stress spreads during periods of shock.

BOX: The History and Evolution of Reinsurance

Reinsurance is a financial transaction through which primary insurers transfer and disperse risks by ceding them to reinsurers. In this process, specific portions of the risks inherent in insurance contracts are carved out and redistributed to entities able to assume them.

The origins of reinsurance can be traced back to marine insurance in medieval Europe around the 14th century, and the practice has evolved alongside changes over time. Initially, reinsurance underwriting was centered on non-life reinsurance covering losses caused by natural disasters. As natural disasters occurred frequently in the 1990s, however, reinsurance became increasingly integrated with financial capital markets amid the expansion in securitization markets[22]. Specifically, mechanisms emerged for raising the capital required for additional underwriting by issuing bonds to investors through financial capital markets, leading to the rapid development of insurance-linked securities markets, including those for catastrophe bonds. Through such financial mechanisms, insurers are able to take on additional risk (that is, underwrite additional policies), although a similar effect can also be achieved through a capital increase without issuing insurance-linked securities. However, capital increases are not easily executed. On the other hand, underwriting capacity can also be strengthened through the use of reinsurance. In this context, insurers began to use reinsurance as an alternative capital-raising tool, taking into account factors such as cost advantages, convenience, efficiency, and transaction flexibility.

Reinsurance in the life insurance sector has emerged later than in the non-life sector. Initially, it was used primarily to transfer biometric risks such as mortality risk and longevity risk, but life reinsurance subsequently became increasingly integrated with financial capital markets, as had occurred in the non-life sector. In this context, reinsurance products with diverse functionalities have emerged, including AIR, which evolved from structures focused on transferring liability-side risks, such as those associated with policy surrenders, into schemes that simultaneously transfer investment risks on the asset side.

[1] In Japan, trends in duration gaps are disclosed, particularly among listed companies, and despite variations across individual firms, the average gap between asset and liability durations has been largely eliminated. On the other hand, in Europe, duration gaps persist despite variations across countries. For example, see EIOPA (2023), "Report on the Impact of Inflation on the Insurance Sector."
For trends across countries and regions, as well as risks to the financial system, see, for example, Aquilina, M., Garavito, F., Gelos, G., Lewrick, U., Packer, F., Pinter, G., Sushko, V., and Todorov, K., "The Transformation of the Life Insurance Industry: Systemic Risks and Policy Challenges," BIS Paper No. 161, 2025.

[2] ESR regulations were introduced in Europe from January 2016, and their application in Japan began at the end of March 2026. Meanwhile, the United States has maintained its existing framework while implementing partial revisions, such as the introduction of principle-based reserving (PBR) for policy reserve valuation, since 2017.

[3] For instance, the International Association of Insurance Supervisors (IAIS) published an issues paper in November 2025 on the increase in alternative investments and the use of AIR.

[4] Comparisons of life insurers across countries and changes in their balance sheet compositions since the global financial crisis are presented in the following paper.
Washimi, K., Inaba, H., and Imakubo, K., "International comparison of life insurers: Balance-sheet differences and their financial stability implications," *Bank of Japan Review Series*, no. 2017-E-2, 2017.

[5] In addition to unit-linked products, there has also been a shift toward hybrid products within individual pension plans -- products that correspond to variable products with guaranteed returns. For example, see the secretariat document for the third meeting of the "Advisory Council on the Economic Value-based Solvency Framework" in September 2019 regarding trends in insurance products in Europe (available in Japanese).

[6] For example, this has been noted in the Prudential Regulation Authority Business Plan (2025/26) in the United Kingdom.

[7] On the other hand, in the United States, where variable annuities are prevalent, the share of equities is relatively high. In Germany, the shift toward unit-linked products has contributed to a rising share of equities. In Japan, the decline in the share of

bonds can be attributed to an actual decrease in foreign bond holdings and a relative decline in the bond share due to rising stock prices. During this period, the outstanding balance of Japanese government bonds (JGBs) has been increasing, particularly in the super-long-term zone.

[8] This discussion assumes the coinsurance structure used mainly by Japanese life insurers, although various contract structures exist in practice. For example, there are structures under which only insurance underwriting risks other than investment risks (such as surrender and lapse risks) are transferred, while policy reserves and the corresponding assets remain with the ceding insurer.

[9] For further details, see the IAIS issues paper referenced in footnote 3. The BMA also conducts regular stress testing for the insurance sector.

[10] Typically, the discount rate is based on risk-free rates (RFRs) by maturity, with reference to government bond yields and swap rates. To reflect market conditions, however, spread adjustments such as volatility adjustments are added.

In Bermuda, liquidity premiums on investment assets are permitted to be added to RFRs for major currencies, which tends to result in relatively higher discount rates. For further details, see the BIS Quarterly Review, September 2024.

[11] Similarly, from the reinsurer's perspective, the reduction in liability value lowers the required capital, generating a profit.

[12] In flow reinsurance, life insurers are able to set higher assumed interest rates for policyholders based on the investment yields offered by reinsurers. It is said that this makes it possible to offer highly competitive products, particularly through bancassurance channels, such as single premium whole life insurance.

[13] In Germany, the relatively smaller scale of life insurers is attributable in part to the significant size of the non-life and reinsurance sectors. In Japan, life insurers' balance sheets have declined somewhat in U.S. dollar terms in recent years due to yen depreciation. In addition, the use of AIR, which involves the transfer of assets to reinsurers, is also considered to have contributed to a reduction in assets.

[14] The Financial Stability Board (FSB) distinguishes insurance companies and pension funds from other financial intermediaries (such as investment funds) in its Global Monitoring Report on Non-Bank Financial Intermediation.

[15] For example, see Eren, E., and Wooldridge, P., "The Role of Non-bank Financial Institutions in Cross-border Spillovers," BIS Papers No. 129, 2022.

[16] Pension funds, which similarly engage in long-term investment, are subject to risk-based regulations that allow relatively greater flexibility in asset management. By contrast, insurance companies, given their payment obligations to policyholders, are required to adhere to stricter risk management practices.

For example, see Stewart, F., "Pension Funds' Risk Management Framework: Regulation and Supervisory Oversight," OECD Working Papers on Insurance and Private Pensions, No. 4, 2010.

[17] According to the IMF's Global Financial Stability Report (October 2025), the use of private letter ratings by U.S. life insurers has been on the rise. Private letter ratings are ratings disclosed solely to investors and issuers, and attention has been drawn to the question of whether such ratings especially by small credit rating agencies may be overly optimistic.

[18] U.S. life insurers have traditionally used interest rate swaps for duration adjustment, and during the period of rising interest rates since 2022, they faced considerable additional margin posting requirements. Japanese life insurers have used currency swaps and similar instruments to hedge the foreign exchange risk associated with investments in foreign currency-denominated bonds. In recent years, however, such hedging activity has declined as hedging costs have risen in line with higher U.S. interest rates.

[19] With respect to actual investment asset allocations, it has become common practice, from a risk management perspective, to establish guidelines at the time of entering into reinsurance contracts and to conduct ongoing monitoring.

[20] See, for example, Financial Stability Report released by the European Insurance and Occupational Pensions Authority (EIOPA) in December 2025.

[21] For the growing complexity in the interconnections between life insurers and alternative asset managers, see Cortes, F., Diaby, M., and Windsor, P., "Private Equity and Life Insurers," IMF Global Financial Stability Notes, issue 01, 2023.

[22] Based on a report by Atsushi Kobayashi on the deepening of reinsurance and recent developments in reinsurance markets, including the diversity of reinsurance and the penetration of finance theory, published in the SOMPO Institute Plus Report Vol.61 in 2012 (available in Japanese).

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