

Uncharted Territory: How Life Insurance Companies Can Navigate the Era of Negative Interest Rates



While insurers around the world face a considerable challenge in a negative rate environment, there are potential solutions. Learning from industry experience in Asia markets with prolonged low interest rates will help insurers formulate appropriate investment strategies in their respective markets.



Stephan van Vliet
 Managing Director,
 Head of Insurance Asset Management
 PineBridge Investments, Hong Kong



Yongho Lee
 Vice President, Insurance Asset Management
 PineBridge Investments, Hong Kong

A prolonged period of low interest rates has beset insurance companies for more than a decade. Now, the adoption of negative interest rates by a number of central banks in Europe as well as Japan is steering the industry into uncharted territory.

Traditionally, local government bonds are one of the major asset classes life insurers use for asset-liability management. But the new era of negative rates means that traditional approaches will struggle to help insurers meet their return requirements. This, plus the relatively small size of the local corporate bond markets, leaves insurance companies with limited options.

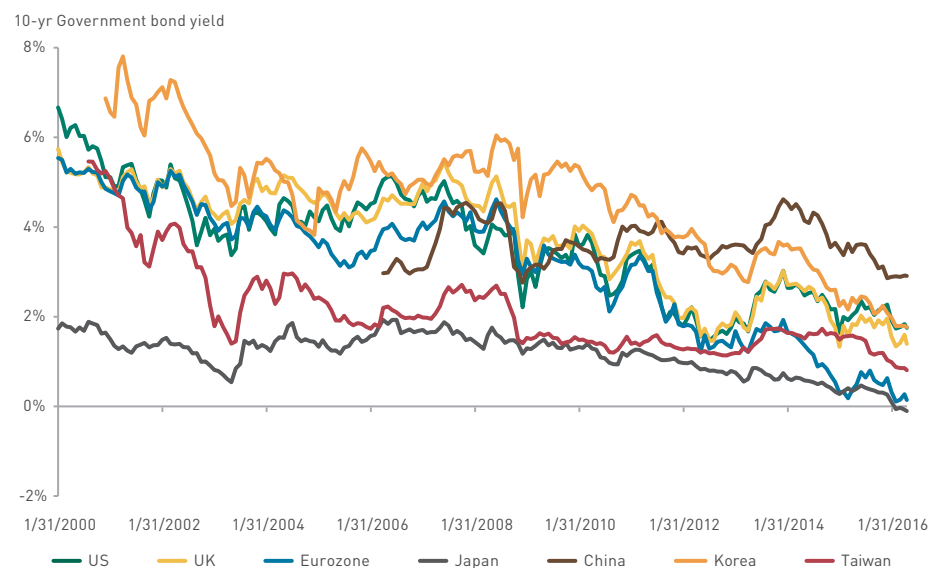
While insurers are facing a considerable challenge, they are not empty handed. The continual fall in yields has given them an incentive to take offshore credit risk for yield enhancement as well as diversification. But it's important to realize that there is no one perfect solution; each insurer needs to determine the best asset allocation strategy to address the "negative world order."

Increased investments to foreign bonds

The asset-liability management (ALM) framework of insurance companies begins generally with duration matching (including cash flow matching) and currency matching. Generally, currency matching is achieved by directing investments into assets that are denominated in the same currency as the liabilities.

The path to negative

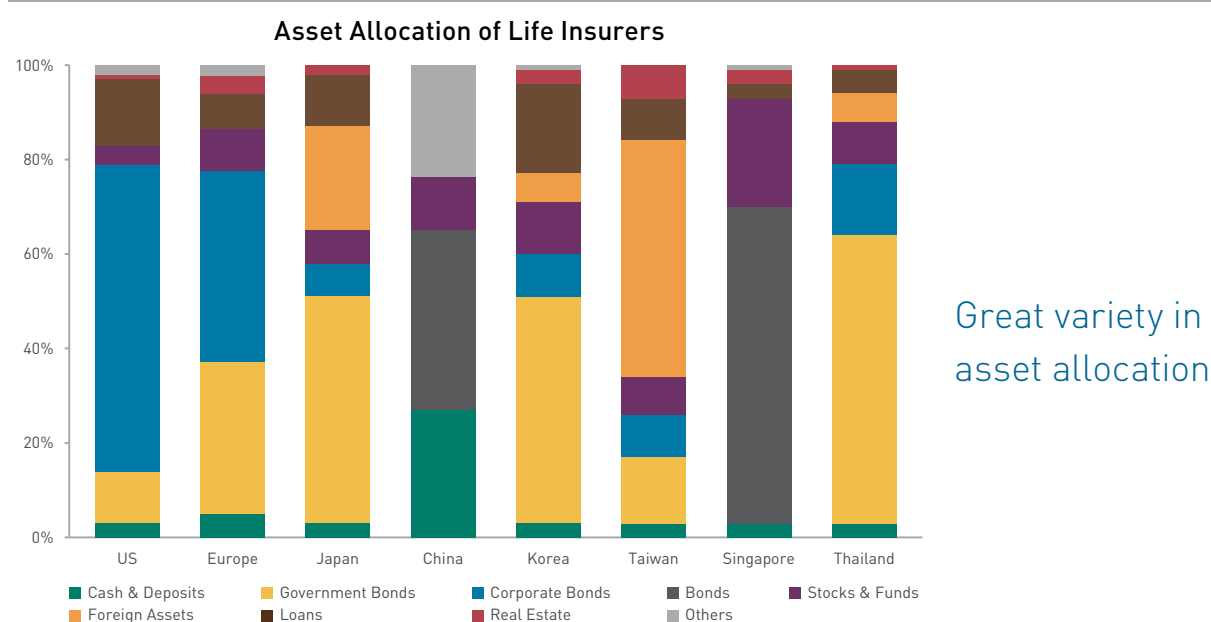
Historical 10-Year Government Bond Yields



Source: Bloomberg.

However, ALM matching becomes problematic when it comes to duration because most Asian countries have an insufficient supply of long-term bonds beyond Treasuries. Given that life insurance liabilities are generally long-dated, it is inevitable that insurance companies will face reinvestment risks posed by shorter duration bonds, and will require capital to offset that risk. The continual decrease in yields has given incentives for insurers to take offshore credit risk not only for the purpose of yield enhancement but also for diversification, which again raises the question of whether to match currency and duration.

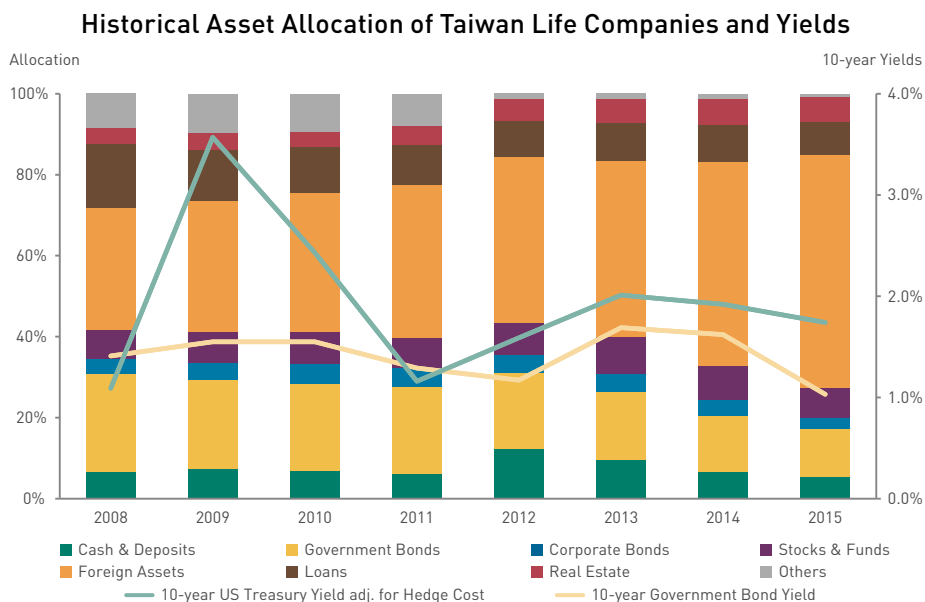
While the low yield environment has become a global theme and changed the investment environment, the asset allocation of insurers varies largely depending on the liability structure, regulatory capital framework, and local capital market conditions.



Source: National Association of Insurance Commissioners, Morgan Stanley Research dated 19 March 2014, The Life Insurance Association of Japan, China Insurance Regulatory Commission, Korea Life Insurance Association, Taiwan Insurance Institute, Monetary Authority of Singapore, and Thai Life Assurance Association. As end of FY2014 except for Europe which is as end of FY 2013.

The asset allocation of insurers in Japan, Taiwan, and Korea has also changed as interest rates have declined. The period when allocations to foreign assets (mostly bonds) started to increase coincides with the period when the yields of 10-year foreign bonds represented by US Treasuries (adjusted for currency hedge cost) becomes higher than 10-year local government bond yields. Generally speaking, Asian insurance companies run short-term rolling currency hedges that make it possible for them to achieve higher currency-hedged foreign bond yields than local yields.

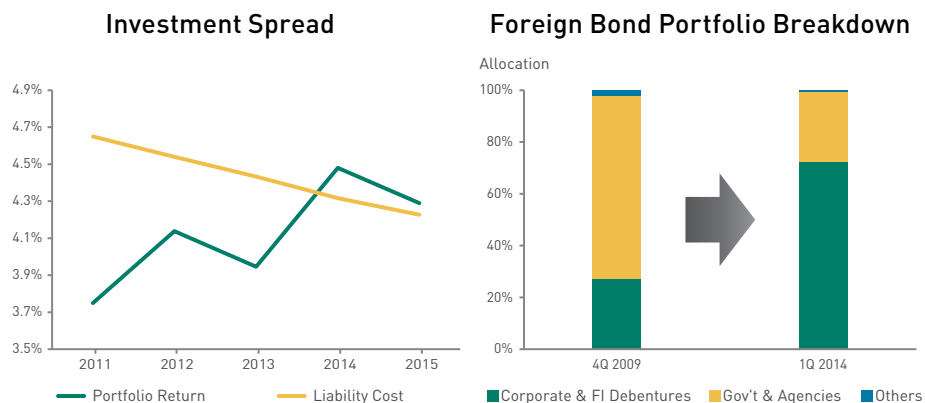
On average, Taiwanese insurers now hold approximately half their portfolio in foreign assets



Source: Taiwan Insurance Institute, Bloomberg, and PineBridge Investments. As of 14 March 2016.
 Note: FX hedge costs are calculated assuming 3-month rolling of FX forward for Taiwan to reflect the market practice.

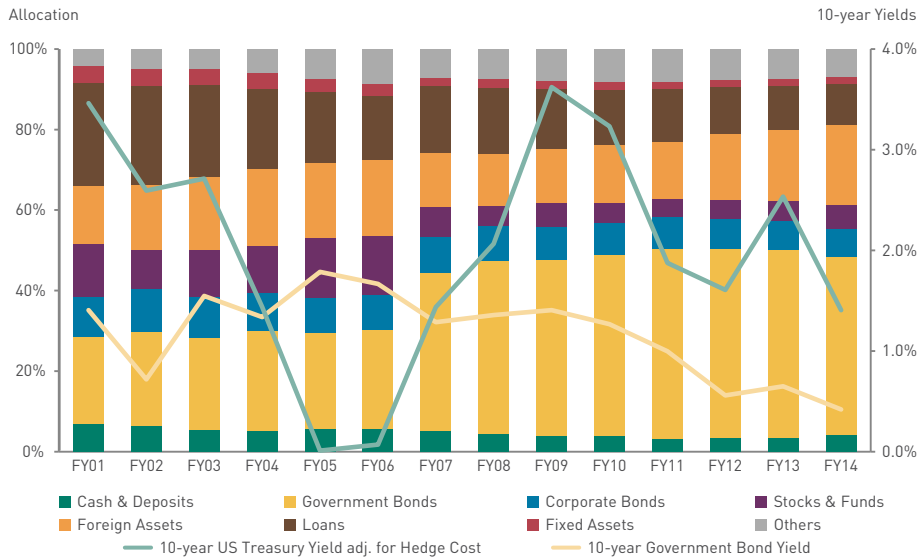
The extent to which these three major Asian markets are exposed to foreign assets depends on the local capital market conditions. Taiwan, for example, has total insurance assets of around US\$500 billion, while the local bond market is less than US\$300 billion. This has led to persistent low yields, low volatility, and low trading volumes in the Taiwan bond market. A relatively small bond market, coupled with the fact that Taiwanese insurers are required to hold capital against negative investment spread while no capital is charged for the duration mismatch, has triggered an aggressive expansion into higher yielding foreign bonds.

Major Taiwanese insurers using foreign credit to deal with negative investment spread



Source: HSBC Research dated 26 June 2014, Taiwan Insurance Institute, Company Disclosures, and PineBridge Investments. As of end of 2015.
 Note: Major Taiwanese insurers included for producing above charts are Cathay Life, Fubon, and Shin Kong.

Historical Asset Allocation of Japan Life Companies and Yields



Japanese insurers are also allocating more to foreign bonds

Source: The Life Association of Japan, Bloomberg, and PineBridge Investments. As of 14 March 2016.
Note: FX hedge costs are calculated assuming 3-month rolling of FX forward for Japan to reflect the market practice.

USD denominated zero coupon callable bonds have been one of the major foreign bond investments for Taiwanese insurers. Reuters reported in May 2015 that the issuance of these bonds with maturity of 30 year yielding above 4% has reached around \$5 billion since February¹. Likewise, Formosa bonds in USD/RMB are in growing demand, and Moody's estimates that 60–70% of foreign currency exposure from invested foreign bonds is hedged at industry level.

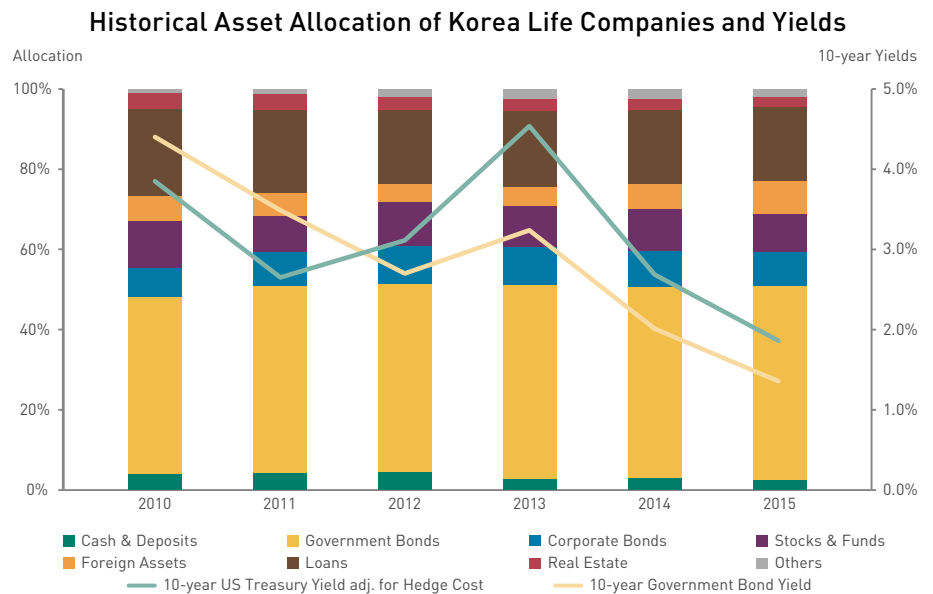
The interest rate environment in Japan is unique and is the result of persistent stagnant economic growth for over a decade after the collapse of its asset price bubble in the 1990s. The Japanese insurance industry has gradually increased its exposure to foreign bonds, which has helped to overcome the prolonged negative investment spread.

Korea's bond market is about double the size of its insurance assets. Until recently, the onshore market offered higher yields, which is why Korea was relatively late to increase its investment allocation into foreign bonds.

Unlike Taiwan, Korean insurers are required to hold capital not only for a negative investment spread but also for duration mis-match. The Financial Supervisory Service in Korea reported that the life insurance industry is facing a negative spread of 40 bps (4.4% portfolio return vs. 4.8% reserve rate) as at end of June 2015. Korean insurers also have been investing in callable bonds for yield enhancement but these were generally sourced from the local market. Within a foreign bond portfolio, Korean insurers have

¹ Source: *Taiwan becomes zero coupon bond hub* dated Friday 8 May 2015 written by Spencer Anderson. <http://www.reuters.com/article/asia-bonds-idUSL4N0XY39W20150508>

Korea has been slower to march into foreign bonds



Source: Korea Life Insurance Association, Bloomberg, and PineBridge Investments. As of 14 March 2016. Note: FX hedge costs are calculated assuming 12-month rolling of FX forward for Korea to reflect the market practice.

long favored making foreign investments using US-dollar-denominated bonds issued by Korean entities, leveraging in-house credit analysis capabilities. Today, however, insurers are expanding their investments into bonds issued by foreign entities as the yields in the US and Korea are currently trading at similar levels.

A gradual US rate hike cycle in coming years widening the spread with interest rates in Asia and the Euro zone could potentially increase the cost of currency hedging, which can further shift demand from US Treasuries to US Corporates and Emerging Market Sovereigns.

To match or not to match?

When interest rates fall below zero, traditional risk models fail because most of these assume rates cannot be negative. Negative rates are uncharted territory in terms of risk and asset management because they make ALM unprofitable or create negative spreads. So insurance asset managers are now facing the question: To match or not to match?

The main factor that drives whether an insurance company matches liabilities is the cost of doing so, which can be measured by the financial cost of hedging and the cost of regulatory capital.

When rates are low and long-term guaranteed liabilities are high, the cost of matching is high. If the cost of capital for failing to match is high, then an insurer may be willing to accept the lower return and negative

investment spreads. This will, in turn, have an impact on its future business profile. In this scenario, for example, the insurer may offer products that are not heavily affected by squeezed margins. When rates fall to ultra-low or even negative territory, the financial cost of hedging becomes more pronounced and less emphasis is placed on duration matching.

Asset risk is also a critical factor that plays out under this scenario – for example, if an insurer decides to shift from government bonds into real estate or below-investment-grade credit. It is prudent or indeed, may be mandated, that they hold capital for the additional risk that is taken.

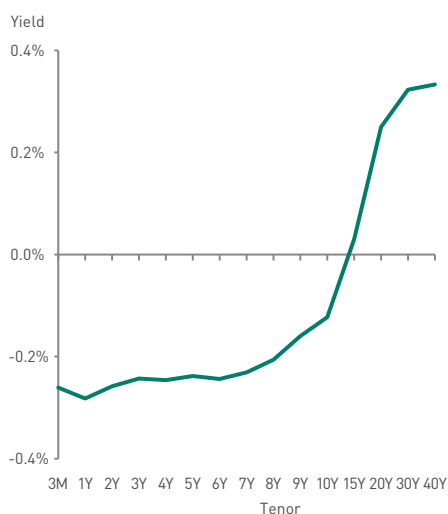
For every insurer and every country there are different asset-liability matching trade-offs. Among the major insurance markets, Japan provides an interesting example warranting further investigation.

Japan’s 10-year yield has been persistently below 1% since 2012, which led insurers to reduce allocations to government bonds. Now yields are negative up to the 15 year tenor which means that 83% of the Government bonds outstanding are in negative territory. Government bonds invested by insurance companies are generally long duration and more than 70% of Japan’s government bonds are longer than 10 years².

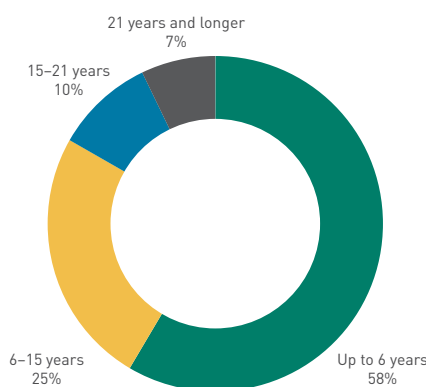
Major insurers in Japan have steadily reduced their allocation to government bonds and replaced these with foreign assets – predominately foreign bonds.

²Source: Annual Reports from major Japanese Life companies including Nippon Life, Dai-ichi Life, Meiji Yasuda Life, Sumitomo Life, Taiyo Life, and Daido Life.

Yield Curve of Japan’s Government Bond



Outstanding Balance of Japan’s Government Bond by Remaining Term to Maturity



Most of Japan’s yield curve is negative

Source: Bloomberg, PineBridge Investments. As of 12 May 2016.

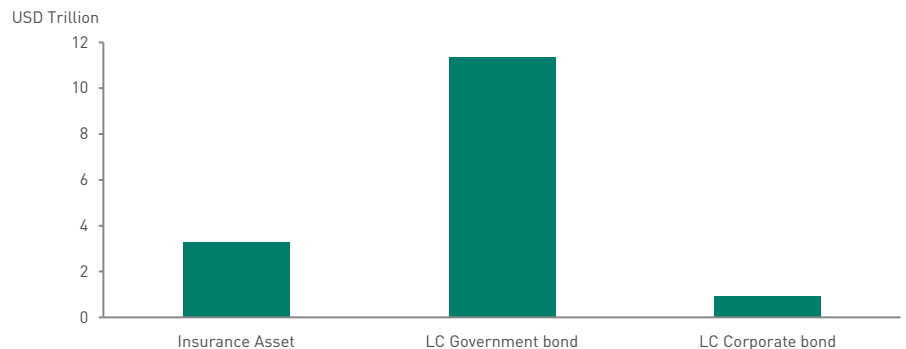
Foreign assets are attracting insurers

Foreign assets	Nippon	Dai-ichi	Meiji Yasuda	Sumitomo	Taiyo	Daido
Bond	75%	74%	79%	91%	91%	57%
Equities	25%	26%	21%	9%	9%	43%

Source: Annual Reports of each company as end of FY2014.

The ultra-low interest rate environment has made Japanese government bonds unattractive for domestic insurers to undertake duration matching, making the risk inherent in foreign credit more palatable. The local credit market, which can potentially provide a better yield alternative to government bonds, is only around one-third of the size of insurance assets because direct bank financing is still a major source of funding for Japanese corporations.

Japan Market Size



Source: Bloomberg, PineBridge Investments. As of 12 May 2016.

Japan's relatively small credit market

Additionally, the US credit market shows better yields compared with Japan's local credits.

The US offers better yields

US Bonds	10-year Yield	Japan Bonds	10-year Yield
Treasury	1.89%	Government Bond	-0.115%
A-rated Corporate Bond	2.78%	A-rated Corporate Bond	-0.07%

Source: Bloomberg, Barclays. As of 22 April 2016. Yield data of A-rated Corporate Bond is from Barclays US Corporate Investment Index – Grade A sub index for US and Barclays Asian Pacific Japanese Yen Index – Grade A sub index for Japan.

We expect to see a further allocation into more alternative and offshore assets by insurance companies due to negative rates. The degree to which insurance companies will embrace this new investment paradigm will depend on their appetite for the relevant risk.

Regulatory framework limitations

In addition to capital, there are also regulatory limitations that dictate how much companies can invest offshore and into riskier investments. For example, insurers in China, Korea, and Thailand are not permitted to invest directly into foreign high yield bonds.

Japan previously had a regulatory limit of 30%, 20%, 30% on total assets for domestic stocks, real estate, and foreign assets, respectively. This limit was abolished following a revision to the Ordinance for Enforcement of the Insurance Business Act as of 18 April 2012.

The Financial Supervisory Service in Korea announced last year that it would lift the current regulatory limit, which consists of a 30% allocation to foreign assets, 6% for derivatives, and a 7% single issuer limit, by 2017.

Taiwan's Financial Supervisory Commission passed a bill in 2014 to exclude foreign currency bonds issued onshore from the 45% limit on foreign investments. In 2013, the regulator started to allow insurance companies to invest in foreign real estate and continuously increased the regulatory cap inclusive of BB+ rated bonds, given certain conditions are met.

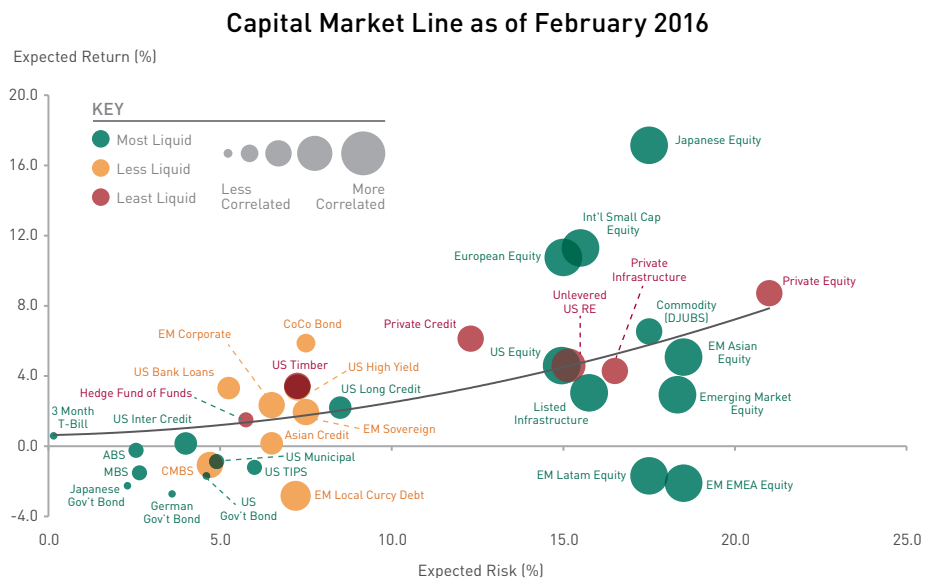
We believe that reforms across the globe are going to continue to be a one-way street, lifting direct measures by liberalizing regulatory limits but imposing indirect measures by increasing the risk charges and governance under different regulatory capital models. This is required in order to accommodate the ultra-low or negative rate environment while at the same time promoting sound risk management practices toward meeting the requirements of economic value-based solvency regimes. Solvency II in Europe, C-ROSS in China, discussions about RBC II in Singapore, and Japan's field tests of economic value-based solvency regime in 2010 and 2015 are all illustrations of this.

With each step toward liberalization, we are likely to see increasing numbers of insurers diversifying into more international and alternative investments.

Optimizing portfolios: A case study from the Japan life insurance industry

The Capital Market Line is a decision-support tool developed by PineBridge's Multi-Asset team, which quantifies several key fundamental judgements for each asset class to generate an intermediate forward looking view (for 5 year period) of expected return, volatility, and correlation amongst the asset classes.

The Capital Market Line from a Japan insurer's perspective



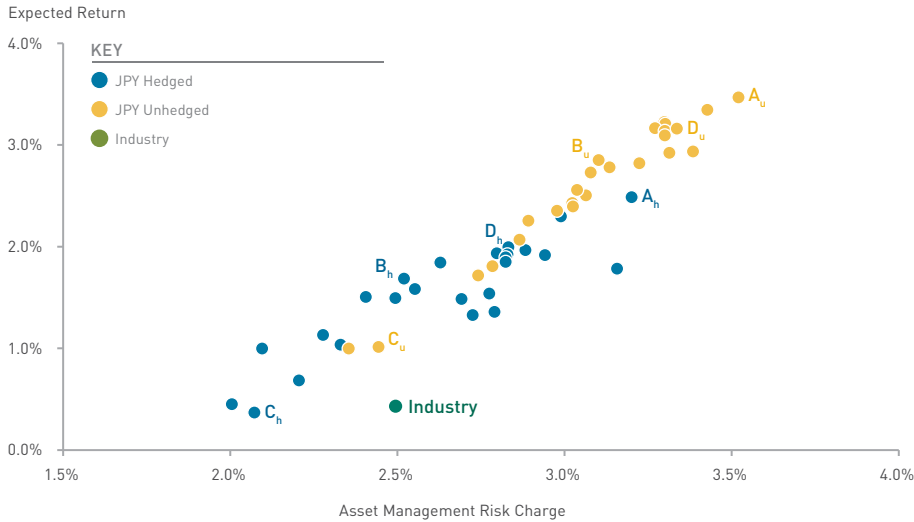
Source: PineBridge Investments. As of end of February 2016. Based on PineBridge Investments' estimates of forward-looking 5-year returns and standard deviation. The Capital Market Line ("CML") is a tool developed and maintained by PineBridge's Global Multi-Asset Team. It has served as the team's key decision support tool in the management of many of our asset allocation products. It is not intended to represent the return prospects of any PineBridge products, only the attractiveness of asset class indices, compared across the capital markets. The CML quantifies several key fundamental judgments made by the Global Multi-Asset Team for each asset class, which when combined with current pricing, results in our annualized expected return forecast for each asset class over the next five years. The expected return for each asset class, together with our view of the risk for each asset class as defined by volatility, forms our CML. Certain statements contained herein may constitute "projections," "forecasts" and other "forward-looking statements" which do not reflect actual results and are based primarily upon applying retroactively a simulated set of assumptions to certain historical financial information. Any opinions, projections, forecasts and forward-looking statements presented herein are valid only as of the date of this document and are subject to change. There can be no assurance that the expected returns will be achieved over any particular time horizon. Any views represent the opinion of the Manager and are subject to change.

The fixed income outlook reflects anticipated developed-market sovereign yields driven by current aggressive monetary policy (negative rates and quantitative easing) and the expected gradual normalization of rates with less concern over disinflation. The equity outlook reflects increased leverage in emerging markets, Europe's cyclical recovery, and Japan's shareholder-friendly corporate governance reforms. The US dollar is expected to remain strong with a widening of interest rate differentials ahead.

While Japanese and US government bonds are the two major asset classes for Japanese life insurers, they have an unattractive return profile over the next five years as shown in the chart above. However, using a smart allocation with a diversified foreign asset portfolio can demonstrably produce better portfolio positioning on a risk-adjusted return basis, measured by the return on the asset risk charge under the Japanese regulatory solvency framework.

We analyzed a range of portfolios to determine what such an allocation could look like using our Capital Market Line forecasts. The following chart shows a representative portfolio of the life insurance industry in Japan as a base portfolio. The blue portfolios are those showing higher risk-adjusted

Risk/Return of Portfolios



Performance improves when lifting currency hedges

Source: PineBridge. For illustrative purposes only. We are not soliciting or recommending any action based on this material.

returns relative to the base portfolio. Foreign bonds are all assumed to be currency-hedged, while foreign equities and alternatives are assumed to be unhedged. The yellow portfolios are equivalent portfolios with the exception that foreign bonds are not currency-hedged.

All 25 of the yen-hedged portfolios show higher risk-adjusted return compared to the base portfolio. This performance further improves when the currency-hedging requirement is lifted. Although the standalone currency risk charge is 10%, it comes with better diversification benefits under the Japanese regulatory solvency framework. Portfolios in the chart are presented in 2 extreme versions (currency hedged in blue and unhedged in yellow) because the current Japanese market practice is that not all foreign bonds are 100% currency-hedged and the hedge ratio varies by company. The allocation to foreign assets for the base portfolio is 21%, while all other model portfolios are further diversified with additional foreign assets (including alternatives) with allocations ranging from 21% to 38% (the average allocation being 30%). Given that Japanese life insurance companies are well capitalized, we believe this level of allocation to foreign assets can be seen in the market for the next five years.

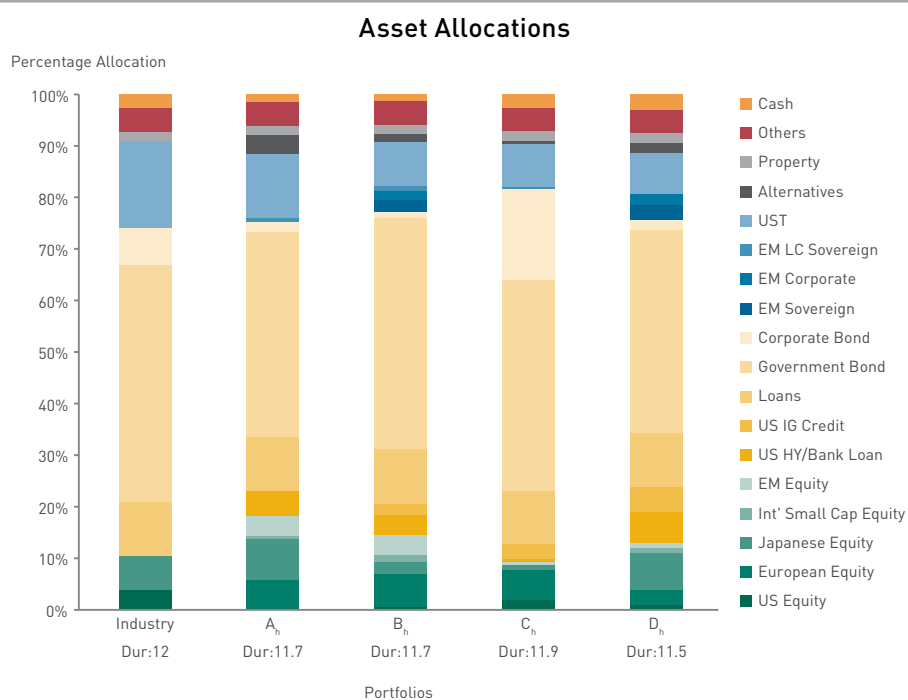
Capitalization of Japanese life insurance companies

	Nippon	Dai-ichi	Meiji Yasuda	Sumitomo	Taiyo	Daido
Solvency Margin Ratio	930.8%	913.2%	1,041%	944.2%	993.9%	1,363.7%

Source: Company disclosures. As end of FY2014. Note minimum regulatory requirement of solvency margin ratio in Japan is 200%.

Portfolio C_h shows a 17% reduction in risk charges, while maintaining the same expected return profile as for the base portfolio. Exposure to foreign assets also remains the same as in the base portfolio, while the composition of the foreign asset portfolio is further diversified mainly through European equity and US investment grade credit. Equity risk charges are reduced by reallocating Japanese equity to local bonds and results in better diversification benefits with the increased allocation to foreign equities. When added to local assets, this contributed to reduced overall portfolio risk charges. This portfolio showed a 48% diversification benefit, compared with 41% of the base portfolio. The diversification benefit can be measured by calculating the percentage reduction of the total portfolio risk charges after diversification, taking into account the correlation matrix embedded in the Japanese regulatory solvency framework from the aggregate sum of total risk charges.

Detailed asset compositions



Portfolio A_h produces the highest risk-adjusted return among the 25 model portfolios in the universe. Such an outcome is achieved by reallocating some portion of the unattractive assets (such as Japan bonds and US Treasuries) for the next five years to more attractive assets like US high yield bonds, bank loans, global equities, and alternatives. The risk level has increased by 28% compared with the base portfolio, while the return profile has significantly improved by more than four times on a yen-hedged basis.

Allocation to foreign assets has increased to 32% where equities consist of approximately one-third of the foreign portfolio. Additional exposure to foreign equity with a similar return profile helps improve portfolio return while providing diversification benefits that limit a significant increase in risk capital.

Portfolio B_h shows how foreign assets can help improve return while keeping the risk level unchanged. Compared with the base portfolio, the return profile almost tripled, with the same level of risk under a yen-hedged basis. Exposure to local yen credits and US Treasuries was reduced and the fixed income portfolio was further diversified with US investment-grade credits, high yield bonds, bank loans, and emerging market debt. Likewise, allocations of both local equity and US equity were reduced and replaced with global equities. This reallocation resulted in increased allocation to foreign assets to 33%, where the equity portion was higher than one-third of the foreign portfolio. Compared with Portfolio A_h, the allocation to Japanese government bonds was unchanged and a larger portion of local risky assets (yen corporate bonds and yen equities) was used for reallocation to foreign assets. Foreign assets have lower stand-alone risk charges than local assets when classified as AFS (available for sales under J-GAAP) under the Japanese regulatory solvency framework. Furthermore, foreign assets come with lower correlation when added to local assets, and portfolio B_h, therefore, was constructed to take advantage of these features.

However, we see that both Portfolios A_h and B_h are relatively more reliant upon performance of the equity portfolio, which can introduce additional volatility that insurers may not want. Considering insurers' general preference toward fixed income assets, we believe Portfolio D_h could be a more suitable model portfolio.

Portfolio D_h shares a similar exposure to foreign assets as Portfolios A_h and B_h, at 32% but with only around one-fifth of the foreign equity portfolio. Similar to Portfolio A_h, the allocation to yen bonds and US Treasuries has been reduced. Portfolio D_h differs from Portfolio A_h by having a much more diversified foreign portfolio containing US investment grade credits, high yield bonds, bank loans, emerging market debt, and global equities. This further results in the portfolio having the highest risk-adjusted return under a yen-unhedged basis, which is represented as the D_u portfolio (see chart, "Risk/Return of Portfolios," on page 11).

Although Japanese equities have the highest expected return conviction in the assumption, adding well diversified foreign assets with a certain level of open currency positions can help better position the portfolio under the Japanese solvency framework. Portfolio D_h does increase the risk level but the improvement in return prospects, which is more than triple that of the base portfolio, outweighs the 14% increase in risk³.

³ These study results assume that insurers have sound foreign credit analysis and currency risk management functions.

Overall, the ultra-low interest rate environment and relatively thin local credit market in Japan would encourage investment decisions to diversify asset risks and take foreign credit risks, supported by the well-capitalized positions of the life insurance industry. Interest rate risk can be increased a little by reducing the portion invested in government bonds, which have previously been used as the main asset class for duration matching. The BOJ's quantitative easing program which aimed to devalue the Japanese yen provides an incentive to take a tactical view on currency movements and assume some currency risk. However, it is important to note that currency volatility can be increased by unsynchronized monetary policy worldwide.

Finding the right solution

There is no easy "one-fits-all" solution for insurance companies seeking to manage their assets amid negative rates. Each country has a different regulatory capital model, domestic capital market size, and a different gap between domestic yields and international yields. Cost of capital and hedging under various market conditions and further amendments to regulation, all pose an important consideration. Monitoring and learning from the trends of peers in other markets will help insurers formulate appropriate investment strategies in their own markets.

We believe that insurers will continue to search for solutions taking selective asset and ALM risk commensurate with their risk budget and investment views.

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