An introduction to liability driven investing in Asia

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Executive summary:

Traditionally, an investor's primary concern is with ensuring that he or she nets a positive return and grows an ever-increasing pool of investable assets. For those investors who must meet future payment obligations, however, such as insurance companies, they also need to think about the other side of the balance sheet and manage potential gaps between assets and liabilities. Globally, they are increasingly utilizing liability driven investment (LDI) strategies in response to minimize any mismatches on their balance sheets and reduce their surplus volatility levels. This paper examines current LDI trends, highlights the challenges and opportunities faced by Asian insurers and outlines key strategies to match future liabilities.

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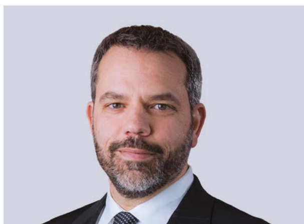

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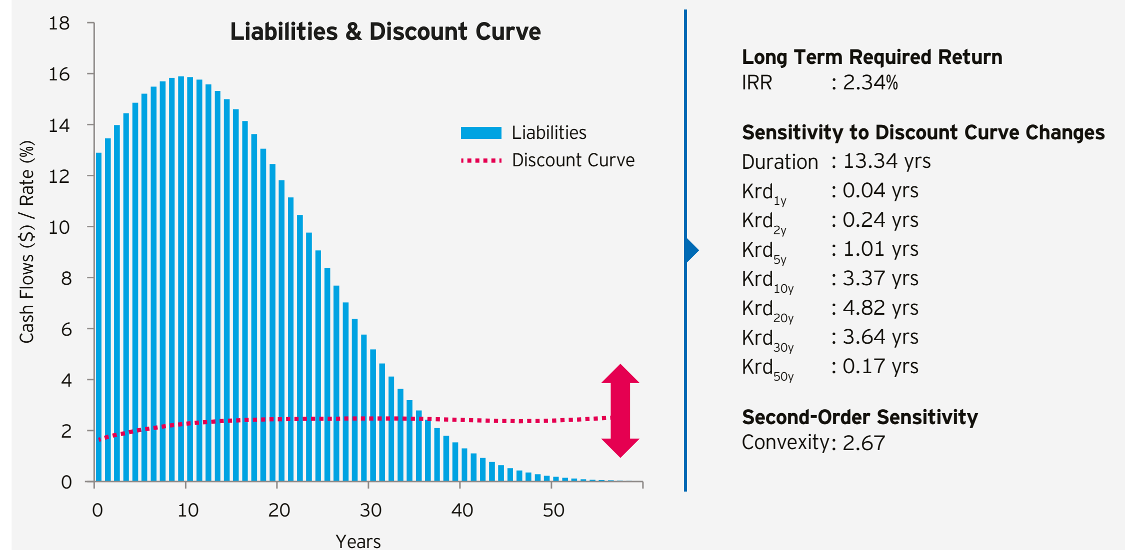
What is LDI?

An LDI strategy takes into account future obligations and seeks to minimize volatility in the gap between assets and liabilities. This is a holistic approach that prioritizes managing relative risk rather than simply growing assets. LDI strategies are deployed by individuals and institutions alike who can forecast future liabilities with some degree of certainty. On the institutional side, insurers and pension funds most commonly use this approach given the significant scale of future payments for which they are accountable.

There are numerous LDI strategies available to investors depending on their unique operating needs. A key area of focus is on constructing the asset portfolio in such a way that it moves in concert with the present value of the liabilities. In order to achieve this, it is important to first fully understand the liabilities themselves, their behavior and their primary embedded risks. For situations where the liability cash flows are known with reasonable certainty, the dominant risk is that of overall interest rate movements. Depending on the exact discount curve that is being used to value the liabilities, it is possible to calculate the long term required return and the related sensitivity to interest rate changes (Figure 1).

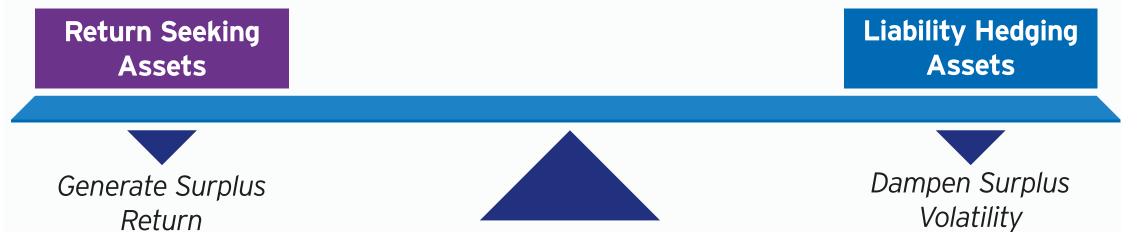
Figure 1: The present value of liabilities is determined by the discount rate



Source: Invesco. Liabilities: Hypothetical liability stream constructed using the Russell Standard Cash Flow Generator (10yr duration @ 6% yield). Discount curve: USD EIOPA curve as of September 30, 2017.

Once there is a better understanding of the liability risks, an asset portfolio can then be designed to target a desired growth rate while also seeking to closely mirror the liability returns themselves. As part of this exercise, assets are typically split into two buckets (Figure 2): "return seeking assets" that are designed to deliver growth that exceeds that of liabilities and "liability hedging assets" that are designed to reduce the surplus risk between assets and liabilities. The latter bucket is typically comprised of fixed income instruments or derivatives that have similar risks as the liabilities (i.e. government bonds, high quality corporate bonds, interest rate swaps, etc.).

Figure 2: Insurers must balance two buckets of assets



For illustrative purpose only.

Currently, LDI is most popular in mature markets in Europe and North America, where insurance companies face a rising tide of payment obligations from an increasingly older population base that is also living longer. Regulatory requirements also call upon insurers in these markets to manage their assets in the context of the liabilities they are designated to pay off. In the US, penalties on capital requirements for asset and liability mismatches are lighter, while in Europe, Solvency II regulations are more punitive.

Given the current low interest rate environment, insurance companies, including those in Asia, are under pressure to increase yields and generate higher returns that can keep pace with future liabilities. To do so, they can extend asset durations and seek higher yielding or growth assets – including high yield bonds, senior loans and equities – while also adding swaps and derivatives to more efficiently manage surplus volatility.

Asian insurers must plan for rising liabilities

The insurance industry is maturing rapidly throughout Asia, but the playing field is still fragmented. Life insurance penetration rates, capital market openness and the development of other insurance services all vary widely by market. Generally speaking, insurance companies in mature economies like Japan would need to invest in liability-hedging assets to better manage surplus volatility. Those in emerging economies like China, on the other hand, are at an earlier stage in their life cycles and are more focused on building return-seeking assets to grow their investment pools.

While LDI may be relatively new in Asia, the region's aging population creates an imperative for all insurers to start planning now for increasing payment obligations and to consider liability risk. This trend will impact key mature and emerging economies alike throughout the region. The number of 60+ year-olds in China, for example, is expected to more than double as a percentage of its overall population from 15.2% in 2015 to 36.5% in 2050 (Figure 3). Meanwhile, four out of every 10 people by that time in Japan, South Korea, Hong Kong and Singapore are all projected to be in the 60+ age group. That is twice the forecasted world average.

Figure 3: 60+ year-old age group as percentage of total population

Country	2015	2050
China	15.2	36.5
Hong Kong	21.7	40.9
Japan	33.1	42.5
Singapore	17.9	40.4
South Korea	18.5	41.5
Thailand	15.8	37.1
World Average	**12.3**	**21.5**

Source: United Nations Department of Economic and Social Affairs/Population Division, 2015.

Regulatory restrictions in Asia

In Asia Pacific, regulatory constraints on insurers investing in certain growth assets also prompt institutions to shift focus and instead increase their attention on risk management through an approach like LDI (Figure 4). In Thailand, for example, insurance companies are not allowed to invest in high yield bonds, reducing the available options to improve risk-adjusted returns. The increasing sophistication of sovereigns throughout Asia Pacific has also led to an increased focus on forward-looking approaches to manage future risks.[1]

Easing regulation in Asia around the use of derivatives by insurers is another area that positively impacts the extent to which institutions can pursue LDI strategies. Derivatives such as inflation and interest rate swaps provide investors with an alternative to purchasing fixed income securities when trying to match embedded risks while also freeing up more capital for growth asset allocations. In 2016, Korea's Financial Services Commission (FSC) announced that it would reduce the limit of financial derivatives transactions for insurance companies. Meanwhile, Taiwan curbed restrictions around derivative use by life insurance companies in 2016.

Figure 4: Insurance regulations in Asia Pacific

China (PRC)[2]	▪ Insurance funds are only allowed to buy bonds with credit rating of BBB- (investment grade) and above ▪ Penetration rates of insurance products are relatively low
Hong Kong[3]	▪ Branches of European insurers must follow the asset liability management practice of their mother companies under the Solvency requirement
Korea[4]	▪ The Financial Supervisory Service (FSS) has eased rules on the currency risk hedging of insurers' overseas assets ▪ Insurance companies may now trade in financial derivative products
Taiwan[5]	▪ Taiwanese insurers with higher risk-based capital ratios are allowed to allocate a greater position of their assets to offshore investments, including overseas real estate and fixed-income assets ▪ Derivatives are allowed to hedge risks arising from the sale of investment-linked policies
Thailand[6]	▪ Insurance portfolios mainly invested in equity and fixed income securities, with very limited exposure to real estate

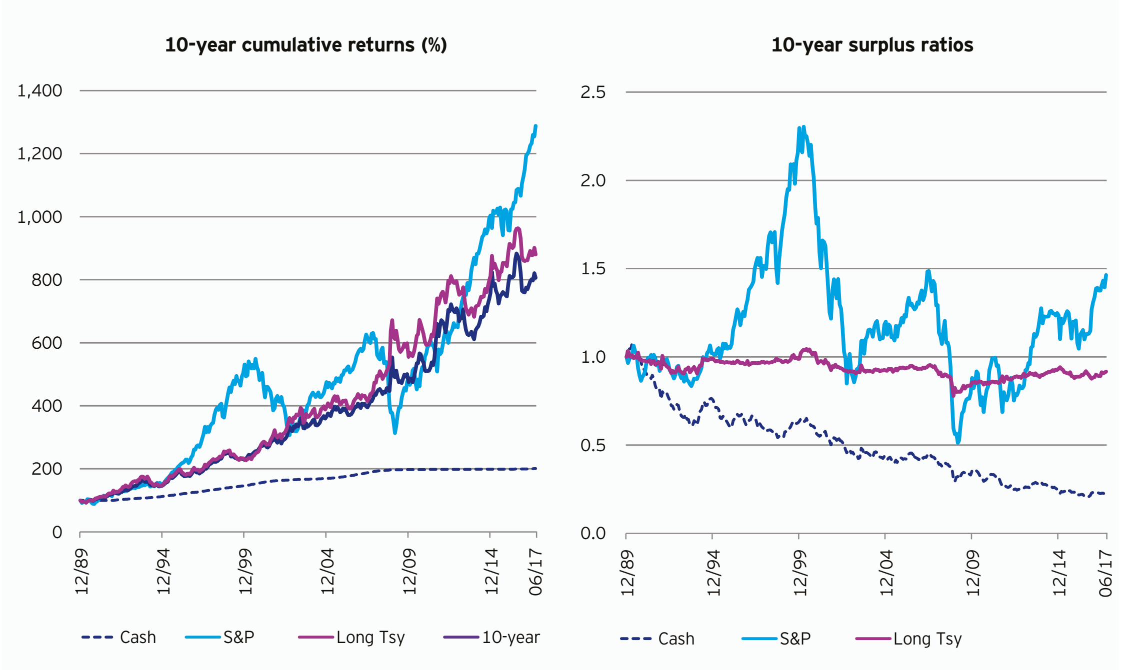
Designing an LDI strategy

LDI strategies endeavor to minimize the asset-liability mismatch risk and create a framework to improve risk/return tradeoff in a liability context. The focus is on managing the surplus volatility by identifying investments that perform in similar ways to future liabilities.

To demonstrate this, we compare the performance of three generic assets classes to a hypothetical liability stream (Figure 5). Investment in US equities (as represented by the S&P 500 Index) resulted in a high volatility in the surplus ratio from 1990 to 2017, while a cash-only position led to deficit positions. Long-term Treasuries, on the other hand, maintained a more precise match between the asset value and the present value of liabilities. The close correlation should come as no surprise since interest rate movement is the key risk driver for both long-term Treasuries and liability values.

1. Invesco discussed current trends facing sovereign investors in the Global Sovereign Asset Management Study 2017.
2. Source: China Insurance Regulatory Commission, March 2015. Invesco, September 2017.
3. Source: Norton Rose Fulbright, citing the Insurance Authority, January 2017.
4. Source: The Korea Economic Daily, citing Financial Supervisory Service (FSS), January 2017. Maeil Business Newspaper, citing Financial Services Commission (FSC), April 2016.
5. Source: Financial Supervisory Commission, April 2016. Asia Asset Management, March 2016. Bloomberg, citing Financial Supervisory Commission, February 2016.
6. Source: The Thai Life Assurance Association, Annual Report 2016.

Figure 5: Identifying assets that behave in similar ways to future liabilities



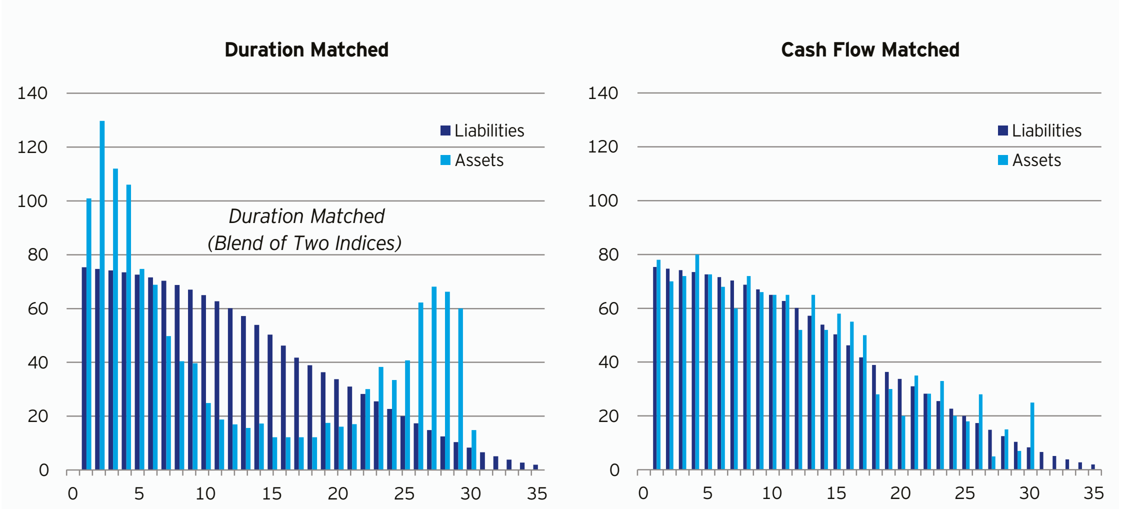
Liabilities: Hypothetical liability stream constructed using the Russell Standard Cash Flow Generator (10yr duration @ 6% yield). Discount curve: USD EIOPA curve. S&P 500 Total Return Index; Bloomberg Barclay's Long Treasury Index; Bloomberg Barclay's 1-3m T-Bills. Invesco analysis. Surplus ratio refers to asset value divided by present value of the liabilities.

Duration matching vs cash-flow matching

A well designed LDI approach seeks to help an insurance company in meeting benefit obligations as they fall due, for example. Assets must generate the returns necessary to meet benefit requirements and even make profits. This is critical because insurers must hold ownership capital to ensure safe payment of claims to policyholders. For insurance companies in markets that are transitioning to more regulatory oversight, steps should be taken to prepare for a potential shift to more liability aware asset portfolios. Such transitions could result in meaningful transaction costs and potentially painful losses if not planned well in advance.

There are various types of LDI strategies to match the future liabilities. As a starting point, an insurance company could focus only on matching the overall duration of the liabilities. While, relatively simple, such an approach is more likely to see cash-flow mismatches (Figure 6), leading to potential reinvestment risk (the risk that future asset cash flows would not be reinvested at the prevailing interest rate from when the assets were initially purchased). Despite these risks however, such an approach would still lead to meaningful risk reduction relative to a liability agnostic approach while also serving as a first step to a further customized investment process.

Figure 6: Duration matching vs. cash-flow matching



Liabilities: Hypothetical liability stream. Duration matched assets: Combination of Bloomberg Barclay's Intermediate Treasury's with Long Treasury's so as to match liability duration. Cash-flow Matched Assets: Hypothetical cash-flow matched portfolio.

By matching more liability risk factors, at the limit, insurance companies may pursue fully cash flow matched solutions. While such solutions may be more constraining in terms of the securities that can be included in the portfolio they ultimately enable the pursuit of a "buy and maintain" investment process. In buy and maintain strategies the need for portfolio re-balancing is significantly reduced as the liabilities are directly paid off by bond coupons and maturing principals. Regulators today typically prefer this approach because it helps lower risk since assets would not need to be sold to meet liability payments. Under Solvency II, closely matched cash flow solutions are allowed to apply for further capital charge reductions.

Regardless of which strategy they choose, LDI is an approach that is increasingly being considered by Asian institutions who can forecast their liabilities with reasonable certainty. The rising tide of liabilities in this region also makes risk management for insurers and pension funds an increasingly important consideration. As the asset management industry in Asia continues to mature, regulators may look to take cues from European and North American counterparts on mandating liability-hedging assets. Considering an LDI strategy before such time would enable Asian institutions to optimize the right approach for their unique operating needs.

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