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VIGIL

Liability-Driven Investing

In this edition of the Vigil, we address the notion of liability-driven investing, and discuss the process and tools made available to ensure the sound management of financial risks.



*“VIGIL: from the latin ‘Vigilare’.
Keeping awake at a time when
sleep is customary; an act of
watching; surveillance” - Merriam
Webster*



N A T C A N
INVESTMENT MANAGEMENT

«The investment universe is characterized by constant movement and change. To successfully navigate therein one must demonstrate intellectual conviction and discipline. One must be capable of reading signs on the distant horizon while avoiding shoals in the near and present. One must also show humility, realism and maintain a good dose of humor. In short we must never fail at being vigilant.

Those qualities are brought forward daily by Natcan's team of professionals. The following commentary reflects the views and opinions of our team on issues impacting Canadian investors and their advisors. »

- Pascal Duquette, president and CIO

>>> NATCAN

Founded in 1990, Natcan Investment Management Inc. is a subsidiary of the National Bank of Canada with approximately 22 billion dollars under management. Natcan is one of the premier institutional money managers in Canada. Our investment leaders follow their convictions with discipline and rigour to serve the best interests of our clients and their financial advisors.

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Étienne Dubé is responsible for elaborating and executing liability-driven investment strategies, namely for pension plans, insurance companies, and endowments. Prior to joining Natcan, Étienne worked with National Bank's Capital Markets area. Previously, he was an investment consultant at Aon, an asset management consulting firm. His main responsibility was to implement pension fund investment policies within the private and public sectors. He also headed the Canadian group of assets/liabilities management, the main responsibility being the development of asset allocation strategies for an array of portfolios. Étienne holds a Bachelor's degree in Actuarial Science and a Master's degree in Statistical science from Université de Montréal. He is a member of the Society of Actuaries and Canadian Institute of Actuaries.

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Gilles Chouinard joined Natcan Investment Management as vice president and client portfolio manager in October 2008 with over 20 years' experience managing portfolios for institutional clients. His previous responsibilities included cash management and interest rates and foreign exchange risk management for a major financial institution with assets exceeding \$100 billion. He holds bachelor's and master's degrees in Business Administration from Université Laval.



Liability-driven investing (LDI) gained notoriety under the name “matching” in the early 1980’s, when interest rates soared and the yield curve inverted. Some of you may recall that the leading cause of the early 1990’s financial crisis (S&L Crisis) in the U.S. was a significant mismatching of the institutions’ funding sources relative to lending assets.

The objective of the liability-driven investing approach is to structure assets to meet the requirements of liabilities. Depending on the type of liabilities at play, this approach takes on a different form and requires specific measures and management.

In simple terms, liability-driven investing is an ongoing process that seeks to develop, implement, monitor, and review asset management strategies while considering liabilities in order to reach financial objectives that are subject to an array of constraints. This management process is crucial if institutions that invest in markets are to efficiently carry out their commitments.

In the case of financial institutions, the main objective is to limit net interest revenue sensitivity to uncoordinated shifts in interest rates. Generally, we try to ensure that an unfavourable interest rate variation will bear minimal impact on results in proportion to the bank’s capital.

When applied to pension funds, the management framework aims to establish a suitable investment strategy that maintains a favourable variance between assets and liabilities. This relationship is referred to as the capitalization and solvency of a plan.

For insurance companies, the objective is to match the cash flow generated from premiums and investment income with disbursements relating to events and product maturity.

The approach can of course be used for any individual or institution that has a financial obligation to settle in the near future and is therefore cumulating funds to do so.

A STRATEGY ABOUT TO REGAIN THE ATTENTION OF PENSION FUND SPONSORS

Liability-driven investing is a familiar concept for pension fund administrators. Recent events

such as the collapse of financial markets in 2001 and 2002, falling interest rates, new accounting principles and increased pressure from legislators have fuelled the interest of many toward this approach.

Until very recently, few dared to venture into this realm, preferring to remain on the sidelines. However, the financial crisis of 2007-2008 appears to have persuaded several administrators that it was time to focus on risk management by utilising an LDI approach.

An efficient LDI process should involve at least the following three steps:

1. Risk identification
2. Risk budgeting
3. Optimization

Risk Identification

This step, essential for optimal process efficiency, consists in establishing plan objectives in terms of assets and liabilities. Contributions, surplus and pension costs are prime examples of what needs to be laid out. Often, the objectives determined at this stage will be contradictory given conflicting interests of plan stakeholders. Some will be fulfilled by increasing the correlation between assets and liabilities (lower contribution volatility) while others, by increasing the expected portfolio return (higher average surplus).

Risk Budgeting

The second step consists in establishing the risk budget by quantifying it in the investment strategy, and establishing boundaries. To do so, several factors need to be addressed, such as the probability of achieving objectives, potential unfavourable outcomes, and the potential loss severity should the objectives not be met. Then, one needs to determine an acceptable level of volatility and the maximum probability of not meeting the objectives. Many factors will come into play here, including risk tolerance, plan maturity, the financial state of the plan, and the level of comfort with derivatives.

A complete LDI process carried out within the scope of corporate risk management will factor

in the sponsor's credit rating, the nature of its activities, and its capital structure. In fact, within an LDI framework, the pension fund is viewed as a business entity like other corporate sectors. This will, for example, help avoid situations where contributions need to be increased in difficult times.

Optimization

After establishing the objectives and risk budget, the next step consists in identifying the optimal strategy that will maximize the return objective and respect the risk limits set beforehand.

At this point, we introduce the minimal risk portfolio (MRP) and the return portfolio. The main function of the MRP is to reproduce the characteristics of the liabilities in order to lower the interest rate and inflation (uncompensated) risks to an acceptable level. This portfolio could be made up of traditional securities (nominal and real bonds and stripped coupons) as well as synthetic financial products (futures contracts on interest rates, countertrade contracts, or swaps). The purpose of synthetic products is to increase the hedge ratio on interest rate risk to 75%, 80%, even 90%, without using all the cash on hand, thus alleviating pressure on returns (lower) and costs (higher). The synthetic financial products that will be selected will depend on the objectives and more precisely, on the type of liabilities to cover: solvency, accounting, or market value.

The allocation to synthetic products in the minimal risk portfolio will be a function of the objectives and the sponsor's level of comfort with derivatives and leveraging. In most cases, and regardless of the plan's objectives, a minimal hedging ratio of approximately 80% is recommended. Once the percentage of derivatives to be utilised has been set, the balance of the portfolio is invested in the returns portfolio to fulfill all of the objectives.

The return portfolio's purpose is to increase performance at the total portfolio level in order to reduce long-term plan costs. This portfolio is made up of a combination of traditional (small and large capitalisations, Canadian and foreign, etc.) and non-traditional asset categories (real estate, commodities,

absolute return strategies, etc.) so as to maximize return within the confines of the pre-established risk budget. The ultimate objective is to invest strictly in compensated risks and preserve a slight correlation between the returns and the minimal risk portfolios.

Then, the two portfolios are combined and the strategy is gradually implemented.

INSURERS

Insurance companies are exposed to the risks relating to the assets they hold, to their commitments, and to the correlation between the two.

Asset-liability management (ALM) was developed to limit the interest rate risk that remains a significant preoccupation for insurers. For many decades, insurance companies were not concerned with interest rate fluctuations. From the 1929 crisis until the mid-1960's, U.S. Treasury bond returns held steady between 2 and 4.5%. However, the situation changed drastically in the 1970's when an inflationary spike drove interest rates up. The combined effect of rate increases and higher volatility prompted individuals to seek investments whose returns would not be overtaken by inflation.

Traditionally, life insurers calculated their premiums based on statistical hypotheses regarding the movement of interest rates and the behaviour of insured individuals. Yet, this approach proved insufficient when rate increases altered policyholder behaviour (insurance policy buyback, lending on policies, money market funds, etc.).

Life insurance policies offer policyholders a certain number of options (settlement terms, buyback, and renewals) that are a valued source of flexibility for clients. Insurers must consider these options when establishing rates. The value of these options remained weak so long as interest rates remained stable. When interest rates became volatile at the beginning of the 1970's, policyholders began to exercise their rights vested in these options. Insurers thus had to make changes to their liability management methods.



ASSET LIABILITY MANAGEMENT FOR THE INSURANCE COMPANY

The first ALM initiative consists in systematically matching the monetary flow of assets and liabilities. Although this first step improves risk management, financial flows are not always stable, especially in the case of property and casualty insurance companies. Left to itself, this management technique strips insurers of much flexibility, as the portfolios that are derived from it are often filled with bonds with lower returns than those built by tolerating a slight gap in money flows.

A less constricting method is to coordinate the sensitivity of assets and liabilities to interest rates. Commonly referred to as immunization, this technique seeks, when interest rates shift, to compensate in asset value the impact of the rate variation on the value of commitments.

Several factors come into play. Matching duration, which more or less corresponds to the average time needed to generate these flows, is a popular method. Matching the duration of assets and liabilities offers a good approximation of risk. If the duration of assets and liabilities is 10 years and the rate drops by 1%, this will cause a 1% increase in assets and commitments.

However, aligning durations will not adequately assess all risks as a gap could occur with rate variations. To remedy this problem, measures of convexity of assets and liabilities may be used. Convexity measures the speed at which the duration changes in relation to interest rates. By coordinating the convexity and the duration of the elements of assets and liabilities, insurers can more accurately hedge the interest rate risk.

These useful management tools would then be complemented by a process of analyses of potential scenarios to measure their consequences on the insurer's reserves and profitability.

The use of a simple model that optimizes portfolio management according to capital, cash flow, duration, reserves, and profitability constraints allows for a clearer analysis of risks

over time and an optimal investment portfolio.

Interest rates are not the only risk factor to influence the value of insurance assets and liabilities. To clearly establish a corporate risk profile, one must understand the correlation between all risk factors.

Seasoned practitioners realize the use of a simple model that introduces all these management techniques is intended to make the management process more dynamic, and is in no way intended to replace the judgment of portfolio managers. Success will come from the integration of these methods and techniques under the experienced guidance of portfolio managers specialized in insurance assets

CONCLUSION

As in the case of previous shocks - inflation and interest rate spikes of the 1970's, and mismatching issues of the early 1990's - the financial crisis of 2007-2008 will no doubt remind plan sponsors and insurance executives of the importance of an investment structure that tackles the unique liabilities being addressed.

Certain liability-driven investing concepts and techniques may appear overly complex. They require disciplined analyses and rebalancing of assets and liabilities. Years of experience, analytical tools, and the availability of new financial vehicles serve to facilitate the task considerably. Author James Allen stated that "In all human affairs there are efforts and there are results, and the strength of the effort is the measure of the result". We strongly believe that the benefits that result from the adroit integration of this disciplined approach are worth a fresh look.

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