

Corporate Asset Liability Management: An integral model for supporting pension and corporate decisions

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Balance sheet management of pension funds plays an increasing role in balance- and risk management of a company. Due to shared risk sources and diversification benefits an integral approach of company and pension funds is required to map the total risk profile of the company and to support policy decisions. Because of the combination of study fields and the complexity this 'new' expertise area Corporate ALM is exceptionally suitable for econometrists and actuaries.

Introduction

In recent years the areas of corporate finance and risk management and asset/liability management for pension funds have developed rapidly. Until now, company and pension fund risk management were two separate (scientific) worlds. In this paper we shall show how econometrists and actuaries can help integrate these worlds together and how this junction can lead to better insight and more efficient decision-making.

In this paper we will first show why pension funds play an important role in corporate risk management. Secondly, we will discuss the importance of an integral approach. After that we will give an overview of the main risk and return measures of an integral approach. Our discussions and arguments will be supported by a number of examples.

Pension funds impact on company results

Since January 1st, the International Financial Reporting Standards (IFRS) are compulsory for companies that are quoted on a stock exchange. These standards legally prescribe corporations with a Defined-Benefit scheme (either final pay or final average pay) to account for the pension assets and pension liabilities on the Balance Sheet and on the Profit & Loss account. According to IFRS, one of the important balance sheet items concerning the liabilities is the Defined-Benefit Obligation (DBO). In determining the DBO, not only the past accrued service is valued, but also future salary increases and future inflation adjustments are taken into account.

The ratio of the Market Value of Assets (MVA) over DBO - the funded ratio - is of importance to the company. When the DBO exceeds the MVA, the company reports it as a debt (liability) on the balance sheet. Of course, the impact of this pension debt on the total balance sheet depends on the size of the pension fund compared to the market capitalization of the company. Besides the 'pension debt' on the balance sheet, the accounting cost of the pension fund (NPPC) is visible in the Profit & Loss account of the company. In addition to these new IFRS posts, contributions to the pension fund influence

the liquidity position of the company. When one looks at multinationals, one needs to bear in mind that there are more than one pension fund. Multinationals deal with (legal) independent pension funds in various countries. For many (Dutch) multinationals the joint pension funds tend to have a magnitude that is at least comparable to a large business unit. In some cases the assets of the pension fund even exceed the value of the company (Bezooyen, 2003). In other words, balance management of the pension fund is becoming an important component of the balance sheet and risk management of the company.

Not an isolated, but an integral approach

From the mid-eighties, Balance Sheet management or Asset/Liability Management (ALM) has developed strongly not only in the Dutch, but also in the international pension sector. From being merely a tool to determine the strategic asset allocation, it has transformed into a policy-supporting instrument that enables integral analysis of pension, contribution, cost-of-living adjustments (COLA) and investment policies. In the same period, corporate risk management also underwent drastic changes. Treasury activities are paying more and more attention to risk management and the number of products (financial derivatives) that can be used in risk management has increased significantly. With this rise of ALM and corporate risk management, the applied models and techniques have become increasingly advanced.

Up until now, an integral approach to corporate risk management and ALM analysis for the joint pension funds has been limited. This is due to several governance issues. For example, in the Netherlands, a pension fund is an independent legal entity with its own executive committee and responsibilities. In the United States the 'Board of Trustees' has an important part in the decision-making process of the pension fund. In spite of these major points of attention, we strongly recommend an integral approach. Why is this important?

First of all, company and pension funds are exposed to a lot of the same sources of risk. A Company that is partly financed by borrowed capital is sensitive to

the changes in interest rates. The same applies to the pension liabilities (in a fair value or in IFRS context) and for the fixed income investments of the pension fund. Besides the interest rates, the developments on the exchange rate market are a source of collective risk. A large part of the turnover of international companies is received in foreign currencies, whereas the pension funds invest part of its assets outside the Euro land. Depending on the pension schemes (conditional or unconditional) and depending on regional differences (in the US defined-benefits are mostly nominal guarantees) inflation plays a more or less role in pension risk. Depending on the sort of products or services the company provides (wages), inflation is a source of risk for the entrepreneur. Finally, there is a relationship between the economic environment of the company and the rate of return the pension fund receives on the equity investments.

In addition to the collective sources of risk, there is also a joint return-framework. After all, pension and business results are accumulated in the annual report of the company. The figures in this annual report largely determine the credit rating of the firm (the credit rating indicates at which interest rate the company can lend) and the development of the quotation of the stock. Besides the relationship between pension fund and company, an integral analysis of the different connected pension funds is of interest.

The above explanation gives us more than sufficient reasons for an integral analysis. The question one can ask here is why is there a limited amount of integral analysis? This can be explained partly by the junction of specialties that such an analysis requires. Knowledge of corporate finance, Treasury (products), IFRS accountancy, pension funds and actuary, macro-economics, scenario analysis and model implementation are necessary to bring an integral analysis to a success. This makes Corporate ALM exceptionally suitable for econometrists or actuaries!

What is required for an integral approach?

In this paragraph we shall discuss a possible project plan for such an integral approach.

At first, we will determine the (collective) sources of risk as we have done above. Secondly, for both the company and the pension fund, we will establish which variables influence the balance sheet, the profit & loss account and the liquidity position. For the development of these variables, we determine the effect of the different sources of risk and the cross-effects. Moreover, the strategic policy of the company and the pension fund - the manner in which the executive committee reacts to possible future scenarios - need to be captured in mathematical rules. An example are the solvency- requirements that define when pension contributions are raised or lowered.

On the side of the company, we map the financial structure (ratio of debt and capital) and the corresponding financing cost (per currency and divide these into fixed

and floating funding). Besides the liabilities, we make an estimation of the operational profit, often EBIT (Earnings before Interest and Taxes) is used for this purpose (also per currency). The relationship of the company profit and the return on stock markets in general is also taken into account. Together with an estimation of the future turnover, large parts of the future annual report can be simulated.

On the side of the pension funds, we first determine which pension funds (countries) are modeled in the analysis. A multinational can be exposed to 40 pension funds, from which generally less than 5 account for 95% of the total pension risk (and returns). After the selection of the pension funds, the current and future liabilities are mapped. (This is comparable to a 'normal' ALM analysis for a pension fund.) The liabilities are valued under both local regulation and IFRS standards. Local regulations are important since they determine the actual contributions (cash contributions from company to pension assets). The cash contributions usually differ from the accounting cost (NPPC) in IFRS. Besides the liabilities of the pension fund, the current and future pension assets are also modeled. This requires the strategic asset allocation (SAA) of the pension funds. Based on this information, the pension components of the balance sheet, the P&L account and the liquidity position can be simulated.

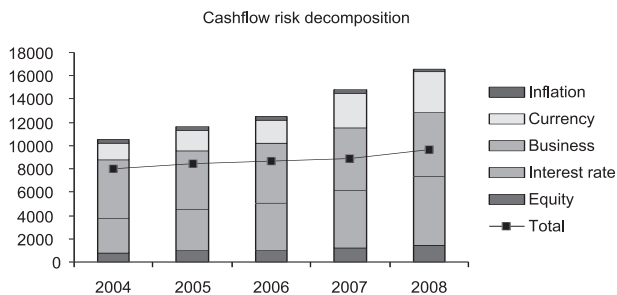
For the development of the company's balance sheet items we use scenario analysis. The first condition for the use of this method is a consistent set with economic scenarios (See Boender 2005 et al, for an extensive description of this method). In the economic scenario set, all risk and return sources that influence the balance sheet items should be included.

Besides the consistency of the economic scenario set the interpretation of the results (risk- and return measures) and the prognosis length of the analysis (short- and/or long term) are important focus points of the integral approach. In contrast with ALM studies for pension funds, the prognosis length of Corporate ALM analysis are /is 5 years instead of 25 years.

After the inventory phase, there is a major challenge for the modeler. It requires a lot of skills to build a model for this practice in a consistent manner. Flexibility and calculation time play an important role in actually using the model for analysis and for management decision- support.

Analysis

Once the model has been built and the parameters are set, the analysis can begin. In the analysis we look at risk and return from a corporate perspective and see whether undesired risk can be removed. Besides providing an insight into the risk profile of the company, Corporate ALM is designed to support policy decisions. We will illustrate this with two examples.



Example 1: Insight analysis of corporate cash flows

When analyzing the corporate cash flows, we look at the net cash contribution to the pension funds, EBITDA and net interest costs (corrected for taxes). An example is shown in figure 1.

Figure 1 shows the ceteris paribus influence of five sources of risk on cash flow risk. Cash flow risk is defined as the 95% Value-at-Risk of the actual corporate cash flow of the company minus the expected corporate cash flow (95% VaR $-/-$ mean). The figure also shows the total cash flow risk (under all economic uncertainty).

From this figure we can, for example, make out that at first a large part of the total cash flow risk comes from interest rate and 'business' risk, but that in future years more-and-more risk can be explained by exchange rate volatility. Another important factor is that the total cash flow risk is lower than the sum of the cash flow risk arising from all sources of risk. This implies diversification between the sources of risk. We also see that total risk increases over time, but the diversification advantage has a relatively sharper increase.

Similar risk decomposition can not only be made for the cash flows, but also for all other relevant variables. For example, when rating agencies draw up their evaluation of the company, they look at the ratio cash flow over net debt (where also pension debts are taken into account).

Example 2: Decision-making support analysis

Suppose a company has part of its debt in dollars and this loan has to be refunded. Given relatively low current US treasury yields, the company first considers refinancing against a fixed interest rate. However, the company also has a pension liability in its US pension fund. This liability increases when interest rates are low (a low discount leads to a higher present value of the liabilities). So, when the US interest rate decreases, the (pension) debt will increase, while interest costs on the refinanced loan remain

unchanged. When the loan is financed on a floating interest rate, the interest rate costs will increase when interest rates rise, but the pension debt declines and the net effect could be better. An optimal decision for Corporate ALM would be the choice to fund at a floating rate.

Summary and Conclusion

In this paper we have shown how the scientific worlds of Corporate Finance and ALM for pension funds could be merged into Corporate ALM. Corporate ALM is capable of mapping the total risk profile of the company and showing the benefits of diversification between company and pension funds. This makes Corporate ALM into an important instrument that provides better insight and enables better decision-making. Based on the described requirements of an integral approach and the given examples, we conclude that this 'new' field of expertise is exceptionally challenging for econometricists and actuaries.

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Jitske en Martijn are both closely involved in both the development of the Corporate ALM system as in the performing of Corporate ALM studies

References

- Bezoooyen, Jeroen van, *Pensions, the Corporate Perspective*, Fiducie, April 2003, volume 11 number 3;
- Boender, C.G.E., C. Dert, F. Heemskerk, H. Hoek (2005), "ALM for Pension funds", to appear in: W.T. Ziemba en J.M. Mulvey (eds)(2005), "Worldwide Asset and Liability Modeling", Cambridge University Press.