



Doctorate **Drs. Roy P.M.M. Hoevenaars**
At the Faculty of Economics and Business
Administration

Title: *'Strategic Asset Allocation & Asset
Liability Management'*

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Friday, 18 January 2008, 10.00 hours

Abstract

A new era of pension fund investments has started. Institutional investors around the world invest trillions of Euros on behalf of many people who save money for their pension. One of the most critical decisions for such long-term investors is the strategic asset allocation. This becomes more of a challenge as the menu of investment choices has grown rapidly and regulatory bodies have adapted existing monitoring frameworks. The introduction of fair value accounting and short-term solvency constraints has emphasized interest rate and inflation risk in pension fund investments. This dissertation discusses important topics for long-term investors such as optimal portfolio choice in the context of liabilities, horizon effects in risks and inflation hedge qualities, alternative investments, dynamic asset allocation strategies and the impact of short-term solvency constraints. The dissertation studies differences in asset allocation between pension fund investors and general asset managers. On top of that, pension beneficiaries are demanding more transparency with regard to the exact nature of their pension arrangement. The sustainability of traditional defined benefit and defined contribution schemes is openly questioned. Discussions on pension reform build on issues like intergenerational risk sharing, life cycle approaches and governance structures. This dissertation identifies embedded (generational) options on the balance sheet, and it uses option valuation techniques to price embedded intergenerational value transfers. The dissertation ends with 10 lessons for strategic asset allocation for long-term investors and asset liability management.

Curriculum Vitae

Roy Hoevenaars was born in 1978 in Roermond (NL). In 2001 he obtained his MSc in econometrics and operations research at Maastricht University (UM). From 2003 to 2007 Roy worked on his Ph.D. dissertation in the Departments of Quantitative Economics and Finance of UM. Chapter two of this dissertation is forthcoming in the Journal of Economic Dynamics and Control and was awarded the 2005 second prize at Inquire Europe, Inquire UK and Q-group. Chapter five is forthcoming in the journal Insurance: Mathematics and Economics. He wrote several chapters on Asset Liability Management (ALM) in books like The Oxford handbook of Pensions and Retirement Income (Oxford University Press), Asset Liability management Tools (Risk books), and Costs and Benefits of Collective Pension Systems (Springer). In 2001, Roy joined the research department of ABP Investments in Amsterdam. He did quant equity research and he was in the strategic and tactical issues group. In 2004 he joined the Financial and Risk policy department at ABP Finance where he was senior policy advisor ALM and coordinator ALM modelling. In 2007, Roy joined the Global Tactical Asset Allocation fund of ABP Investments in Amsterdam as senior portfolio manager.



Interview

What would be your advice to people or pension funds who invest money for the long run?

"Long-term investors should evaluate the attractiveness of an asset class from at least four perspectives: return, risk diversification, inflation hedge qualities and liability hedge qualities. Diversification is extremely important. Long-term investors can not only benefit from risk diversification between assets, but also from time diversification within an asset class and good inflation hedge qualities in the long run. I investigate risk properties of alternative assets like commodities, credits, listed real estate and hedge funds. Among these assets, commodities have the best risk diversifying properties. Their correlations with stocks and

bonds are negative at short and long investment horizons. On the other hand, commodities have a flat term structure of annualized volatilities which make them relatively less attractive in the long run than the mean reverting stocks and bonds. Term structure properties of listed real estate seem to a large extent captured by the traditional asset classes. In fact, listed real estate is often seen as an equity category. Investment grade credits seem a good substitute for government bonds with a higher expected return. The term structures of investment grade credits mimic those of bonds, and the correlation between stocks and credits is slightly higher than for bonds. The hedge fund index has a high exposure to stocks and bonds. I show that risk diversification properties and inflation hedge qualities are more robust to the uncertainty in the model parameters than mean reversion properties of for instance equities. The allocation to alternative assets in the portfolio depends on the investment horizon and the risk attitude of the investor. Although the utility costs of not investing beyond stocks and fixed income are economically significant, investors should evaluate whether they outweigh implementation issues such as advanced risk management, advanced legal requirements, high entrance costs, high manager selection skills and reputation risk."

Which differences in asset allocation are there between pension fund investors and general asset managers?

"The strategic asset allocation can be analytically decomposed in a return optimizing part and a hedge part. Differences in strategic investment portfolios for asset-only and asset-liability investors are due to differences in the global minimum variance and liability hedge portfolio. The return optimizing portfolio is the same. The main difference shows up in the duration of the bond portfolio. Asset-only investors have a large demand for short-term instruments due to their strong positive correlation with inflation at longer horizons. Asset-liability investors not only need to deal with reinvestment risk of T-bills, but also with duration mismatch risk with respect to the liabilities. However, an important lesson is that asset-liability investors have more degrees of freedom than closing the duration gap. Short-dated bonds remain attractive for their low risks at short horizons and good diversification properties with stocks and bonds at longer horizons. Furthermore, to trade off nominal inflation risk and real interest rate risk long-dated nominal bonds are a better long real rate hedge, but short-dated nominal bonds provide a better hedge against cumulative inflation. Besides, stocks also have positive real rate hedge qualities at longer horizons. Another difference is that pension funds allocate more money to alternatives that are a good hedge with the liabilities and inflation. Finally, I also find that the benefits of long-term investing are larger when there are liabilities. The analysis also indicates that dynamic asset allocation strategies based on short-term solvency risks are not necessarily in line with the long run goals of a pension fund. As a consequence, short-term risk management and interest rate hedge strategies are a danger for liability-driven investment."

How could pension funds governors benefit from your dissertation when considering changes in the pension contract?

"Sustainability, transparency and continuity are key concepts in pension contracts. Understanding the relationship between the various stakeholders by identifying the value transfers embedded in the pension deal seems critically important. The value-based ALM approach with generational accounting principles developed in this dissertation reveals the hidden value transfers between generations which cannot be identified by the classical ALM output in terms of probability distributions. As such it adapts a different perspective of ALM than welfare analyzes based on utility functions. Understanding the (embedded) options written by one group of stakeholders to another group of stakeholders is important for a fair and sustainable contract. The embedded options give insights in the relationships between the stakeholders. The first step is to identify embedded (generational) options on the balance sheet. In the second step these embedded options are valued using option valuation techniques. I identify embedded indexation, surplus, deficit and generational options. The analysis show how a particular investment, indexation or contribution rate strategy leads to embedded value transfers between young and old generations. This method is also useful in evaluating other collective contracts which lead to embedded intergenerational value transfers, like public finance and reforms in social security systems. I argue that the valuation of embedded (generational) options is a valuable instrument for good pension governance to evaluate pension reforms and other changes in the pension contract in the coming years."

The Faculty of Economics and Business of Universiteit Maastricht offers undergraduate (BSc) and graduate (MSc and MPhil) programmes as well as executive programmes and tailor-made education at UMBS. The study programmes are ranked as the best in The Netherlands in yearly reviews. The Faculty is internationally renowned for its Problem Based Learning method, its research, the international environment and the facilities.

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