Risk in pension plans

Chapter 5

Conclusion

This dissertation is a compilation of three related studies on pension funds, and in particular on pension contracts, fund management and risk management. The chapters concentrate on topical issues currently facing pension funds, namely: how to organize new pension contracts, how to invest for the long term and how to respond to the historically low interest rates prevalent in the aftermath of the 2008 financial crisis. The findings of the chapters contribute to our understanding of these practical issues, and can aid pension funds, the pension regulators and individuals themselves in being better prepared to face these challenges.

5.1 Summary of findings

The second chapter evaluates the benefits of intergenerational risk-sharing in a pension system without any guarantees. More and more employers around the world are concerned about what corporate pension guarantees mean for the balance sheet of the company. Many companies have gone bankrupt due to overwhelming pension liabilities. Accordingly, many companies are moving from Defined Benefit (DB) to Defined Contribution (DC) for just this reason. When an employer does not want to carry the risk of the pension, employees can share the risk among themselves. One of the main findings of the chapter is that risk-sharing is welfare improving even without any sort of employer guarantee.

In particular, I analyze a collective defined contribution (CDC) pension fund which aims at intergenerational risk sharing among different age cohorts using a return smoothing mechanism. Using a utility based framework, I find that approximately one third of unexpected return shocks should be passed on directly to all the cohorts in the year the shock occurs, by means of the smoothing mechanism. I demonstrate that risk-sharing implemented in this way is welfare improving compared to a plan with no risk sharing, and is more sustainable compared to a defined benefit pension fund. Additionally,

I show that the asset allocation of such a pension fund automatically corresponds to the life-cycle portfolio choice theory.

In the next chapter, I move on to analyze the investments of pension funds, and evaluate their long-term mindset. This question is constantly raised at academic and practitioner conferences, as there is strong potential for increasing the returns of individuals' saving for retirement. I consider a long-horizon investor as an investor that is not influenced by recent returns on the portfolio in setting investment objectives. This investor rebalances any substantial changes to the portfolio due to market movements. This means that the investor is not "moving with the market", which could be a buy-low and sell-high strategy and hence harmful for investment performance.

So, the main question boils down to: how does the portfolio of a long-term investor like a pension fund change relative to the stated strategic portfolio? I investigate the dynamics of pension fund portfolios using an international database of pension funds that spans over twenty years, and I focus on portfolio rebalancing. I find that a significant proportion of the change in the weight of equity is related to passive change in the portfolio due to realized equity returns. Moreover, pension funds engage in asymmetric rebalancing, as they rebalance poorly when the stock market is doing well but strongly when the stock market is doing badly. Actual changes in the equity portfolio only partially reflect strategic changes. I also study cross-sectional differences in rebalancing. The results indicate that US and defined benefit pension funds rebalance less. Moreover, external managers and active managers can be identified as the major source of poor rebalancing. Lastly, as between asset classes, pension funds are more passive in alternative investments.

Continuing the analysis of the investments of pension funds in the next chapter, I look at the effects of a low-interest rate environment on pension fund investments. Interest rates are important for pension funds because they serve as an indicator of future economic activity and thus of the performance of multi-asset class pension fund portfolios. Moreover, long-term interest rates determine the market value of pension liabilities. Thus, a decrease in long-term interest rates depresses the funding ratio of pension funds, *ceteris paribus*. Interest rates have been exceptionally low since 2008 and this has led to a significant change in investment opportunities. For this reason, I try to answer the question of whether this has led to any substantial changes in pension fund portfolios and whether there are any insights from the academic literature on how to overcome the challenges posed by low interest rates.

I analyze changes in the portfolio policies of pension funds since the start of the current low interest rate environment. I find that they have on average reduced the allocation to equity and increased the allocation to fixed income, which is inconsistent with the literature on strategic asset allocation. Next, more generally, I investigate empirically the relationship between variables that predict asset returns and portfolio

allocation in levels as well as changes. I find that the dividend-price ratio shows the strongest relationship among other variables. However, I find a negative relationship as opposed to a positive one as predicted by the literature. Overall, the results suggest that pension funds are unable to incorporate predictive information in their strategic asset allocation, but they do take active decisions by under or over-weighting their portfolio relative to the stated strategic portfolio in order to benefit from time-varying investment opportunities. Analyzing these results in the context of the results of Chapter 3, actively managed portfolios that make market timing decisions also appear to be chiefly responsible for the procyclical investment behavior. Given that more and more pension risks are being transferred to employees from employers, via e.g. CDC contracts discussed in Chapter 2, these results points towards causes of major future setbacks in retirement.

5.2 Future research

These are exciting times for research in pension finance. Any outstanding research has real potential for impacting lives in a substantive and positive way. Moreover, as the coverage of pensions increases in developing countries, the influence of pension research will also increase. Results of the research can help formulate better governance regulations, which need to evolve as quickly as the pension systems themselves are evolving.

There are multiple directions in which the research presented in this dissertation can be extended. In analyzing the collective defined contribution (CDC) system, I have assumed that the introduction of a CDC pension contract would mean that the firm does not have any liability in relation to underfunding of its pension fund. One interesting avenue would however be to introduce a "soft" guarantee. If the pension fund of a company is performing very poorly, the employees may have an incentive to leave the company. This is because they will not expect to receive a big part of their salary in the future in the form of their pension payments. This suggests that although the firm does not have any explicit obligation in times of pension fund underfunding, it may nonetheless in practice have to help the fund out regardless. This type of question can be tackled in a theoretical model. Another aspect is that the analysis in this dissertation is set in a partial equilibrium framework. This is a simplifying assumption, but clearly pension funds form a big part of the economy and equilibrium considerations are important. It would therefore be worth exploring how the results will hold in equilibrium.

It is clear that there are multiple interesting possibilities for further examination regarding pension fund investments, which can build on the results of chapter three and four. First, regulations for pension funds generally do not receive as much attention as

those for the banks. However, pension fund regulations have a long way to go towards facilitating, or at minimum not hindering, pension funds in investing optimally for the long term. Further analysis is required about whether and/or how funding and other regulatory requirements are encouraging pro-cyclical investment behavior. Secondly, it has been well understood that pension funds have become a large part of the economy. However, their potential for long-term macroeconomic effects on the wider economy has not been fully understood. This is a promising area for both theoretical and empirical research. Lastly, I have considered pension funds separately from the private wealth of an individual. It would be worth analyzing pension fund wealth in combination with personal savings, social security benefits and any additional private savings in a retirement account, which together will form the total wealth of an individual in retirement.