

INTERNSHIP PROJECT PROPOSAL

Title	Robeco-01 - The value of dynamic glidepaths within DC propositions
Research Area	Pensions / Asset management
Dutch language mandatory	No
Type of internship¹	Only as regular internship
Internship period	Flexible
For students in	MSc EME and MSC QFAS
Internship remuneration	No
Organization and (sub)section	Robeco Investment Solutions

Short description internship project (incl. literature)

DC (Defined Contribution) schemes and target date funds use glidepaths to allocate the available risk budget to investments. In general the available risk budget is reduced as the participant gets closer to the target date (i.e. retirement date). Whereas in the past the reduction was sometimes based on rules of thumbs, currently many schemes (at least in the Netherlands) derive the glidepaths using more advanced techniques from the academic literature; for instance the derivation of the so-called human capital (i.e. the discounted value of future labour income) is now also taken into account (see e.g. Campbell and Viceira (2002)).

One feature which most glidepaths don't take into account is the accumulated wealth. For example, the risk budget within a chosen glidepath depends only on the age of the participant. Recent literature challenges this approach. Basu, Byrne and Drew (2011) show that a strategy in which the allocation to risky assets will be decreased if the accumulated wealth is higher than a preset target wealth (and the other way around), will result in general in better outcomes in terms of final wealth. Also Blake, Wright and Zhang (2013) show that strategies which will increase the allocation to risky assets if the fund is below a pre-determined target (and vice versa) will increase the probability of achieving this target.

An interesting element in long term investing is the effects of the parameter uncertainty (see Barberis (2000)): the acknowledgment that estimators for means and volatilities are uncertain, will reduce the attractiveness of risky assets. Within the extensive literature in the field of equity strategies it is often found that the more elaborate strategies in terms of optimization (the use of Bayesian methods, robust optimization methods etc) perform well in-sample but rather poorly -of- sample compared to a 'simple' equally weighted 1/N strategy due to among others the estimation errors (see e.g. DeMiguel, Garlappi and Uppal (2009)).

In this internship we would like to look into the effects of the parameter uncertainty on the dynamic strategies of e.g. Basu *et al.* (2000) or Blake *et al.* (2013).

¹ TiSEM also offers the possibility of an extended master. For more information, see the pdf "Extended Master info". An extended master follows a fixed program: Company traineeship March-October 2018; Company assignment and Master thesis October 2019-January 2019

The main research question for this internship is the analysis of these dynamic strategies:

- Do these strategies deliver comparable results within a Dutch DC context as they do in the in the above papers?
- What are the effects of parameter uncertainty or estimation errors on the strategies and results?
- What practical recommendations follow from your analysis for future developments of glidepaths?

Literature:

- Barberis, N., 2000, "Investing for the long run when returns are predictable", *Journal of Finance*, Vol. 55(1), pp. 225-264
- Basu, A. K., A. Byrne and M.E. Drew, 2011, "Dynamic lifecycle strategies for target date retirement funds", *Journal of Portfolio Management*, Vol. 37(2), pp. 83-96
- Blake, D., D. Wright and Y. Zhang, 2013, "Target-driven investing: Optimal investment strategies in defined contribution pension plans under loss aversion", *Journal of Economic Dynamics and Control*, Vol. 37(1), pp. 195-209
- Campbell J.Y. and L.M. Viceira, 2002, "Strategic asset allocation: portfolio choice for long-term investors", Oxford University Press
- DeMiquel, V., L. Garlappi and R. Uppal, 2009, "Optimal versus naïve diversification. How inefficient is the 1/N portfolio strategy", *Review of Financial Studies*, Vol. 22, pp. 1915-1953