

## INTERNSHIP PROJECT PROPOSAL

<b>Title</b>	<b>Robeco-02: Human wealth and developing pension schemes</b>
<b>Research Area</b>	
<b>Dutch language mandatory</b>	No
<b>Type of internship<sup>1</sup></b>	Only as regular internship
<b>Internship period</b>	Fixed: specify period: April - September
<b>For students in</b>	All programs (with interest in quantitative problems)
<b>Organization and (sub)section</b>	Robeco

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Within defined contribution (DC) schemes an employee builds up capital for retirement in a personal account. In contrast, defined benefit schemes are based on a collective account for all employees. Recently, DC schemes are gaining more and more attention. We expect this trend to continue in the future. In a nutshell we can say an employee who saves via a DC-scheme puts money in his personal account every month. For a DC scheme, the cumulated wealth over the lifecycle will be uncertain caused by shocks in the financial assets in which the pension savings are invested.

The goal of this project is to determine the optimal asset allocation for a DC pension scheme over time. We focus on including human capital in the asset allocation decision. Human capital is defined as income that has still to be earned. Although a young person hardly has any financial capital (savings) yet, he has many working years to come, consequently his human capital is high.

The evolution of human and financial wealth over time determines the optimal allocation to stocks and bonds, see Bodie, Merton and Samuelson (1992), Campbell and Viceira (2002), and Benzoni, Collin-Dufresne, and Goldstein (2007). The safer the payout (salary) from human capital is, the more it behaves like a bond. Thus, if human capital behaves mostly like a bond, a young investor is already heavily invested in bonds implicitly via his human capital. Therefore, he should optimally invest all his financial wealth in risky assets. On the other hand, if human capital is risky, a young investor should invest in the safer bonds because he is already invested in the risky asset via his human capital.

With this internship we would like gain more insight in the way human capital could be included in asset allocation decisions over the lifecycle. In other words, could we, by including human capital in the asset allocation decision, derive superior DC lifecycle schemes?

### References

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<sup>1</sup> TiSEM now also offers the possibility of an extended master. For more information, see the "Infopakket Extended Master." An extended master follows a fixed program: Company traineeship March-October 2017; Company assignment and Master thesis October 2017-January 2018



Benzoni, L., Collin-Dufresne, P., and Goldstein, R.S., 2007, "Portfolio Choice over the Life-Cycle when the Stock and Labor Markets are Cointegrated," *Journal of Finance*, 62(5) 2123–2167.

Bodie, Z., Merton, R.C., and Samuelson, W.F., 1992, "Labor Supply Flexibility and Portfolio Choice in a Life Cycle Model", *Journal of Economic Dynamics and Control*, 16 427-449.

Campbell, J.Y., and Viceira, L.M., 2002, "Strategic Asset Allocation: Portfolio Choice for Long Term Investors", Oxford University Press.