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Placement Officer

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Education

2022 to present	Ph.D. in Business, Tilburg University Operations Research track, Quantitative Finance & Actuarial Science research area Expected completion in June 2026
2016 – 2018	Research Master in Business and Finance, Universidad Carlos III de Madrid Finance track, research oriented program with 120 ECTS taught in English Average grade 8.75 out of 10
2014 – 2015	Exchange Program, University of Southern California
2012 – 2016	Bachelor's Degree in Business Administration, Universidad Carlos III de Madrid English program with 240 ECTS Average grade 8.62 out of 10

Research Interests

Finance, Lifecycle Investing, Pensions, Portfolio Optimization, Housing Markets, Household Finance and Market Frictions.

Employment

2019 – 2022	Software Developer, Metelogica S.A., Madrid
2016 – 2018	Research and Lecture Assistant, Universidad Carlos III de Madrid

Working Papers

*Lifecycle Investing when House Prices are Cointegrated with Income (**Job Market Paper**)*

This paper studies the possibilities that residential real estate investment brings to lifecycle portfolios by incorporating the long-run relationship between house prices and income into the model. Labor income is at the core of lifecycle models and a significant body of literature argues that income is cointegrated with house prices through rents. Under this hypothesis, residential real estate investment can be used to hedge regional income changes on top of hedging rents. Regional income is very much related to the cost of labor intensive services such as elderly care, health care or education, and these services together with housing can constitute a sizable portion of household budgets. What makes investment in real estate attractive is thus the potential to hedge both housing and labor intensive services by exposing the portfolio to income changes. Preliminary results can rationalize the traditional role of housing, and not stocks, as the primary savings vehicle of households.

Daily Leverage and Long-Term Investing using Leveraged Exchange Traded Funds (w/ Anne Balter & Nikolaus Schweizer)

This paper explores the potential of leveraged Exchange Traded Funds (LETFs) for long-term investors and lifecycle portfolios. Leverage can increase welfare by enabling strategies that match the risk appetite of risk-tolerant

investors, or by increasing financial wealth exposure to compensate for the illiquidity of human capital. We find LETFs to be suitable for both purposes with a caveat: risks associated to LETFs make it worth-while typically only if the investor is sufficiently risk-tolerant. We also solve a dynamic portfolio optimization problem taking leverage costs and limits into account. We find that the optimal leverage target is fairly insensitive to typical leverage costs, and that welfare gains of relaxing leverage constraints are sizeable for risk tolerant investors. In our suitability analysis we study the risks of modelling discretely leveraged returns with geometric Brownian motion, as well as the probability of LETFs crashing over horizons of up to 40 years derived from extreme value theory and historical data.

Welfare Effects of Collective Investment for Heterogeneous Agents (w/ Anne Balter & Nikolaus Schweizer)

When heterogeneous agents invest in financial markets using the same, collective investment strategy, their individual risk preferences and risk capacities need to be aggregated to come up with a collective strategy. In this paper, we consider this problem for a social planner whose objective is to minimize the maximal certainty-equivalent regret across agents, thus minimizing the regret from being part of the collective. For the financial investment problem, we assume leverage constraints, discrete trading and a restriction to deterministic lifecycle strategies. In order to compute the regret-minimizing investment strategy, we apply a recent technique based on evolutionary dynamics and population games. This gives an efficient algorithm for finding optimal dynamic compromises between hundreds of agents. We then explore the idea of clustering agents into groups so that instead of a single lifecycle there are, say, two or three. We find that already with relatively few groups near optimal welfare can be achieved for all agents. Moreover, in our setting with leverage constraints, CRRA utility and heterogeneous wage trajectories, grouping agents only by their coefficient of risk aversion regardless of their wage trajectories leads to a near-optimal clustering.

Work in Progress

Evaluation of Retirement Income Loss Control Strategies (w/ Daniel Mantilla-Garcia & Nikolaus Schweizer)

We derive the investment plan for the accumulation phase of a lifecycle model seeking to maximize retirement income. Lifecycle investment models comprise two distinct phases: the individual works and makes contributions to the pension fund during the accumulation phase, and consumes those savings after retirement during the decumulation phase. For simplicity the investment plans for each phase are often derived independently. During the accumulation phase the objective is to maximize wealth at retirement and at the retirement date these proceeds are used to buy annuities. This decoupling misses some retirement income hedging motives that would otherwise be present when interest rates are stochastic and individuals are risk averse. To preserve retirement income hedging motives in the accumulation phase, we follow Mantilla-Garcia (2024) and formulate the retirement objective in terms of the number of standardized retirement annuities that wealth at retirement can buy. The resulting continuous-time model improves pension adequacy while maintaining the simplicity and typical features of lifecycle models.

Teaching Experience

Winter 2023 – 2025	*Data Analytics for Non-Life Insurance*, undergraduate level Tutorials – Tilburg University
Winter 2017	*Introduction to Business Administration*, undergraduate level Lectures and tutorials – Universidad Carlos III de Madrid

Refereeing

Journal of Pension Economics & Finance

Seminar & Conference Presentations

2025	Netspar Pension Day, Netspar Stochastics & Computational Finance, Universidade de Lisboa

	12th Advanced Mathematical Methods for Finance Conference, University of Verona Netspar International Pension Workshop, Netspar Quantitative Finance & Actuarial Science Workshop, Tilburg University 16th Actuarial and Financial Mathematics Conference, Ghent University
2024	International Pension Research Association Doctoral Tutorial, Netspar Netspar Pension Day, Netspar Quantitative Finance & Actuarial Science Workshop, Tilburg University 12th Bachelier World Congress, FGV EMAp Netspar International Pension Workshop, Netspar Netspar Workshop on Collective Investments for Heterogeneous Individuals, Netspar
2023	Quantitative Finance & Actuarial Science Workshop, Tilburg University Netspar Pension Day, Netspar

Computer Skills

LaTeX, Python, JAX, R, Julia, Linux, Git, PostgreSQL, Kubernetes, NodeJS, TypeScript, HTML, CSS, React, FluxCD

Languages

Spanish (native), English (fluent), German (intermediate), Russian (intermediate), Dutch (beginner)

References

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