



# MADS HEBSGAARD

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PhD Fellow in Statistics & Quantitative Finance, Department of Finance, CBS

## EDUCATION

2025 - 2028	<b>PhD Statistics</b>	Copenhagen Business School
	Researching my Bayesian covariance shrinkage framework at Center for Statistics in Department of Finance.	
2023 - 2025 GPA: 11.3/12	<b>MSc Quantitative Finance and Mathematics</b>	Copenhagen Business School
	Thesis: <i>Variance and Correlation Risk Premia: Cross Asset-Class, Period, Variance, and Cost Analysis</i>	
2020 - 2023 GPA: 9.6/12	<b>BSc Finance and Mathematics</b>	Copenhagen Business School
	Thesis: <i>Betting Against Beta in the US Stock Market</i>	

## EXPERIENCE

Jul 2023 - Jul 2025	<b>Research Assistant</b>	Copenhagen Business School
	Assisted Professors Ramlau-Hansen and Rangvid with research on pensions and savings. Collected and analysed Statistics Denmark data; simulated ATP models in Python; co-authored Finans/Invest articles.	
Jan 2023 - Jun 2025	<b>Instructor</b>	Copenhagen Business School
	Taught <i>Numerical Algorithms</i> and <i>Introduction to programming</i> to classes of 50. Covered numerical algorithms e.g. Gauss elimination, Gram-Schmidt process and gradient descent in C++. Teaching reports link.	
Jun 2022 - Apr 2023	<b>Junior Consultant</b>	Sophub
	Managed forecasting for Royal Unibrew's operations, monthly KPI reporting, and associated meetings. Optimized sales forecasts through data analysis. Programmed in VBA and C#, while utilizing SQL.	

## SELECTED PROJECTS

2025	<b>Improved ex ante correlation estimates</b>	private repo
	Bayesian inspired approach to estimating correlations utilizing resampling for ex-ante portfolio construction, tested on CRSP data.	
2025	<b>Variance and Correlation Risk Premia</b>	volpy repo
	Implemented model-free variance swap replication for 236 instruments ( $\approx 185$ M option quotes) and analysed VRP across assets and regimes.	
2023	<b>Betting Against Beta</b>	BAB repo
	C++ program using CRSP data (1926–2022) to construct BAB factors and replicate Frazzini & Pedersen (2014) returns.	
2022	<b>WizardWars</b>	WizardWars repo
	Developed a game about strategic spellcasting to learn C# and have fun.	

## PUBLICATIONS

Aug. 2024	<b>The total savings of Danes</b>	FINANS/INVEST
	how large a pension is really possible?	Hebsgaard, Ramlau-Hansen and Rangvid
	We analyse Danes' savings with register data from Statistics Denmark. By converting free assets (real estate, investments, and bank balances) into life annuities, we show that total pension income can reach replacement rates of 90–100% for many households, though disparities remain. Led empirical and visualization work.	
Feb. 2025	<b>New model for the ATP-pension</b>	FINANS/INVEST
		Hebsgaard, Ramlau-Hansen and Rangvid
	We propose a lifecycle investment strategy for ATP, shifting from a diversified portfolio to bonds near retirement. The model delivers 15–30% higher pensions while preserving guarantees and inflation protection. Developed models in Python, documented assumptions, and simulated alternative scenarios.	
Oct. 2025	<b>There is still a need for a better ATP pension</b>	FINANS/INVEST
	a reply to ATP	Hebsgaard, Ramlau-Hansen and Rangvid
	We address ATP's concerns with our model in <i>New model for the ATP-pension</i> . The article reviews their six main critique points and incorporates ATP's own modelling assumptions to show that our original conclusions remain valid.	

Languages    C++, Python, R, C#, Stata, L<sup>A</sup>T<sub>E</sub>X, Wolfram Language, VBA, MATLAB, SQL, Git  
Databases    WRDS (CRSP, OptionMetrics), Statistics Denmark, Bloomberg