

Steven Hoekstra

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Profile

I study how household balance sheets shape consumption and macroeconomic forecasts, the welfare effects of housing policy, and when estimated models can be trusted to evaluate policy, including when microdata on households and firms improves their counterfactuals. I build agent-based models with optimising households, calibrated to microdata and estimated with simulation-based inference.

Research Interests

Macroeconomics, household balance sheets, inflation, housing and labour markets, agent-based and heterogeneous-agent models, forecasting, expectations, misspecification, simulation-based inference.

Working Papers

Forecasting with a Dutch Agent-Based Model and Optimally Behaving Households

Job market paper, with Cars Hommes and Frank Pijpers. PDF

Embeds optimising two-asset HANK households with subjective expectations in a Dutch agent-based model calibrated to administrative microdata. At twelve quarters, forecast errors are 40.5–54.2% lower than univariate benchmarks for household consumption and significantly lower for investment; comparisons with heuristic rules point to dynamic household behaviour and portfolio choice as the source of the gain. Runner-up, Society for Computational Economics Graduate Student Paper Award, CEF 2026

Identification, Estimation and Misspecification and Their Effects on Forecasting and Policy: Wage–Price Pass-Through in a Dutch Agent-Based Model

Working paper, single-author. PDF. Known-truth simulation study and a Dutch application to the 2021–23 inflation episode.

BeforeIT.jl: High-Performance Agent-Based Macroeconomics Made Easy

Working paper, with Meligrana, Devetak, Reiter, Minnella, Poledna, Bardoscia and Glielmo. PDF · Package · Earlier version (arXiv, 2025). Implemented the CANVAS and growth-rate variants, the multicountry forecasting pipeline and its validation tools.

Also contributor to CalibrateBeforeIT.jl, calibration routines for BeforeIT.jl models.

Work in Progress

Shortage or Misallocation? The Welfare Loss from Dutch Housing Policy, 2015–2035

Single-author. A spatial macroeconomic ABM comparing four Dutch housing-policy levers.

When Does Microdata Help? Conditioning Information in Estimated Structural Models

Early stage.

Education

PhD in Economics — University of Amsterdam

2023 — current

Supervisors: Prof. dr. C.H. Hommes and Prof. dr. F.P. Pijpers

Expected thesis submission: May 2027; expected defence: September 2027

MPhil Economics and Econometrics — Tinbergen Institute (*cum laude*)

2021 — 2023

Specialisation: Complexity, Mathematics, and Computation

Thesis: An Agent Based Model of the Dutch Economy

Supervisors: Prof. dr. C.H. Hommes and Prof. dr. F.P. Pijpers

MSc Econometrics — University of Amsterdam (*cum laude*)

2020 — 2021

Specialisation: Complexity and Economic Behaviour

Thesis: Endogenous Financial Instability via Heterogeneous Beliefs

Supervisor: Prof. dr. C.H. Hommes

MSc Economics — London School of Economics 2019 — 2020
Specialisation: Public Economics
Thesis: The Inequality of Education using a Two Agent New Keynesian Model
Supervisor: Prof. F. Cowell

Exchange Programme — Royal Melbourne Institute of Technology 2018 — 2019
Minor in Finance and Programming

BSc Economics and Business Economics — University of Groningen 2016 — 2019
Thesis: The Impact of News Coverage on Security Prices

BSc Econometrics — University of Groningen 2015 — 2018
Thesis: Arbitrage Smoothing and Term Structure Models

Work Experience

De Nederlandsche Bank — PhD Intern Apr. — Dec. 2025

- Implemented the Bank of Canada CANVAS agent-based model for the Netherlands
- Estimated inflation channels using neural ratio estimation
- Wrote a note on the wage–price channel using this estimated model

Statistics Netherlands (CBS) — Thesis Intern Mar. — Sept. 2023

- Calibrated the agent-based model of Poledna et al. (2023) with Dutch register and national accounts data
- Developed an extension incorporating optimal consumption
- Ran simulations with both models and analysed their internal dynamics

SEO Amsterdam Economics — Research Assistant 2020 — 2021

- Studied academic pressure in secondary schools through stakeholder interviews and a nationwide survey

Grants

NWO Compute Grants — Snellius

Three awarded compute grants of 1,000,000 CPU hours each on Snellius, the Dutch national supercomputer, worth about 15,000 euros each at SURF's rates (3,000,000 CPU hours in total).

Teaching

Graduate

Behavioural Macro and Finance — Lecturer 2025 — present

Developed and taught the MSc lecture series with Cars Hommes, University of Amsterdam.

MPhil guest lecture — Tinbergen Institute

Annual guest lecture in Behavioural Macroeconomics and Complexity.

Undergraduate

BSc Econometrics thesis supervision — University of Amsterdam

Ongoing.

Mathematics 3: Advanced Linear Algebra — Tutor 2025 — 2026

Mathematics 2: Linear Algebra — Tutor 2024 — 2025

Microeconomics for AE — Tutor 2023 — 2024

Presentations

2026	Computing in Economics and Finance (CEF), Society for Computational Economics
2026	Workshop on Economic Science with Heterogeneous Interacting Agents (WEHIA)
2025	Agent-Based Modelling for Policy (ABM4Policy), European Central Bank, Frankfurt
2025	7th Behavioral Macroeconomics Workshop, University of Bamberg
2025	MacroABM 2nd Workshop, <i>Microdata in Macromodels</i> , Vienna University of Economics and Business
2025	Workshop on Economic Science with Heterogeneous Interacting Agents (WEHIA)
2025	De Nederlandsche Bank, Amsterdam
2023	De Nederlandsche Bank, Amsterdam

Honours and Scholarships

Honours

Runner-up — Graduate Student Paper Award 2026
Society for Computational Economics, Computing in Economics and Finance (CEF), for Forecasting with a Dutch Agent-Based Model and Optimally Behaving Households.

Cum Laude — MPhil Economics and Econometrics, Tinbergen Institute 2023

Cum Laude — MSc Econometrics, University of Amsterdam 2021

Scholarships

Full scholarship (merit based) — Tinbergen Institute 2022

Tuition fee waiver — Tinbergen Institute 2021 — 2023

Visits and Summer Schools

Visiting Scholar — IIASA, Laxenburg Summer 2022
International Institute for Applied Systems Analysis. Visited Dr. S. Poledna to work on agent-based models

Tools for Macroeconomists: Advanced Tools — University of Oxford Aug. 2021
Doctoral-level course on DSGE models: solving and simulating models with heterogeneous agents, continuous time models, occasionally binding constraints and bounded rationality

Tools for Macroeconomists: The Essentials — University of Oxford Aug. 2021
Doctoral-level course on DSGE models: numerical analysis, perturbation and projection methods, Blanchard-Kahn conditions and sunspot solutions, the Kalman filter and Bayesian estimation

Skills

Programming	Python, Matlab, R, Julia, C, SQL, Bash
High-performance computing	Parallel computing (MPI, BSPlib, Slurm)
Methods	Agent-based modelling, heterogeneous-agent models, neural-network solvers, simulation-based inference, network methods, machine learning, econometrics, dynamic stochastic general equilibrium modelling (Dynare)

References

Prof. dr. C.H. Hommes
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Prof. dr. F.P. Pijpers
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