

# YATHEESAN J. SELVAKUMAR

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**Fields:** Macroeconomics, Econometrics, Finance

**Citizenship:** United Kingdom

## EDUCATION

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- 2025 (*exp*)      **New York University**, Ph.D., Economics  
*Dissertation: Essays in Macroeconomics*
- 2019              **King's College London**, Grad. Dip., Mathematics (Distinction)
- 2016              **London School of Economics & Pol. Science**, M.Sc., Economics (Distinction)
- 2012              **University College London**, B.Sc., Economics

## REFERENCES

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Professor Thomas J. Sargent  
19 West 4th Street, 6th floor  
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Professor Simon Gilchrist  
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Professor Jaroslav Borovička  
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Professor Juan F. Rubio-Ramirez  
Emory University, Rich Memorial Building  
Atlanta, Georgia 30322-2240  
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## AWARDS AND SCHOLARSHIPS

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- 2020-2024      Henry M. McCracken Scholarship – New York University

## WORKING PAPERS

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1. **Estimation of Heterogeneous Economies with Micro Data (with M. C. Iao)** (Job Market Paper).

We give sufficient conditions under which dynamic equilibrium models with heterogeneous-agents can be represented by a first-order reduced-rank vector autoregression. We exploit this result to develop an econometric framework that enables the rapid estimation of a rich class of models with macro and repeated cross-sections of micro data. In monte-carlo simulations, we show that including micro-data delivers precision up to an order of magnitude larger than conventional approaches. We apply our method to estimate a medium-scale HANK model with heterogeneous exposures to aggregate fluctuations at the household-level. Our estimates imply that poorer households are more sensitive to changes in aggregate income on average, and that this sensitivity is heightened conditional on a monetary policy shock. Through the lens of the model, our method estimates that heterogeneous earnings exposures amplify the consumption response to monetary policy shocks by 40%, substantially larger than those implied by traditional estimation methods.

2. **Dynamic Mode Decompositions and Vector Autoregressions (with Prof. T. J. Sargent)**

Sufficient conditions on state-space matrices  $A$ ,  $C$ ,  $G$ ,  $R$  allow inferring them from a reduced-rank first-order vector autoregression (VAR) that can be computed with a Dynamic Mode Decomposition (DMD), thereby connecting DMD modes to hidden Markov states in the state-space system. When these sufficient conditions hold, our technique provides a fast way to infer parameters of the linear state space system. An application infers two macro-economic aggregate factors from dynamics of CEX cross sections.

3. **Linearizing Stochastic systems with the Koopman Operator**

This paper provides an alternative computationally-efficient approach to approximate non-linear stochastic models. The novel method combines both perturbation and projection methods and draws on results from Koopman operator theory. I state convergence results and demonstrate its capabilities on a highly non-linear consumption- based asset-pricing model with external habits.

## WORK IN PROGRESS

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4. *Dynamic Mode Decomposition of a CEX cross-section* (with Prof. T. J. Sargent)

5. *Deep Asset Allocation* (with Prof. J. Rubio-Ramirez)

6. *Granular Identification of Vector Autoregression Models* (with H. Han, and L. Gagliardone)

## PRESENTATIONS

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| 2024 | IMIM Rising Stars Seminar Series; Society for Economic Dynamics, Barcelona; NYU Internal seminars (Econometrics, Student Macro Lunch, Stern Macro Lunch) |
| 2023 | NYU internal seminars (Econometrics, Student Macro Lunch)  |
| 2022 | NYU internal seminars (Econometrics, Student Macro Lunch)  |

## RESEARCH EXPERIENCE

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<i>2020-2025</i>	<b>Prof. T. J. Sargent</b> – New York University
<i>2022-2023</i>	<b>Prof. Thomas Philippon</b> – New York University
<i>2022-2023</i>	<b>Prof. T. M. Christensen</b> – New York University
<i>2021</i>	<b>Prof. T. J. Sargent and L. P. Hansen</b> – New York University

## TEACHING EXPERIENCE

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<i>Fall, 2024</i>	<b>Intermediate Macro</b> – New York University <i>TA for Prof. G. McIntyre</i>
<i>Summer, 2023</i>	<b>Foundation of Finance (MBA)</b> – NYU Stern <i>TA for Prof. A. Lynch</i>
<i>Spring, 2022</i>	<b>Econometrics II (Ph.D.)</b> – New York University <i>TA for Prof. T. Cogley and R. Crump</i>
<i>Summer, 2022</i>	<b>Foundations of Finance (MBA)</b> – NYU Stern <i>Prof. A. Lynch</i>

## WORK EXPERIENCE

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<i>2017-2019</i>	<b>Bank of England</b> – External Monetary Policy Committee Unit
<i>2016-2017</i>	<b>Fulcrum Asset Management</b> – Research Economist
<i>2012-2015</i>	<b>HSBC Bank, PLC</b> – Global Asset Allocation strategist

## PROFESSIONAL SERVICE

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*Referee:* Journal of Econometrics; Young Economists' Symposium