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Education

Ph.D. In Economics, New York University, 20015-2022 (expected)
Thesis Title: *Dynamic Oligopoly and Monetary Policy: A Deep Reinforcement Learning Approach*.
M.Phil. in Economics New York University, 2015-2017
M.A. in Economics, Pontifica Universidad Católica de Chile, 2011-2012
B.A. in Economics, Pontifica Universidad Católica de Chile, 2007-2011
Visiting Student, University of Chicago, 2012-2013

References

Professor Ricardo Lagos
19 West Fourth St., 6th Floor
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Professor Thomas Philippon
Kaufman Management Center
44 West Fourth Street, 9-03
(212) 998-0490 (office)
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Professor Stijn Van Nieuwerburgh
19 West Fourth St., 6th Floor
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212-854-5553 (office)
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Research Fields

Primary fields: Macroeconomics, Industrial Organization.

Secondary fields: Machine Learning, Finance.

Teaching Experience

Spring 2018-2019-2020	Graduate Macro-Finance at Stern, New York University, teaching assistant for Professor Philippon
Fall 2021	Intermediate Macroeconomics, teaching fellow for Professor McIntyre
Fall 2020	Microeconomics at Stern, teaching fellow for professor Cabral
Spring and Fall, 2017	Introduction to Microeconomics at Stern, teaching fellow for Professor Bowmaker
Fall 2019, Spring 2020	Introduction to Macroeconomics, teaching fellow for Professors McIntyre and Piazis
Fall 2009-2011	Advanced Macroeconomics, Pontificia Universidad Católica de Chile, teaching fellow for Professor Schmidt-Hebbel

Research Experience

2017-2020	New York University, Research Assistant, Prof. Thomas Philippon
2018	New York University, Research Assistant, Prof. Cecilia Parlatore and Eduardo Dávila
2016-2018	New York University, Research Assistant, Prof. Laura Veldkamp
2016-2017	New York University, Research Assistant, Prof. Stijn Van Nieuwerburgh
2013-2014	Pontificia Universidad Católica de Chile, Research Assistant, Prof. Jeanne Lafortune
2013	Pontificia Universidad Católica de Chile, Research Assistant, Prof. Tomas Rau
2013	University of Chicago, Research Assistant, Prof. Casey Mulligan

Professional Experience

Full-time Adjunct Instructor, Pontificia Universidad Católica de Chile, 2014-2015.
Teacher Coordinator of university wide Principles of Microeconomics Courses, Pontificia Universidad Católica de Chile, 2014.
Referee Services for Journal of Industrial Organization.

Honors, Scholarships, and Fellowships

2015	MacCracken Fellowship, New York University
2013	Raul Yver Award for the Best Economist of the Generation, Pontificia Universidad Católica de Chile.
2013	Academic Excellence Award, M.A. in Economics, Pontificia Universidad Católica de Chile
2013	Maximum Distinction Award in Masters Thesis, M.A. in Economics, Pontificia Universidad Católica de Chile, 2013.

Publications

Covarrubias, Matias; Gutierrez, German and Thomas Philippon (2021), "From Good to Bad Concentration? U.S. Industries over the past 30 years," NBER Macroannuals, Forthcoming.

Covarrubias, Matias; Lafortune, Jeanne and José Tessada (2015) "Who Comes and Why? Determinants of Immigrants Skill Level in Early XXth Century US." Journal of Demographic Economics, 1(1), 2015.

Research Papers

Dynamic Oligopoly and Monetary Policy – A Deep Reinforcement Learning Approach (Job Market Paper)

I evaluate the effect of dynamic oligopolistic strategies on the transmission of monetary policy and conclude that tacit collusion increases the effectiveness of monetary policy. The main innovation of the paper is that I solve the strategic problem of firms by using state-of-the-art artificial intelligence algorithms called Deep Reinforcement Learning. These algorithms learn by experimenting and improving their strategies over time, using only information about their period rewards and the evolution of the state. Additionally, they approximate the policy and value functions using neural nets, which are well suited for high-dimensional problems. Using this approach, I construct a monetary economy with menu costs and oligopolistic competition at the sector level. After benchmarking with known results in the literature, I allow for repeated game strategies by making the game's horizon infinite. We get a range of converging equilibria, going from the Markov equilibrium calculated in recent studies to high-markup equilibria that I interpret as tacit collusive equilibria. The main result is that monetary policy effectiveness, measured by its contribution to the volatility of log consumption, is up to 39% larger with collusive strategies versus with non-collusive strategies. By inspecting the converging policies, we observe that the increased effectiveness is due to stronger pricing complementaries in collusive strategies. Such strategies are supported by steep reaction functions that ensure that deviations are costly.

The Construction of Crises: Time-To-Build and Financial Frictions in Real Estate (with Josue Cox)

We evaluate the contribution of frictions in the supply side of real estate to boom and bust dynamics, mostly attributed to demand-side frictions in the macro-financial literature. In particular, we study the effect of time-to-build (TTB) and its interaction with leverage and default of real estate developers, focusing on the commercial real estate market (CRE). For our calibration, going from 8 quarters of TTB to four quarters of TTB decreases the negative impact of financial crises on the price of CRE by 35%. The main mechanism is that more TTB increases inertia in supply, which interacts with endogenous default rates to amplify small shocks. Also, construction put in place reaches the trough after five periods, highlighting the model's construction lags. Finally, our model can replicate the construction response to changes in CRE's price observed in the data.

Research In Progress

The Amazon Shock: Pass-Through Estimation through Amazon Annual Fee Changes (with German Gutierrez and Sophie Piton)

We use data on Amazon prices and sales to estimate the casual response of prices to annual changes to Amazon fees, that is, we estimate cost pass-through. The identification strategy relies on variation on products' categories and sellers' relation with Amazon. In particular, annual changes in fees vary across broad categories. In addition, a seller's exposure to the fee change depends on whether the seller is Amazon; a third party that uses Amazon to fulfill their orders; or third parties that fulfill themselves. This variation is exogenous at the product level on the window around the announcement of Amazon fee

changes. The recovered cost pass-through at the product level allows us to calculate the difference between the pass-through of large firms and small firms, among other heterogeneity sources. The final step of this project, which follows the main exercise in Wang and Werning (2020) is to use an oligopolistic general equilibrium model to derive the implication of the heterogeneous pass-through of big vs. small firms to the effectiveness of monetary policy in the United States.