

# Mathias Jimenez

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EDUCATION	<b>Stanford University</b> Ph.D. Candidate, Department of Economics ( <i>Expected June 2022</i> ) <i>Dissertation Title: "Essays in Monetary Theory and History"</i> <i>Fields:</i> Macroeconomics, Finance.
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**Universidad Torcuato Di Tella**  
Posgrado en Economía, 2015

**Universidad de Montevideo**  
Licenciatura en Economía, 2013

RELEVANT SKILLS	Languages: Spanish (Native), English, Portuguese Programming: R, SQL, Matlab, $\text{\LaTeX}$ , Markdown Software: QGIS, Eviews, Dynare, Excel, Github Others: statistical modeling, causal inference, social network analysis, geographic information systems (GIS), numerical optimization, time-series econometrics, financial asset pricing, financial forecasting.
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INDUSTRY EXPERIENCE	<b>Data Scientist Intern at Adobe Inc.</b> <i>Location:</i> San Francisco, California. <i>Dates:</i> October 2017 – July 2018 ( <i>10 months</i> ) <i>Job Description:</i> Alongside a team at Stanford Economics and in partnership with the Adobe Digital Economy team, we leverage Adobe Analytics' real-time data coming from millions of e-commerce transactions to study firm pricing strategies across industries and online versus offline aggregate inflation dynamics. The project involved extensive use of SQL for querying from Adobe's servers and R programming for data wrangling and statistical analysis.
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**Project Manager at Credifast**  
*Location:* Montevideo, Uruguay.  
*Dates:* December 2012 – December 2013 (*1 year*)  
*Job Description:* I led a team in this micro-credit company to develop a new internal software solution for daily front-end and back-end use. It involved managing a developer, designing software's customized reports, automatizing the credit approval process and product offers using statistical risk analysis and financial math.

**Intern at Infopesca**  
*Location:* Montevideo, Uruguay.  
*Dates:* March 2010 – June 2010 (*4 months*)  
*Job Description:* I worked as a commercial analyst at Infopesca, a multilateral organization dedicated to producing reports on worldwide fishing markets and offering consultancy services for Latin American governments and private fishing industries. The job mainly consisted of working with a team to produce monthly market reports and maintain statistical information about worldwide fishing markets.

*Are Banks Technologically Obsolete? A New Monetarist Approach (2020)*

**Tech stack and skills:**

Economic modeling, financial asset pricing, L<sup>A</sup>T<sub>E</sub>X

**Abstract:** Given the current state of technology, which could allow agents to transfer directly Central Bank fiat money seamlessly and cheaply across the world, are we close to reaching a stage where private banks become “technologically obsolete”? To provide some insights about this question, we build a monetary search model with several “imperfections” in the medium-of-exchange (MOE), such as asymmetric information in its value, imperfect supply elasticity, and transportation costs. Banks are “experts” in this MOE and have access to a payment infrastructure that can facilitate payments among non-banks by issuing transferable debt. Our model is specifically designed to account for historical evidence on banking origins, innovations, and also to speculate about its future. We first show what we call the “Two Worlds” result, which allows us to partition the parameter space into two sub-spaces that speak to the relevance of banking in the competitive equilibrium. Our main result suggests that we might not be far away from private banks becoming obsolete technologically speaking. Formally, suppose we start from a parameterized model consistent with being in a “Banking World”. Then, even if the payment infrastructure endowed to banks is as good as it can get, agents in equilibrium strictly prefer to use only the MOE for payments when asymmetric information frictions and transportation costs vanish.

*The Life-Cycle of Banking (2021)*

**Tech stack and skills:**

Statistical modeling, social network analysis, spatial and time-series econometrics, R programming, OCR, QGIS, Excel, Github, L<sup>A</sup>T<sub>E</sub>X

**Abstract:** This paper is the first to document the evolution of a banking system from inception to maturity defined in terms of its turnover dynamics. For this, we digitized multiple novel historical sources for the Canadian banking system, from the founding of its first bank in 1817 to 1933, when turnover then stabilized for twenty years. We show a clear tendency to higher market concentration driven both by failures and acquisitions of smaller banks, and overall, mergers are more common when branch overlap is low. Banks start locally, which partitions competition by region. We also find branch clustering within each region, although only for rural areas. Later, larger banks start expanding nationwide, which coincides with the start of the merger wave. Regarding financial access, the number of years until the first branch varies substantially. However, conditional on that, the time until the second bank opens a branch arrives mostly within two years, suggesting a somewhat high spatial competitive pressure. In the end, the banking system expands to the point where there is at least one branch in almost 100% of locations with a non-negligible population. In terms of the financial network, links in the correspondent banking network used for inter-bank liquidity services are driven by the fact that only the correspondent bank has a branch where settlement occurs. However, we show that links are only formed after that location has a transportation route where the respondent has its branches. This fact suggests a positive relationship between trade and the demand for financial services. On the other hand, the correspondent network converges to being wholly disconnected due to branching, which implies that it does not converge to the usual “core-periphery” topology extensively documented elsewhere. Finally, in terms of banks’ balance sheets, we show a clear tendency to higher leverage ratio driven in the cross-section by larger banks.

This fact is consistent with a “diversification channel” since banks with higher spatial branch coverage have a lower non-performing proportion of loans, even controlling by the number of branches and size of the bank. The composition of bank liabilities also changes. Privately-issued banknotes start out being more prominent, but demand deposits and then time deposits take over. On the asset side, the reserve ratio also shows a downward tendency but converges to a more homogeneous cross-sectional ratio around 10%. Interestingly, larger banks hold a higher portfolio share of safe and liquid marketable assets, and we show evidence that these banks use these liquid funds to finance inter-bank loans to smaller and distressed banks during international financial crises.

***The Extent of Financial Fragility in Un-Regulated Banking Systems: Evidence from Canada, 1871-1913 (work in progress, 2022)***

#### **Tech stack and skills:**

Economic modeling, numerical optimization, social network analysis, spatial and time-series econometrics, R programming, Excel, L<sup>A</sup>T<sub>E</sub>X, Github

**Abstract:** This paper challenges the conventional view that unregulated banking systems are “robust-but-fragile”, where banks provide valuable services during normal times but are also susceptible to a systemic run under financial stress. We use novel and granular data for Canada from 1871 to 1913, a period where there was no Central Bank, no currency monopoly, no deposit insurance, no explicit nor implicit bailout guarantees, no liquidity requirements, no mandatory public audits or inspections, and no public resolution authority. In this context, we show, among other things: i) The system evolved towards a handful of cooperative and well-diversified large banks, with no need for correspondent relationships. ii) Banks self-organized under an association that implemented centralized daily net clearing and settlement, liquidity management oversight, and rules for crises management and resolution. Moreover, the largest banks acted as ad-hoc central bankers by being lenders of last resort and making assume-and-purchase agreements with others at the brink of failure. iii) There were no system-wide runs even though Canada’s principal trading and financial partners (the US and UK) did have several. However, the system experienced some localized financial distress, and several bank failures were accompanied by fraud from top executives to both shareholders and creditors. The paper suggests that more work needs to be done in modern quantitative banking models to disentangle purely decentralized mechanisms from policy-induced microstructure. It also underscores the complexities in modeling and doing counterfactuals on path-dependent systems.

RESEARCH AND  
TEACHING  
EXPERIENCE

#### **Research Assistant for Pete Klenow**

Summer 2017 – Summer 2018   Economic Growth

#### **Lecturer at Universidad Torcuato Di Tella**

Spring   2015   Introduction to Probability

#### **Teaching Assistant at Stanford University**

Fall	2021	Principles of Economics
Spring	2020	Introduction to Financial Decision Making
Winter	2020	Games Developing Nations Play
Fall	2020	Finance, Corporations, and Society
Spring	2019	Economic Analysis III
Fall	2019	Economic Analysis I
Spring	2018	Economic Analysis III
Winter	2018	Economic Policy Seminar 101
Fall	2018	Economic Analysis III

#### **Teaching Assistant at Universidad Torcuato Di Tella**

Winter	2015	Statistical Inference ( <i>Graduate</i> )
Fall	2015	Introduction to Probability ( <i>Graduate</i> )

#### **Teaching Assistant at Universidad de Montevideo**

Spring	2013	TA Mathematical Economics II
Spring	2012	TA Mathematical Economics II
Winter	2012	TA Industrial Organization
Winter	2011	TA Statistics I
Spring	2011	TA Microeconomics I

COURSES	2021	Blockchain Technologies, Berkeley University edX
	2021	Decentralized Finance (DeFi) Deep Dive, Duke University Coursera
	2021	Bitcoin and Cryptocurrency Technologies, Princeton University Coursera.
	2018	Princeton Initiative, Princeton University.
	2018	Alternative Money University Workshop, CMFA.
	2015	J-PAL's Short Course on Experimental and Quasi-Experimental Methods.
ACADEMIC AWARDS	2021 – 2022	Adam Smith Fellowship, Institute for Humane Studies.
	2020 – 2021	Thomas C. & Irene W. Graham Fellow, Institute for Humane Studies.
	2018	Full Scholarship for Alternative Money University Workshop, CMFA.
	2017	Selected for Princeton Initiative 2017.
	2016 – 2021	Stanford University School of Humanities and Sciences Fellowship.
	2015	Full Scholarship for J-PAL's Short Course on Experimental and Quasi-Experimental Methods, Unverisdad Torcuato Di Tella.
OTHER AWARDS	2006	Bronze medal, 2006 International Basketball Championship, Uruguayan juvenile basketball National Team.
	2004	Silver medal, 2004 Uruguayan juvenile National League.