

# Mathias Jimenez

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EDUCATION      **Stanford University**  
Ph.D. Candidate, Department of Economics (*Expected June 2022*)  
*Dissertation Title: "Essays in Monetary Theory and History"*  
*Fields: Macroeconomics, Finance.*

**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,  $\LaTeX$ , Markdown  
Software: QGIS, Eviews, Dynare, Excel, Github  
Others: statistical modeling, graph data analysis, geo-spatial data analysis, time-series econometrics, spatial econometrics, causal inference, game theory, financial asset pricing, optimization, financial forecasting.

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.

INDUSTRY EXPERIENCE      **Data Scientist Intern at Adobe Inc.**  
*Location:* San Francisco, California.  
*Dates:* October 2017 – July 2018 (*10 months*)  
*Job Description:* By taking advantage of a partnership between Stanford Economics and the Adobe Digital Economy team, I worked under the supervision of Pete Klenow where I leveraged 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.

**Project Manager at Credifast**  
*Location:* Montevideo, Uruguay.  
*Dates:* December 2012 – December 2013 (*1 year*)  
*Job Description:* I led a project in this micro-credit company to develop a new internal software solution for daily front-end and back-end use. It involved designing financial reports, testing software updates, automatizing credit approval and product offers, and training employees on how to use the software.

**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, game theory, financial asset pricing, L<sup>A</sup>T<sub>E</sub>X

**Abstract:** Given the current state of technology, agents could potentially deal with exchange by transferring directly Central Bank fiat monies. Are we close to private banks becoming technologically obsolete in the provision of payment services?. To provide insights into this question, we build a monetary search model where transferring the medium-of-exchange (MOE) entails dealing with transfer costs, imperfect supply elasticity, and asymmetric information in its value. Banks are special because they are experts in assaying the quality of the MOE and have access to a retail payment infrastructure, which allows them to issue unlimited unforgeable and cheaper-to-transfer bank debt, but at the expense of possible discounts due to decentralization in the issuance of money compared to a homogeneous MOE. Given this model, 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 the extent of near-future obsolescence depends on a sort of “race” between private banks and Central Banks on future innovations in retail payments. Formally, suppose we start from a parameterized model consistent with being in a Banking World, where only bank debt is used for exchanges. Then, if asymmetric information and transfer costs on the MOE converge to private standards, then even with an arbitrarily good private payment infrastructure, the environment converges to a Non-Banking World, where agents demand only the MOE for payments, and sometimes also some complementary bank credit when money supply is sufficiently low. However, we also show that, if instead MOE transfer costs become arbitrarily close but still higher than private standards, and bank debt transfers become as homogeneous as transferring funds within a Central Bank, then the environment remains a Banking World. Therefore, our main results suggest that ultimately the near future obsolescence of private banks depends on whether they offer fast and seamless bank debt transfers that resemble what would be like transferring debt within the same institution like a Central Bank. Moreover, these private innovations would need to compensate for future public innovations in the cost of retail transfers of Central Bank debt.

***The Life-Cycle of Banking (2021)***

**Tech stack and skills:**

Statistical modeling, graph data analysis, spatial and time-series econometrics, R programming, OCR, QGIS, Excel, Github

**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, graph data analysis, spatial and time-series econometrics, R programming, 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 (*Graduate*)  
 Fall 2015 Introduction to Probability (*Graduate*)

**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

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, Universidad 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.