Mario Rafael Silva

Assistant Professor of Economics

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I. Academic and Professional Qualifications

University of California Irvine — **Sep 2012 - June 2017**

PhD Economics

- Dissertation: "Essays on Liquidity, Monopolistic Competition, and Search Frictions"
- Committee: Guillaume Rocheteau, William Branch, Fabio Milani

Stanford University — **Sep 2005 - Jun 2009**

BS Mathematics

II. Academic and Professional Experience

Department of Accountancy, Economics, and Finance, Hong Kong Baptist University — **August 2021 - present**

Assistant Professor

Department of Economics and Finance, Tongji University — **Oct 2017 - July 2021**

Assistant Professor

ECON ONE RESEARCH, Boutique Economic Consulting Firm — **Mar 2012 - Aug 2012**

Data Analyst

- Processed (cleaned, standardized, grouped, sorted, etc.) transaction level data for multiple firms for an antitrust matter regarding an alleged horizontal price fixing conspiracy in the polyfoam industry that settled for $433 million (primarily using SAS)
- Created data summaries, descriptive statistics and visual representation of data using SAS and Excel

Research assistantship — **June 2013 - August 2013**

Project with Professors Linda Cohen and Amihai Glazer linking alumni university donations to patents (used Bloomberg Law, Westlaw Campus for legal dockets)

- Conducted extensive research and analysis on the correlation between alumni university donations and patents, under the guidance of Professors Linda Cohen and Amihai Glazer.
- Utilized Bloomberg Law and Westlaw Campus to access legal dockets and gather relevant data for the research project.
- Assisted in data collection, organization, and interpretation, ensuring accuracy and reliability of findings.

Research assistantship. — **June 2007 - August 2007**

- Conducted archival research under the guidance of Professor Tim Bresnahan, analyzing key developments that contributed to the rapid growth of online social networks in the mid-2000s, distinguishing them from earlier attempts.

III. Teaching Experience

August 2021 - present

1. Hong Kong Baptist University

- Data Analytics for Business Decision Making (BUSI2045), Spring 2025
  - Thorough introduction to data management and basic statistical inference with the aim of developing research design for business. The course is based largely on Python programming and includes a group project in which teams design questionnaires, gather data, analyze, and present it.
- Advanced Macroeconomics (ECON 7800), 2021-2023
  - Emphasizes key concepts and measurement issues in macroeconomics, computation of equilibrium, the application of overlapping generations models to liquidity and growth, real business cycle models, financial frictions, the role of endogenous firm entry, a liquidity-based model of monetary policy, heterogeneous agents, unemployment, and demand-induced fluctuations. The course serve to harness the most salient aspects of a PhD-level course in macroeconomics while removing enough technical components to make it accessible to advanced masters students.
  - https://github.com/msilva913/ECON-7800-Programs (Course programs for ECON 7800, Advanced Macroeconomics)
- Digital Economy (ECON 4035, ECON 7640), Spring 2022
  - Focuses on ongoing work on Central Bank Digital Currency, especially as it relates to financial inclusion and liquidity, effects on bank deposit funding and investment, and government financial transfers.

2. Tongji University — **February 2018 - July 2021**

- PhD Macroeconomics (Spring 2019, 2020), time series and computational assignments based on Python
  - Covers dynamic systems, time series, dynamic programming methods, real business cycle theory and extensions, heterogeneous agents, the basic New Keynesian model, business cycle models of firm entry and endogenous variety, unemployment theory, and financial frictions. The course helps train students to simulate models using the Python language. Includes discussion of value function iteration, Euler-equation-based methods, and log linearization.
- Money and Banking (Fall 2018, 2019, 2020)
  - Advanced undergraduate. Treatment of commodity money, fiat money, inflation, international monetary systems, price surprises, capital, liquidity and financial intermediation, fully backed central bank money, the payments system, bank risk, and financial multipliers.
- Market Structure, Innovation, and the Macroeconomy (Spring 2018, 2019)
  - Masters level course which incorporates insights from industrial organization and imperfect competition and explores their aggregate implications for innovation, growth, trade, and the formation of new goods.

3. UC Irvine (Teaching Assistant) — **September 2012 - June 2017**

Basic and intermediate micro-and macroeconomics, intermediate econometrics, game theory, global economy

IV. Scholarly and Professional Work

Published

- "Unsecured Credit, Product Variety, and Unemployment Dynamics", *Macroeconomic Dynamics*, 2020
  - I develop a theory of feedback between revolving credit and product development and examine its ability to explain labor market volatility. Extending the Mortensen–Pissarides model with an endogenous borrowing constraint and free entry of monopolistically competitive firms reproduces stylized facts in the data and amplifies both productivity and financial shocks through mutual causality. Higher debt limits encourage firm entry and raise product variety (the entry channel), and greater variety makes default more costly and thereby raises the equilibrium debt level (the consumption value channel). Though productivity shocks are sufficient to generate higher volatility, financial shocks are essential in approximating the time series patterns of unemployment, vacancies, and revolving credit in the data, and reproduce the rise in unemployment during the Great Recession.
- "Corporate Finance, Monetary Policy, and Aggregate Demand", *Journal of Economic Dynamics and Control*, 2019
  - I study how heterogeneity of financial frictions and monopolistic competition influence the pass through of the nominal interest rate to the real lending rate, its transmission into investment, and corporate cash holdings. Firms finance stochastic investment opportunities with either bank-issued credit or money. The market structure generates an aggregate demand externality which doubles transmission at the a policy rate of 4.8% and magnifies the effects of financial frictions on investment. In line with empirical evidence, the cash-to-sales ratio increases with the extent of financial constraints, and rises with the intensity of competition for financially constrained firms. Financial constraints raise firms' sensitivity to monetary policy; and a mean-preserving spread of financial frictions reduces investment and output, strengthens transmission, and reduces the external share of finance. I estimate markups on Compustat data using the production approach pioneered by Hall (1978) and more recently applied by De Loecker, Eeckhout, and Unger (2018).
- "New Monetarism with Endogenous Product Variety and Monopolistic Competition", *Journal of Economic Dynamics and Control*, 2017
  - I examine the role played by endogenous variety and monopolistic competition in the long-run transmission of monetary policy. I integrate free entry, product variety and monopolistic competition into a New Monetarist framework, considering preferences that give rise to either constant or variable markups. I find that inflation generally reduces variety. Under CES preferences, firms are inefficiently small, with the inefficiency increasing with product differentiation and the extent of search frictions. The Friedman rule is the best policy under CES preferences. In contrast, with variable elasticity of demand, inflation can increase firm size, reduce markups, and raise welfare, even though output is lower. Under CES preferences, the welfare cost of inflation is high; moreover, this cost increases monotonically with the markup and is higher with endogenous variety than with a fixed product space.
- "Decentralizing Constrained-Efficient Allocations in the Lagos-Wright Pure Currency Economy", *Journal of Economic Theory*, 2016, joint with Ayushi Bajaj, Guillaume Rocheteau, and Tai-Wei Hu
  - This paper offers two ways to decentralize the constrained-efficient allocation of the Lagos-Wright (2005) pure currency economy. The first way has divisible money, take-it-or-leave-it offers by buyers, and a transfer scheme financed by money creation. If agents are sufficiently patient, the first best is achieved for finite money growth rates. If agents are impatient, the equilibrium allocation approaches the constrained-efficient allocation asymptotically as the money growth rate tends to infinity. The second way has indivisible money, take-it-or-leave-it offers by buyers, and no government intervention.

Working Papers

- "Productive demand, Sectoral Comovement, and Total Capacity Utilization", joint with Marshall Urias, in submission
  - We investigate business cycle fluctuations in a three-sector model where demand shocks influence the Solow residual and estimate it using Bayesian techniques. Our novel identification strategy uses capacity utilization data from both nondurable and durable goods sectors to identify key parameters of goods market frictions. In our simplified setting, incorporating capacity utilization data reveals that goods market frictions and demand shocks play a more significant role than indicated by an estimation which only uses conventional macroeconomic variables. In our general setting, shocks to shopping effort account for the majority of the forecast error variance in output, the Solow residual, and utilization. Furthermore, search demand shocks and sector-specific wage markup shocks prove essential for inducing positive comovement of utilization data and fitting sectoral data overall.
- "Unemployment and Labor Productivity Comovement: the Role of Firm Exit", joint with Miroslav Gabrovski, in submission
  - The Diamond-Mortensen-Pissarides model implies a nearly perfect correlation between productivity and unemployment, yet the empirical relationship is mild. We show that incorporating sunk entry costs and a congestion channel of vacancy creation in an otherwise standard setup can reconcile the discrepancy. Sunk costs cause vacancies to be a positively valued, predetermined variable. If the destruction shock is infrequent, most vacancies were created in the past, so the number of vacancies correlates closer with past than with current productivity. The model, calibrated to match micro-level evidence on product and firm destruction, matches both the contemporaneous and dynamic correlations between productivity and unemployment.
- "Liquidity, Unemployment, and the Stock Market" , joint with William Branch
  - Interest-rate spreads and the unemployment rate vary negatively with stock prices. We study an unemployment search model with a twist: households self-insure against preference shocks by accumulating equity claims. Higher stock market valuations relax liquidity constraints, creating an aggregate demand channel that strengthens firms' hiring incentives. Quantitatively, a negative shock to stocks decreases the liquidity value of equity and increases unemployment. A ``perfect storm'' of an increase in risk and a drop in the velocity of publicly-provided assets produces a self-fulfilling crash to an equilibrium with high unemployment and low stock prices. Economies which rely more heavily on privately issued assets are more fragile.

Work in progress

- "Sunk vacancy costs, endogenous product variety, and labor market frictions"
  - The economy features significant market power and formation and exit of businesses and product lines. We study the interaction between labor market frictions and endogenous product variety in a real business cycle model. The first novel feature is bidirectional feedback: increased employment provides additional resources for product line expansion, while greater product variety enhances households' consumption diversification capabilities, thereby boosting job creation and employment. Labor market variables demonstrate heightened persistence due to both the gradual adjustment of product lines and vacancy creation, with the latter stemming from sunk entry costs and congestion effects.

    Furthermore, since the elimination of a product line simultaneously terminates associated vacancies, vacancy persistence closely correlates with product line longevity. This creates a crucial distinction between separation rate and product destruction rate shocks. While separation rate shocks trigger vacancy reposting, destruction shocks deplete firm vacancies entirely, resulting in only the latter generating a Beveridge curve.
- "Liquidity, Unemployment, and Fiscal Policy" (2022), joint with Oliko Vardishvili
  - We study the effect of a credit crunch on stock market values and unemployment in a heterogeneous-agent setting in which there is feedback from household consumption demand to revenue and the stock market capitalization. The forces depend on aggregate-demand and interest-rate channels. We study the effects of types of fiscal policy (direct purchases, hiring subsidy, government debt) and study the connection between fiscal multipliers and wealth inequality.

V. Scholarly and Professional Activities

Research grants (External)

- General Research Fund (GRF)
  - Project Number 12502123, Exercise Year 2023/2024. Bayesian estimation of liquidity-augmented model with endogenous business formation: application to inflation. Project Fund: $454,136 (HKD). Approved project duration: 24 months.
- 2. National Natural Science Foundation of China
  - Research Fund for International Young Scientists (awarded November 2018

Conference and workshop presentations

2024 Seminar at the University of Macao (September); Society for Economic Measurement Conference, Atlanta (August); Hong Kong Junior Macroeconomics Workshop (May); Money and Macroeconomics Workshop, Melbourne (March)|2023 Western Economics Association Economics International, Melbourne (April) |2022 HKBU Junior Macro Group (August); National Taiwan University (April)| 2021 Universita di Roma Tor Vergata; Federal Deposit Insurance, Corporation| 2019 Peking University HSBC, Shenzen (Oct); Western Economics Association International, San Francisco (July); Seminar at Shanghai University of Finance and Economics (May)|2018 Society of Economic Measurement Conference, Xiamen University (May); Seminar at Ashoka University (April)|2017 Society for Computational Economics Conference, New York (June); Midwest Macroeconomics, Baton Rouge (May)|2016 Western Economics Association International, Portland (June); West Coast Search and Matching Workshop, San Francisco Federal Reserve (May); Midwest Macroeconomics Conference, Purdue University (May)|2015 Midwest Macroeconomics Workshop, St. Louis (May)

Professional associations

- **American Economics Association; Econometric Society; Western Economics Association International**
- **Hong Kong Junior Macro Group**

Refereeing

- Economic Inquiry
- Macroeconomic Dynamics

VI. Honors, Awards, and Prizes

- Graduate Dean's Dissertation Fellowship (awarded for Fall 2017)
- Economics Merit Fellowship (2012-2017)
- Summer Research Fellowship (2014, 2015, 2016)
- Pass with Distinction on Macroeconomics Qualifying Exam (June 2013)

VII. Service

July 2023 - 2024

Task Force on Equality, Diversity, and Inclusion (EDI)

Following the award of the 5-year EQUIS Accreditation in April 2022, the main goal is to establish a policy for equality, diversity, and inclusion (EDI), to be included in the School's strategic plan. We are also working on measurable outcomes (KPI's). Action and progress will be included in the EQUIS mid-term progress report.

VIII. Computer Skills

- Languages & Software: Julia, Python, R, Mathematica, Markdown, Matlab, Dynare, LaTeX, STATA, SAS, Excel, Inkscape, GitHub, TikZ
- Quantitative: Global solution methods, Bayesian estimation, panel data methods, structural vector autoregressions, GLM, GMM
- Programming: functional, object-oriented, parallel processing, multiple dispatch

IX. Languages

Spanish (fluent), Italian (conversational)