Research on Innovation, Online Firms, and Technology

I am a PhD student in the Stanford Department of Economics. My broad research interests are in **firm dynamics, innovation, entrepreneurship, and human capital development.** I am currently working on a set of joint projects with Stripe.com and Amazon Web Services (AWS) concerning the rise of internet start-ups, forecasting, cloud computing, and the effects of borrowing constraints. I am also working on related projects on technical change and innovation, with a particular focus on the impact of Covid-19 on work-from-home technologies development. I would be excited to attend the NBER Digitization Tutorial, an exciting opportunity to have contact with more work on the research frontier of this field, as well as an outlet to meet, discuss, and develop research with other likely minded PhD students and researchers.

My Stanford PhD fields are: **Labor Economics, Public Economics (completed), Industrial Organization and Corporate Finance (in progress)**. I am currently mainly advised by Nick Bloom. I have also done two years of past graduate work at the University of Oxford where I was on the MPhil pathway to the DPhil, and completed all courses required for the PhD. At Oxford, my graduate fields were: **Labour Economics, Public Economics, and Applied Econometrics**.

I now describe three current projects I am currently working on.[1]

1) In "Rationalizing Entrepreneurs' Forecasts" we analyze, benchmark, and run RCTs on a panel of 7,463 U.S. entrepreneurs making incentivized sales forecasts. We assess accuracy using a novel administrative dataset obtained in collaboration with a leading US fintech e-commerce firm. At baseline, only 13% of entrepreneurs can forecast their firm's sales in the next 3 months within 10% of the realized value, with 7.3% of the MSE attributable to bias and the remaining attributable to noise. We then try to improve entrepreneurs forecasts, and find that increased reward payments significantly reduce bias but have no effect on noise. A historical sales data intervention has no effect on bias but significantly reduces noise. Since bias is only a minor part of forecasting errors, reward payments have small effects on MSE, while the historical data intervention reduces it by 12.4%. A training intervention has negligible effects on bias, noise, and ultimately MSE.

2) In "Directed Technological Change: The Case of Work from Home Patents during Covid-19 and Beyond" we examine the text content of U.S. patent applications, identifying those that advance technologies in support of video conferencing, telecommuting, remote interactivity, and working from home (collectively, WFH). We find that the share of new patent applications that advance WFH technologies steadily increases after the onset of COVID-19. The share of WFH applications is up around 50% in the first year after January 2020 compared to the last pre-pandemic year, 75% in the second year, and more than double in the last 3 months of 2022. The absolute number of WFH applications similarly reached multiple new time highs greatly surpassing any pre-pandemic peaks. This evidence suggests that (re-)directed technical change in reaction to COVID-19.

3) In "The Effects of Business Loans and Technology Support on the Growth of U.S. Online Start-ups" we will focus on the relationship between borrowing constraints, access and information about cutting-edge technology on the performance of U.S. online businesses. With the help of two large U.S. technology companies we randomize access to loans and free cloud computing credits (as well as information about the potential use of technology) to US online start-ups, to see if they will have a causal impact on firm development. We will check the performance of these companies on a wide variety of metrics (sales, growth, input choices, etc.), heterogeneity in the treatment effects, as well as possible channels through which the effect may take place using both administrative data provided by our partners and data collected independently by the researchers (webscraping, surveying, etc.).

[1]More information, including working paper versions, and extended abstracts can be found on attached CV and including personal website. Full contact list is given in my CV. Email: mihaic@stanford.edu

MIHAI A. CODREANU

Links: | | | | |

You can also find me on my new personal website, where I regularly update my work: **mihaicodreanu.net**

EDUCATION

Ph.D. in Economics, Stanford University
Expected Completion: June 2027.

M.Phil. in Economics, Nuffield College, University of Oxford, 2019-21 (Distinction)
B.A. in Economics, University of Manchester, 2016-19 (First Class Honours, rank: 1st/3,904)

FIELDS OF INTEREST

Stanford Ph.D. fields (completed & expected): **Labor, Public, IO, Corporate Finance**
Research interests: **Firm dynamics, Innovation, Entrepreneurship, Human capital development**

RESEARCH

- **Working Papers**:

"Rationalizing Entrepreneurs' Forecasts" (with N. Bloom and R. Fletcher).

Presented[‡]: NBER SI Entrepreneurship, EEA-ESEM, Columbia/Wharton MAD Conference.
Useful links: latest Working Paper version, latest slide deck, summarizing thread.

"Directed Technical Change: Work from Home Patents During Covid-19 and Beyond" (with N. Bloom, S. Davis and Y. Zhestkova).

Useful links: latest Working Paper version.

- **Work in Progress**:

"The Effects of Business Loans and Technology Support on the Growth of U.S. Online Start-ups" (lead-author, with N. Bloom, D. Muhaj, and D. Yuan).

"From Schoolmates to Business Partners: The Labor Market Effects of Going to a More Selective School Revisited" (with E. Krkoska).

"The Human Capital, Labor, and Fiscal Impacts of Introducing Work-Search Requirements for Single Parents" (with T. Waters). IFS Working Paper (forthcoming), feeding into IFS-Deaton Review of Inequality.

POLICY-ORIENTED WORK

- **Academic Briefing Notes**:

"What can previous recessions tell us about the Covid-19 downturn?" (with B. Bell, S. Machin), LSE CEP Covid Briefing Note 7, August 2020. Selected media: The Independent, The Guardian, LSE Blog.

"The changing generosity of the UK state pension system to the self-employed" (with R. Crawford, J. Cribb, C. Emmerson), IFS Report R182, October 2020. Selected media: The Times (paywall), IFS Presentation.

WORK EXPERIENCE

Amazon Web Services
Research Collaborator *2022 - Present*

Stripe.com
Graduate Researcher (external Stanford contractor) *2021 - Present*

[‡]All presentations were given by me, unless otherwise indicated.

UK Institute for Fiscal Studies (IFS)
Research Scholar *2021 - Present*
External Collaborator (Income, Work and Welfare sector) *2020-21*
Summer Research Student (Income, Work and Welfare sector) *Summer 2019*
Summer Research Student (Public Finance sector) *Summer 2018*

The CORE Project
External Advisor *2022 - 2023*

London School of Economics (LSE)
Center for Economic Performance Collaborator *2021 - 2022*
Occasional RA (Steve Machin, Brian Bell) *2020-21*
Research Intern (CEP Labour Markets) *Summer 2020*

University of Oxford
Research Assistant (Hamish Low, Abi Adams-Prassl) *2019-20*
Nuffield College Fundraising Student Team *2019*

University of Manchester
Undergraduate Peer TA (ECON20110 Econometrics) *2018-19*
Various part-time jobs (IT Services, private tutor, etc.) *2016-19*

Romanian Government, Ministry of Public Finance
Research Intern (Macroeconomic Research and Analysis Unit) *Summer 2017*

EXTERNAL CONFERENCES & PRESENTATIONS

2023: American Economic Association ASSA, Poster Session (New Orleans, LA)

2022: Columbia Business School, Wharton/Columbia MAD Conference (New York City, NY), Stripe Data Science Seminar Series (New York City, NY), NBER Summer Institute, Entrepreneurship (Boston, MA), ERMAS Annual Congress (Cluj-Napoca, Romania), EEA-ESEM Annual Congress, Contributed Sessions (Milano, Italy)

SCHOLARSHIPS & AWARDS

ERMAS Prize for Best Paper by a Young Romanian Economist *2022*
Stanford Graduate Student Funding *2021*
Ratiu Foundation Research Grant *2020*
Oxford University Clarendon Scholarship *2019*
Inaugural Nuffield College Max Corden Scholarship *2019*
Manchester Graduation OAAA (top student in Faculty of Humanities) *2019*
Top student, University of Manchester Economics Examinations *2017, '18, '19*
Honorific UN-Romania Ambassador of Equality of Opportunity *2017*

OTHER INFORMATION, SKILLS & QUALIFICATIONS

Technical	Stata, MATLAB, Python, R, C/C++, SQL
Languages	Romanian (native), English (bilingual), French (advanced)
Qualifications	UK ONS Secure Environment Accredited Researcher (2021-26)
Professional	Member of the European Economic Association (EEA)
Citizenship	Romania (European Union)
Residency	UK (indefinite leave to remain, settled status), US (F-1 visa)