

Macro Questions, Micro Data

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May 9, 2023

Introduction

- Three revolutions in empirical economics over past 20 years:
 - ▶ [25 years ago] “Credibility revolution” in empirical work: new research designs to credibly estimate causal effects (e.g., using randomized experiments)
 - ▶ [15 years ago] Administrative data for more powerful research designs (e.g., using tax data)
 - ▶ [5 years ago] Machine learning techniques: powerful tools to solve prediction problems and to build new datasets
- Macroeconomics has adopted these techniques relatively slowly

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Introduction

- My work sheds new light on traditional questions from “macro” (e.g. inflation, growth, economic stimulus) using data and methods from “micro”
- Illustrate with three examples today:
 - Inflation and inequality
 - Access to innovation careers and growth policies
 - Stimulus payments and consumer spending

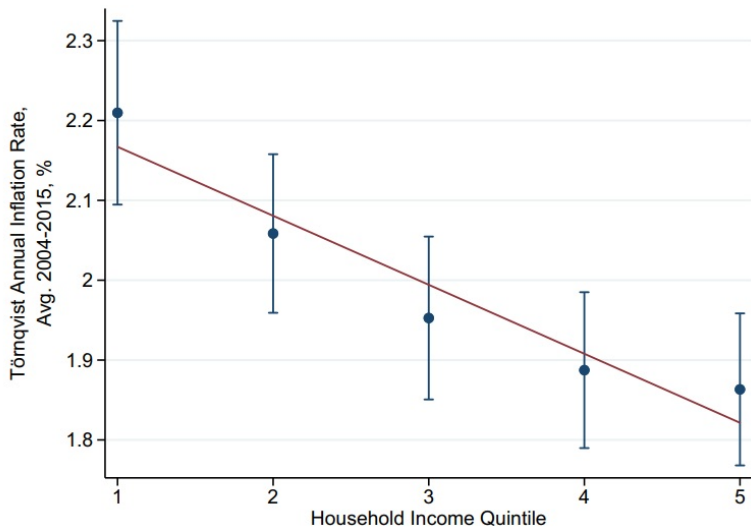
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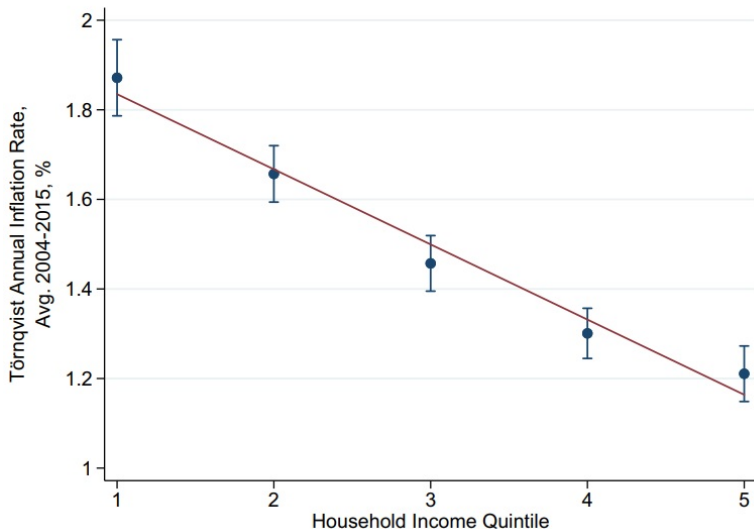
Inflation and Inequality

Jaravel, Xavier. "The unequal gains from product innovations: Evidence from the US retail sector." *The Quarterly Journal of Economics* 134, no. 2 (2019): 715-783.

Inflation Inequality in the United States



Inflation Inequality in the United States, Scanner Data



Explanation: Innovations and Financial Incentives...

- Shifts in income distribution ⇒ Increased demand for premium products
- ⇒ Shift in direction of product innovations
- ⇒ Increase in purchasing-power inequality

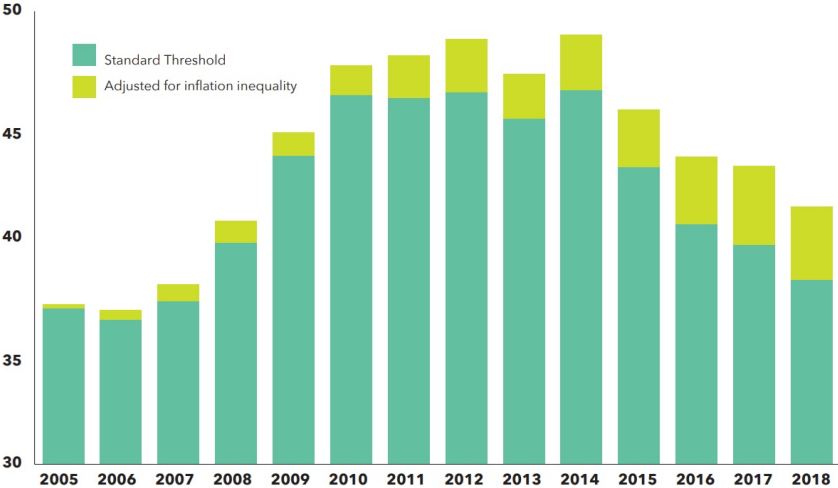
Implications

Percent change in real household income growth from 2004 to 2018, by quintile, under official metrics and after adjusting for inflation inequality



Implications

INDIVIDUALS IN POVERTY UNDER THE OFFICIAL THRESHOLD AND INEQUALITY INFLATION ADJUSTED THRESHOLD, IN MILLIONS, 2005-2018



Innovation Careers and Growth Policies

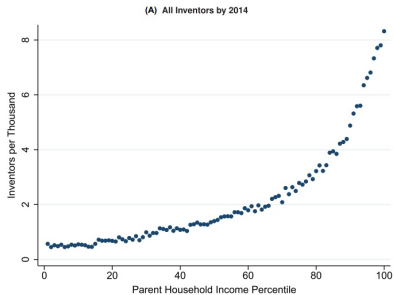
Bell, Alex, Raj Chetty, Xavier Jaravel, Neviana Petkova, and John Van Reenen. "Who becomes an inventor in America? The importance of exposure to innovation." *The Quarterly Journal of Economics* 134, no. 2 (2019): 647-713.

Einiö, Elias, Josh Feng, and Xavier Jaravel. "Social push and the direction of innovation." Working Paper (2023).

The “Lost Einsteins” Agenda

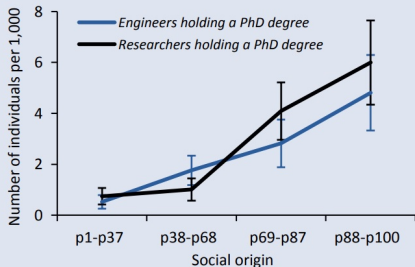
- Recent works makes three points:
 - ① Large pool of untapped talent
 - ② Large effects on the macroeconomy and inequality
 - ③ Program evaluations to find powerful policy levers (e.g., role models)
- Large potential to increase growth rates and reduce inequality (of opportunities and outcomes)
 - ▶ There are many policies already deployed in the spirit, but in a piecemeal fashion, without the right level of ambition

Large Pool of Untapped Talent - by Parent Income



United States
Bell et al. (2019)

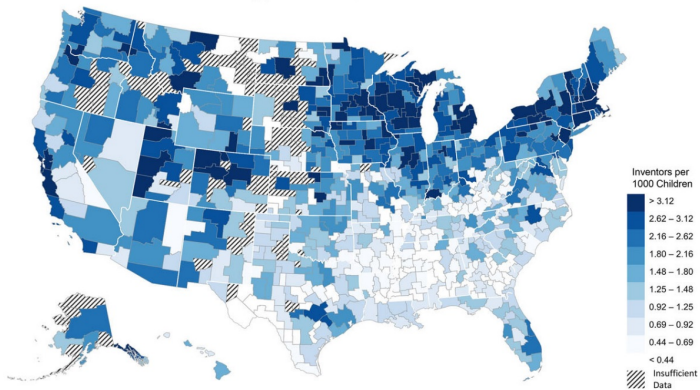
Share of individuals who become researchers or engineers holding a PhD degree by social origin



France
Feng-Jaravel-Richard (2022)

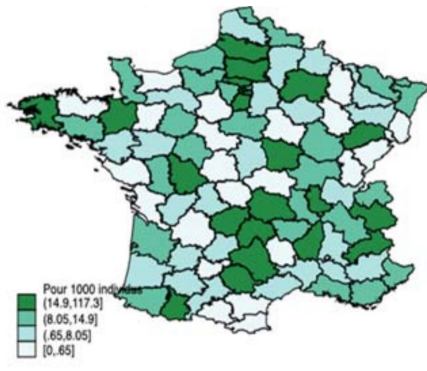
Large Pool of Untapped Talent - Geographically

(A) Patent Rates by Childhood CZ



United States – inventor rates by childhood CZ
Bell et al. (2019)

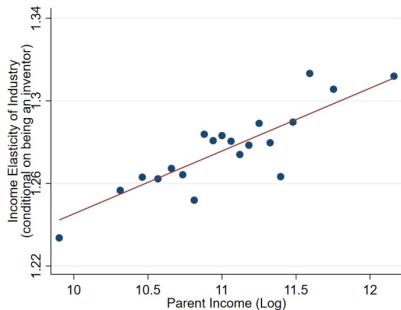
Large Pool of Untapped Talent - Geographically



France – PhD engineers by childhood CZ
Feng-Jaravel-Richard (2022)

The Sociological Drivers of Innovation

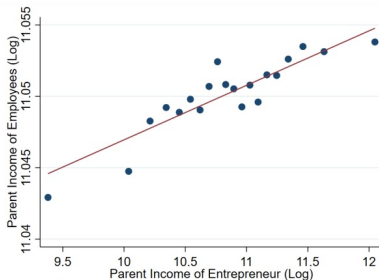
Income Elasticities and Parent Income



Coeff. = .0304** (s.e. 0.0125). The sample includes inventors (N=7962).
Parent income is measured as the sum of father's income and mother's income.
Data sources: Finnish FLEED and FOLK datasets and patent applications. Inventors in 2007-2015.
The scatter plot uses sample averages by 5-percentile bins.
The smallest bin includes 398 observations.

Entrepreneur parent income
vs. customer income

Parent income of employees and own parent income

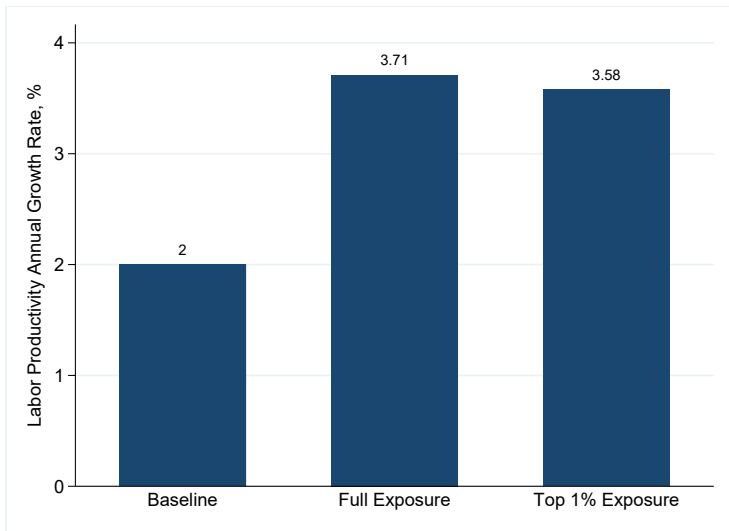


Coeff. = .004*** (s.e. 00).
The sample includes entrepreneurs who have at least one employee (N=167573).
The regression is weighted by the number of employees.
Parent income is measured as the sum of father's income and mother's income.
Data sources: Finnish FLEED and FOLK datasets. Entrepreneurs in 2007-2015.
The scatter plot uses sample averages by 5-percentile bins
The smallest bin includes 6751 observations.

Entrepreneur parent income
vs. employee parent income

Einio-Feng-Jaravel 2023

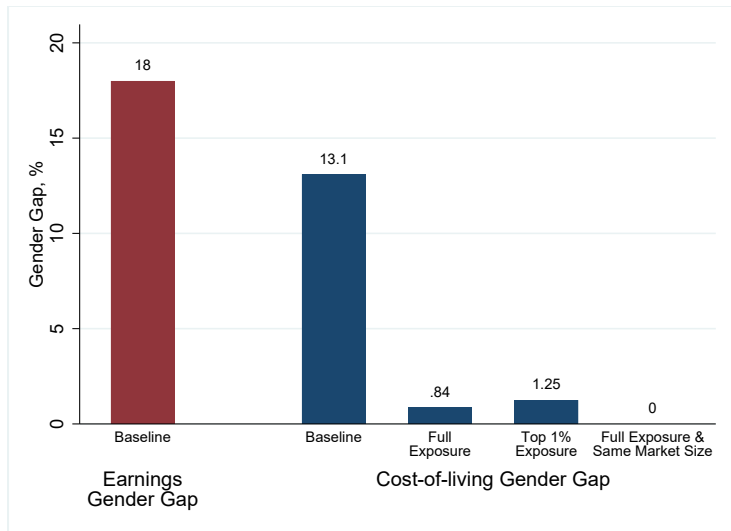
Large Macroeconomic Potential - Growth



Growth Impacts of Drawing Women into Innovation Careers

Einio-Feng-Jaravel 2022

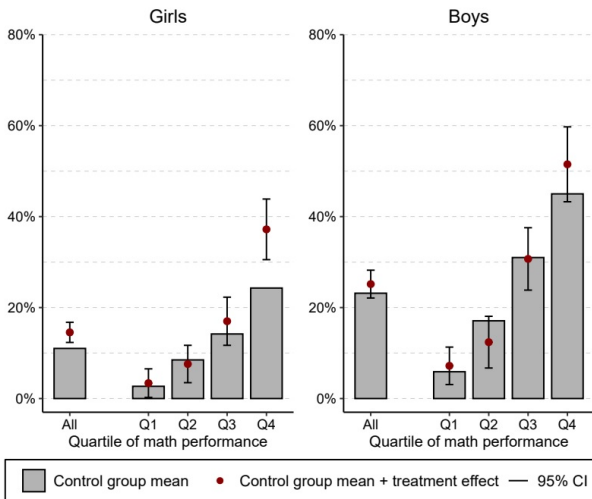
Large Macroeconomic Potential - Inequality



Gender Inequality Impacts of Drawing Women into Innovation Careers
Einio-Feng-Jaravel 2022

Program Evaluation: the Importance of Role Models

Enrollment in selective STEM



Breda-Grenet-Monnet-Van Effenterre (2021)

Stimulus and Consumer Spending

Boehm, Johannes, Etienne Fize, and Xavier Jaravel. "Five Facts about MPCs." Working Paper (2023).

Does “Helicopter Money” Work?

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Raghuram Rajan questions 'helicopter money'; says people may not spend

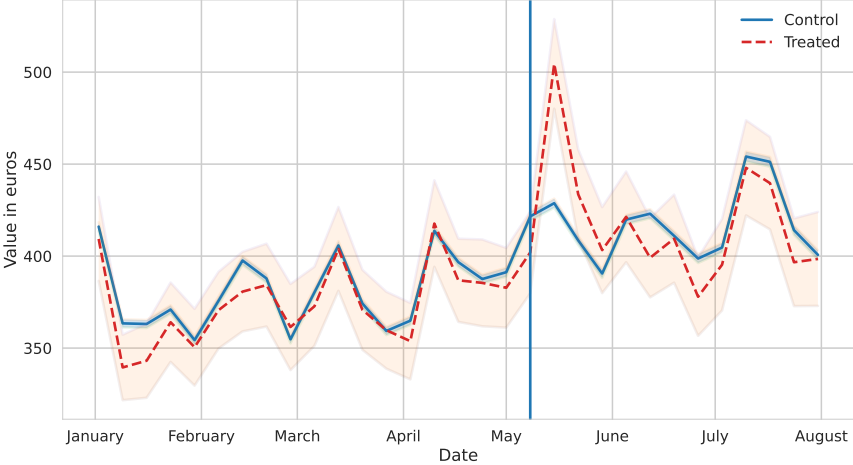


There is a probability that people may not spend and save it, thereby not contributing to growth, he said.

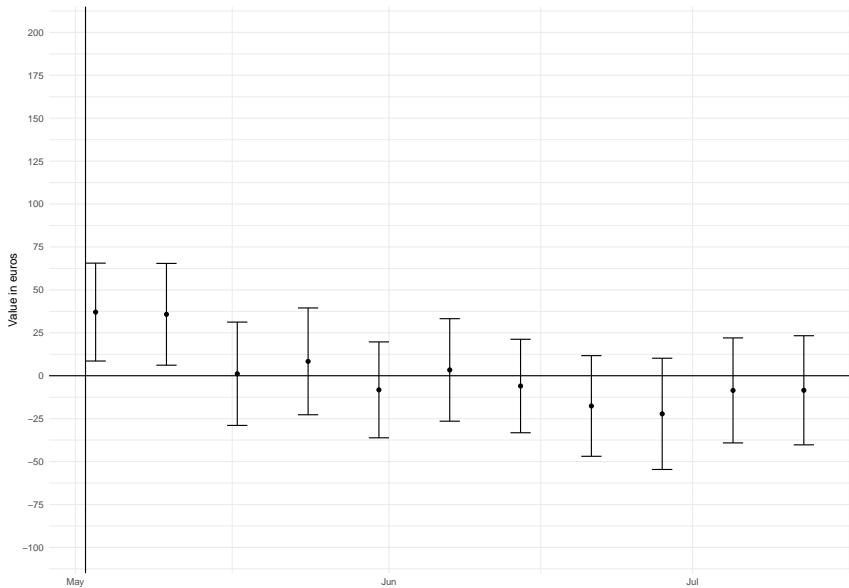
Experimental Evidence...

- Experimental estimates of MPC with policy-relevant, scalable intervention:
 - ▶ We give €300 prepaid cards at random across French households
- Several treatment arms to study the potential role of negative interest rates
 - ① No restrictions
 - ② Expiry date after three weeks
 - ③ 10% negative rate each week
- Linked to bank data
 - ▶ High-frequency expenditure data
 - ▶ Rich household covariates

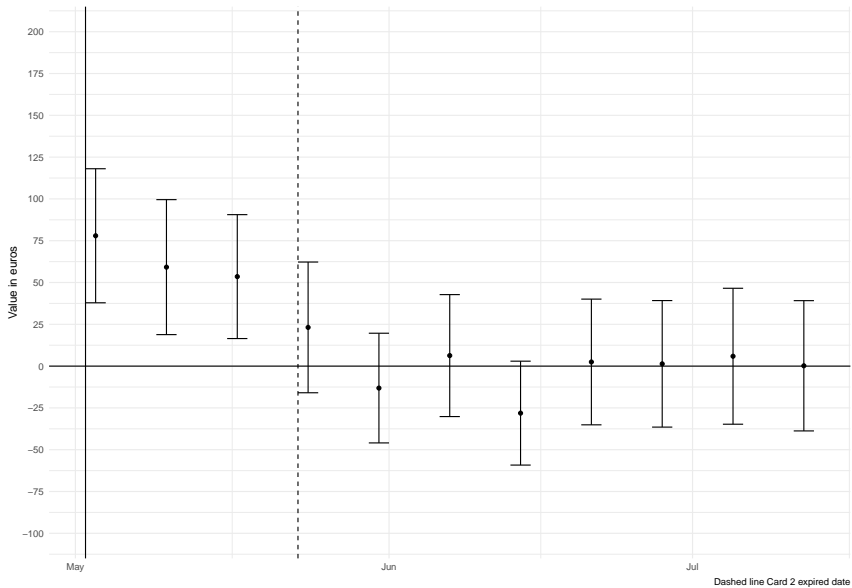
Weekly Total Spending



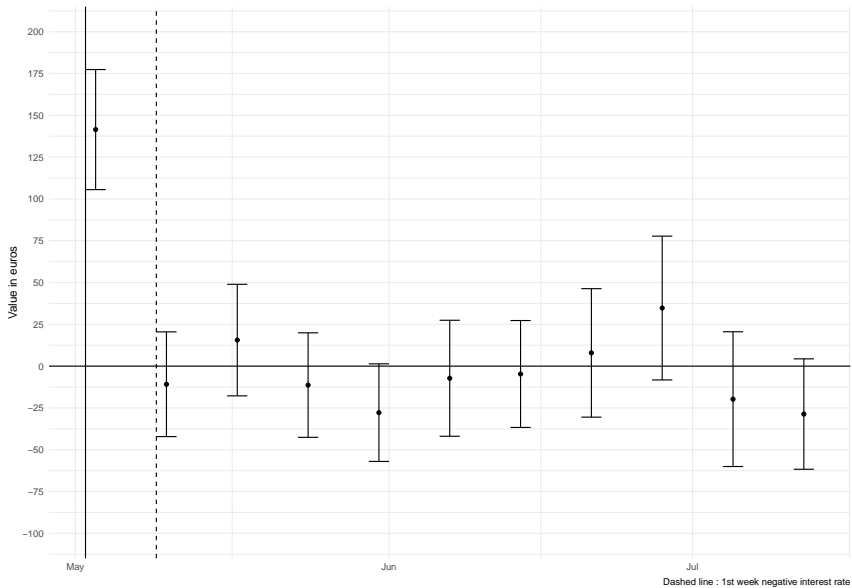
Weekly Spending Response: Card 1



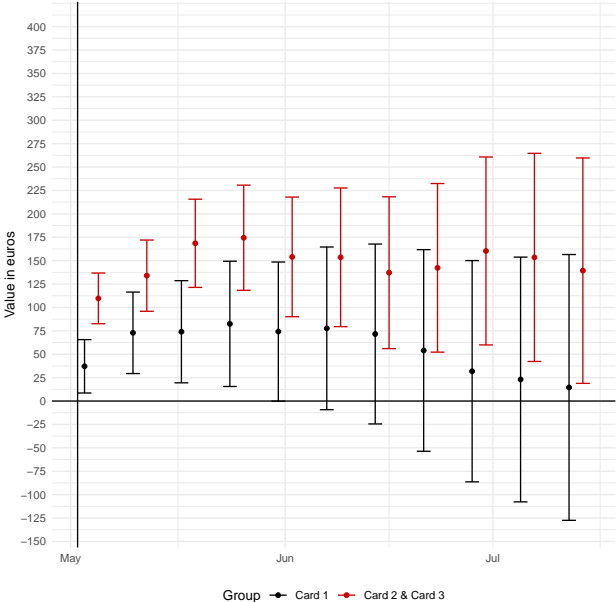
Weekly Spending Response: Card 2 (Expiry)



Weekly Spending Response: Card 3 (Negative Interest Rate)



Cumulative Spending Response by Card Type



Lessons

- Implementation design & household targeting can greatly alter the MPC and the effectiveness of short-run stimulus
 - ▶ Relevance for policy
- MPC estimates present a set of facts that models of consumption ought to match
 - ▶ Concentration of consumption response early on cannot be accounted for in standard calibrated Heterogeneous-Agents-New-Keynesian models (Kaplan-Violante 2014, Auclert-Rognlie-Straub 2018)
 - ▶ Heterogeneity by treatment group difficult to match for standard macro models without “behavioral” features
 - ★ Results point towards salience / mental accounting (rather than present-bias)

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Conclusion

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- Using micro data & methods to shed new light on macro question has great potential in many policy-relevant areas
- Encourage PhD students to take both advanced applied micro & advanced macro courses