

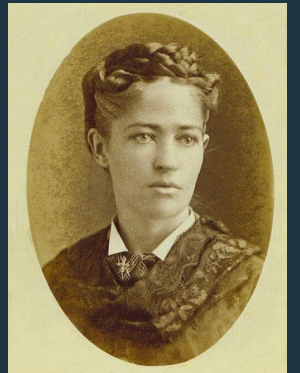


Programme on
Innovation and Diffusion

Democratising Entrepreneurship

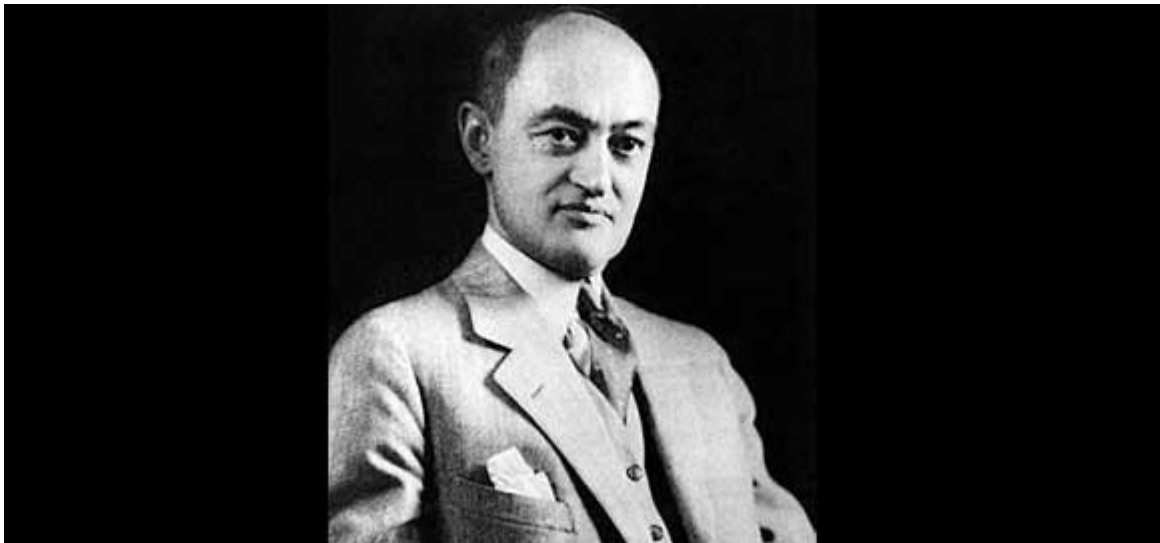
Stone Centre Workshop
December 3rd, 2022

John Van Reenen



Issues

- **Entrepreneurship** and **Innovation** key to growth
 - Generation and commercialization of new ideas
 - Externalities and non-rivalries means multiple market failures (although empirical evidence on these stronger for innovation)
 - What should be done?



What is “democratising entrepreneurship”?

1. Many barriers to firm **entry** and firm **growth**
 - How can we reduce such frictions & market failures?
 - Create more level playing field (e.g. competition policy, but wider than this)
 - Business Meritocracy: Equal opportunities for new firms/ideas

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2. (My focus) Stark **under-representation** of certain **groups** (URGs) in innovation and entrepreneurship eco-systems:
 - Women, Minorities, Working Class (e.g. people who grew up in low-income households), etc.
 - Partly due to discriminatory barriers, which are both **inequitable and inefficient**, reducing potential growth
 - e.g. Hsieh et al (2019, ECMA): 20-40% of US productivity growth 1960-2010 due to falls in discrimination => improvement in talent allocation

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 - **NB:** Important distinction between low-income firms (SMEs) vs. low-income households

OUTLINE

- 1. Three Basic Facts**

2. Who becomes an inventor

3. Who becomes an entrepreneur

4. Why should we care?

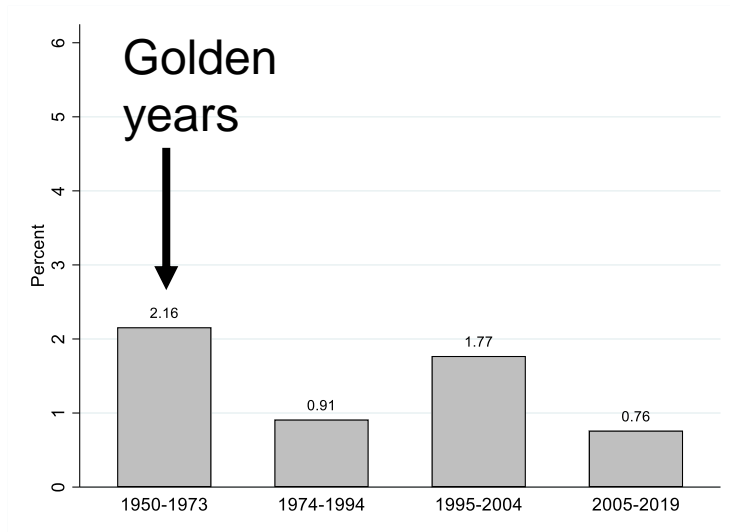
5. Policy and Discussion

I. Slowing productivity growth: Total Factor Productivity (TFP) growth since WW2, 1950-2019

A. United States

B. Euro Area

C. United Kingdom



Source: Teichgraber & Van Reenen (2022). Data publicly available at: <http://www.longtermproductivity.com/> Updated from Bergeaud, Cette, and Lecat (2016).

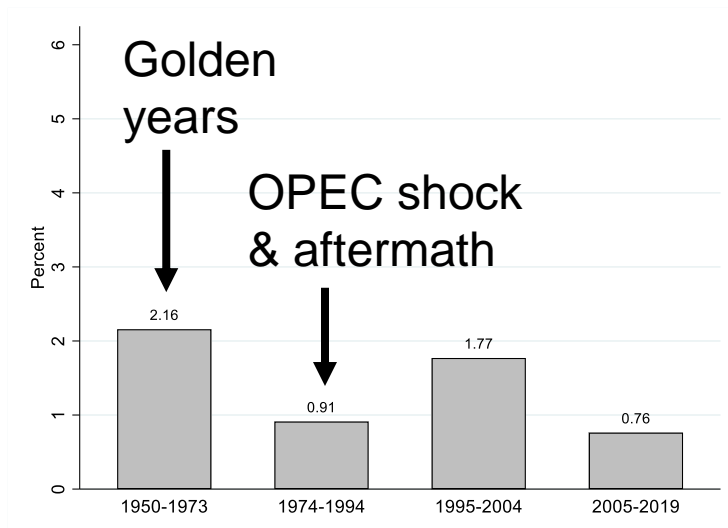
Notes: Average annual TFP growth in the US (panel A), Euro-area (panel B), and UK (panel C). Insufficient data for whole Euro-area so Germany, France, Italy, Spain, Netherlands, and Finland are used.

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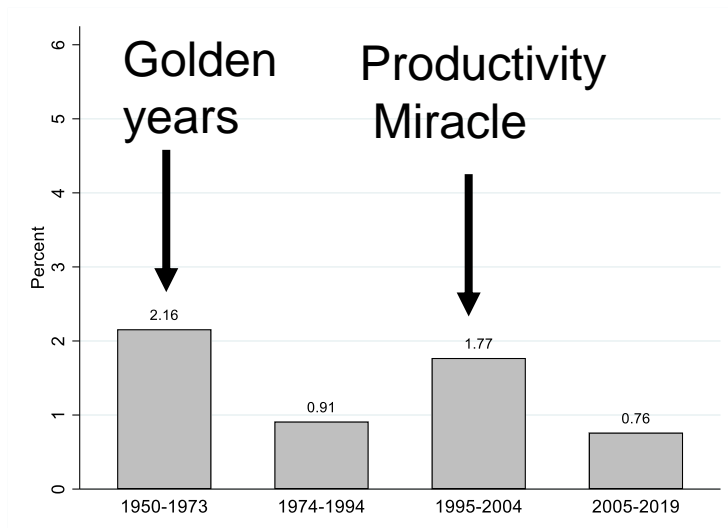
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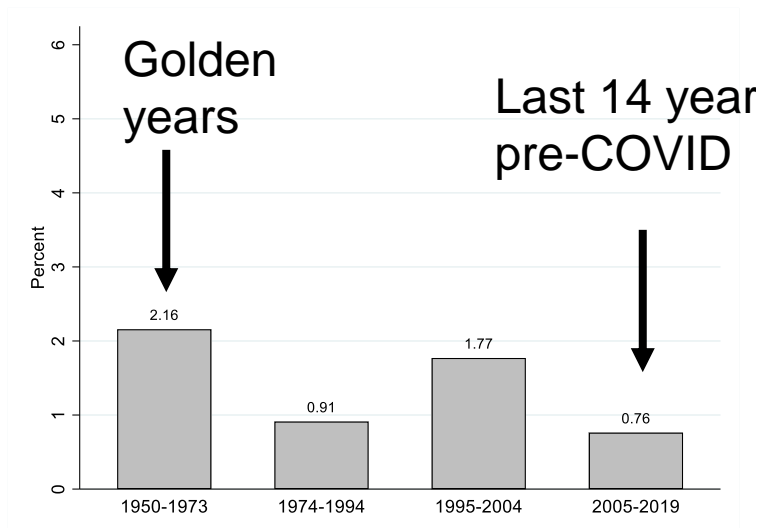
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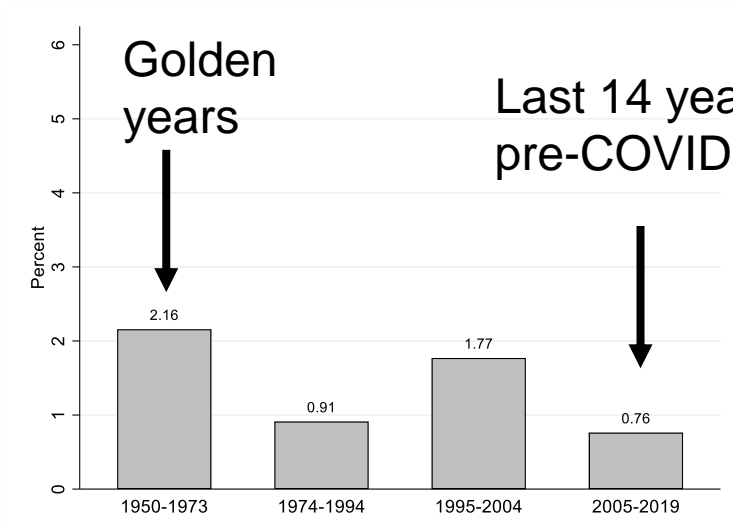


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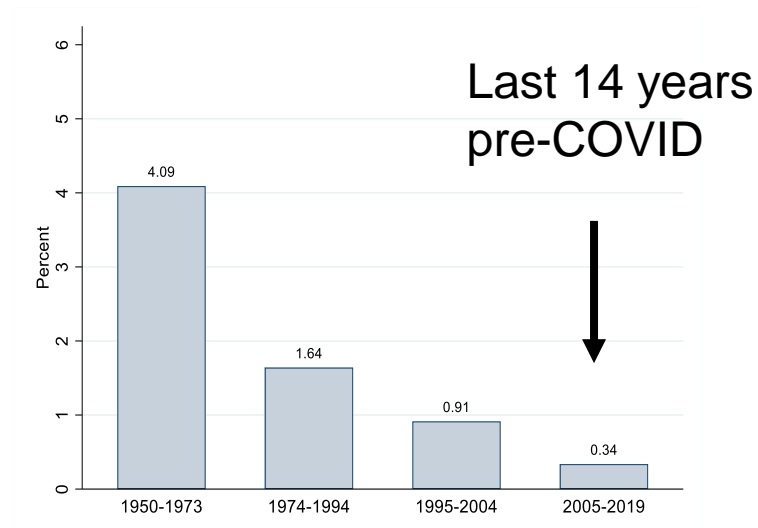
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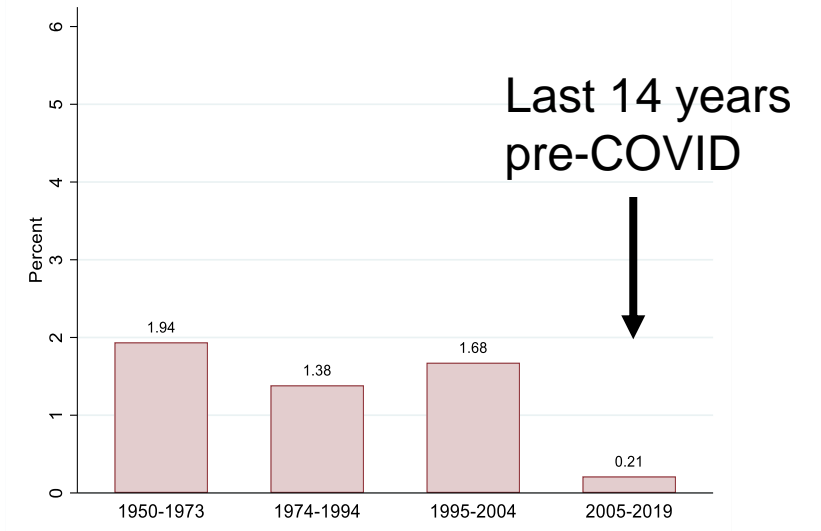
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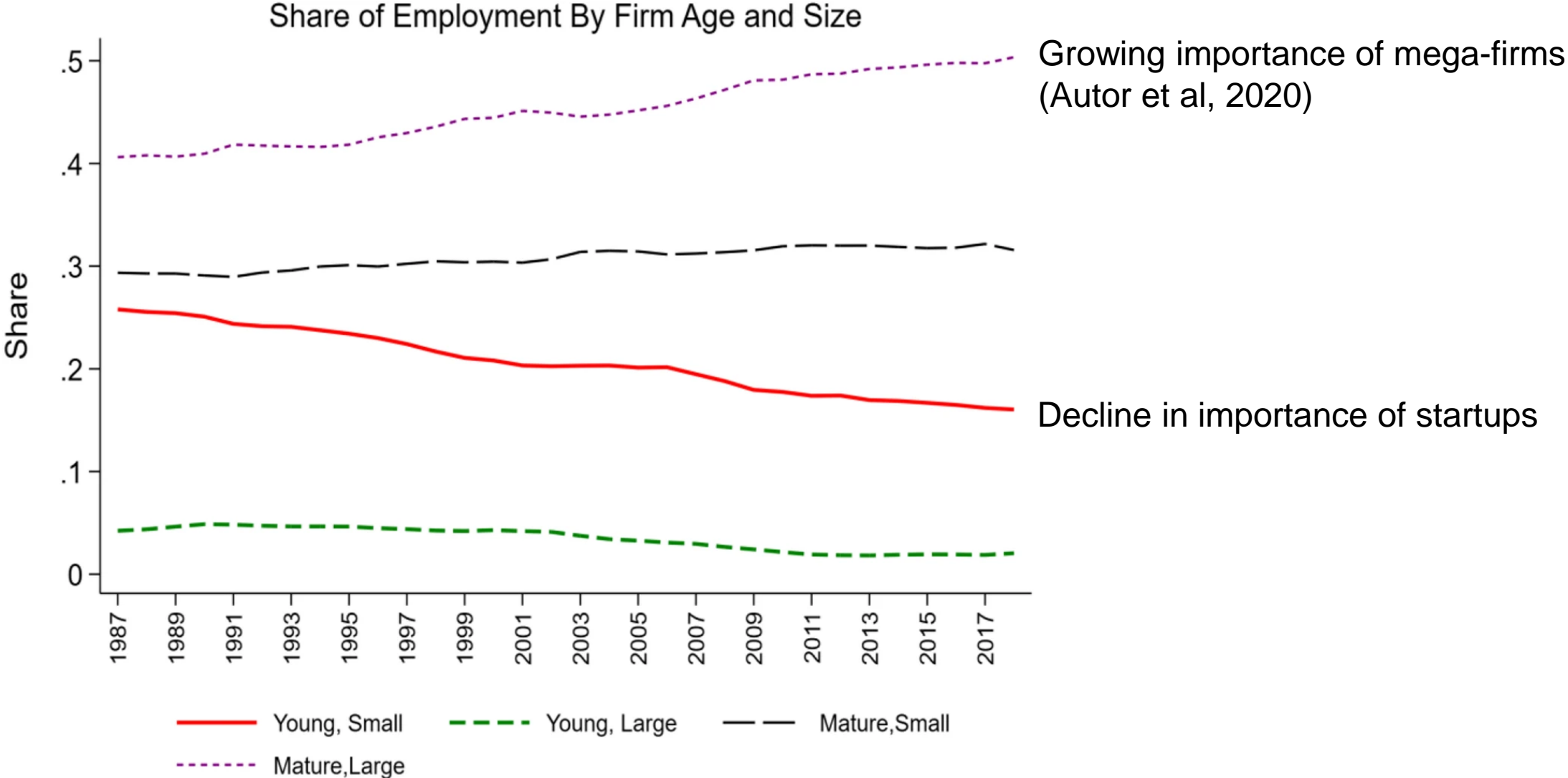
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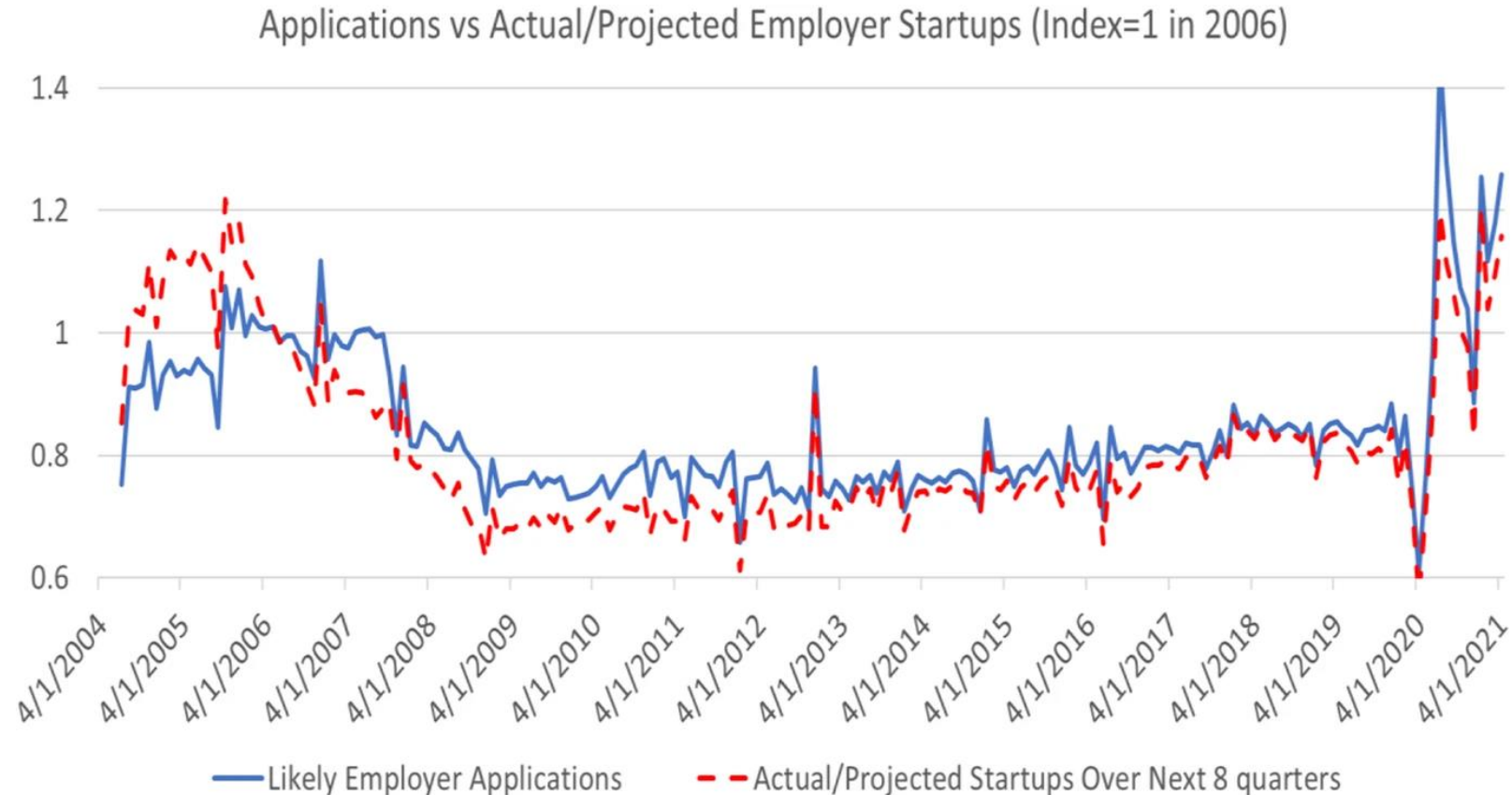
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II. Declining Business Dynamism: “Out with the New and In with the Old?”, US, 1987-2019



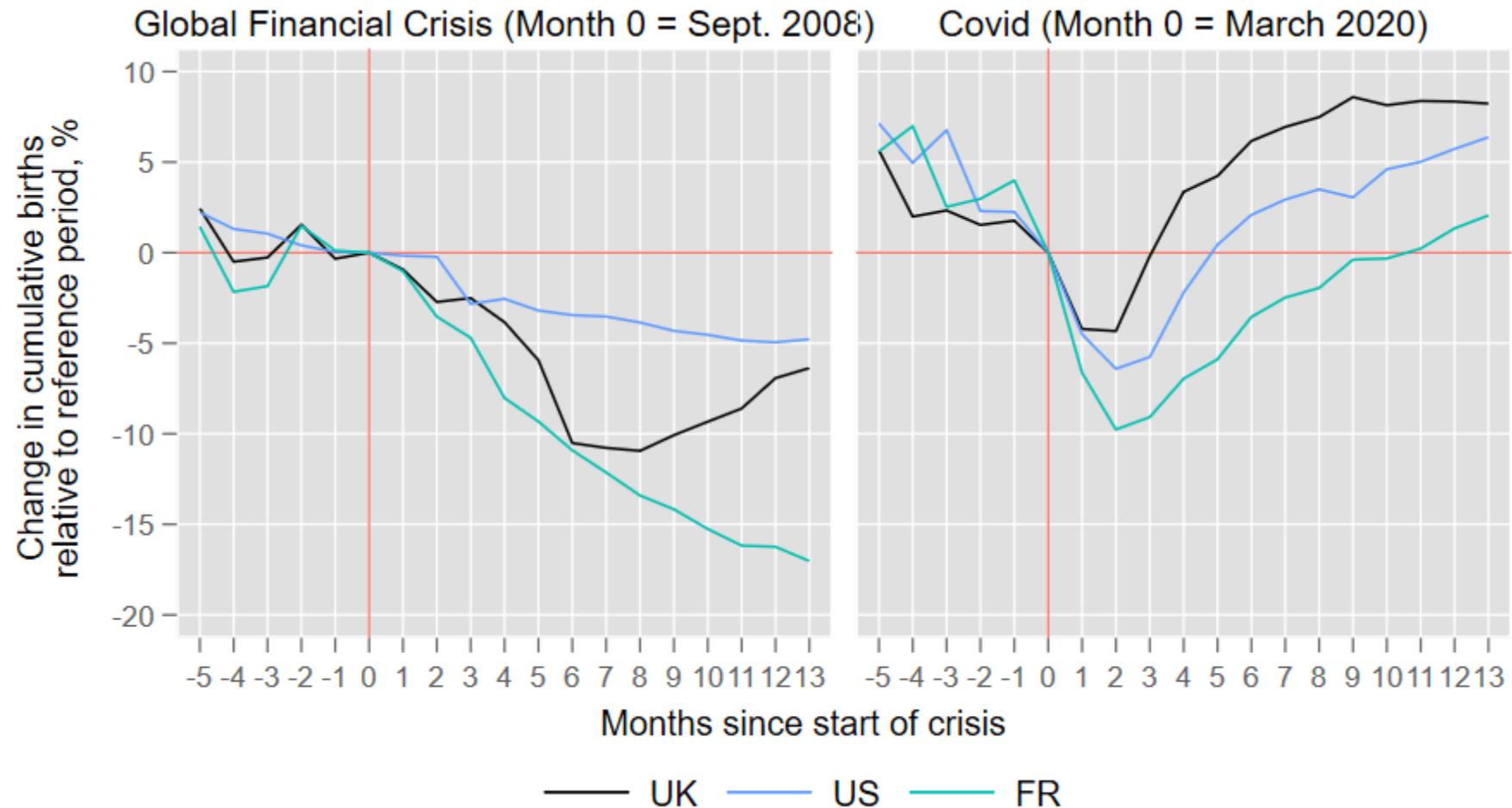
Source: Haltiwanger (2022); US BDS, “Young” are firms less than 5 years old.
<https://link.springer.com/article/10.1007/s11187-021-00542-0#Fig1>

Ray of Hope? Burst of Pandemic Entrepreneurialism



Source: Haltiwanger (2022); US BDS,
<https://link.springer.com/article/10.1007/s11187-021-00542-0#Fig1>

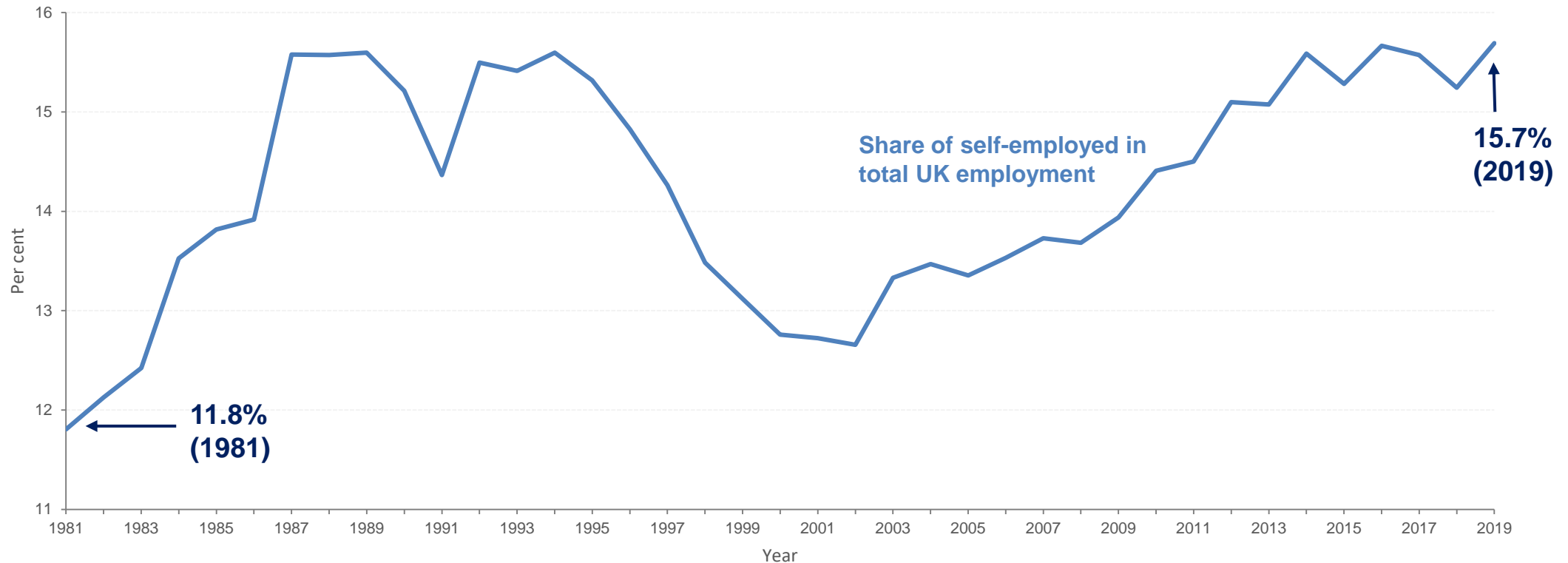
Also in other countries: Cumulative business creation relative to pre-crisis, Global Financial Crisis (GFC) vs Pandemic for the UK, US and France



Source: Bahaj, Piton and Savagar (2022)

<https://bankunderground.co.uk/2022/06/22/booming-entrepreneurship-during-the-covid-19-pandemic/>

III. Most self-employed (SE) are not classical “entrepreneurs”. Example of UK where share of SE of jobs has increased a lot especially since 2001



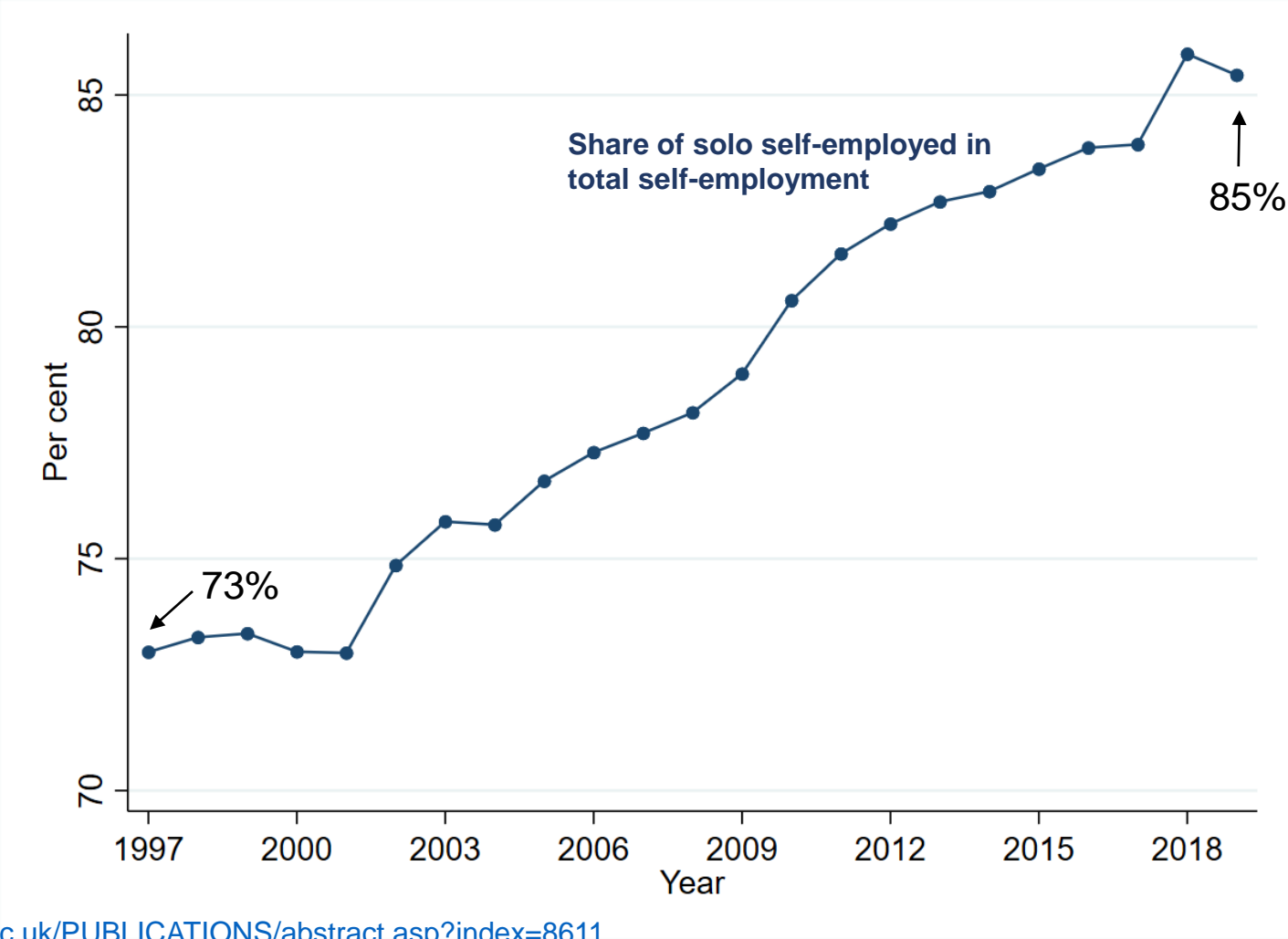
Source: ONS/LFS; <https://poid.lse.ac.uk/PUBLICATIONS/abstract.asp?index=8611>

Notes: Share of self-employed in total UK employment.

Mostly, this is Solo Self-Employed – those SE who don't employ any workers, 1997-2019, UK

Self-employed (SE) composed of:

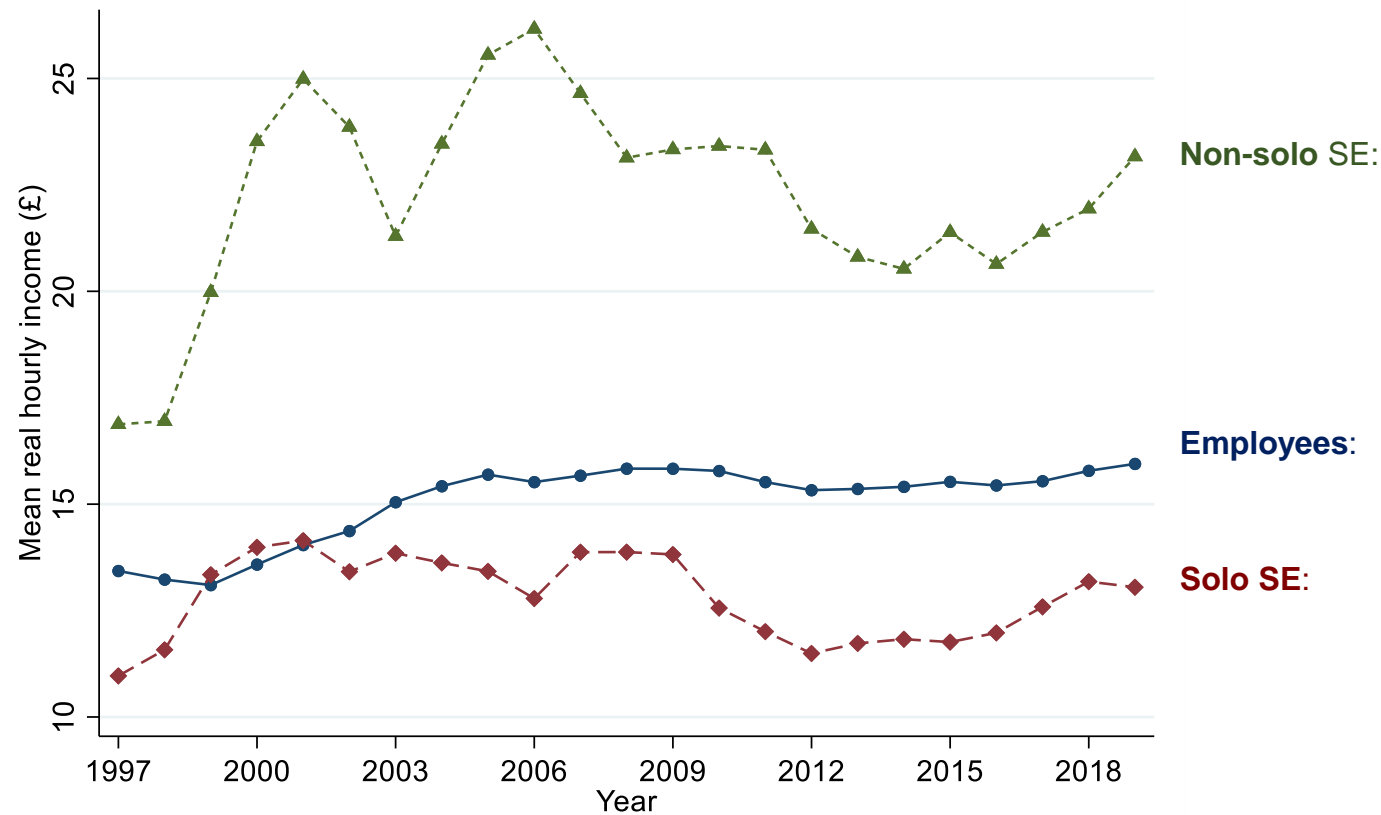
- Non-solo Self-employed
- **Solo self-employed** (do not employ other workers)



Source: Labour Force Survey (LFS), <https://poid.lse.ac.uk/PUBLICATIONS/abstract.asp?index=8611>

Notes: Share of solo self-employed in total self-employment.

Average hourly income of Solo Self Employed is lower and has grown more slowly than non-Solo Self Employed, UK



Source: Family Resources Survey (FRS), <https://poid.lse.ac.uk/PUBLICATIONS/abstract.asp?index=8611>

Notes: Average weekly hours refer to all hours worked per week excl. unpaid overtime. Hourly income is calculated as total weekly income divided by weekly hours worked. Data are shown as three-year moving averages.

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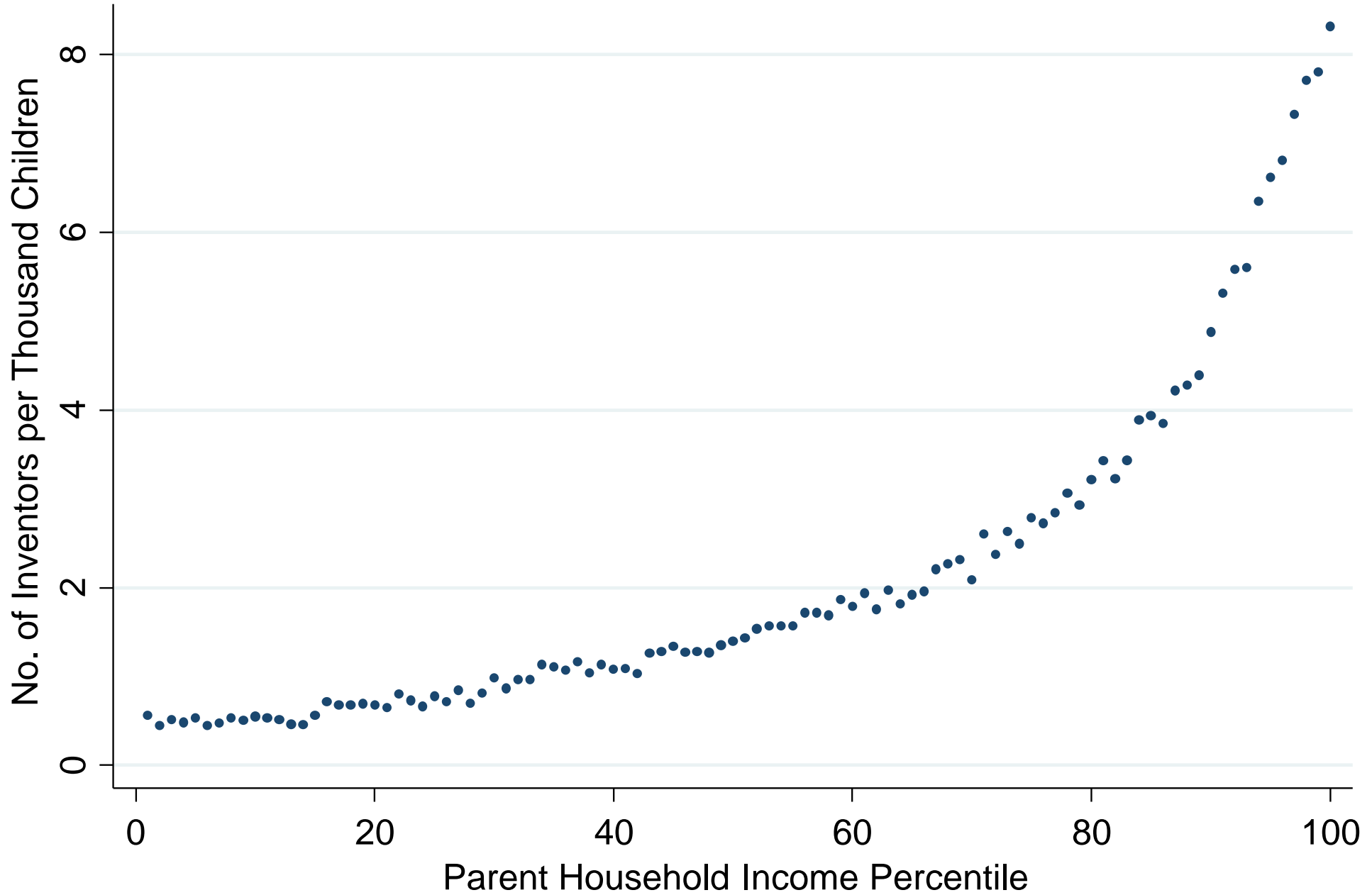
5. Policy and Discussion

Who becomes an inventor?

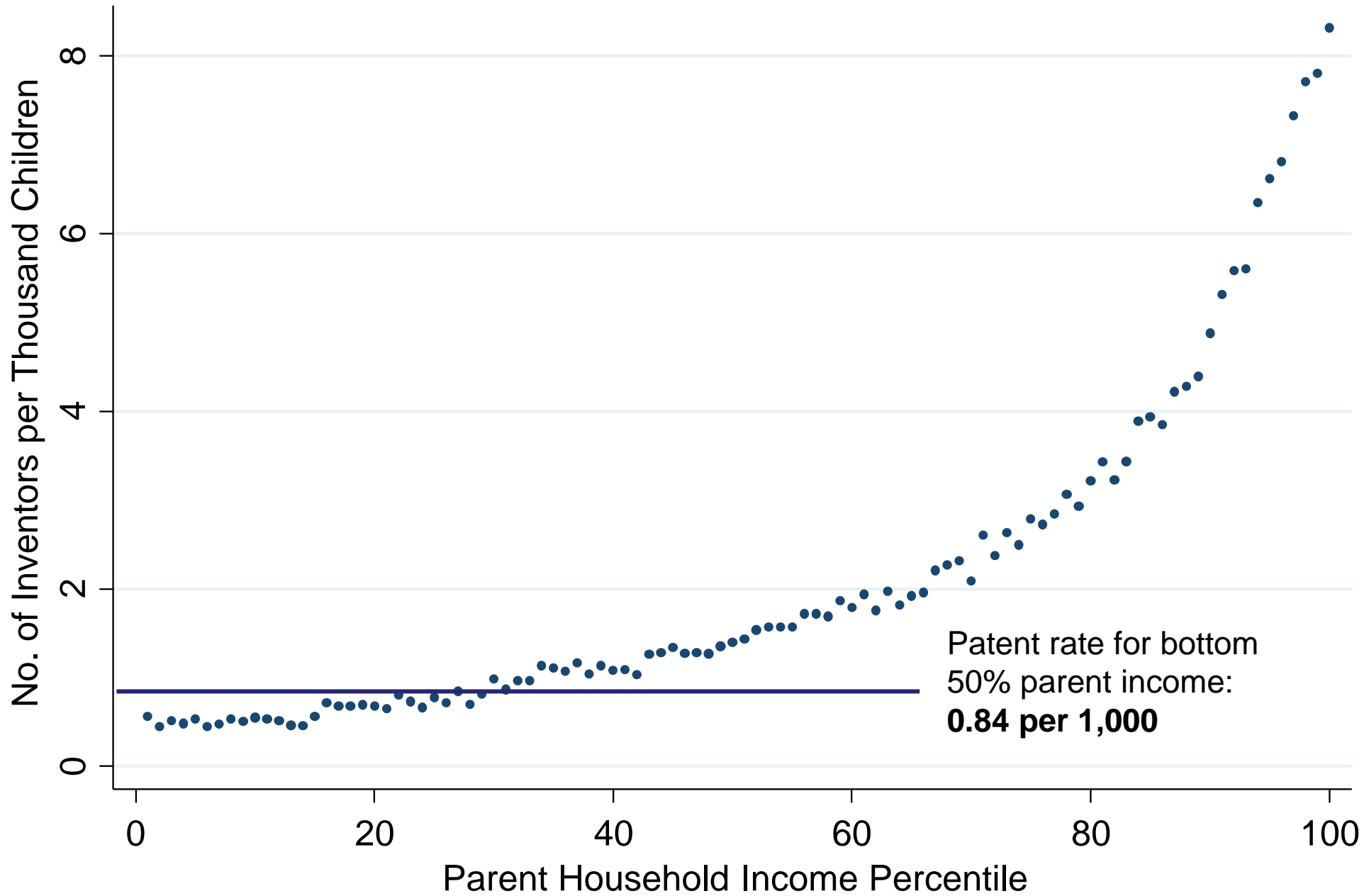
- Inventors are drawn from a relatively narrow slice of the population: born into wealthier families, white and male. Examples:
- **US:** Bell, Chetty, Jaravel, Petkova & Van Reenen (2019a): Match IRS with all patents since 1996: 1.2 million inventors (>2 billion obs)
- **Finland:** Aghion, Akcigit, Hyytinen & Toivanen (2018)



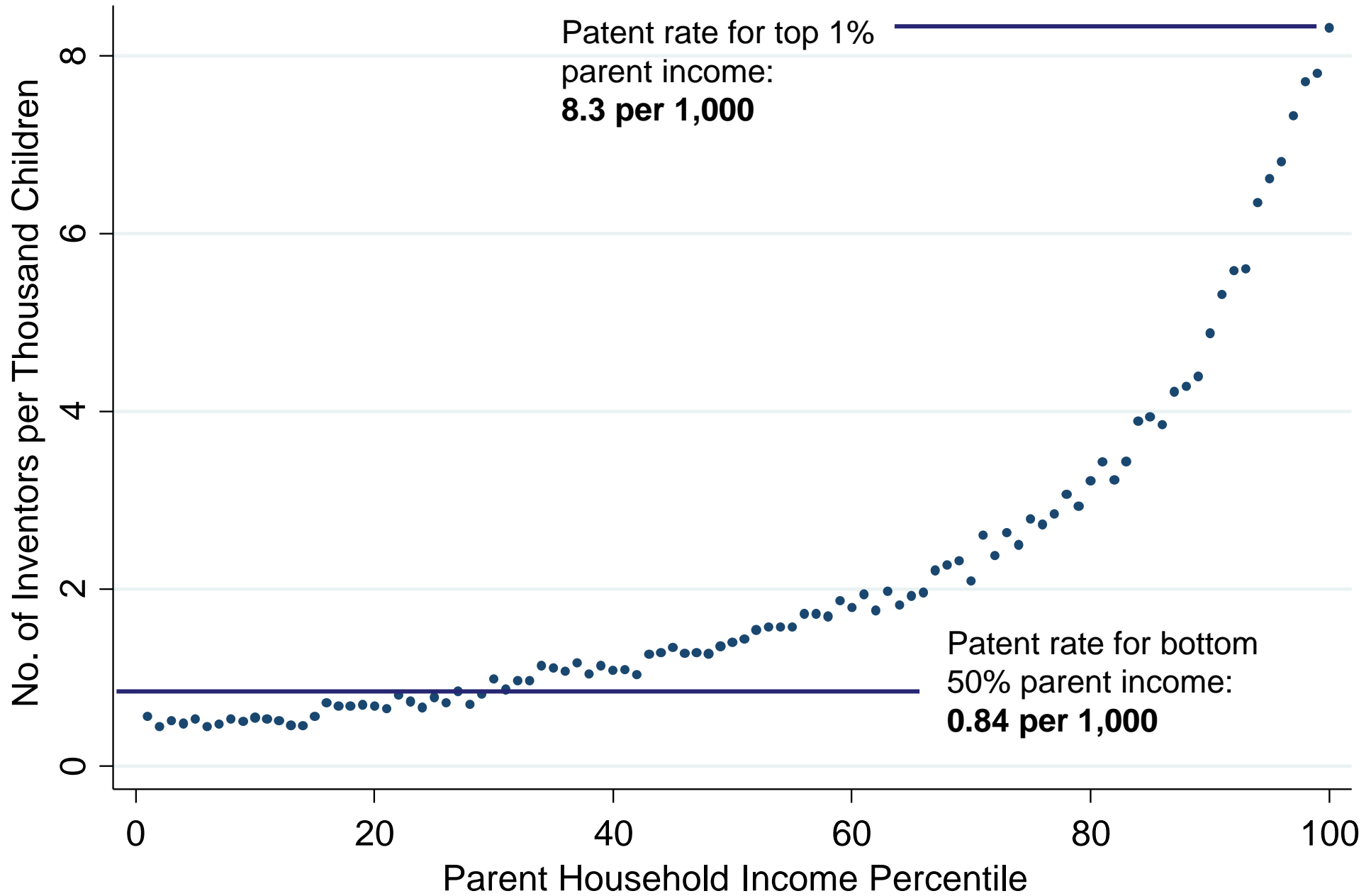
Patent Rates vs. Parent Income Percentile



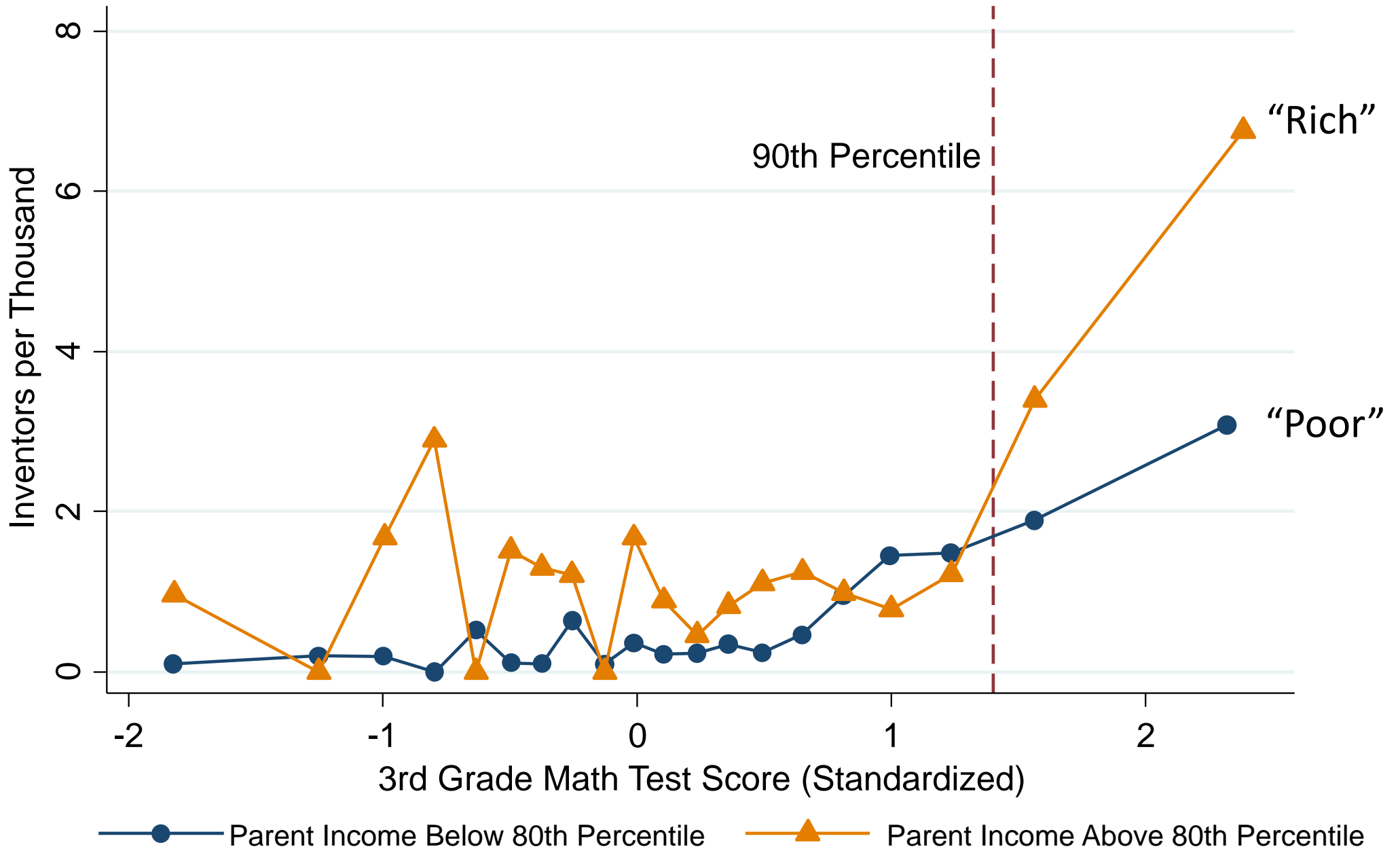
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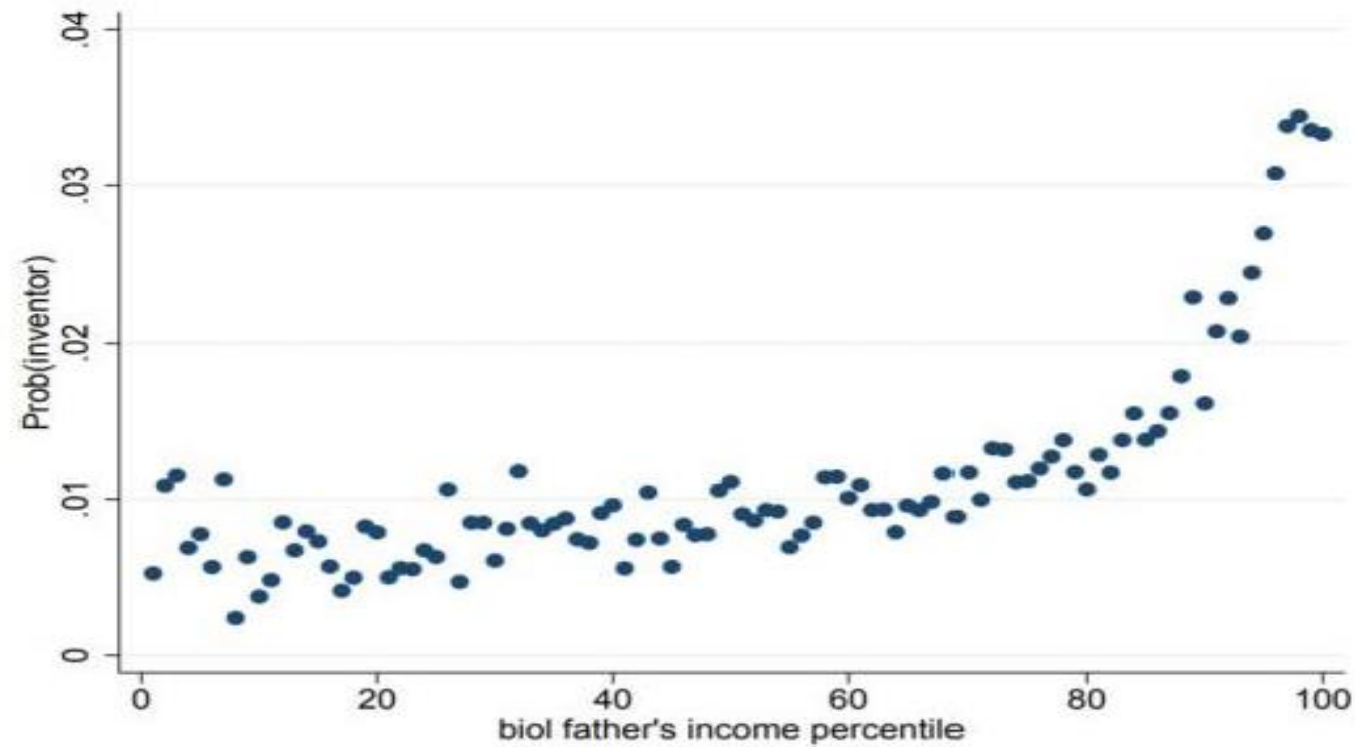
Patent Rates vs. Parent Income Percentile



Vast majority of inventor-parent income relationship not explained by measurable early ability

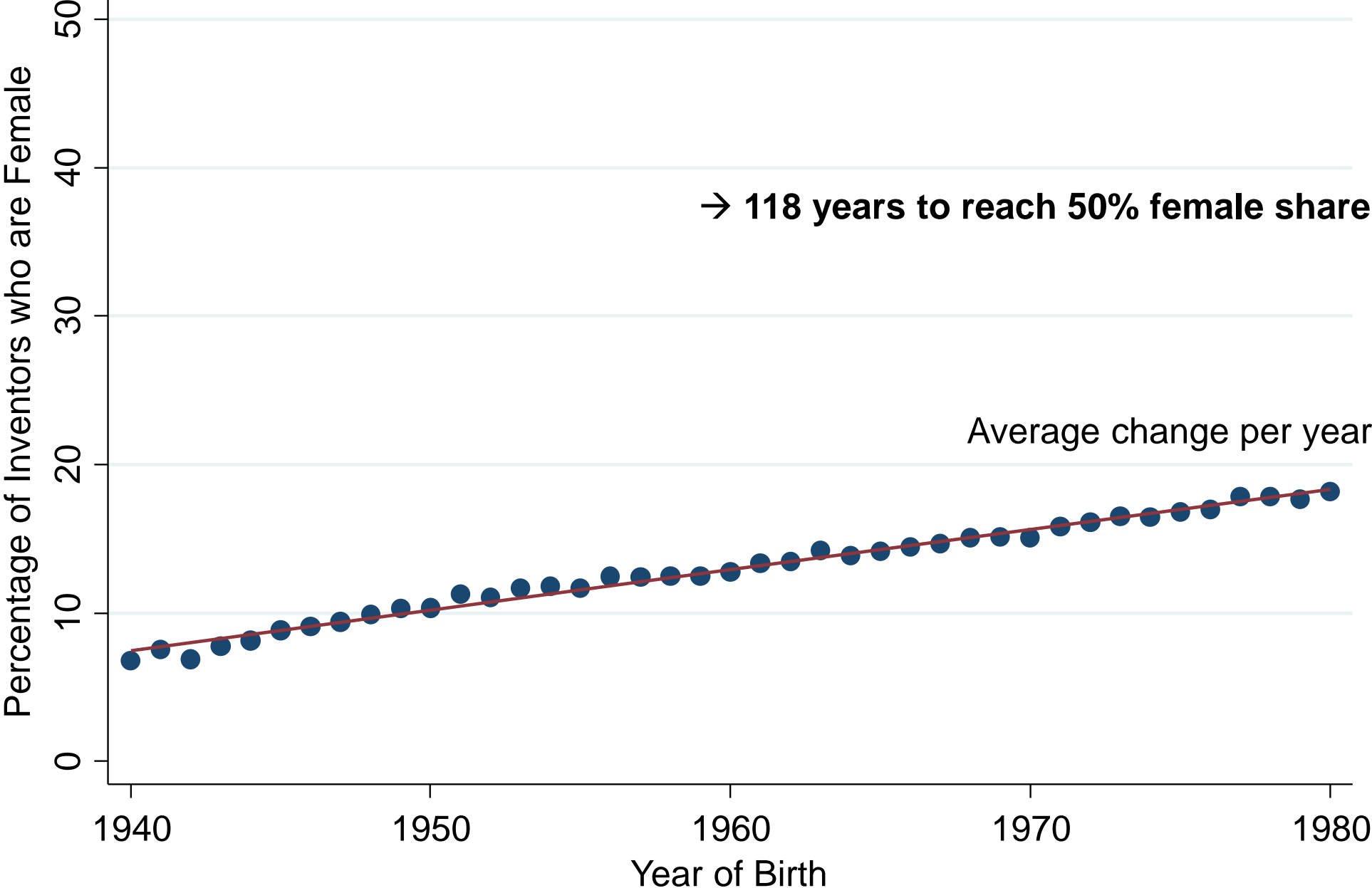


Inventor- Parent income is also observed in low inequality Finland, although gradient is less steep than US

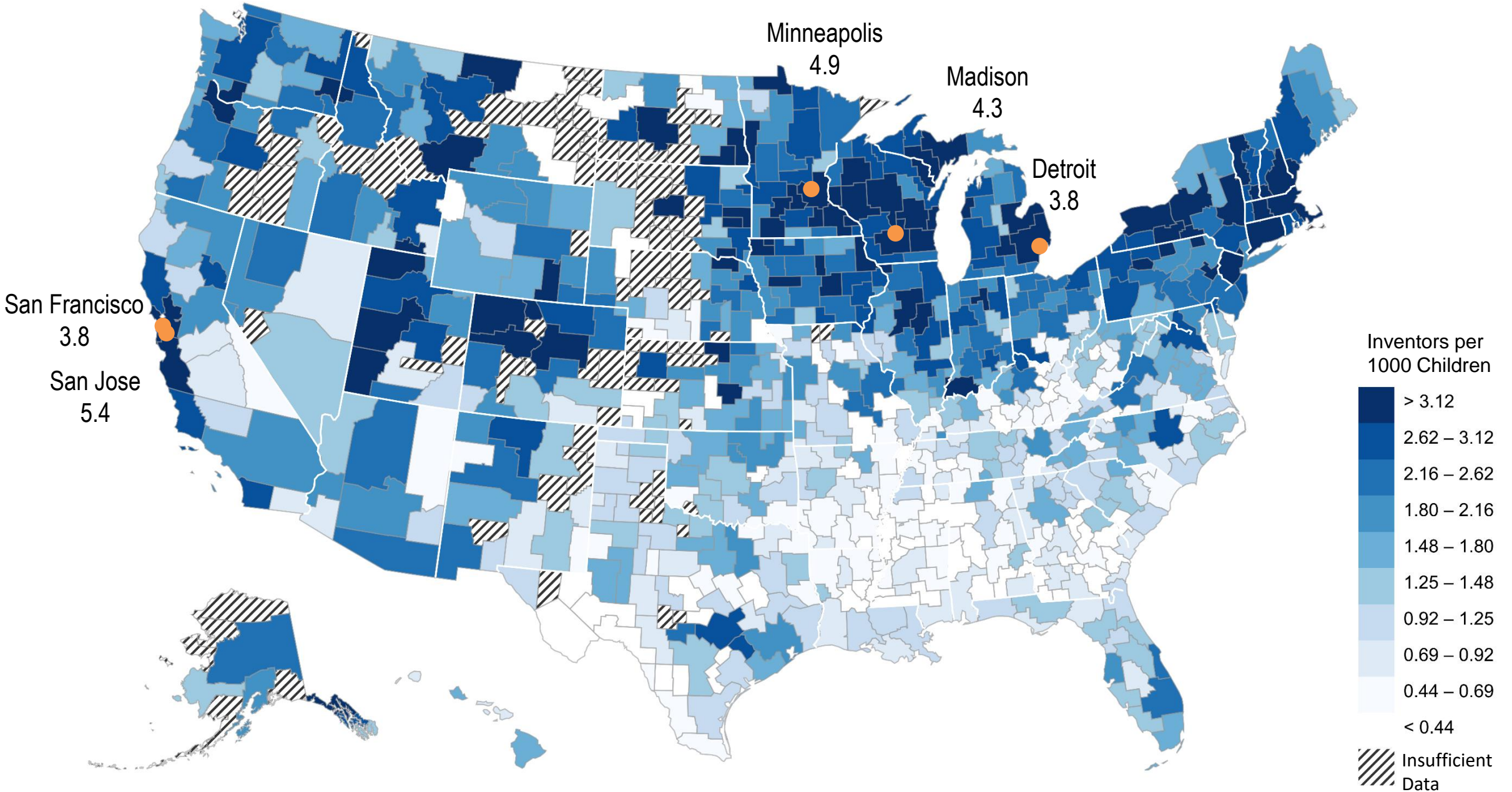


Source: Aghion, Akcigit, Hyytinen & Toivanen (2018)

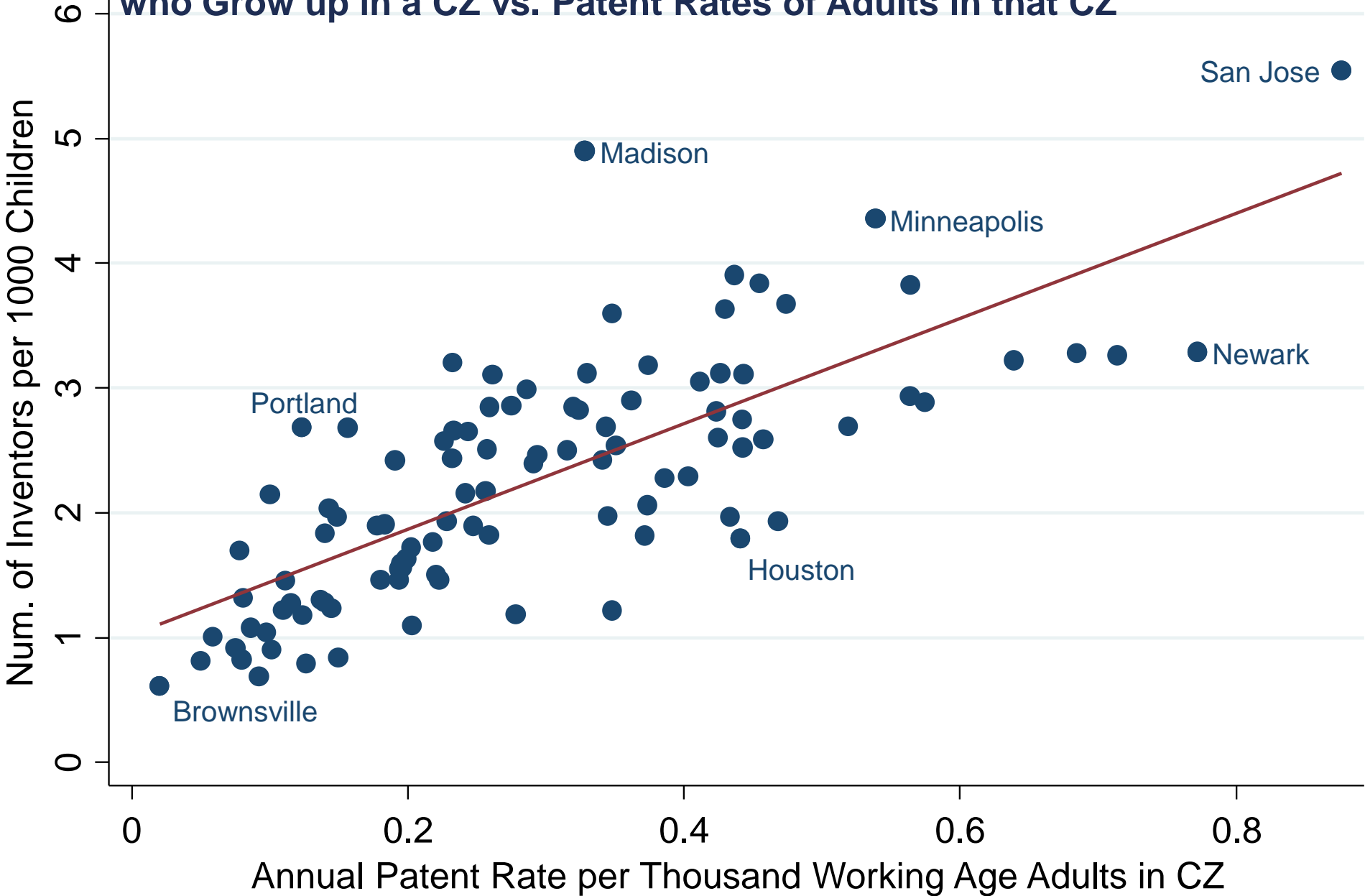
Gender: Percentage of Female Inventors by Birth Cohort



The Origins of Inventors: Patent Rates by Childhood Commuting Zone



Being more exposed to innovation when growing up seems to matter: Patent Rates of Children who Grow up in a CZ vs. Patent Rates of Adults in that CZ

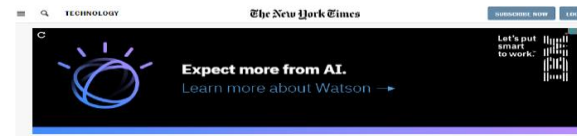


Who becomes an inventor?

- Show causal impact of early innovation exposure to future invention:
 - Movers' design
 - Distinguishing exposure effects by
 - Narrow technology class
 - By gender of inventor in child's CZ

Finding the “Lost Einsteins and Marie Curies”

- Major impediment to innovation is that supply of talented inventors held back by class, race and gender (e.g. schools in low income neighbourhoods, exposure to role models; networks and mentors, discrimination, etc.)
- Unlocking this hidden talent could quadruple innovation rate



Wanted: 'Lost Einsteins.' Please Apply.



Daniel Gross, of Pioneer, center, with Heidi Hartung, left, the group's operations manager, and Lorea Dominguez, one of its advisors. Jason Hesser for The New York Times

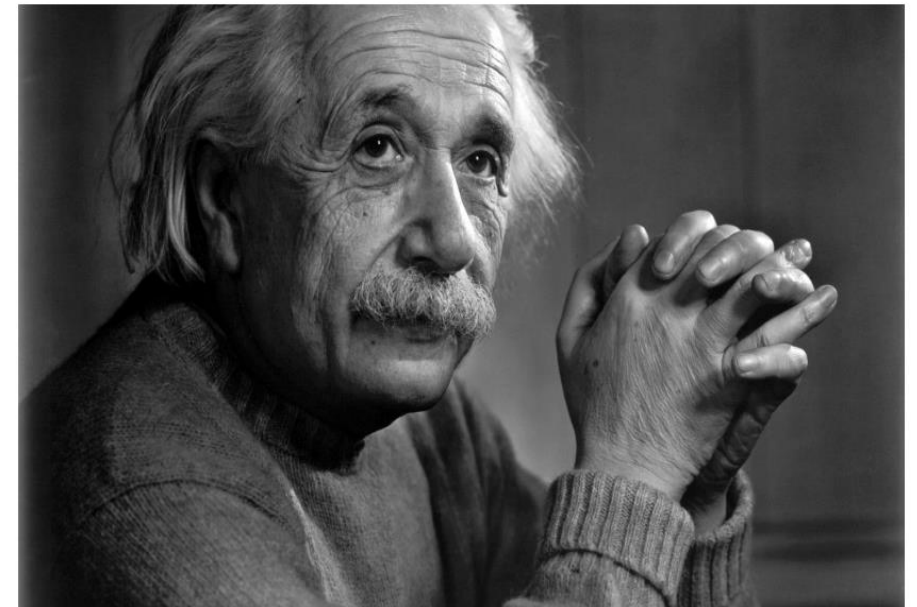
By Steve Lohr

Aug. 9, 2018

Leer en español

Silicon Valley has created a model for identifying and nurturing high-potential young companies. Pioneer, an experimental fund, hopes to do much the same thing for high-potential people.

The group, which is being announced on Thursday, plans to use the Internet-era tools of global communication and crowdfunding to solicit and help select promising candidates in a variety of fields, along with evaluations by experts. Its goal is to put more science and less happenstance into the process of talent discovery — and reach more



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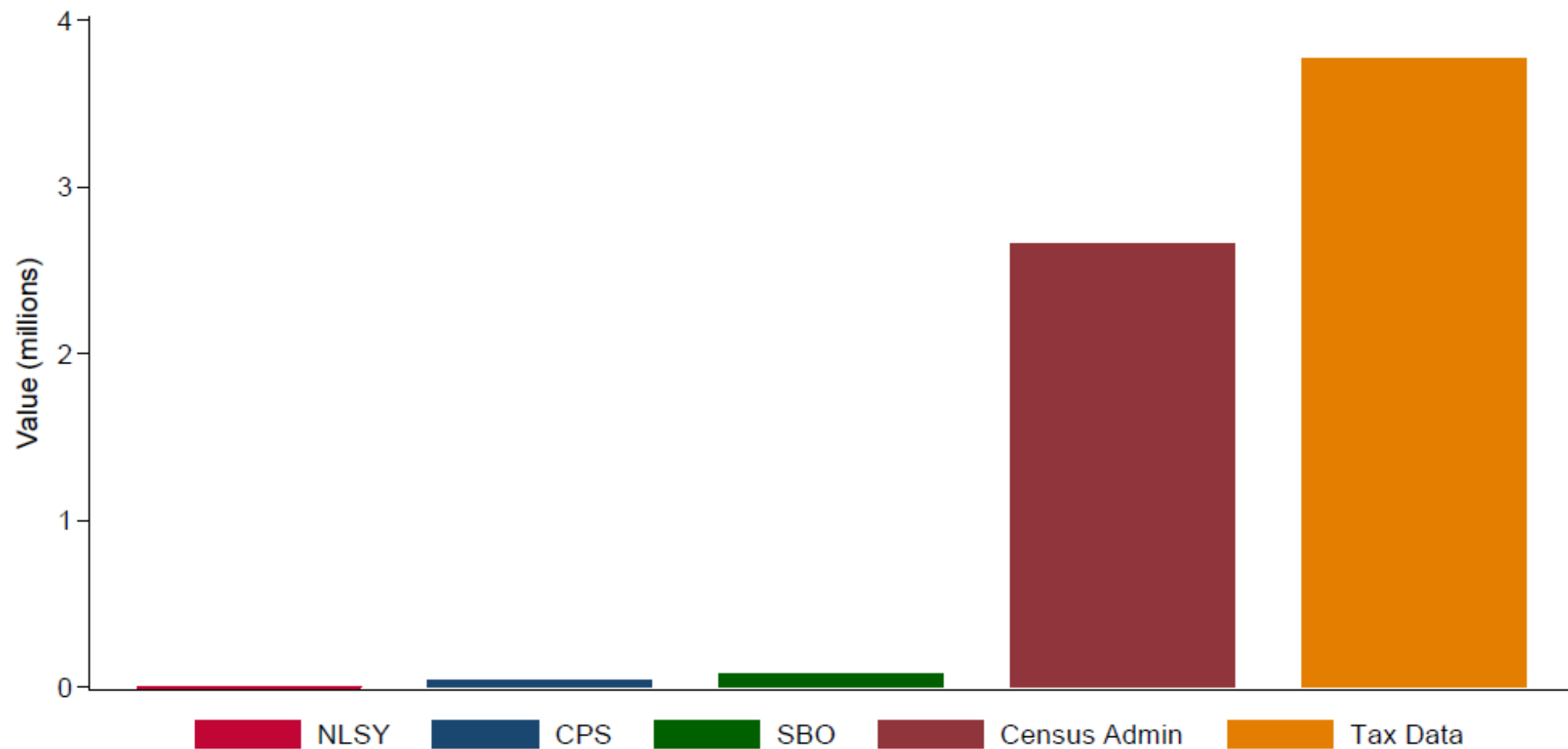
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Who becomes an entrepreneur?

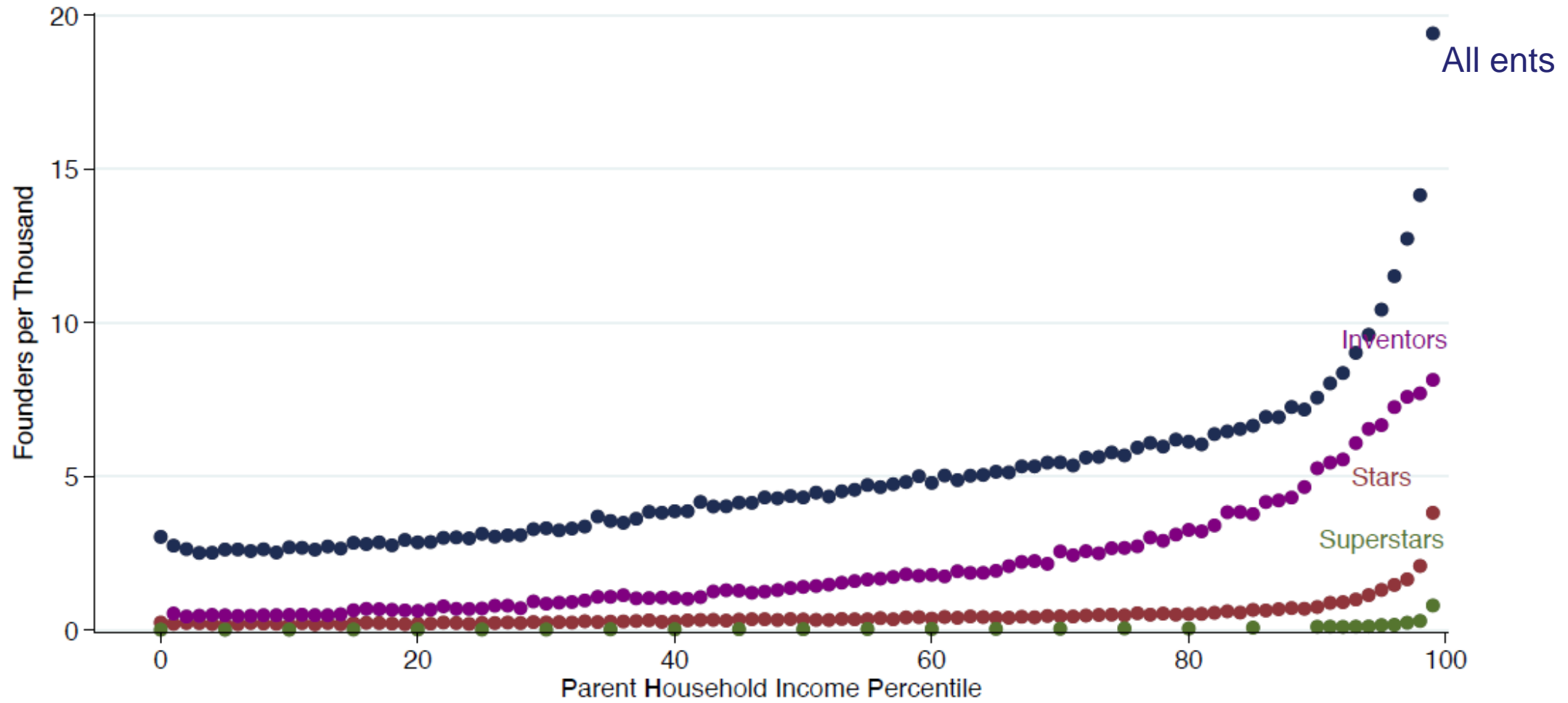
- Use IRS data to examine “missing entrepreneurs” (Chetty, Smith, Van Reenen, Zidar and Zwick, 2022)
- Identify **new firms**:
 - from C-Corp, S-corp & partnership tax filings (1120, 1120S, 1065). Excludes unincorporated sole props; shell companies & spinoffs using W2 data
- Identify **founders**:
 - Owners in year firm started (K-1, 1125-E forms). For C-corps exclude owners with no W-2 income from firm in first 2 years
- About 4 million **entrepreneurs** 2000-2017
 - Most existing work on NLSY, CPS, SPO have samples in hundreds.

Benchmarking

Number of Entrepreneurs by Dataset



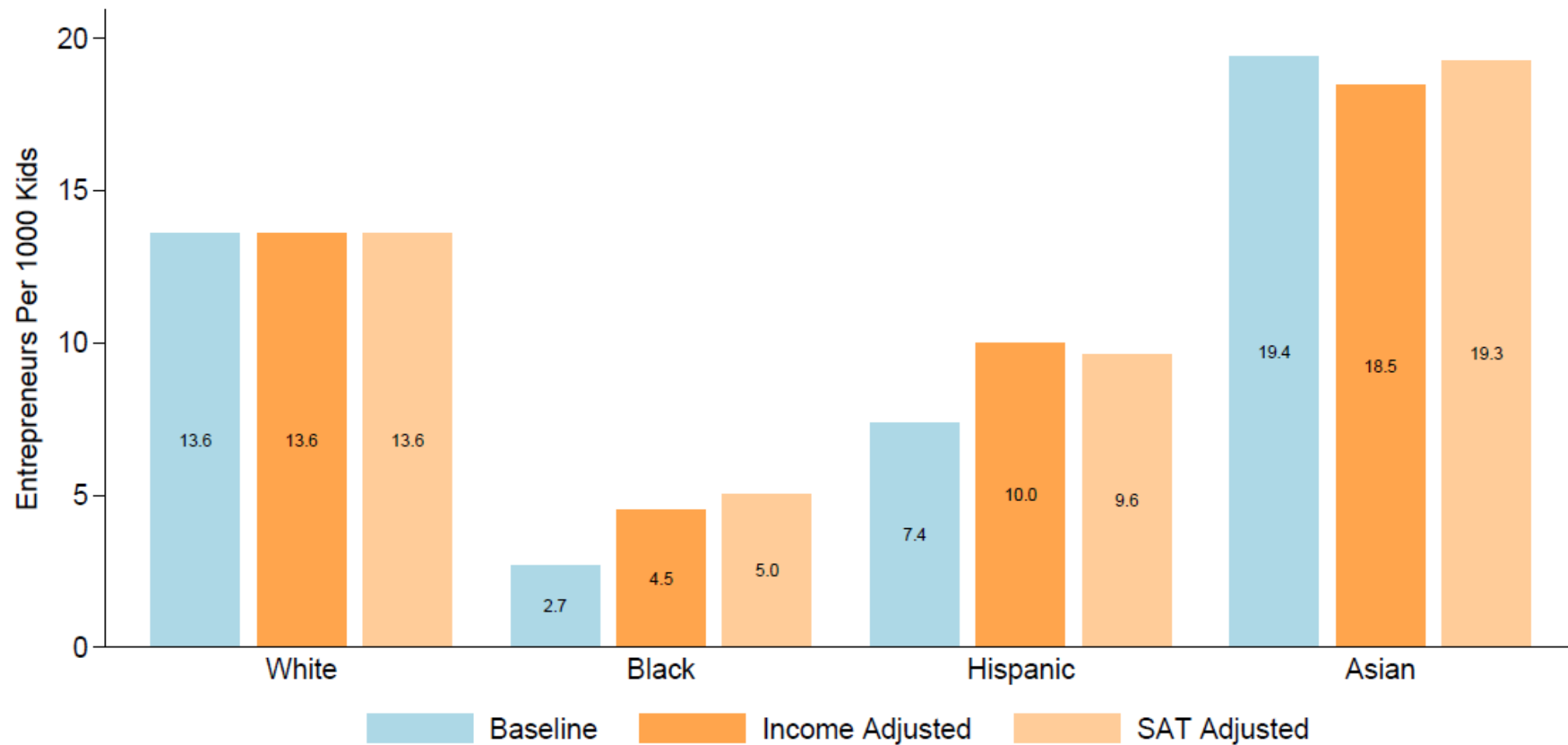
Entrepreneurship Rates Lower if Born into a Low Income Family



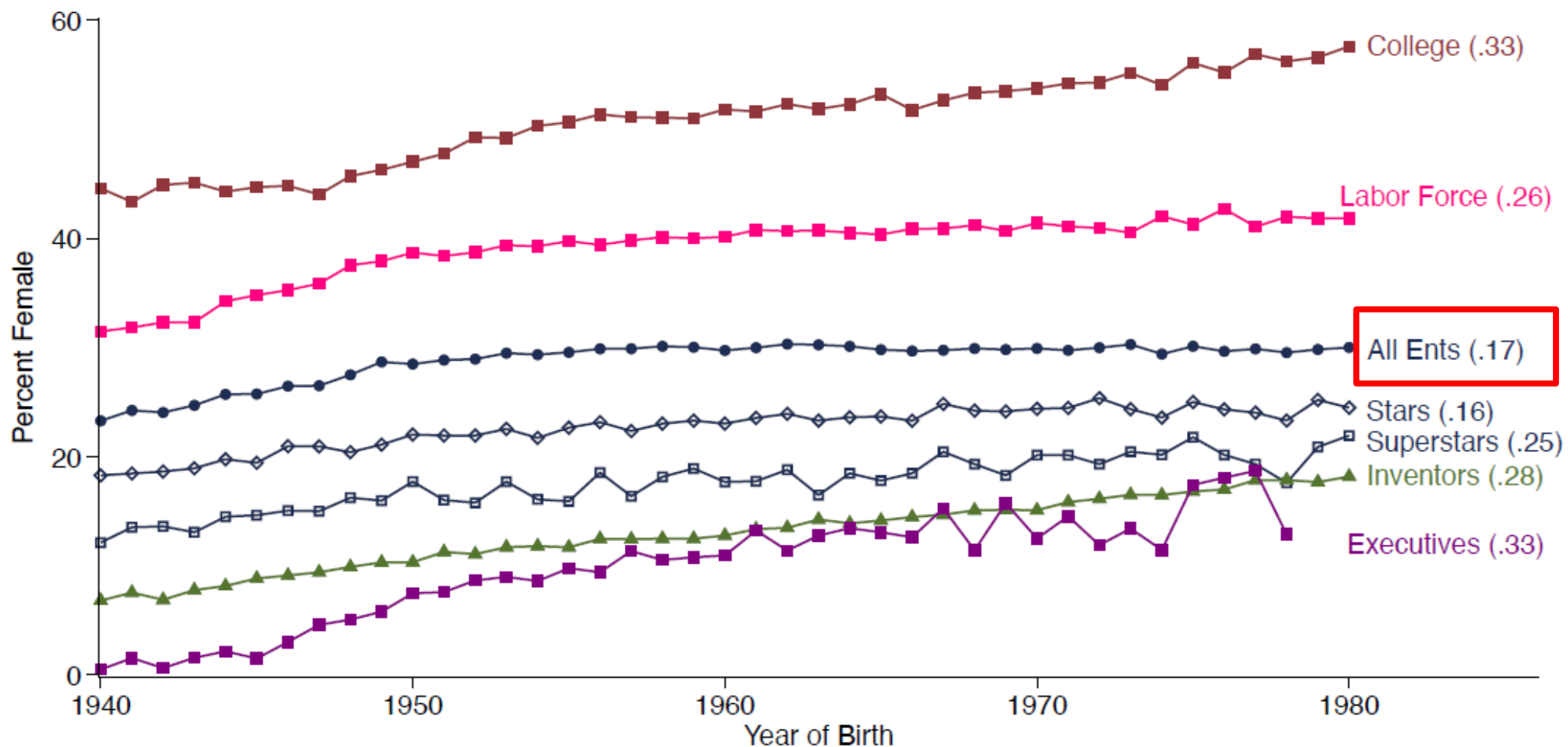
Relative to inventors:

1. Higher rates of broad entrepreneurship at the bottom
2. More convex growth within top decile

Entrepreneurship Rates Lower if Black or Hispanic

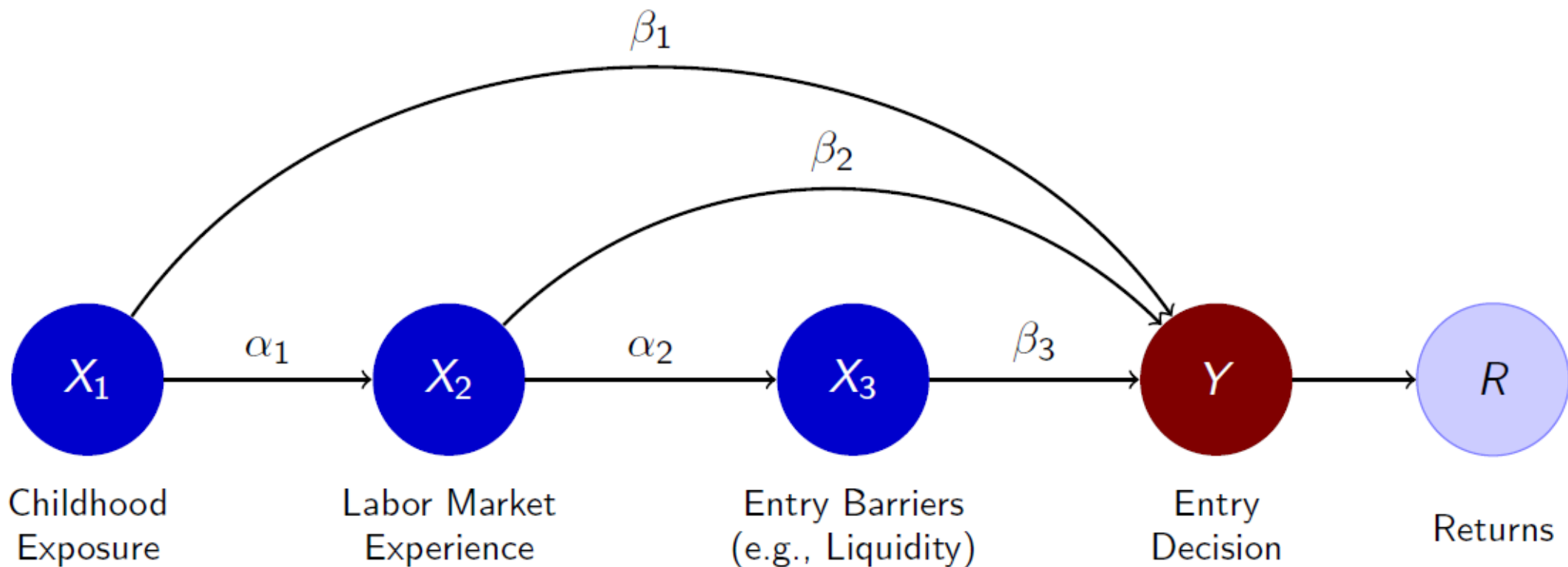


Female Entrepreneurship Rates are Stagnant



Note: Growth rate in percentage points per year in parentheses.

The Entrepreneurial Pipeline



Question: How much of ΔY due to α s, β s, and ΔX s?

Estimating the Person-Level Returns to Entrepreneurship

Goal: Measure average returns to entrepreneurship and differences across groups

- Restrict to first-time entrepreneurs and those with no prior business income
- Outcomes that may reflect firm exits
 - Today: total income, In progress: wealth, after-tax returns
- Follow entrepreneurs from $t = -5$ through $t = 8$

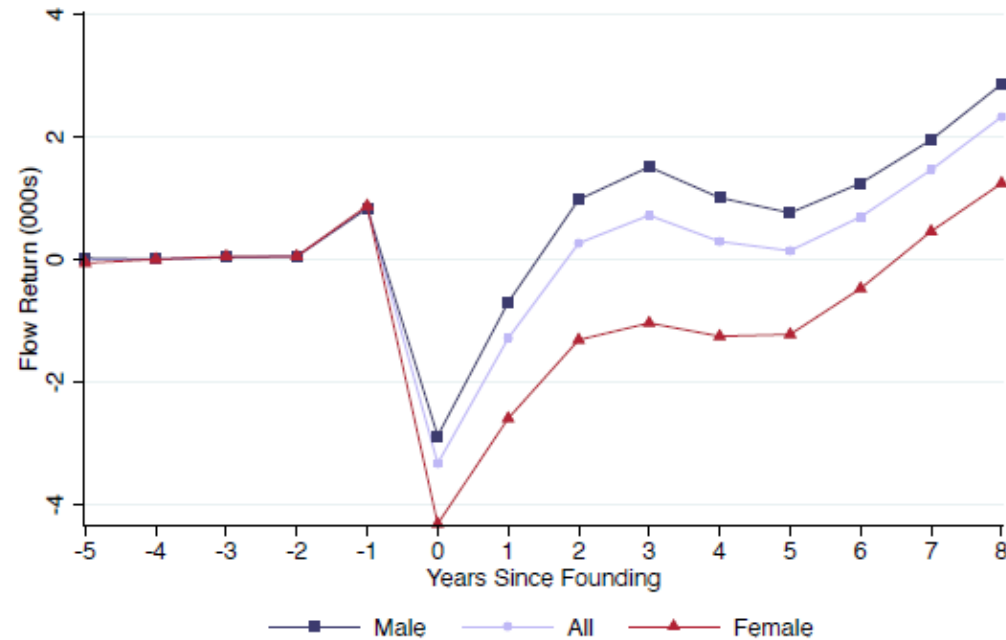
Strategy: High dimensional 1-1 match between entrepreneurs and workers

1. Income history: AGI quantiles in $t \in \{-2, -3, -4\}$, with top 1% split into P99-99.9 and top 0.1%
2. NAICS 2-digit industry for employer in $t = -1$
3. Geo: Census region plus California
4. Age (3-year bucket), gender, single vs. joint filing status

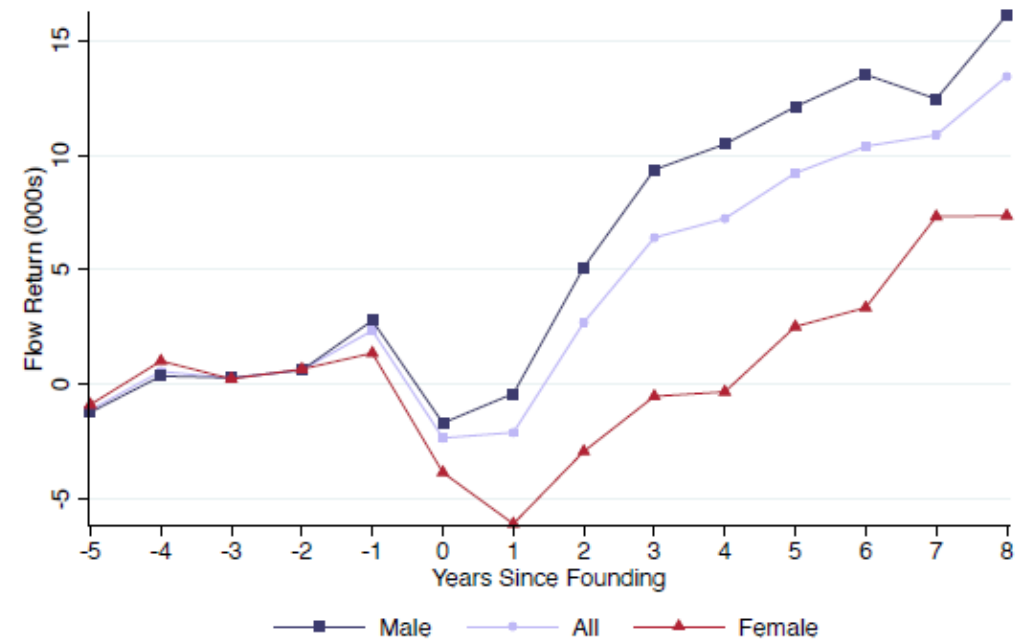
Mechanism: Test up-front barriers-to-entry model [Hsieh Hurst Jones Klenow 2019]

Financial Returns to Entrepreneurship

Median Return



Mean Return



Result: Entrepreneurship pays at P50 and mean

- Confirms findings on incorporated entrepreneurs (e.g., Levine Rubinstein 2017)
- Mean return for females is half that for males
- Median return for females is negative for several years
- Mean returns also lower for URGs and non-top parental income kids

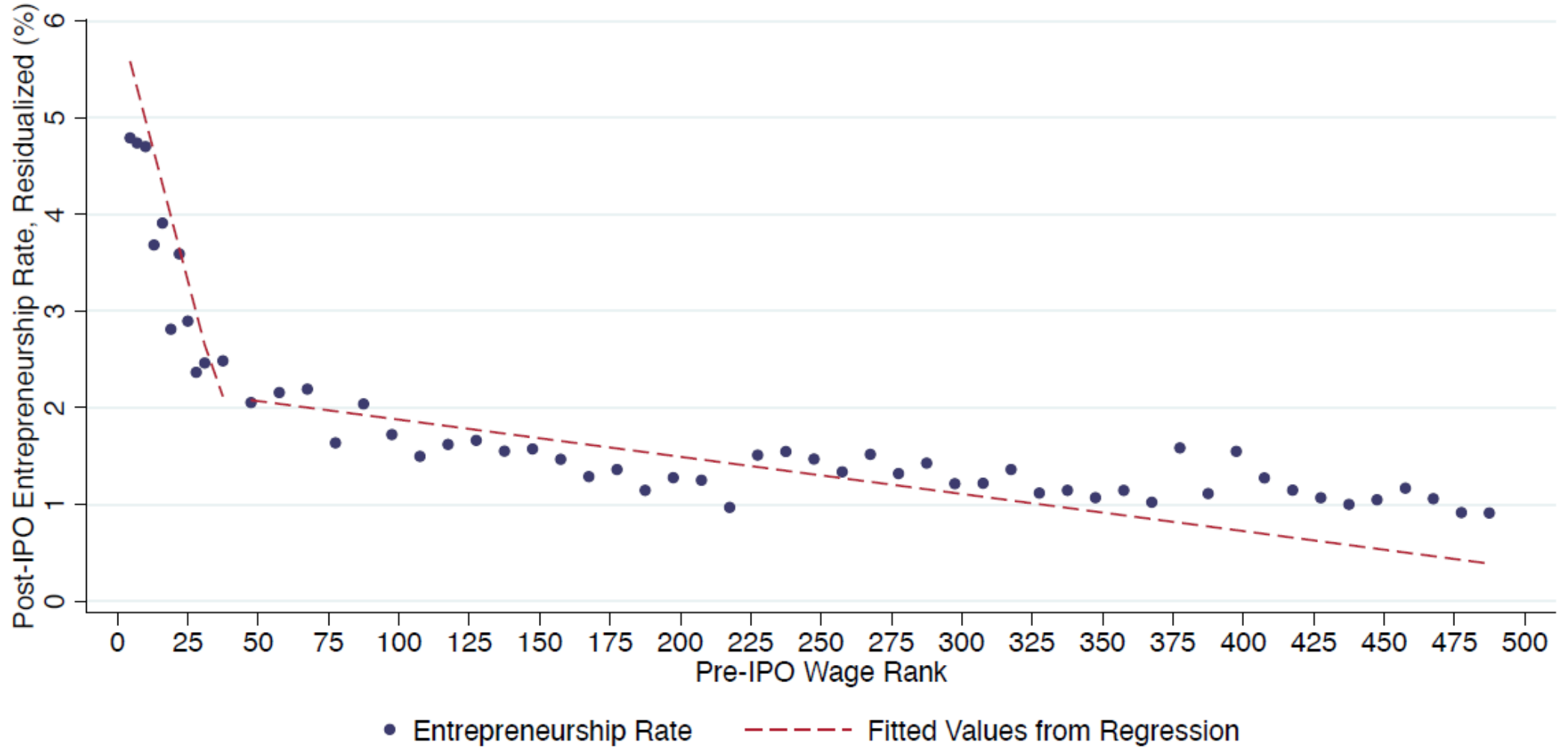
What makes an entrepreneur?

- **Experience**: working in industries occupations & firms that are entrepreneurship friendly (i.e. with high rates of workers eventually becoming entrepreneurs - like software). To get causal impact of experience:
 - Using growth of industries in CZ at time of labor market entry as shifter of first job (e.g. software vs. restaurants in San Fran for 22 yr-olds in '99 vs. '00)
 - Important in general and particularly important in explaining URG gap (explain ~half of black-white ent. gap and ~quarter of female-male ent. gap)

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- **Liquidity**
 - Use “windfall wealth shocks” based on individual wage rank in pre-IPO firm
 - Important in general, but doesn't explain much of URG gap

IPO Cash Windfalls and Early Employee Entrepreneurship



Result: Larger windfall from IPO → Higher probability of becoming entrepreneur in the future

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- **Liquidity**
 - Use “windfall wealth shocks” based on individual wage rank in pre-IPO firm
 - Important in general, but doesn't explain much of URG gap
- **Exposure** to entrepreneurship in childhood
 - Use location, industry type and movers' design
 - Explains ~fifth of black-white gap, but none of gender (but maybe not refined enough spatially, cf. Mertz et al 2022 on Denmark) & very little of class

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Why does it matter if URGs excluded?

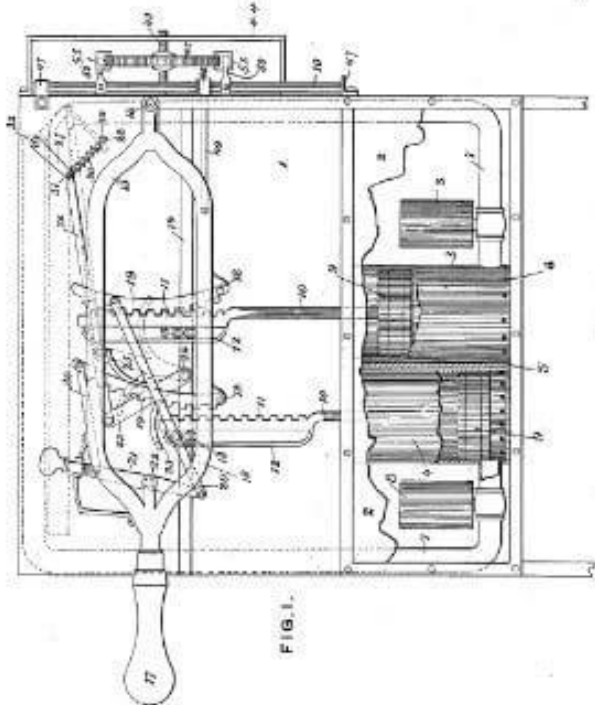
- Equity
- Loss of growth potential
 - Build on Hsieh et al (2019) Roy model but include entrepreneurs, with exposure effects and labor experience effects
 - Simulate policies and GDP impact
- Skews direction of technical change

Josephine Cochran, 1839- 1913



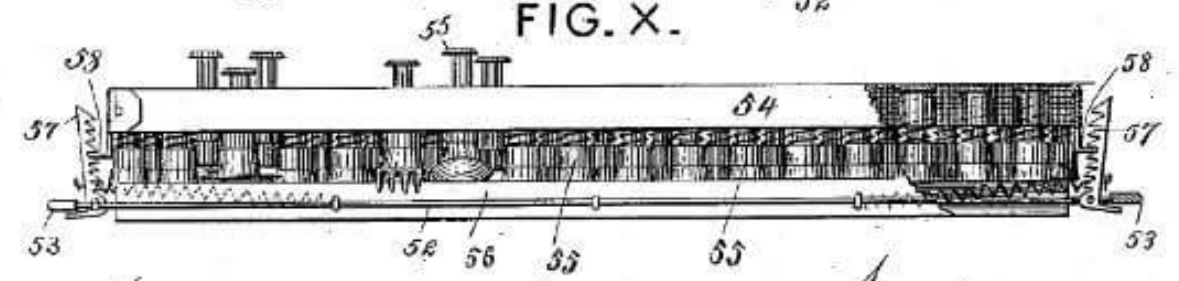
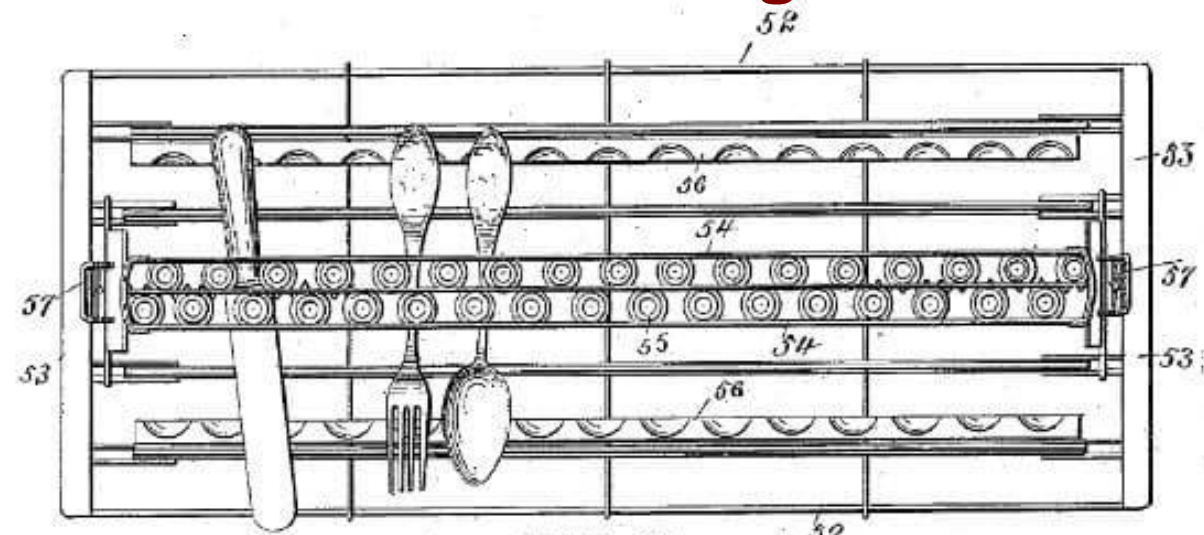
Josephine Cochran, 1839- 1913: Inventor of modern dish-washer and founder of Crescent Washing Machine Company

(No Model.)
 J. G. COCHRAN.
 DISH WASHING MACHINE.
 No. 355,139. Patented Dec. 28, 1886.



Attest:
 Geo. P. Smallwood
 J. A. Hopkins

Inventor:
 Josephine G. Cochran
 By Knight Bros



Attest:
 F. A. Hopkins
 Geo. Wheelock

Inventor:
 Josephine G. Cochran
 By Knight Bros
 Atty's.



Note: Cochran's U.S. patent no. 355,139 (filed 1885) for a "dish washing machine" also included a system for cleaning flatware as well as dishes (Figure X, at right). See Gozen (2022)



A domestic version of the electric dishwasher manufactured by Josephine Cochran's Crescent Washing Machine Company in the early 1900s.

THE GREAT DOMESTIC PROBLEM SOLVED!

MACHINES IN DAILY USE

AT	Chicago
THE VIRGINIA, Chicago	
NATIONAL, Chicago	
THE LACOTA, Chicago	
THE VICTORIA, Chicago	
PALMER HOUSE, Chicago	
THE NATIONAL, Elgin	
SEAFER'S RESTAURANT, Chicago	
ROXBOROUGH'S, Chicago	
TOBY FAUNT'S, St. Louis	

GUARANTEED TO GIVE SATISFACTION.

Saves its cost in six months in leakage; semi-annually in labor.

The Only Machine Used at World's Fair!

HIGHEST AWARD AT WORLD'S FAIR, MEDAL AND DIPLOMA.

The Garis-Cochran

DISH-WASHING MACHINE COMPANY.

INCORPORATED. CAPITAL STOCK, \$60,000.
 OFFICERS:
 Gen. D. CHAFFE, President
 Rev. L. GAMB, Secretary
 Shelbyville, Ill.
 JOSEPHINE C. COCHRAN, Treasurer and Manager
 Chicago.
 The design in the scullery in hotels and restaurants converted into a graceful and artistic pleasure.
 Parts and Combinations protected by Patents.

ATTENTION!

Hotel Men, Stewards, Restaurant and Boarding House Keepers.

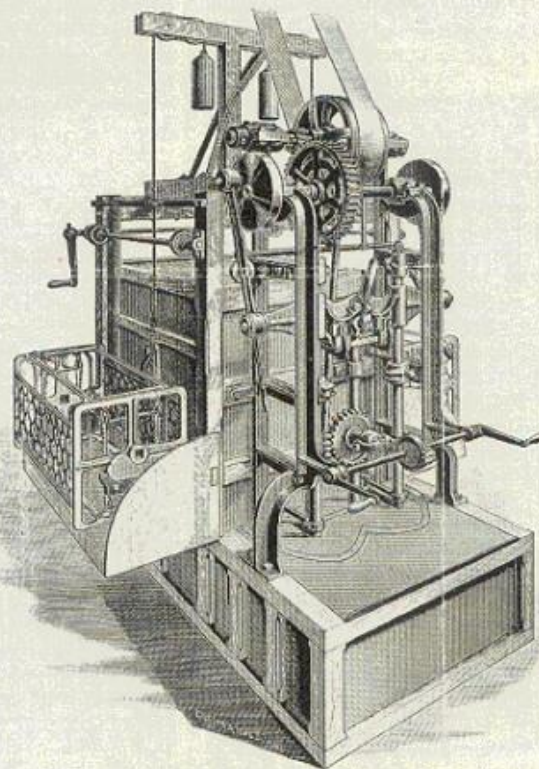
Increase your PROFITS and save space by using a

GARIS-COCHRAN DISH-WASHING MACHINE.

Come and Investigate.

In practical operation at The Mass. Charitable Mechanics Ass'n Fair, Huntington Ave.,

in the Café in the basement, where orders will be received, and all questions answered, and the fullest opportunity to investigate offered until Nov. 30, 1895.



View of the machine closed and washing a crate of dishes. The dish racks are set in the basket shown on the left, which revolve in on a track and revolves under a cascade of water under high pressure. When one basket is in the water is out. 5 x 8 x 6 ft. space required. This machine washes, soaks, rinses, and dries 5 to 10 dozen dishes in two minutes.

VICTORIA HOTEL, CHICAGO, Sept. 5, 1895.

Dear Sir: We have your favor of the 1st inst. in which you request letter concerning "dishwasher" which has been in use in our hotel for the last three years. The machine has given me excellent satisfaction, and we have no reason whatever to complain of its work. I understand the Virginia Hotel, which is owned by the same people as this, are using one of your machines, and the same is entirely satisfactory. Yours truly, WALTER BARKES, Associate Manager.

New York and New England Territory for Sale.

ADDRESS, MANAGER

GARIS-COCHRAN DISH-WASHING MACHINE CO., 1682 Massachusetts Ave., Cambridge.

EXAMINE THE MACHINE

and its work, read a few of our references, and be convinced.

Our machines have been in use for periods of three months to four years, nine months in the largest and best houses in the West, and have given universal satisfaction.

Every Enterprising and Progressive Hotel Man should investigate this Machine.

It is simple and easy to run. A man can learn how to use it in an hour.

Our No. 1, for hotels and large restaurants, requires 2 H. P.

No. 2, for Cafés, small restaurants, and boarding houses feeding 50 to 100, can be run by hand or 1/4 H. P.

Start of a Family Affair



Yes, KitchenAid Home Dishwashers were practically born in the world's finest hospitals, hotels, restaurants, schools, clubs . . . born of the experience gained in building Hobart Commercial Dishwashers.

The superior performance of KitchenAid and Hobart Commercial Dishwashers is a "family affair." The same time-proved advantages . . . the same unexcelled quality that have made Hobart preferred in commercial service are inherent in KitchenAid Home Dishwashers.

Food Mixers • Dishwashers • Coffee Mills

KitchenAid

The Finest Made . . . by Hobart

World's Largest Manufacturer of Food, Kitchen, and Dishwashing Machines

KitchenAid's exclusive Hobart revolving wash and rinse . . . circulated electric hot air drying . . . front opening door and independently sliding racks with the two-positioned, adjustable upper rack to suit your everyday needs . . . the plate warmer feature . . . all are the result of the design and manufacturing experience covering more than 50 years.

For the home dishwasher that you can be sure will perform to the complete satisfaction of your family, choose KitchenAid.

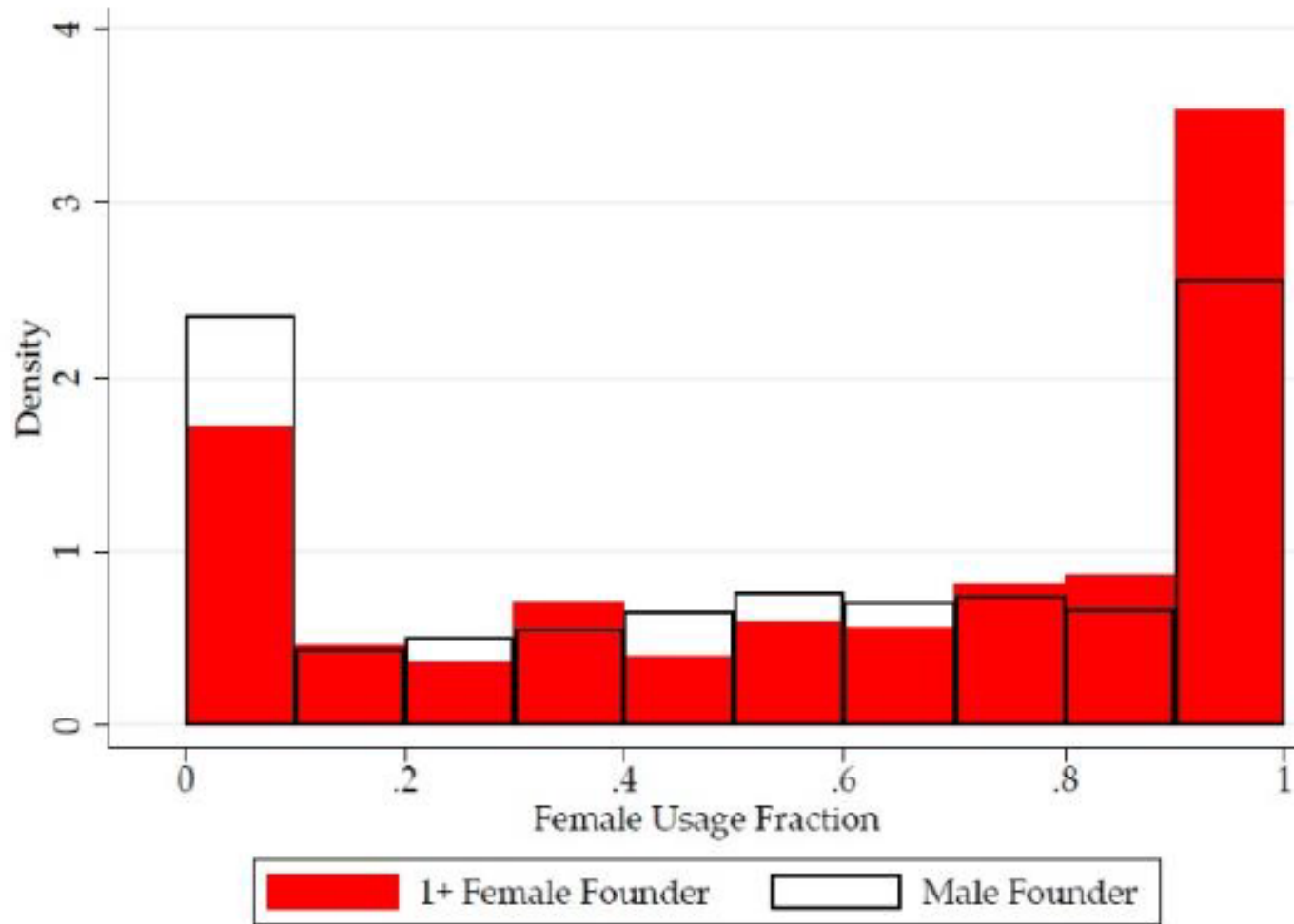
THANK YOU

KitchenAid Home Dishwasher Division The Hobart Manufacturing Co., Dept. K.T., Troy, Ohio Please send me the information checked below:

Literature Name of nearest distributor

Name
 Address
 City Zone State

Panel C: Female user fraction vs. founder gender for phone applications



Source: Einio, Feng and Jaravel (2020)

OUTLINE

1. Data and Basic Facts
2. Who becomes an inventor
3. Who becomes an entrepreneur
4. Why should we care?

5. Policy

Policies

- Increase rewards at the top – e.g. top rate cuts, etc. (Akcigit et al, 2022)
 - Unlikely to be effective (US & UK has tried without much success) and good theoretical reasons why this is the case (Bell et al, 2019b)
- General **reductions** in inequality
 - Might be desirable on other grounds, but not well targeted on the problem
- More labor market **experience** in entrepreneurship-friendly sectors for URGs
 - Internships, entry programs, firm hiring practices, information, networks, etc.
- **Exposure policies** at early age for URGs (e.g. Card & Giuliana, 2016; Cohodes, 2010; Breda et al, 2021; inventor education programmes)
- Targeted financial support – entrepreneurship grants, etc.
 - May get more ents, but not so effective on bridging gaps
 - Reducing direct discrimination (e.g. “VC Tech Bros”)



NEWS & VIEWS

Power, text messages and the tech bros pandering to Elon Musk



Questions

- Is the association of family wealth and future entrepreneurship & innovation due to liquidity constraints?
 - Hurst and Lusardi (2004) argue not using inheritance windfalls, etc., but IPO evidence suggests some effects
 - Still, much wider influences than simply income: education, neighborhoods, networks, etc.
- Place based policies
 - Is it really place or people?
 - Creating clusters, etc. very hard. Lessons are to remove things holding back development of agglomeration. Targeted interventions along lines of comparative advantage

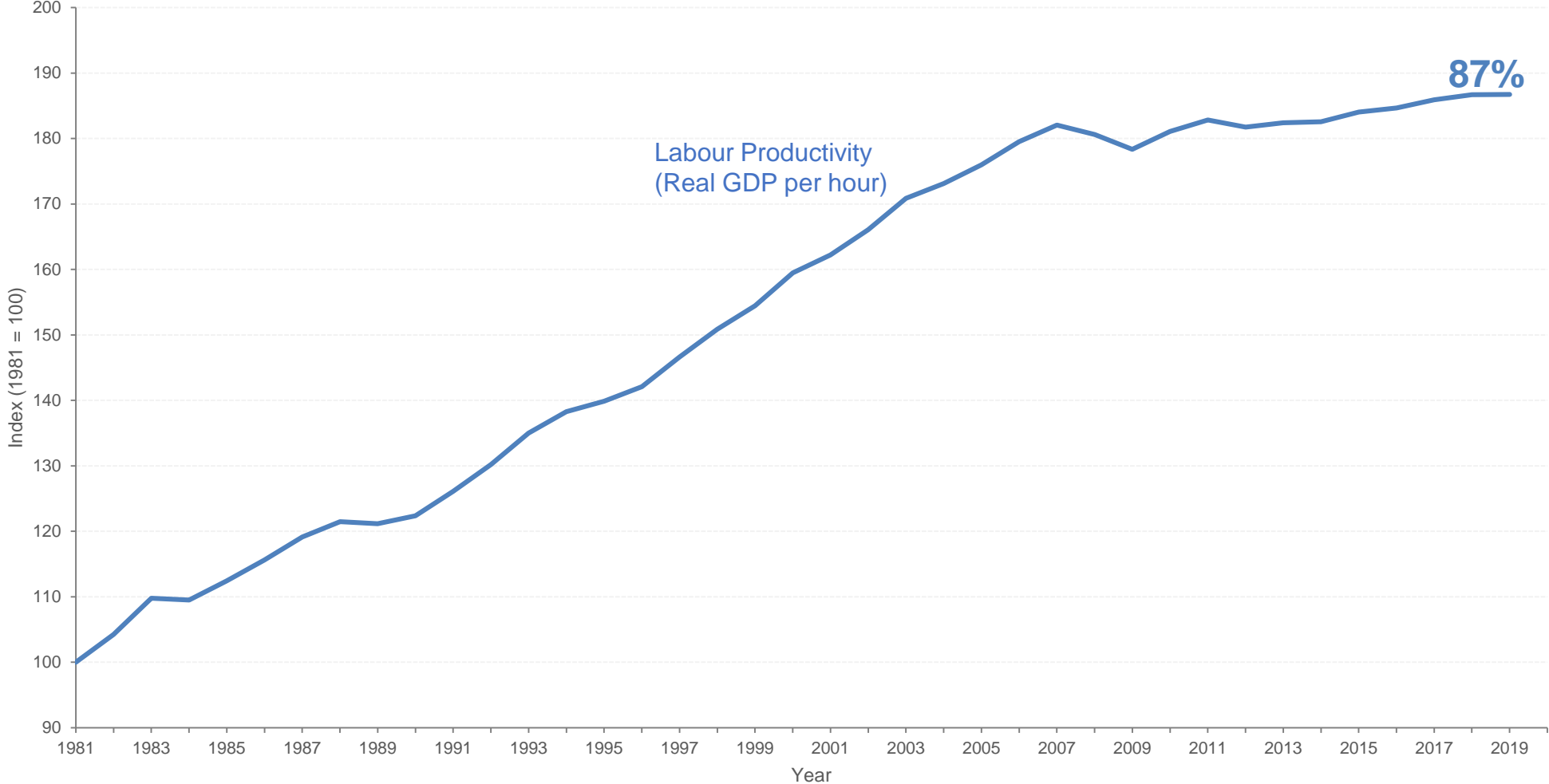
Questions

- Which of the URG specific policies are most effective?
 - Some low-cost interventions on exposure and information seem to have quite large effects
- What are factors that are slowing down general productivity growth?
 - How important is business dynamism for this process: e.g. entrepreneurial decline vs. more general innovation decline

THANKS!



UK labour productivity in increased by about 87% over last four decades (1981-2019)



Source: ONS

Notes: Labour productivity is defined as real GDP (using the GDP deflator) divided by total hours worked.

Some Further Reading (and viewing)

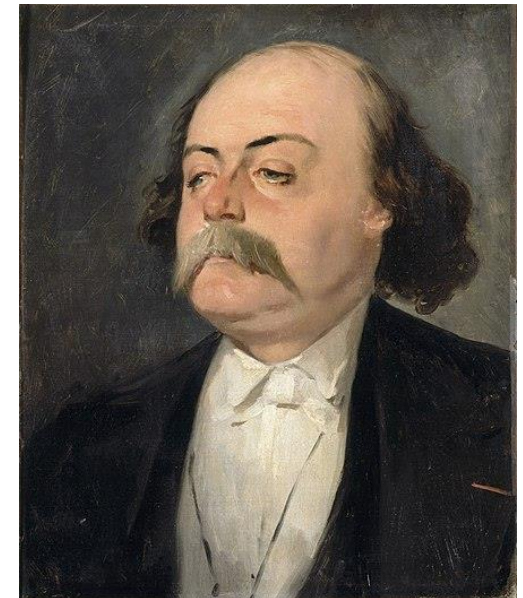
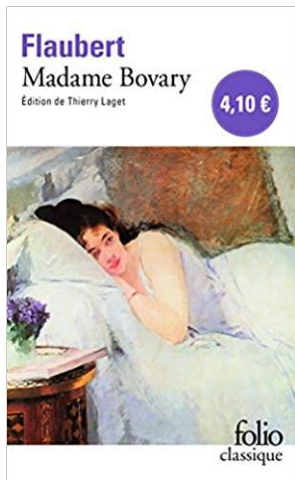
- “Innovation Policies to Boost Productivity” (2020) Hamilton Policy Proposal 2020-13
https://www.hamiltonproject.org/assets/files/JVR_PP_LO_6.15_FINAL.pdf webinar
- “A Toolkit of Policies to promote Innovation” (Nick Bloom, Heidi Williams and John Van Reenen), *Journal of Economic Perspectives* (2019) 33(3) 163–184 <http://cep.lse.ac.uk/pubs/download/dp1634.pdf>
- “Why Do We Undervalue Competent Management” (Raffaella Sadun, Nick Bloom and John Van Reenen) *Harvard Business Review* (2017), September-October
- “Measuring and Explaining Management practices across firms and nations” (Nick Bloom and John Van Reenen) *Quarterly Journal of Economics* (2007) 122(4), 1351–1408.
- “Who Becomes an Inventor in America? The Importance of Exposure to Innovation” (Alex Bell, Raj Chetty, Xavier Jaravel, Neviana Petkova and John Van Reenen), <http://cep.lse.ac.uk/pubs/download/dp1519.pdf> *Data Quarterly Journal of Economics* (2019) 134(2) 647–713, [New York Times](#) [Vox Atlantic](#) [Fortune Conversation](#) [VoxUS](#) [Economist](#) [VC Centrepiece](#) [INET](#)
- “OPENing up Military Innovation: An Evaluation of Reforms to the U.S. Air Force SBIR Program” (Sabrina T. Howell, Jason Rathje, John Van Reenen and Jun Wong), *Vox* 2021 <https://poid.lse.ac.uk/textonly/publications/downloads/poidwp004.pdf>
- “The Intellectual Spoils of War: Defense R&D, Productivity and Spillovers” (Enrico Moretti, Claudia Steinwender and John Van Reenen) <http://cep.lse.ac.uk/pubs/download/dp1662.pdf> [Vox](#)

Further reading

- “The World Management Survey at 18” (Scur, Sadun, Van Reenen, Lemos & Bloom, 2021), *Oxford Review of Economic Policy* <https://poid.lse.ac.uk/textonly/publications/downloads/poidwp002.pdf>
- World Management Survey <http://worldmanagementsurvey.org/>
- “Increasing Difference Between Firms” *Changing Market Structures and Implications for Monetary Policy*, Jackson Hole Symposium (Van Reenen, 2018) 19-65 <http://cep.lse.ac.uk/pubs/download/dp1576.pdf> [NYT](#) [NPR](#)
- LSE Growth Commission Final Report (Aghion et al, 2013) <http://www.lse.ac.uk/researchAndExpertise/units/growthCommission/documents/pdf/GCReportSummary.pdf>
- “Management as a Technology” (Bloom, Sadun and Van Reenen, 2017): <http://cep.lse.ac.uk/pubs/download/dp1433.pdf>
- “Do Fiscal Incentives increase innovation? An RD Design for R&D” (Antoine Dechezlepretre, Elias Einio, Ralf Martin, Kieu-Trang Nguyen and John Van Reenen), CEP Discussion Paper 1413 [Vox](#), <http://cep.lse.ac.uk/pubs/download/dp1413.pdf>

Le Dictionnaire des idées reçues (Dictionary of Received Ideas) by Gustave Flaubert (1911)

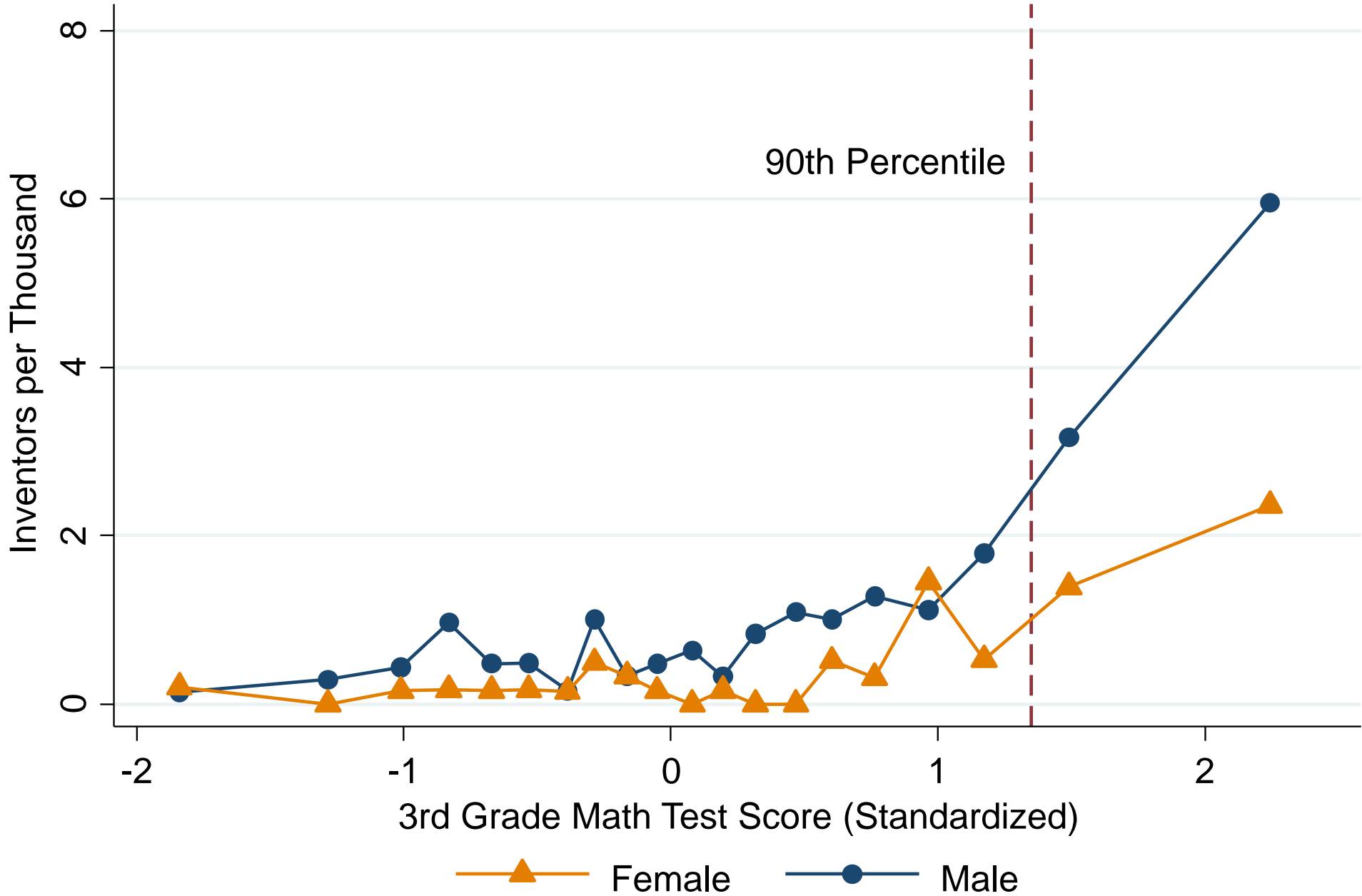
Inventors - “All die in the poor house. Someone else profits from their discoveries, it’s not fair”



Why should the government subsidize innovation?

- **Empirical evidence suggests social return to innovation at least three times larger than private returns**
 - Bloom, Shankerman & Van Reenen (2013); Lucking, Bloom and Van Reenen (2020); Jones & Summers (2022)

Patent Rates vs. 3rd Grade Math Test Scores by Gender



Data

- Patents grants from 1996-2014 from USPTO (Google XML files) and applications from 2001
- Federal income tax returns covering U.S. population from 1996-2012
- Patent data were linked to tax data by inventor name, city, and state at time of patent application
 - 86% of people in patent files linked to tax data
 - Over 1.2 million unique inventors in linked patent-tax data
 - Over 2 billion person-year observations



Innovation Policy: The “Lightbulb” Table

(1)	(2)	(3)	(4)	(5)	(6)
Policy	Quality of evidence	Conclusiveness of evidence	Benefit - Cost	Time frame:	Effect on inequality



Source: Bloom, Van Reenen and Williams (2019, *Journal of Economic Perspectives*)

Innovation Policy: The “Lightbulb” Table

(1)	(2)	(3)	(4)	(5)	(6)
Policy	Quality of evidence	Conclusiveness of evidence	Benefit - Cost	Time frame:	Effect on inequality
Direct R&D Grants	Medium	Medium		Medium-Run	↑
R&D tax credits	High	High		Short-Run	↑
Patent Box	Medium	Medium	Negative	n/a	↑

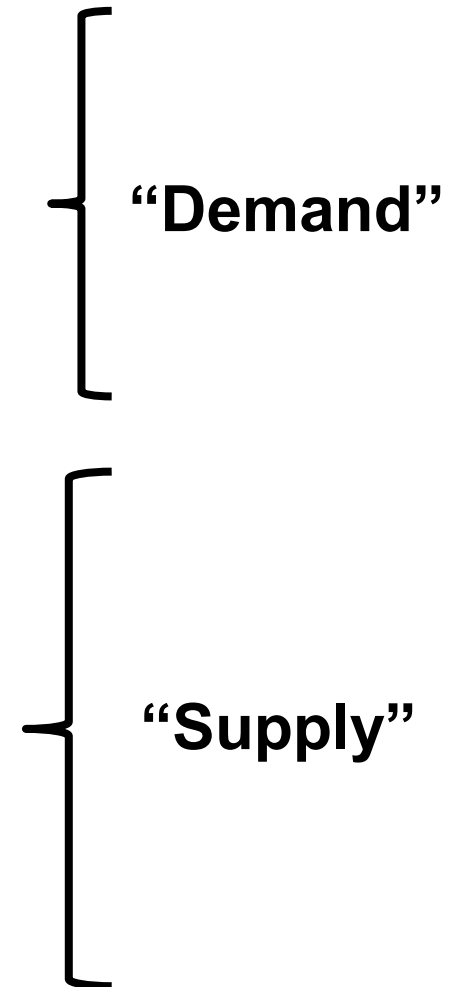
“Demand”



Source: Bloom, Van Reenen and Williams (2019, *Journal of Economic Perspectives*)

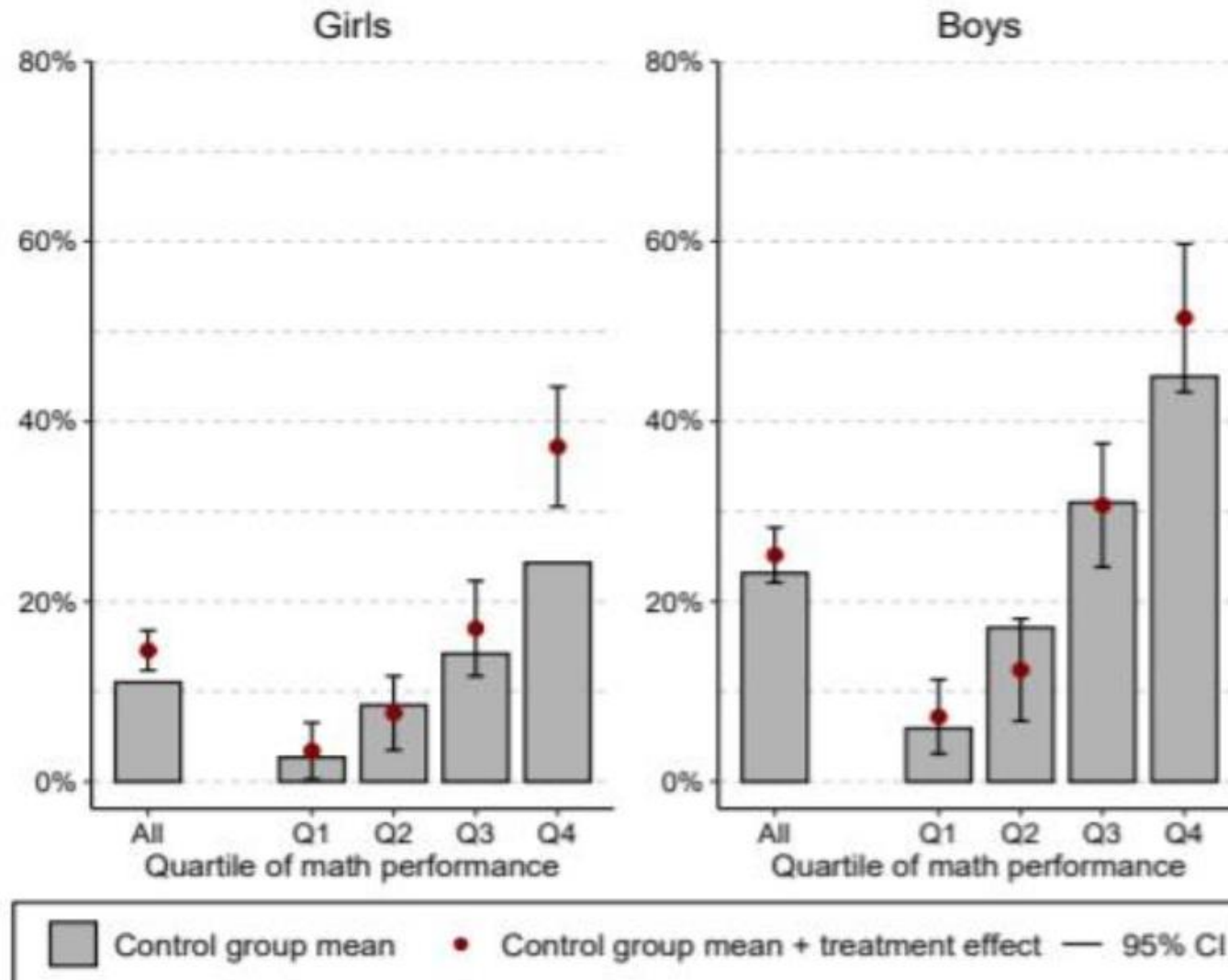
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Direct R&D Grants	Medium	Medium	💡💡	Medium-Run	↑
R&D tax credits	High	High	💡💡💡	Short-Run	↑
Patent Box	Medium	Medium	Negative	n/a	↑
Skilled Immigration	High	High	💡💡💡	Short to Medium-Run	↓
Universities: incentives	Medium	Low	💡	Medium-Run	↑
Universities: STEM Supply	Medium	Medium	💡💡	Long-Run	↓
Exposure Policies	Medium	Low	💡💡	Long-run	↓
Trade and competition	High	Medium	💡💡	Medium-Run	↑



Source: Bloom, Van Reenen and Williams (2019, *Journal of Economic Perspectives*)

RCT: Exposure to female scientist role model in Grade 12 increased probability of girls enrolling into STEM undergraduate



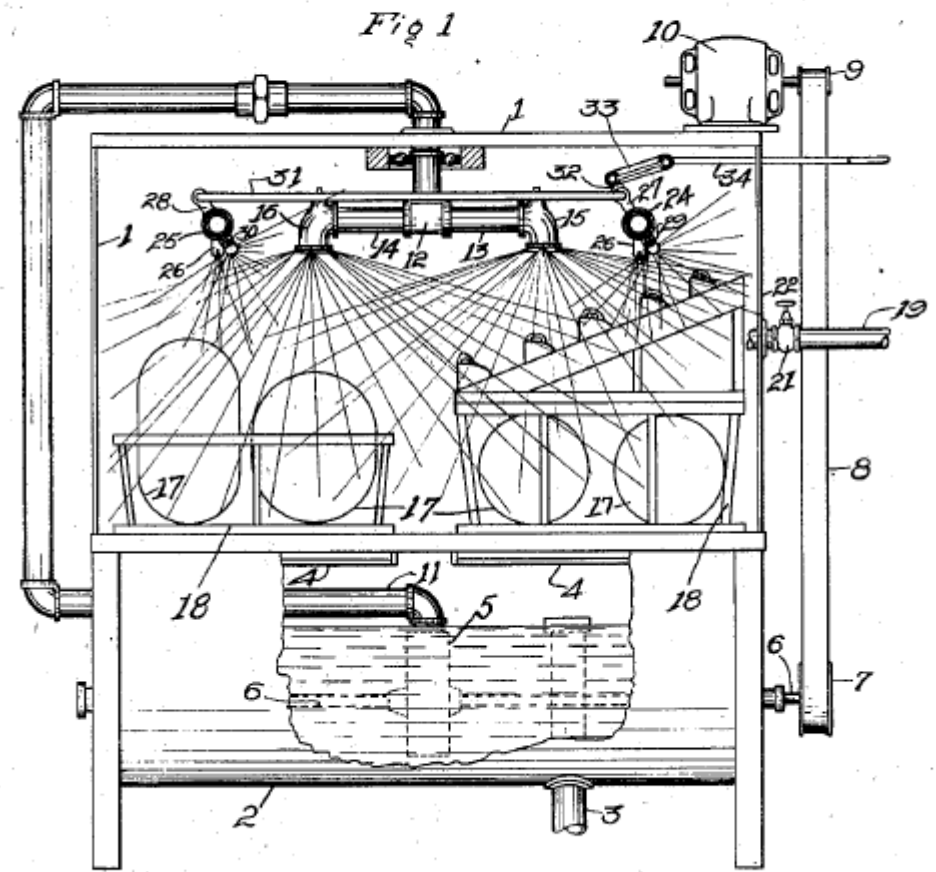
Source: Breda et al. (2021).

Josephine Cochran

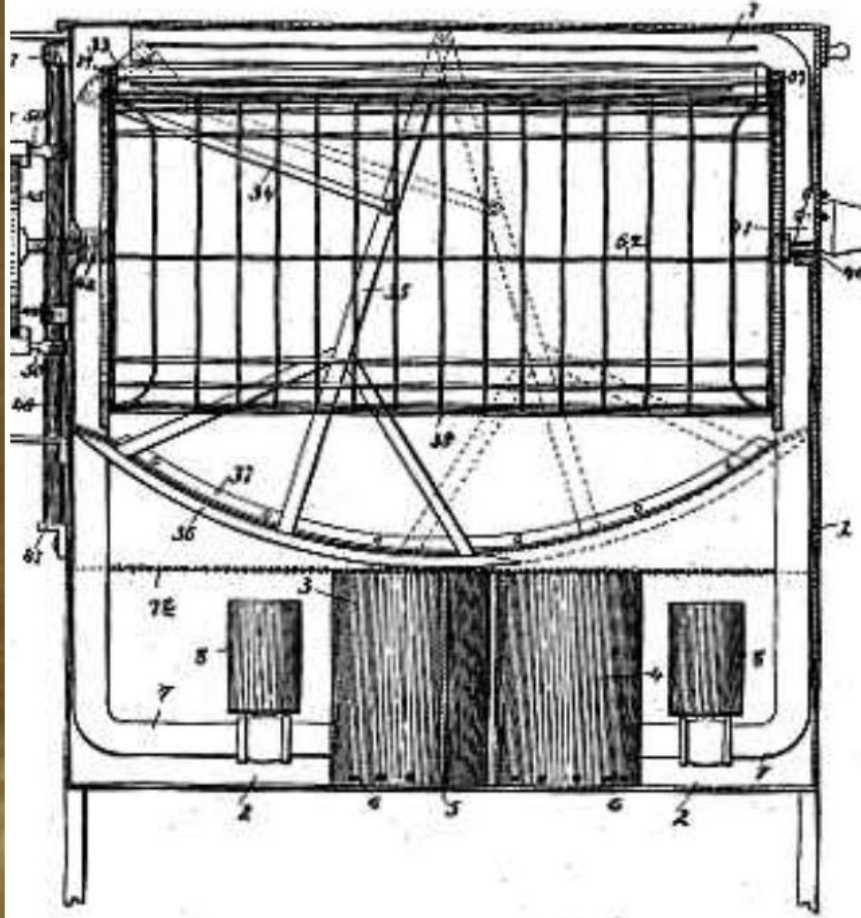
J. GARIS-COCHRANE, DEC'D.
A. F. COLT, EXECUTRIX.
DISH WASHING MACHINE.
APPLICATION FILED APR. 29, 1914.

1,223,380.

Patented Apr. 24, 1917.
2 SHEETS—SHEET 1.

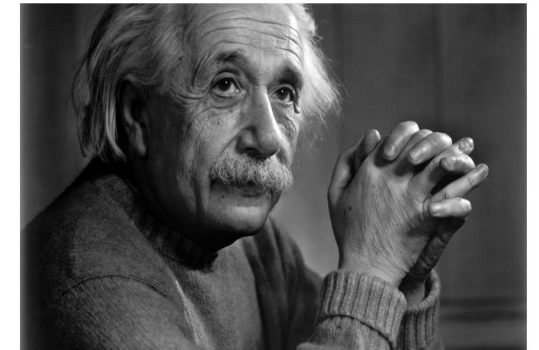
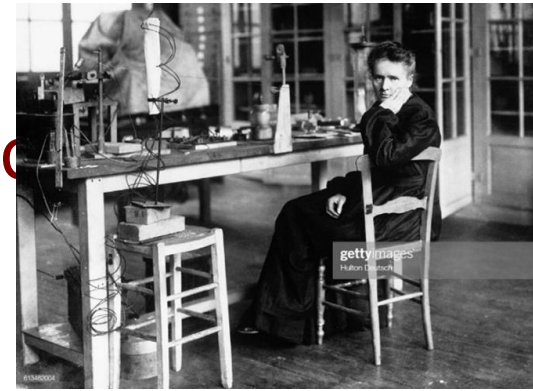


"If nobody else is going to invent a dishwashing machine, I'll do it myself,"



Successful Innovation Po

- R&D tax credits
- Direct government grants
- **Human capital supply**
 - Expanding STEM workforce
 - Universities
 - Immigration
 - **“Lost Einsteins & Marie Curies”**: Few women, minorities & kids from low-income families in inventor pool = big loss of talent (Bell, Chetty, Jaravel, Petkova & Van Reenen, 2019a,b)
- Competition and trade policy



Assembling the Data

Firms: Identify new firms from C-corp, S-corp, and partnership tax filings (1120, 1120S, 1065)

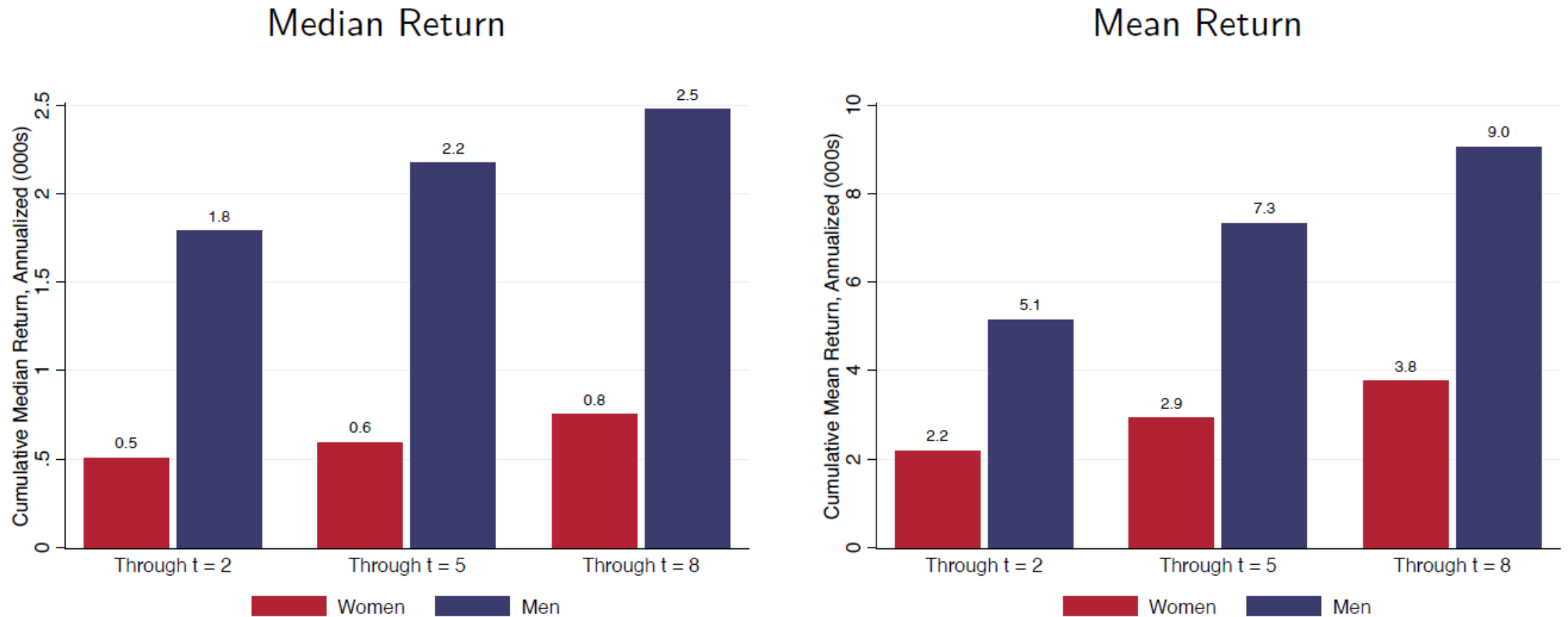
- Excludes unincorporated sole props; also exclude shells and spinoffs using W-2 data to isolate true new firms
- Validation: Number of new firms aligns with Census BDS on new firms [▶ Census Comparison](#)

Founders: Owners in year firm started (K-1, 1125-E forms) [Smith Yagan Zidar Zwick 2019]

- For corps, exclude owners without W-2 income from the firm in first two years
- Validation: Use S-corps to test for Type I and II errors, outperforms W-2 method

Demographics: Parental background, childhood location, gender, race obtained from individual level panel constructed in prior studies [Chetty Hendren Kline Saez 2014]

Return for Females is Half that for Males



Result: Female entrepreneurs earn lower returns → Inconsistent with Roy model logic

- Other factors/frictions cause women to earn less after entry
- Confirms SBO findings on incorporated+unincorporated ents (e.g., Robb 2002)
- Conditioning on founding industry closes $\approx 1/3$ of the gender gap

Quantifying the Role of Labor Market Experience

Research Designs: Shocks to initial industry assignment

1. Across-initial-CZ, within-current-CZ-cohort

- E.g., in Boston at 35, at 22 in Salt Lake versus at 22 in Akron
- Outcome is ever founding after 22
- Assumption: Error among movers in the same CZ now

2. Across-cohort, within-CZ

- E.g., 1979 versus 1980 cohort in Salt Lake at 22
- Outcome is ever founding after 22
- Assumption: Error in adjacent cohorts in the same age-22 CZ

Decomposition of Direct Effects (In Progress)

Panel A. Differences in Characteristics (1980 Cohort)				Panel B. Share of Outcome Difference Explained			
	Characteristics				Wealth	Experience	Exposure
	Wealth (\$K)	Experience (%)	Exposure (%)				
Pooled Sample	59.2	2.62	4.93				
Men	61.2	2.75	4.94				
Women	57.5	2.5	4.92	<i>Men versus Women</i>			
Difference	3.7	0.25	0.02	P(ent)	0.1%	29.1%	≈0
T10 Par. Inc.	211.7	2.83	4.92				
B90 Par. Inc.	40.3	2.53	4.93	<i>Top 10 versus Bottom 90 Parent Income</i>			
Difference	171.4	0.3	-0.01	P(ent)	3.2%	25.0%	≈0
ORG Races	99.5	2.68	4.92				
URG Races	39.6	2.26	4.69	<i>ORG versus URG Races</i>			
Difference	59.9	0.42	0.22	P(ent)	2.4%	48.8%	18.8%

Diffusion

- Diffusion of new technologies (e.g. ICT)
- Diffusion of productivity-related management practices (WMS, MOPS, etc.)
 - **Structural Policies**
 - Competition
 - Trade
 - FDI
 - Education
 - **Direct policies**
 - Consultancy-style interventions
 - Classroom training
 - Information