The Rise of American Ingenuity: Innovation and Inventors in the Golden Age
Akcigit, Grigsby, Nicholas (2017)

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Motivations

Background

- Innovation and technological progress at the core of endogenous growth literature

Filling the Gap

- Long Run evidence missing because of data limitation

Contributions

- A unique dataset : Comprehensive US patents (6 million patents) between 1880 and 1940 at the level of the individual inventor, matched to US Census Data (46 percent match)
  - Patents: commonly used measure of innovation
  - Low access cost to patenting: key to the approach
- A Framework for Analyzing Key macro and micro-level determinants
  1. At the state level (macro): examine population density, financial development, geographical connectedness, social structure
     - Instrument Variables to reveal the causal effect of invention on growth: OSRD contracts for wartime technological development
  2. At the inventor level (micro): examine life cycle, education and migration decisions

Main Findings

		Agree	Disagree	New Fact
Fact 1	More inventive states and sectors **grew faster** on average.	✓		
Fact 2	**Densely-populated** states were more inventive.	✓		
Fact 3	**Financially-developed** states were more inventive.	✓		
Fact 4	**Geographically-connected** states were more inventive.	✓		
Fact 5	States associated with **slavery** were less inventive but **religiosity** is not robustly correlated with inventiveness.	✓	✓	
Fact 6	Inventors were **more educated** on average and were most productive between the age of **36 and 55**.	✓		
Fact 7	Inventors were **positively selected** through exit early in their careers, but were less productive and more likely to exit late in their careers.			✓
Fact 8	The patents of **new inventors received more citations** on average, and were more likely to be in the top decile of the citations distribution.			✓
Fact 9	Inventors **delayed marriage** and had **fewer children**.			✓

Main Findings

Fact 10	Inventors were more likely to **have migrated** from their state of birth. They moved to states that were more conducive to innovation.			✓
Fact 11	**Father's income** was correlated with becoming an inventor. This effect disappears once **child's education** is controlled for.			✓
Fact 12	Successful patentees had substantially higher **labor income**, even controlling for demographics and education.	✓		
Fact 13	Inventor's income was highly correlated with the **quality of invention** measured by patent citations.	✓		
Fact 14	Broad measures of **income inequality**, such as 90/10 ratio, Gini coefficient, were negatively correlated with innovation.	✓	✓	
Fact 15	However, the **top-1% income share** has a U-shaped relationship with innovation.	✓	✓	
Fact 16	Innovation was strongly positively correlated with **social mobility**.	✓		

For myself (not keep)

Findings interpretations

- 1 Contribution : provided empirical evidence. Estimate suggest that if MA and WY have the same GDP per capita in 1900 and pop density, in 2000, MA would be 30% richer than WY just because differences in innovativeness. OSRD contracts for wartime techno development as an instrument for innovation
- 2 A one standard deviation increase in the percent of a pop living in an urban area is associated with an increase in innovation that is 41.5% of its mean.
- 3 Financial development as bank deposits per capita in 1920
- 4 Geographic connectivity may increase innovation both by allowing inventors to sell their inventions to a larger market, and by encouraging the fre exchange of ideas across geographies. Positive relationship holds for non-western states, that had much lower transporation costs in general
- 5 Wright (1986) for the slavery argument, Weber (ascetic protestanism) for the religion argument. See Benabou's literature (negative relationship between religiosity and innovation in the US)
- 6 Straightforward
- 7 Same

For myself (not keep)

Findings interpretations

- 8 Same
- 9 Same
- 10 Same
- 11 Capturing only inventors early in their career because must be same household. Potential mechanisms: wealth of parents, credit constraint, better-connected social circles, useful skills from parents. When including the child's own eduaion, the effect of parental income disappears, suggesting that parental income only positively affects the proba of becoming an inventor through its effect on children's access to education
- 12 Straightforward
- 13 One the one hand, if innovation dislaces incumbent firms and creates new wealth for competing entrants, more innovative societies are more likely to have lower income inequality (Jones and Kim). However, if innovation primarily strengthens incumbent firms, allowing them to increase markups and constrain output, income inequality in a society may rise with its level of innovation.
- 14 Straightforward

Remaining Questions / Comments

- Macro level: The OSRD IV tries to make the case from correlation to causality of invention on growth. Why is this result not more emphasized in the framing of the paper?
- Data: Are the sample of matched / unmatched inventors (to Census data) *"balanced"*? Across states?
- Policy: How to interpret the findings (especially macro ones) in light of policy?
- Is there any *"path dependence"* and peer effects: do inventors live in states with more inventors, *ceteris paribus*?
- Methodology: Why favor state level over county level for the main analysis?
- What about the role of major (scientific) schools?