

Nationalistic Labor Policies Hinder Innovation

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Summary

- Does access to high-skill foreign labor affect innovation?
- Important topic
 - Innovation key driver of economic growth
 - High-skill foreign labor major source of innovation
 - Policy makers need evidence on outcomes

Summary

- Examine access to H1B workers by US financial institutions around the financial crisis
- Employ American Workers Act (EAWA) prevented financial institutions that took TARP money from applying for new H1B workers (until TARP funds paid back or EAWA ended)
- Paper looks at financial institutions that took TARP money
- Measures differential exposure to EAWA ban (based on pre-crisis fraction of H1B workers who are STEM)
- Reduction in patenting for more exposed financial institutions during EAWA prohibition on hiring H1B workers

Identification Strategy

- The challenge:
 - Even in the absence of EAWA, would expect decrease in innovation by financial institutions during crisis
 - Financial institutions with more STEM H1B workers before the crisis may be different and have different exposure to the crisis
 - Authors are very aware of this issue, a lot of discussion in the paper when introducing diff-in-diff strategy
 - It would be helpful for the reader if there were more summary statistics showing the characteristics of the treated and untreated firms

Identification Strategy Suggestion

- There are two ways for firms to innovate: (1) develop internally and (2) acquire innovative small firms
- Do EAWA constrained firms increase acquisitions of small innovative firms?
 - Innovation based story predicts constrained firms acquire more. This is a way to obtain innovation despite hiring constraint.
 - Alternative stories based on differential exposure to financial crisis, predicts fewer acquisitions (e.g., worse opportunities, financial constraints, etc.)

Measurement of Key Variable

- Treatment effect is measured based on the fraction of H1B workers who are in STEM
 - Firm A: 1 H1B STEM worker; 50 STEM workers total $\rightarrow 1$
 - Firm B: 100 H1B workers, 50 in STEM; 50 STEM workers total $\rightarrow 0.5$
- Ideal measure is fraction of STEM workers in the financial institution who are H1B workers
- Problem is that domestic STEM workers not directly observable
- Proxy for domestic STEM workers using names on patent applications combined with name-nationality imputing algorithms

Timing

- Unit of observation is firm-month. Dependent variable is patent filings in month.
- Affected period begins the month EAWA H1B application restrictions begin until the month restriction ends
- I would expect much slower reactions
- The H1B hiring process is not fast
 - If a firm today, May 23, 2023, wants to hire a new H1B worker, the earliest possible start date is October 1, 2024
 - Depending on the time of year and how quickly the H1B quota is hit, lag between filing used to identify attempt to hire H1B worker and start of employment can be anywhere from 2 to 18 months
 - Authors could use variation in the lag between filing and employment start date to sharpen tests → useful variation in when effect would be expected to appear

Timing

- Lag between employment start and patent filing
 - Standard in the patent literature to look at three to five year window after an event (e.g., Bernstein et al., 2019)
 - Lerner, Sorensen, and Stromberg (2011) and Brav, Jiang, Ma, and Tian (2018) find takes around two years before observe increase in patenting. Bena, Ortiz-Molina, and Simintzi (2022) find four year lag.
- Authors find large drop in patenting by first-time inventors
 - Cannot observe when first-time inventor hired
- Authors suggest financial institutions hire inventors with pre-existing innovations and then file for patents
 - If innovation already developed, why is there a need to hire the person? Why not purchase or license?

Patent Quality

- The authors find EAWA restrictions associated with a decrease in patent quality (fewer avg. cites per patent)
- Should hiring constraints increase or decrease *average* patent quality?
 - Suppose a firm has a set of N innovative projects that it would undertake in the absence of hiring constraints
 - If subject to hiring constraints, should prioritize and allocate limited labor to most important projects, drop least important projects
 - I would expect a decrease in total citations but an increase in average citations per patent

Overall

- Very interesting paper on important policy topic
- Combine: (1) Restrictions on H1B hiring by financial institutions that take TARP funds and (2) Pre-crisis variation in use of H1B STEM workers
- Find that more exposed institutions have greater reduction in innovation