Discussion

Human Capital, Skilled Immigrants, and Innovation

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What does the paper do?

- Innovation outcomes due to the supply shock (in 2004) of high skilled immigrants workers on immigrant-dependent firms
- Outcome variables: R&D expenditure, patents, number of citations.
- Treated group: employers that have at least 20 high skilled immigrant workers
  - "using a lower number, dramatically increases the number of sample firms and it becomes much more difficult to get a high-quality match for the control group of non-dependent firms"
- Matched group: propensity score matching method

Comments

- Restricting to 20 workers
- Selection bias?
- Arbitrary: same filter for all industries (20 is large for chemicals and relatively small for IT/software)
- Total 774,786 firm-year observations for the period 2002–2011 in the dataset: With the filter, authors obtain 18,693 firm-year observations
- How many firm-year observations if there is no restriction or if restriction at 15/10/5 ?

Comments

- Propensity score matching: firm size, leverage, market-to-book ratio, sales, general, and administrative expense (SG&A), R&D expenditures, and patent/R&D as covariates

- Not clear why these covariates
- Use of innovation related variables (R&D expenditures, and patent/R&D) ?
- Reverse causality
- Dangers of ex-post matching: matching on variables that change due to participation (i.e., endogenous)

Comments

- Immigration policy shock (year = 2004 and later)
- Confounding effect of global financial crisis (year 2007/08 and later)
- Graphs: innovation variables decline only after 2006 (effect of financial crisis or immigration policy shock?)
- Financial crisis: firms may postpone expenditure on R&D hiring of foreign workers
  - "During 2002–2008, an average of about 125 H-1B-dependent firms filed petitions to hire H-1B workers but in 2009, the year of the great recession, only 41 firms filed such petitions, respectively"
- With a lag of two (three) years, the decline in innovation outcome is stronger (period coinciding with full blown financial crisis)

Comments

- Real wages have declined for both the immigrant and host-country workers after the immigration policy shock.
- Greater decline for immigrant workers
- If immigrant workers are critically important for firm's innovation (as the paper suggests), one would expect a significant increase in real wages after the negative supply shock
- Decline in real wages: consistent with financial crisis story

Comments

- What can be done ?
- Use firm level data on share of immigrant workers in total workforce (instead of arbitrarily grouping firms as immigrant-dependent and non-dependent using dummy variable)

$$y_{it} = \alpha_0 + \mu_i + \lambda_t + \beta_{it} \frac{immigrants}{total} + \varphi \frac{immigrants}{total} * shock(post2004) + \delta . X'_{it} + \varepsilon_{it}$$

- Instrumental variable method to address endogeneity in addition to propensity score matching