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)

\[ y_{it} = \alpha_0 + \mu_i + \lambda_t + \beta_{it} \frac{\text{immigrants}}{\text{total}} + \varphi \frac{\text{immigrants}}{\text{total}} \times \text{shock (post 2004)} + \delta X_{it} + \varepsilon_{it} \]

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