

Inventor data for research on migration
and innovation: A survey and a pilot
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Discussion

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Overview

- Two substantive pieces:
 - Excellent survey of prior work on high-skilled migration
 - **Ethnic-Inv** database construction and description
 - Combination of authors' inventor database (**APE-INV**, based on Patstat) and **IBM-GNR** (based on US immigration data from early 1990s)

Some questions

- Does high skill migration increase innovative activity in the receiving country?
- Do returning migrants with inventive experience increase innovation in their home country?
- Need three things:
 - Information on migration status – use ethnicity of name as a proxy measure
 - Information on inventive activity – use patent applications as a proxy measure
 - Some kind of natural experiment? – EU expansion?, variations in US immigration laws, etc.

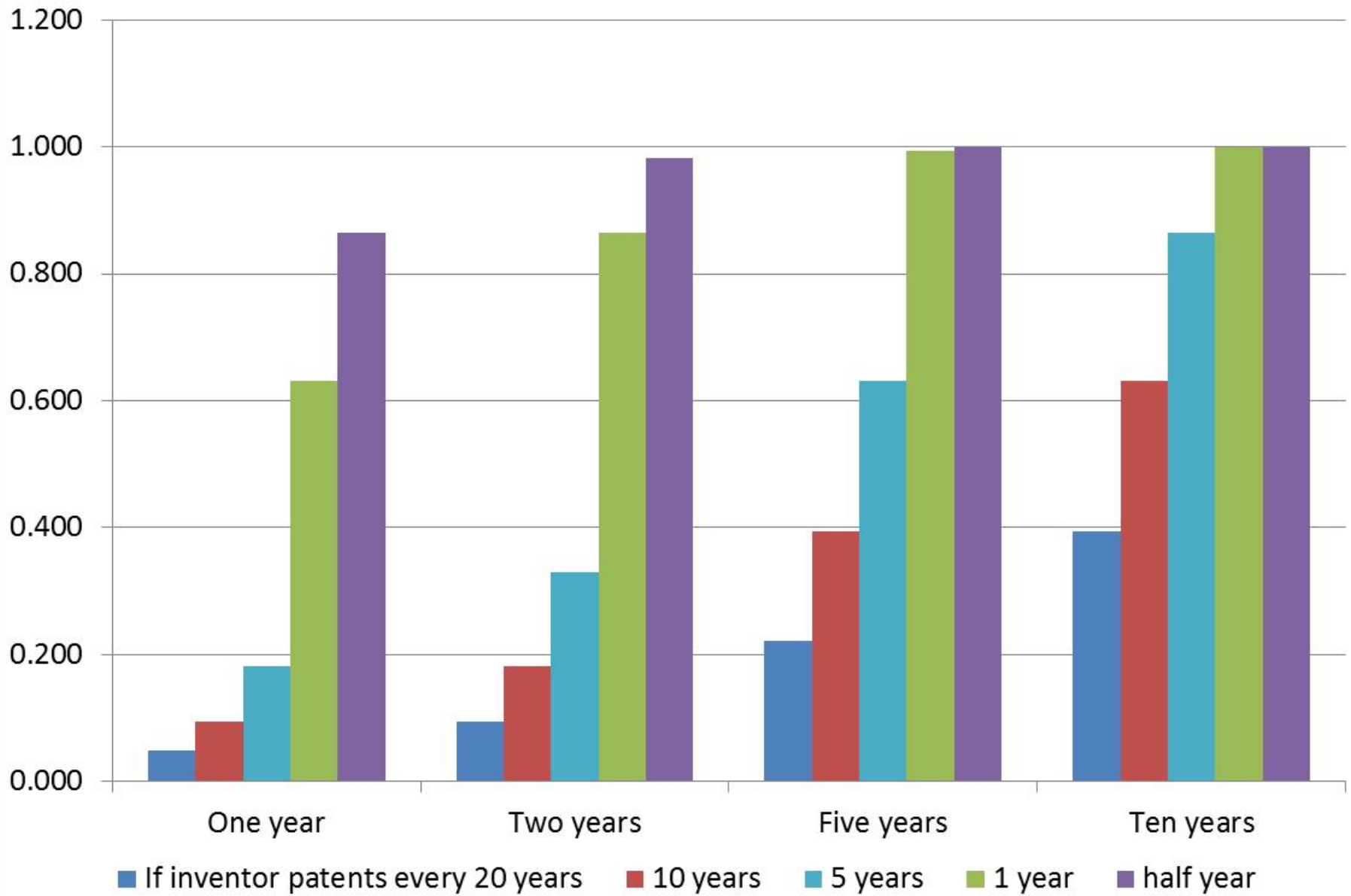
Summary comment

- Advantages of the approach in this paper
 - Captures inventive activity better than simple education measures
 - Relies on administrative data (lower cost)
 - In principle, some technology information
- Challenges
 - Name disambiguation
 - Countries (e.g., US) with multiple ethnicities that may be longtime residents, not migrants
 - Binary nature of patent data as compared to underlying concept it measures
 - Gender – surnames are masculine in general; fortunately most patenting inventors are also male

Patents as a measure

- More than half of inventions/innovations not patented (see *Hall et al. 2013* on UK data, *Fontana et al. 2013* on R&D 100, many others)
- Very skewed value distribution, suggesting skewed input cost also (e.g., cf. pharma and ICT)
- For many inventors, a relatively rare event
 - For some, we observe no patents
 - For others, we observe very few
- Next slide: the probability of seeing at least one patent for inventors with different frequencies of discovery

Probability of observing a patent during different time intervals



Conclusion on measurement

- Data time series is 1978-2009 (early years sparse).
 - Long enough for older inventors
 - Probably not a serious source of bias given entry cohort and technology controls
 - However, measuring underlying returnee invention will be challenging because of shorter intervals.
 - Failure to observe invention before return (no migration)
 - Failure to observe invention after return

Some suggestions

- Construct a simulation model of inventors with varying propensities to patent and to migrate
 - Compute the probability that you will observe migrating inventive activity
- Investigate more carefully the impact of changes in legal EU immigration on patent productivity in the countries they go to (compare UK to others?)
- More ambitious – a behavioral or structural model that allows for learning while inventing, so productivity changes over time (and may interact with mobility)
 - Current paper essentially cross sectional
- Calibration using Miguelez-Fink database (PCT data) and others; combining sources.