The effect of inventor mobility on inventor productivity

MCI Course Term Paper

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15 February, 2017

Outline

Prior Literature

Variation in the mobility of inventors across regions

- Almeida and Kogut (1999) suggested that interfirm mobility of engineers influences the local transfer of knowledge.
- Ge et al. (2016) interpret the higher levels of mobility in silicon valley as the outcome of targeted retention of human capital.
- Unanswered is if the variation in inventor mobility can also explain the variation in innovation productivity in the future.

Research Question

- What is the relationship between the movement of some inventors into or out of a region and the average productivity of inventions from those inventors?

Trends

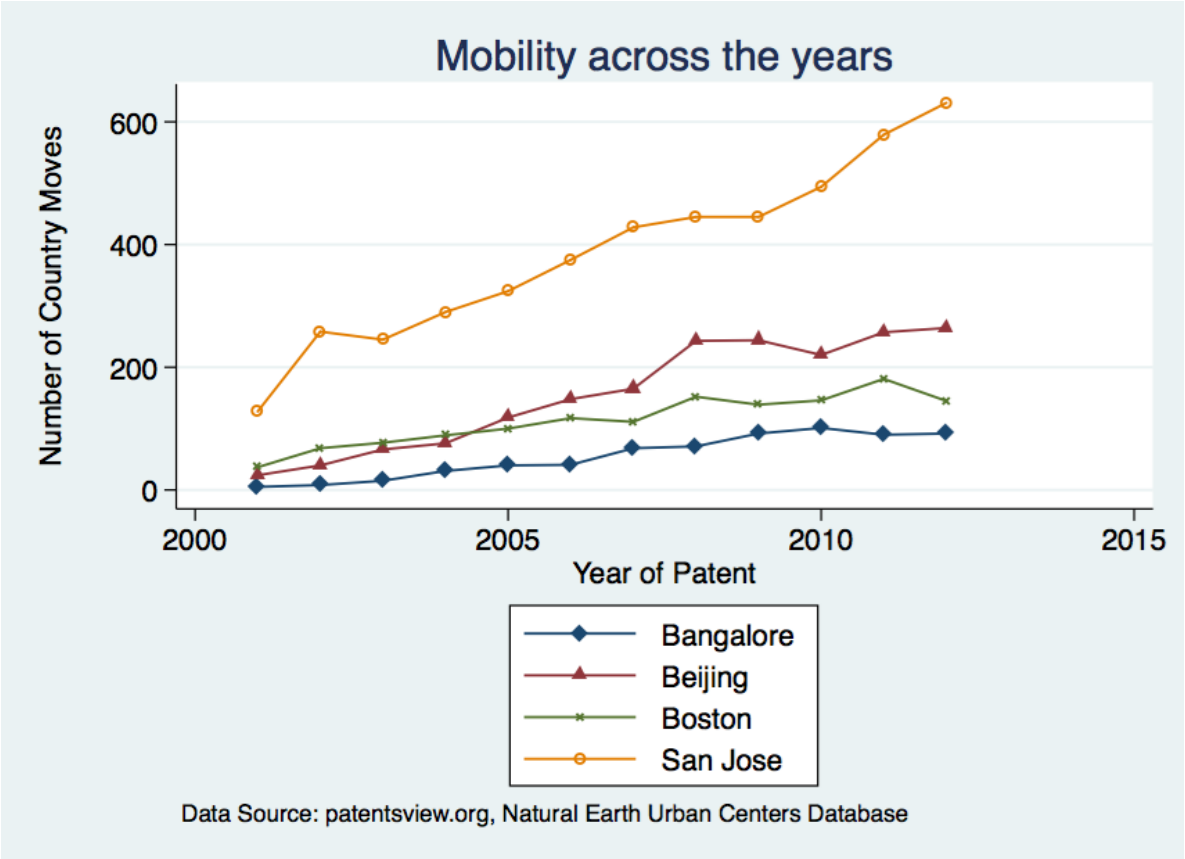

Figure: Country moves by year

Trends

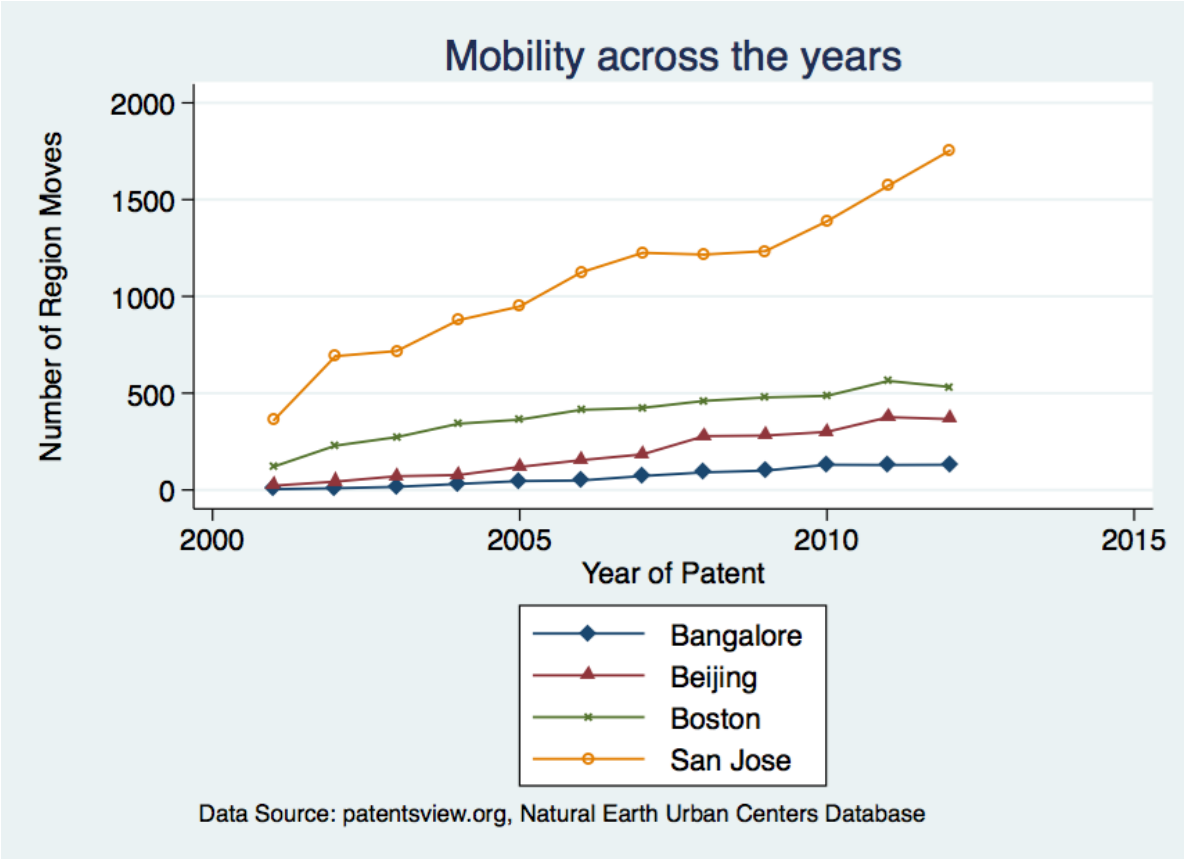

Figure: Region moves by year

Statistics

Table: Summary statistics

Variable	Mean	Std. Dev.	N
Moved Region (MR)	0.06	0.238	4368062
Moved Country (MC)	0.021	0.143	4368062
Productivity	1.79	2.647	4368062
Prior Patents of Inventor (PPI)	4.716	16.718	4368062
Prior Patents of Team (PPT)	24.557	112.7	3721064

Relevance of Answering the Research Question

- Received wisdom earlier was that firms would locate themselves in economic agglomerations to benefit from knowledge spillovers (Jaffe et al., 1993).
- Zhao (2006) has argued that multinational enterprises may benefit from conducting R&D in countries with weak IPR protection by making up for the weaker IPR protection through better internal organization.
- The anecdotal increase in the mobility of employees at the weak IPR subsidiaries raises a potential paradox.
- If increased mobility of employees influences transfer of knowledge (Almeida and Kogut, 1999), should we expect higher productivity from inventors in those teams into which other inventors have moved in?
- The answer to this question is not completely explained by theory

Managerial and Policy Implications

- The innovation policy of emerging countries is influenced with the expectation that the presence of multinational R&D will create value adding spillover effects.
- Productivity of innovation provides a richer proxy for value adding innovation, and effects of inventor mobility may inform innovation policy
- Current work may inform managerial decisions about how to organize R&D teams around the world

Hypotheses

- H1: An increase in the average mobility of inventors in a region increases the average productivity of the inventor
- H2: The effect in H1 is moderated positively by the strength of the prior pool of inventions by the inventor
- H3: The effect in H1 is moderated negatively by the strength of the prior pool of inventions by the inventing team

Methodology

- Data Source: Patents from USPTO, source: patentsview.org
- Unit of Analysis: Inventor-Year
- Dependent Variable: Productivity of inventor in a year
- Primary Explanatory Variable: Mobility of innovators (Between-Region Mobility, Between-Country Mobility)
- Moderating Variables: Prior patents of inventor (PPI), Prior patents of team (PPT)
- Control Variables: Technology subcategories, Year effects

Results

Potential Issues

- Direction of Causality
- Underestimation bias of mobility - effects
- Mechanism by which mobility affects productivity - other explanations
- Alternative measures of productivity

Almeida, P. and Kogut, B. (1999). Localization of knowledge and the mobility of engineers in regional networks. *Management Science*, 45(7):905–917.

Ge, C., Huang, K.-W., and Png, I. P. L. (2016). Engineer/scientist careers: Patents, online profiles, and misclassification bias. *Strategic Management Journal*, 37(1):232–253.

Jaffe, A. B., Trajtenberg, M., and Henderson, R. (1993). Geographic localization of knowledge spillovers as evidenced by patent citations. *The Quarterly Journal of Economics*, 108(3):577–598.

Zhao, M. (2006). Conducting r&d in countries with weak intellectual property rights protection. *Management Science*, 52(8):1185–1199.