The effect of inventor mobility on invention complexity

ETIG Course Term Paper

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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 complexity of future inventions.

Research Question

- What is the relationship between the movement of some inventors into or out of a region and the average complexity of inventions of employees working in the affected regions?

Relevance of Answering the Research Question

- Received wisdom earlier was that firms would have a greater incentive to keep highly dependent technology developed in weaker IPR countries secret (Cohen et al., 2000).
- However 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 complex inventions 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.
- Complexity 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 complexity of innovation generated from that region
- H2: The effect in H1 is moderated positively by the relative strength of the intellectual property rights regime of the region

Methodology

- Data Source: Patents from USPTO, source: patentsview.org
- Unit of Analysis: Region-Year
- Dependent Variable: Complexity of innovation
- Primary Explanatory Variable: Degree of mobility of innovators
- Moderating Variable: IPR Score
- Control Variables: Technology classes, Firm effects, Year effects

Potential Issues

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

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

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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.

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