Explore the micro-foundations of human capital externalities: knowledge spillover, labor market matching, specialization, or diversity?

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**Introduction**

The study of micro-foundations of human capital externalities (HCE) is lagging behind the study of micro-foundations of urban agglomeration economies. One reason is the limited tools researchers have to measure different dimensions of human capital. By derive information from Occupation Information System (ONET), this study try to export the following potential human capital externality micro-foundations:

- Knowledge spillover
- Labor market matching
- Labor market specialization
- Labor market diversity

**Data and Measurements**

- Learning or knowledge spillover is believed to be the key mechanism behind human capital externality (Jacobs, 1970). It works through workers exchange of ideas, imitation, or learning by doing. Therefore, the presents of high level of aggregated human capital (measured as share of workers with top 20% ability) in a local labor market is used to identify the knowledge spillover effect.

- Larger labor markets are more efficient for employer and employee matching. Labor market matching effect is proxy by log of population size. This is similar the “urbanization effect”

- Labor market specialization and diversity might be important to HCE. The measures are built upon the occupation clusters developed by Feser (2003). He defines clusters of occupations based on the knowledge domains, where knowledge structures are similar within the clusters and the different across the clusters. 21 clusters are defined. Specialization is the percentage share of certain cluster, and diversity is defined using Herfindahl-Hirschman Index.

**Results**

- I find evidence of positive knowledge spillover effects. The effect is the strongest for highest educated group.

- Labor market matching seems to be more important for the high school, some college and college degree holders. It does not seem related to wage growth for high school drop outs and post college degree holders.

- Labor market specialization always negatively impact wage.

- Labor market diversity only negatively impact wage for high school graduates.

- I find no imperfect substitution effect between increasing demand for high skill labor and demand for low skill labor.

My findings are quite different from early work based on 1980 and 1990’s data (Moretti, 2004). Further investigation is needed to find out if the discrepancy is an issue of identification or fundamental change in the labor market (i.e. labor market polarization b/c technology change, Autor and Dorn, 2009).

**Identification strategies**

A Mincerian wage model, similar to Moretti (2004) is used.

- Unobserved personal characteristics: such as cognitive abilities, non-cognitive abilities, and efforts. I propose using occupation fixed effect to control for individual unobserved characteristics, because occupation is a labor market matching outcome, and it is a dynamic process.

- Unobserved MSA characteristics: The time in-variant characteristics are controlled by MSA fixed effect. I try to control the following time-variant characteristics: unemployment rate, labor demand shock, housing cost, population size, share of potentially innovative workers, labor market specialization measures, and labor market diversity measures.

- MSA*Occupation fixed or random effect models are used.

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