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KNOWLEDGE SPILLOVERS, ABSORPTIVE CAPACITY AND ENTREPRENEURSHIP IN U.S. CITIES (INTERACTIVE PAPER)

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INTERACTIVE PAPER

KNOWLEDGE SPILLOVERS, ABSORPTIVE CAPACITY AND ENTREPRENEURSHIP IN U.S. CITIES

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Principal Topic

This paper studies knowledge flows, as measured by patent citations, between pairs of US cities. It adds to the knowledge spillover literature by quantifying the distance within which knowledge flows are localized in the US. This analysis further allows us to estimate the knowledge absorptive capacities of cities. Differences in absorptive capacities are explained by local economic conditions such as the entrepreneurial, innovative, and industrial structures of the cities. Given the limited research on knowledge absorption beyond the firm level, the paper significantly contributes to that literature.

Method

We use the NBER patent citation database to measure the citations made by patents granted to 106 US MSAs/PMSAs (cities) in the 1990s to prior patents granted to these cities. Excluding same city and few instances of zero citations, a sample of 11,106 observations is constructed. Using the variable transformation method of Hirschberg and Lye (2001), we directly estimate using distance dummy variables the geographical distance within which citations between cities are higher than average. Unit specific effects of the citing and cited cities, are controlled for with a series of dummy variables. The coefficients of the citing city dummy variables provide a measure of the external knowledge absorption capacities of the cities. Data on local economic conditions are used to explain differences in such absorptive capacities.

Results and Implications

The paper finds that citations are greater than average when cities are within 800 miles. The effect of distance is non-linear; the effect is much stronger at closer distances like 50 miles than at 500 miles. Once distance dummy variables are included, state borders provide no additional information.

The second stage of the estimation finds that more entrepreneurial, innovative, and diverse cities absorb more external knowledge. The business churn rate has a stronger positive effect on knowledge absorption than other measures of entrepreneurship. Based on industrial and patent Herfindahl indexes, the results support the Jacob's (1969) hypothesis that diversity of economic activity is beneficial. "Company towns" identified by Agarwal *et.al.* (2010) as myopic, absorb less external knowledge supporting that paper's hypothesis. Furthermore, concentration on computer and medical patents increase knowledge absorption. These results identify another channel through which policies promoting entrepreneurship and innovation can positively impact cities.

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