

Essays on Agglomeration in the U.S. Manufacturing Industries, 1988-2003

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This dissertation consists of two essays dealing with the trends in industrial agglomeration and changes in the influence of micro-determinants of agglomeration due to globalization in the U.S. manufacturing industries for the period 1988-2003. The first essay discusses the trends in manufacturing agglomeration and the second essay discusses the impact of globalization on the micro-determinants of agglomeration.

First essay explores recent agglomeration trends in the U.S. manufacturing industries between 1988 and 2003 using employment and employment-based agglomeration measures such as Ellison-Glaeser Index and Gini index and using Herfindahl index which is a measure of industrial concentration due to scale economies. Between 1988 and 2003 forty two states lost and eight states gained manufacturing employment with a loss of more than 5.13 million manufacturing jobs nationwide. Middle Atlantic, New England, and South Atlantic are the three divisions with highest drops in manufacturing employment with Middle Atlantic division's loss of 45 percent jobs, New England division's loss of 44 percent and South Atlantic division's loss of 28 percent jobs in the manufacturing industries. Three states that experienced the most decrease in manufacturing jobs in 2003 measured in percent of their 1988 employment are New Jersey (51 percent); New York (51 percent) and Connecticut (48 percent). Textile and apparel industries, metal related industries and leather and leather goods industries etc. are among the industries that experienced relatively higher attrition in manufacturing jobs in 2003. Three trends are apparent. First, employment has declined across regions, years and industries. Second, the industries that were among the most agglomerated industries in 1988 have generally displayed decrease in agglomeration indices (both in terms of EGI and Gini measures) later years including 2003. This trend may imply that for these industries, attrition of manufacturing employment in later years mainly occurred from the counties with relatively higher share of employment in the concerned industries in 1988. Third, industries that are found to be least agglomerated in 1988 have often displayed increase in agglomeration in later years including 2003. This trend may imply that for these industries, attrition of manufacturing employment in 2003 mainly occurred from the counties with lower employment share of the concerned industries in 1988. Similar trends are observed for the Herfindahl indices. Changes in the Herfindahl indices may be due to changes in traditional scale economies caused by advancements in the ICTs.

This second essay explores the differential impacts of technological advancements and trade liberalization on the three Marshallian determinants of industrial agglomeration for U.S. manufacturing industries. These three micro-determinants of agglomeration are goods pooling (input sharing), labor pooling (availability of labor), and idea pooling (knowledge spillover). The impact of decrease in employment on industrial agglomeration is ambiguous, and warrants empirical investigation. An index of agglomeration index is regressed on proxies for three micro-determinants of agglomeration, after controlling for transportation costs, natural advantage and other state level economic variables, and after inclusion of interaction variables for technological advancement and trade liberalization. The regression results for both the OLS and FE specifications are consistent with the hypothesis that there was a structural change in the effect of the micro-determinants of industrial agglomeration in the U.S. manufacturing industries beginning in 1995. Innovative use of time dummy variable (representing technological change since the mid 1990s), and average tariff rate (representing a proxy for trade liberalization) allow us to classify gross impact of globalization on micro-determinants into two separate segments: impact of technological advancements and impacts of trade liberalization. The results are partially consistent with the hypothesis that globalization has attenuated the effect of micro-determinants on agglomeration for U.S. manufacturing industries. This attenuation is statistically more apparent for labor pooling and idea pooling, but not for goods pooling. The key findings are robust to alternative specifications of the econometric model, particularly to changes in the proxies used for LP.