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Industrial reallocation across US cities, 1977–1997

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Abstract

Between 1977 and 1997, US employment shifted dramatically in favor of industries that used skilled labor intensively. During this same period, some cities withered while others prospered. This paper examines employment growth in 39 industries across 316 cities to evaluate the importance of learning by doing, industry-specific location fundamentals, human capital externalities, and hiring cost explanations in these geographic shifts. Growth in industries that used skill intensively was particularly sensitive to the presence of local human capital. That growth was almost always negatively related to the initial size of the industry within the city implies a limited role for learning by doing and industry-specific location fundamentals stories.

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“(In a dynamic economy—i.e. rapid change in technology and demand—a major challenge to entrepreneurship is the conversion of old resources to new uses.” Benjamin Chinitz [9].

1. Introduction

According to a recent article in *The New York Times*, “slowly but steadily, a high-technology phoenix is rising on the steel shards of Easton, Bethlehem, and Allentown, the towns that comprise the Lehigh Valley. [...] Some 65 high-technology companies have moved into the valley or been founded there in the last five years, representing 38,500 jobs—or about 12 percent of the area’s total employment. It is a striking example of the

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extent to which high technology is transforming some of the most damaged areas of the Rust Belt's industrial economy" [11].

In the last quarter of the 20th century, the composition of industrial employment transmogrified, shifting away from goods production and towards service production. Between 1977 and 1997, employment in the steel industry fell by nearly 40 percent from 1.2 million to 730,000; employment in transportation equipment declined from just under 1.9 million to 1.67 million; and employment in textiles and apparel from 2.3 to 1.45 million, a decline of 36 percent.¹ By contrast, employment in the service industries soared by 250 percent in business services from 2.3 to 8.1 million, and by 216, 201, and 196 percent in health, professional, and social services.

It took nearly a quarter of a century for the steel cities of Pennsylvania to recover from the steel shocks of the 1970s and 1980s. To take one particularly hard-hit area, overall employment in the Beaver County, PA metropolitan area declined by 20 percent between 1977 and 1997, driven largely by an 87 percent (!) decline in steel employment. Was it inevitable that overall employment would decline in response to the decline in demand for steel? Blanchard and Katz [5] pointed out that negative shocks need not lead to a decline of the city as a whole. As demand for the city's output declines, the demand for labor falls, thus reducing wages, in response to which firms in newer, rising industries might enter. However, their evidence indicated that job formation in regions that experience declines in labor demand responds only weakly to movements in wages; most of the adjustment to a decline in labor demand takes the form of out-migration.²

If, as Blanchard and Katz [5] argued, firms respond only weakly to falling wages and rents, what *do* firms respond to? A number of recent theories of urban growth might help shed light how cities adjust to shifts in the pattern of labor demand. Learning-by-doing stories (Premer and Walz [29], Brezis and Krugman [7], Soubeyran [33]) imply that an initial presence of an industry may give rise to faster subsequent employment growth in that industry. Stories of growth based on an extension of the theory of location fundamentals (Davis and Weinstein [10]) also suggest such a relationship. By contrast, stories of growth based on human capital externalities (Lucas [20]) suggest that cities with higher average levels of human capital might grow faster provided that human capital—in the language of Henderson et al. [17]—gives rise to a dynamic externality, as would be the case if the rate of technological progress is related to the current stock of human capital.

Most theories of urban growth take the overall structure of industry demand in the economy as constant. However, the last quarter of the 20th century was characterized by dramatic industrial change in which resources were being freed from certain sectors and could flow into new ones. In particular, as will be seen, industries that used human capital

¹ Declines in some smaller industries were even more pronounced: employment in leather and leather products declined from 255 to 87 thousand, or by 66 percent, and employment in petroleum and coal products fell from 151 to 115 thousand, a decline of nearly 24 percent. Employment did, however, rise in some goods-producing industries: employment in instruments rose by 47 percent, and employment in printing and publishing by 34 percent, compared with a rise of total private employment of 62 percent. Most of the increases, of course, were outside of manufacturing.

² Partridge and Rickman [28, p. 14] find that demand shocks dominate supply shocks in explaining relative regional growth, but that migration innovations are still an important source of job growth fluctuations.

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