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Human capital and the rise of American cities, 1900–1990

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Abstract

We propose that cities that start out with proportionately more knowledgeable people grow faster in the long run because (a) knowledge spillovers are geographically limited to the city and (b) much knowledge is most productive in the city within which it is acquired. We found that city-aggregates and metropolitan areas with higher average levels of human capital grew faster over the 20th century. The estimated effects of human capital were large: a standard deviation increase in human capital in 1900 was associated with a 38% increase in average annual employment growth of city-aggregates over the period 1900–86. The estimated effects for metropolitan areas were smaller but still economically significant: a standard deviation increase in 1940 human capital was associated with an increase in average annual employment growth over the period 1940–90 of about 15%. Although the rise of the automobile appears to have overwhelmed the importance of human capital in cities dominated by manufacturing early on, human capital seems to have been economically more important in manufacturing cities than in non-manufacturing cities later on. Moreover, the estimated effects of human capital persisted for very long periods of time, suggesting either that adjusting to the steady state is very lengthy, or that shocks to growth are correlated with the presence of human capital.

Keywords: Urban growth; City growth; Human capital; Spillovers

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1. Introduction

Between 1860 and 1920 the number of American cities with 10 000 or more people increased from 93 in 1860 to 752 in 1920; the number with 100 000 or more people increased from 9 to 68. As Schlesinger (1933, p. 435) put it, the era witnessed the 'momentous shift of the center of national equilibrium from the countryside to the city.'[1] Not all cities, however, participated equally in the transformation. Some cities experienced unprecedented population growth; other cities were nearly stagnant; and still others shrank. What determined which cities rose and which fell?

In this paper we examine the potential for human capital to offer an explanation. This is not the first paper to study the link between city growth and human capital. Empirical papers by Glaeser et al. (1992, 1995); Nardinelli and Simon (1996) and Simon (1998) have identified human capital as a determinant of city growth in the post-World War II period, and Beeson et al. (1999) identified human capital infrastructure as a determinant of county growth over the period 1840–1990. The theoretical starting point of these papers was Lucas (1988), who suggested that the very *existence* of cities was evidence of the external effects of human capital: 'What can people be paying Manhattan or downtown Chicago rents *for*, if not for being near other people?' (p. 39).[2]

In contrast to most previous research, which has examined the relationship between human capital and city growth in the post-World War II period, this paper focuses on the early 20th century, when America had only just embarked on her transition from agriculture to manufacturing. The data also permit examination of longer time periods than most previous studies. This is of interest because the models of Eaton and Eckstein (1997) and Black and Henderson (1999) predict parallel growth of human capital, and therefore, of employment across cities in the long run. Their models suggest that the initial effects of human capital should die out. Our analysis allows us to determine whether this was empirically the case for US cities.

Our study has a number of limitations. The fortunes of cities are linked in large

[1] Schlesinger began a long tradition of stressing the importance of cities to American economic development, much of it a reaction to Frederick Jackson Turner's emphasis on the frontier as the driving force in American economic history. The most thorough statistical study of world urbanization in the nineteenth century remains Weber (1899). For a history of American cities, see Glaab and Brown (1967). For short discussions, particularly of the nineteenth century, see Davis et al. (1972) and Higgs (1971).

[2] Recent models of city growth that incorporate human capital externalities into models of city growth include Palivos and Wang (1996); Black and Henderson (1999) and Eaton and Eckstein (1997). Other driving forces of city growth include increasing returns to scale in producer and consumer services (Abdel-Rahman and Fujita, 1990; Abdel-Rahman, 1988; and Rivera-Batiz, 1988). Ioannides (1994) adapted the Dixit–Stigler–Romer model of product diversity as a growth model for a Henderson-type system of cities with an overlapping generations structure.