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‘Transport and urban growth in the first industrial revolution’

Cities generally grow with the process of economic development. Sometimes change is so radical that a new urban-industrial cluster emerges. Britain experienced such a fundamental change in economic geography during the industrial revolution. Around 1680 most of the urban population was in or near London and most other towns were very small in comparison. By 1841 a large urban cluster emerged in the northwest near towns like Manchester, Liverpool, and Birmingham.

What factors encouraged the labor force and firms to choose certain locations, like the cities and towns in the northwest or London? The traditional view is that endowments, most importantly coal, was the major factor determining location. A different explanation stresses access to markets, giving some towns advantages in attracting workers and firms. Market access was a function of geographical location, transport infrastructure, and technology. The latter two were transformed by an early revolution in transport in England and Wales. New canals, bridges, and ports were built, while existing roads and rivers were improved by trusts and joint stock companies. Technology changed through innovation in vehicles, like wagons, coaches, and sailing vessels.

In this paper we estimate market access using transport costs derived from a multi-modal freight model. It incorporates networks through new GIS data on roads, inland waterways, ports, and coastal shipping routes. These networks are further differentiated by infrastructural quality measures based in historical sources. Geography is incorporated through the slope of the terrain. Technology is incorporated through transport cost parameters, like coastal freight rates per mile, estimated from historical sources. Our model identifies the least cost route across all available networks between 458 towns at two benchmark dates, 1680 and 1830. We then show that the lowest freight cost between towns declined dramatically relative to the price of coal. We construct a market access variable using the inverse trade cost weighted sum of English town populations or other measures of market size.

Our reconstruction of inter-urban transportation infrastructure and technology shows that market access increased substantially across most of England and Wales in the pre-steam era. However, the degree of change was very different across space and depended on transport change. Originally market access was high only near London and some coastal areas. By 1830 market access increased substantially in the midlands and northwest industrial clusters, approximately equaling market access near London.

In our final analysis we estimate the effects of changes in market access on town population growth from 1680 to 1841, controlling for endowments. The results show that changes in market access are robustly associated with higher population growth. The importance of transport is further illustrated using a counterfactual, where transport networks and technology are assumed to not change between 1680 and 1830. We find that the total urban population in England and Wales would have been 17% lower in 1841. In summary, our findings imply that changes in transport infrastructure and technology had a large impact on the size of many important towns during the industrial revolution.