Growth or redistribution?
The impact of an intracity transport project on the spatial distribution of economic activity
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1 Research Question

There is a large amount of evidence proving that investing in transportation leads to increased economic activity. However, the literature is thin on whether this increase stems from the creation of new firms or merely from economic activity relocating closer the investment. This research is interested in how an intracity project (the 1999 Jubilee Line Extension (JLE) in London) affected the spatial distribution of activity.

Studies on the redistribution of economic activity find that intercity investments decentralise activity, whereas intracity likely centralise. Chandra and Thompson 2000 finds that new interstate highways raise total earnings for counties close to the investment by 6-8%. However, total earnings fell by 1-3% for counties adjacent to highway counties. This result suggests that interstate highways lead to pure redistribution without net gains in productivity.

2 Data & Methodology

The research uses the firm level Business Structure Database (BSD), which accounts for almost 99% of economic activity in the United Kingdom (Office for National Statistics 2017). This data makes it possible to analyse business unit and employment figures for every Middle-layer Super Output Area (MSOA), which are sufficiently small areas to measure the spatial distribution of activity (5 to 15 thousand inhabitants per MSOA).

Three causal methods are used to identify the shift in economic activity caused by the JLE. First, a differences-in-differences method is employed following Gibbons and Machin 2005 by analysing the impact of reducing the cost of commuting to the centre of London. Second, we use *planned route IV* as a source of quasi-random treatment. There were eight plans developed for the routing of the JLE to regenerate the East London Docklands area (OMEGA Centre n.d.). Similar planned route IV was used by Baum-Snow 2007 or Donaldson 2010. And third, synthetic controls are created for every MSOA area following Abadie and Gardeazabal 2003 using area-specific variables.

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Following Redding and Turner 2015, this reduced form equation is estimated on a panel dataset:

$$E_{it} = \beta_0 + \beta_1 JLE_{it} + \beta_2 X_{it} + f_i + t_i + \epsilon_{it}, \tag{1}$$

E_{it} denotes the number of employees in MSOA i at year t. JLE_{it} is a dummy variable which takes the value of one if an MSOA received the treatment (a new station was opened within 500 meters of the centre of the MSOA). X_{it} denotes time- and location-varying local characteristics - sectoral composition and geographical distance-weighted effective density. f_i denotes location specific time-invariant unobservables and t_t are time fixed effects. ϵ_{it} is a time-varying location specific IID error term.

3   Preliminary results

The new Jubilee line connects the central business district (CBD) with the agglomeration; however, it does not provide direct access to the very centre of the CBD, the City of London. Instead, it connects aspiring business centres, including Canary Wharf, the new financial centre. Travel times to the CBD decreased only by 2 minutes on average; however, capacity increased significantly. No other major public transportation scheme opened in London between 1997 and 2007.

We find that the JLE led to a significant redistribution in the local economy. Areas treated by the JLE experienced increasing company size and increasing employment share of business and professional services. The JLE decreased the concentration of activity in London as it induced growth outside of the City of London.

Estimating Equation 1 for 983 MSOAs in London between 1997 and 2007 shows that employment increased by 12% due to the JLE. However, using planned JLE routes as an IV decreases the effect to 3%. This result shows that treating reverse causality is crucial in estimating the benefits of an intracity transport scheme.

We find no proof of adverse effects of redistribution in untreated areas; therefore, we account the overall increase in employment as real growth. Next steps include a postcode level analysis, a public transportation travel time dose-treatment and the implementation of the synthetic control group method.

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