LSE Spatial Economics Research Centre

Thursday, 5 November 2015

Facebook or Wikipedia? ICT and Education: Evidence from Student Home Addresses

Dr Rosa Sanchis-Guarner, BA Postdoctoral Fellow at the IC Business School and CEP Research Associate

The Government is currently investing over £1 billion to provide superfast broadband to 95% of the UK by 2017. Both the European Union and the US have similarly ambitious plans to increase access to broadband services providing download speeds of 30Mbps or above. These investments are justified as having positive impacts on individuals and businesses, ranging from higher productivity to more flexible working schedules.

One important justification is that better broadband will improve educational attainment. Students of all ages spend a lot of time online, and online educational resources are increasingly popular (YouTube or Wikipedia, or more recently massive open online courses - MOOCs). However, the existin evidence on the impact of broadband is far from conclusive as it is hard to assess the causal impact of broadband on socio-economic outcomes. In ou recent paper we combine a rich collection of microdata with an original empirical strategy to study whether better broadband improves educational attainment. However, despite government investment in this area we find improved broadband has no causal impact on pupils' achievement.

In order to understand the relationship between ICT and educational achievement we set up a simple theoretical model that decomposes the effect int two mechanisms: the impact of ICT on study hours and the impact of ICT on study-hour productivity. On the one hand, reduced ICT costs could have a positive impact on learning productivity as, with faster connections, students can access more online educational content per unit of time (i.e. Wikipedi On the other hand, students might decrease study hours by spending more time online on other activities (i.e. Facebook). The net effect is unclear.

To test between these two hypotheses - Facebook or Wikipedia - we use English microdata that allows us to link administrative test scores for the population of primary and secondary school student to the available ICT at their home addresses. We focus on the impact of ICT on standardised (Key Stage) tests scores for English pupils aged 7 to 16 years old during the period 2002-2008. To causally estimate the impact, we exploit a well-known feature of DSL-broadband technology - that the length of the copper wire that connects residences to the local exchange station is a key determinant o the available internet connection speeds. Capacity constraints at the individual telephone exchange stations lead to invisible and essentially randomly placed boundaries of station-level catchment areas that in turn give rise to substantial and discontinuous jumps in the available ICT across neighboring residences. Variation in available broadband speed stems from jumps in the length of the copper wire that connects residences to their assigned exchange station on the slower side (longer distances to connected exchange) relative to the faster side (shorter distances to connected exchange) of given boundary segment. We exploit this feature across more than 20,000 boundaries in England in a spatial regression discontinuity (RD) design.

The jump in available ICT across exchange station boundaries is substantial. The average difference in residential distances to their connected exchange station between neighboring residences on different sides of the boundary is 725 meters, 2,250 meters when restricting the estimation to the top third of boundary segments with the largest mean difference in connection distances. These discontinuous jumps in copper wire connection length translate into substantial differences in the available ICT across space. We find that the average jump in the time cost of accessing a given amount of online content rises by 22 percent when moving from the slow side of a boundary segment to the faster side of the invisible boundary (47 percent for th top third).

When turning to the effect of available internet speed on test scores, our estimates suggest that even very large changes in the available internet connection speeds have a precisely estimated zero effect on educational attainment. Our robustness checks show that the estimates are causally identified: house prices, student socioeconomic characteristics and access to local (dis-)amenities are unaffected by the boundaries. Using the additio microdata on student time use and internet use to quantify the channels underlying this zero overall effect, we find that jumps in the available ICT have no significant effect on student time spent studying online or offline, or on their study productivity.

Access to fast broadband has been claimed as important for educational success, and the lack of such connections identified as a drawback for the development of rural communities. Our research suggests a less negative scenario. Given the amount of funds committed and the bold claims made about superfast broadband investment, more robust evidence is urgently needed. Some of the future work of the CEP Urbanisation Programme will focus on providing such evidence. So get off Facebook, and watch this space.

Posted by Neil Lee on Thursday, November 05, 2015 G+1 Recommend this on Google

No comments:

Post a Comment

Newer Post Home Older Po

Subscribe to: Post Comments (Atom)