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Title: Internet and firm productivity: a multilevel approach based on experienced broadband speed data

Abstract:

The discussion about the potential productivity gains from digital technologies is almost as old as digital technologies themselves. From early futuristic approaches to the various forms of the productivity paradox, there are still open questions regarding if and how the internet, and its usage, are linked to positive economic effects. The usual caveat to unpack this relationship is data about internet usage that is detailed enough to be linked to economic outputs. This problem becomes even more severe if we are interested in capturing whether such a relationship is affected by the attributes of place and space. To fill this gap we develop a multilevel framework where we combine firm-level microdata with aggregated local authority experienced broadband speed metrics. This allows us to observe individual firms, their productivity, and other firm characteristics and the effects of broadband speeds after accounting for spatial effects and place characteristics. Our main results indicate that it is differences in the top (90th percentile) internet speeds that are associated with higher firm productivity rather than variation in the median whilst, as perhaps expected, these results vary by sector. These findings have significant policy implications, highlighting the material impact of roll-out decisions and presenting policymakers with dilemmas regarding efficiency vs equity.