

How to evaluate case study: Broadband

Instrumental variables method (SMS level 4)

What was the programme and what did it aim to do?

This study analyses the effect of Norway's National Broadband Policy. Implemented from 2001 to 2007, this policy aimed to ensure that the entire country had access to broadband at a reasonable price. To achieve its aims, the Norwegian government built comprehensive broadband infrastructure through a state-owned company called Telenor. To date, Telenor owns most of the broadband infrastructure in Norway. The federal government also disbursed around \$50 million to broadband expansion projects proposed by rural municipalities.

What's the evaluation challenge?

Evaluating broadband provision policies such as this is hard because the areas which receive the infrastructure are usually different to those which do not. In this case, although the policy aimed to achieve universal coverage, due to budget restrictions, areas that were more likely to benefit from the infrastructure were prioritised. This means that areas that received the infrastructure may have had more productive businesses, or households more likely to demand broadband (e.g. better educated or wealthier). As a result of this selection, if we compare differences in outcomes for firms in treated areas to firms in other areas, these differences may not reflect the impact of the programme. Instead, they may simply reflect differences in the other characteristics (e.g. higher education) of areas that receive support.

What did the evaluation do?

The study makes use of a source of randomness in firm adoption of broadband due to difference in the timing of the roll out of the broadband infrastructure across municipalities. The precise timing of when each area got its infrastructure was to some extent random. Therefore the study compares outcomes for firms who had adopted broadband because they are located in a municipality that happened to get its infrastructure early, to firms who had not adopted broadband because they are located somewhere that would only get the infrastructure later on. The method that the study uses to make this comparison is called an instrumental variables approach.

How good was the evaluation?

According to our [scoring guide](#), the instrumental variables method receives a maximum of 4 (out of 5) on the Maryland Scientific Methods Scale. This is because it does well to control for both observable (e.g. deprivation) and unobservable (e.g. quality of governance) differences between treated and untreated areas. To achieve a 4, the instrument (i.e. the timing of infrastructure roll-out) must identify firms that adopted broadband but were not different to other firms in any other way. Since the study examines only firms in municipalities that were due to receive the infrastructure, these firms are likely to be similar in characteristics. The study suggests that the timing of the roll out may have been influenced by topographical and demographic conditions but these are controlled for in the statistical analysis. Therefore we score the study a 4 on the SMS.

What did the evaluation find?

The study concludes that broadband has different impacts on firm productivity, depending on the skill levels of employees. While the policy increased the productivity of skilled workers, it decreased the productivity of unskilled workers. That is, the effect of broadband is strongly skill-biased increasing the

wages of skilled workers and decreasing the wages of unskilled workers. The study suggests that this negative impact on unskilled worker productivity can be attributed to the fact that broadband replaces some low-skilled tasks and leads workers to focus on other tasks in which they are relatively less productive.

What can we learn from this?

Firstly, the study suggests that government-led provision of broadband infrastructure can positively impact firm adoption of broadband. Secondly, broadband may not have universally positive impacts on productivity and wages. In this case, skilled workers gained, while unskilled workers lost out.

Reference

Akerman, A., Gaarder, I., & Mogstad, M. (2013). The Skill Complementarity of Broadband Internet. IZA Discussion Papers 7762. Institute for the Study of Labor (IZA) [Study 620 from our [Broadband review](#)].

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