

Does high-speed internet boost exporting?

Commission Working Paper 2022/2

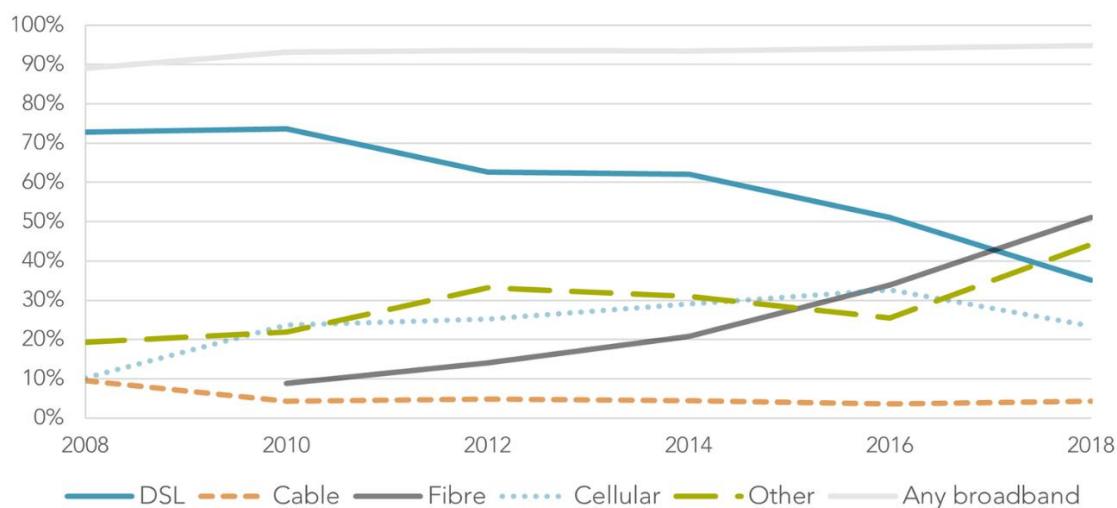
December 2022



Access to high-speed internet provides a range of potential benefits to firms looking to enter export markets. At the most basic level, internet-based digital technologies, such as websites and online platforms, can increase the visibility of firms to potential foreign customers and reduce the search costs and informational frictions in establishing trade relationships. As internet technologies develop, new opportunities open up in areas that were traditionally considered non-tradable, as complex services and digital goods can increasingly be delivered remotely. If used well, these technologies can also have an indirect impact on firms' ability to trade internationally, through increasing their productivity and reducing costs, thus giving them a competitive edge in the global market.

Does high-speed internet boost exporting? by Lynda Sanderson, Garrick Wright-McNaughton and Naomitsu Yashiro explores whether the adoption of high-speed, fibre-to-the-premises internet increases the likelihood that New Zealand firms export. New Zealand started its nationwide rollout of fibre broadband in 2010 under the Ultra-Fast Broadband (UFB) Initiative. While broadband uptake was already high, the 2010s saw rapid shift to fibre broadband as firms moved away from slower digital subscriber line (DSL) connections (Figure 1). Detailed data on firms' connection types and ICT activities linked to broader employment and firm performance data allows the research to examine whether early adopters of fibre internet were more likely than otherwise similar firms to start exporting, and whether this relationship differed according to how firms were already using the internet.

Figure 1 | Broadband connection types of New Zealand firms, 2008–2018



Note: Firms may report more than one type of connection. Responses weighted to represent the population of firms with six or more employees. Fibre-to-the-premises was not included as a response option in 2008.

Why this topic?

New Zealand has long been a victim of “the tyranny of distance”, in which geographic isolation from large markets and suppliers puts it at a disadvantage relative to other countries. Transport costs are higher and it is more difficult and costly to get information and build relationships with potential customers. As a result, New Zealand's exports account for only 27% of GDP, considerably below comparable OECD economies. It is also among the OECD economies least integrated into global value chains (OECD 2021). Low integration into global trade has weighed on New Zealand's productivity growth by constraining its production scale to the small domestic market, and by limiting technology diffusion from the global productivity frontier (NZPC 2021).

The development of digital and internet-based technologies presents an opportunity for New Zealand to break free of the negative effects of distance, with repeated calls since the 2000s for New Zealand producers to shift away from traditional commodities towards “weightless” exports. The rapid technological shifts which occurred in response to the Covid-19 pandemic provide further opportunities for New Zealand, increasing acceptance of online, remote communication and further raising the profile of internet-mediated trade.

This research examines how firms responded to the rollout of fibre broadband under the national Ultra-Fast Broadband (UFB) initiative. The analysis considers whether differences across firms – in terms of the types of products they sell or their pre-existing capability to use internet-based tools – are associated with different outcomes following UFB adoption. Such differences suggest that investments in the physical infrastructure of fibre broadband require complementary investments in human capital and organisational capacity to make the best use of the opportunities that digital technologies can provide.

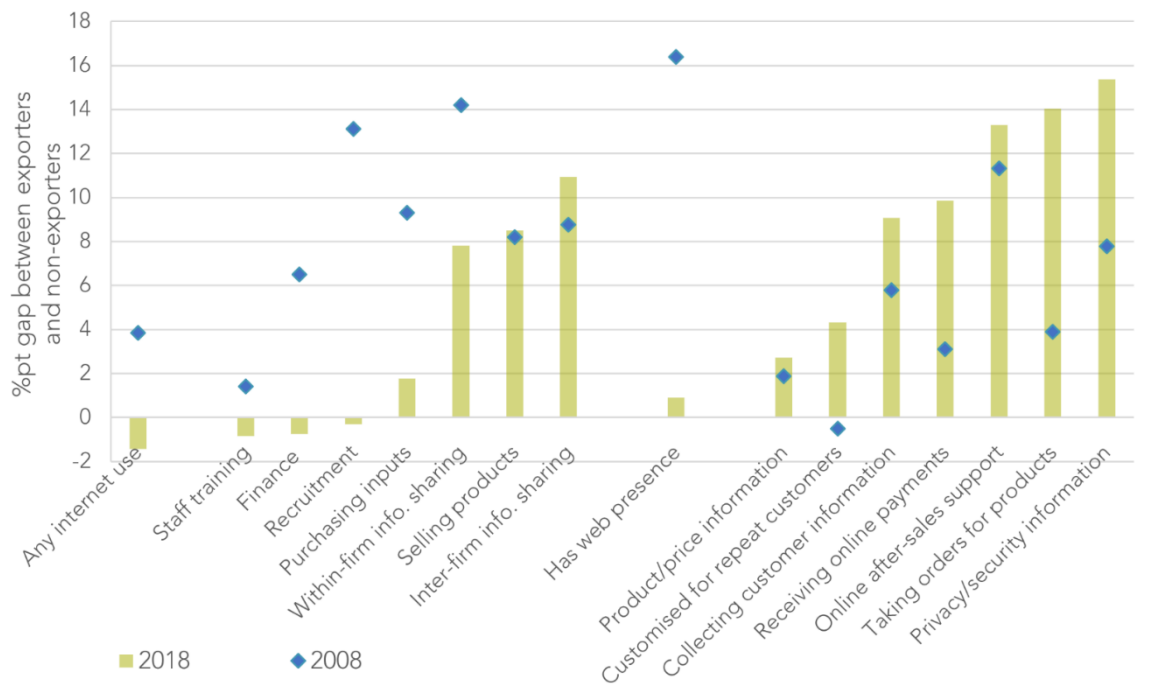
How do we measure firms' existing ICT capabilities?

Providing firms with high-speed internet access is unlikely to significantly change their export potential if the firm uses the internet only for relatively simple activities such as e-mail or internet banking. The research uses rich information from the ICT module of the Business Operations Survey to develop three indices to proxy for firms' capability to exploit high-speed internet. These indices are based on responses to the questions “For which of the following activities, if any, does this business use the internet?”, “Which of the following features and facilities are offered on this business's web presence(s)?” and “In the last two financial years, has this business done any of the following to get more benefit from its ICT?”. Each question includes a number of possible response options such as “sharing information with other business partners (eg collaboration with business partners)” and “implemented new work practices (eg teamworking)”. Responses to each question are reduced to an index using principal components analysis.

ICT capability, UFB adoption and exporting

The research finds that exporting firms are more likely to access UFB than non-exporters, even after controlling for the industries they operate in and their larger size compared to non-exporters. Exporting firms use the internet for a wider range of activities, have more sophisticated functions on their websites (Figure 2) and are more likely to invest in complementary activities to make the most of their ICT. We make use of both the longitudinal nature of the data collection and the policy choice to prioritise schools in the rollout of fibre broadband to explore the relationship between exporting and UFB uptake.

Figure 2 | Exporters use the internet for more activities and have more functions on their websites



Note: Figure shows how much more likely exporters are than non-exporters to report using the internet for a given purpose or having a particular function on their web presence (conditional on having a web presence).

We find that New Zealand firms that adopted UFB in the early years of the national rollout were subsequently more likely to start exporting. This relationship was stronger among firms that were already using the internet more intensively prior to adopting fibre or were making complementary investments to benefit from their ICT use. The role of prior ICT capability was particularly notable for small firms (which generally make less use of ICT) consistent with a certain level of capability being required to exploit the faster connections. Looking across industry groups, we find that the positive relationship between exporting and UFB uptake is limited to services industries. This is consistent with their greater ability to deliver products via digital channels. In contrast, we find no significant relationship for goods-producing and trading industries, which typically use ICT less intensively.

To address the question of whether higher export propensity among UFB adopters reflects a causal relationship from UFB uptake to export entry, we employ an instrumental variable (IV) estimation that exploits the historical pattern of UFB rollout which prioritised fibre connections for schools and hospitals. These estimates are consistent with a positive causal relationship from UFB adoption to exporting. That is, firms predicted to have earlier access to UFB due to their proximity to schools are more likely to enter exporting in the years immediately following adoption. However, these results remain inconclusive, as the IV analysis is not feasible for the sub-samples in which UFB is expected to be most relevant.

What does this mean for the New Zealand economy?

Investments in high-speed broadband, such as New Zealand’s Ultra-Fast Broadband initiative, help to set the conditions under which firms have access to a wider international market. While uptake of UFB became widespread over the 2010s, capabilities to make best use of faster internet and associated technologies continue to differ significantly across firms. To the extent that UFB adoption is of particular value to smaller firms and to professional services industries, such initiatives may help to diversify exports away from traditional products and exporters. However, with many small firms making limited use of new technologies, there is scope to benefit more from high-quality infrastructure through improving ICT capability.

References

OECD (2021). OECD Economic Surveys: New Zealand 2022. Organisation for Economic Cooperation and Development, Paris.

NZPC (2021). New Zealand firms: Reaching for the frontier. Final report for the Frontier Firms inquiry. New Zealand Productivity Commission, Wellington. Available from www.productivity.govt.nz/inquiries/frontier-firms/.

To find out more

“Does high-speed internet boost exporting?” – New Zealand Productivity Commission Working Paper 2022/2 – available from www.productivity.govt.nz/research

Email us: info@productivity.govt.nz

Follow us on Twitter: @nzprocom

LinkedIn: <https://www.linkedin.com/company/new-zealand-productivity-commission/>