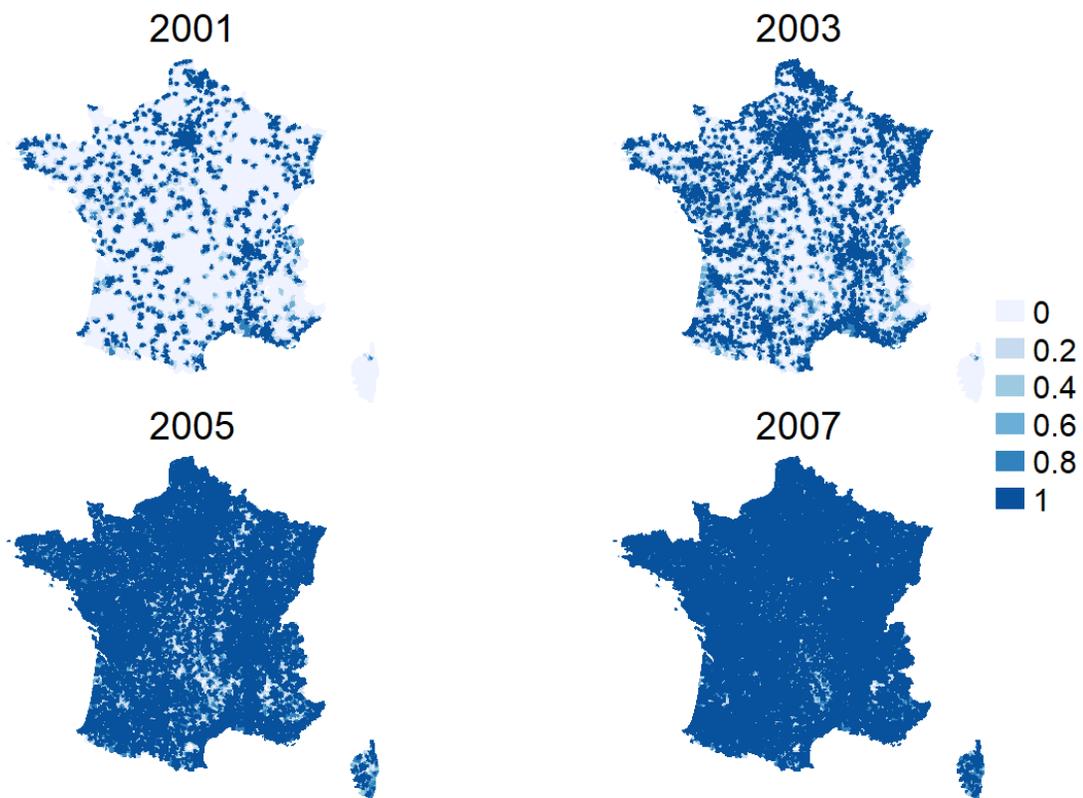


# Broadband internet changes the geography of international trade

By Clément Mazet-Sonilhac and Clément Malgouyres (with [Juan Carluccio](#) and Thierry Mayer)

*The diffusion of information and communication technology (ICT) is considered to be a factor for economic growth, notably in developed countries. In particular, the diffusion of broadband internet could improve firms' ability to find trading partners abroad as well as products suited to their needs. In France, the roll-out of broadband between 1998 and 2008 corresponds to a substantial improvement in firms' imports.*



***Chart 1: A decade of gradual broadband roll-out***

*Source: Banque de France and authors' calculations*

*Note: The broadband coverage of French municipalities is given for four years. A figure of between 0 and 1 (i.e. 0% and 100%) indicates that a town has partial coverage or that it only gained access during the year in question.*

## What is the impact of broadband internet on international trade?

Several recent studies have considered the impact of broadband on wages, the unemployment rate or firms' productivity (see [Bertschek and al. \(2016\)](#) for a review of the literature). However, little research has focused on its impact on international trade, even though ICT diffusion is a major driver of globalisation.

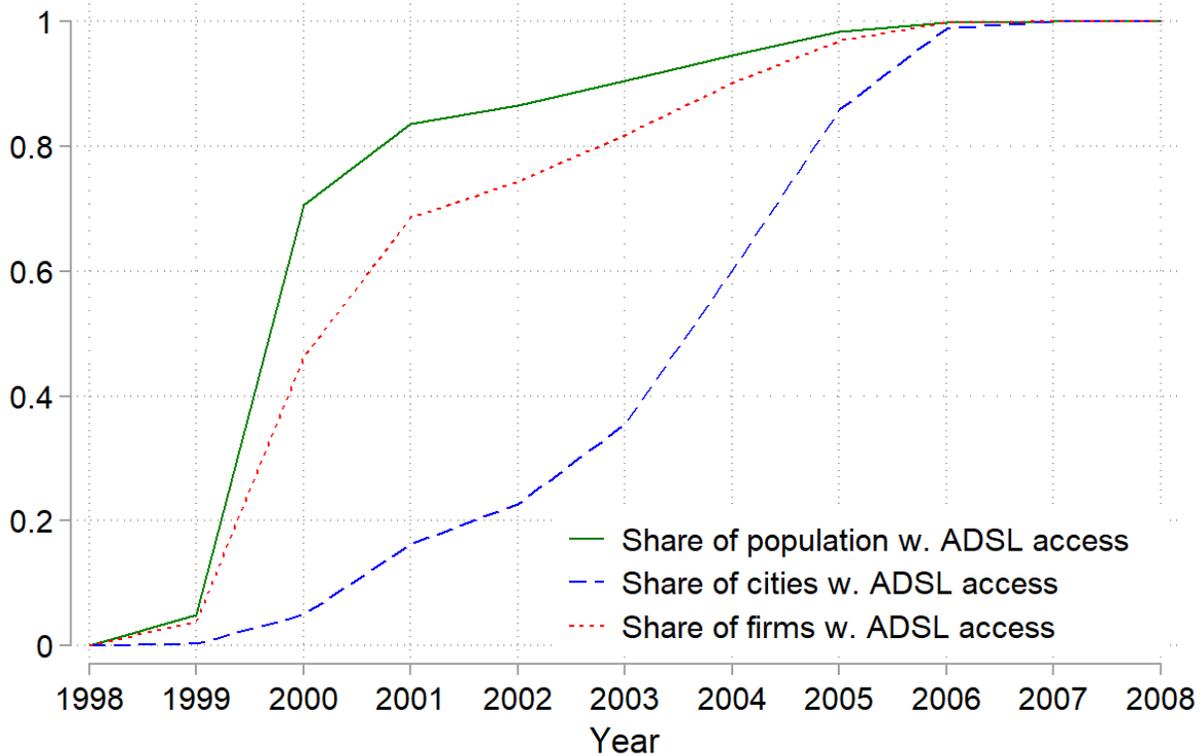
Indeed, broadband is seen as reducing the information frictions that hamper most economic relations. For instance, [Friedman \(2005\)](#) predicts the "death of distance" and explains that new information technologies have done away with the traditional obstacles stopping ideas and goods from flowing freely. This point of view has since been called into question by economists who believe that the physical distance in trade has lost little of its importance, despite ICT diffusion (see [Disdier and Head, 2008](#)). It therefore remains relevant to question the impact of broadband diffusion on international trade.

At the macroeconomic level, [Clarke and Wallsten \(2006\)](#) show that a country's internet penetration is positively correlated with an increase in goods exports, particularly for developing countries that export to developed countries. This positive impact could be linked to the reduction in communication costs and those related to finding the right trading partner.

In a study based on individual data from Norwegian firms, [Akerman et al. \(2018\)](#) do not find a direct impact of broadband access on firms' trade. They do however show that broadband increases the sensitivity of international trade to distance between importing and exporting countries, as well as the sensitivity to the economic size of their markets. Consequently, broadband would appear to change the geography of international trade due to the reduction in information frictions.

## The French case: a heterogeneous impact on goods imports

France Télécom commercially launched broadband internet in 1999 using the Asymmetric Digital Subscriber Line (ADSL) technology. This technology uses the existing telephone network (around 33 million physical copper lines) to transmit numerical data. The diffusion of broadband was very gradual: as Chart 1 shows, the big urban centres were equipped at the start of the 2000s whereas rural and remote areas had to wait ten years. One of the reasons why broadband took so long to roll out was that telephone lines had to be eligible for this new technology. Indeed, in 2000, only 11 million lines (or one-third of the network) could be equipped with this technology. Furthermore, massive infrastructure investment was required to modernise the remaining two-thirds.



***Chart 2: The most densely populated municipalities were the first to have broadband access***

*Sources: BdF, INSEE, authors' calculations*

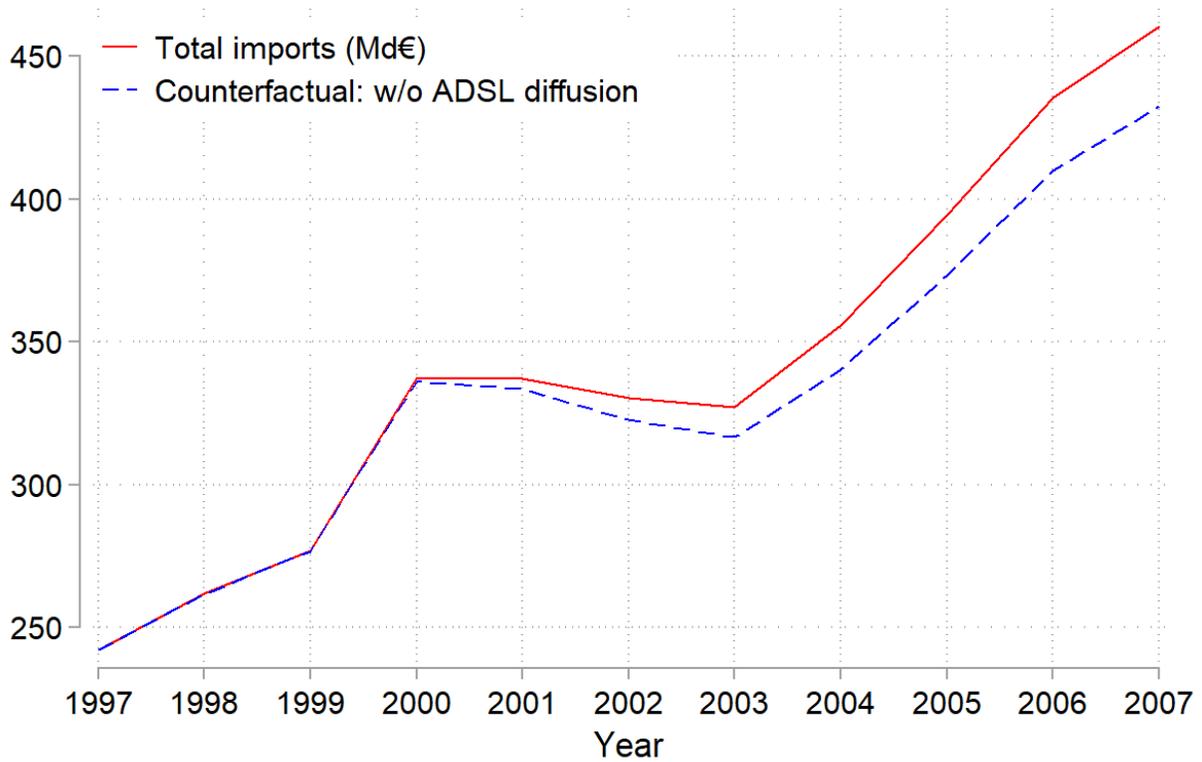
*Note: this represents the coverage rates. The number of broadband subscribers is lower: for example, only 8 million French citizens subscribed in 2005 (whereas 95% of the population was covered)*

While the roll-out of broadband was very gradual at the geographical level, the first municipalities to be equipped were those that were the most densely populated. In 2002, 20% of the municipalities equipped corresponded to 70% of the firms, while around 85% of the population was located in areas with broadband coverage (see Chart 2).

In an ongoing study, [Carluccio, Malgouyres, Mayer and Mazet-Sonilhac, \(2018\)](#) use the gradual roll-out of broadband in France to assess the impact of access to this technology on the imports of French companies. For this assessment, the authors use spatial and temporal variations in broadband access to compare the companies with access and those without. The study focuses particularly on small- and medium-sized importers, located in a single municipality. These firms are theoretically more exposed to information frictions.

For these companies, broadband access leads to an increase in the value of imported goods, irrespective of the destination, of around 20% in the medium term (i.e. five years after gaining

broadband access). The positive impact of the diffusion of this technology in France varies according to the countries from which the goods are imported. The increase in French imports is particularly strong (compared with the estimated overall impact) in the case of trade with China and Eastern Europe. This heterogeneity is consistent with the theory of information frictions since the positive impact of broadband seems to affect emerging markets the most. Access to these countries is considered more difficult (distance, language and cultural differences, and level of development) and networks and providers were initially underdeveloped.



**Chart 3: The rise in the value of French imports of foreign goods would have been smaller without broadband access**

*Sources: Customs authorities and authors' calculations*

*Note: Chart 3 shows the rise in the total value per year of goods imports by French firms in EUR billion between 1997 and 2007 as well as the counterfactual development in the absence of broadband.*

The results of the study show that the rise in French imports between 1999 and 2007 would have been 15% smaller (around EUR 30 billion) without broadband diffusion at the start of the 2000s in France. This figure is obtained by deducting from the flow of imports the share attributed to the diffusion of broadband, as measured in the study.

For instance, the diffusion of broadband increases firms' ability to find trading partners abroad as well as products suited to their needs. As a result, the productivity of these firms appears to be improved, as shown by the results of a recent study that highlights the importance of intermediate inputs in the production process ([Blaum et al., 2018](#)). This result also stresses the importance of infrastructure investment by governments and private operators in order to reduce geographical broadband access inequalities. In France, this is the objective of the very high-speed broadband [plan « Très Haut Débit »](#) launched in February 2013, which involves private operators and local authorities: only 31.2% of households and business premises in rural areas had broadband access at 31 December 2016.

Studies are underway to assess whether broadband diffusion had any impact on French firms' ability to export. But they are not yet available.