

The Employment and Wage Impact of Broadband Deployment in Canada

Dr. Olena Ivus and Matthew Boland

Queen's School of Business
Queen's University



Broadband in Canada

- Government spends hundreds of millions of dollars on subsidies for the broadband deployment in Canada.
- Much of these funds have been allocated to rural and remote areas.
- The evidence suggests that Internet connectivity lowers the cost of doing business in remote locations.
- Our understanding of the actual economic impact of broadband availability is limited.
- The major unresolved question is:

How has the deployment of broadband Internet impacted economic activity and regional growth?

Our Contribution

- This paper evaluates the impact of broadband deployment on regional employment and wage growth.
- It differs from the earlier literature in four important respects:
 1. This is the only study to evaluate the impact of broadband deployment on economic activity in Canada.
 2. Our study estimates the true, causal effects, rather than mere association, between broadband deployment and economic growth.
 3. Since Canada was the first country to introduce broadband, our data allow analysis of economic growth over longer time periods.
 4. Of critical importance, we distinguish between goods and service industries.

Methodology

➤ Unit of analysis:

- 69 economic regions: 31 rural and 38 urban
- Rural economic regions do not contain a census metropolitan area
- The 14-year period from 1997 to 2011

➤ Outcome variables:

- employment and wage growth

➤ The key independent variable:

- change in broadband availability

➤ Controls for initial or permanent characteristics:

- population, population density, age distribution, educational attainment, firm/establishment size

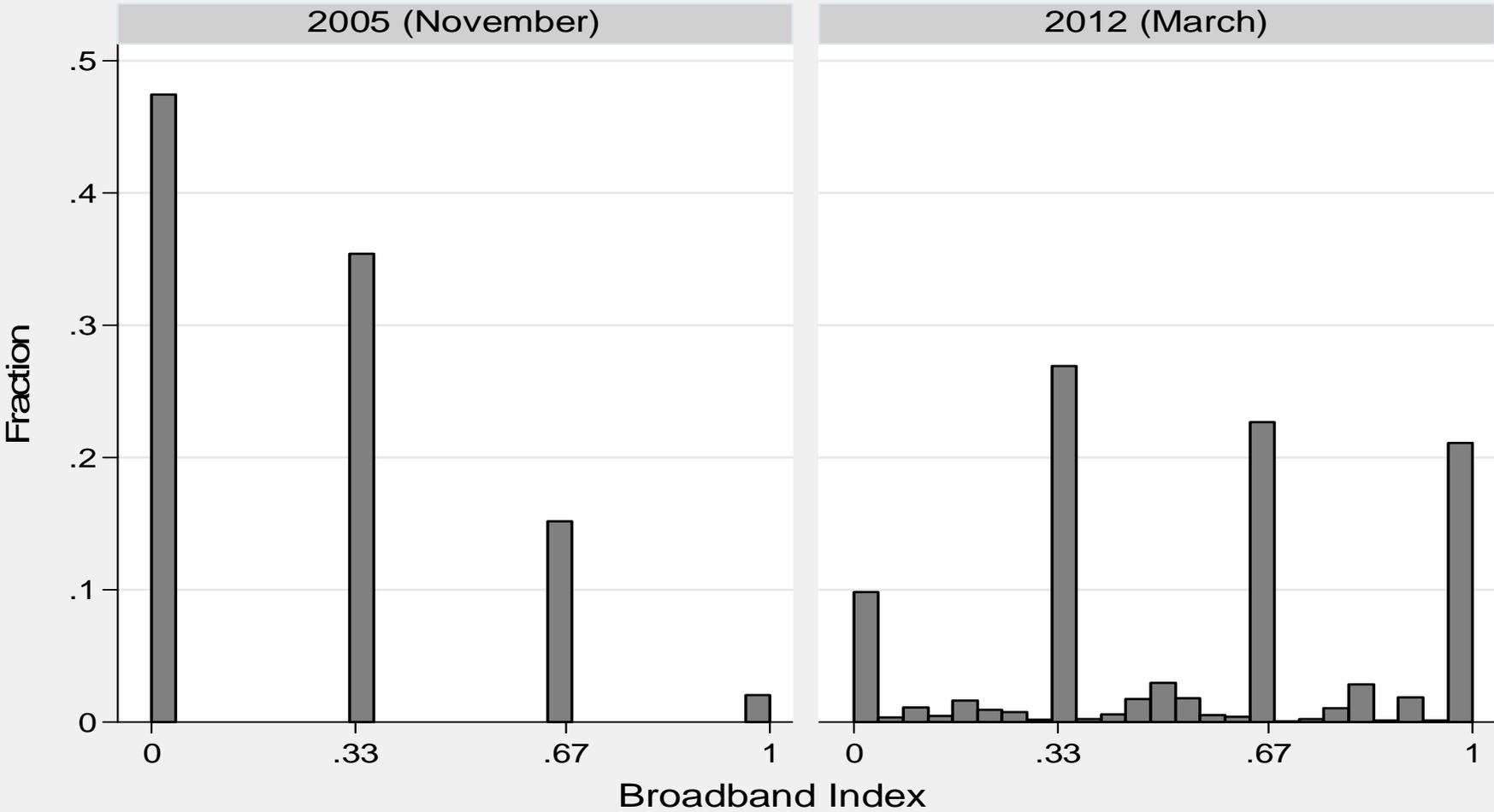
Methodology

- **The key empirical challenge:**
 - Many of the factors influencing broadband deployment are intricately connected to economic activity.
 - Economic conditions themselves can influence broadband deployment rates.
- **Our approach:** use the variation in elevation within each region to explain the difference in broadband coverage across regions.
 - Elevation variation affects the cost of deploying broadband.
 - This allows us to identify the true, causal effect from broadband deployment to economic activity.

Data

- The Labour Force Survey: 1997, 2005, and 2011
- National Broadband Coverage data, compiled by the CRTC and Industry Canada.
 - Detailed records of broadband availability across Canada
 - The data were collected in two rounds:
 1. At the community level for November 2005
 2. At the hexagonal level, from July 2009 to March 2012
 - Three types of broadband access technology:
 - DSL (1/0), Cable (1/0), and Fixed Wireless (1/0)
- Our sample: 4,344 communities.
- Focus on the availability of any broadband service, regardless of technology.

Broadband availability across communities



Graphs by time

Employment Growth Results

- **Aggregate employment growth**
- **When we consider all regions together:**
 - The average impact of broadband deployment on the aggregate employment growth is zero.
- **When we distinguish regions by their rural/urban status:**
 - Rural regions lag in terms of employment growth.
 - Broadband deployment promotes aggregate employment growth in rural regions at the expense of urban regions.
- **Employment growth by industry group:**
 - No impact on employment growth in **the goods industries**
 - Broadband deployment promotes **service** employment growth in rural regions at the expense of urban regions.

Employment Growth by Industry Results

- Broadband deployment promotes rural employment growth and has no impact on urban employment growth in:
 - Educational services
 - Public administration
 - Information, culture, and recreation
 - Finance, insurance, and real estate

- Broadband deployment promotes employment growth in rural regions at the expense of urban regions in:
 - Professional, scientific and technical services
 - Business, building and other support services

Employment Growth by Industry Results

- We observe no impact on employment growth in:
 - Agriculture
 - Resource-based, mining
 - Construction
 - Manufacturing
 - Trade
 - Transportation and warehousing
 - Health care and social assistance
 - Accommodation and food services

Wage Growth Results

- Broadband deployment promotes **service** wage growth in rural and urban regions, with no difference in the impact between the regions
 - Information, culture, and recreation industries
 - Educational services
 - Accommodation, food services
 - Public administration

- No impact on wage growth in **the goods industries**

What our estimates imply

- Assume all communities within a given economic region moved from having zero broadband coverage in 1997 to coverage by any one broadband technology in 2012.
- Our estimates predict that in such a scenario:
 - Service employment growth will
 - rise by 1.17 percentage points per year in rural regions
 - fall by 1.21 percentage points per year in urban regions
 - Average wage growth in service industries will
 - rise by 1.01 percentage points per year in rural regions
 - rise by 0.99 percentage points per year in urban regions

Conclusion

- This paper provides the first empirical assessment of the impact of broadband on employment and wage growth in Canada.
- We find that the deployment of broadband in 1997-2011 promoted rural employment and wage growth in service industries.
- Our results suggests that broadband helps businesses in service industries overcome geographical barriers that have traditionally hampered rural employment growth, and in so doing, limits the urban/rural employment gap.