Cloud Computing Research Collaboration: An Application to Access to Financial Services

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Harnessing the power of on-demand cloud computing for collaborative research at the Bank of Canada

Teaching Corner

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Econometrics Pedagogy and Cloud Computing: Training the Next Generation of Economists and Data Scientists

High Performance Computing (HPC) Resources at the Bank of Canada

- Edith2
  - On-premise HPC appliance
  - For use with sensitive data

- Digital Analytical Zone (DAZ)
  - Cloud computing platform
  - Supported by Microsoft Azure

Photo: Edith Whyte. ca 1966. Bank of Canada Archives (PC223-17) Credit: Unknown.

See: "Central bankers at the frontier: the state of the art in advanced analytics and AI" for a detailed description of this infrastructure

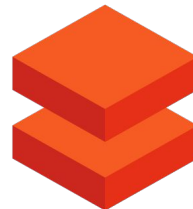# Cloud Computing for Research Collaboration

Advantages

- On-demand

- Scalable

- Easy collaboration with external researchers

- Low startup costs

Considerations

- Latency

- Training costs

- Budget restrictions

Microsoft Azure Databricks for Research Collaboration

- Jupyter-style notebook

  interface

- Fully managed clusters

- Machine learning tools

- Integrated version control

Empirical Use Case

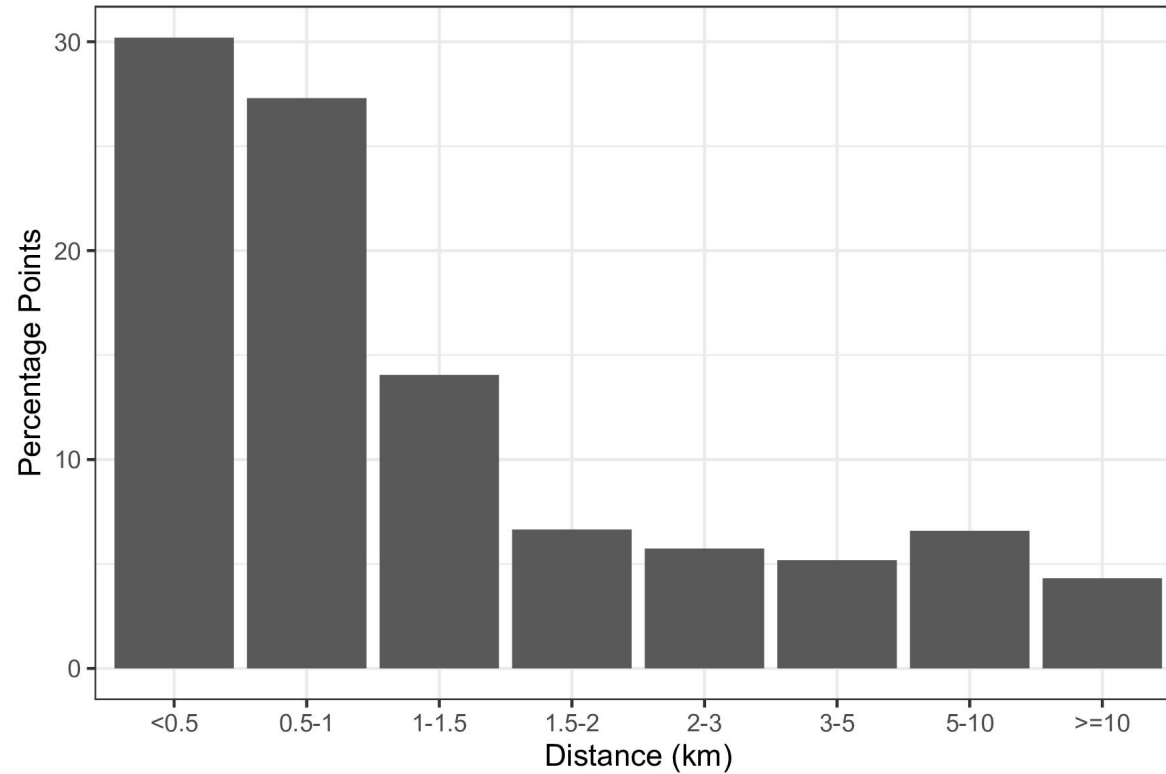# Access to Financial Services in Canada

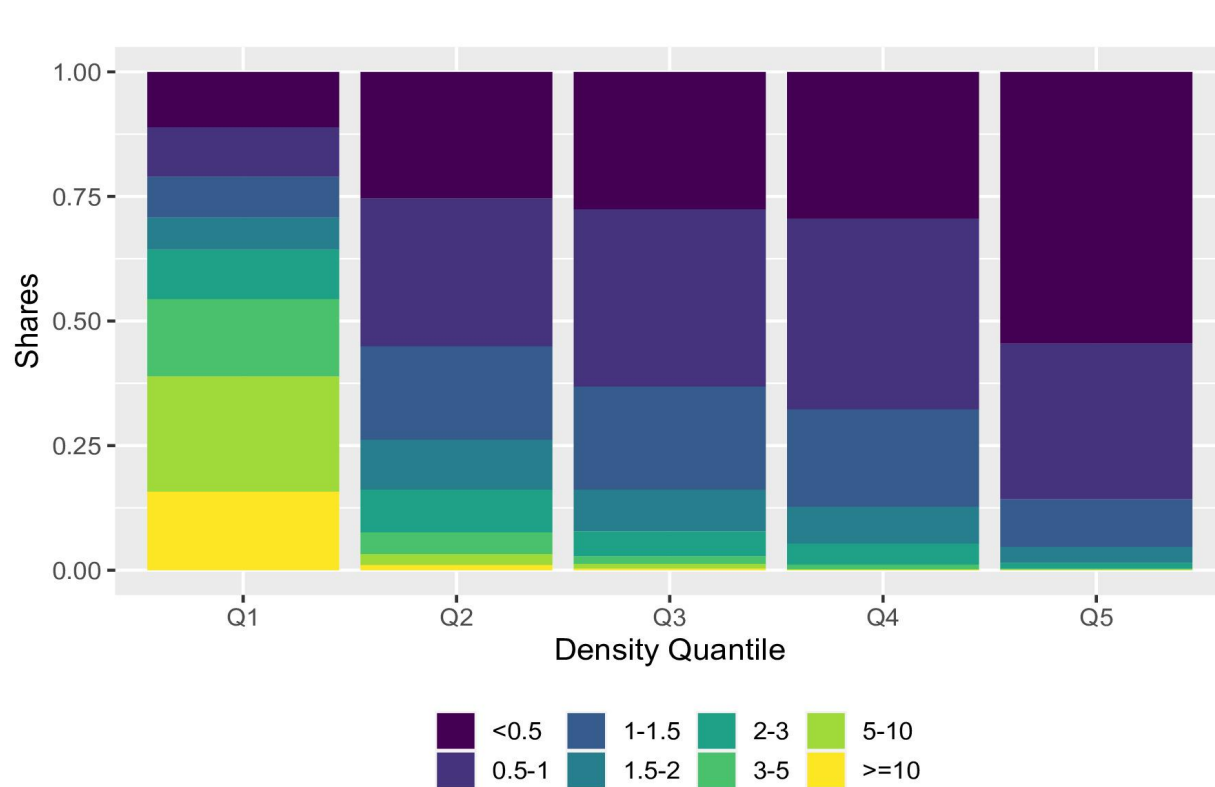Mapping consumers and their nearest bank branch

- Challenge: **24,000+** postal codes

- Computed straight line distances from population centroids to financial institutions

- Use Jupyter/PySpark docker image to manage computational needs

See: "A Spatial Model of Bank Branches in Canada" Staff Working
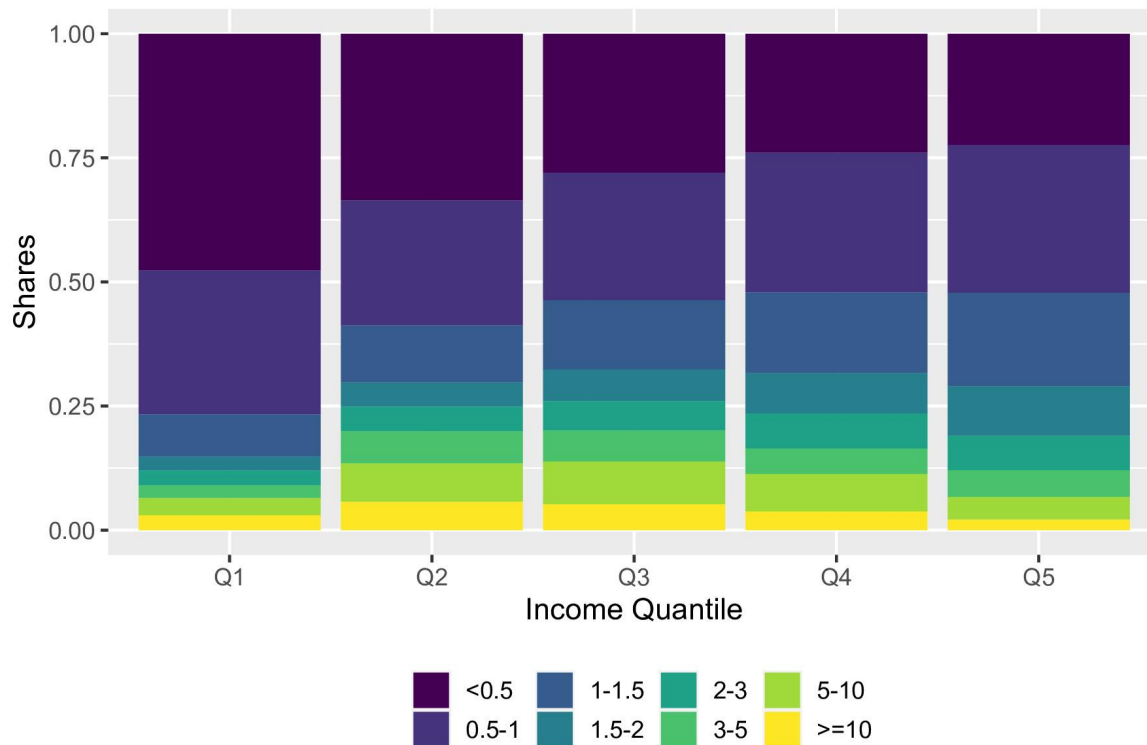Paper 2020-4 (English) by Heng Chen, Matthew Strathearn

Over 50% of Canadians have access to a bank branch within 1 km

Banks are located in the most densely populated areas

Bank branches are distributed across diverse income levels

The Added Value of Cloud Computing

- Custom, scalable resources

- Streamlined collaboration

- Low startup costs

Thanks/Merci

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