Trade, Farmer’s Heterogeneity and Agricultural Productivity: Evidence from Colombia

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Access to urban centers (UC) and Agricultural Productivity

• Motivation
  • There are large differences in agricultural labor productivity between developed and developing countries
  • Within countries, there are also large differences between regions
    • Some farmers have low productivity and produce for local markets
    • Some farmers have high productivity and access high-value markets

• Questions
  • Does access to UC explain part of these regional differences?
  • What is the effect of improving farmers’ access to UC on agricultural productivity?
Summary

• Hypothesis
  • Better access to urban centers generate the following outcomes:
    1. Farmers’ sales to high-value markets increase (e.g., international customers)
    2. Farmers upgrade their production methods (↑ investments in land)
    3. Farmers hire more workers (↑ ratio of workers to managers)

• Empirical analysis
  • Rich data from Colombian agricultural census
  • Historical data on the formation of urban centers (to construct evaluation method)
  • Instrumental variables approach
Data from Colombia

- **Agricultural census from 2014**
  - (1) Sales destinations (trading firms, local market,...)
  - (2) Investments in land
  - (3) Share of farm managers

- **840 thousand farmers in 1200 municipios**

- **We selected 33 *departamentos* capitals**
  - Coincide with major urban centers

- **Computed travel distance to every urban center using Google maps API (access to UC)**
Data from Colombia

- Agricultural census from 2014
  - (1) Sales destinations (trading firms, local market,...)
  - (2) Investments in land
  - (3) Share of farm managers
- 840 thousand farmers in 1200 municipios
- We selected 33 departamentos capitals
  - Coincide with major urban centers
- Computed travel distance to every urban center using Google maps API (access to UC)
- Data on historical location of mines
- Data on historical location of cities
• **Geography or access to urban centers?**

• Regions that are comparable in terms of a rich set of observable characteristics (rainfall, biome, temperature, slope, measures of agricultural suitability)
Identification Strategy (2 out of 2)

- Geography or access to urban centers?
  - Regions that are comparable in terms of a rich set of observable characteristics (rainfall, biome, temperature, slope, measures of agricultural suitability)

- Access to UC causes Ag productivity or Ag productivity causes access to UC?
  - Exploit historical factors that affected the location of urban centers that are not directly related to modern agricultural production in Colombia
Does access to urban centers explain part of the regional differences in agricultural production?

• ↑ 1% the travel distance to UC ↓ 0.2% the share of farmers selling to high value markets
• ↑ 1% the travel distance to UC ↓ 0.1% the ratio of agricultural workers to farm managers
• ↑ 1% the travel distance to UC ↓ 0.2% the ratio of farmers making investments in land
Going back to our 2 questions

- Does access to urban centers explain part of the regional differences in agricultural production?
  - ↑ 1% the travel distance to UC ↓ 0.2% the share of farmers selling to high value markets
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- What is the effect of improving farmers’ access to UC on agricultural productivity?
  - Combine our empirical results with new theory of farming production
  - Economic mechanism explain one third of the regional differences in output per worker
  - ↓ 50% the cost of travel distance to UC ↑ 6% the output per worker
We show that access to UC have a strong relationship with farmers’ choice
  - Sales destination
  - Investments in land
  - Workers employed

Future work: Why does access to urban centers matter?
  - Better output prices?
  - Better access to information and assistance?
  - Lower input costs?
  - Change relationship between traders and farmers?

Improving our understanding of these can help us design more effective policies.