(RE)DEFINING CONNECTIVITY TO ASSESS ECONOMIC IMPACTS

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presenting joined work with

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Trade, transport, and economic development

Economic Geography, Trade Literature

Improving market access

Lower transfer costs

Market enlargement:
- Specialization effects
- Economies of Scale and Agglomeration
- Innovation & diffusion

Output
Productivity
Employment

Geography/distance
Transportation
Trade barriers

Lower transfer costs
Improving market access

Transportation
Trade barriers

Geography/distance

Economic Geography, Trade Literature
Aims

1. Understand how distance (remoteness) relates to:
   - transport networks;
   - trade barriers; and
   - market access

2. Determine strength of correlation between connectivity and usual metrics

3. Formulate outlook on future research
* Sum of all trading partners’ GDP weighted by the inverse of bilateral distance
Death of distance hypothesis

Impact of transport: setting the scene

• Need to proxy for transport cost

• Two main approaches

1. Accessibility:
   – generalised transport cost (including distance) X destination
   – empirical NEG: mostly trade-based

2. Volumes measures
   – traffic data
   – aviation-specific
Accessibility

- Empirical NEG: Trade-based accessibility

  \[ EXP_{ij} = \alpha \text{DIST}_{ij} + \beta \text{EC\_DIST}_{ij} + \gamma CNY_i + \delta \text{PTN}_j \]

- Market Access = \[ \sum \text{DIST}^\alpha \text{EC\_DIST}^\beta \text{PTN}^\delta \]

\( EXP_{ij} \) = exports  
\( \text{DIST}_{ij} \) = bilateral distance  
\( \text{EC\_DIST}_{ij} \) = economic distance  
\( CNY_i \) = exporting country  
\( \text{PTN}_j \) = importing country
Distance effect (coefficient)

- Persistent and increasing over time
- Challenges death of distance hypothesis
- Hypotheses:
  - No transport effect
  - Proxied transaction costs
  - Home bias
- Regional differences?
  - Add interactions

Data source: IMF DOTS & CEPII
Europe

Distance effect (coefficient)

Markers indicate significance at the 5% level

Share of regional trade

Coefficient estimate


Markers indicate significance at the 5% level

Oceania

Distance effect (coefficient)

Markers indicate significance at the 5% level

Share of regional trade

Markers indicate significance at the 5% level
East & Central Asia

Distance effect (coefficient)

Share of regional trade

Markers indicate significance at the 5% level
Middle East

**Distance effect (coefficient)**

Markers indicate significance at the 5% level

**Share of regional trade**

Markers indicate significance at the 5% level

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B. Lenaerts
South & South-East Asia

Distance effect (coefficient)

Share of regional trade

Markers indicate significance at the 5% level
Africa

Distance effect (coefficient)

Markers indicate significance at the 5% level

Share of regional trade

Markers indicate significance at the 5% level
North America

Distance effect (coefficient)

Share of regional trade

Markers indicate significance at the 5% level
Accessibility

• Regional integration dominates distance effect
  - Emergence regional supply and value chains
  - Economics of variety

• Biased accessibility values
  - Regional integration lowers accessibility?

• Furthermore...
  - Distance ≠ good proxy
  - Distance ≠ policy variable
  - Distance: no regional differentiation
  - No substitution possible
Transport connectivity

• Connectivity
  – Freeness of movement between nodes in an *aspatial* network

• Air transport: Global Connectivity Index (GCI)

• New air transport connectivity metric:
  – Combines *flight-level* & *destination-level* dimensions
  – Indicator of service quality
  – Data calibrated weighing parameters
  – Connectivity at airport level

• Data:
  – Starting from 1990
  – All airports & airlines worldwide

*Developed at MIT Laboratory for Aviation and the Environment (LAE)*
Existence of a link?

No

connectivity

No

Link-Identification-Level

Yes

Link-Quality-Level

Link Quality

Frequency

Directness

Destination quality

Connectivity

Destination-Level
Volume measures

- Aspatial measures
- Proxy for transport services?
- Not for small (possible remote) airports

Data sources: World Bank & MIT LAE

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Trade connectivity

• Suggestions
  – Allow for regional differentiation in trade proxies
  – 1st stage: view distance as geography-fixed effect
  – 2nd stage: redefine as trade connectivity: $\sum EC\_DIST^\beta PTN^\delta$

• Market Access = Transport connectivity + Trade connectivity + Market Potential
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