Growing Knowledge about Globalization (GKG)
Observing Trade, 1980-2001

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Globalization is everywhere.

Articles on Globalization

- Mass Media
- Scholarly
Globalization is a process leading to greater interdependence and mutual awareness (reflexivity) among economic, political, and social units in the world, and among actors in general.

Mauro Guillén 2001
Globalization is a Black Box

- Theory raced ahead of evidence
- Entrenched theoretical and public policy debates: *Is it good or bad?*
- Empirical evidence is uneven
Consequences of the....

- Failure to understand the structure of globalization
- Failure to analyze interaction dynamics
- Failure to foresee unintended consequences, crises, “normal accidents”, systemic malfunctions
Contents of the Black Box: Transactions

- Link disparate actors (nodes) around the globe
- Actors can be people, cities, countries, or organizations
- Measured as trade, capital transfers, treaties, travel, collaborations, and communication
Black Box of Globalization: Network Analysis

- Reveals the structure of social relations
- Reveals winners and losers of globalization processes
- Illustrates change over time and potentially reveals mechanisms of change
Map the Pattern of Transactions: Reveal Globalization Network

- Build database on transactions
- Develop tools for visualizing transactions statically and dynamically
- Create open access data and tools for scholarly and public policy investigators
Models of Globalization

- Universal
- Clustered
- Hegemonic
Growing Knowledge about Globalization

- **Who?**
  - A cross-national, multi-institutional collaboration

- **What?**
  - Database, web-based interface for public access, and development of visualization tools

- **How?**
  - Research, descriptive publications, teaching tools, and open access website

- **When?**
  - Five-year effort from 2005-2010
GKG Projects and Products

- Reference Volumes
- Conferences
- Case Studies
- Website
- Statistical and Data Products

- Observing Trade
- Tracking People
- Following the Money
- Transmitting Culture
- Surveying Institutions
## Significant Moments of Observation

<table>
<thead>
<tr>
<th>Year</th>
<th>Characterization of Era</th>
</tr>
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</table>
| 1980 | “Crisis in the Global System”  
Post OPEC, UNCTAD, collapse of Import Substitution, onset of debt crisis |
| 1990 | “Victory of the Market”  
Establishment of EC, End of Cold War, GATT, Structural Adjustment Policies, Container Shipping |
| 2001 | “North versus South”  
WTO, Internet |
Data and Methods

- **Trade Data**
  - World Trade Analyzer
  - $ Amount of exports/imports between every country
  - Including an aggregate of all commodities and 93 of those related to food, shelter, clothing, energy, machinery and engines.

- **Network Maps**
  - Apply *NetMap Visualizer* software
  - Analyze country and regional trade patterns
  - Observe emergent groups
  - Display Cartesian maps
  - Follow step links from central nodes
Too Much Information?
Randomness or Chaos?

1980
World Trade
All commodities
No thresholds
Domestic or International?
1980 Trade Structure with links >=0.3% of Total Trade
Value: Euro-12
Emergent Group Analysis

- NetMap creates several types of analyses, including:
  - Pre-defined groups based on some attribute such as regions or civilizations
  - Emergent groups

- Emergent groups represent countries which trade more with each other than with any other countries.
  - Composed of at least 3 countries
  - Which share at least 50% of the same trade ties
2001 Emergent Group Analysis

Emergent Group Members:
- US
- Japan
- Brazil
- Canada
- China
- UK
- Hong Kong
- Mexico
- S. Korea
- Malaysia
- Saudi Arabia
- Singapore
- Thailand
- Taiwan
- Taiwan
- Euro-12

Canada
UK
Mexico
US
Euro-12
2001 Cartesian Map Analysis

US

Euro-12

China

Unknown Destination

Japan
Concentration of World Trade Links >= 0.3% of Total Value

Percent of World Trade in Top 0.1% of Links
World Trade Value
Value of Trade in Top 0.1% of Links
Issue: Global Equality

- Rich get Richer?
- 80/20 Rule?
- Power Distribution
Distribution of Links: Total Trade at $Million Threshold

1980

2001

Number of Links

Number of Countries

Number of Links

Number of Countries
Distribution of Links: Total Trade at 0.03% Threshold

1980

2001
Distribution of Links: Total Trade at 0.3% Threshold

1980

2001
<table>
<thead>
<tr>
<th></th>
<th>Threshold</th>
<th>1980</th>
<th>2001</th>
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<tbody>
<tr>
<td><strong>Number of Isolates</strong></td>
<td>$\text{Million}$</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>0.03%</td>
<td>83</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>0.3%</td>
<td>136</td>
<td>149</td>
</tr>
<tr>
<td><strong>Average Number of Links without Isolates</strong></td>
<td>$\text{Million}$</td>
<td>45.4</td>
<td>63.9</td>
</tr>
<tr>
<td></td>
<td>0.03%</td>
<td>6.3</td>
<td>6.2</td>
</tr>
<tr>
<td></td>
<td>0.3%</td>
<td>2.8</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Degrees of Separation without Isolates</strong></td>
<td>$\text{Million}$</td>
<td>1.3</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>0.03%</td>
<td>2.3</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>0.3%</td>
<td>3.1</td>
<td>2.6</td>
</tr>
</tbody>
</table>
Concentration of World Trade
Top 25% in 1980

N. America
E. Asia
Middle East
Africa
CIS & Baltics
Europe
Unknown Destinations
Concentration of World Trade
Top 25% in 1990

- US
- Canada
- Japan
- UK
- Euro-12
Concentration of World Trade
Top 25% in 2001

- France
- Japan
- Mexico
- United States
- United Kingdom
- Euro-12
- Canada
- US
- UK
Concentration of World Trade
Top 50% in 2001
Concentration of World Trade
Top 75% in 2001

- N. America
- S.E. Asia
- E. Asia
- Unknown Destinations
- Middle East
- India
- Africa
- Latin America
- CIS & Baltics
- Europe
- Australia
- Africa
Issue #2: Regional Effects

- Americas
- NAFTA
- Africa
- South Africa (Fractal?)
The Americas: 1980
Fifty Largest Unidirectional Trade Links
The Americas: 2001

Canada

US

Brazil

Argentina

Neth. Antilles

Mexico

US
The Americas w/o NAFTA: 1980

Brazil
Argentina
Neth. Antilles
Venezuela
Chile
The Americas w/o NAFTA: 2001

- Brazil
- Argentina
- Neth. Antilles
- Venezuela
- Peru
- Ecuador
- Chile
Americas in World Trade

The Americas and World Trade

- % of World Total wo NAFTA
- % of World Total with NAFTA
- Inter-American wo NAFTA
- Inter-American with NAFTA

% of World Trade

Volume (1000 USD)
The Americas: Food in 2001

Canada

US

Brazil

Chile

Venezuela

Mexico
The Americas: Textile Fibers in 2001

- Argentina
- Brazil
- Canada
- Colombia
- Chile
- Mexico
- US
The Americas: Apparel in 2001

- Canada
- US
- Brazil
- Mexico
- Chile
- Colombia
- Argentina
- US
- Mexico
- Canada
- Brazil
- Chile
- Colombia
- Argentina
The Americas: Fuel in 2001

- Canada
- US
- Brazil
- Venezuela
- Argentina
- Neth. Antilles
- Mexico
- US
The Americas: Machinery in 2001

Canada

US

Brazil

Venezuela

Mexico

Chile

Colombia

Argentina

US
Africa, US & Euro-12

1980
All Commodities
50 Largest Links

These links represent:
88.90% of Africa trade
discounting trade between US & Euro-12
Africa, US & Euro-12

2001
All Commodities
50 Largest Links

These links represent:
84.65% of Africa trade
discounting trade between US & Euro-12
Intra-African Trade

1980
All Commodities
50 Largest Links

These links represent:
77.52% of All Intra-African Trade
Intra-African Trade

2001
All Commodities
50 Largest Links

These links represent:
75.83% of All Intra-African Trade
## Africa in World Trade

<table>
<thead>
<tr>
<th>Percent of World Trade for:</th>
<th>1980</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-Africa Trade</td>
<td>0.11%</td>
<td>0.13%</td>
</tr>
<tr>
<td>Africa Trade including Trade with US and Euro-12</td>
<td>5.48%</td>
<td>1.92%</td>
</tr>
</tbody>
</table>
Summary and Next Steps

- **Nodes: Additional characteristics**
  - Empire and “Civilization”
  - World Development Indicators and Economic System
  - Etc.

- **Links: Additional transactions**
  - Tourism and Air Travel
  - Internet usage and Phone calls
  - Migration

- **Layering Structures**
  - E.g., Combining trade linkages and cultural information

- **Dynamic Modeling**
  - E.g., Visualizing change over time or thresholds
Telephone Calls 1995
by World Bank
Estimated Income Levels

- Classic display of the relationships predicted by dependency theory.
- Richest countries and even semi-rich (Socialist economies): internally and globally integrated.
- Poorer regions: not well integrated with each other and links only to the rich.
Schedule
2005-06

- Data uploaded to www.princeton.edu/~ina
- Interactive production of Netmap
- Conference March 2006
- Publication of Observing Trade Fall 2006
- Expansion of data and further pubs, 2006-2010.

www.princeton.edu/~ina/gkg