International Supply Chains and ASEAN Developing Economies

Enhancing ASEAN Logistics Services Seminar
Cebu, Philippines, 1-2 May 2014

Douglas Brooks
Asian Development Bank
Outline of discussion

• An ASEAN story

• Why logistics services?
  • *Trade and growth nexus*
  • *Well functioning supply chains are important for trade*

• Facilitating supply chain development

• The 4 I’s for investment

• Managing risks and vulnerability in supply chains

• Key points
Only modest increase in intra-ASEAN connectivity - TRADE

Share of Intra-ASEAN Trade

Trade with the rest of the world

Intra ASEAN trade

Source: ADB ARIC database (2013)
The same for INVESTMENT

Cumulative FDI flows to ASEAN

Cumulative FDI flows from the rest of the world

Source: ADB ARIC database (2013)
In developing Asia...

- Roughly 50% of developing Asia’s exports are intraregional
- Most intraregional trade appears to be intra-industry as well (esp. electronics, auto parts)
- Tripolar expansion of PRC, India and ASEAN expected to boost intraregional trade further
The trade and growth nexus

Openness and Growth -113 Economies

Source: ADB staff estimates from Penn World Tables 7.0, using the Wacziarg and Welch (2008) methodologies and classification
Greater physical connectivity is most apparent in the GMS
Greater physical connectivity is most apparent in the GMS

Infrastructure Development in GMS

ADB (2010)

Roads
Telecommunications
Power Transmission Line
Greater physical connectivity is most apparent in the GMS
Concepts

• **Global Value Chains** – focus on *value-added*, across countries (trade in tasks, capabilities)

• **Vertically-Integrated Supply Chains** – focus on ensuring *supply* of inputs from one step to the next (trade in goods, availability of low-cost suppliers, infrastructure)

• **Production Networks** – focus on *coordination* of disparate but interconnected activities (service links, logistics)

• **Outsourcing** – theory of the firm; *ownership*; costs and externalities

• **Offshoring** – rapid recent growth; *location*; employment concerns/benefits

• **Embodied services** – measurement; attribution
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Decreasing trade costs central to expansion of SCs (Brooks and Hummels 2010)

• The advent of fast transport (air shipping and faster ocean vessels) was equivalent to reducing tariffs on manufactured goods from 32% to 9% between 1950-1998

• Each additional day spent in transport reduces the probability that the US will import from source country by 1-1.5%

• Containerization in ocean transport changed the composition of freight rates, lowering the cost of distant relative to proximate travel

• Relative declines over time in air shipping prices make time-savings less expensive ➔ aggregate trade growth, growth in time-intensive forms of integration such as vertical specialization
### Trade costs take many forms

<table>
<thead>
<tr>
<th>Transport Cost</th>
<th>Inventory Cost</th>
<th>Transit Time</th>
<th>Quality of Products</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Elasticity of trade flows to transport costs ranges from -2 to -3.5 (Limao and Venables, 2001)</td>
<td>- Storage and warehousing costs (can be high for specific types of products)</td>
<td>- Export delays reduce the exports of time-sensitive agro products are reduced by 7% (Djankov et al. 2006)</td>
<td>- Some products require special transport and storage conditions</td>
<td>- Security - Pilferage or piracy</td>
</tr>
<tr>
<td>- 10% increase in ad valorem transport costs lowers trade by 3-4% (De 2009)</td>
<td>- Possibility of just in time inventory system</td>
<td>- $1 billion collective GDP gain of GMS from export and import time reduction by 25% (Strutt et al. 2008)</td>
<td></td>
<td>- Feed back mechanism between supply and demand</td>
</tr>
<tr>
<td></td>
<td>- Implications on cash flow</td>
<td></td>
<td></td>
<td>- Information and trade finance complement logistics</td>
</tr>
</tbody>
</table>
Global Value Chains in 2008/9

Benno Ferrarini - Asian Development Bank
Computed with data from the OECD-WTO TIVA database, accessed 09/15/2013

Source: Ferrarini (2013)
Participation in GVCs

Foreign inputs and domestically produced inputs used in third economies’ exports, as a share of gross exports, 2009 (TIVA database)

Source: OECD (2013)
What have we learnt so far?

• More than 50% of world trade is in intermediate goods (excluding oil and fuel)
• 75% to 80% of world trade is actual value-added
• More services are traded and more SME participation when accounting for indirect VA imbedded in manufacture exports
• Bilateral trade balances are significantly reshuffled (ex. the size of the China-US deficit is halved)
• Jobs implications of ‘trade in tasks’ differ between Industrialised and Industrializing Countries ...

Source: Escaith (2013)
Trade looks different in value added terms

In *TiVA*, Services share doubles

Services enter the value chains:
- Directly in the manufacturing process
- Pre- or post-manufacturing stage
- Post-retail services and recycling

Source: Escaith (2013)
Global value chains

Value added

Production process

Planning
R&D
Design & testing
Material/parts
And components
Assembly
Final products
Marketing
Sale
Services

Source: WTO-IDE-JETRO (2011)
Traditional trade statistics do not show the full picture

Traditional trade statistics do not show the full picture. The diagram illustrates the components and cost breakdown of an iPhone produced by Apple. The iPhone, priced at $179.00, is assembled in China (CHN) for $6.50. The components are sourced from Japan (JPN) for $10.75, South Korea (KOR) for $22.96, Germany (GER) for $30.15, and the rest of the world (ROW) for $48.04. Apple sold 11.3 million iPhones in the US in 2009.
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# SEZs can circumvent shortcomings in logistics and supply chain weaknesses

<table>
<thead>
<tr>
<th>Economy</th>
<th>Number of Zones</th>
<th>Key Sectors</th>
<th>Key Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>266</td>
<td>Automobiles, petroleum, electronics</td>
<td>US – domestic</td>
</tr>
<tr>
<td>Taipei, China</td>
<td>14</td>
<td>Electronics, semiconductors, electrical, high technology</td>
<td>Japan, US</td>
</tr>
<tr>
<td>Korea, Rep. of</td>
<td>10</td>
<td>Electronics, high technology</td>
<td>Japan, US</td>
</tr>
<tr>
<td>Malaysia</td>
<td>13</td>
<td>Electronics, semiconductors, electrical, automotive parts</td>
<td>Japan, US, ASEAN</td>
</tr>
<tr>
<td>Philippines</td>
<td>83</td>
<td>Electronics, semiconductors, electrical, automotive parts</td>
<td>Japan, US, ASEAN</td>
</tr>
<tr>
<td>PRC</td>
<td>187</td>
<td>Apparel, electronics, electrical</td>
<td>US, Japan, EU</td>
</tr>
<tr>
<td>Indonesia</td>
<td>27</td>
<td>Apparel, footwear, electronics, food processing</td>
<td>Japan, US, ASEAN</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>185</td>
<td>Apparel, footwear, luggage, electrical, metal working</td>
<td>Japan; ASEAN; Taipei, China</td>
</tr>
</tbody>
</table>

The LPI provides a good summary of the quality of supply chains in ASEAN economies.

### Logistics Performance Score 2014

<table>
<thead>
<tr>
<th>Country</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>4.0</td>
</tr>
<tr>
<td>Malaysia</td>
<td>3.6</td>
</tr>
<tr>
<td>Thailand</td>
<td>3.4</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>3.2</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3.1</td>
</tr>
<tr>
<td>Philippines</td>
<td>3.0</td>
</tr>
<tr>
<td>Cambodia</td>
<td>2.7</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>2.4</td>
</tr>
<tr>
<td>Myanmar</td>
<td>2.3</td>
</tr>
</tbody>
</table>

### Components of the LPI

- **Efficiency of the customs clearance process**
- **Quality of trade and transport related infrastructure** (ports, railroads, roads, information and technology)
- **Ease of arranging competitively priced international shipments**
- **Logistics competence** of transport operations, customs brokers
- **Tracking and tracing** of consignments
- **Timeliness** of shipments in reaching destinations

Regional cooperation in trade-related infrastructure

- Externalities, economies of scale
- Coordination can leverage impacts
- GMS special forums to coordinate transport, telecoms, electric power
- Cross country economic corridors, hubs and gateways, including SEZs
- Special needs of landlocked economies
- Harmonization of soft infrastructure
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Addressing the supply chain challenges: 4 I’s for Investment

- Infrastructure
- Institutions
- Incentives
- Information
Trade costs can be reduced through infrastructure investments

Accumulated Reduction in Trade Costs Resulting from Infrastructure Investment 2010-2020 (% of trade value)

<table>
<thead>
<tr>
<th>Country</th>
<th>From Transport Infrastructure</th>
<th>From Communications Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>14.0</td>
<td>0.7</td>
</tr>
<tr>
<td>Malaysia</td>
<td>25.3</td>
<td>6.6</td>
</tr>
<tr>
<td>Philippines</td>
<td>11.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Thailand</td>
<td>15.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>12.2</td>
<td>5.9</td>
</tr>
</tbody>
</table>

Source: Fan (2012)
Infrastructure

- Lower marginal costs ⇒ larger minimum efficient scale of production ⇒ economies of scale
- Reduces time costs  
  - Search and border costs  
  - Costs of entering into, and monitoring, supply contracts  
  - Time between perception of demand and supply response  
  - Impacts trade of differentiated products more than homogeneous ones  
- Market and supplier access most important FDI factors, > production costs  
- Service efficiency improvements equivalent to moving 1000’s of kms closer to trading partners  
- Eases congestion costs
Institutions

- Predictable legal rights and procedures
- Enforceable and equitable competition policy
- Sound regulatory framework
- Long term, local currency bond markets
- Border clearance procedures
Incentives: Example of service providers – principle of minimum transactions

No Intermediary

One Intermediary

Source: Adapted from Banomyong (2012)
• Reduction of time costs
  • *Search and border costs*
  • *Costs of entering into, and monitoring supply contracts*
  • *Time between perception of demand and supply response*
  • *Impacts differentiated products more than homogeneous ones*
Infrastructure and logistics influence both absolute and comparative advantage

- Mitigate limits in factor endowments
- Importance of timeliness and reliability of delivery
- Intraregional integration
- Changes in composition of trade point us toward changes in the kinds of infrastructure needed
  - Light goods
  - Air transport
  - Demand for certainty, timeliness
  - Needs of small firms, new trade flows
  - Services
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• Key points
Flexibility and resilience: Thailand 2011

Production Index

Source: Office of Industrial Economics, Ministry of Industry, Thailand
Supply chains are vulnerable to disruptions...

**Key Triggers of Global Supply Chain Disruptions as Identified by Respondents**

<table>
<thead>
<tr>
<th>Category</th>
<th>Trigger</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental</td>
<td>Natural disasters</td>
<td>59%</td>
</tr>
<tr>
<td></td>
<td>Extreme weather</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Pandemic</td>
<td>11%</td>
</tr>
<tr>
<td>Geopolitical</td>
<td>Conflict and political unrest</td>
<td>46%</td>
</tr>
<tr>
<td></td>
<td>Export/import restrictions</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Terrorism</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>Corruption</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>Illicit trade and organized crime</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>Maritime piracy</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Nuclear/biological/chemical weapons</td>
<td>6%</td>
</tr>
<tr>
<td>Economic</td>
<td>Sudden demand shocks</td>
<td>44%</td>
</tr>
<tr>
<td></td>
<td>Extreme volatility in commodity prices</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Currency fluctuations</td>
<td>26%</td>
</tr>
<tr>
<td></td>
<td>Border delays</td>
<td>26%</td>
</tr>
<tr>
<td></td>
<td>Global energy shortages</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>Ownership/investment restrictions</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>Shortage of labor</td>
<td>17%</td>
</tr>
<tr>
<td>Technological</td>
<td>Information and communications disruptions</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Transport infrastructure failures</td>
<td>6%</td>
</tr>
</tbody>
</table>

**Source:** WEF (2012)
In the longer term, cartelization and uncompetitive markets also pose risks

- Market power is important in international shipping
  - Minimum efficient scale in shipping is significant
  - Carriers are often organized in cartels (liner conferences) determining shipping prices and market shares.
  - EU-Competitiveness Council - cartelization led to less competitive shipping markets and higher shipping prices.
Rapid growth also implies risks to supply chains

• Unbalanced trade = unbalanced demand for transportation

• Rapid growth => Congestion
  • Not just in transport services; quality control

• Interdependence
  • E.g., Congestion in China is an Asia-wide problem

• But…economies of scale in trade services
  • Information
  • Competition among service providers
Supply chain governance

Addressing market efficiency

• Investigating the nature of transactions costs
  ▶ Where do the bottlenecks exist?

• Overcoming or managing coordination costs
  ▶ Political economy considerations

• Competition – cabotage laws, monopsonies
  ▶ Providing the right environment
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Key points

• Sequencing of infrastructure investments closely related to industrial structure (and its dynamics)
• Infrastructure and logistics developing fast, but the needs are still large
• Regional cooperation in trade and logistics infrastructure can boost regional integration, growth and development
• Steps to lower transactions costs differ at different points along the supply chain
• Risk management is crucial, especially for perishable goods like agricultural commodities
• Changes in technology will ➔ ???
Thank you