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Asia's Infrastructure, Trade Costs and Regional  
Cooperation

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# Asia's Infrastructure, Trade Costs and Regional Cooperation

Douglas H. Brooks  
Peru, June 2008



# Outline

- Context (Asian trade)
  - Intraregional trade
  - Production fragmentation
- What, and how large, are trade costs?
- Infrastructure's role in reducing trade costs

# Trade in Developing Asia

- More than 50% of Asia's exports are intraregional
- Dual expansion of PRC and India expected to boost intraregional trade further
- Most intraregional trade appears to be intra-industry as well (esp. electronics)

# Trade Integration in Asia

## Emerging East Asia and Other Selected Regions in World Trade

Group	Total Exports (US\$ billion)			Share of World Trade (%)		
	1990	2000	2005	1990	2000	2005
<b>East Asia</b>	417.8	1193.9	2136.6	13	19.2	21.7
<b>East Asia (excl. China)</b>	355.7	944.7	1374.6	11	15.2	13.9
<b>East Asian Intra-Trade</b>	136.1	456.4	901.7	4.2	7.3	9.1
<b>East Asia to Rest of World</b>	281.7	737.4	1234.8	8.7	11.8	12.5
<b>East Asia to EU 15</b>	65.1	176.1	308.2	2.0	2.8	3.1
<b>East Asia to United States</b>	94.2	252.1	365.9	2.9	4.0	3.7
<b>East Asia to Japan</b>	61.7	145.9	203.8	1.9	2.3	2.1
<b>East Asia to China</b>	24.3	109	282.7	0.8	1.7	2.9
<b>WORLD EXPORTS</b>	<b>3224.8</b>	<b>6233.1</b>	<b>9859</b>	<b>100</b>	<b>100</b>	<b>100</b>

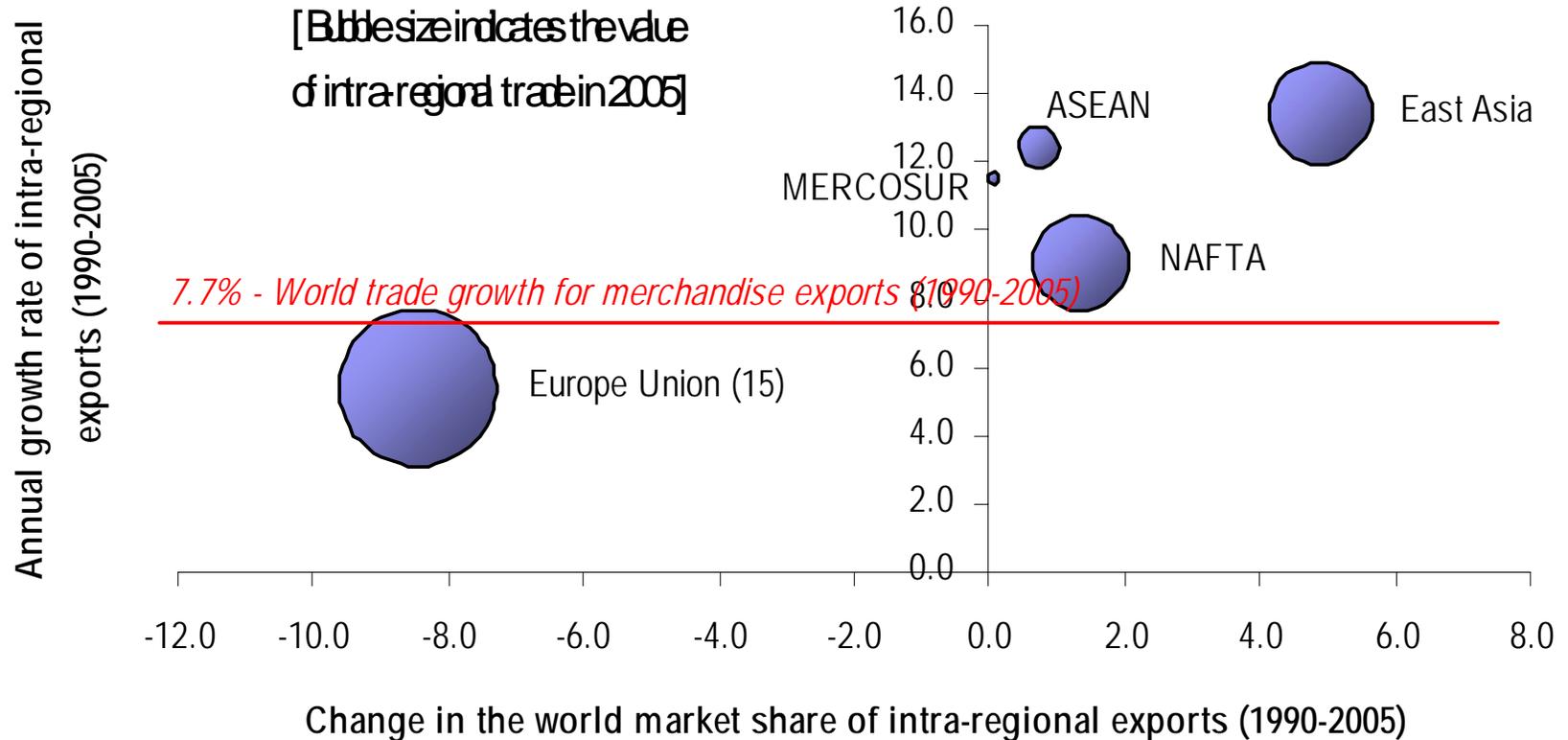
Source: Calculated from UN COMTRADE data (S2, items-total).

Notes: East Asia includes Brunei, Cambodia, China, Hong Kong (China), Indonesia, Korea Rep., Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, Singapore, Taipei, China, Thailand, and Vietnam.



# Intra-regional trade comparison

## Intra-regional Trade of Major Regions: 1990-2005



Source: UN COMTRADE Dataset (S2, items-total).

Note: East Asia includes Brunei, Cambodia, China, Hong Kong (China), Indonesia, Korea Rep., Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, Singapore, Taipei, China, Thailand, and Vietnam.

## Key Points:

- Asia, in particular East Asia, has high integration in trade, mostly through trade in P&Cs;
- Asian economies have been important in world production networks. Many countries are involved at different stages in the assembly process;
- Cost of services links is very important in this process of integration, which requires superior infrastructure and logistics.
- Infrastructure and logistics in Asia have been developing fast, but the needs are still large.

# Stylized facts

- Trade value falls rapidly over distance
- Trade is higher between adjacent countries, those sharing a common language, those with more migration
- Large home bias is observed in trade flows
- Countries with “better” trade infrastructure trade more

# What are trade costs?

- Traditional focus: tariffs, quotas
  - Obvious and explicit taxes on trade
  - Operate “at the border”
  - Amenable to policy action
- Tariffs are declining in importance
  - Percentage of total explicit trade costs for US
    - 1958 = 75%; 1970 = 50%; 2004 = 25%

# What are Trade Costs?

- Broadly defined, trade costs include policy barriers (tariffs and nontariff barriers), transportation costs, local distribution costs, information costs, contract enforcement costs, and other border-related barriers such as language and currency conversion

**Table 1. Representative trade costs of industrialized countries**

<b>Total Trade Costs</b>	170
<b>1. International Trade Costs</b>	74
1.1 Border-related Trade Barriers	44
1.1.1 Policy	8
1.1.2 Language	7
1.1.3 Currency	14
1.1.4 Information cost	6
1.1.5 Security	3
1.2 Transportation Cost	21
1.2.1 Freight	11
1.2.2 Time	9
<b>2. Retail and wholesale distribution costs</b>	55

Source: Anderson and van Wincoop (2004)

# Variation in Trade Costs

- Trade costs vary widely across countries
- Developing countries' trade costs 2X or more higher in some categories
- Trade costs vary widely across product lines, by factors of 10 or more
- Highly variable across good, partners
  - Implies a large role in allocating trade
  - US:  $COV = \text{stdev}(f)/\text{mean}(f) = 150\%$ 
    - Good with shipping cost one standard deviation above mean has costs 150% greater.
  - Within product  $COV = 70\%$

# Importance of Time

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

# Time costs?

- Air prices are many times higher than ocean prices for the same good, but
- air cargo is a rapidly growing share of trade
  - Ton-miles, growing at 8.4 % per year since 1975
  - Values:
    - US 1/3 of imports, 1/2 of exports outside N. America
    - Similar number for big Latin American countries

# Why is air cargo growing?

- Rapid declines in air shipping costs
- Trade in high quality goods
  - Timeliness is a complement input
  - Ad-valorem impact of air price is lower
- Consumer incomes and impatience (waiting is an inferior “good”)
- Growth in international production sharing (aka fragmentation, vertical specialization)
- Use of airplanes to hedge demand uncertainty

# Reducing Trade Costs

- Cost-cutting developments may do more to lower trade costs than reducing tariffs or quotas
- So may reductions in red tape and administrative fees or delays
- Trade facilitation in WTO Doha Round

# Technology and Changes in Trade Costs

- The advent of fast transport (air shipping and faster ocean vessels) is equivalent to reducing tariffs on manufactured goods from 32% to 9% between 1950-1998 (Hummels 2001)
- Containerization in ocean transport changed the composition of freight rates, lowering the cost of distant relative to proximate travel (Hummels 1999)

# Infrastructure and Trade Costs

- Lower marginal costs → larger minimum efficient scale of production → economies of scale
- A country more deeply involved in global production networks will benefit more than one that is not

# Infrastructure and Trade Costs

- By reducing commercial distribution margins, infrastructure can narrow the gap between producer and purchaser prices
- Expanded scope for domestic absorption and for supply to export markets

1. Infrastructure and trade logistics play an important role in promoting economic growth in Asia by, among others,

- reducing trade costs,
- increasing market- and supplier-accessibility,
- improving international competitiveness.

2. Trade and FDI have also been crucial ingredients of the rapid growth and fast integration in Asia.

3. Further economic integration and successful trade and production networks in the region demand superior infrastructure and logistics services.
4. However, infrastructure in Asia is still rather fragile. Also, much needs to be done for cross-border physical connectivity in Asia.

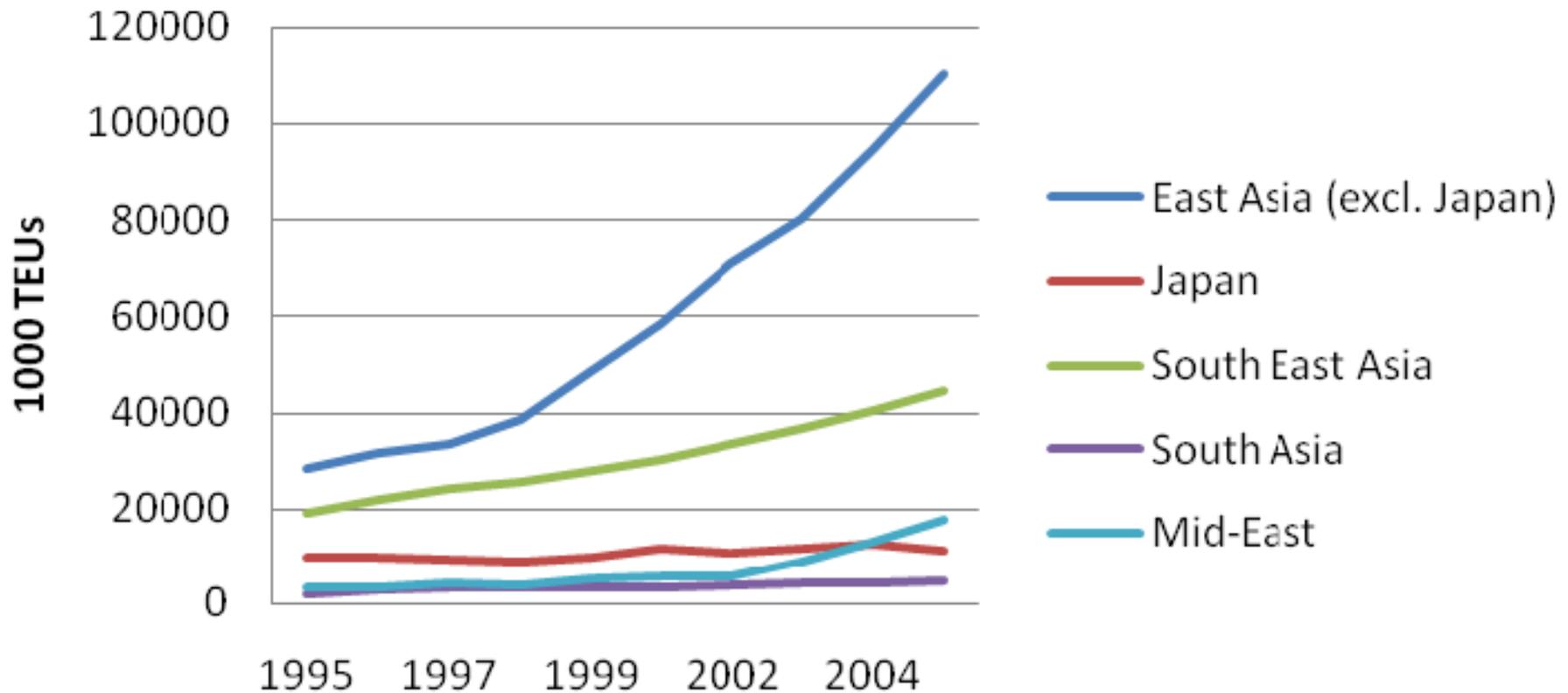
# Trade Costs and Infrastructure

- Infrastructure reduces distribution margins
  - Lowers consumer prices and raises consumer welfare
  - Lowers transaction costs, raises value added, profitability
  - Expands links to global distribution networks

# Trade Costs and Infrastructure

- Trade affects transportation service demand through (Hummels):
  - Changes in weight/value
  - Demand for timeliness
  - Trade at the extensive margin
  - Production fragmentation

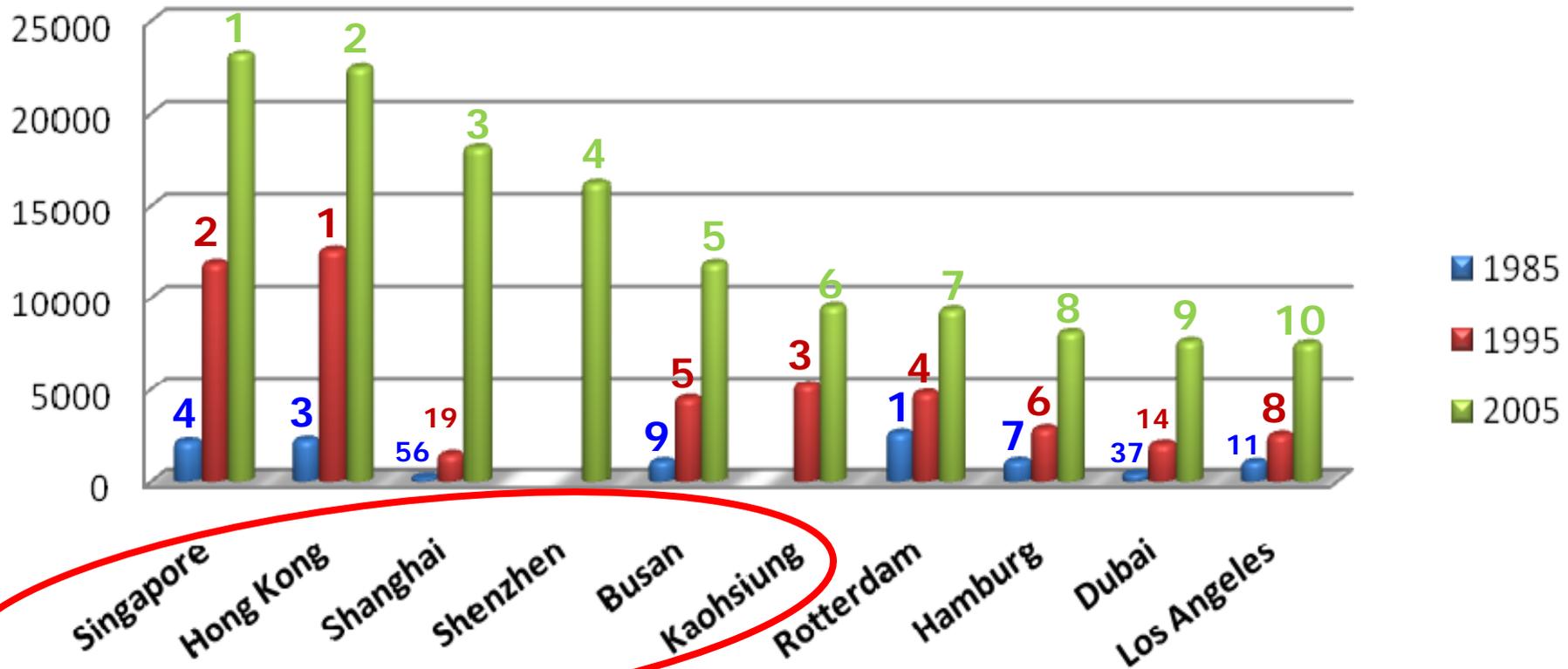
# Container Traffic of Major Ports in Asia (1995-2005)



Data source: Containerisation International Yearbook (2007) and data compiled by Dr. Jean-Paul Rodrigue.

Note: The data for each subregion before 2001 is aggregated over the top 100 ports, while for the post-2001, the data is aggregated over the top 50 ports.

# World Port Ranking in 1985, 1995, 2005 (Unit: 1000 TEUs)



Data source: Containerisation International Yearbook (2007) and data compiled by Dr. Jean-Paul Rodrigue.

Note: Data for Shenzhen in 1985 & 1995, for Kaohsiung in 1985, and for Singapore in 1985 are not available. Singapore port data in 1986 is used for 1985.

# Port Efficiency

- New harbor, wharf or terminal decreases port costs by 2%
- Procurement of a new crane decreases port costs by 1%
- Increasing # of berths and deepening channels at ports have less effect (Haveman et al, forthcoming)

# Infrastructure and Trade Costs

- Inland freight charges may be greater than ocean freight
- Railway construction crucial inland for bulk commodities
- Relative decline for air freight and insurance vis-à-vis ocean in PRC

# Transportation modes

- Can be substitutes or complements
- Air- and seaports better with efficient rail and road connections
- Land transport about 7X more costly than sea
- Lowering trade costs by 10% with infrastructure can increase exports >20% (Limao and Venables 2001)

# ICT Infrastructure

- Reduces times 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

# Infrastructure network externalities

- ICT, railways, water supply systems
- Natural monopoly characteristics
- Role for competition policy

# Soft Infrastructure for Trade

- Predictable legal rights and procedures
- Enforceable and equitable competition policy
- Sound regulatory framework
- Long term, local currency bond markets
- Border clearance procedures

# Infrastructure influences both absolute and comparative advantage

- Mitigates limits in factor endowments
- Asia's production fragmentation and trade in P&C
- Importance of timeliness and reliability of delivery
- Intraregional integration

# Infrastructure, Trade Costs, and FDI

- Locational advantages closely linked to quality of infrastructure services
- Market and supplier access most important FDI factors, > production costs
- Service efficiency improvements equivalent to moving 1000's of kms closer to trading partners
- Easing congestion costs

# Regional Cooperation in Trade-related Infrastructure

- Coordination can leverage impacts
- GMS special forums to coordinate transport, telecoms, electric power
- Cross-country economic corridors
- Harmonization of soft infrastructure

# Thank you

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