

A Quantitative Assessment of Economic Impact of Trade Delays on Regional Integration in South Asia:

A Computable General Equilibrium Approach (GTAP)

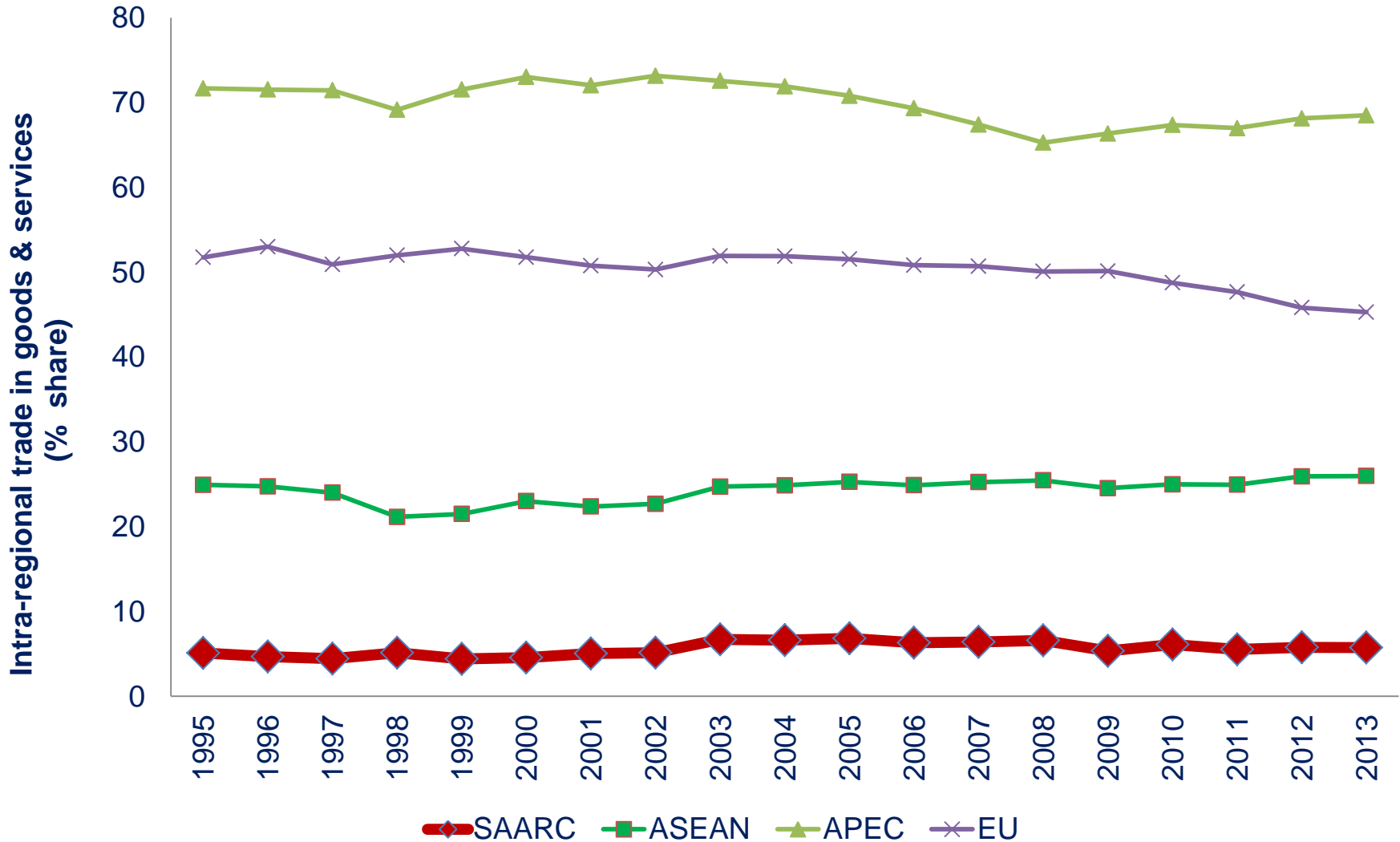
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Outline

- Stylized Facts
- Motivation
- Estimation of Time Delays Database
- Model Implementation
- Simulations
- Results
- Way Forward

Intra-regional Trade in South Asia



Why Does Intra Regional Trade in South Asia Remain Low?

Tariff Barriers ??

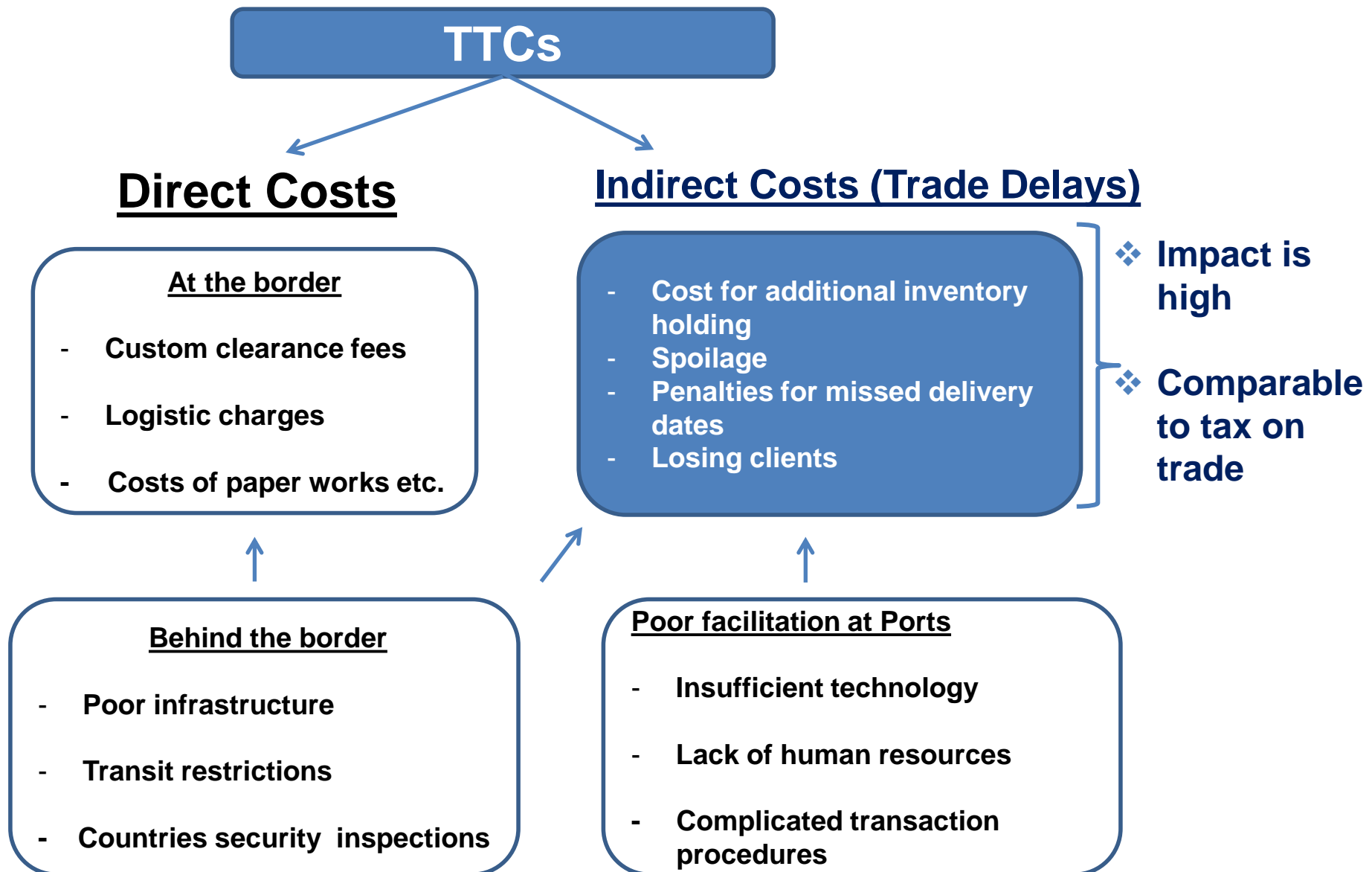
Poor trade facilitation !!!

What is Trade Facilitation (TF)

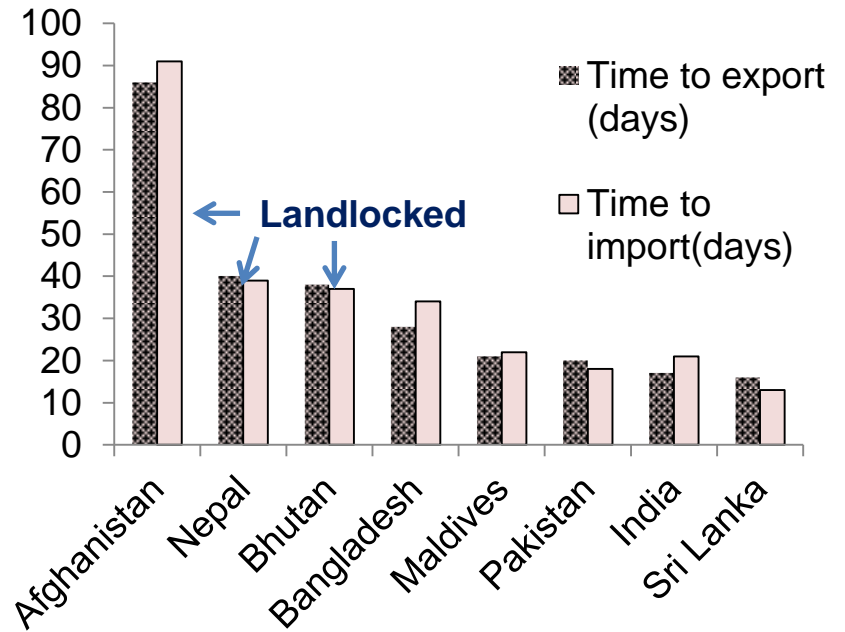
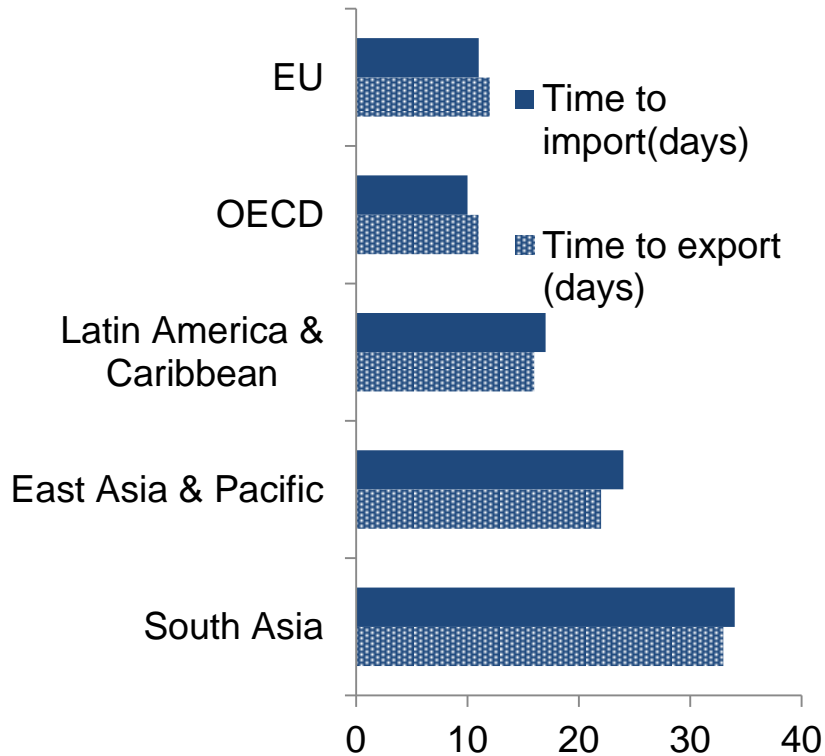
TF refers to simplification and harmonisation of export and import processes and expediting the movement, release and clearance of goods including goods in transit **(WTO,2015)**

Minimize trade transaction costs (TTCs)

Trade Transaction Costs (TTCs) in South Asia



Time to trade in South Asia



Source: Doing Business Report (World Bank, 2015)

Reduction of trade delays



Lower trade transaction costs



Increase market access



Export diversification



Increase exports and imports



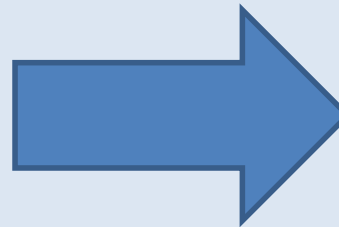
Producers and consumers better off



Increase intra-regional trade

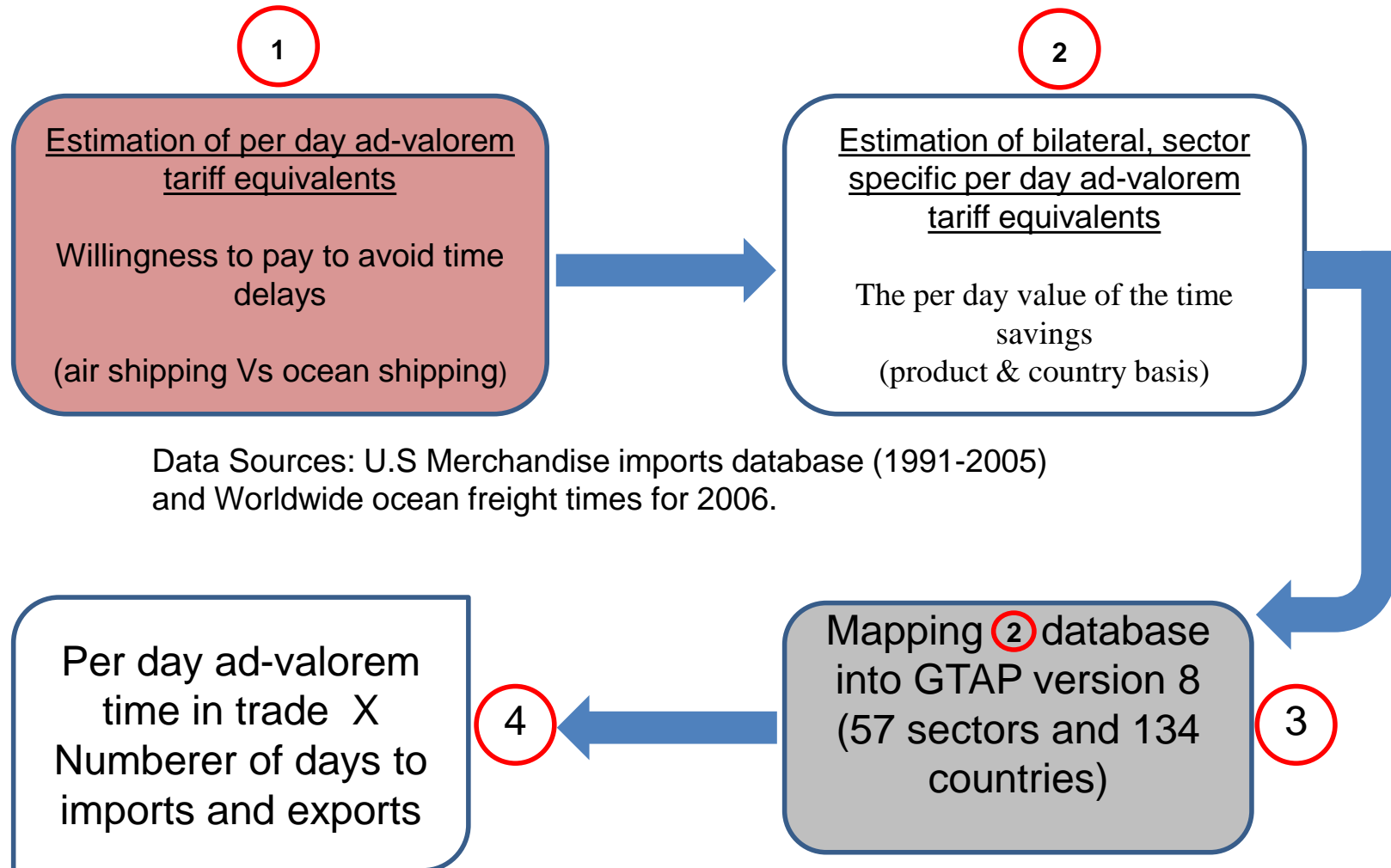


Faster economic growth



Quantitative Estimation of these impacts in South Asia based on GTAP

Estimation of Ad-Valorem Time in Trade Database (Minor and Hummels ,2013)



Data Sources: U.S Merchandise imports database (1991-2005)
and Worldwide ocean freight times for 2006.

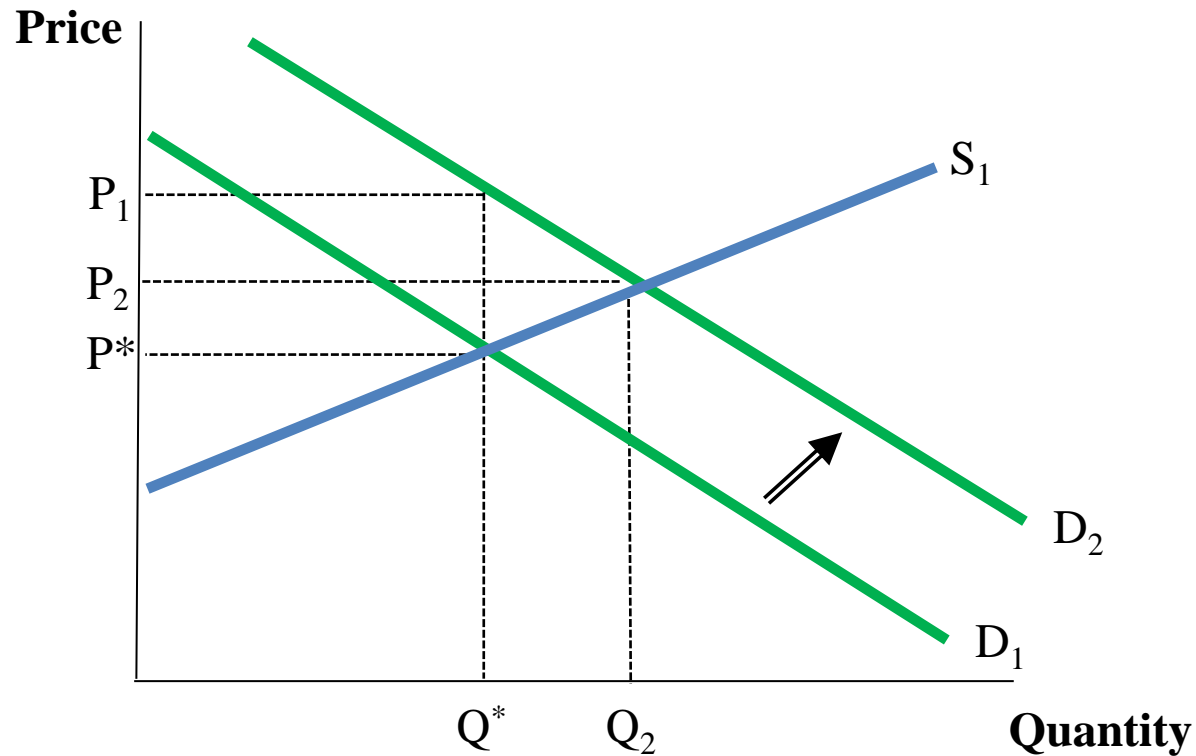
Data Sources: World Bank Doing
Business Data (2007)

Implementation of trade delays in the Standard GTAP model

Iceberg Approach

Implementation of trade delays in the standard GTAP model

Welfare impacts of reduction in trade delays



Source: Minor and Hummels (2013)

Implementation of trade delays in the Standard GTAP model

The import demand equation

$$qxs_{irs} = -ams_{irs} + qim_{is} - \sigma_m^i (pms_{irs} - ams_{irs} - pim_{is})$$

The import price equation

$$pim_{is} = \sum_r \theta_{irs} pms_{irs} - ams_{irs}$$

Where;

σ_m^i = Elasticity of substitution among imports of i

qxs_{irs} = Percentage change in bilateral exports of i from r to s

qim_{is} = Percentage change in total imports of i into s

pms_{irs} = Percentage change in price of imports of i from r in s

pim_{is} = Percentage change in average import price of i in s

ams_{irs} = Demand shift equal to the ad valorem value of trade delays of i from r to s

θ_{irs} = The Share of commodity i shipped from region r to region s

Data Aggregation

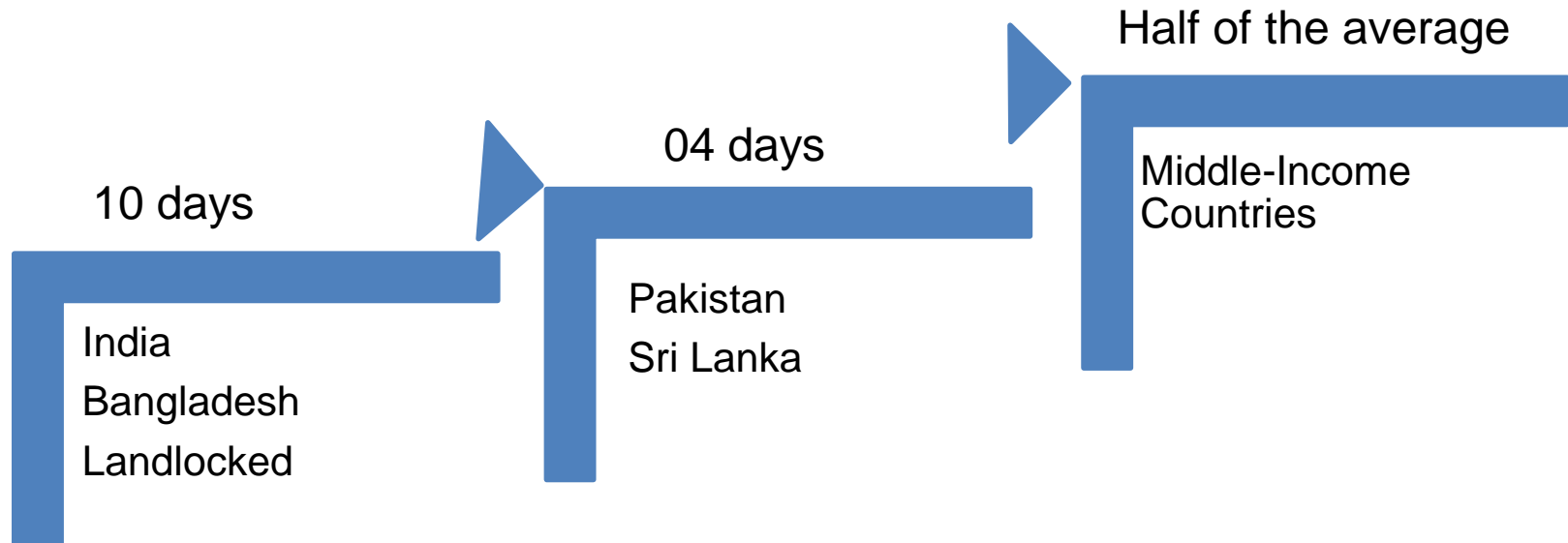
Regional aggregation

1. Pakistan
2. India
3. Bangladesh
4. Sri Lanka
5. Landlocked (Nepal, Bhutan, Afghanistan)
6. Unites States of America
7. European Union
8. China
9. Rest of the World

Sectoral aggregation:

1. Grains and Crops
2. Vegetable and Fruits
3. Livestock and Meat Products
4. Mining and Extraction
5. Processed Food
6. Textiles and Clothing
7. Light Manufacturing
8. Heavy Manufacturing
9. Utilities and Constructions
10. Transport and Communication

Simulations



Based on Hertel and Mirza (2009)

Simulations

Number of days to imports

| Country | Customs Clearance | Port Handling | Inland Transport | Total |
|-----------------------------------|-------------------|---------------|------------------|-------|
| India | 4 | 6 | 10 | 20 |
| Pakistan | 2 | 4 | 2 | 8 |
| Bangladesh | 9 | 13 | 2 | 24 |
| Sri Lanka | 4 | 2 | 2 | 8 |
| Land-Locked Countries(South Asia) | 5 | 5 | 10 | 20 |
| USA | 1 | 1 | 1 | 3 |
| Eu28 | 1 | 2 | 2 | 5 |
| UAE | 1 | 1 | 1 | 3 |
| China | 4 | 2 | 3 | 9 |
| Row | 3 | 3 | 3 | 9 |

Simulated number of days to imports

| Country | Customs Clearance | Port Handling | Inland Transport | Total |
|------------------------------------|-------------------|---------------|------------------|-------|
| India | 2 | 3 | 5 | 10 |
| Pakistan | 1 | 2 | 1 | 4 |
| Bangladesh | 5 | 8 | 1 | 14 |
| Sri Lanka | 2 | 1 | 1 | 4 |
| Land-Locked Countries (South Asia) | 2.5 | 2.5 | 5 | 10 |
| USA | 1 | 1 | 1 | 3 |
| Eu28 | 1 | 2 | 2 | 5 |
| UAE | 1 | 1 | 1 | 3 |
| China | 4 | 2 | 3 | 9 |
| Row | 3 | 3 | 3 | 9 |

} No Change

Source: Minor and Hummels (2013)

Source: Authors' calculations based on Hertel and Mirza (2009)

Results

Percentage Change in Imports by Commodity in South Asia due to reduction in Trade Delays

| Sectors | India | Pakistan | Bangladesh | Sri Lanka | Land locked | South Asia |
|-------------------------------|-----------|-----------|------------|------------|-------------|------------|
| Grain crops | 6 | 1 | 16 | 32 | 176 | 13 |
| Meat & livestock | 36 | 43 | 44 | 41 | 138 | 52 |
| Extractions | 0.3 | 3 | 41 | 1 | 190 | 1 |
| Processed foods | 2 | 8 | 19 | 18 | 32 | 8 |
| Vegetable & fruits | 11 | 63 | 76 | 125 | 254 | 41 |
| Textile &wearing-apparel | 3 | 12 | 1 | -7 | 34 | 4 |
| Light manufacturing | 3 | 16 | 37 | 23 | 64 | 12 |
| Heavy manufacturing | 0.3 | 1 | 7 | 5 | 17 | 1 |
| Utilities &constructions | - 3 | 2 | 11 | 14 | 43 | - 0.1 |
| Transport& communications | 0.3 | 2 | 11 | 10 | 36 | 3 |
| Other services | 0.3 | 2 | 10 | 15 | 36 | 1 |
| All commodities | 1 | 4 | 13 | 9 | 37 | 3 |

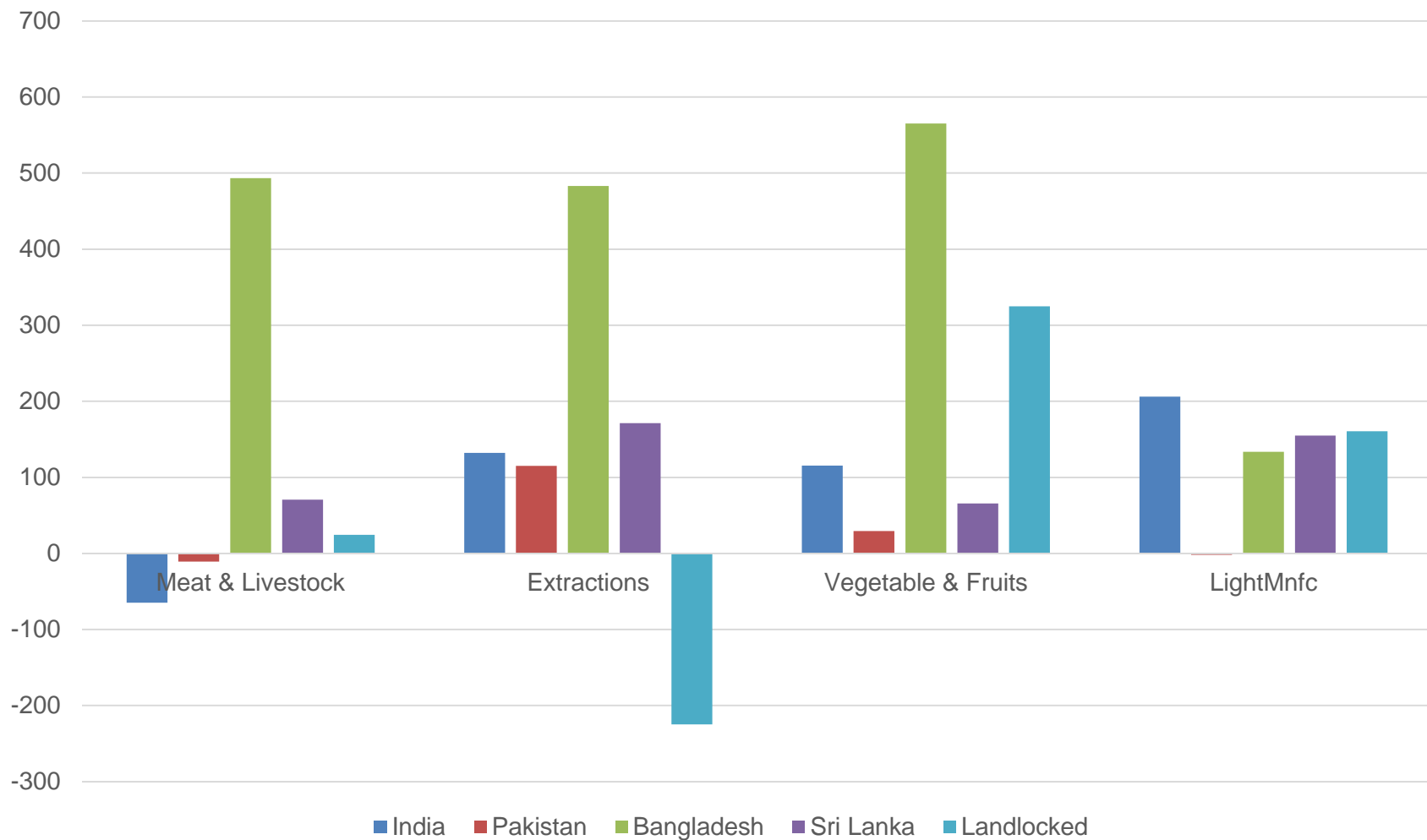
Source: Authors' calculations

Percentage Change in Exports by Commodity in South Asia due to reduction in Trade Delays

| Sectors | India | Pakistan | Bangladesh | Sri Lanka | Land locked | South Asia |
|----------------------------|-------|----------|------------|-----------|-------------|------------|
| Grain Crops | 3 | 8 | 63 | 2 | 236 | 10 |
| Meat & Livestock | 2 | 70 | 8,913 | 1,120 | 499 | 60 |
| Extractions | 2 | 141 | 1,048 | 56 | (31) | 11 |
| Processed foods | 1 | 1 | 38 | 2 | 52 | 4 |
| Vegetable & fruits | 16 | 70 | 2,764 | 202 | 403 | 100 |
| Textile & Wearing-apparel | 1 | -1 | -19 | -16 | 51 | -5 |
| Light manufacturing | 6 | 16 | 66 | 113 | 505 | 19 |
| Heavy manufacturing | 0 | 8 | 119 | 0 | 55 | 1 |
| Utilities & constructions | 0 | -3 | -24 | -23 | -83 | -15 |
| Transport & communications | 0 | -2 | -15 | -15 | -56 | -3 |
| Other services | -1 | -3 | -18 | -24 | -75 | -2 |
| All commodities | 0.4 | 3 | 8 | -2 | 18 | 1 |

Source: Authors' calculations

Changes in Trade Balance in Selected Sectors in South Asia (US\$ million)



Percentage Change in Intra-Regional Trade in South Asia

| Sectors | % Change |
|----------------------------|-----------|
| Grain crops | 27 |
| Meat & livestock | 361 |
| Extractions | 288 |
| Processed foods | 18 |
| Vegetable & fruits | 162 |
| Textile & wear-apparel | 30 |
| Light manufacturing | 225 |
| Heavy manufacturing | 15 |
| Utilities & constructions | -77 |
| Transport & communications | -5 |
| Other services | -4 |
| All commodities | 37 |

Source: Authors' calculations

Note: Intra-regional trade is calculated as total export sales from South Asia to South Asia

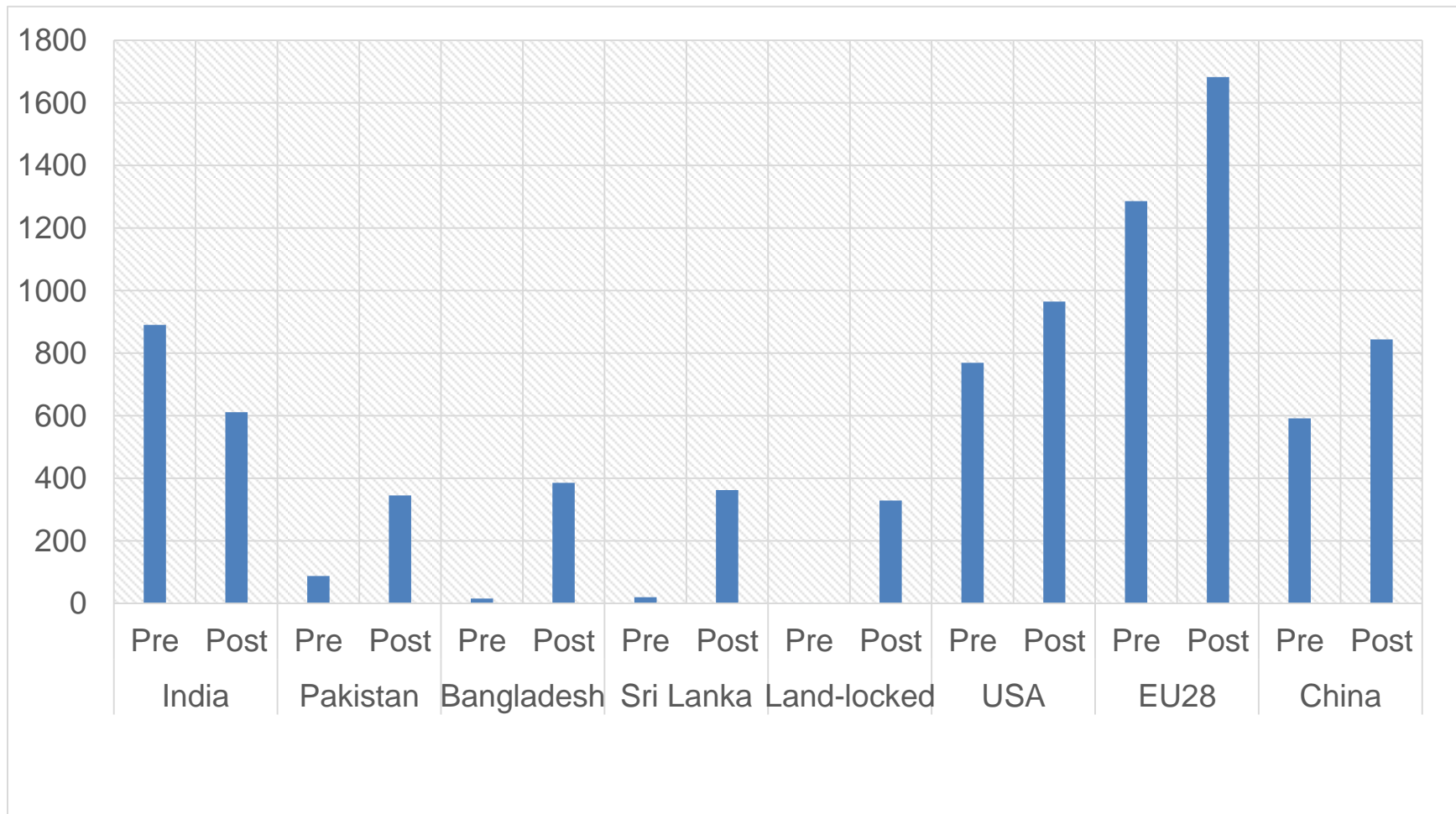
Percentage Change in Intra-Regional Trade due to Reduction of Three Elements of Trade Delays

| Country | Reduction of Customs Delays | Reduction of Inland Transport Delays | Reduction of Port Handling Delays |
|------------|-----------------------------|--------------------------------------|-----------------------------------|
| India | 9 | 5 | 13 |
| Pakistan | 17 | 8 | 20 |
| Bangladesh | 10 | 40 | 13 |
| Sri Lanka | 8 | 20 | 12 |
| Landlocked | 14 | 48 | 17 |
| South Asia | 11 | 11 | 15 |

Source: Authors' calculations

Note: Intra-regional trade is calculated as total export sales from South Asia to South Asia

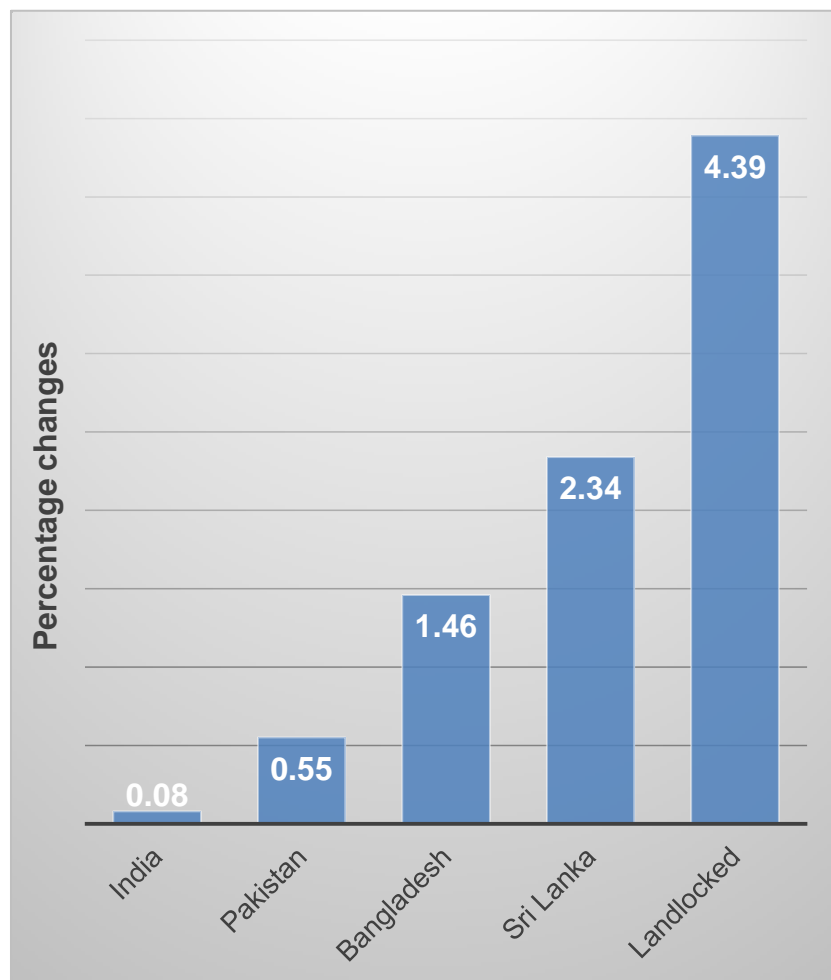
Export Sales from South Asia and the Rest of the World to the Landlocked Countries (US\$ million)



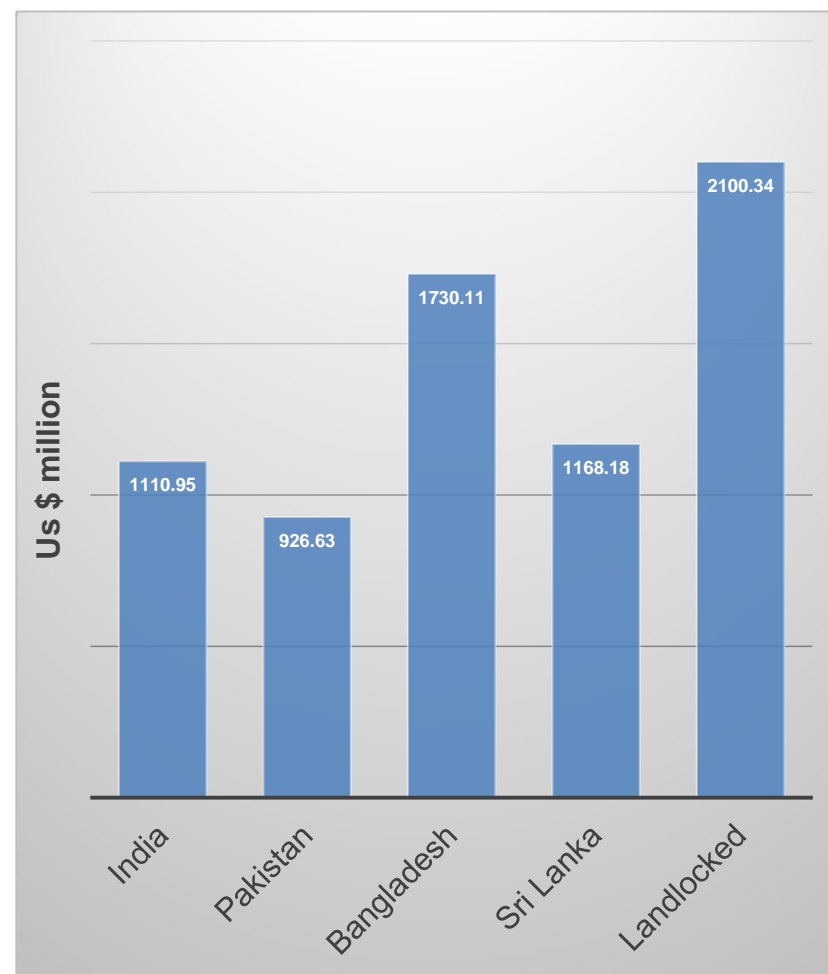
Source: Authors' calculations

Macro Economic Changes

Changes in real GDP



Welfare Improvement



Source: Authors' calculations

Way Forward

Extension of ad valorem trade time database

- ✓ Extension to the GTAP version 9
- ✓ Incorporating investment costs of reduction of trade delays to the GTAP model
- ✓ Estimating long run effects of trade delays

Thank you

Changes in Intra-Regional Trade in South Asia by Country and Sector (US\$ million)

| Sector | India | | Pakistan | | Bangladesh | | Sri Lanka | | Landlocked | | South Asia | |
|---------------------------|-------|--------------|----------|--------------|------------|--------------|-----------|--------------|------------|--------------|------------|---------------|
| | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Grain crops | 644 | 705 | 71 | 90 | 133 | 155 | 54 | 96 | 60 | 172 | 961 | 1,218 |
| Meat&livestock | 90 | 105 | 30 | 66 | 0.43 | 245 | 8 | 88 | 5 | 112 | 134 | 616 |
| Extractions | 177 | 283 | 6 | 90 | 18 | 441 | 16 | 110 | 71 | 195 | 288 | 1118 |
| Processed foods | 1,040 | 1,050 | 293 | 321 | 12 | 193 | 214 | 250 | 137 | 193 | 1,696 | 2,004 |
| Vegetable&fruits | 248 | 232 | 74 | 114 | 3 | 384 | 15 | 95 | 89 | 301 | 430 | 1,125 |
| Textile&wear-apparel | 772 | 809 | 388 | 389 | 69 | 257 | 31 | 80 | 103 | 235 | 1,363 | 1,770 |
| Light manufacturing | 137 | 289 | 37 | 79 | 6 | 163 | 54 | 137 | 23 | 168 | 257 | 837 |
| Heavy manufacturing | 5,049 | 5,269 | 545 | 676 | 139 | 440 | 290 | 365 | 384 | 629 | 6,406 | 7,379 |
| Utilities & constructions | 3 | 4 | 1 | 1 | 0.31 | 0.26 | 0.37 | 0.3 | 116 | 22 | 120 | 27 |
| Transport& communications | 40 | 45 | 23 | 23 | 4 | 4 | 17 | 15 | 10 | 4 | 95 | 91 |
| Other services | 171 | 180 | 29 | 29 | 21 | 18 | 16 | 12 | 17 | 5 | 254 | 243 |
| All commodities | 8,372 | 8,970 | 1,496 | 1,877 | 406 | 2,297 | 716 | 1,249 | 1,015 | 2,034 | 12,005 | 16,428 |

Source: Authors' calculations

Note: Intra-regional trade is calculated as total export sales from South Asia to South Asia