

## Intraregional Trade Costs in Asia: A Primer

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### Abstract

While much has been said about the need to promote intraregional trade and the importance of reducing associated trade costs, quantitative estimates of such costs have been lacking. A new comprehensive measure of international trade costs is applied in this paper to calculate ad valorem trade costs within and between 4 Asian subregions, including ASEAN and SAARC. Extra-regional trade costs of the 4 subregions with free trade areas outside Asia, such as NAFTA and the EU, as well as their trade costs with China, India and Japan are also calculated. The analysis concludes with an evaluation of the importance of tariff in overall trade costs. Sharp differences across Asian subregions are identified. ASEAN is found to have much lower intra-subregional trade costs than other Asian subregions, as well as mostly lower trade costs with free trade areas outside Asia. While SAARC intra-subregional trade costs remain exceedingly high, South Asia is found to have made the most progress in reducing such costs since 2003. North and Central Asia, which groups together Russia and landlocked economies in transition, still faces prohibitive trade costs - sometimes exceeding 300% tariff equivalent. Within the East and North-East Asia subregion, a subset of three countries - Japan, China and Republic of Korea - is found to have the lowest intra-group trade costs of any country groups examined in this paper, although the three countries have not signed free trade agreements with each other. Estimates of trade costs between Asian subregions and China, India and Japan, highlight how effective China has been in reducing its trade costs with ASEAN as well as other Asian and non-Asian subregions, achieving generally lower international trade costs than Japan as of 2007. Tariff costs account for a small portion of the overall international trade costs of Asian subregions - typically 10% or less - confirming the need for trade policy makers and negotiators to sharpen their focus on reducing non-tariff barriers.

Keywords: Trade facilitation, trade costs, regional integration Subregion, Asia

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## Introduction

Reducing international trade costs is high on the agenda of developing countries in Asia as they strive to maintain or enhance their trade competitiveness in an increasingly challenging global environment. At the same time, it has become increasingly clear that these countries need to diversify their export markets and trade more with each other, both to foster harmonious and sustainable regional development and reduce the risks associated with dependence on a limited number of developed country markets.

Most Asian countries are already actively engaged in bilateral or regional trade and economic integration initiatives, and many of these initiatives include trade facilitation or trade cost reduction programs or targets.<sup>1</sup> There is ample evidence that successful implementation of these programs – or achievement of targets – would have a very significant impact on intraregional trade.<sup>2</sup> However, little is known about the level of intraregional trade costs in Asia and to what extent these costs may have decreased over time. In an effort to address this knowledge gap, we estimate and analyze intra and extra regional trade costs of 4 Asian subregions, namely Association of South-East Asian Countries (ASEAN), South Asian Association for Regional Cooperation (SAARC), North and Central Asia, and East and Northeast Asia.

The definition and measure of trade costs adopted in this paper is presented in the next section, along with other methodological considerations and data sources. Empirical findings are then discussed, starting with intra and extra regional trade costs of Asia as a whole, followed by intra- and inter- subregional trade costs, and trade costs of Asian and other subregions with China, India and Japan. Tariff and non-tariff trade costs of Asian subregions are also examined briefly before we conclude.

## Methodology and Data

### *Trade Cost Definition and Measure*

There have been many attempts to develop trade costs measures. Much effort has focused on direct measurement of various trade cost components, such as international transport costs (using actual shipping costs of a standard container to various destinations or more aggregate CIF/FOB trade data),<sup>3</sup> or costs of moving goods from the factory to the deck of a ship at the nearest sea port (including, e.g., cost of preparing trade documentation, customs clearance, goods transport and handling to the port).<sup>4</sup> Others (e.g., Kee et al., 2009) have estimated cost of observed tariff and policy based non-tariff barriers (e.g., import quotas, subsidies, antidumping duties). Still others have relied on surveys of business or logistics service providers to derive

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<sup>1</sup> For example, Asia-Pacific Economic Cooperation (APEC) leaders committed to a 5% reduction in trade costs in 2001, followed by an additional commitment of a 5% cut in 2005. Quantitative estimates of trade costs - necessary to determine whether or not targets were being achieved – have not been made available, however (Shepherd, 2010).

<sup>2</sup> See, e.g., Helble, Shepherd and Wilson (2007), Abe and Wilson (2008), and Duval and Utoktham (2009).

<sup>3</sup> See, e.g., Limão and Venables (2001) and De (2006, a, b).

<sup>4</sup> For example, cost of export and/or cost of import indicator in Doing Business Report, World Bank, 2010.

qualitative or quantitative indicators of international trade cost components.<sup>5</sup> However, these approaches do not provide a comprehensive measure of international trade costs - and combining the different measures and indicators into a comprehensive measure is hardly feasible.

We therefore adopt the measure of comprehensive trade costs proposed by Jacks, Meissner and Novy (2009) for calculating international trade costs in this paper.<sup>6</sup> This bilateral measure of trade costs is comprehensive in the sense that it includes *all additional costs involved in trading goods bilaterally relative to those involved in trading goods intranationally (i.e., domestically)*. It captures trade costs in its wider sense, including not only international transport costs and tariffs but also other trade cost components discussed in Anderson and van Wincoop (2004), such as costs associated with the use of different language and currencies. Direct and indirect costs associated with completing trade procedures or obtaining necessary information are also included.

This measure is derived from the gravity equation, the workhorse econometric model of trade, and is fully grounded in trade theory. Bilateral trade costs can be expressed as a tariff equivalent, as follows:

$$\tau_{ij} \equiv \left( \frac{t_{ij}t_{ji}}{t_{ii}t_{jj}} \right)^{\frac{1}{2}} - 1 = \left( \frac{x_{ii}x_{jj}}{x_{ij}x_{ji}} \right)^{\frac{1}{2(\sigma-1)}} - 1$$

where  $\tau_{ij}$  denotes geometric average trade costs between country  $i$  and country  $j$

$t_{ij}$  denotes international trade costs from country  $i$  to country  $j$

$t_{ji}$  denotes international trade costs from country  $j$  to country  $i$

$t_{ii}$  denotes intranational trade costs of country  $i$

$t_{jj}$  denotes intranational trade costs of country  $j$

$x_{ij}$  denotes international trade flows from country  $i$  to country  $j$

$x_{ji}$  denotes international trade flows from country  $j$  to country  $i$

$x_{ii}$  denotes intranational trade of country  $i$

$x_{jj}$  denotes intranational trade of country  $j$

$\sigma$  denotes elasticity of substitution

According to this equation, trade costs are directly inferred from observable bilateral and intranational (domestic) trade data, showing how much more expensive bilateral trade is relative to intranational trade. Intranational trade is ideally defined as gross output less export. However, since gross output data is not available for most developing countries in Asia, intranational trade is calculated instead as gross domestic product (GDP) minus export.<sup>7</sup> Subregional trade costs are calculated as simple averages of bilateral trade costs of countries within each subregion.<sup>8</sup>

<sup>5</sup>For example, see the Logistics Performance Index of the World Bank; or the Executive Opinion Survey of the World Economic Forum, and its Enabling Trade reports.

<sup>6</sup> This measure was also earlier derived by Head and Ries (2001).

<sup>7</sup> Jacks, Meissner and Novy (2009) finds that the percentage change of trade costs over time using GDP in the calculation is similar to those computed with gross output. The paper shows high correlation between gross output and GDP, which makes GDP as a proxy of gross output is still theory consistent. Novy (2009) notes however that using GDP data overstates intranational trade and thus the level of trade costs because GDP includes (nontradable) services.

<sup>8</sup> We initially calculated subregional trade costs using aggregate international and intranational trade of subregions, but this was found to be misleading due to missing trade and GDP data of different countries in each subregion in various years.

### Data and Country Groups

Bilateral international trade flows from 1988-2008 are obtained from UN Commodity trade database (Comtrade) and downloaded using the World Integrated Trade Solution (WITS). Bilateral import data is used as it is generally believed to be of better quality than export data. GDP and gross exports, which are used in calculation of bilateral intranational trade, are obtained from World Development Indicator (WDI) and UN Comtrade, respectively.<sup>9</sup> Bilateral tariff data used to calculate non-tariff trade costs at the subregional level are from the UNCTAD TRAINS database.<sup>10</sup> Following past literature, elasticity of substitution is assumed to be constant over time and set at  $\sigma = 8$ <sup>11</sup>.

Various country groups were identified to enable analysis of trade costs at the subregional level. Most country groups were based on existing subregional integration initiative or free trade area memberships, e.g., ASEAN and the North-American Free Trade Area (NAFTA). The East and North-East Asia and the North and Central Asia subregions are defined following the practice of the United Nations. Importantly, table 1 shows countries in each subregion for which data was available, and which could therefore be included in the calculation of subregional trade costs.

**Table 1: Country Groups – Definition of Regions and Subregions**

| MERCOSUR            | EU5                                       | NAFTA                   | AUS-NZ                   | Asia   |  |   |  |
|---------------------|---|-------------------------|--------------------------|--|--|---|--|
|                     |   |                         |                          | ASEAN  | East and North-East Asia                     | North and Central Asia  | SAARC  |
| Argentina<br>Brazil | France<br>Germany<br>Italy<br>Spain<br>UK | Canada<br>Mexico<br>USA | Australia<br>New Zealand | Indonesia<br>Malaysia<br>Philippines<br>Thailand | China<br>Japan<br>Korea<br>Macao<br>Mongolia | Armenia<br>Azerbaijan<br>Georgia<br>Kazakhstan<br>Kyrgyz Rep.<br>Russian Fed. | Bangladesh<br>India<br>Pakistan<br>Sri Lanka |

### Intra and Extra Regional Trade Costs of Asia

As shown in Table 1 above, the Asia group considered here consists of Japan and 20 developing economies spanning South, Southeast, East and North-East, as well as North and Central Asia - All these countries are members of ESCAP. Figure 1 and 2 show trade costs of Asia with subregional groups of countries both within and outside it, and how these costs have changed between 2003 and 2007.

Asia trade costs with all 4 of its subregions are higher than those with the European Union (EU5). They are also higher than with NAFTA, except in the case of trade with East and North-East Asia and ASEAN. Trade costs with NAFTA amount to a 190% tariff equivalent, while those with intraregional groups range from 175% (for ASEAN) up to 253% (for North and Central Asia) tariff equivalents. Asia extra-regional trade costs are highest with MERCOSUR as of 2007, but it is with that subregion that most progress was made in reducing costs since 2003 (-6%).

<sup>9</sup> All above mentioned data was downloaded in June 2010.

<sup>10</sup> Data downloaded through WITS as simple average of effectively applied tariff in July 2010.

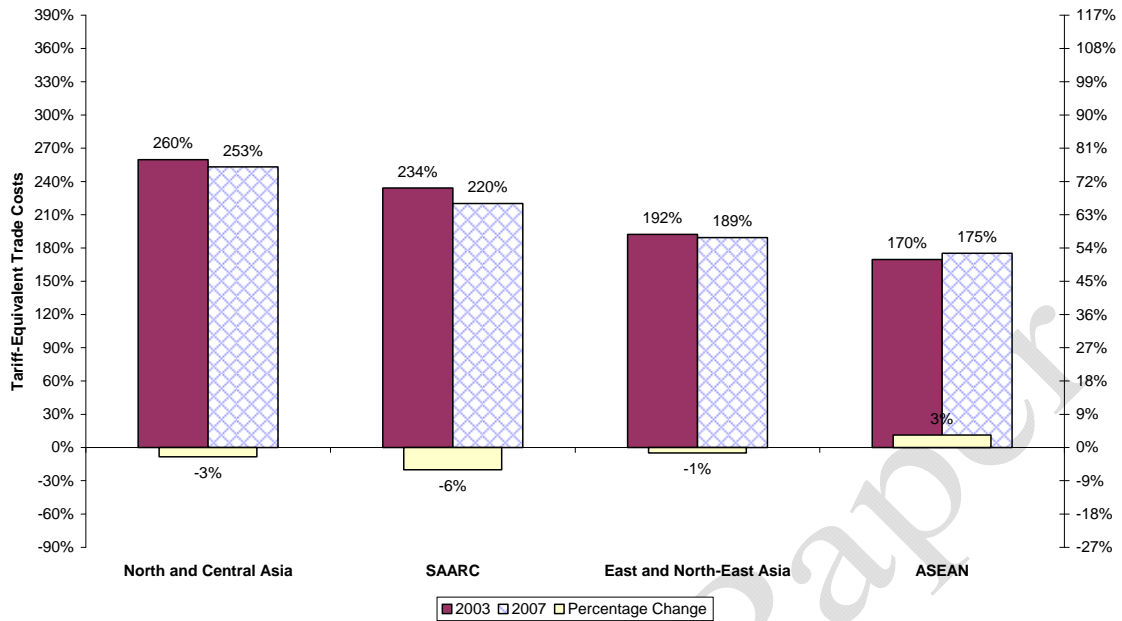
<sup>11</sup> This value of elasticity of substitution is the same as in Anderson and van Wincoop (2004) and Novy (2009). The past literature, for example, Anderson and van Wincoop (2003) and Jacks, Meissner and Novy (2009), suggests that results are not sensitive to the choice of parameter.

Asia intraregional trade costs are highest with North and Central Asia, followed by South Asia. They are lowest with ASEAN, but the results suggest progress in reducing trade costs with that subregion may have stalled since 2003. Most progress in reducing intraregional trade costs seem to have been made with South Asia (-6%), although trade costs with that subregion remain 26% higher than with ASEAN. Overall, trade costs of Asia (as a group) with itself remain high. Intra and extra-regional trade costs of Asia have changed little between 2003 and 2007, decreasing by similarly small amounts during that period.

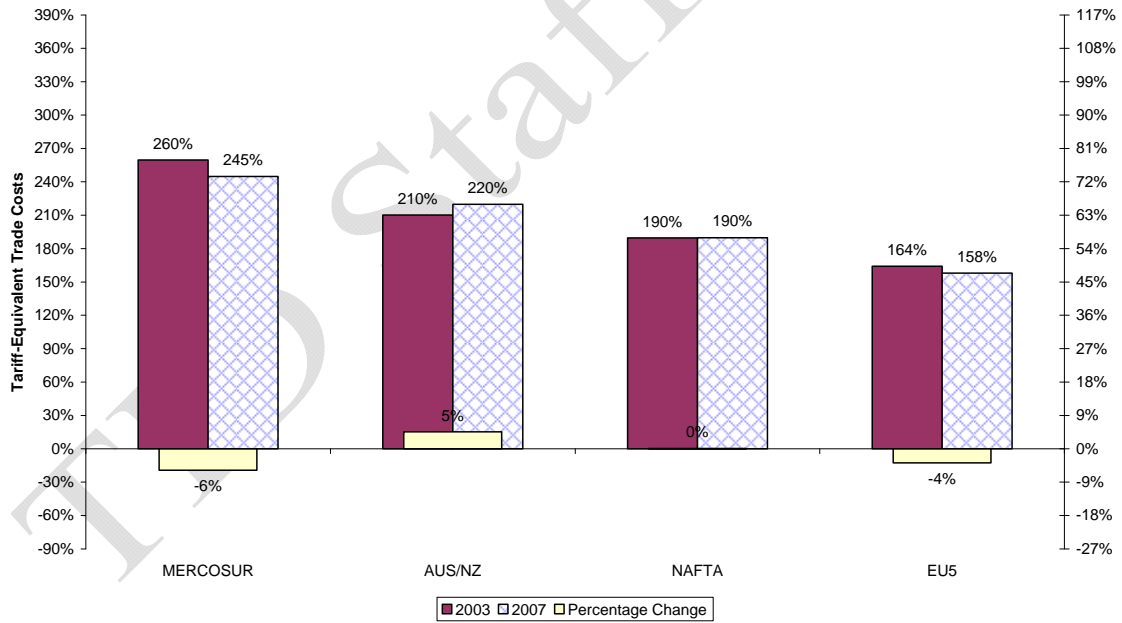
Generally, these results confirm the lack of economic and trade integration between economies of the greater Asia region. It also shows that these countries as a group may have focused on reducing trade costs more with developed countries and trading blocs outside Asia than within. We explore if these results hold at the more disaggregated level of Asian subregions in the next section.

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**Figure 1: Intra-Regional Trade Costs of Asia (with its Subregions)**



**Figure 2: Extra-Regional Trade Costs of Asia (with selected free trade areas)**



**Box 1: How do our estimates of trade costs compare with those of other similar studies?**

Anderson and van Wincoop (2004), based on an extensive reviews of available information on trade costs, suggested that overall ad-valorem trade costs - between developed countries – might amount to about 170%, broken down into 74% international trade costs and 55% local distribution costs.

Very recent papers by Novy (2009) and Shepherd (2010) use the same trade cost measure adopted in our paper. Novy reports trade costs in 2000 ranging from 25% (between US-Canada) to 70% (between US-Germany), but used gross output data rather than GDP data – he finds that using GDP data increase substantially its trade cost estimates (e.g., from 31% to 47% for US-Canada in 1993<sup>12</sup>). Shepherd uses GDP data and its trade cost estimates in 2006 range from 35% (between China and the World) to 86% (between Brunei Darussalam and the World), respectively. According to Shepherd (2010), trade costs of APEC and ASEAN with the rest of the world during 2001-2006 stand at 56 and 53%, respectively.<sup>13</sup>

Our own estimate of trade costs between US and Canada and US and Mexico stand at 41% and 47% in 2007, respectively. This in line with Novy's own estimates using GDP data. However, the Asian subregional trade costs calculated using the same method and data sources and reported in this paper range from 61% (between ASEAN countries) to 359% (between AUS/NZ and North and Central Asia) in 2007. The mostly higher values of ad valorem trade costs in this paper may therefore not be attributed to methodological or data differences but rather to the fact that we are estimating trade costs between groups of developing countries (with the exception of Japan), some of which include landlocked countries facing significant natural barriers to trade. The impressively wide range of comprehensive trade costs reported in this study is consistent with findings from earlier studies that focused on measuring specific trade cost components. For example, import costs reported in the World Bank Doing Business Report 2010 for Central Asian landlocked countries often exceed USD 3,000 per container, while they amount to around USD 600 for ASEAN.

Brooks and Ferrarini (2010), using a closely related but different trade cost measure and trade data sources, reports trade costs of 27% btw. China and ASEAN, and 42% between India and ASEAN in 2007. In contrast, we estimate trade costs between China and ASEAN at 62%, and 113% between India and ASEAN. One underlying reason for the different estimates is the use of different elasticities of substitutions. While these estimates are clearly different in absolute term, they are similar in relative terms, both suggesting that trade cost of ASEAN with India are much higher (at least 60 % higher) than those with China.

Overall, the variation in absolute values of overall trade costs in the most recent literature suggest that it would be inappropriate to use estimates from different studies - using different methodologies and data sources - to compare and assess national or regional performances, although comparison of trade cost results presented in relative terms may be feasible. In that context, the development of consistent and up-to-date database of bilateral trade costs estimates by ESCAP and ARTNeT is a welcome development.

<sup>12</sup> Our own estimate in this study is 50% for the same year, which is also consistent with the estimate of Anderson and van Wincoop (2004).

<sup>13</sup> Shepherd (2010) appears to be using  $i=country$  and  $j=rest\ or\ the\ world$  when applying the bilateral trade costs formula, such that his results are difficult to compare with those of Novy (2009) or ours.



### Intra-subregional and Inter-subregional Trade Costs in Asia

Trade costs of the 4 Asian subregions with themselves and each other are summarized in Table 2. Trade costs of these subregions with Australia and New-Zealand (AUS/NZ), European Union 5 (EU5) and NAFTA are also included for benchmarking purposes.

**Table 2: Intra and Inter-subregional Trade Costs in Asia:  
2007 Estimates and Progress Since 2003<sup>14</sup>**

| Full Dataset             | 2007          |                |                          |                        |              |               |              |
|--------------------------|---------------|----------------|--------------------------|------------------------|--------------|---------------|--------------|
|                          | ASEAN         | SAARC          | East and North-East Asia | North and Central Asia | AUS/NZ       | EU5           | NAFTA        |
| ASEAN                    | 61%<br>(-2%)  |                |                          |                        |              |               |              |
| SAARC                    | 151%<br>(-7%) | 150%<br>(-8%)  |                          |                        |              |               |              |
| East and North-East Asia | 155%<br>(-1%) | 246%<br>(1%)   | 128%<br>(-3%)            |                        |              |               |              |
| North and Central Asia   | 300%<br>(8%)  | 301%<br>(-14%) | 223%<br>(-7%)            | 162%<br>(-3%)          |              |               |              |
| AUS/NZ                   | 103%<br>(-4%) | 185%<br>(-1%)  | 174%<br>(4%)             | 359%<br>(-3%)          | 74%<br>(3%)  |               |              |
| EU5                      | 127%<br>(1%)  | 155%<br>(-5%)  | 153%<br>(-4%)            | 184%<br>(-5%)          | 148%<br>(0%) | 72%<br>(-2%)  |              |
| NAFTA                    | 122%<br>(1%)  | 179%<br>(-10%) | 138%<br>(-12%)           | 282%<br>(-6%)          | 149%<br>(0%) | 124%<br>(-4%) | 62%<br>(-3%) |

Note: values in parentheses show percentage changes in trade costs since 2003

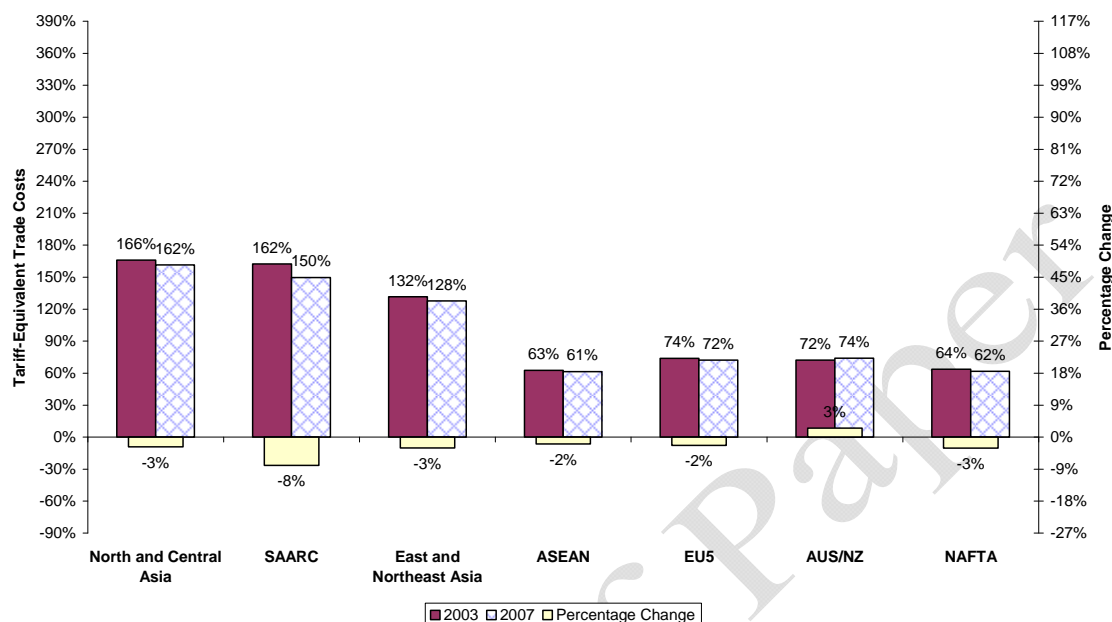
Inter-subregional costs are consistently much higher than intra-subregional costs. This is consistent with the existence of natural trade costs - e.g., the trade costs associated with geographical distances - not easily addressed through policy intervention, as well as the fact that most trade integration initiatives have taken place at the subregional rather than at the regional level of Asia. At the same time, however, trade costs changes reported in Table 2 suggest that, in recent years, more progress has been made in reducing trade costs inter-subregionally than intra-subregionally. Trade costs of each Asian subregion are briefly discussed below.

#### *ASEAN trade costs*

ASEAN has the lowest intra-subregional trade costs of all subregions, although results show only minor improvements have been made between 2003 and 2007 – ASEAN intra-regional trade costs fell from 92% in 1996 to 66% tariff equivalent in 2001, with limited subsequent progress (see Annex 1). ASEAN trade costs with other Asian subregions are found to be at least twice as high as the intra-ASEAN trade costs, suggesting a comparatively high level of trade and economic integration.

Figure 3 also shows that the intraregional trade costs of ASEAN are comparable to those of NAFTA and about 15% lower than those of EU5 or between Australia and New-Zealand. This is noteworthy, as it suggests that the relatively low amount of intra-regional trade within ASEAN – compared to that of EU5, for example – may not be attributed to trade facilitation issues but rather to issues of trade complementarities between members.

<sup>14</sup> Alternative service-sector adjusted trade cost estimates are presented in Annex 3.

**Figure 3: Intra-subregional Trade Costs of Asian Subregions, 2003/2007**

ASEAN trade costs with the East and North-East Asia region and SAARC are similar, involving a 90% additional ad valorem trade cost compared to intra-ASEAN trade.<sup>15</sup> This is significantly higher than the additional trade costs involved in trading with AUS/NZ or EU5 (42% and 66%, respectively). ASEAN trade costs with North and Central Asia remain prohibitively high with no improvements made between 2003 and 2007. In contrast, ASEAN trade costs with SAARC have decreased substantially (-7%) during that period.

#### **SAARC trade costs**

Intra-SAARC trade costs are found to be very high, amounting to two-and-a-half time the Intra-ASEAN trade costs. SAARC is the only region investigated for which intra-regional trade costs are not significantly lower than its extra-subregional trade costs. Indeed, SAARC trade costs with ASEAN and with itself are roughly the same.<sup>16</sup>

SAARC trade costs with other subregions do not compare favorably with those of ASEAN. Our estimates suggest that SAARC trade with EU5 and East and North-East Asia involve additional ad valorem trade costs of 28 to 91%, respectively, compared to ASEAN trade costs with those regions. SAARC and ASEAN trade costs with North and Central Asia are similar, although SAARC is geographically much closer to that subregion.

Notwithstanding SAARC's generally high trade costs, results suggest that the region has made significant progress between 2003 and 2007 in lowering costs. Intra-SAARC costs have decreased by 8% since 2003, and its costs with ASEAN and North and Central Asia have also decreased by 7 and 14%, respectively.

<sup>15</sup> As shown in Annex 2, trade costs between ASEAN and East Asia (China-Japan-Rep. of Korea) are only 69%, i.e., involving only an 8% additional trade costs compared to intra-ASEAN trade.

<sup>16</sup> This is particularly noteworthy, as our SAARC trade cost estimate does not even include Nepal trade costs due to missing data.

### ***East and North-East Asia trade costs***

Aggregate trade costs of this subregion are difficult to interpret, as it features two OECD member countries (Rep. of Korea and Japan), as well as one least developed and landlocked country (Mongolia) and China. The intra-regional trade cost estimate, which is roughly double that of ASEAN, suggest at best a moderate level of trade integration among members of this group.

This group is characterized by a relatively narrow range of trade costs with other subregions, ranging from 155% ad valorem trade costs with ASEAN, to 246% with SAARC. This subregion has the lowest trade costs of any Asian subregions with North and Central Asia, and trade costs with that subregion have decreased significantly since 2003 (-7%).

When the three leading economies in this group, i.e., China, Japan, and Rep. of Korea, are isolated and brought together into an East Asia subregion, we find that this newly defined East Asia group has lower intra-subregional trade costs than even ASEAN - This is particularly remarkable as the three countries did not enter into free trade agreements with each other as of 2007. East Asia is also found to have made significant progress in reducing trade costs with all Asian and non-Asian subregions (-4% to -19%) between 2003 and 2007, resulting in this group having the lowest trade costs of any subregions with any subregions (see Annex 2).

### ***North and Central Asia trade costs***

This subregion consists of economies in transition that are mostly landlocked. This certainly contributes to making trade costs in North and Central Asia the highest among all Asian subregions. This is true of both its intra-subregional trade costs and its trade costs with other subregions.

While this subregion is geographically proximate to both EU5, East and North-East Asia, and SAARC, its trade costs with SAARC appear to be approximately capping at 70% higher than those with EU5 or the East and North-East Asia subregion. However, the significant reduction in trade costs observed between North and Central Asia and both SAARC and East Asia (-14% and -7%, respectively) indicate that Central Asia is increasingly integrating into the rest of Asia.

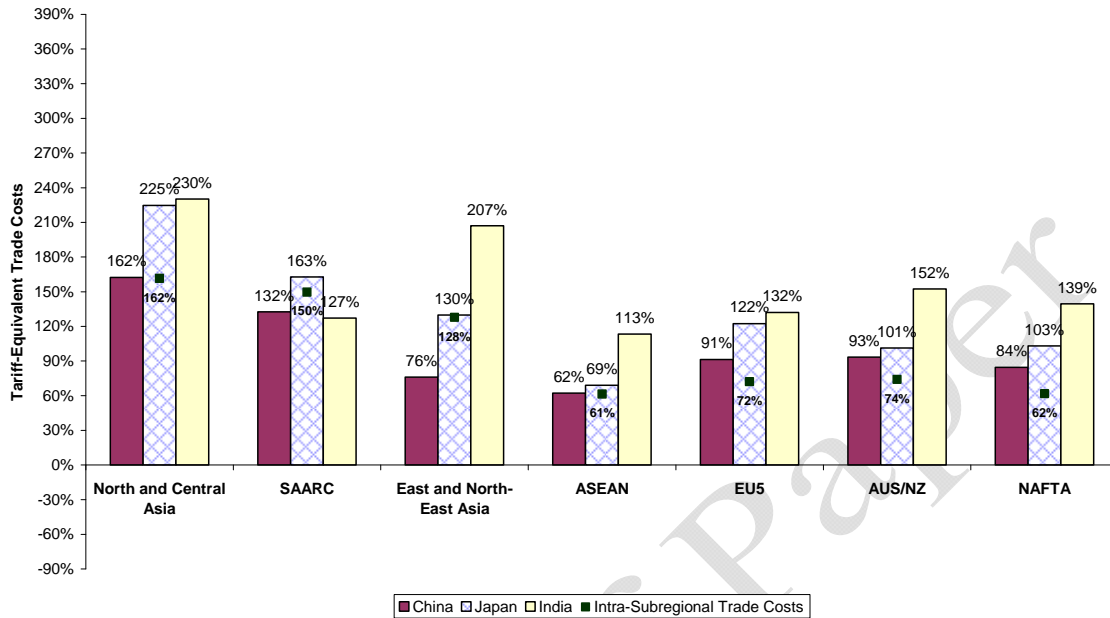
## **Trade Costs of Asian Subregions with China, India, and Japan**

In order to further deepen our understanding of intra-Asia trade costs, we explore below the trade costs between the 4 Asian subregions and the three Asian giants: Japan, India, and China.

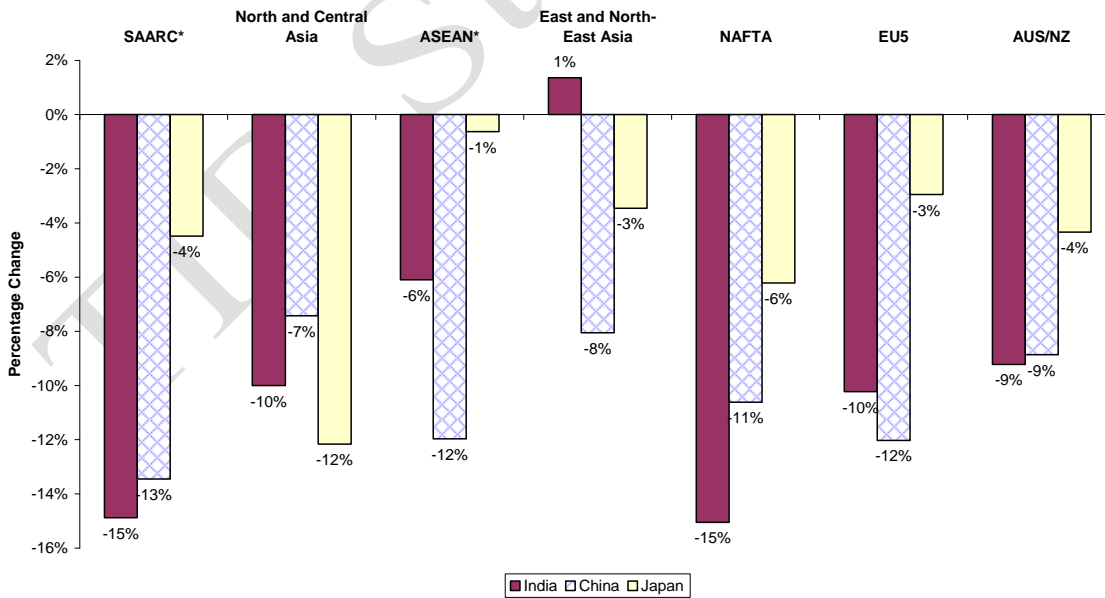
Trade costs of all subregions are lowest with China, followed by Japan, and India. The most striking finding is that the trade costs with China of all Asian subregions are lower or closely equal to their intra-subregional trade costs (refer to Figure 3). The range of trade costs faced by China across the subregions is also much lower than that faced by Japan (and India), revealing China's success in reducing trade costs with a wide range of country groups in Asia and beyond. Indeed, trade costs between China and Australia/New-Zealand are even found to be slightly lower than those between Japan and Australia/New-Zealand.

Trade costs of all three Asian giants are lowest with ASEAN, ranging from a 62% tariff equivalent for China to 113% for India. This confirms the role of ASEAN as a regional trade hub – with which each of the three major Asian economies have signed free trade agreements. Trade costs between each of the three countries and other Asian subregions – to which they do not belong - are often almost twice as high as those with ASEAN. Trade Costs of China, India, and Japan are unsurprisingly highest with North and Central Asia.

**Figure 4: Trade Costs between Selected Subregions and China, India, and Japan (2007)**



**Figure 5: Changes in Trade Costs between Selected subregions and China, India, and Japan: 2003-2007 (percentage change)**



As shown in Figure 5, trade costs reductions with China have been most consistent across all Asian subregions, ranging from 8 to 13%. In contrast, trade costs reductions with India have varied greatly, from a 15% reduction with SAARC (India's own subregion) to an actual increase in trade costs with the East and North-East Asia subregion.

In the case of Japan, improvement of trade costs in recent years are found to have been most significant with North and Central Asia (-12%), with costs reduction with other subregions not exceeding 4%. In particular, our results indicate that, measured in terms of trade costs reduction, trade integration between ASEAN and Japan has been much slower than with China in recent years, and resulting in an ad valorem Japan-ASEAN trade cost premium of 7% over those of China-ASEAN in 2007.

### Asian Subregions Tariff vs. Non-Tariff Trade Costs

The comprehensive measure of trade costs used in this study includes all added observable and unobservable costs associated with trading goods internationally rather than domestically. While breaking down this overall trade cost measure into its key components would be useful, we leave this challenging task for another paper. As an initial step, however, we simply calculate comprehensive non-tariff ad-valorem trade costs by removing applied tariff rates from our comprehensive ad-valorem trade costs.<sup>17</sup>

The resulting non-tariff trade costs are compared to tariff costs at the subregional level. Figure 6 shows the level of these ad valorem costs for trade within and between each of the Asian subregions for the years 2003/4 and 2007/8. The results indicate that non-tariff barriers are clearly on a very different scale than tariff barriers: average subregional tariffs vary from nearly 0 to at most 22%, while non-tariff costs vary from 61% to over 350%. Figure 6 also suggests that Asian subregions have made relatively more progress in reducing tariffs than in reducing non-tariff barriers, with reduction in tariff costs in many cases exceeding 25% between 2003/4 and 2007/8.

**Figure 6: Intra and Inter Subregional Tariff and Non-Tariff Trade Costs in Asia (2003/4 and 2007/8)\***

<sup>17</sup> Non-Tariff Trade Costs = [(1+ Trade Costs)/(1+Tariff)] -1.



equivalent. Finally, within the East and North-East Asia subregion, a subset of three countries - Japan, China and Republic of Korea – were found to have the lowest intra-group trade costs of any free trade areas examined in this paper (including, e.g., NAFTA), although the three countries had not yet signed free trade agreements with each other.

Estimates of trade costs between Asian subregions and China, India and Japan, highlighted how effective China has been in reducing its trade costs with ASEAN as well as other Asian and non-Asian subregions, achieving generally lower international trade costs than Japan as of 2007. In contrast, estimates of trade costs between India and Asian subregions (other than SAARC) suggest much room left for improvement.

Our analysis showed that tariff costs account for a small portion of the overall international trade costs of Asian subregions – typically 10% or less. This confirms the need for trade policy makers and negotiators to sharpen their focus on reducing non-tariff barriers, including trade facilitation and improvement of trade logistics services.

Decomposing the large non-tariff portion of the international trade costs presented here into key components will be emphasized in future work to derive more specific policy recommendations. Alternative ways to calculate intranational trade - as an essential element in the calculation of ad valorem trade costs - in the absence of gross output data in most Asian countries will also be explored, in particular to take into account the potential bias of the GDP-based estimates presented in this paper against countries and subregions with large services sectors.

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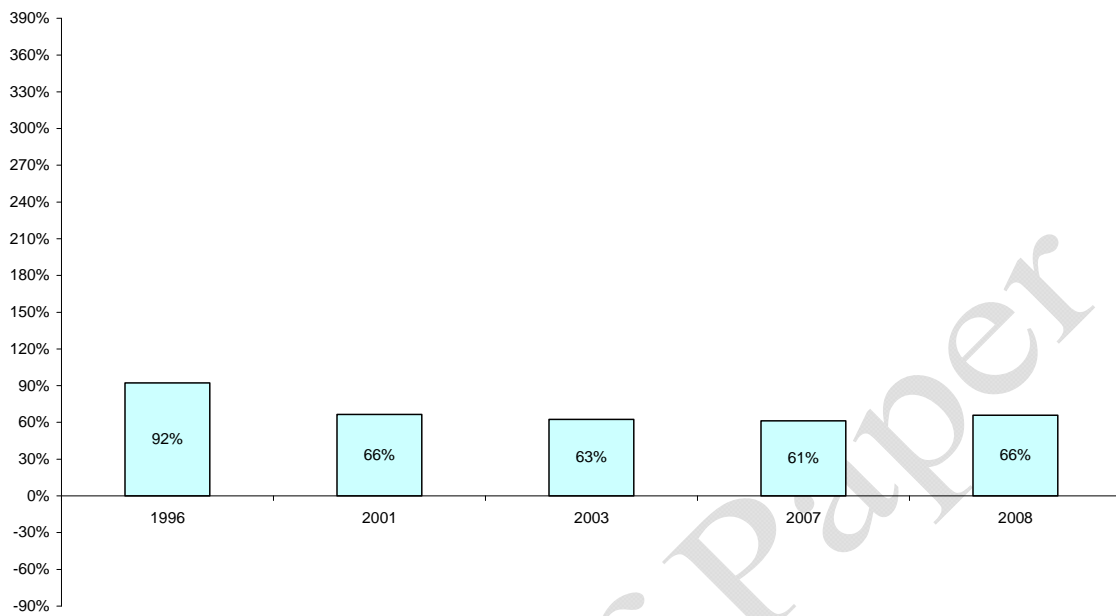
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**Annex 1: Intra-Subregional Trade Costs of ASEAN (1996-2008)**



**Annex 2: Intra and Inter-Subregional Trade Costs of East Asia (China, Korea and Japan)**

|                        | 2007          |                |                |                        |              |               |              |
|------------------------|---------------|----------------|----------------|------------------------|--------------|---------------|--------------|
|                        | ASEAN         | SAARC          | East Asia      | North and Central Asia | AUS/NZ       | EU5           | NAFTA        |
| ASEAN                  | 61%<br>(-2%)  |                |                |                        |              |               |              |
| SAARC                  | 151%<br>(-7%) | 150%<br>(-8%)  |                |                        |              |               |              |
| East Asia              | 69%<br>(-4%)  | 147%<br>(-7%)  | 57%<br>(-11%)  |                        |              |               |              |
| North and Central Asia | 300%<br>(8%)  | 301%<br>(-14%) | 193%<br>(-19%) | 162%<br>(-3%)          |              |               |              |
| AUS/NZ                 | 103%<br>(-4%) | 185%<br>(-1%)  | 100%<br>(-5%)  | 359%<br>(-3%)          | 74%<br>(3%)  |               |              |
| EU5                    | 127%<br>(1%)  | 155%<br>(-5%)  | 111%<br>(-6%)  | 184%<br>(-5%)          | 148%<br>(0%) | 72%<br>(-2%)  |              |
| NAFTA                  | 122%<br>(1%)  | 179%<br>(-10%) | 97%<br>(-8%)   | 282%<br>(-6%)          | 149%<br>(0%) | 124%<br>(-4%) | 62%<br>(-3%) |

### Annex 3: Service-sector adjusted Intra and Inter-Subregional Trade Costs

Trade costs calculated using [GDP – exports] instead of Gross Output tend to be overestimated, mainly because GDP includes (non-tradable) services. This also means that trade cost estimates may be biased upward for countries with large service sectors, i.e., for developed economies. To account for this issue, we calculate trade costs using [GDP - export] as an upper-bound trade cost; and trade costs using [(1-service share of GDP) (GDP – exports)] as a lower-bound trade cost; and take the average of the two. Since data on the service of GDP is missing for many countries, the service share of GDP of the income group to which a country belongs is used instead. Comparing the results below with those in Table 2, absolute level of trade costs are now significantly lower, while rate of change of trade costs and relative trade costs across subregions remain similar. This in line with the earlier findings of Novy (2009) who found percentage change in trade costs remained stable when [GDP – export] was used instead of Gross Output.

|                          | ASEAN4        | SAARC4         | East and North-East Asia | North and Central Asia | AUS/NZL      | EU5           | NAFTA        |
|--------------------------|---------------|----------------|--------------------------|------------------------|--------------|---------------|--------------|
| ASEAN4                   | 53%<br>(-2%)  |                |                          |                        |              |               |              |
| SAARC4                   | 139%<br>(-8%) | 138%<br>(-8%)  |                          |                        |              |               |              |
| East and North-East Asia | 141%<br>(-1%) | 227%<br>(1%)   | 113%<br>(-3%)            |                        |              |               |              |
| North and Central Asia   | 280%<br>(8%)  | 282%<br>(-14%) | 204%<br>(-7%)            | 149%<br>(-3%)          |              |               |              |
| AUS-NZL                  | 90%<br>(-4%)  | 168%<br>(-1%)  | 155%<br>(4%)             | 329%<br>(-3%)          | 61%<br>(3%)  |               |              |
| EU5                      | 113%<br>(1%)  | 139%<br>(-5%)  | 135%<br>(-4%)            | 166%<br>(-6%)          | 129%<br>(0%) | 59%<br>(-3%)  |              |
| NAFTA                    | 109%<br>(1%)  | 162%<br>(-10%) | 122%<br>(-13%)           | 259%<br>(7%)           | 130%<br>(0%) | 107%<br>(-4%) | 50%<br>(-3%) |