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Agricultural trade costs in Asia and the Pacific:

Patterns, compositions and determinants

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Abstract

Agriculture remains the backbone of most Asia-Pacific developing economies and approximately 50% of the Asian working population is employed in the agricultural sector. In view of the export potential of agricultural products in the region, it is urgent to reduce trade costs in this sector, particularly since they are typically twice as high as those for manufactured goods. Agricultural trade costs within each of the different Asian subregions and country groups are not found to differ sharply, particularly when tariff costs are excluded. Indeed, while agricultural tariffs are less than 5% in most subregions, they remain high between South Asian countries (SAARC) as well as between East and Northeast Asian countries (ENEA). Agricultural trade costs appear to have fallen within and between most subregions and country groups examined between 2003 and 2009, although improvements in trade costs appear to have been slower in Asian subregions than in developed country groups (EU and NAFTA). The trade cost regression analyses and variance decomposition exercise reveal that, when a wide range of countries are considered in the analysis, geographic distance is the single most important factor accounting for differences in trade costs between country pairs, followed by maritime logistics performance, and ease of getting credit. Access to and use of ICT in partner countries and tariff rates of partner countries are also found to account for a significant but a small and similar share of agricultural trade cost variations across countries. Interestingly, when the analysis is focused only on trade costs between ASEAN and OECD countries, the importance of geographic distance and tariff costs in explaining trade cost differences across countries vanish while the importance of both maritime logistics services and non-tariff measures such as SPS/TBT requirements become the key determinants. These results clearly suggest a need for many individual Asian developing countries to enhance maritime and other international logistics services while further building capacity to comply with non-tariff measures.

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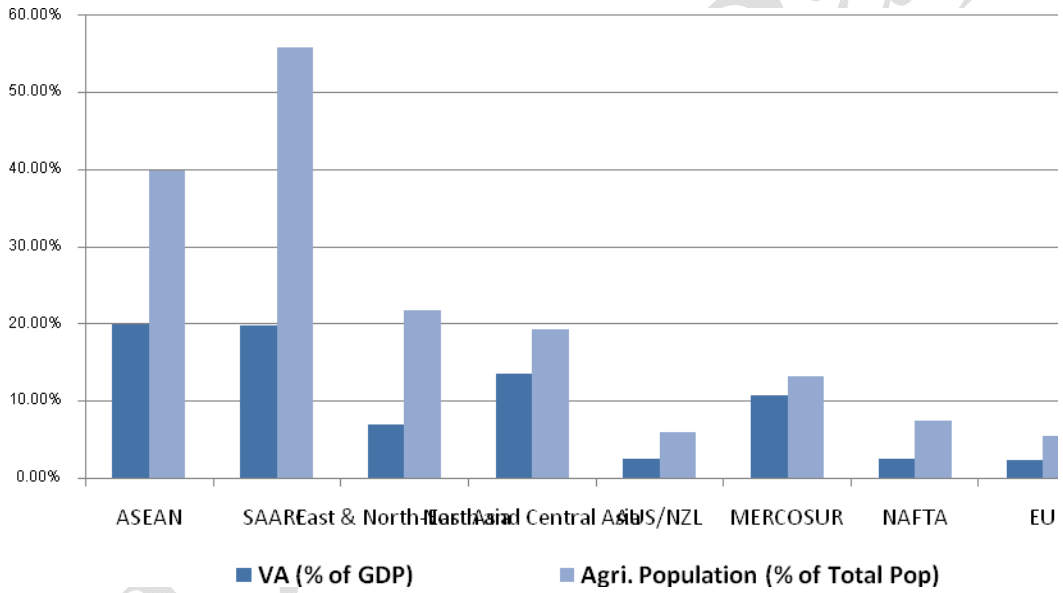
1. Introduction

As developing and emerging economies in the Asia and the Pacific region seek ways to maintain growth in a difficult global economic environment, enhancing competitiveness in international markets has become a priority. Reducing international trade transaction costs can go a long way towards making a country more competitive. While costs vary substantially across developing countries in the region, most still face very high extra- and intra-regional trade costs on average. This is particularly true for trade in agriculture and food products.

Agriculture is the backbone of most Asia-Pacific economies and approximately 50% of the Asian working population is employed in the agricultural sector (see figure 1). In view of the export potential of agricultural products in the region, it is particularly important to reduce trade costs in this sector. Not least, a more competitive agricultural sector may contribute to urgently needed poverty alleviation in developing countries in the Asia-Pacific.[1]

Figure 1: Value added in agriculture as a percentage of GDP and economically active population in agriculture as a percentage of total population in 2009



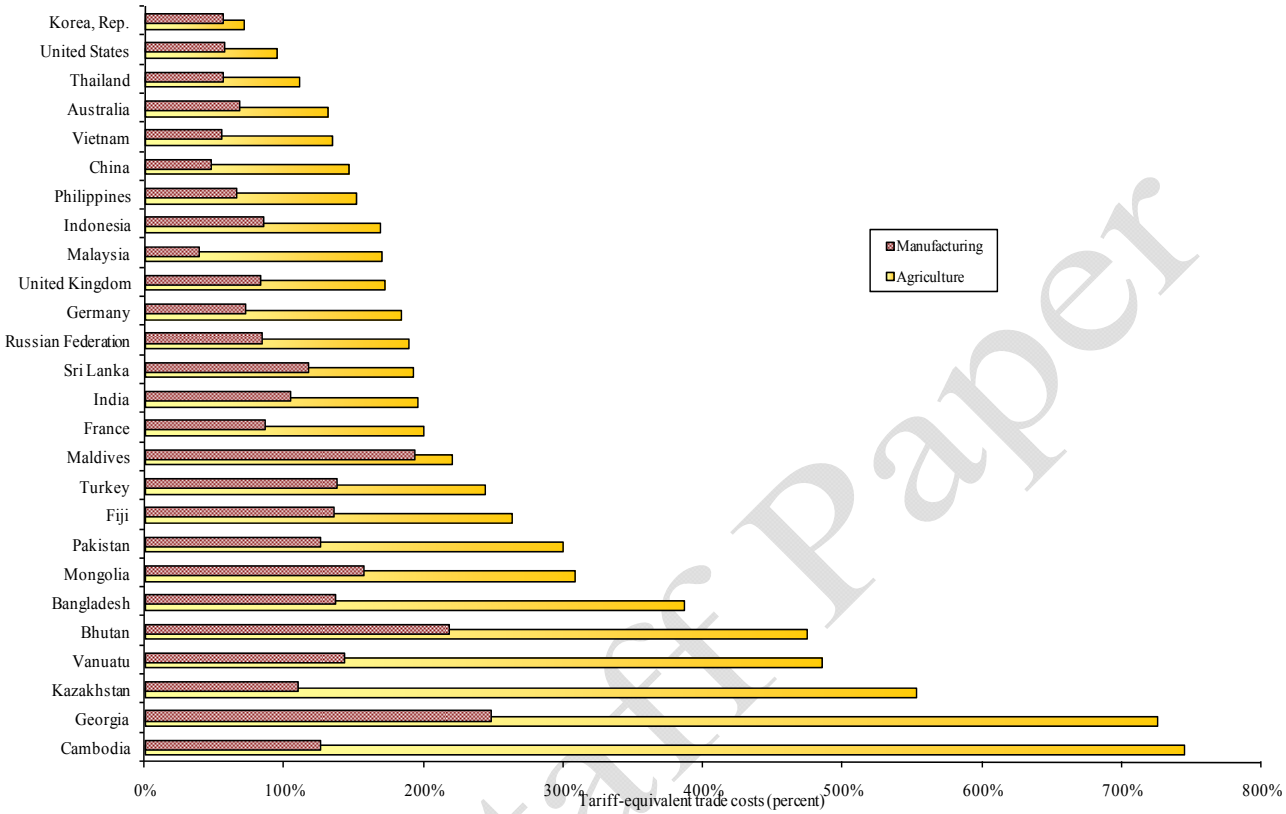
Source: Data retrieved from the World dataBank (World Bank), FAO statistics on 15 February 2012.

With rising incomes, changing food habits and a growing population in the region, agricultural trade is expected to expand in the coming years. In fact, agricultural commodity production and consumption is already shifting away from developed countries towards developing regions such as Asia and the Pacific (OECD-FAO 2009). As shown in Figure 2, however, agricultural trade costs remain exceedingly high, particularly when compared to manufacturing trade costs.

Given the important role of agricultural trade in the Asia-Pacific region, it is essential to know more about the level of agricultural trade costs and to what extent these costs may have decreased over time. Thus, this paper presents intra-, inter- and extra-regional agricultural trade costs of Asia-Pacific sub-regions and contrasts them with those in member countries of the European Union (EU) as well as MERCOSUR and the North American Free Trade Agreement (NAFTA).

[1] The Asia-Pacific region is home to more than two-thirds of the world's poor (ESCAP, 2010).

Figure 2: Agricultural and Manufacturing Comprehensive Trade Costs, excluding tariffs, between Selected Economies and Japan



Source: Duval and Utoktham (2011a).

The next section describes the methodology used by UN ESCAP to calculate so-called 'comprehensive trade costs'. Section 3 summarizes comprehensive trade cost patterns in the Asia and the Pacific region and some other regions. Section 4 separately discusses the tariff and non-tariff components of agricultural trade costs. Section 5 presents the results of an empirical assessment investigating the impact of tariff and other policy- and non-policy-related factors that influence comprehensive trade costs in agriculture. Section 6 concludes.

2. Trade cost calculation and data

Broadly defined, international trade costs include all costs incurred in getting a good to a final user other than the marginal cost of producing the good (Anderson and van Wincoop, 2004). In particular, this includes transportation costs (both freight costs and time costs), policy barriers (tariffs and non-tariff barriers), information costs, contract enforcement costs, costs associated with the use of different currencies, and legal and regulatory costs, both direct and indirect,
In this paper, this broad definition of trade costs is adopted and we therefore use the trade cost database developed at UN ESCAP by some of the authors on the basis of Chen and Novy (2009), who define bilateral trade costs as follows:

$$\tau_{ijkt} \equiv \left(\frac{t_{ijkt} t_{jikt}}{t_{iikt} t_{jjkt}} \right)^{\frac{1}{2}} = \left(\frac{x_{iikt} x_{jjkt}}{x_{ijkt} x_{jikt}} \right)^{\frac{1}{2(\sigma_k - 1)}} \quad ; \qquad \textbf{(1)}^2$$

where k denotes sector and t denotes time (omitted in the legend below)
τ_{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 intra-national trade costs of country i
t_{jj} denotes intra-national 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 intra-national trade of country i
x_{jj} denotes intra-national trade of country j
σ_k denotes sector-specific elasticity of substitution between goods in the sector k

Intra-national trade of country i or j may in turn be defined as Gross Output minus Total Exports of country i or j.

Table 1: Countries and regions included in the sub-regional analysis

Asian and South Pacific Economies				
Austrlia and New Zealand (AUS-NZL)	**East and Northeast Asia (ENEA)**	**ASEAN**	South Asian Association for Regional Cooperation **(SAARC)**	**North and Central Asia (NCA)**
Australia New Zealand	China Japan Korea (Rep.of) Mongolia	Cambodia Indonesia Malaysia Philippines Thailand Vietnam	Afghanistan Bangladesh Bhutan India Maldives Nepal Pakistan Sri Lanka	Armenia Azerbaijan Georgia Kazakhstan Kyrgyz Republic Russian Federation
EU			**NAFTA**	**MERCOSUR**
Austria Belgium Bulgaria (2007) Cyprus (2004) Czech Rep. (2004) Denmark Estonia (2004) Finland France	Germany Greece Hungary (2004) Ireland Italy Latvia (2004) Lithuania (2004) Luxembourg Malta (2004)	Netherlands Poland Portugal Romania (2007) Slovakia (2004) Slovenia Spain Sweden United Kingdom	Canada Mexico United States	Argentina Brazil Paraguay Uruguay Venezuela

The UN ESCAP Trade Cost database (version 2) covers 108 countries of which 26 belong to Asia and the Pacific.[3] It features aggregate bilateral costs of trade in goods from 2001 to 2009 as well as bilateral costs of trade in agricultural goods and bilateral costs of trade in manufacturing goods. Most country groups are based on existing sub-regional integration initiatives or free trade agreements such

[2] Trade costs may be expressed in tariff-equivalent form, defined as $TET_{ij} = T_{ij}-1$ (see for example, Jack, Meissner, and Novy, 2008). For the full derivation of trade costs from the micro-founded gravity equation see Anderson and van Wincoop (2003) and Chen and Novy (2009).

[3] Details on data sources and methodology used to calculate bilateral trade cost are provided in Duval and Utoktham (2011a), available at: http://www.unescap.org/tid/publication/swp511.pdf.

as the ASEAN and the North-American Free Trade Agreement (NAFTA). The East and North-East Asia and the North and Central Asia sub-regions are defined according to the practice of the United Nations. The descriptive analysis in section 3-6 considers only countries and sub-regions listed in table 1. The econometric analysis in section 7 includes all countries in the database.

3. Patterns of comprehensive agricultural trade costs

This sub-section presents average trade cost patterns between and within Asia-Pacific and other sub-regions in the agricultural sector. In particular, table 2 shows average bilateral comprehensive trade costs for these country groups between 2007 and 2009 and how these costs have changed since the period 2001-2003.

Sub-regional average trade costs are calculated as the sum of all bilateral trade costs between all countries of the sub-region(s) considered divided by the number of country pairs for which data is available. In that context, it is worth noting that a sub-region with a higher number of countries will tend to have higher average trade costs, as not all countries within a sub-region can be expected to have close direct trading relationships with all the others. This for example affect the EU, where considering only the trade costs between the three largest EU economies (Germany, France and the United Kingdom) would reduce the average EU agricultural trade costs from the 175% reported in table 2 to about %.[4]

As shown in table 2, average trade costs between North and Central Asian (NCA) countries and other groups are particularly high; highest costs are found with NAFTA (489%). Intra-NCA trade costs are however lower than NCA's trade costs with all other sub-regions and country groups considered. In accordance with conventional trade theories, trade costs are lower within free trade regimes compared to trade costs between country groups, which are not in the same trading regime. Given the geographic proximity among countries within the investigated groups, the finding is also consistent with the argument of higher trade costs for regions/countries geographically further away. ENEA and SAARC are exceptions; their trade costs are lowest with Australia and New Zealand rather than within the group.

Overall, Asia-Pacific sub-regions and the other country groups shown in table 2 managed to reduce both their average intra- and extra-regional trade costs since the beginning of the century (2001-2003); but some exceptions exist (e.g., SAARC and ENEA or SAARC and NAFTA). While Australia and New Zealand and NCA considerably reduced trade costs with most other country groups (in many cases more than 20% cost reductions), other Asia-Pacific sub-regions show lower reductions on average.[5]

[4] This will deserve careful attention in future work. In previous analysis, e.g. Duval and Utoktham (2011a), sub-regional averages were calculated on the basis of the 3 or 4 largest economies within a sub-region or country group. A more systematic way to address this issue in the future would be to calculate a weighted average using the economic size of each country pair. Intra-regional EU-3 is approximately 80%.

[5] In the appendix, separate comprehensive trade cost figures for countries within sub-regions (appendix tables A2-A6) as well as trade cost figures for each of these countries with other regions (appendix figures A1-A5) are reported.

Table 2: Agricultural trade costs between and within country groups: Average of 2007-2009 (in tariff equivalent percentages) and change since period 2001-2003 (in percentages)

	ASEAN	AUS/ NZL	ENEA	NCA	SAARC	EU	MERCO SUR	NAFTA
ASEAN	**193%** (-20.4%)	**199%** (0.8%)	**213%** (-8.0%)	**367%** (-1.4%)	**268%** (-10.9%)	**307%** (-3.9%)	**258%** (-11.0%)	**210%** (3.5%)
AUS/NZL	**199%** (0.8%)	**95%*** (-7.8%)	**151%** (-9.6%)	**402%** (-27.8%)	**185%** (-36.1%)	**322%** (-1.7%)	**227%** (-28.8%)	**172%** (-12.9%)
ENEA	**213%** (-8.0%)	**151%** (-9.6%)	**202%** (-6.5%)	**391%** (-7.4%)	**303%** (3.5%)	**333%** (-6.8%)	**295%** (-15.8%)	**189%** (-11.0%)
NCA	**367%** (-1.4%)	**402%** (-27.8%)	**391%** (-7.4%)	**170%** (-32.7%)	**362%** (-9.8%)	**301%** (-22.0%)	**330%** (-40.6%)	**489%** (9.8%)
SAARC	**268%** (-10.9%)	**185%** (-36 .1%)	**303%** (3.5%)	**362%** (-9.8%)	**212%** (1.6%)	**323%** (-8.9%)	**358%** (-4.2%)	**307%** (8.9%)
EU	**307%** (-3.9%)	**322%** (-1.7%)	**333%** (-6.8%)	**301%** (-22.0%)	**323%** (-8.9%)	**175%** (-22.9%)	**256%** (-23.2%)	**243%** (-4.8%)
MERCOSUR	**258%** (-11.0%)	**227%** (-28.8%)	**295%** (-15.8%)	**330%** (-40.6%)	**358%** (-4.2%)	**256%** (-23.2%)	**107%** (-58.3%)	**241%** (-9.5%)
NAFTA	**210%** (3.5%)	**172%** (-12.9%)	**189%** (-11.0%)	**489%** (9.8%)	**307%** (8.9%)	**243%** (-4.8%)	**241%** (-9.5%)	**51%** (-26.4%)

Notes: a) *Average of year 2004-2006 is used due to missing data; b) Values in parentheses show percentage changes in agricultural trade costs since the period 2001-2003.

4. Tariff and non-tariff components of comprehensive agricultural trade costs

There are many potentially important determinants of agricultural trade costs. This section separately investigates the tariff and non-tariff components of comprehensive agricultural trade costs between and within Asia-Pacific and other sub-regions.

Tariff rates on agricultural goods exceed the rates applied to manufactured goods in both developed and developing countries with the exception of SAARC and Australia (see Appendix table A1). The level of agricultural tariff protection is particularly high in Japan, the Republic of Korea, China and India. Unilateral reforms as well as bilateral and regional trade agreements since 2001 have led to significant tariff reductions in Asia-Pacific countries. The progress of liberalization is however slower in the agricultural sector compared to manufacturing. Agricultural tariff protectionism even increased for Japan and the Republic of Korea since the beginning of the century.

Table 3 shows the average bilateral tariff rates on agricultural goods between and within Asia-Pacific and other sub-regions as well as the respective percentage changes since the 2001-2003 period.[6] It can be seen that average bilateral tariffs of ENEA considerably increased with all other sub-regions, while

[6] Average bilateral tariffs for different country groups are calculated as follows:

$$ga\_tariff\_ijji = \sqrt{(1+tariff_{ij})(1+tariff_{ji})}$$

where ga_tariff_ijji denotes the geometric average of tariffij and tariffji
tariffij denotes simple average effective import tariff imposed by country *i* on country *j*
tariffji denotes simple average effective import tariff imposed by country *j* on country *i*.

reductions in tariffs between SAARC and most other regions can be reported. Particularly interesting is the fact that these two sub-regions impose relatively high tariffs among themselves. This is important as the gains from eliminating tariffs between themselves may exceed the gains obtained by cutting developed countries tariffs (see for example, Anderson and Martin, 2005). Among Asia-Pacific sub-regions, the intra-regional tariff rates of NCA in 2007-2009 are less than 1%. This is largely attributed to the free trade agreement between NCA countries.

Despite some progress in agricultural tariff liberalization, Asia-Pacific countries should continue their efforts to reduce tariffs as their imposition not only creates a direct cost amounting to the customs duties collected, but also indirect costs in the form of additional documentation requirements and controls – both of which are included in the non-tariff comprehensive trade cost component. Reduced or zero tariffs may therefore result in multiplier effects with respect to the reduction of total trade costs (Duval and Utoktham, 2011).

Overall, the analysis shows that direct tariff costs account for a relatively small portion of total comprehensive agricultural trade costs in all investigated country groups of Asia and the Pacific; ranging from 0% to 20%. Therefore, the focus of trade policymakers in the promotion of trade has shifted towards non-tariff costs. The non-tariff comprehensive trade cost component corresponds to the difference between total comprehensive ad-valorem trade costs and applied tariff rates[7], and thus not only includes border and behind-the-border trade restrictive policies (such as SPS, TBT, quotas, import and export licenses, export restrictions, customs surcharges, and anti-dumping, safeguard measures and discretionary licensing)[8], but any form of other costs such as distance, culture, history, logistics infrastructure and services, exchange rates, the business environment, level bureaucratic border and behind-the-border procedures; among others.

Agricultural non-tariff comprehensive trade costs between and within Asia-Pacific and other sub-regions are illustrated in table 4. Non-tariff trade costs between sub-regions are always higher than those within the sub-region. This is consistent with the existence of natural trade costs (e.g., geographic distance) which cannot be influenced by policy interventions.[9] Overall, Australia and New Zealand compared to the other investigated Asia-Pacific sub-regions have the lowest non-tariff comprehensive trade cost levels, followed by ASEAN and ENEA. The number ranges from 95% trade between Australia and New Zealand, to high levels of 382% for trade with NCA.NCA has high non-tariff trade costs with all other sub-regions, which illustrates the trade challenges developing landlocked countries face in the Asia-Pacific. While in most cases non-tariff trade costs were reduced between and within the investigated country groups during the last decade, Australia and New Zealand is the sub-region, which made most progress.[10]

[7] Non-Tariff Trade Costs = [(1+Trade Costs)/(1+Tariff)]-1
[8] Appendix table A7 presents UNCTAD's list of non-tariff trade policies.
[9] The costs due to geographical distance may however decrease with better infrastructure and transportation means.
[10] In the appendix, separate comprehensive non-tariff trade cost figures for countries within sub-regions (appendix tables A2-A6) as well as non-tariff trade cost figures for each of these countries with other regions (appendix figures A1-A5) are reported.

Table 3: Agricultural tariffs between and within country groups: Average of 2007-2009 (in tariff equivalent percentages) and change since period 2001-2003 (in percentages)

	ASEAN	AUS/ NZL	ENEA	NCA	SAARC	EU	MERCO SUR	NAFTA
ASEAN	**6%** (6.28%)	**5%** (-10.78%)	**18%** (47.15%)	**6%** (-0.51%)	**14%** (-28.55%)	**6%** (-9.87%)	**7%** (-22.75%)	**7%** (-10.01%)
AUS/NZL	**5%** (-10.78%)	**0%** (-100%)	**15%** (64.80%)	**4%** (-9.87%)	**9%** (-20.71)	**3%** (-28.45%)	**2%** (-20.31%)	**3%** (13.05%)
ENEA	**18%** (47.15%)	**15%** (64.80%)	**24%** (12.72%)	**16%** (29.19%)	**20%** (6.82%)	**13%** (13.03%)	**21%** (47.43%)	**17%** (10.45%)
NCA	**6%** (-0.51%)	**4%** (-9.87%)	**16%** (29.19%)	**1%** (-91.91%)	**8%** (-35.48%)	**5%** (-28.24%)	**7%** (-23.36%)	**8%** (57.91%)
SAARC	**14%** (-28.55%)	**9%** (-20.71)	**20%** (6.82%)	**8%** (-35.48%)	**14%** (-32.46%)	**10%** (-17.85%)	**12%** (-18.67%)	**13%** (6.41%)
EU	**6%** (-9.87%)	**3%** (-28.45%)	**13%** (13.03%)	**5%** (-28.24%)	**10%** (-17.85%)	**0%** (-93.47%)	**5%** (-32.45%)	**4%** (-47.41%)
MERCOSUR	**7%** (-22.75%)	**2%** (-20.31%)	**21%** (47.43%)	**7%** (-23.36%)	**12%** (-18.67%)	**5%** (-32.45%)	**0%** (-95.53%)	**5%** (-17.44%)
NAFTA	**7%** (-10.01%)	**3%** (13.05%)	**17%** (10.45%)	**8%** (57.91%)	**13%** (6.41%)	**4%** (-47.41%)	**5%** (-17.44%)	**0%** (-95.96%)

Note: Values in parentheses show percentage changes in tariff rate between the 2001-2003 and the2007-2009 average.
Source: ESCAP Trade Cost database

Table 4: Agricultural non-tariff comprehensive trade costs between and within country groups: Average of 2007-2009 (in tariff equivalent percentages) and change since period 2001-2003 (in percentages)

	ASEAN	AUS/ NZL	ENEA	NCA	SAARC	EU	MERCO SUR	NAFTA
ASEAN	**176%** (-19.2%)	**185%** (2.1%)	**170%** (-8.8%)	**328%** (6.2%)	**219%** (-6.5%)	**286%** (-2.5%)	**238%** (-8.7%)	**190%** (4.8%)
AUS/NZL	**185%** (2.1%)	**95%*** (-7.7%)	**120%** (-17.5%)	**382%** (-27.7%)	**163%** (-31.9%)	**309%** (0.1%)	**222%** (-28.5%)	**164%** (-13.5%)
ENEA	**170%** (-8.8%)	**120%** (-17.5%)	**148%** (40.9%)	**332%** (-0.1%)	**231%** (-0.5%)	**287%** (-7.2%)	**236%** (-22.2%)	**149%** (-2.6%)
NCA	**328%** (6.2%)	**382%** (-27.7%)	**332%** (-0.1%)	**162%** (-19.0%)	**300%** (2.6%)	**282%** (15.8%)	**302%** (-13.8%)	**403%** (0.3%)
SAARC	**219%** (-6.5%)	**163%** (-31.9%)	**231%** (-0.5%)	**300%** (2.6%)	**176%** (10.3%)	**284%** (-8.0%)	**311%** (-2.2%)	**255%** (5.6%)
EU	**286%** (-2.5%)	**309%** (0.1%)	**287%** (-7.2%)	**282%** (15.8%)	**284%** (-8.0%)	**173%** (-15.1%)	**239%** (-20.1%)	**231%** (0.2%)
MERCOSUR	**238%** (-8.7%)	**222%** (-28.5%)	**236%** (-22.2%)	**302%** (-13.8%)	**311%** (-2.2%)	**239%** (-20.1%)	**107%** (-53.3%)	**225%** (-8.2%)
NAFTA	**190%** (4.8%)	**164%** (-13.5%)	**149%** (-2.6%)	**403%** (0.3%)	**255%** (5.6%)	**231%** (0.2%)	**225%** (-8.2%)	**51%** (-17.3%)

Note: *Average of year 2004-2006 due to missing data
Source: ESCAP Trade Cost Database

5. Determinants of comprehensive agricultural trade costs

This section examines the determinants of agricultural trade costs; in particular, the relative contribution to agricultural trade costs of natural factors (including geographic or cultural distance and language) [11], and those related to policies and regulations (tariff and non-tariff) as well as infrastructure are studied. To do so, we develop a simple trade cost model featuring both natural factors as well as a number of indicators of trade facilitation performance.

Following Duval and Utoktham (2010), *depth of credit information* is used as a proxy for ease of getting credit. This factor is particularly important for agricultural trade given that trade transactions typically take longer compared to those for manufactured goods. A proxy for ease of access and use of information and communication technologies (ICT) in partner countries, i.e., *internet users per 100 people*, is also included in the model. ICT access and usage is found to be another important determinant of trade costs in earlier studies on trade facilitation (e.g., Shepherd and Wilson,2009, among others). Furthermore, maritime and port logistics performance – proxied by UNCTAD's liner shipping connectivity index - is used as an explanatory variable.[12]

Table 5 illustrates the progress of depth of credit information in each region. All regions, especially in North and Central Asia, have improved their credit data acquisition quality. Table 6 illustrates the progress on internet users per 100 people and liner shipping connectivity index. It stands out that it is again North and Central Asia having the best ICT development in developing countries of the Asia-Pacific and an outstanding liner shipping connectivity level compared to all investigated country groups. Moderate progress could be observed in other Asia-Pacific subregions.

Table 5: Depth of credit information (scale 0-6: 0 is worst, 6 is best)

Regional Grouping	2004-2006	2010-2012
ASEAN	3.0	3.8
AUS/NZL	5.0	5.0
East and North-East Asia	4.2	5.0
European Union	4.5	4.5
MERCOSUR	4.9	5.3
NAFTA	6.0	6.0
North and Central Asia	1.4	5.1
SAARC	1.7	2.7

Source: Doing Business, online available at http://www.doingbusiness.org

Table 6: Internet users per 100 people and liner shipping connectivity index

Regional Grouping	Internet users (per 100 people)		Liner shipping connectivity index (maximum value in 2004 = 100)	
	2004-2006	2010-2011	2004-2006	2010-2011
ASEAN	13.98942	26.42539	26.36515	36.31442
AUS/NZL	64.5353	81.00728	23.9546	23.3321
East and North-East Asia	49.03481	53.14147	81.71655	100.9171
European Union	49.93892	70.3554	31.08935	37.22926
MERCOSUR	16.36351	39.31941	18.2341	21.19208

[11] Anderson and van Wincoop (2004), Chen and Novy (2009); Jack, Meissner, and Novy (2008).
[12] As in Duval and Utoktham (forthcoming).

Regional Grouping	Internet users (per 100 people)		Liner shipping connectivity index (maximum value in 2004 = 100)	
	2004-2006	2010-2011	2004-2006	2010-2011
NAFTA	51.47791	63.73418	50.34219	53.10972
North and Central Asia	8.166583	36.4301	7.938622	12.33108
SAARC	3.127061	12.03636	20.69727	24.32674

Source: World Development Indicator Databank, online available at http://data.worldbank.org
Note: LSCI for North and Central Asia is available only for non-landlocked countries

Table 7 shows that non-tariff measures (NTMs) are likely to be important determinants of comprehensive trade costs in the agricultural sector. In table 7, OTRI stands for Overall Trade Restrictiveness Index,TTRI for Tariff Trade Restrictiveness Indexand NTM for Non-Tariff Measures by country groups. For methodological details see Hoekman and Nicita (2008) or Kee, Nicita, and Olarreaga (2009).According to these indices, NTMs rose only in the European Union between 2005 and 2007. Following Hoekman and Nicita (2008), who include the NTM index in an extended gravity model, we include NTM in our trade cost model.

Table 7: Trade restrictiveness index (2005-2007)

Regional Grouping	Trade Restrictiveness	2005	2006	2007
ASEAN	OTRI (%)	38.77	41.22	33.33
	TTRI (%)	7.06	9.06	4.67
	NTM (%)	31.71	31.91	30.32
AUS/NZL	OTRI (%)	38.38	34.33	32.66
	TTRI (%)	2.24	3.23	2.97
	NTM (%)	36.14	31.10	29.69
East and North-East Asia	OTRI (%)	47.07	53.61	35.81
	TTRI (%)	28.00	28.30	27.84
	NTM (%)	19.07	17.65	15.43
North and Central Asia	OTRI (%)	44.27	33.63	31.73
	TTRI (%)	11.78	4.54	4.17
	NTM (%)	32.49	29.63	28.44
SAARC	OTRI (%)	48.30	45.53	32.61
	TTRI (%)	31.32	20.81	14.64
	NTM (%)	25.46	26.80	21.92
European Union	OTRI (%)	54.99	58.00	58.48
	TTRI (%)	24.80	16.35	14.01
	NTM (%)	30.18	41.92	44.47
MERCOSUR	OTRI (%)	42.01	39.58	38.98
	TTRI (%)	11.65	10.46	11.32
	NTM (%)	30.36	29.12	27.66
NAFTA	OTRI (%)	41.02	32.83	21.09
	TTRI (%)	20.63	14.75	8.45
	NTM (%)	20.39	18.08	12.64

Source: World Trade Indicator Database[13]

[13] Online available at the following link: http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/TRADE/0,,contentMDK:22421950~pagePK:148956~piPK:216618~theSitePK:239071,00.html

Accordingly, the following reduced form equation is estimated:

$$\ln(CTC_{ij}) = \beta_0 + \beta_1\ln(distance_{ij}) + \beta_2(cult_{ij}) + \beta_3\ln(tariff_{ij*ji}) + \beta_4\ln(NTM_{ij}) + \beta_5\ln(lsci_{ij}) + \beta_6\ln(internet_{ij}) + \beta_7(creditinfo_{ij}), \quad (1)$$

where

$distance_{ij}$ is bilateral distance in kilometers

$cult_{ij}$ is a set of dummy variables of cultural distance, which consists of
contig (contiguity): dummy variable indicating "1" if 2 countries are contiguous and "0" otherwise
comlang_off (common official language): dummy variable indicating "1" if 2 countries have a common official language and "0" otherwise

$tariff_{ij*ji}$ is a geometric average of $tariff_{ij}$ and $tariff_{ji}$

NTM_{ij} is a geometric average of NTM_i and NTM_j

$lsci_{ij}$ is a geometric average of $lsci_i$ (liner shipping connectivity index) and $lsci_j$

$internet_{ij}$ is a geometric average of internet users per 100 ppl_i (number of internet users per 100 inhabitants) and internet users per 100 ppl_j

$creditinfo_{ij}$ is a geometric average of ease of doing business indicators of i and j, which is proxied by the depth of credit information index (0-6).

Table 8 reports detailed information about the variables and data used in the estimations (including their expected sign. The estimations are run in a cross-country panel of 60 countries for the period 2005-2007.[14]

Table 8: Trade Cost Model Variables and Data Sources

Variable Name	Source	Expected Sign	Description
$\ln(ctc_{ij})$	ESCAP/TID		Natural log of comprehensive trade costs CTC (T_{ij}).
$\ln(distance_{ij})$	CEPII	+	Natural log of geodesic distance, following the great circle formula, which uses latitudes and longitudes of the most important cities/agglomeration (dense of population) in kilometers between reporting country and its trade partner.
contig	CEPII	-	Dummy variable indicating "1" if 2 countries are contiguous and "0" otherwise.
comlang_off	CEPII	-	Dummy variable indicating "1" if 2 countries share official language and "0" otherwise.
$\ln(tariff_{ij*ji})$	TRAINS	+	Natural log of geometric average of $tariff_{ij}$ and $tariff_{ji}$
$\ln(ntm_{ij})$	WB TI*	+	Natural log of geometric average of NTM_i and NTM_j [15]
$\ln(lsci_{ij})$	WB TI*	-	Natural log of geometric average of liner shipping connectivity index of reporter and partner (maximum value in 2004 = 100): The higher the LSCI, the better port connectivity, which implies lower trade costs.
$\ln(internetusers\_per100ppl_{ij})$	WB TI*	-	Natural log of internet users (per 100 people): the more internet users, the better ICT infrastructure and services, which implies lower trade costs.
$creditinfo_{ij}$	WB TI*/WB DB**	-	Geometric average of getting credit: depth of credit information index (0-6): the more credit information available, the easier and cheaper the credit, which implies lower trade costs.

* World Bank Trade Indicator Database, available at: http://info.worldbank.org/etools/wti/1a.asp ;
** World Bank Doing Business Data, available at: www.doingbusiness.org

The estimation results are presented in table 9. We use OLS and report clustered standard errors with clustering unit "country pair" (to take account of possible correlations of errors within country pairs) in our baseline estimation, Model (1). All countries of appendix table A8 are included. Following

[14] Appendix table A8 reports the countries used in the regressions.
[15] The data is in tariff-equivalent term so the study rebases the data into factor cost i.e. applying 1+rate/100 before calculating for geometric average.

Chen and Novy (2009), Poisson Pseudo Maximum Likelihood (PPML) estimation is also used as an alternative way to estimate the model[16] (as shown in Model (2)). Comparing the result of OLS and PPML, we can see that the two models give similar results and the estimates of the coefficients are similar, thus we do an analysis based on Model (1). Further robustness checks, where partner-specific fixed effects are used in OLS and PPML estimations, are reported in appendix table A9.[17] The results remain consistent with those from Models (1) and (2).

For a subset of countries, the baseline estimations are rerun and reported under Models (3) and (4) for OLS and PPML estimations, respectively. In particular,these models include data on ASEAN countries trading with both ASEAN and OECD countries and OECD countries trading with both OECD and ASEAN. In models (5) and (6), the regressions are run only on ASEAN countries trading with OECD and OECD with ASEAN.

According to Model (1) physical distance is an important determinant of trade costs. A 10% increase in distance between partner countries is associated with a 1.6% increase in comprehensive trade costs. Having a common border with a partner country has a moderate impact on trade costs and reduces the ad-valorem trade cost value by 19 percentage points.[18]. Reductions in tariff or non-tariff measures by 10% are associated with reductions in agricultural comprehensive trade costs of nearly 6% and 3%, respectively. A 10% improvement in the liner shipping connectivity index implies a reduction in trade costs of nearly 2%.

For behind-the-border indicators, good access to modern ICT such as the internet is not statically associated with agricultural trade costs in our model. An increase of the credit information index from 5 to 6, for example, contributes to a trade cost reduction of around 3.6 percentage points of the ad valorem value.[19]

Table 9: Determinants of comprehensive trade costs: Estimation results

VARIABLES	(1) All: OLS with bilateral variables	(2) All: PPML with bilateral variables	(3) ASEAN/ OECD: OLS	(4) ASEAN/OECD: PPML	(5) AO/OA: OLS	(6) AO/OA: PPML
$\ln(distance_{ij})$	0.160***	0.168***	0.167***	0.170***	0.140**	0.137**
	[18.03]	[15.63]	[16.04]	[14.68]	[2.465]	[2.210]
contig	-0.210***	-0.259***	-0.133***	-0.170***		
	[-5.454]	[-5.550]	[-2.835]	[-3.288]		
comlang_off	-0.0276	-0.0119	-0.0989***	-0.111***	-0.174*	-0.147
	[-0.895]	[-0.326]	[-2.941]	[-2.637]	[-1.756]	[-1.150]
$\ln(tariff_{ij*ji})$	0.586***	0.578***	0.890***	0.957***	1.179**	0.766
	[4.043]	[3.321]	[4.463]	[4.747]	[1.988]	[1.112]
$\ln(ntm_{ij})$	0.288**	0.306*	0.452***	0.530***	1.889***	1.838***

[16] PPML is widely used in gravity models. PPMLresults are robust for truncated data and give consistent estimates in non-linear transformation (including log linearization) models with the existence of heteroskedasticity as discussed in Silva and Tenreyro (2006) and Hoekman and Nicita (2008). Even though our trade cost figures are mostly non-zero values (i.e. the data is not truncated), estimating PPML regressions still serves as a robustness check.

[17] Partner fixed effect represents each partner country's characteristics. The model with fixed effect control is used for checking explanatory power of the model without fixed effect control i.e. using log of geometric average explanatory variables for reporter/partner countries.

[18] $e^{-0.210*1} - e^{-0.210*0} = e^{-0.210} - 1 = 0.8479 - 1 = -0.1894 = -18.94\%$

[19] This is the lower bound of the effect. Since the exponential function is concave, the change is not a constant and is increasing in the decreasing rate. The unit change of, for example, credit information index from 5 to 6 will contribute to percentage change less than the change from 4 to 5. In the case of Model (1), initially, given that both countries achieve an improvement in their credit information index rating from 5 to 6 , we have $e^{-0.0461*6} - e^{-0.0461*5} = 0.7584 - 0.7941 = -0.0357 = -3.57$ % or approximately a 3.6% reduction of trade costs.

VARIABLES	(1) All: OLS with bilateral variables	(2) All: PPML with bilateral variables	(3) ASEAN/ OECD: OLS	(4) ASEAN/OECD: PPML	(5) AO/OA: OLS	(6) AO/OA: PPML
	[2.263]	[1.901]	[2.609]	[2.796]	[5.353]	[4.919]
$\ln(lsci_{ij})$	-0.181***	-0.182***	-0.163***	-0.163***	-0.225***	-0.219***
	[-16.04]	[-13.78]	[-12.25]	[-11.41]	[-4.962]	[-4.832]
$\ln(internetusers\_per100ppl_{ij})$	-0.0295	-0.0293	-0.0162	-0.00182	-0.0259	0.00796
	[-1.255]	[-0.949]	[-0.457]	[-0.0448]	[-0.295]	[0.0801]
$creditinfo_{ij}$	-0.0461***	-0.0564***	-0.0996***	-0.116***	-0.123***	-0.121***
	[-6.516]	[-6.938]	[-6.020]	[-6.644]	[-3.384]	[-3.108]
Constant	0.643***	0.632***	0.564***	0.565***	0.809	0.685
	[6.560]	[5.628]	[4.030]	[3.584]	[1.409]	[1.117]
Observations	2,017	2,017	903	903	190	190
R-squared	0.438	0.321	0.559	0.452	0.460	0.366
Reporter FE	No	No	No	No	No	No
Partner FE	No	No	No	No	No	No
Income group	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE	Country pair	Country pair	Country pair	Country pair	Country pair	Country pair
Adj. R-squared	0.434	.	0.552	.	0.424	.

Robust in brackets

*** p<0.01, ** p<0.05, * p<0.1

t-stat. in square brackets

Note: AO/OA indicate that the sample is restricted only to trade costs between ASEAN and OECD countries, i.e, trade costs among ASEAN countries, or among OECD countries, are not included.

We can quantify the contribution of explanatory variables to the total variation of trade costs using Fields' (2003) method:

$$\kappa_h = \frac{\beta_h \operatorname{cov}(x_h, T_{ijt})}{\operatorname{var}(T_{ijt})}$$

where κ_h denote contribution (in percentage) of explanatory variable x_h to trade costs T_{ijt}
β_h denotes the estimated regression coefficient associated with x_h

The relative contributions are reported in table 10. Using model (1), (2) or (3) from the previous table 9, it is found that natural barriers contribute between 19 and 30% to total comprehensive trade costs. Tariffs account up to 5% in these models; whereas our non-tariff measures seems to only play a minor role for trade costs in those 3 models. Trade-related infrastructure, that is, the LSCI variable, contributes between 5 and more than 15% to total trade costs. Ease of access and use of information and communication technologies, proxied by internet users per 100 inhabitants, accounts for less than 2% and depth of credit information for 2% to 6%.

From the estimation results of the sub-sample including only ASEAN countries' trade costs with OECD countries (model (5)), it can be learnt that the distance is not the main contributor to trade costs variation anymore and port connectivity becomes even more important compared to the other models. The drastic reduction of the contribution of distance to trade costs when one focuses solely on trade between ASEAN and OECD may come from the fact that OECD countries are mostly European and thus geographically close together. The distances between each ASEAN country and each OECD country are large but not that much different from each other. This makes trade cost variations due to distance less important among the ASEAN-OECD country pairs, with liner shipping connectivity and logistics services explaining a larger share of the variation in trade costs between the countries.

The role of non-tariff measures is more important (up to 5%) for trade costs between OECD and ASEAN developing countries. The significant and positive contribution of non-tariff measures to agricultural trade costs in the case of ASEAN-OECD trade, combined with the non-significance of tariff costs, also imply that product standards and conformance issues among countries from these two groups may need particular attention. These results indeed suggest that although tariffs may at times be prohibitive, real or perceived inability to meet non-tariff measures such as SPS/TBT requirements likely account for a larger share of agricultural trade costs.

Table 10: Relative contributions of different factors to comprehensive trade costs.

	(1)	(2)	(3)	(5)
ln of distance	19.35%	23.37%	29.65%	1.18%
Contiguity	3.46%	1.97%	3.24%	0.00%
common official language	0.13%	0.16%	1.09%	1.63%
ln of geometric average bi-directional tariff	2.32%	1.27%	3.22%	-2.18%
ln of non tariff barriers	-0.66%	0.27%	-1.01%	4.74%
ln of LSCI	10.98%	4.76%	15.05%	26.17%
ln of internet users	2.01%	0.53%	0.56%	0.75%
credit information	4.24%	2.03%	5.46%	14.13%
partner fe		26.40%		
income group fe	1.98%	0.00%	-1.52%	-0.76%
year fe	0.01%	0.01%	0.15%	0.38%
Total variation explained by model	43.82%	60.77%	55.89%	46.04%
Residual	56.18%	39.23%	44.11%	53.96%
Total	100.00%	100.00%	100.00%	100.00%

Conclusions

Agriculture remained the backbone of most Asia-Pacific developing economies and approximately 50% of the Asian working population was employed in the agricultural sector. In view of the export potential of agricultural products in the region, it was urgent to reduce trade costs in this sector, particularly since they were typically twice as high as those for manufactured goods. Agricultural trade costs within each of the different Asian subregions and country groups were not found to differ sharply, particularly when tariff costs were excluded. Indeed, while agricultural tariffs were less than 5% in most subregions, they remained high between South Asian countries (SAARC) as well as between East and Northeast Asian countries (ENEA). Agricultural trade costs appeared to have fallen within and between most subregions and country groups examined between 2003 and 2009, although improvements in trade costs appeared to have been slower in Asian subregions than in developed country groups (EU and NAFTA). The trade cost regression analyses and variance decomposition exercise revealed that, when a wide range of countries were considered in the analysis, geographic distance was the single most important factor accounting for differences in trade costs between country pairs, followed by maritime logistics performance, and ease of getting credit. Access to and use of ICT in partner countries and tariff rates of partner countries were also found to account for a significant but a small and similar share of agricultural trade cost variations across countries. Interestingly, when the analysis was focused only on trade costs between ASEAN and OECD countries, the importance of geographic distance and tariff costs in explaining trade cost differences across countries vanish while the importance of both maritime logistics services and non-tariff measures such as SPS/TBT requirements become the key determinants. These results clearly suggest a need for many individual Asian developing countries to enhance maritime and other international logistics services while further building capacity to comply with non-tariff measures.

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Appendices

Table A1: Comparison of bilateral agricultural tariff rates and manufacturing tariff rates: Selected countries and sub-region

	Geometric average of tariff_ij_sa and tariff_ji_sa (average of 2007-2009)			
	Agricultural goods	Manufactured goods	Agricultural goods	Manufactured goods
High-income countries			**Developing countries**	
Australia	4.94% (-6.88%)	6.05% (-22.55%)	ASEAN	7.63% (-12.04%)	7.17% (-23.79%)
Canada & United States	5.48% (-11.90%)	5.83% (-20.56%)	China	10.00% (-17.92%)	7.55% (-33.75%)
European Union	4.45% (-5.47%)	3.83% (-22.48%)	South Asia (Exclude India)	9.84% (-29.00%)	11.07% (-24.23%)
Japan	10.60% (16.09%)	5.60% (-13.24%)	India	17.37% (-2.93%)	9.91% (-46.65%)
Korea	28.150% (52.07%)	7.91% (-13.37%)	Central Asia	7.52% (0.14%)	5.93% (-24.31%)
			MERCOSUR	6.66% (-17.31%)	9.57% (-16.55%)

ASEAN: Indonesia, Malaysia, Philippine, Thailand, Vietnam; South Asia: Bangladesh, Pakistan, Sri Lanka; Central Asia: Kazakhstan, Russian Federation; EU: Austria, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherland, Portugal, Spain, Sweden and United Kingdom; MERCOSUR: Argentina, Brazil, Uruguay

Note: values in parentheses show percentage changes in tariff rate from 2001-2003 to 2007-2009
Source: ESCAP Trade Cost database

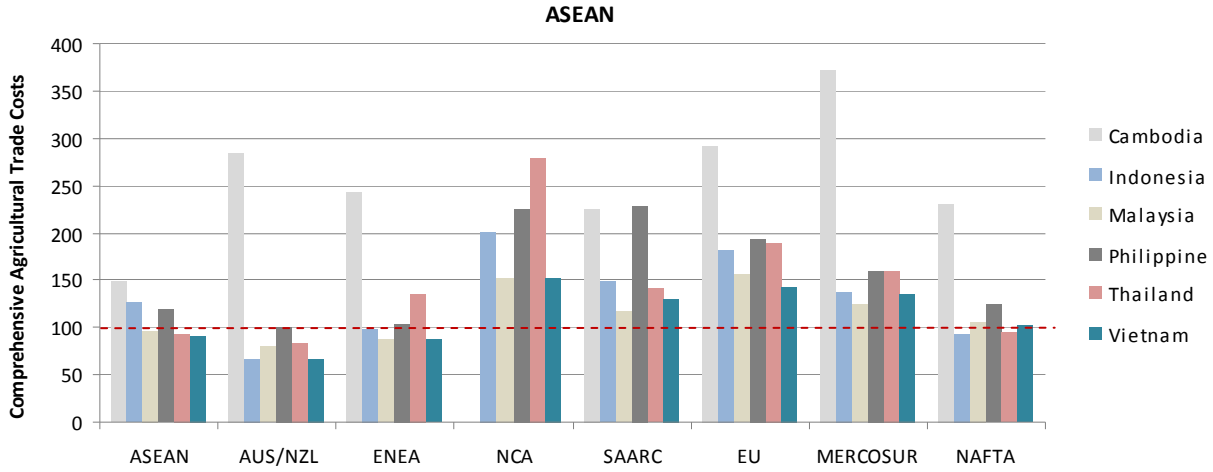
Table A2: Bilateral agricultural trade costs among ASEAN countries: Average of 2007-2009

		Indonesia	**Cambodia**	**Malaysia**	**Philipinnes**	**Thailand**	**Vietnam**
Indonesia	CTC		542%	134%	214%	159%	169%
	NTC		509%	132%	206%	138%	162%
Cambodia	CTC	542%		254%		184%	157%
	NTC	509%		232%		153%	142%
Malaysia	CTC	134%	254%		216%	116%	124%
	NTC	132%	232%		205%	94%	120%
Philippines	CTC	214%		216%		202%	201%
	NTC	206%		205%		172%	192%
Thailand	CTC	159%	184%	116%	202%		150%
	NTC	138%	153%	94%	172%		123%
Vietnam	CTC	169%	157%	124%	201%	150%	
	NTC	162%	142%	120%	192%	123%	

Notes: CTC denotes comprehensive trade costs; NTC denotes trade costs excluding tariff costs.

Figure A 1: Comparison of average agricultural trade costs between each ASEAN member and different country groups (Average of 2007-2009, intra-EU trade cost = 100)

(a) Total comprehensive trade costs



(b) Non-tariff comprehensive trade costs

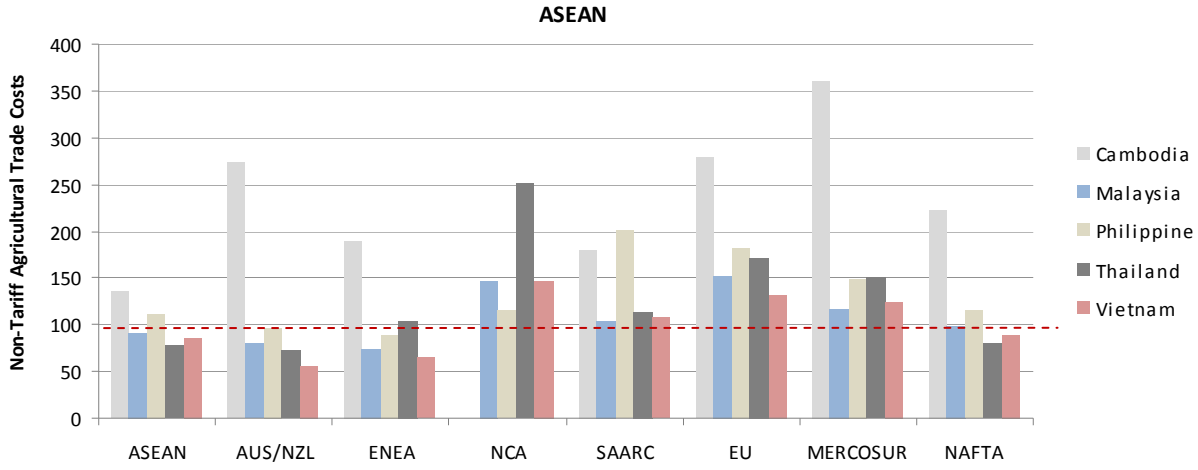
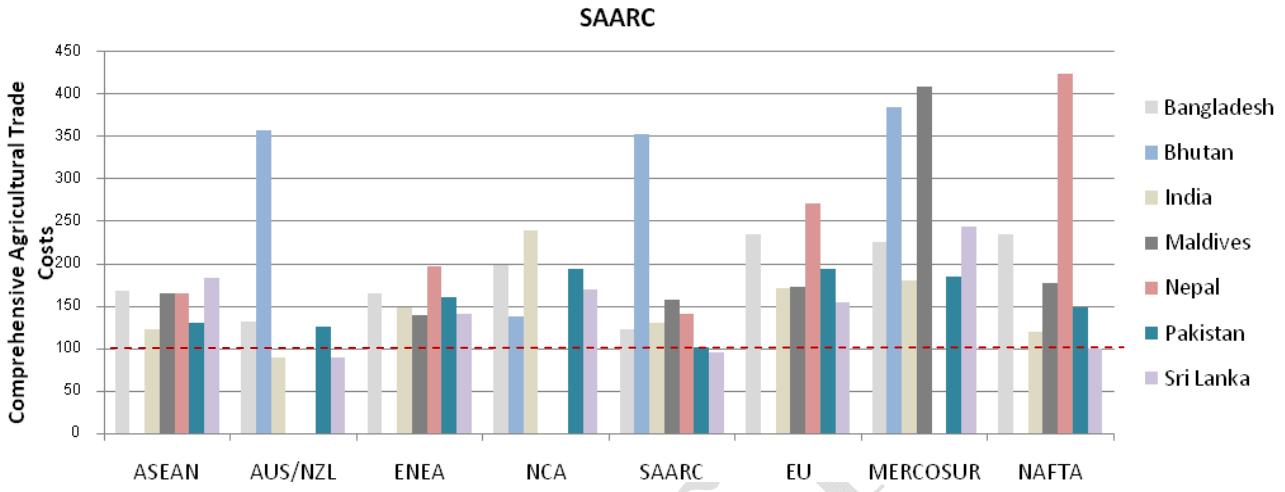


Table A3: Bilateral agricultural trade costs among SAARC countries: Average of 2007-2009

		Afghani-stan	Bangla-desh	Bhutan	India	Sri lanka	Mal-dives	Nepal	Pakistan
Afghanistan	CTC				203%				192%
	NTC				167%				173%
Bangladesh	CTC				144%	344%			154%
	NTC				105%	293%			124%
Bhutan	CTC				240%				
	NTC				207%				
India	CTC	203%	144%	240%		144%	428%	152%	164%
	NTC	167%	105%	207%		109%	370%	108%	124%
Sri lanka	CTC		344%		144%		126%	251%	144%
	NTC		293%		109%		94%	227%	122%
Maldives	CTC				428%	126%			
	NTC				370%	94%			
Nepal	CTC				152%	251%			336%
	NTC				108%	227%			299%
Pakistan	CTC	192%	154%		164%	144%		336%	
	NTC	173%	124%		124%	122%		299%	

Figure A 2: Comparison of average trade costs between each SAARC member and different country groups (Average of 2007-2009, intra-EU trade cost = 100)

(a) Total comprehensive trade costs



(b) Non-tariff comprehensive trade costs

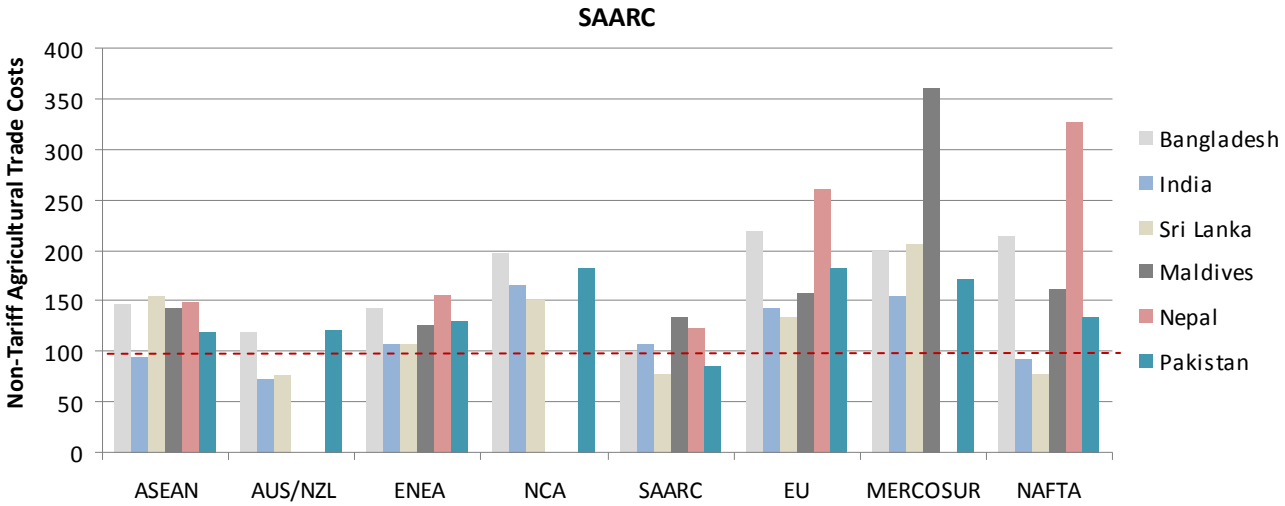
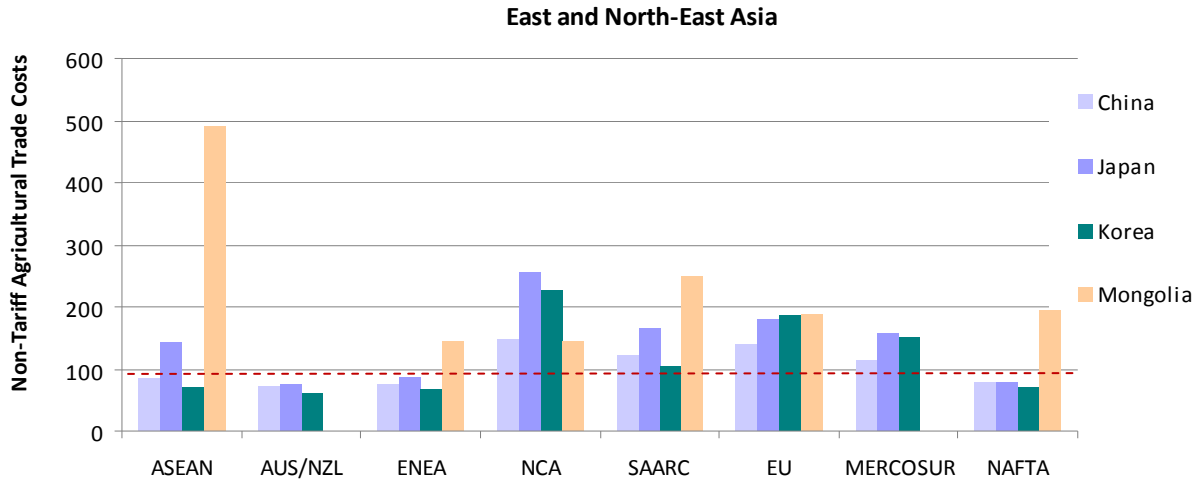


TABLE A4: BILATERAL AGRICULTURAL TRADE COSTS AMONG ENEA COUNTRIES: AVERAGE OF 2007-2009

		China	Japan	Republic of Korea	Mongolia
China	CTC		181%	166%	211%
	NTC		146%	95%	188%
Japan	CTC	181%		120%	323%
	NTC	146%		71%	307%
Republic of Korea	CTC	166%	120%		391%
	NTC	95%	71%		264%
Mongolia	CTC	211%	323%	391%	
	NTC	188%	307%	264%	

Figure A 3: Comparison of average trade costs between each ENEA member and different country groups (Average of 2007-2009, intra-EU trade cost = 100)

(a) Total comprehensive trade costs



(b) Non-tariff comprehensive trade costs

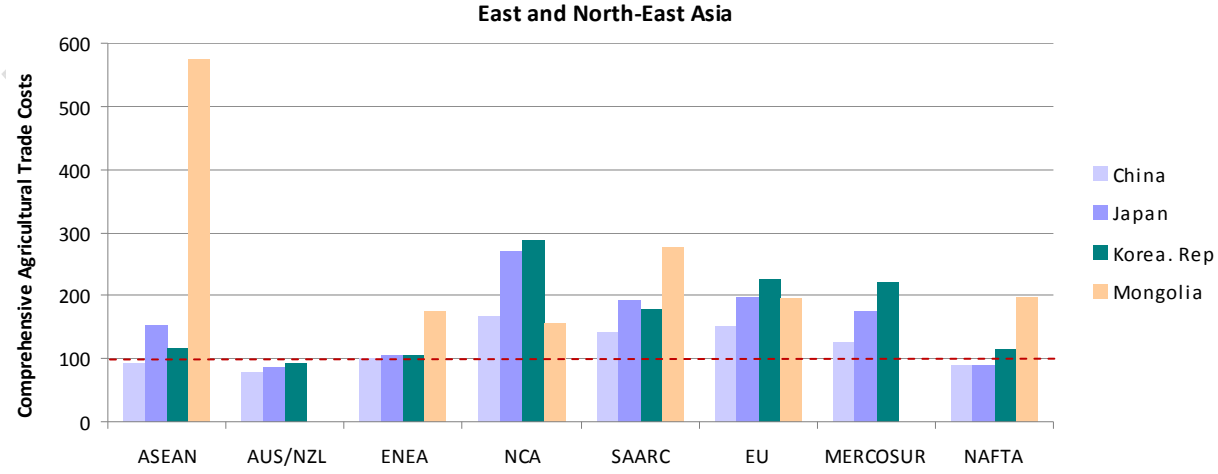
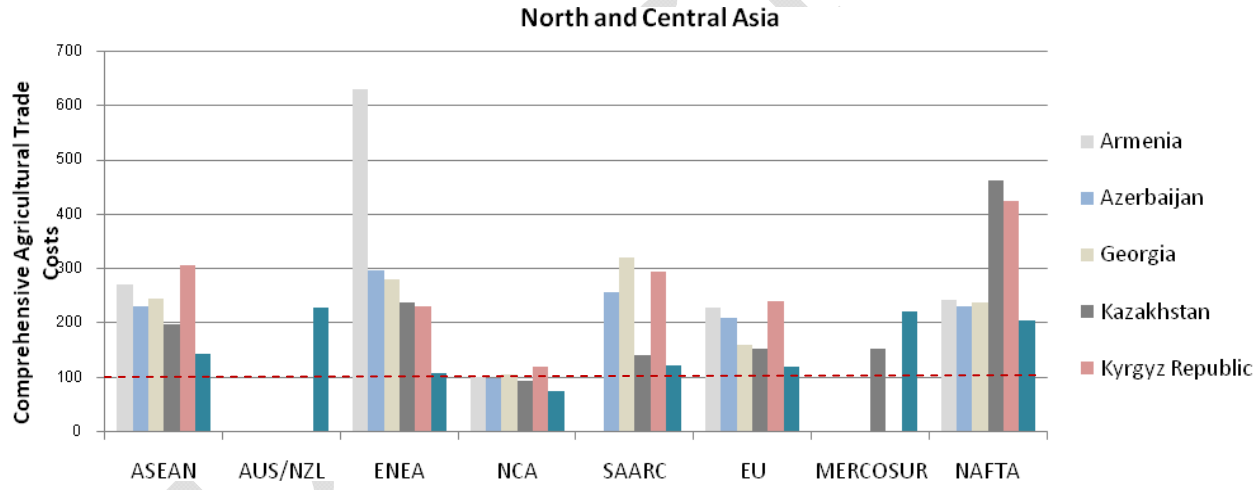


Table A5: Agricultural trade costs among NCA countries: Average of 2007-2009

		Armenia	Azerbaijan	Georgia	Kazakhstan	Kyrgyz Republic	Russian Federation
Armenia	CTC			156%	312%		158%
	NTC			156%	312%		158%
Azerbaijan	CTC			185%	163%	385%	97%
	NTC			185%	161%		97%
Georgia	CTC	156%	185%		180%	306%	146%
	NTC	156%	185%		177%	287%	146%
Kazakhstan	CTC	312%	163%	180%		150%	114%
	NTC	312%	161%	177%		148%	113%
Kyrgyz Republic	CTC		385%	306%	150%		145%
	NTC			287%	148%		145%
Russian Federation	CTC	158%	97%	146%	114%	145%	
	NTC	158%	97%	146%	113%	145%	

Figure A 4: Comparison of average trade costs between each NCA member and different country groups (Average of 2007-2009, intra-EU trade cost = 100)

(a) Total comprehensive trade costs



(b) Non-tariff comprehensive trade costs

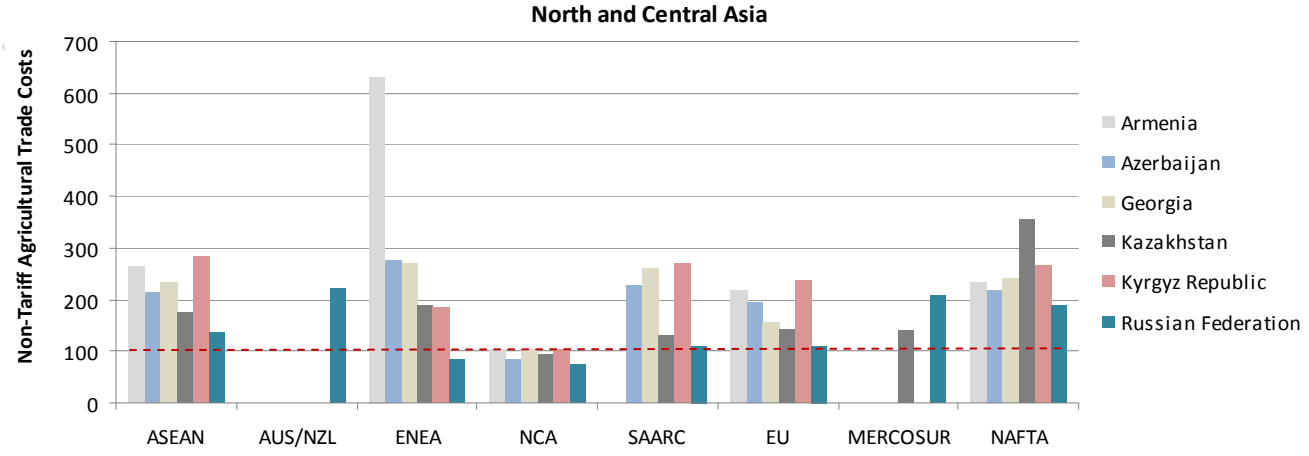
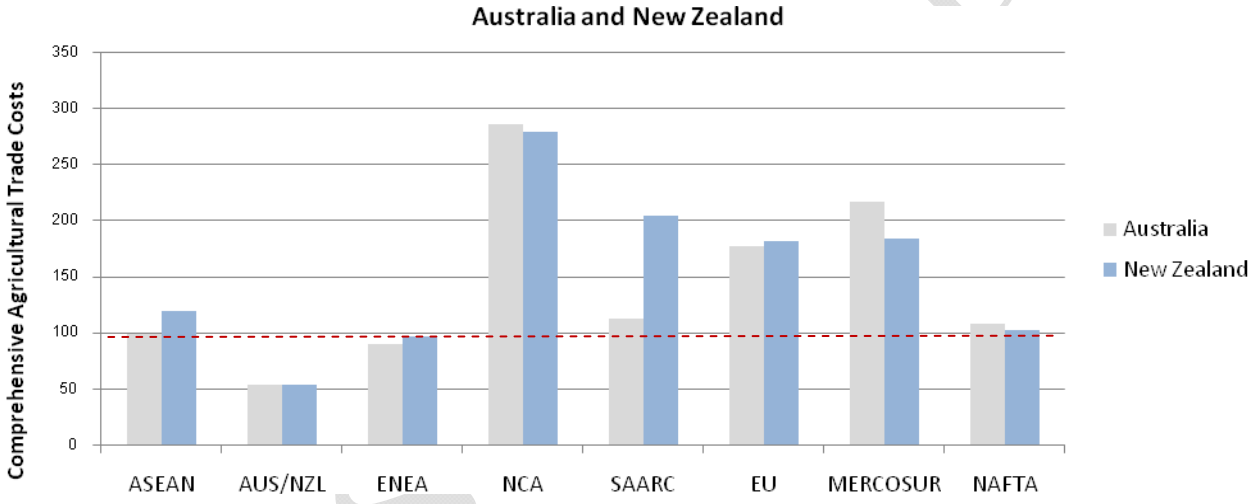


Table A6: Agricultural trade costs between Australia and New Zealand: Average of 2007-2009

reporter	Data	AUS	NZL
AUS	CTC		95%
	NTC		95%
NZL	CTC	95%	
	NTC	95%	

Figure A 5: Comparison of average trade costs between Australia and New Zealand and different country groups (Average of 2007-2009, intra-EU trade cost = 100)

(a) Total comprehensive trade costs



(b) Non-tariff comprehensive trade costs

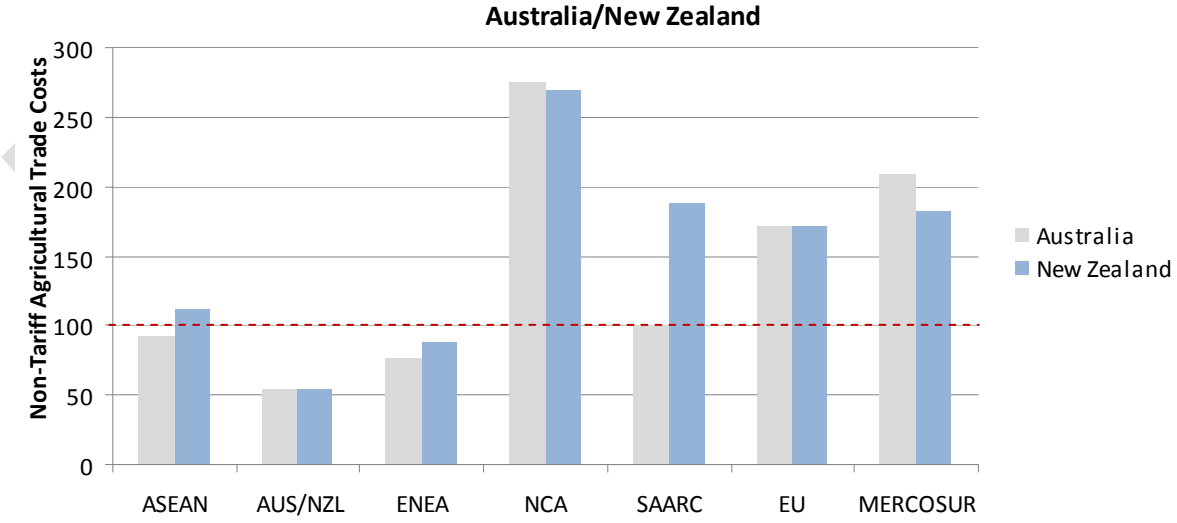


Table A7: UNCTAD Classification of NTMs

(A) Sanitary and phyto-sanitary measures (SPS)	Sanitary and phytosanitary measures include laws, decrees, regulations, requirements, standards and procedures to protect human, animal or plant life or health.
(B) Technical barriers to trade (TBT)	Technical barriers to trade are regulations/standards referring to technical specifications of products and conformity assessment systems thereof.
(C) Other technical measures	Pre-shipment inspection, special customs formalities not related to SPS/TBT and other special customs formalities not related to SPS/TBT.
(D) Price control measures	Price control measures are implemented to control the prices of imported articles in order to: support the domestic price of certain products when the import price of these goods is lower; establish the domestic price of certain products because of price fluctuation in domestic markets, or price instability in a foreign market; and counteract the damage resulting from the occurrence of "unfair" foreign trade practices.
(E) Quantity control measures	Quantity control measures are aimed at limiting the quantity of goods that can be imported, regardless of whether they come from different sources or one specific supplier. These measures can take the form of restrictive licensing, fixing of a predetermined quota, or through prohibitions.
(F) Para-tariff measures	Other measures that increase the cost of imports in a manner similar to tariff measures are known as para-tariff measures. Four groups are distinguished: customs surcharges; additional taxes and charges; internal taxes and charges levied on imports; and decreed custom valuation.
(G) Finance measures	Financial measures are intended to regulate the access to and cost of foreign exchange for imports and define the terms of payment. They may increase import costs in the same manner as tariff measures.
(H) Anti-competitive measures	Measures to grant exclusive or special preferences or privileges to one or more limited groups of economic operators, for social, fiscal, economic or political reasons.
(I) Export related measures	Export related measures are measures applied by the government of the exporting country on exported goods.
(J) Trade related investment measures	Local content measures, which restrict the level of imported components and trade balancing measures.
(K) Distribution restrictions	Restrictions to limit and rule the way the products are distributed. It may be controlled through additional licensing or certification requirements.
(L) Restriction on post-sales services	Measures restricting producers of exported goods in exporting countries providing post-sales service in the importing country.
(M) Subsidies	Financial contribution by a government or government body to a production structure, be it a particular industry or company, such as the direct transfer of funds or potential transfer of funds (for example grants, loans, equity infusions), payments to a funding mechanism and income or price support.
(N) Government procurement restrictions	Measures controlling the purchase of goods by government agencies, generally by giving preference to national providers.
(O) Intellectual property	Intellectual property legislation covers patents, trademarks, industrial designs, layout designs of integrated circuits, copyrights, geographical indications and trade secrets.
(P) Rules of origin	Rules of origin cover laws, regulations and administrative determinations of general application applied by government of importing countries to determine the country of origin of goods.

Source: UNCTAD, Trade Barriers Reporter online available at the followinig link: http://ntb.unctad.org/docs/Classification%20of%20NTMs.pdf

Table A8: Countries included in the analysis

East Asia & Pacific (10)		**Europe & Central Asia (29)**			**North America (2)**
Australia	Korea (Rep. of)	Austria*	Ireland	Romania	Canada
Brunei Darussalam	Malaysia	Czech Republic	Italy	Russian Federation	United States of America
China	New Zealand	Denmark	Kazakhstan*	Slovakia*	
Indonesia	Philippines	Estonia	Latvia	Slovenia	**South Asia (3)**
Japan	Thailand	Finland	Lithuania	Spain	Bangladesh
		France	Moldova*	Sweden	India
		Germany	Netherlands	Switzerland	Sri Lanka
		Greece	Norway	Turkey	
		Hungary*	Poland	United Kingdom	
		Iceland	Portugal		

Latin America & Caribbean (11)			**Middle East & North Africa (2)**		**Sub-Saharan Africa (3)**
Argentina	Colombia	Peru	Malta*	Oman	Cameroon
Bolivia	Mexico	Uruguay			Namibia
Brazil	Nicaragua	Venezuela			South Africa
Chile	Paraguay				

* indicates the additional coverage only in Model 2

Table A9: Robustness testing for country-specific fixed effect

VARIABLES	(1) All: OLS -- with reporter-sided variables and partner fixed effect	(2) All: PPML -- with reporter-sided variables and partner fixed effect
$\ln(distance_{ij})$	0.197***	0.208***
	[23.57]	[22.12]
contig	-0.120***	-0.144***
	[-3.203]	[-3.374]
comlang_off	-0.0359	-0.0279
	[-1.453]	[-0.999]
$\ln(tariff_{ij*ji})$	0.349**	0.360**
	[2.521]	[2.276]
$\ln(ntm_{ij})$	-0.114	-0.0934
	[-0.872]	[-0.607]
ln_lsci_i	-0.0875***	-0.0893***
	[-15.41]	[-13.91]
ln_internet_per100ppl_i	-0.00823	-0.00754
	[-0.558]	[-0.436]
get_credit_creditinfo_idx_i	-0.0334***	-0.0429***
	[-4.531]	[-3.934]
Constant	-0.156	-0.213*
	[-1.437]	[-1.754]
Observations	2,180	2,180
R-squared	0.622	0.555
Reporter FE	No	No
Partner FE	Yes	Yes
Income group	Yes	Yes
Year	Yes	Yes
Clustered SE	Country pair	Country pair
Adj. R-squared	0.609	.
Robust in brackets		
*** p<0.01, ** p<0.05, *p<0.1		
t-stat. in square brackets		