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Trade Facilitation in Asia and the Pacific: Which Policies and Measures affect Trade Costs the Most?

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Executive Summary

How much of international trade costs can be mitigated through implementation of trade facilitation measures and policies? What measures and policies affect trade costs the most? This paper presents findings from an initial analysis of new non-tariff trade cost estimates and their determinants, based on a bilateral database of comprehensive trade cost maintained by ESCAP. Although trade costs consist for the most part of non-tariff trade costs, tariff cuts accounted for a very significant portion of trade costs reduction between 1996-99 and 2004-07. That said, most countries are found to have reduced their non-tariff policy-related trade costs between 1996 and 2007. Among the top trade facilitating economies are Malaysia, the United States, China, Republic of Korea and Thailand, with Japan and Germany following closely. The dominance of Asian countries in the ranking is fully consistent with the trade-led growth strategies of these economies and their emphasis on reducing international trade costs.

The more detailed analysis of bilateral non-tariff policy-related trade costs further reveals that ASEAN developing countries often faced higher such costs when trading with one another than with the United States or Japan in 2007. However, while the trade costs of many developing countries with developed countries have remained roughly unchanged since 1996, their trade costs with other developing countries have often sharply decreased between 1996 and 2007 – at least within ASEAN. A closer look at the bilateral trade costs of large Asian economies revealed that China, Republic of Korea and Japan have achieved similar levels of trade facilitation, but that India has lagged behind. China impressively reduced its trade costs with all 13 partner economies examined in our study. Non-tariff policy-related trade costs between China and India decreased significantly over the past 10 years.

Results of the non-tariff policy-related trade costs modeling exercise strongly suggest that improving port efficiency (liner shipping connectivity) and access to information and communication technology facilities is essential to reducing trade costs. Policies aimed at liberalizing logistics and information technology services and increasing competition among service providers should therefore be readily considered, with a view to maximizing efficiency at any given level of hard infrastructure development. Establishment of public-private partnerships to accelerate the development of the national IT and transport and logistics infrastructure may also be actively pursued. The econometric results also supports the view that, given limited resources available, focusing on improving the overall business environment may be often more effective in facilitating trade than implementing soft measures solely targeted at speeding up movement of goods between factory and the port (or vice-versa).

Table of Contents

List of Tables

List of Figures

List of Boxes

Introduction

Trade facilitation, broadly defined here as the reduction of (direct and indirect) trade costs, has become a priority for developing countries who seek to maintain their competitiveness. Indeed, international trade costs faced by developing countries remain high, including for intra-regional trade. This is also the case in Asia, where trade facilitation performance varies greatly across subregions, as well as within countries in each subregion. As shown in table, 1, comprehensive costs of trade in goods range from 53% of value of goods for intraregional trade among Southeast Asian countries, to a prohibitive 282% for trade in goods between South and Central Asia countries.

Table 1: Intra-regional Comprehensive Trade Costs (2007; Tariff Equivalent)

	Southeast Asia	South Asia	East and North-East Asia	North and Central Asia	Australia-New-Zealand	European Union	North America
Intra Asian trade							
Southeast Asia	53%						
South Asia	139%	138%					
East and North-East Asia	141%	227%	113%				
North and Central Asia	280%	282%	204%	149%			
Extra Asian trade							
Australia-New-Zealand	90%	168%	155%	329%	61%		
European Union	113%	139%	135%	166%	129%	59%	
North America	109%	162%	122%	259%	130%	107%	50%

Source: Duval and Utoktham (2010), Annex 3 (services-sector adjusted estimates).

How much of international trade costs of goods can be mitigated through implementation of trade facilitation measures and policies? What measures and policies affect trade costs the most? Trade facilitation performance is affected by a wide range of factors. Some are inherent to the location, culture or history of the trading partners and may be difficult to address through policy, at least within a reasonable time frame. Others, such as the availability of logistics infrastructure and services, a favorable exchange rate, a conducive business environment, or transparent and streamlined border procedures, may be influenced by policy makers. This paper evaluates the overall importance of the component of international trade costs that is influenced by these other factors, and assesses the significance of a number of specific policy-related factors in reducing trade costs.

This paper makes several contributions to the existing literature on trade facilitation and trade costs. First, we present trade costs based on a measure that is both comprehensive and founded in micro-economic theory. In contrast, most of the available empirical research on trade costs is based on a specific subset of trade costs (e.g., transport costs) or on data from perception surveys. Second, we decompose our comprehensive trade costs into natural (time-invariant) and non-tariff policy-related trade cost estimates, the later providing a broad indicator of the level of bilateral trade facilitation performance. While these initial estimates will certainly need to be refined in future work, they provide new insights on potential to improve trade facilitation between partner countries. Finally, we estimate the direct effect of various trade facilitation measures and policies on trade costs. Past literature, analyzing the impact of trade facilitation has done so mainly by estimating the effect of various trade facilitation indicators on bilateral trade flows using extended gravity models (e.g., Wilson, Mann and Otsuki, 2004). Given that trade facilitation measures and policies affect trade flows through reducing the cost of trade, our approach can reasonably be expected to yield more accurate results and understanding of what factors may be most important for policymakers to focus on.

Methodology and Data

Defining Comprehensive Trade Costs

As shown by Jack, Meissner, and Novy (2008; 2009), gravity equations derived from the Anderson and van Wincoop (2003) trade model as well as other leading trade models such as the model with heterogeneous firms of Melitz and Ottaviano (2008), can be solved for an expression of bilateral comprehensive trade costs. This bilateral measure of trade costs is truly comprehensive in the sense that it includes *all additional costs involved in trading goods internationally with another partner (i.e. bilaterally) relative to those involved in trading goods intranationally (i.e., internally or 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.

Following Chen and Novy (2009), such all-inclusive trade costs may be defined as follows:

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

where 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 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

σ denotes elasticity of substitution between all goods[2]

According to this equation, trade costs are directly inferred from observable bilateral and intranational (domestic) trade data, showing how much more expensive bilateral international 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, alternative measures are needed. Following Novy (2008) and others (e.g., Shepherd, 2010), we first define x_{ii} and x_{jj} as gross domestic product (GDP) less export and apply equation (1) to calculate trade costs. In an effort to improve on previous studies, however, we call the resulting cost estimates "upper-bound" trade costs (τ_{ij}^{UB}) [3] and calculate "lower-bound" trade costs (τ_{ij}^{LB}) where x_{ii} and x_{jj} is adjusted for the

[1] As in Jack, Meissner, and Novy (2008), trade costs may be expressed in tariff-equivalent form, defined as $TET_{ij} = T_{ij}-1$. See Annex 1 for the full derivation of trade cost from the micro-founded gravity equation of Anderson and van Wincoop.

[2] See Anderson and van Wincoop (2003) for detailed discussion of elasticity of substitution between goods. For the purpose of comparing results to past literatures, this paper follows Anderson and van Wincoop (2004) and Novy (2008) by setting $\sigma = 8$.

[3] Novy (2008) finds that the percentage change of trade costs over time using GDP in the calculation is similar to those computed with gross output. Novy (2008) also shows high correlation between gross output and GDP, which makes GDP as a proxy of gross output still theory consistent. Novy (2008) notes however that using GDP data overstates intranational trade and thus the level of trade costs because GDP includes (non-tradable) services.

share of services in GDP.[4] T_{ij}, referred to as "comprehensive trade costs" (CTC) in the rest of the paper, is then calculated as the simple average of the upper-bound and lower-bound trade costs.

Table 2: Comparison of GDP and Gross Output based trade cost of selected countries with the United States of America (in tariff-equivalent)

Reporter::	Partner:	Upper-bound Trade Costs	Lower-bound Trade Costs	Comprehensive Trade Costs (CTC)	Novy (2009)
United States	Canada	41	21	31	25
	Germany	85	58	71	70
	Japan	80	53	66	65
	Korea	76	50	63	70
	Mexico	47	27	37	33
	United Kingdom	88	61	74	63

Table 2 provides a comparison between various trade cost calculated using GDP data and those calculated using gross output for selected developed economies by Novy (2008). Our CTC estimates are found to provide a better approximation of gross output based trade costs than simply using GDP based upper bounds trade costs.

Isolating Non-Tariff Policy-related Comprehensive Trade Costs

As we are mainly interested in non-tariff barriers to trade in the context of trade facilitation, we start by removing import tariff from our bilateral measure of comprehensive trade cost to calculate a non-tariff comprehensive trade cost (T_{ij}^{nt}). Following Anderson and van Wincoop (2004), this is done by dividing geometric average trade cost T_{ij} *by* $(1+tariff_{ij})$, where the tariff is the weighted average tariff rate of country *i* on imports from country *j*.[5] We then seek to remove the "natural" and essentially time-invariant factors affecting trade, which themselves may not be influenced by policy.[6]

[4] $x_{ii}^{for\ \tau_{ij}^{LB}} = NS(x_{ii})$, where NS is the average non-service sector share of GDP of countries in the income group to which country *i* belongs to. Income group definition follows that of the World Development Indicator database. The same applies to country *j*.

[5] CTC is an aggregate measure of import and export costs, such that the tariff of *j* on *i* are also included in it. Therefore, one could also have used the geometric average of the tariff imposed by each country in a given country-pair on each other (i.e., $(tariff_{ij}*tariff_{ji})^{1/2}$), given that T_{ij} is in theory influenced by tariffs imposed by both countries. By using only $tariff_{ij}$ to arrive at our non-tariff measure of trade cost of country *i* with country *j*, we recognize the fact that country *i* has no direct influence on the tariff of country *j*. Overall, both approaches often yield nearly identical estimates, due to the fact that tariff typically account for only about 3-6% of comprehensive trade costs when expressed in tariff equivalent terms.

[6] The importance of these "exogenous" factors have been discussed extensively in the past. See for example, Rodrick et al. (2002).

Based on the existing trade modeling literature, such factors include geographic distance between countries as well as cultural distance, such as the use of different languages.[7] Non-tariff comprehensive trade cost can therefore be modeled as follows:

$$T_{ijt}^{nt} = DISTANCE_{ij}^{\beta_1} e^{\beta_0 + \beta_2 CULT_{ij} + \varepsilon_{ijt}} \quad (2)$$

where

$DISTANCE_{ij}$ is bilateral distance in kilometers

$CULT_{ij}$ is a set of dummy variables of cultural distance, namely, CONTIG and COMLANG_OFF as defined in table 3.

Taking natural logarithm to linearize parameters, we obtain:

$$\ln(T_{ijt}^{nt}) = \beta_0 + \beta_1 \ln(DISTANCE_{ij}) + \beta_2 (CULT_{ij}) + \varepsilon_{ijt} \quad (3)$$

Equation (3) is estimated using ordinary least squares with reporter, partner and year fixed effects. The fixed-effect dummies broadly capture the characteristics (e.g., business environment, infrastructure, trade policies, etc.) of each reporter and partner countries. The model is estimated using a cross-country panel data of 92 countries covering the period 1988-2008 (see table 3). Definitions, sources and expected signs of all variables are presented in table 4.