

Trade Costs in South Asia

**What Matters More for Trade in South Asia – Trade Tariffs or Trade Transactions Costs?
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Abstract

The paper examines the excessive direct costs and time taken in crossing borders in South Asia and assesses the implications for trade from increased efficiency of cross-border transactions. The estimates of monetary costs and time have been derived from existing field research undertaken in the region in recent years. These estimates are taken as measures of border inefficiencies in trade amongst South Asian countries. We employ the standard GTAP modeling framework and database (Version 6) to estimate the trade and welfare costs of inefficiencies in cross-border trade transactions among the South Asian economies and compare these costs with those resulting from trade policy barriers. The removal of transactions costs is simulated as output augmenting technical change for the relevant sectors and trade flows. We find that the removal of such inefficiencies in trade transactions would increase welfare in the region by about \$116 million per year as compared to a gain in income of \$418 million from a preferential removal of trade tariffs in the region. However, it is worthwhile to note that the gains accruing to some smaller countries in the region are much larger from removal of transactions inefficiencies than those from tariff policy liberalization. For instance, Bangladesh, which tends to suffer a loss in income from trade policy liberalization, is found to be the biggest beneficiary of increased efficiency of trade transactions. Also, the nondiscriminatory nature of transaction cost improvements leaves the rest of the world better off. The results underscore the importance of implementing reforms in border infrastructure and logistics in tandem with other policy reforms to enhance the political and economic viability of regional agreements.

1. Introduction

Intra-regional trade in South Asia¹, which was estimated to be around 19 percent in 1948, fell to around 2 percent of the region's total trade in 1990 largely as a result of adoption of inward-oriented, import substituting industrialization since the 1950s as well as political conflict between two of the region's biggest economies—India and Pakistan—along with other bilateral disputes (World Bank, 2004). Since the 1990s, comprehensive trade policy liberalization and strengthened regional and bilateral trade arrangements have improved the policy environment for trade in the region. Despite this the share of intra-regional trade has risen to a meager 4 percent of total trade, which is quite low compared with similar trade in other developing regions within and outside Asia. The share of intra-regional trade in the Association of South East Asian Nations and the European Community is 26 percent and 67 percent respectively. This relative lack of importance of intra-regional trade in South Asia has been generally ascribed to the low correspondence between South Asia exports and South Asia import demand implying limited opportunities of trading within South Asia.

However, some key stylized facts suggest alternative answers to this puzzle. First, existing evidence suggests that the unrecorded trade is roughly of the same magnitude as recorded India-Nepal, India-Pakistan and India-Bangladesh trade but considerably less than the recorded India-Sri Lanka trade. According to Taneja (2005), informal or unofficial trade in the South Asia region is around \$1.5 billion, which is approximately 72 percent of formal trade for corresponding years. This implies that transactions costs of informal trade are lower than costs of trading through official channels and a decline in official trade costs may not only substitute informal for formal trade but may also create new opportunities for trade. Second, studies (Subramanian and Arnold, 2001) have shown that transport and transit costs of trading within South Asia are much higher than those with rest of the world, suggesting that potential exists for efficiency-driven increases in intra-regional and international trade in the region. Also, a significant increase in India-Sri Lanka trade, following implementation of the India-Sri Lanka Free Trade Agreement since 2000, partly driven by Indian investments in Sri Lanka, also suggests trade potential of deeper regional arrangements in the regions, especially covering cooperation in transport infrastructure and border procedures.

Existing literature on trade costs argues that it would be useful to improve the factual content of work on the benefits of trade facilitation, especially through introduction of greater precision with respect to trade transactions costs for certain

¹ The general discussion in the paper covers 8 South Asian economies (members of the regional grouping known as the South Asia Association for Regional Cooperation, to which the new member Afghanistan would accede in April 2007, the others being founder members since 1985), subject to data availability, which consist of Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. However, the model estimates cover only Bangladesh, India and Sri Lanka, as the latest publicly available Version 6 of the GTAP Database covers only these countries in its regional disaggregation.

product categories and types of businesses.² In this paper we attempt to do so by focusing on the land border trade transport and logistics costs in South Asia. Existing applied general equilibrium analysis in case of South Asia focuses on the implications of liberalization of trade tariffs, which have been reduced significantly in recent years through a number of regional and bilateral arrangements in the region.³ In contrast, to our knowledge, there are no estimates of the trade and welfare costs of inefficient border transactions in the region although regional cooperation in harmonization of technical standards and trade facilitation is lagging behind tariff liberalization. This is despite the existence of well acknowledged constraints imposed by transport and trade administration procedures in the region along with availability of some survey based quantitative estimates of such costs. In this paper we utilize the existing evidence on trade costs and the computable general equilibrium modeling methodology to measure, *ex-ante*, the impact of trade policy barriers and transactions costs on intra-regional trade and welfare in South Asia.

The paper is organized as follows: In the next section, we describe the transport and logistics complexity in South Asia. In section 3, we provide estimates of trade transport costs in the region derived from existing primary research in the region. Section 4 outlines the methodology for estimating costs of trade barriers on intra-regional trade and incomes. The results are presented in section 5. We conclude in section 6 by pointing out some of the limitations of the paper along with the direction of further research to improve the scope, coverage and policy content of the analysis.

2. Border Transport Logistics in South Asia

A significant proportion of trade within the South Asia region is carried through land borders using ground transportation. This intra-regional trade in South Asia encounters many problems related to physical infrastructural bottlenecks and procedural delays at the land border customs stations, which affect both transit and border trade in the region. Amongst the eight South Asian countries considered in this paper, three namely Afghanistan, Bhutan and Nepal are landlocked economies with the latter two dependent entirely on India for their sea borne international trade outside the region. India is the centre of trade and transit activity in the South Asia region. India is the largest economy in the region accounting for 78 percent of regional production and approximately 80 percent of intra-regional trade. India shares extensive land borders with Bangladesh, Nepal, Pakistan and Bhutan, while none of these countries, with the exception of Pakistan, share their borders with any third country within South Asia. While Nepal and Bhutan share borders with China in addition to India, Bangladesh does not have land access to any country apart from India. Although all trade with Sri Lanka is carried through other modes of

² See OECD, 2002.

³ The South Asian Free Trade Area (SAFTA) began to be implemented in July 2006. India has free trade agreements with Bhutan, Nepal and Sri Lanka in addition to the transit agreements with Bangladesh, Bhutan and Nepal.

transportation, a land bridge between India and Sri Lanka has been under contemplation for sometime (see RIS, 2004).

The Nepal-India and the Bangladesh-India borders are the hubs of trade and transit activity in the region. The India-Pakistan border trade, which has long been afflicted by political problems, is much less vibrant. Bangladesh and India share a long, porous border. The Petrapole (India) and Benapole (Bangladesh) land customs station accounts for roughly two-thirds of the total official trade between India and Bangladesh (Table 2). Border trade between India and Pakistan is permitted only through a rail link along the Attari (India) and Wagah (Pakistan) border in the Punjab. India-Pakistan official trade is also carried through the sea route between Mumbai (India) and Karachi (India). Since Pakistan allows only a limited number (773) of items to be imported from India, a significant amount of unofficial trade takes place between the two countries via sea through third countries. Regional trade with Sri Lanka is carried mostly through the sea route and for the purposes of this study is taken to be equivalent to trade with countries outside the region.

Trade costs are large and impose significant costs in the South Asia region. Direct transport costs include freight charges and insurance as well as speed money paid to border administration. Indirect transport costs include holding costs for goods in transit, inventory costs due to buffering the variability of delivery dates. Indirect costs must be inferred. Infrastructure is likely to have a considerable effect on the time costs of transport. These transport costs vary across countries and by commodities and overtime. Transport costs tend to be higher in bulky and perishable agricultural products. In fact, policy protection in agriculture tends to complement natural transport driven protection, thereby imposing disproportionately higher trade costs on agricultural commodities. Similarly, transport costs for a major export sector of South Asia, namely clothing also tends to get pronounced due to the just-in-time fashion driven nature of the production, distribution and consumption process of the industry.

3. Data and Estimation of Border Transport Costs

One of the distinguishing features of the GTAP model is the delineation of the transport sector as a separate sector. Transport costs are measured as transport margins i.e. as percent of cost of the good shipped. However, the data utilized for the construction of transport margins (*cif/fob*) is quite limited. The GTAP V6 database uses the same sources and methods used in the GTAP V5 database (Gehlhar and McDougall, 2006) with 1997 as the base year. It is argued that freight rates for seaborne routes remained more or less unchanged. But airfreight is known to have declined in a discernible manner in recent years resulting in increasing share of goods being shipped by air. The transport margin data are obtained at the sub-sector level from the US bilateral trade sources. Due to the limitation of the GTAP V6 data combined with the fact that transport costs are widely recognized to be an increasingly important impediment to trade, partly as a result of declining manufacturing tariffs, in developing countries, part of the exercise in this paper

involved estimating transport and logistics cost of trade for the countries directly relevant to this study. The estimation procedure is described below.

Several studies (including Subramanian and Arnold, 2001; Das and Pohit, 2004; World Bank, 2006, Taneja, 2007) have recorded the dismal state of border and transport infrastructure and the resulting inefficiencies in the important trade corridors of intra-regional trade of South Asia. Most recent and comprehensive quantitative indicators of the magnitude of these costs are available in the case of the Indian exports to Bangladesh and Pakistan. Based on a survey of 15 transporters and 82 exporters, Das and Pohit (2004) estimate the actual cost of an average shipment from the Indian city of Kolkata to the point of customs clearance in Bangladesh to be 12.31 percent of the value of the shipment, compared to an ideal cost of 1.93 percent, suggesting an average excess or *iceberg* cost of 10.38 percent. The total loss in time is estimated to be around 4 days. The cost estimate is based on the payment of bribes and the imputed cost of the inefficiencies implicit in the extra time involved in transportation, customs clearance, unloading and return to the Indian side of the border. While Das and Pohit (2004) provide only the average cost, World Bank (2006), based on Subramanian et al (2001), provides commodity-wise estimates. There are no corresponding estimates of transactions costs of Bangladeshi exports to India mainly because of the low volume of this type of trade. However, Das and Pohit (2004) suggest that the costs are not symmetric and that in fact Bangladeshi exporters/Indian importers face worse conditions and bear greater costs of export to India. Bangladeshi traders pay bigger bribes to obtain visa and customs clearance, have to wait longer to cross the Indian border as priority is accorded to outbound Indian exports and lack of warehousing facilities on the Indian side also lead to losses, particularly of perishable products.

We use the above-mentioned commodity-wise estimates of transactions costs of Indian exports to Bangladesh to build equivalent estimates for the remaining dimensions of intra-regional trade in South Asia. First, we use the Doing Business: Trading Across Borders (2006) indicators for South Asian countries (Table 3) to estimate trade transactions costs for Bangladesh exports to India. We take the average cost of India's trade to be the base and use the variation from the Doing Business indicators to estimate the average cost for Bangladesh. The Doing Business data indicates that the time and direct cost of customs clearance and port and terminal handling is higher in Bangladesh compared to India. Second, from these estimated average costs, commodity-wise transactions costs are computed in a manner similar to the method used in case of India. Finally, the variation in the country-wise export and import costs implicit in the Doing Business data is used to estimate the average and commodity-wise costs of import flows for India and Bangladesh. Since trade with Sri Lanka is carried through modes other than ground transportation, we treat Sri Lanka to be equivalent to other regions of the world economy with no Sri Lanka-specific improvements in efficiencies expected to accrue in India and Bangladesh and vice-versa. The estimated costs are presented in Table 4.

4. Methodology and Experimental Scenarios

Trade transactions costs may be incorporated either as a difference between the sellers and buyers price or as a fraction of the traded good itself which is lost as the melted part of an iceberg a la Samuelson (1954) during the course of the transaction. While in the former approach, the markup on the sellers price is taken to represent real resources used up in the functioning of the market and as an income-generating activity, under the iceberg approach, such costs represent pure inefficiencies in the system. Following Hertel, Walmsley and Itakura (2001), we adopt the latter approach to modeling excessive border costs in this paper. These transactions costs are not an explicit component of the existing GTAP database. Thus, we simulate the removal of estimated trade costs as import-augmenting technical change in the GTAP model. The variable *ams*, in Version 6.0 of the GTAP model, represents the import-augmenting technical change, which is shocked positively to implement an increase in efficiency of specified trade flows.⁴

The GTAP V6 database distinguishes 87 regions, 57 sectors and 5 primary factors. As only three (Bangladesh, India and Sri Lanka) of the eight SAARC economies are distinguished as separate regions in V6 of the GTAP database, our analysis is limited to these countries.⁵ However, we expect the results to extend to the rest of the region due to the similarity of conditions in the region with respect to transport infrastructure and logistics. In our analysis, the database is aggregated into 5 regions and 17 sectors (Table 5).

The basic theoretical features of the model are as follows: Regional household behaviour is represented by an aggregate utility function specified over composite private consumption, government purchases and savings. The composite household owns endowments of factors of production and receives income from selling them to firms. The household also receives income from government revenue/subsidy. On the production side, firms employ domestic factors and intermediate inputs from domestic and foreign sources to produce output. Throughout it is assumed that there exists perfect competition and constant returns to scale in production activities. Prices on goods and factors adjust until all markets clear. The GTAP measures welfare changes, resulting from changes in trade and domestic taxes and subsidies, by direct evaluation of the impacts on the expenditure and production revenue functions and government revenues. Welfare changes are measured in terms of changes in equivalent variation.

We undertake alternative policy experiments to gain a perspective on the relative importance of trade transactions costs and trade tariffs in the region. The

⁴ A complete description of the formal model is available in Hertel (1997). The special features of the GTAP Version 6 database can be found in Dimaranan and McDougall (2004). The model is solved using the software GEMPACK (Harrison and Pearson 1996).

⁵ The latest available GTAP database V6.2 additionally covers Pakistan and the author plans to extend the analysis by requesting the corresponding aggregation from the Center for Global Trade Policy Analysis.

objective is to assess the relative magnitude of trade and welfare impact from improvement in efficiency of trade transactions.

Scenario 1: Removal of inefficiencies in land border transactions in South Asia.

Scenario 2: Preferential removal of trade tariffs in South Asia i.e. all South Asian countries remove their bilateral tariffs but retain tariff protection against countries outside of the South Asian region.

5. Preliminary Summary Results

The welfare implications of the simulations are presented in Table 6. A complete elimination of transactions costs results in a regional welfare gain of \$116 million. The largest gains in dollar terms accrue to Bangladesh amounting to \$73 million. Gains accruing to India amount to \$43 million. The results of the tariff liberalization scenario are quite different. India turns out to be the biggest beneficiary of the regional free trade scenario with gains amounting to \$466 million. In sharp contrast, Bangladesh suffers a loss of \$91 million due to regional free trade. Sri Lanka benefits marginally from tariff removal. The rest of the world incurs a terms of trade loss due to free trade within South Asia.

The extent of the gains vary across countries depending on the extent of initial policy distortions and inefficiencies and existing trade patterns. Countries with initially high levels of policy distortions such as India benefit more tariff removal. While efficient producers and exporters would tend to gain, large importers of agricultural commodities may lose from an increase in world prices of agricultural products.

The gains accruing from tariff liberalization are substantially larger because tariffs directly distort decisions on the consumption and production sides and are the most pervasive distortion in the current database across commodities and countries, whereas transactions cost estimates are used only in case of Indian and Bangladeshi imports. However, it needs to be kept in mind that the gains from tariff liberalization are overestimates due to the outdated nature of the tariff data used, which pertain to the year 2004 since when tariffs have been reduced substantially on a unilateral and preferential basis in South Asia.

6. Concluding Remarks

South Asian countries themselves are increasingly attributing the lack of intra-regional trade to non-tariff barriers and inadequate regional infrastructure. This paper quantifies the potential benefits of improving trade and transit related infrastructure as an instrument to promote regional trade and investments. It has been argued that South Asian economies need to develop regional transport and transit systems (RIS 2004). At present, the countries in the region use different product classification system, different customs documentation and electronic data interchange systems. Some existing protocols require that the goods be transshipped from vehicles of one

country to another, increasing the time and damage costs of the cargo. This paper underscores the benefits of implementing policy and transactions costs reforms simultaneously to maximize the benefits in terms of distribution of gains across countries and commodities. Such measures would also enhance the competitiveness of the countries in trade outside the Subcontinent.

The analysis above suffers from a number of drawbacks such as the limitation of transactions costs estimates to Indian and Bangladeshi export flows. Similar information is available for Pakistan. The analysis could be extended to cover Pakistan, which is available in V6.2 of the GTAP database. However, the landlocked countries of South Asia remain outside the ambit. Survey estimates of transactions costs are available for different years and most likely outdated. Transactions costs considered are limited to bribes and transport time delay costs excluding other components. The analysis could also be extended to study the impact of investment-driven increases in trade and incomes given the increasing importance of such trade in the region.

The current coverage of the trade costs in the GTAP database is inadequate for studying implications of changes in trade costs and non-tariff barriers, especially in developing countries. This is despite the recent improvements in information related to these indicators from a variety of periodic surveys (see Bagai and Wilson, 2006). Further research on this subject, especially in the context of developing countries, could benefit through improvements in data quality utilizing existing databases.

To conclude, the answer to the question posed at the beginning of this paper i.e. what matters more for trade and income in South Asia – trade tariffs or trade transactions costs is conditional. In other words, it depends on the country in question. For instance, while India gains more from trade policy liberalization, Bangladesh gains more from transport sector improvements. One could surmise that small landlocked countries, dependent more heavily on trade, such as Nepal and Afghanistan would also gain considerably from improvement in transaction costs efficiencies. Given the nondiscriminatory nature of efficiency gains in trade costs, the world as a whole would gain more from increased efficiency than preferential trade policy liberalization in South Asia.

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Table 1: Share of Intra-regional Trade in South Asia, 2005

Region	Share of intra-regional trade (%)
South Asia	4.1
Afghanistan	na
Bangladesh	10.3
Bhutan	na
India	2.4
Maldives	18.3
Nepal	49.0
Pakistan	2.7
Sri Lanka	14.4

Source: Direction of Trade Statistics, IMF, CD-RoM, July 2006.

Table 2: Major Transport Corridors used for Trade within South Asian

Corridor	Proportion of trade
Kathmandu-Birgunj in Nepal - Raxaul-Kolkata/Haldia in India (road)	0.70 (India-Nepal trade)
Benapole in Bangladesh - Petrapole in India (road)	0.67 (India-Bangladesh trade)
Amristar in India - Lahore in Pakistan (rail)	na
Karachi in Pakistan – Mumbai in India (sea)	na

Sources: Das and Pohit, 2004; Karmacharya, 2006; Taneja, 2007.

Table 3: Customs and Border Crossing Times in South Asia, 2006

Region	Duration (days)		Cost (US\$)	
	Customs clearance and ports handling		Customs clearance and ports handling	
	Exports	Imports	Exports	Imports
Afghanistan	7	14	550	350
Bangladesh	8	19	552	737
Bhutan	9	10	700	1400
India	10	10	120	306
Maldives	3	9	200	184
Nepal	6	12	623	712
Pakistan	5	6	284	285
Sri Lanka	5	7	162	559

Source: www.doingbusiness.org/exploretopics/tradingacrossborders.

Table 4: Sector-wise Average Trade Tariffs and Border Costs in South Asia

Sectors/Region	India		Bangladesh		Sri Lanka
	Avg. tariff	Transaction cost (Goods exported to Bangladesh)	Avg. tariff	Transaction cost (Goods exported to India)	Avg. tariff
Wheat	0.00	8.66	4.96	11.69	0.00
Fruits and vegetables	40.19	5.09	15.17	6.87	20.87
Other crops	12.76	9.30	3.82	12.56	27.52
Other primary	15.70	2.55	21.03	3.44	0.64
Rice	50.00	6.13	4.55	8.28	33.33
Sugar	40.00	4.57	24.68	6.17	23.08
Vegetable Oils	82.58	1.50	18.41	2.03	15.79
Other food products	57.00	1.80	25.26	2.43	13.15
Textiles and clothing	26.51	1.72	30.24	2.32	1.61
Paper and plastics	20.48	1.08	20.72	1.46	8.51
Chemicals	30.98	0.87	13.79	1.17	6.66
Non metallic minerals	32.22	16.71	23.83	22.56	12.50
Metals	33.58	3.00	18.37	4.05	6.67
Motor vehicles	40.30	0.29	20.41	0.39	11.54
Other transport	18.87	0.31	15.89	0.42	5.30
Electric equipment	15.07	0.47	13.65	0.63	2.89
Other Manufactures	27.63	1.10	14.30	1.49	6.25

Notes: (1) Please refer to Section 3 for sources used to compute transactions costs. However the transaction costs here pertain to exports as against imports for the relevant flow mentioned.
(2) Average tariffs are from GTAP Database V6.

Table 5: Regional and Sectoral Aggregation

Regions	Sectors
Bangladesh	Wheat
India	Fruits and vegetables
Sri Lanka	Other crops
Rest of South Asia	Other primary
Rest of the World	Rice
	Sugar
	Vegetable Oils
	Other food products
	Textiles and clothing
	Paper and plastics
	Chemicals
	Non metallic minerals
	Metals
	Motor vehicles
	Other transport
	Electric equipment
	Other Manufactures
	Services

Table 6: Some Preliminary Summary Results (Region-wise EV in US\$ million)

Region	Removal of transactions costs	Preferential tariff removal in SA
Bangladesh	73.18	-90.83
India	43.51	466.38
Sri Lanka	-0.48	42.13
Rest of South Asia	-0.58	337.80
Rest of the world		-480.63

Notes: 1. The transaction cost experiment in this table assumes that cost of bilateral exports and imports for a region are symmetric. This would be revised in accordance with the methodology described in section 3.

2. In case of preferential tariff liberalization, average import tariff rates have been used. The corresponding bilateral rates could have been used instead.