

IMPACT OF TRADE FACILITATION ON SECTORAL EXPORT PERFORMANCE: A Case for SAARC Countries

Muhammad TAIMUR,* Mohsin Hasnain AHMAD
and Uzma IRAM****

Abstract

Previous literature focuses on aggregate data of export in case of SAARC region that could possibly mask and miss the channels between trade facilitation and export growth. Therefore, in order to assess the effect of trade facilitation on export performance and unmask the important information for policy formulation. The underline aim of this study is to investigate the nexus of trade facilitation and sectoral export namely primary and manufacturing export performance of SAARC countries. Using gravity model augmented with trade facilitation indicators, the overall empirical results confirm that trade facilitation improvement can indeed contribute to the export performance of SAARC region. Findings of the study recommend that in the face of lackluster export performance of most member countries, trade facilitation reforms are recommended as an effective remedy to maintain and enhance the export performance in the region.

Key words: Trade Facilitation, Primary and Manufacturing Export, SAARC Countries.

I. Introduction

The concept of trade facilitation has received a much greater attention from the last few years. The transaction costs of trade are among the significant factors of international trade flows. Improvement in trade facilitation measures has seen very effective for lowering the trade cost and accelerating the trade performance especially in developing countries.

The tariff barriers have been reduced significantly over the years by Regional Trade Agreements (RTAs) and Free Trade Agreements (FTAs) [WTO (2013)]. Despite the benefits of declining tariff barriers, non-tariff barriers (NTBs) can also play their role. Dicken (2011) claimed that since 1970s non-tariff barriers has been increased markedly. According to OECD (2011), NTBs have more negative impacts than tariff barriers, because government earns revenues from tariff barriers and NTBs resulting a “dead weight loss” in the shape of welfare losses to consumers

* Research Scholar, ** Assistant Professors/Research Economists, Applied Economics Research Centre, University of Karachi, Pakistan.

by losing employments, reducing the variety of products and decreasing the government revenue. Therefore, the NTBs reducing any gains in trade due to the eliminations or reductions of tariffs.

The NTBs has been addressed, through the facilitation policies. The WTO defined trade facilitation as; “the simplifications and harmonization of international trade procedures” involving the activities practices and formalities in “collecting, presenting, communicating and processing data required for the movement of goods in international trade” [WTO (2013)¹]. The United Nation Economic Commission for Africa in 2010, estimates show that once the NTBs are eliminated, the intra-regional trade of UNEC could increase by 22 per cent [United Nation Economic Commission (2010)].

The transaction costs of trade are among the significant factors of international trade flows, its direct and indirect cost involved in export processes is estimated up to 15 per cent of the value of traded goods [OECD (2003)]. Trade facilitation is commonly seen an active tool for reducing trade and transaction related cost. It induces the FDI and rises the trade flows which increases public revenue and also increases the welfare of consumer. The estimated result suggest that trade facilitation increases the economic development and trade [Wilson, Man and Otsuki (2003)]. In case of developing countries, trade facilitation upturns the capability of these nations to become an integrated part of the global supply chain [OECD (2005)]. According to World Bank (2009) enterprises in SAARC countries take a great deal of additional documents, time and cost obligatory to their export procedure as compared to developed economies.

As per World Bank report (2009) enterprises in SAARC countries take ampler documents, time and cost during exporting process as compared to other developed nations. For instance, In SAARC economies, on average, it took 33 days and 8 documents and cost 1522 US\$ per container require to export a standard container of goods (Table 1 and 2), whereas in OECD countries an identical good would only take 8 days to export, require four documents and cost 969 US\$ per container for export [Doing Business (2015)].

Being an important channel for growth and development, exports play a very significant role for any economy. From historical perspective SAARC's export performance in term of share to world export is very disappointing. Its share is very trifling and declining till 1990. The merchandise exports of SAARC region is less than 1 per cent to world export if India is excluded. The region shares to world exports gradually falls to 0.8 per cent in 1990 as it was 3.7 per cent in 1950 and then steadily rises reaching to 2.04 per cent level in 2014, (see appendix table: A.1). On the other hand, according to World Development Indicators [WDI (2014)] SAARC region is sharing approximately 24 per cent of the world population which has

¹ In broader sense, it does not merely include at the border issues but beyond the border issues too, dealing with business environment, strong institutions, the quality of infrastructures and domestic procedures. [See UNTAD (2001), OECD (2005)].

tremendous scope for growth and development for the wellbeing of the region. However, its share to world exports is not very noteworthy as compared to other Asian countries. So from this background SAARC is very interesting for research, because poor trade facilitation and fragile institutional structure seems hurdle to export growth in the South Asian region.

TABLE 1
Trade Facilitation Indicators for SAARC Countries
Average over the Period (2004-2015)

	Documents to Exports	Time to Exports	Cost to Exports	Documents to Imports	Time to Imports	Cost to Imports
	(Number)	(Days)	(US\$ per Container)	(Number)	(Days)	(US\$ per Container)
Afghanistan	10	73.8	3,257.50	10	78.3	3,425
Bangladesh	6	31.6	1081.8	9	42	1,344.70
Bhutan	9	38	1,702	11	37	2,102
India	7	18.7	954.8	10	24.3	1,167.30
Maldives	7	21	1,419.60	9	21	1,409.40
Nepal	11	40	2,545	11	39	2,650
Pakistan	8	22.3	649.9	8	20.2	651.3
Sri-Lanka	6.8	21.1	568.9	7.6	19.9	674.2
Average	8.1	33.31	1,522.40	9.5	35.2	1,678

Source: Calculated from Doing Business.

TABLE 2
Trade Facilitation Indicators for Selected OECD Countries and SAARC
(Average over the period 2004-15)

	Documents to Exports	Time to Exports	Cost to Exports	Documents to Imports	Time to Imports	Cost to Imports
	(Number)	(Days)	(US\$ per Container)	(Number)	(Days)	(US\$ per Container)
Denmark	4	6	751.9	3	5	701.9
Finland	4	9	554.5	5	7.7	556.5
Germany	4	8.4	869	4	7	892
Luxembourg	5	8	1,383.30	4	7	1,382.22
Netherlands	4	7	919.5	4.7	6	981.9
Norway	4	8	993.9	5	7	852
Sweden	3	9	678.6	3	6	700.2
Switzerland	3	8	1,481.70	4	8	1,444.40
United Kingdom	4	9	1014	4	7	1,154.60
United States	3	6	1039	5	5	1,261.50
Average of OECD	3.8	7.8	968.5	4.2	6.6	992.722

Source: Calculated from Doing Business.

While reviewing the relevant literature some studies tried to explore the impact of trade facilitation on trade but they relied on aggregate data that could possibly mask and miss channels between trade facilitation and export growth. Therefore, in order to assess effect of trade facilitation on export performance and unmask the important information for policy formulation. In this paper we investigate the nexus of trade facilitation and sectoral export namely primary and manufacturing export performance of SAARC countries.

The paper is organized as follows: Section II provides review of literature. Econometric methodology, data source and variables definition is explained in Section III. The empirical results are discussed and reported in Section IV. Finally, Section V presents conclusion and policy implication.

II. Literature Review

Most of the research has been done to assess the effect of Trade facilitation (TF) on aggregate trade volumes. Regarding the export volume and TF Wilson, et al. (2003), Engman (2005), Wilson, et al. (2005), Iwanow and Kirkpatrickz (2007), Lee and Park (2007), Milner, et al. (2008), Djankove, et al. (2010), Freund and Pham (2010), Djankove, et al. (2014); all tend to find significant results. On the other hand, there is a very limited amount of research that deals with the effect of TF regarding the diversification and sectoral export performance.

Sadikov (2007) has found that the impact of TF is not equal for homogenous and differentiated goods. Using the number of signatures required for exports to the volume of trade, resulted that differentiated goods were more sensitive to change in TF than of homogenous. Dennis and Shepherd (2007) studied exports data of developing to EU countries, using 8-digit level for their work regarding the diversification and volume of export and found that a 1 per cent decrease in the cost of exporting merchandise would increase the export diversification by 0.3 per cent. Martinez-Zarzoso and Marquez-Ramos (2008) determined the effect of trade facilitation on sectoral export for 167 importers and 13 exporter countries, estimated results suggest that by lowering the number of days, cost and number of documents to exports has stronger impacts on the volume of differentiated products. Iwanow and Kirkpatrick (2008) explored Sub-Saharan Africa (SSA), found that the export performance of manufacturing has been increased in Africa due to improvement in trade facilitation. Lee and Kim (2012) analysed highly disaggregated data; sector wise plus income levels of the countries, and used a composite index for trade facilitation. The results suggest that the developing countries responding more in primary goods to trade facilitation. Persson (2012), if transaction costs proxied by number of days dropped by one per cent the number of exported differentiated products would increase by 0.6 per cent and homogenous by 0.3 per cent.

III. Econometric Methodology and Variables Definition

1. Augmented Gravity Model with Trade Facilitation

The following gravity model augmented with trade facilitation indicators is used for this research study.

$$EXP_{ijst} = \beta_0 \cdot Y_{it}^{\beta 1} \cdot Y_{jt}^{\beta 2} \cdot POP_{it}^{\beta 3} \cdot POP_{jt}^{\beta 4} \cdot D_{it}^{\beta 5} \cdot e^{(\beta_6 COM_COL_{ij} + \beta_6 COM_OFF_LANG_{ij} + \beta_8 DOCUMENT_EXP_u + \beta_{10} TIME_EXP_u + \beta_{11} COST_EXP_u + \vartheta_i + \vartheta_j + \xi_{ijt})}$$

where “*i*” is showing exporter, “*j*” is representing importer and “*t*” in the subscripts of the variables showing time period (years) here in our case. Subscript “*s*” to dependent variable in model is showing sectors that is; primary or secondary. Variable name their description and sources are given in the following table 3 from year 2006 to 2013.

TABLE 3
Variables Names, Description and their Sources

Variable	Description	Source
Dependent Variables		
EXP_{ijs} : Exports from <i>i</i> to <i>j</i> of Commodity in sector	Value of exports (US\$) for the given data set	Unctad
1. EXP_{ijps} : is total export in Primary sector	Value of exports (US\$) sector wise for the given data set	Unctad and WTO
2. EXP_{ijms} : is total export in manufacturing sector		
Independent Variables		
TIME_EXP _{<i>i</i>}	Total number of days	Doing Business
DOCUMENT_EXP _{<i>i</i>}	Total number of Documents	Doing Business
COST_EXP _{<i>i</i>}	Transport costs (US\$ per container)	Doing Business
Y _{<i>i</i>}	GDP _{<i>i</i>} of exporter(US\$)	GDP from WDI
Y _{<i>j</i>}	GDP _{<i>j</i>} of importer(US\$)	GDP from WDI
D _{<i>ij</i>}	Distance between exporter and importer	CEPII
COM_OFF_LANG _{<i>ij</i>}	Dummy will be 1 if language is common officially otherwise 0	CEPII
COM_COL _{<i>ij</i>}	Dummy for common colony	CEPII
POP _{<i>i</i>}	POP total in millions	POP from WDI
POP _{<i>j</i>}	POP total in millions	POP from WDI
ADJ _{<i>ij</i>}	Dummy will be 1 if border is common officially otherwise 0	CEPII
ϑ_i	Exporters dummy	Known
ϑ_j	Importer dummy	Known from the study

2. Trade Facilitation Variables

Trade facilitation being a core variable to our study, it would be adequate if we provide detailed description to its data collection. Doing Business is a source which collects data on procedural requirements for importing and exporting a standard container of merchandises. Each official procedure alongside the time and cost from the contract to the conveyance of the good is recorded for the two parties to export or import a standard container. The numbers of documents are also recorded to complete the required procedures. The procedure for exporting goods started from packing at the plant to their departure from port's exit, while importing procedures are recorded from the container arrival to the port, its entry into the cargo and reaching to the factory warehouse. Custom brokers, indigenous cargo forwarder, shipping lines and port authorities make available data on these cost, documents and time to complete the process. Several assumptions are applied to make the information analogous cross-wise over the countries. The fundamental assumptions refer to the types of goods for business and trade. The business must have 200 workers at least and must be situated in the most populace cities of the country. It must be private, means that not working inside the export processing zones or an industrial domain with extraordinary import or export benefits. Business must be owned by locals not foreigner and it should export more than 10 per cent of its sale.

The tradable product needed to be travelled in a dry cargo of 20-foot; fully loaded container not contain military stuffs and which is not hazardous. Moreover, it does not need any extraordinary condition for refrigeration, transport and are not required any unique environmental safety standards except recognized by international standards. The last but not least, the products must fall under the ensuring Standard International Trade Classification (SITC). The study takes into account the three different indicators of trade facilitation such as documents, time and cost per standard container, Martínez-Zarzoso and Ma´rquez-Ramos (2008) used the document variable considering its number to complete administrative procedures altogether for exporting and importing a standard container, Maria Persson (2012) used number of days. The cost measures exclude duties or exchange charges. Just official costs are recorded and it does not include tariff or trade taxes. Dennis and Shepherd (2007) and Maria Persson (2012) use the same variable, found that trade flows increase by lowering transport costs.

3. Econometric Methodology

Typically, panel data deals with the two major effects for instance fixed effect (FE) and random effect models (RE). FE model capture time specific and individual specific intercepts, whereas RE model deals with country and time specific intercepts as instrument of random trouble. Hausman test is employed to choose fixed effect or

random effect model. To perform econometric estimation of model we apply different estimation techniques to our panel data set. The majority of the methodology applying in traditional way likewise as estimation by Poisson using fixed effect to estimate the model. As the empirical literature postulates that that econometric model of gravity equation comprises numerous time invariant variables. For illustration some important variables in our model for example population, distance or trade barriers reveal a minute change within the data set for our concern. By applying simply fixed effect all these variables would be excluded in the regression. Further more there are always chances of zero export/trade and heteroscedasticity in trade gravity data set, such as in our case, we found that probability was greater than χ^2 (by `xtset3` command in STATA 2013) presenting heteroscedasticity.

Santos Silva and Tenreyro (2006) present a simple way of dealing with this problem. They show that under weak assumptions gravity model contains the correct set of explanatory variables, the Poisson pseudo-maximum likelihood estimator provides consistent estimates of the original nonlinear model. It is exactly equivalent to running a type of nonlinear least squares on the original equation. As Shepherd (2013) also claimed that Poisson estimator have a number of additional desirable properties for applied policy researchers using gravity models. First, it is consistent in the presence of fixed effects, which can be entered as dummy variables as in simple OLS. Second, the Poisson estimator naturally includes observations for which the observed trade value is zero. Such observations are dropped from the OLS model because the logarithm of zero is undefined. Third, interpretation of the coefficients from the Poisson model is straightforward, and follows exactly the same pattern as under OLS. Although the dependent variable for the Poisson regression is specified as exports in levels rather than in logarithms, the coefficients of any independent variables entered in logarithms can still be interpreted as simple elasticities.

IV. Empirical Results

1. *Trade Facilitation and Primary Exports*

This section investigates empirically the impact of trade facilitation on the manufacturing exports of SAARC region. Gravity model is estimated using OLS, FE (Fixed Effect) and Poisson FE. Three specifications are considered in relation to the trade facilitation measures. Whereas the first model specification includes number of documents, the second includes time, and the third incorporates cost indicator.

Table 4 represents the results obtained from gravity and augmented gravity with trade facilitation measures. Column 1 shows simple gravity model results, whereas column 2 shows trade facilitation (number of documents to export) results. Column 3 is about second specification (time to export; as number of days) and column 4 is for 3rd specification (cost to export).

TABLE 4
Estimation Results of Primary Exports

Independent Variable	(1)			(2)		
	OLS	FE	Poisson FE	OLS	FE	Poisson FE
lnY _{it}	2.486***	0.358	0.085	2.505***	-0.903	0.176
	-0.068	-0.266	-0.139	-0.068	-0.692	-0.222
lnY _{jt}	0.535***	0.596***	0.696***	0.548***	0.595***	0.696***
	-0.022	-0.022	-0.012	-0.022	-0.022	-0.012
LnPOP _i	1.083***	0.621	-1.939	1.076***	0.474	-4.07
	-0.021	-1.939	-8.646	-0.021	-4.261	-9.405
LnPOP _j	0.790***	0.832***	0.743***	0.797***	0.832***	0.742***
	-0.02	-0.02	-0.013	-0.02	-0.021	-0.013
LnD _{ijt}	-1.403***	-1.51***	-1.17***	-1.454***	-1.506***	-1.165***
	-0.059	-0.589	-0.064	-0.06	-0.059	-0.064
COM_COL _{ij}	0.703***	0.610***	1.087***	0.637***	0.607***	1.087***
	-0.096	-0.088	-0.173	-0.09	-0.088	-0.173
COM_OFFLANG _{ij}	0.366***	0.510***	0.340***	0.507***	0.514***	0.340***
	-0.117	-0.11	-0.125	-0.12	-0.119	-0.125
ADJ _{ij}	0.535	0.372**	-1.223***	0.269	0.373*	-1.22***
	-0.022	-0.2	-0.257	-0.205	-0.12	-0.257
Lndexp _{it}	-	-	-	-1.336***	-0.217	-3.257**
				-0.269	-1.249	-1.621
Lntexp _{it}	-	-	-	-	-	-
Lncexp _{it}	-	-	-	-	-	-
C	-9.210***	16.921	-	-6.40***	17.81	-
	-0.757	-23.231		-0.943	-23.8	
Time Dummy	None	None	None	None	None	None
Cross-sectional Dummy	None	None	None	None	None	None
Number of obs.	3593	3593	3678	3593	3593	3678
R ²	0.58	0.48	-	0.58	0.48	-
F-stat.	651.27	223.31	-	657.6	209.3	-
Prob>chi ²	0	0	0	0	0	0

(Continued)

The F-statistic is the small-sample counterpart of the Wald (Chi Squared) statistic and it is a measure of the overall significance of the estimated models and the values here in each of the specifications are considerably satisfactory with level of significance being 1 per cent in each case. This of course is indicative that all the exogenous variables are jointly explained significantly in case of SAARC'S primary exports over the study period.

TABLE 4 (Continue)
 Estimation Results of Primary Exports

Independent Variable	(3)			(4)		
	OLS	FE	Poisson FE	OLS	FE	Poisson FE
$\ln Y_{it}$	2.195***	-0.946	0.253***	2.25***	0.476	-0.374
	-0.152	-0.67	-0.063	-0.07	-0.309	-0.144
$\ln Y_{it}$	0.534***	0.595***	0.696***	0.573***	0.596***	0.696***
	-0.022	-0.022	-0.012	-0.022	-0.022	-0.012
$\ln POP_i$	1.017***	0.617	0.282	1.074***	7.108***	-4.255
	-0.037	-4.178	-5.142	-0.02	-2.075	-6.766
$\ln POP_i$	0.790***	0.832***	0.743***	0.819***	0.832***	0.743***
	-0.02	-0.02	-0.013	-0.02	-0.02	-0.013
$\ln D_{iit}$	-1.402***	-1.507***	-1.166***	-1.440***	-1.505***	-1.167***
	-0.059	-0.059	-0.063	-0.058	-59	-0.063
COM_COL_{ii}	0.702***	0.607***	1.086***	0.659***	0.611***	1.085***
	-0.089	-0.088	-0.173	-0.088	-0.088	-0.174
$COM_OFFLANG_{ii}$	0.357***	0.514***	0.341***	0.383***	0.509***	0.343*
	-0.117	-0.119	-0.126	-0.115	-0.119	-0.127
ADJ_{ii}	0.251	0.373*	-1.222***	0.366*	0.372**	-1.224***
	-0.207	-0.2	-0.257	-0.202	-0.2	-0.257
$\ln exp_{it}$	-	-	-	-	-0.701	-2.533**
					-1.147	-1.155
$\ln exp_{it}$	-0.644**	-0.054	-1.08***	-	-	-
	-0.3	-0.439	-0.211			
$\ln cexp_{it}$	-	-	-	1.268***	-0.061	-0.76***
				-0.108	-0.287	-0.185
C	-4.789**	16.82	-	0.886	21.894**	-
	-2.196	-23.25		-1.135	-9.332	
Time Dummy	None	None	None	None	None	None
Cross-sectional Dummy	None	None	None	None	None	None
Number of obs.	3593	3593	2678	3593	3593	3678
R ²	0.59	0.48	-	0.6	0.48	-
F-stat.	562.2	209.3	-	542.34	209.3	-
Prob>chi ²	.0000	.0000	.0000	.0000	.0000	.0000

Note: The dependent variable is the logged value of exports in primary sector at SITC 3-digit level for all the regressions except the Poisson. Country and time effect is used. Robust coefficients along with standard error in parenthesis are given. Asterisks indicates the significance level at 1% (***), 5% (**) and 10% (*).

2. Trade Facilitation and Manufacturing Exports of SAARC

Section IV(2) showing empirically the impact of trade facilitation on the manufacturing exports of the region. Gravity model is estimated using OLS, FE (Fixed Effect) and Poisson FE. Three specifications are considered in relation to the trade facilitation measures. Whereas the first model specification includes number of documents, the second includes time, and the third incorporates cost indicator.

TABLE 5
Estimation Results of Manufacturing Exports

Independent Variable	(1)			(2)		
	OLS	FE	Poisson FE	OLS	FE	Poisson FE
lnY _{it}	1.053***	0.185	0.131	1.051***	0.406	0.217
	-0.054	-0.537	-0.217	-0.054	-0.557	-0.229
lnY _{it}	0.849***	0.877***	0.837***	0.848***	0.877***	0.837***
	-0.018	-0.018	-0.054	-0.018	-0.018	-0.055
LnPOP _i	1.369***	-4.825	1.283	1.370***	-5.862*	-0.576
	-0.016	-3.378	-4.984	-0.017	-3.449	-5.173
LnPOP _j	0.839***	0.856***	0.718***	0.838***	0.856***	0.719***
	-0.016	-0.016	-0.022	-0.016	-0.016	-0.022
LnD _{ijt}	-0.57***	-0.533***	-0.515**	-0.564***	-0.532***	-0.515***
	-0.047	-0.047	-0.178	-0.048	-0.047	-0.178
COM_COL _{ij}	0.467***	0.492***	1.053***	0.474***	0.494***	1.053***
	-0.017	-0.071	-0.131	-0.072	-0.071	-0.131
COM_OFFLANG _{ij}	0.246**	0.12	0.221	0.229**	0.117	0.22
	-0.093	-0.097	-0.172	-0.096	-0.097	-0.173
ADJ _{ij}	0.855***	0.970***	-0.517	0.853***	0.969***	-0.515
	-0.165	-0.163	-0.427	-0.165	-0.163	-0.427
Lndexp _{it}	-	-	-	0.155	-1.51	-2.578**
				-0.212	-1.014	-0.804
Lntexp _{it}	-	-	-	-	-	-
Lncexp _{it}	-	-	-	-	-	-
C	-9.51***	25.57		9.838***	31.94*	-
	-0.6	-18.81		-0.75	-19.29	
Time Dummy	None	None	None	None	None	None
Cross-sectional Dummy	None	None	None	None	None	None
Number of obs.	3609	3609	3676	3609	3609	3676
R ²	0.75	0.58	-	0.75	0.584	-
Prob>chi ²	0	0	0	0	0	0

Note: The dependent variable is the logged value of exports in primary sector at SITC 3-digit level for all the regressions except the Poisson. Country and time effect is used. Robust coefficients along with standard error in parenthesis are given. Asterisks indicates the significance level at 1% (***), 5% (**) and 10% (*).

Table 5 shows estimation results obtained from gravity and augmented gravity with trade facilitation variable (Documents to exports). Column 1 presents simple gravity model results and column 2 depicts augmented results of first specification. Column 2 is showing trade facilitation (number of documents to export) results. Column 3 is about second specification (time to export) and column 4 is for 3rd specification (cost to export).

TABLE 5 (Continue)
Estimation Results of Manufacturing Exports

Independent Variable	(3)			(4)		
	OLS	FE	Poisson FE	OLS	FE	Poisson FE
lnY _{it}	0.863***	0.243	0.238	0.912***	0.046*	-0.223
	-0.121	-0.542	-0.176	-0.056	-0.567	-0.212
lnY _{it}	0.849***	0.877***	0.838***	0.870***	0.877***	0.837***
	-0.018	-0.018	-0.055	-0.018	-0.018	-0.055
LnPOP _i	1.326***	-4.799	1.576	1.362***	-5.225	0.842
	-0.03	-3.379	-3.676	-0.016	-3.418	-3.072
LnPOP _j	0.839***	0.856***	0.718***	0.856***	0.856***	0.718***
	-0.016	-0.016	-0.022	-0.016	-0.016	-0.022
LnD _{ijt}	-0.569***	-0.533***	-0.515**	-0.589***	-0.533***	-0.516**
	-0.046	-0.047	-0.178	-0.047	-0.047	-0.177
COM_COL _{ij}	0.466***	0.492***	1.052***	0.442***	0.491***	1.051***
	-0.071	-0.071	-0.131	-0.071	-0.071	-0.132
COM_OFFLANG _{ij}	0.24	0.12	0.221	0.254**	0.121	0.224
	-0.093	-0.097	-0.172	-0.092	-0.097	-0.17
ADJ _{ij}	0.859***	0.970***	-0.515	0.924***	0.969***	-0.517
	-0.165	-0.163	-0.428	-0.164	-0.163	-0.428
Lndexp _{it}	-	-	-	-	-	-
Lntexp _{it}	-0.420*	-0.305	-0.57***	-	-	-
	-0.24	-0.354	-0.144			
Lncexp _{it}	-	-	-	-0.725	0.214	-0.696
				-0.087	-0.277	-0.137
C	-0.42***	26.1	-	-3.70***	27	-
	-0.24	-18.83		-0.916	-18.906	
Time Dummy	None	None	None	None	None	None
Cross-sectional Dummy	None	None	None	None	None	None
Number of obs.	3609	3609	3676	3609	3609	3676
R ²	0.75	0.58	-	0.75	0.58	-
Prob>chi ²	0	0	0	0	0	0

Note: The dependent variable is the logged value of exports in primary sector at SITC 3-digit level for all the regressions except the Poisson. Country and time effect is used. Robust coefficients along with standard error in parenthesis are given. Asterisks indicates the significance level at 1% (***), 5% (**) and 10% (*).

The coefficient can be interpreted as elasticity here, the table 5 results showing significance at 5 per cent of Poisson FE with the negative sign, so improving trade facilitation levels by 1 per cent will increase manufacturing exports by approximately 2.58 per cent. Column 3 in table 5 signifying that, the OLS and Poisson results are according to the theory with negative sign, but the coefficient of Poisson is higher than OLS coefficient depicting that a 1 per cent decrease in the number of days to

export will increase manufacturing exports by 0.574 per cent. These results are broadly consistent with previous findings that lower trade costs are associated with greater export expansion. Inma Martínez-Zarzoso and Laura M´arquez-Ramos (2008) found that a one-unit decrease in number of documents causes 2.6 per cent increase in export of that country.

All the results estimated are broadly and satisfactorily consistent with theoretical expectations. The coefficient can be interpreted as elasticity, reported results in table 4 reveal significance at 5 per cent for both the OLS and Poisson FE with the negative sign, so the findings suggest that improvement in trade facilitation levels by 1 per cent increases primary exports by approximately 3.26 per cent to number of document indicator, 1.08 per cent to the number of days and .06 per cent to cost per standard container. These findings are generally consistent with previous findings that lower trade costs are associated with greater export expansion. Inma Martínez-Zarzoso and Laura M´arquez-Ramos (2008) found that a one-unit decrease in number of documents causes 2.6 per cent increase in export of that country. Persson (2008) showed that decreasing border delays by 1 per cent would increase the number of exported products by about 0.61 per cent. Chahir Zaki (2007) also found that, it is quite clear that the impact of trade facilitation is greater for highly value added products, perishable, seasonal and intermediate goods. Dennis and Shepherd (2011), found that export costs negatively affect (by 0.3 per cent) developing country export diversification. Thus, it covers a quite important range of products. That is why it will generate high gains through quicker (less time and documents) and more computerized (more technology) trade procedures.

V. Conclusion

SAARC is included among those regions, which are highly populated and more than 40 per cent of the world's poor live in this region. It is well recognized in theoretical and empirical literature that export is one of most important channel of growth. Therefore, considering the significance of export in growth process, this paper has tried to investigate the impact of one of the important factor of export performance particularly for developing countries which emerge in recent decade and that are trade facilitation.

The aim of this paper is that whether inefficiencies in trade facilitation affect the export performance or not. It is investigated that SAARC countries could upsurge their export by improving trade facilitation. Two particular questions are answered: First, does trade facilitation positively enhancing sectoral export performance in SAARC countries? Second, does primary exports responding more/less to trade facilitation compared to manufacturing sector.

The effect of trade facilitation on export flows are evaluated using disaggregated level for both the primary and manufacturing data. The gravity model aug-

mented with trade facilitation variables taking three different estimation techniques namely OLS, Fixed Effect and Poisson Fixed Effect to evaluate the models. Three proxies of trade facilitation indicators; number of documents, number of day and cost to export per standard container are used for quantitative analysis. The empirical results suggest that as trade facilitation improving, it is positively enhancing exports performance for the region. Two types of results for primary and manufacturing sector are investigated.

Overall results confirm that trade facilitation is very important policy device for boosting up the sectoral export performance for SAARC region in term of documents, time and cost to export. However, according to broader definition of trade facilitation, improving port facilities and custom authorities also fall under the same frame, which is likely having substantial impacts to the volume and diversification of exports. The study suggests other areas to be prioritized so that the export performance of the member countries to be improved. These suggestions are made to stabilize the SAARC countries' currency which is partly dealing with the execution programmes targeting improved condition of macroeconomic forecasting. But still resilient efforts in this area are required. This research study is an attempt to contribute in literature on trade facilitation and sectoral export performance nexus in SAARC countries, but still there is research area or question that needs to be answered. One possible research question is that whether this relationship will hold for services sector exports. There is a need to explore the impact of trade facilitation on service sector exports for future research.

*Applied Economics Research Centre,
University of Karachi, Pakistan*

Bibliography

- Arvis and Shepherd, 2011, The poisson quasi-maximum likelihood estimator: A solution to the problem in gravity models, MPRA paper 34334, University Library of Munich, Germany.
- Bacchetta, M., C. Beverelli, O. Cadot, M. Fugazza, J.M. Grether, M. Helble, A. Nicita, and R. Piermartini, 2012, A practical guide to trade policy analysis, World Trade Organization.
- Baldwin, R., and D. Taglioni, 2006, Gravity for dummies and dummies for gravity equations, National Bureau of Economic Research.
- Bobkova, B., 2012, Gravity model estimation using panel data—is logarithmic transformation advisable, Charles University in Prague.
- Bourdet, Y., and M. Persson, 2011, Reaping the benefits of deeper euro-med integration through trade facilitation.
- Burger, M., F. Van Oort and G. J. Linders, 2009, On the specification of the gravity model of trade: Zeros, excess zeros and zero-inflated estimation, *Spatial Economic Analysis*, 4(2): 167-190.
- Céline Carrere, 2003, Revisiting the effect of regional trading agreements on trade flows with proper specification of the gravity model, CERDI, Université d’Auvergne.
- Chaney, T., 2008, Distorted gravity: The intensive and extensive margins of international trade, *American Economic Review*, 98(4): 1707-21.
- Deardorff, A., 1998, Determinants of bilateral trade: Does gravity work in a neo-classical world, in: *The regionalization of the world economy*, University of Chicago Press, ; 7-32.
- Dennis, A., and B. Shepherd, 2011, Trade facilitation and export diversification, *The World Economy*, 34(1): 101-122.
- Dennis, A., and B. Shepherd, 2007, Trade costs, barriers to entry, and export diversification in developing countries, World Bank Policy Research working paper 4368, Washington, DC: World Bank.
- Dhungel, D., 2004, South Asian Association for regional co-operation (SAARC): Prospects for development, *The Pakistan Development Review*, 43(4): 933-941.
- Dicken, P., 2011, *Global shift: Mapping the changing contours of the world economy*, London: Sage Publications Limited.
- Djankov, S., C. Freund, and C.S. Pham, 2010, Trading on time, *Review of Economics and Statistics*, 92(1): 166–173.
- Eaton, J., and S. Kortum, 2002, Technology, geography, and trade, *Econometrica*, 70(5): 1741-1779.
- Eichengreen, B., and D.A. Irwin, 1996, The role of history in bilateral trade flows, in: *The regionalization of the world economy* (33-62), University of Chicago Press.
- Engman, M., 2005, The economic impact of trade facilitation, OECD trade policy working paper 21, Paris: Organisation for Economic Co-operation and Development.

- Evenett, S.J., and W. Keller, 2002, On theories explaining the success of the gravity equation, *Journal of Political Economy* 110(2): 281-316.
- Feenstra, R.C., and H. Ma, 2014, Trade facilitation and the extensive margin of exports, *Japanese Economic Review*, 65(2): 158-177.
- Flowerdew, R., and M. Aitkin, 1982, A method of fitting the gravity model based on the poisson distribution, *Journal of regional science*, 22(2): 191-202.
- H. Mikael Sandberg, 2004, The impact of historical and regional linkages on free trade in the americas: A gravity model analysis across sectors, American Agricultural Economics Association annual meeting, Denver: Colorado.
- Head, K., and T. Mayer, 2004, The empirics of agglomeration and trade, *Handbook of regional and urban economics*, 4: 2609-2669.
- Head, Keith, 2003, Gravity for beginners, mimeography, University of British Columbia.
- Helpman, E., M. Melitz and Y. Rubinstein, 2004, Trading partners and trading volumes, Document interne, Harvard University.
- Inmaculada, Martínez-Zarzoso and D. Felicitas Nowak-Lehmann, 2003, Augmented gravity model: An empirical application to Mercosur-European Union trade flows, *Journal of Applied Economics*, 6: 291-316.
- Iwanow, T., and C. Kirkpatrick, 2008, Trade facilitation and manufactured exports: Is Africa different, *World Development*, 37(6): 1039-1050.
- Jain, R., and J.B. Singh, 2009, Trade pattern in SAARC countries: Emerging trends and issues, RBI occasional papers, 30(3).
- Lanka, S., 2006, Mahinda Chinthana: Vision for a new Sri Lanka: A ten-year horizon development framework.
- Lee, H.Y., and C.S. Kim, 2012, The impact of trade facilitation on the extensive and intensive margins of trade: An application for developing countries, *Journal of East Asian Economic Integration*, 16(1): 67-96.
- Lee, H., and I. Park, 2007, In search of optimised regional trade agreements and applications to East Asia, *World Economy* 30(5): 783-806.
- Lesser, C. and E. Moisé-Leeman, 2009, Informal cross-border trade and trade facilitation reform in sub-Saharan Africa, OECD trade policy working paper 86, Paris: Organisation for Economic Co-operation and Development.
- Martínez-Zarzo and Márquez-Ramos, 2008, The effect of trade facilitation on sectoral trade, *B.E. Journal of Economic Analysis and Policy*, 8(1): 42.
- Melitz, M.J., 2003, The impact of trade on intra-industry reallocations and aggregate industry productivity, *Econometrica* 71(6): 1695-725.
- Milner, C., O. Morrissey and E. Zgovu, 2008, Trade facilitation in developing countries, Credit research paper 08/05, Nottingham: Centre for Research in Economic Development and International Trade.
- Newton, Isaac, 1687, *Philosophiæ naturalis principia mathematica*, retrieved 16 May 2012 from University of Cambridge, Cambridge Digital Library: <http://cudl.lib.cam.ac.uk/view/PR-ADV-B-00039-00001/9>.

- Nguyễn Thanh Thủy and Arcand Jean-Louis, 2009, Gravity equation for different product groups: A study at product level, Hanoi: Development and Policy Research Center DEPOCEN.
- OECD, 2009, Overcoming border bottlenecks: The costs and benefits of trade facilitation, OECD Trade Policy Studies, Paris.
- OECD, 2003, Quantitative assessment of the benefits of trade facilitation, (TD/TC/WP(2003)31/ FINAL), OECD: Paris.
- OECD, 2005, The economic impact of trade facilitation, Paris: OECD trade policy working paper.
- OECD, 2011, The impact of trade liberalisation on jobs and growth, OECD trade policy papers 107.
- OECD, 2011, The impact of trade liberalisation on jobs and growth, OECD trade policy papers 107.
- Olayiwola, W.K. and O.A. Ola-Drauid, 2013, Economic integration, trade facilitation and agricultural exports performance in ECOWAS member states, In presentation at the eighth African economic conference on 'Regional Integration in Africa', Johannesburg, South Africa.
- Persson, M., 2012, Trade facilitation and the extensive margin, *The Journal of International Trade and Economic Development: An International and Comparative Review*, DOI:10.1080.
- Planning Commission, 2010, Outline perspective plan of Bangladesh 2010-2021, Making vision 2021, A Reality GE Division, Dhaka.
- Pursell, G., A. Khan and S. Gulzar, 2011, Pakistan's trade policies: Future directions, International Growth Centre.
- Sadikov, A., 2007, Border and behind-the-border trade barriers and country exports, IMF working paper 07/292, Washington, DC: World Bank.
- Shepherd, B., 2013, The gravity model of international trade: A user guide, ART-NeT Books and Research Reports.
- Silva, J.S., and S. Tenreyro, 2006, The log of gravity, *The Review of Economics and Statistics*, 88(4): 641-658.
- Starck, Sarah, 2012, The theoretical foundation of gravity modeling: What are the developments that have brought gravity modeling into mainstream economics, Department of Economics Copenhagen Business School Porcelænshaven 16A, 1. fl., 1.78 2000 Frederiksberg C. Denmark.
- SWEPRO, 2003, Trade facilitation from a developing country perspective, Stockholm.
- Tinbergen, J., 1963, Shaping the world economy, *The International Executive* 5(1): 27-30.
- UNECA, AU, AfDB, 2004, Assessing regional integration in Africa, I. Addis Ababa: United Nations Economic Commission for Africa.
- United Nations Economic Commission for Africa, A.U., 2010, Assessing regional integration in Africa IV: Enhancing Intra-African Trade.

- Wilson, J.S., C.L. Mann, and T. Otsuki, 2003, Trade facilitation and economic development: A new approach to quantifying the impact, *World Bank Economic Review* 17(3): 367–89.
- Wilson, J.S., C.L. Mann and T. Otsuki, 2005, Assessing the benefits of trade facilitation: A global perspective, *World Economy*, 28(6): 841–71.
- World Bank, 2004, Trade policies in South Asia: An overview, Report 29949, Volume I: Operational Summary.
- World Bank, 2014, World Development Indicators, <http://data.worldbank.org/indicator>, (accessed 15.12.2014).
- World Trade Organisation, 2006, Trade Policy Review, September 2006.
- World Trade Organisation, 2010, Trade Policy Review, September 2010.
- World Trade Organisation, 2012, Trade Policy Review, September 2012.
- World Trade Organisation, 2013, March 20, Retrieved April 15, 2013, https://www.wto.org/english/news_e/news13_e/lldc_20mar13_e.htm

APPENDIX

TABLE A-1
Merchandise Exports Trend in SAARC Countries
(US\$ millions)

Year/Country	1950	1960	1970	1990	2000	2010	2014
Afghanistan	53	50	86	235	137	388	535
	<i>-0.09</i>	<i>-0.04</i>	<i>-0.03</i>	<i>-0.01</i>	<i>-0.001</i>	<i>-0.003</i>	<i>-0.003</i>
Bangladesh	274	325	519	1671	6389	19194	30405
	<i>-0.44</i>	<i>-0.25</i>	<i>-0.16</i>	<i>-0.05</i>	<i>-0.1</i>	<i>-0.125</i>	<i>-0.161</i>
Bhutan	–	–	–	70	103	641	555
				<i>-0.002</i>	<i>-0.001</i>	<i>-0.004</i>	<i>-0.003</i>
India	1145	1332	2026	17969	42379	226351	317380
	<i>-1.85</i>	<i>-1.02</i>	<i>-0.64</i>	<i>-0.52</i>	<i>-0.66</i>	<i>-1.479</i>	<i>-1.676</i>
Maldives	2	2	4	78	109	198	326
	<i>-0.003</i>	<i>-0.001</i>	<i>-0.001</i>	<i>-0.002</i>	<i>-0.002</i>	<i>-0.001</i>	<i>-0.002</i>
Nepal	1	17	42	175	804	856	975
	<i>-0.002</i>	<i>-0.01</i>	<i>-0.01</i>	<i>-0.005</i>	<i>-0.01</i>	<i>-0.006</i>	<i>-0.005</i>
Pakistan	489	394	397	5589	9028	21410	24714
	<i>-0.79</i>	<i>-0.31</i>	<i>-0.13</i>	<i>-0.16</i>	<i>-0.14</i>	<i>-0.14</i>	<i>-0.131</i>
Sri-Lanka	328	385	342	1912	5430	8602	11200
	<i>-0.53</i>	<i>-0.23</i>	<i>-0.11</i>	<i>-0.05</i>	<i>-0.08</i>	<i>-0.056</i>	<i>-0.059</i>
SAARC Region	2292	2504	3416	27700	64379	277640	386089
	<i>-3.71</i>	<i>-2</i>	<i>-0.94</i>	<i>-0.8</i>	<i>-0.99</i>	<i>-1.814</i>	<i>-2.039</i>
Developing Economies	21051	31714	60334	840994	2052172	6438434	8490932
	<i>-34.04</i>	<i>-24.4</i>	<i>-19.03</i>	<i>-24.17</i>	<i>-31.84</i>	<i>-42.075</i>	<i>-44.839</i>
Developed Economies	38830	97786	242202	2519069	4238022	8254521	9682025
	<i>-62.8</i>	<i>-71.98</i>	<i>-76.4</i>	<i>-72.42</i>	<i>-65.76</i>	<i>-53.944</i>	<i>-51.129</i>

The small italic values showing Region and Country share to World Merchandise Export.