

Are Existing Trading Blocks Building or Stumbling Blocks?

1. Introduction

In today's multilateral trading system and globalization era, the number of Regional Trading Agreements (RTAs) has been steadily increasing and perhaps an irreversible feature. In one way or another, almost every country in the world forms part of an RTA. The total number of RTAs notified to the WTO currently amounts to 165ⁱ and there are many more in the process of negotiation. In the face of this phenomenon, countries not member of any RTA should fear being marginalized in trade.

Regionalism (or PTA's) can be classified into three different waves- first, second and third. The first wave of PTA's was more geared towards goods trade liberalization given that tariff rates on imports were very high. In 1958, the formation of the European Economic Community (EEC) (now European Union) marked the first wave of PTA's. Developing countries, stimulated by the EEC initiative, attempted to create a number of PTA's. However, none of them succeeded. The rationale on which their ideas were based was different from the EEC one. Developing countries saw PTA's as a way of reducing cost of import-substituting industrialization through opening their markets to other developing countries.

The second wave of regionalism was marked by the conversion of United States to Article XXIV of GATT. The U.S.A. signed FTA's with Israel, Canada (CUSFTA) and Mexico (through NAFTA). Although emphasis was still on liberalization of merchandise trade, the second wave of regionalism also saw the inclusion of rules of origin (limiting trade creation and encouraging trade diversion), non-tariff barriers and other non-traditional areas (e.g. competition policy). It is under this wave of regionalism that focus

was laid on whether preferential trade arrangements were “building blocks” or “stumbling blocks”. Bhagwati and Panagaria (1999) argues that PTAs that increases multilateral trade either by adding new members over time or by prompting accelerated multilateral trade negotiations are building blocks; else, they are stumbling blocks.

The third wave of regionalism started in the 1990s when a number of PTA s started mushrooming all over the world. The WTO notified 165 RTAs currently and there are many more in the process of negotiation. Many PTAs take the form of bilateral agreements between countries and many countries are now members of various PTAs. A number of “spaghetti bowl” and “hub and spoke”, therefore, exist today.

Analytically, preferential trade arrangements give rise to two static effects on trade flows, trade creation and trade diversion, two concepts put forward by Viner (1950). Trade creation is the replacement of domestic expensive production by cheaper imports from the preferred partner and trade diversion takes place when a country switches its source of imports from more efficient producers who are excluded from the preference, to a less efficient producer who benefits from the preference.

However, the effects of trade preference schemes are very hard to identify and measure empirically as it is very difficult to identify a particular development actually caused by trade preferences that would not otherwise have occurred. This is the main reason for the relatively few empirical studies made in this field.

Empirical techniques that have been used to evaluate the effects of PTAs are the ex-ante and ex-post approaches. Under the ex-ante approaches the **partial equilibrium** approach and the **computable general equilibrium** (CGE) approach have been extensively used in analysis. Such approaches are base on several assumptions and inferences are drawn on

welfare following the formation of PTAs. Under ex-post approaches the simplest approach examines the **evolution of market shares** before and after the formation of the PTA. However, these cannot be statistically tested. One common way by which economists have empirically tested the benefits of preferential trade arrangements is to compare the rate of **growth of exports** before and after the formation of the PTA. However, this may not be a much reliable indicator as, for exact estimates, a counterfactual analysis is required. It is not clear how exports would have behaved in the absence of the PTA. Among the statistical approaches the **gravity model** whereby a binary preference variable together with other variables such as GDP and distance, are regressed on bilateral trade flows. Recent studies have made use of refinements and extension of the traditional gravity models and the traditional gravity model is extended. More sophisticated studies test the ability of preference margins and factor endowments to explain trade. Some of the ex-post models involve the construction of the customs union's **anti-mode**, i.e. the expected normal flows of trade under the non-integration hypothesis.

Since the purpose of this paper is to study whether the existing PTAs are building blocks or stumbling blocks, the empirical technique used is the ex-post gravity approach.

2. THE GRAVITY MODEL

Tinbergen (1962) and Poyhonen (1963), who were independently analysing trade flows between European countries, were the pioneers in using gravity models in economics. In its most basic form the gravity model states that trade (either export or sum of import and

export) is a function of importing countries and exporting countries GDP and distance between the countries. In a log-linear form it is written as follows:

$$\ln(X_{ij}) = a + \beta_1 \ln(GDP_i) + \beta_2 \ln(GDP_j) + \beta_3 \ln(D_{ij})$$

In the recent past, the basic gravity model has been augmented to include a number of other variables (like population and language similarity) in different forms as explanatory variables of trade. However, there has also been a large debate on variables used in the gravity models. Some researchers, including Rahman (2003) and Sharma and Chua (2000) use trade value (i.e. sum of imports and exports) as dependant variable while other researchers, including Adams, Dee, Gali and McGuire (2003) use only exports value. In this study, exports is used as the dependant variable, rather than total bilateral trade because it permits to identify export and import diversion separately. On the explanatory variables side, GDP, GNP, GDP per capita, GNP per capita, sum of GDP and products of GDP have all been used to represent incomeⁱⁱ. In this study GDP of the importing and exporting countries are used.

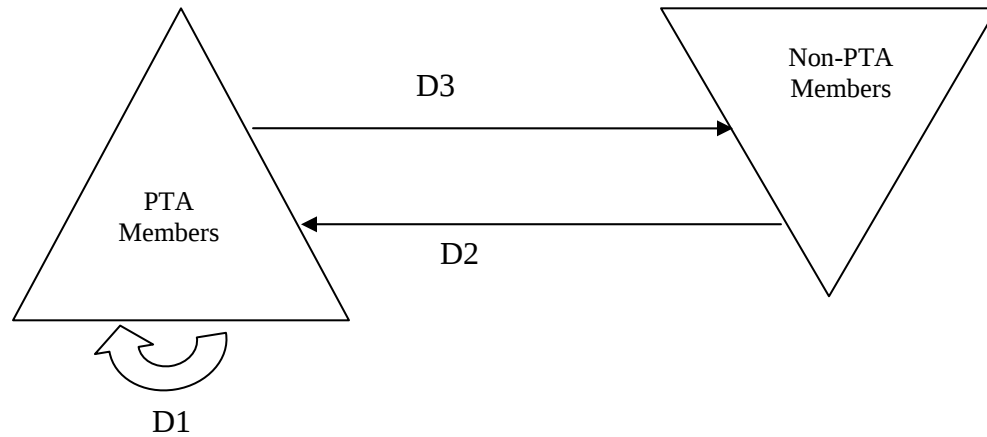
Basically studies using gravity models argue that trade are inversely related to size variables (e.g. population size). The argument on which this hypothesis is based is that the larger a country's population size, the more that country's productive capacity and the more self sufficient it will be.

PTA-specific dummies to capture the trade creation and trade diversion of PTAs have been widely used in literature. However, the number of dummies for each PTA differs among various studies, and thereby the explanation of the estimated coefficients for these

dummies differs. Some studies use one dummy for each PTA to capture the intra trade-bloc effect of a PTA (e.g. Aitken (1973)); some studies used two dummy variables for each PTA to separately capture the effects of intra-bloc and extra-bloc trade (e.g. Frankel (1997)); some studies, added three dummy variables for each PTA to not only, separately capture the effects of intra-bloc and extra-bloc trade, but also to distinguish between extra-bloc effects on imports and extra-bloc effects on exports (e.g. Soloaga and Winters (2001)).

Following Soloaga and Winters (2001), this study uses three dummies for each PTA. Figure 1 below gives an overview of these dummy variables. D1 captures the effects of the PTA's intra-bloc trade. It takes a value of one if both countries belong to the same PTA. A positive coefficient on this dummy variable indicates that the formation of a PTA enhances intra-bloc trade. D2 captures the effects of the PTA on members' imports from non-members. It takes a value of one if only the importing country is a member of the PTA. A negative coefficient on this dummy variable indicates import diversion. D3 captures the effects of the PTA on members' exports to non-members. It takes a value of one if only the exporting country is a member of the PTA. A negative coefficient on this dummy variable indicates export diversion.

Figure 1: use of PTA-specific dummy variables- the example of COMESA



A PTA can be categorized as a building bloc or stumbling bloc to free trade depending on the ‘net trade effects’. To go with Frankel (1997), the sum of the significant intra-bloc and extra-bloc effects obtained from a gravity model can be used to infer whether the bloc is a building bloc or stumbling bloc to free trade. A positive value would indicate a building bloc, that is, the bloc liberalized trade more internally than have diverted trade from the rest of the world.

Bergstrand (1988) was the first researcher to explicitly include price variables in his analysis. Based on the assumption of infinite elasticity of substitution in production and consumption of traded goods, the conventional gravity model does not consider price as a variable that influences trade flows between countries. In this study, following Bergstrand (1988), we use bilateral exchange rate as a proxy of price variable.

3.The Model

The corresponding reduced form of an augmented gravity model used is as follows:

$$\begin{aligned} \ln X_{ijt}^{iii} = & a + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln POP_{it} + \\ & \beta_4 \ln POP_{jt} + \beta_5 \ln RER_{ijt} + \beta_6 \ln DIST_{ij} + \beta_7 BORD_{ij} + \\ & \beta_8 LANG_{ij} + \sum_{ij} PTA_{ij} + \sum_j PTA_{i-j} + \sum_i PTA_{j-i} + \varepsilon_{ijt}. \end{aligned}$$

Where

$\ln$ is natural logarithmic transformation

X_{ijt} is the value of exports from country i to country j in year t. we use exports as the dependant variable, rather than total bilateral trade because it permits to identify export and import diversion separately.

GDP_{it} is GDP of the exporting country in year t

GDP_{jt} is GDP of the importing country in year t

POP_{it} is population size of the exporting country in year t

POP_{jt} is population size of the importing country in year t

RER_{ijt} is the bilateral exchange rate between country i and country j in year t.

$DIST_{ij}$ is the distance between the capital cities of country i and country j

$BORD_{ij}$ is a dummy that takes the value of 1 if country i and country j share a common border; 0 otherwise.

$LANG_{ij}$ is a dummy that takes a value of 1 if country i and country j have the same first language; 0 otherwise.

PTA_{ij} is a dummy variable taking the value of 1 if both countries are participants of a specific PTA in the sample; 0 otherwise. It also has a time dimension.

PTA_{i-j} is a dummy variable taking the value of 1 if the importing country is a participant of a specific PTA in the sample; 0 otherwise. It also has a time dimension.

PTA_{j-i} is a dummy variable taking the value of 1 if the exporting country is a participant of a specific PTA in the sample; 0 otherwise. It also has a time dimension.

4. DATA

In this study, we use a panel data analysis to estimate export flows from 147 exporting countries for a period of 21 years (1980-2001). GDP and population data obtained from World Development Indicators (WDI) from World Bank. Bilateral exports data and exchange rate data obtained from IMF Direction of Trade Statistics (DOTS) and IFS respectively. Distance, common border and language data obtained from John Haven's international trade data website^{iv}. For some countries some data were missing for some specific years. To avoid the problem of missing data, these countries have been left out of the analysis for those years. The equation is estimated using a Tobit model.

5. RESULTS

The estimates are reported in tables 1 and 2 below.

The size of economies, GDP and population size for both importing and exporting countries, act as a proxy measure for the level of demand in the importing country and level of supply in the exporting country. The higher the output (GDP) levels in the exporting and importing countries, the higher the export potentials for the countries. As expected, exports of country i varies positively with the size of GDP of both importing and exporting countries.

As expected, trade is negatively related to the level of population for both importing and exporting countries indicating that large countries tend to be more self-sufficient. A larger population size in the exporting country would mean that much of the goods produced are consumed at home and a lower volume is exported. A larger population size in the importing country would mean that the country has a larger labour force and therefore capacity to produce more and import less.

Trade is negatively related to distance for two reasons namely, transportation costs and transportation time. Transportation costs are lower, the closer the distance between two trading partners. Also, the lesser time involved in delivering the goods and concerns about possibilities for goods to, the closer the trading partners. As expected the coefficient of the distance variable negative and significant.

As expected, bilateral trade is positively related to countries sharing a common border and language familiarity.

The only variable having an unexpected sign is the real effective exchange rate.

Table 1 Gravity model of trade – Econometric results from full sample.

Dependant variable: Ln Exports; time period 1980-2001; Tobit maximum likelihood estimates.

Variables	Coef.	P>t
Ln GDP exporting country	.9470943	0.000
Ln GDP importing country	.7708457	0.000
Ln population size of exporting country	-.1063789	0.000
Ln population size of importing country	-.0109229	0.001
Ln bilateral real exchange rate	-.0181917	0.000
Ln distance	-.9502746	0.000
Border	.5702495	0.000
Linguistic similarity	.5081119	0.000
_cons	-29.61167	0.000
LRχ^2 (chi2)	133162.20	
Pseudo R-square	0.2164	
Log likelihood	-241138.43	
_se	1.705662	

Source: Authors calculation.

As discussed above, a PTA can be categorized as a building block or a stumbling block depending on the net trade effects of the particular PTA. Based on our estimates of the

coefficients of the dummy variables for each PTA, table 3 shows whether a particular PTA is a building bloc or stumbling bloc.

Table 2: PTA building or stumbling bloc.

PTAs	Extra-block effect on exports	Extra-block effect on imports	Intra-block effect	SB or BB
ANDEAN	-.38	-.55	1.37	BB
APEC	.57	.102	1.14	BB
CACM	-.20	-.27	1.87	BB
CER	-.70	.32	-1.54	SB
COMESA	-.36	-.46	1.19	BB
EFTA	.005*	-.31	.83	BB
EU	.31	.22	-.17	BB
MERCOSUR	-.17	-.61	1.37	BB
NAFTA	-.98	-.37	.005*	SB
SADC	.21	-.24	1.42	BB
SPARTECA	.41	-.31	2.17	BB

Source: Authors calculation

* Not significant at 1% level.

Building blocks are blocks that liberalized trade more internally than have diverted trade from the rest of the world. From the results obtained, we see that out of the eleven blocks studied, two of them are stumbling blocks and the remaining nine are building blocks.

We compare our estimates with some of the past estimates in table 3 below.

Table 3: Comparing Estimates.

PTAs	Own estimates	Krueger (1999a)	Clark & Tavares (2000)	Adams, Dec, Gali & McGuire (2003)
ANDEAN	BB	--	BB	BB
APEC	BB	--	--	--
CACM	BB	--	--	--
CER	SB	--	--	SB
COMESA	BB	--	--	--
EFTA	BB	--	BB	SB
EU	BB	--	BB	
MERCOSUR	BB	SB	BB	SB
NAFTA	SB	SB	--	SB
SADC	BB	--	--	--
SPARTECA	BB	--	--	BB

An important point to note here is that we did not find any study in existing literature which took into account African trading blocks. Thus, we believe that our study is the first of its sort to estimate PTAs of all continents together. The two African trading blocks taken into consideration for analysis are the SADC and COMESA and both of these blocks seems to be building blocks.

Our estimates comes to reinforce previous studies stating that NAFTA and CER are indeed stumbling blocks and ANDEAN, EU and SPARTECA are building blocks. As far as MERCOSUR and EFTA is concerned, some past studies show that they are building blocks while some other past studies show that they are stumbling blocks. Our estimates show that they are both building blocks.

6. CONCLUSION

In this study we estimated whether existing PTAs are building blocks or stumbling blocks. Our study is different from past studies on 2 aspects: first, it takes into account more countries and more years and most recent data; second, it includes two African PTAs. So far we have not come across any such studies which include African PTAs. Our estimates show that both these African PTAs- SADC and COMESA- are building blocks. Our estimates also reinforce some past studies in their conclusions on whether some PTAs are building or stumbling blocks. We also report the coefficients on the observable effects determining bilateral trade. Except real effective exchange rate, all the other variables are as expected and highly significant.

7. References

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ⁱ WTO website-http://www.wto.org/english/tratop_e/region_e/regfac_e.htm

ⁱⁱ For a review on the explanatory variables included in past studies refer to Adams, Dee, Gali and McGuire (2003)

ⁱⁱⁱ Exports for some countries to partners in some or all years may be equal to zero. Very small numbers can be used in the place of zero without loss of generality. Eichengreen and Irwin (1995), used $\ln(X_{ijt} + 1)$ as the dependant variable. Soloaga and Winters (2001) used a tobit specification.

^{iv} <http://www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeData.html>