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**ASSESSING REGIONAL TRADE ARRANGEMENTS:
ARE SOUTH-SOUTH RTAs MORE TRADE DIVERTING?**

by

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ABSTRACT

It has generally been argued that regional trade agreements (RTAs) among developing countries may induce potential adverse effects on trade patterns among RTA members and between them and third countries. Using an expanded gravity model this paper estimates for a number of regional trade arrangements among developing countries the gross trade creation and diversion effects resulting from RTA formation. This paper brings evidence in favor of the idea that South-South RTAs, and African RTAs in particular, are not more trade diverting than other RTAs. This evidence suggests that increased trade with both regional partners and third countries in the case of South-South RTAs might be explained by the removal of “invisible” trade barriers as a result of trade facilitation measures favored by RTA formation.

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Keywords: regional trade agreements, gravity model, trade creation, trade diversion, African RTAs

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I. INTRODUCTION

The past decade has witnessed a renewed interest in regional trade agreements (RTAs), with many policymakers and academics questioning the impact RTAs have had on members and third countries.¹ A particular distinction in this debate was drawn between RTAs involving developing countries only (South-South RTAs) and those between developed and developing countries (North-South RTAs). Initially, regional cooperation schemes among developing countries were also encouraged by international organizations as a means toward regional stability and development. In this context it was also argued that regionalism could serve as an elite-socialization process and as a lock-in mechanism for domestic political and economic reforms in the less developed RTA members (Whalley, 1996).

The early theoretical and empirical work started in the 1950s with Viner's seminal work (Viner 1950).² Viner opened new ground when he advanced the idea that the welfare effects stemming from the formation of an RTA is ambiguous. In a simple partial equilibrium model under perfect competition RTA may increase the level of trade between members at the expense of less efficient domestic producers (*trade creation*) but also of more efficient third countries (*trade diversion*). The net effect of RTA on trade (as a proxy for welfare) thus depends on the relative size of these two effects. Further refinements were brought when dynamic effects were incorporated into this stylized static approach to regional integration. The dynamic effects resulting from regional integration usually cited are *competition effects* and *scale effects*. These dynamic effects of regional integration are often used to justify the formation of such trading arrangements. Both the European Union project and NAFTA have been justified on economies of scale that not only

allowed RTA members to increase their intra-regional exports but also their trade with the rest of the world.³ Recent multi-country computable general equilibrium (CGE) models incorporate information about levels of protection not only in RTA members but also in non-members. Simulations of these models accounting to some extent for the overall effects of regional integration arrangements attributable to extra-regional levels of protection.

Despite these analytical advances, however, the initial Vinerian ambivalent conclusion that RTAs could enhance or reduce welfare remains.⁴ The issue of the net effect of RTAs on the welfare of the member States and on the world economy is therefore an empirical issue. Moreover, even if there was a clear-cut analytical answer to the question of the sign of the effects, the magnitude of these effects would still be of interest.

The attempts to clarify empirically the ambiguous effects of RTAs predicted theoretically have so far failed to solve the puzzle. Several studies advanced pessimistic conclusions about the impact of RTAs in Africa. A recent World Bank research project on regionalism concluded that South-South regional blocs are problematic in several respects (World Bank 2000a). According to the World Bank study, apart from doubtful non-economic benefits, South-South RTAs between two or more poor countries is very likely to generate trade diversion, especially when external tariffs are high (World Bank 2000a: 42). Similarly, Yeats (1998) looked at detailed trade data from Sub-Saharan Africa and concluded that, judged by the variance in their trade patterns from what current comparative advantage would predict, intra-regional trade has potential adverse effects on members and on third countries. He con-

cludes that “preferences for African intra-trade do not appear to have the potential to make an important impact on these countries’ trade ... [and] they may have a negative impact on Africa’s industrialization and growth if they divert regional imports from low to higher cost sources” (Yeats 1998: 116). Based on a homogeneous goods assumption, the same conclusion is advanced by Schiff (1997) who argues that any RTA between small developing countries will most likely induce a replacement of cheaper imports from the rest of the world with more expensive intra-RTA products from less efficient suppliers. Arguing from a rather different perspective Park (1995) states that “the smaller the intra-regional shares in total trade ... the more likely the trading blocs would become trade diverting”. Given the lower intra-trade shares of South-South RTAs (especially African RTAs) compared to North-North or North-South RTAs, the suggestion is once again that South-South RTAs are potentially more trade diverting than other RTAs. Negative impacts of South-South RTAs were found or predicted not only in Africa but also in Latin America.⁵

An equal amount of dissenting opinions are put forward by other studies. For instance, Elbadawi (1997:213) notes that “economic integration [in Africa] could generate the thresh-

old scales necessary to trigger the much-needed strategic complementarities...within the region”. Other scholars used CGE analysis and found that trade creation is prevalent in the case of certain South-South RTAs. For instance Evans (1998) and Lewis et al. (1999) found positive net effects of regional integration initiatives in Southern Africa, while Flores (1997) advances similar conclusions about MERCOSUR.

This paper takes on these conclusions and tests them empirically using an expanded gravity model, able to identify both trade creation and trade diversion effects arising from several RTAs. The paper is organized as follows: section 1 briefly presents the main gravity model used to estimate the trade effects of regional trade arrangements and its variants. Section 2 explains the actual model used in this paper. Section 3 presents the results and discusses the main findings. Section 4 proposes an explanation for the gravity model results that contradict the view that African RTAs are most likely to have negative effects of both intra- and extra-trade patterns of their members. Starting from the basic theory of regional integration arrangements, it suggests a further explanation based on the impact of RTAs on eliminating transaction costs and non-tariff trade barriers.

II. THE GRAVITY MODEL

When it comes to empirical estimates of the RTA effects, the standard Vinerian analysis is very often replaced by a variety of methods to quantify the effects of economic integration upon the volume and direction of international trade flows. One such method is the gravity model, which has been used widely as a baseline model for estimating the impact of a variety of policy issues, such as, political blocs, patent rights, regional trading groups and various trade distortions.⁶ The widespread use of gravity equations in estimating the trade effects arising from RTA formation is despite the fact that initially they have tended to lack strong theoretical bases. Most early articles using gravity models were *ad hoc* rather than being based on solid theoretical foundations. Exceptions to this trend include later work by Anderson (1979), Bergstrand (1990), Deardorff (1998), and Feenstra, Markusen and Rose (1998).⁷

Typically, in the case of gravity model of trade, bilateral trade flows are dependent upon the size of the two economies and the distance between them:

$$X_{ij}^t = f(Y_i^t, Y_j^t, D_{ij}) \quad (1)$$

where X_{ij}^t are exports from country i to country j at time t , Y_i^t and Y_j^t are the GDPs at time t of country i and j , respectively. D is the distance between the capital cities of the two countries. The rationale behind the gravity model is that trade is associated with economic size, measured as GDP, and is inhibited by distance (which increases transportation costs, as well as other transaction costs). Specifically, a high level of income in the exporting country indicates a high level of production, which increases the availability of products for export while a high level of income in the importing

country suggests higher demand and therefore, higher imports. Therefore both Y_i^t and Y_j^t should be positively correlated with the level of bilateral exports. Since distance increases transport costs, its coefficient is expected to be negative.

For estimation purposes, the basic gravity model is most often used in its log-linear form:

$$\log(X_{ij}^t) = \alpha + \beta_i \log(Y_i^t) + \beta_j \log(Y_j^t) + \gamma D_{ij} + \varepsilon_{ij} \quad (2)$$

where ε_{ij} is the log normally-distributed error term.

It is also common to expand the basic gravity model by adding other variables, which are thought to explain the impact of various policy issues on trade flows. In the case of gravity equations used to estimate the impact of regional trade arrangements dummy variables are added for each RTA under scrutiny. Furthermore, in order to avoid capturing by these dummy variables the impact of other influences on trade, other dummy variables are added to control for common language and common border.⁸

Thus, the most commonly used version of the expanded gravity model assessing the impact of RTAs is the following:

$$\log(X_{ij}^t) = c_0 + c_1 \log(Y_i^t) + c_2 \log(Y_j^t) + c_3 D_{ij} + c_4 contig + c_5 lang + c_m RTA_k + \varepsilon_{ij} \quad (3)$$

$$k = 1, n$$

$$m = 6, k+6$$

where $contig$, $lang$, RTA_k are dummies for common border, common language and RTA membership. The coefficients for all these dummy variables are expected to be positive since

neighboring countries or those sharing the same language are assumed to trade more than non-neighboring countries or countries having different languages.

III. THE CURRENT MODEL

As most other studies, the model used here estimated the log-linear form of the gravity equation, using standard OLS regression analysis. The dependent variable is total merchandise exports, in log form, from country i to country j , in a given year. The values of total bilateral exports, expressed in current US dollars, were obtained from the IMF (2000). The model is estimated for a cross-section dataset of more than 100 countries. The trade data matrix has been supplemented with GDP and GDP per capita data for three individual years: 1994, 1996, and 1998. As shown in the Annex, most RTAs under examination were already launched by 1994, and therefore their impact on trade flows should be already identifiable. In addition, a separate regression was run on a pooled data set for these years.

The GDP and population data are found in World Bank (2000b). Both GDP and GDP per capita are expressed in purchasing power parity (PPP) values. PPP values are in theory preferable since temporary shifts in exchange rates can distort the comparability on data.⁹

The other variables considered are physical distance (measured as the great circle distance between capital cities), common borders (or contiguity), as touched upon, and language. Physical distances are available at <http://www.indo.com/distance>. The information on languages and contiguity is based on CIA (1999). All these variables are constant over the time span used.

The variables of interest are those capturing the trade effects of various RTAs. For this, two dummies for each RTA are introduced, as proxies for the two main trade effects – trade creation and diversion.¹⁰ These dummies do not capture the welfare effects associated with trade

creation and diversion, as defined by Viner (1950), for the simple reason that the dependent variable measures the bilateral export flows and not welfare. What they capture instead are changes in volumes of trade among RTA members, on one hand, and between them and non-members, on the other. The crucial factor that links changes in export volumes with welfare is the efficiency gains or losses associated with this change.

The two dummy variables that have been constructed are as follows. One of them (INTRA_RTA) takes the value of 1 for each observation where both countries are members of the RTA. This dummy captures the increase in exports from RTA members as a result of RTA formation. The interpretation of this dummy variable is not straightforward. Its impact depends on the relative efficiency of RTA members, compared to the efficiency of foreign suppliers. If the RTA is formed with the most efficient supplier, then any increase in intra-RTA trade should be welfare increasing and therefore INTRA_RTA should be interpreted as trade creation. If, on the contrary, the RTA is not formed with the most efficient supplier then the interpretation of INTRA_RTA depends on the extent to which intra-trade flows substitute less-efficient domestic production or more efficient foreign suppliers trade.

Given the lack of information on this degree of substitution between different suppliers, the increase of intra-RTA trade flows (irrespective of whether this has been due to substitution of domestic or foreign suppliers) captures what Balassa (1967) has called *gross trade creation*, as opposed to the Vinerian definition of *net* trade creation resulting from newly created intra-RTA trade at the expense of domestic suppliers. In the following discussion,

INTRA_RTAs will be interpreted as gross trade creation, in the sense given by Balassa (1967). Yet, as will be shown in the following discussion, one can reasonably draw some conclusions about net trade creation, when the two dummy variables are jointly taken into consideration.

The second dummy variable (EXTRA_RTAs) takes the value of 1 if the exporter is a third country and the importer is an RTA member. This dummy approximates the change in exports from third countries to RTA member as a result of RTA formation. If there is a decrease in exports from more efficient third country exporters, this variable should be interpreted as trade diversion. On the contrary, if there is an increase in exports from third countries as a result of RTA formation this dummy should be interpreted as trade creation.

The two dummies can reasonably be interpreted jointly, based on the values of EXTRA_RTAs (table 1). If total third country exports decreased as a result of RTA formation (e.g. EXTRA_RTAs < 0), it is very likely that the increase in intra-RTA trade flows was,

to a large extent, achieved at the expense of third country exports and therefore the gross trade creation effect captured by INTRA_RTAs should be interpreted as a small net trade creation effect, plus a more significant trade diversion effect.

Alternatively, if EXTRA_RTAs > 0 as a result of RTA formation, then it can reasonably be assumed that the increase in intra-RTA trade flows comes mainly at the expense of domestic producers and therefore INTRA_RTAs should be interpreted as a significant Vinerian trade creation effect and a small trade diversion effect.

With these specifications spelled out, eighteen such dummy variables (nine INTRA_RTAs and nine EXTRA_RTAs dummies) are included in the model for the following RTAs: AFTA, Andean Community, Caricom, COMESA, ECOWAS, European Union, MERCOSUR, NAFTA, SADC.

The main regression equation for the three years single years (1994, 1996, 1998) becomes:

$$\begin{aligned}
 exports_{xm}^t = & c_0 + c_1gdp_X^t + c_2gdp_M^t + c_3gdppc_X^t + c_4gdppc_M^t + c_5dist + C_6CONTIG + C_7LANG + \\
 & + C_8INTRA_AFTA + C_9EXTRA_AFTA + C_{10}INTRA_AND + C_{11}EXTRA_AND + C_{12}INTRA_CARICOM \\
 & + C_{13}EXTRA_CARICOM + C_{14}INTRA_COMESA + C_{15}EXTRA_COMESA + C_{16}INTRA_ECOWAS + \\
 & C_{17}EXTRA_ECOWAS + C_{18}INTRA_EU + C_{19}EXTRA_EU + C_{20}INTRA_MERCOSUR + \\
 & C_{21}EXTRA_MERCOSUR + C_{22}INTRA_NAFTA_TC + C_{23}EXTRA_NAFTA + C_{24}INTRA_SADC + \\
 & C_{25}EXTRA_SADC + \varepsilon_{ij}
 \end{aligned} \tag{4}$$

where all variables in lowercase are expressed in logarithmic form:

<i>exports</i>	logarithm of exports from country X to M in year t
C	intercept
gdp_X^t	logarithm of country's X GDP in year t
gdp_M^t	logarithm of country's M GDP in year t
$gdppc_X^t$	logarithm of country's X GDP per capita in year t
$gdppc_M^t$	logarithm of country's M GDP per capita in year t
<i>dist</i>	logarithm of distance between the capital cities of X and M
CONTIG	dummy variable taking the value of 1 if countries X and M share a common border, otherwise being zero
LANG	dummy variable taking the value of 1 if countries X and M share a common language, otherwise being zero
INTRA_RTAs	dummy variable taking the value of 1 if countries X and M are part of the RTA, zero otherwise
EXTRA_RTAs	dummy variable taking the value of 1 if country M is a member of the RTA and X a non-member, zero otherwise. A list of RTA examined and their membership is provided in Annex 1.

For the pooled data, two year dummies were added (Y94, Y98).

Table 1. Interpreting RTA dummies

Dummy variable	Sign	
	+	-
INTRA_RTA	Trade creation, if EXTRA_RTA>0 Trade diversion, if EXTRA_RTA<0	Trade creation
EXTRA_RTA	Trade creation	Trade diversion

Before discussing the empirical results, it should be noted that the current empirical analysis differs in three important respects from many gravity models found in the literature. The first stems from the way bilateral trade data and RTA dummies were constructed. A large majority of gravity models estimate RTA effects using total bilateral trade flows as a dependent variable. However, for a given pair of countries, with total bilateral trade one cannot distinguish between the impact of RTA formation on exports from non-member to RTA members from that on exports from the RTA member to the non-member. Therefore, a constant level for the overall bilateral trade (exports and imports) may be the result of a reduction in imports from non-members and an increase in exports from RTAs to third countries. Such trade diversion effects will not be captured when using overall trade flows. Hence, using bilateral exports instead of total bilateral trade is crucial for the construction of a meaningful EXTRA_RTA dummy, which takes the value

of 1 only on those data points registering exports from a non-member country to an RTA member.

The second distinguishing feature is that the analysis in this paper uses a larger number of countries.¹¹ Relying on a larger sample of countries allowed for testing a larger set of RTAs. In particular, it allowed estimating the effects of several African RTAs whose functioning was questioned in the literature. The third advantage refers to the use of pooled data. When the regression was performed on the 1994-1998 pooled data the equation also includes dummies for two of the three years included in the pool, Y94 and Y98, taking the value of 1 if trade and GDP data were from 1994 and 1998, respectively. The advantage of pooled data is that it allows for testing explicitly for changes in trade patterns over time, and to examine how these changes may have differed among various RTAs.

IV. THE FINDINGS

Table 2 reports the results from these regressions, based on the specifications discussed above. The applied regression method was the standard OLS, with White heteroskedastic-consistent errors. While most effects are similar to those reported by previous studies, there are some notable differences in the trade effects of several RTAs involving developing countries.

Results were quite robust over the 1990s, with most variables maintaining their coefficients over time. The estimated coefficients on GDP, GDP per capita, distance, contiguity and language have all the expected signs and are highly significant in all regressions. It is interesting to note that coefficients for exporting countries of both GDP and GDP per capita are systematically higher than the same coefficients for importing countries.

The positive effect of GDP per capita indicates that richer countries export more than poor ones. However, the coefficient shows a moderate downward trend over the 1994-1998 period from 0.76 to 0.59 for exporters and from 0.56 to 0.47 for importers. The coefficients for distance, contiguity and language all have the expected signs and are highly statistically significant in all regressions. The only dummy year that turned out statistically significant is Y98, showing the negative impact on trade of the 1998 financial crisis. The R-square values range from 0.6 to 0.7, denoting that 60 per cent to 70 per cent of the variation in trade flows is explained by the variables used in the model. Quite interestingly, there is ample evidence that South-South RTAs are less trade diverting than theoretically predicted.¹² The estimates for each RTA are briefly discussed below.

Even though they were less in operation during the sample period than other RTAs, AFTA trade effects were significant, both statistically and in magnitude. INTRA_AFTA is well above unity in all years, suggesting that AFTA countries were trading in 1996 and 1998 more than 4 times (more than 5 times in 1994) than one would expect, given all the other gravity variables.¹³ At the same time, imports of AFTA countries from third countries were also more than four times in 1994 and more than double the level of trade between two otherwise comparable non-AFTA countries in 1998. One indication of these results is that even though progress toward creating AFTA was rather slow among ASEAN countries, there is evidence for an outward oriented trade arrangement.

Despite its early inception, the Andean Community had lower estimates for both INTRA_AND and EXTRA_AND than many more recent RTAs.¹⁴ While intra-Andean trade seemed to be more than two times higher than trade levels between otherwise similar countries, exports from third countries were 23 per cent to 40 per cent lower than those between otherwise similar non-Andean members. These results suggest that during the period examined there was evidence of trade diversion in the Andean region.

Similar results with regard to their sign were found for MERCOSUR. Statistically significant results however were obtained only for EXTRA_MERCOSUR dummy in 1994 and 1996 and for both dummies in the pooled data. In the period 1994-1998, it appears that Mercosur increased trade among members more than two times and reduced extra-regional imports with more than a third of their level, as

Table 2. Gravity model results (LOG(EXPORTS) as dependent variable)

Variable	1994	1996	1998	1994-1998
C	-32.2** (0.72)	-34.6**(0.67)	-34.5**(0.62)	-32.4**(0.48)
LOG(GDPX)	1.01** (0.02)	1.04**(0.01)	1.12**(0.01)	1.03**(0.01)
LOG(GDPM)	0.82** (0.02)	0.89**(0.01)	0.88**(0.01)	0.85**(0.01)
LOG(GDPPCX)	0.76** (0.03)	0.70**(0.02)	0.59**(0.02)	0.71**(0.02)
LOG(GDPPCM)	0.56** (0.03)	0.53**(0.03)	0.47**(0.03)	0.52**(0.02)
LOG(DIST)	-1.16** (0.04)	-1.10**(0.03)	-1.14**(0.03)	-1.21**(0.02)
CONTIG	1.01** (0.15)	1.04**(0.15)	0.94**(0.14)	0.00**(0.00)
LANG	0.97** (0.08)	1.15**(0.07)	0.97**(0.06)	1.11**(0.05)
INTRA_AFTA	1.73**(0.34)	1.44**(0.33)	1.38*(0.56)	1.79**(0.17)
EXTRA_AFTA	1.42**(0.13)	1.19**(0.12)	0.87**(0.11)	1.34**(0.08)
INTRA_AND	0.70**(0.26)	0.69**(0.23)	0.97#(0.54)	0.82**(0.15)
EXTRA_AND	-0.25*(0.11)	-0.44**(0.11)	-0.51**(0.12)	-0.32**(0.08)
INTRA_CARICOM	2.34**(0.56)	3.72**(0.35)	4.41**(0.58)	2.95**(0.34)
EXTRA_CARICOM	-0.01(0.16)	0.01(0.15)	0.08(0.14)	-0.01(0.11)
INTRA_COMESA	1.01**(0.30)	1.15**(0.26)	0.96**(0.21)	1.13**(0.19)
EXTRA_COMESA	0.25*(0.12)	0.33**(0.10)	0.22*(0.09)	0.28**(0.07)
INTRA_ECOWAS	0.89**(0.33)	0.76*(0.33)	0.50*(0.22)	0.82**(0.21)
EXTRA_ECOWAS	0.03(0.15)	0.18#(0.11)	0.04(0.10)	0.04(0.09)
INTRA_EU	0.28**(0.09)	0.26**(0.09)	0.16(0.17)	0.23**(0.06)
EXTRA_EU	0.67**(0.09)	0.37**(0.08)	0.50**(0.07)	0.52**(0.06)
INTRA_MERCOSUR	0.35(0.37)	0.40(0.43)	0.46(0.58)	0.84**(0.23)
EXTRA_MERCOSUR	-0.33*(0.13)	-0.46**(0.13)	-0.21#(0.12)	-0.36**(0.09)
INTRA_NAFTA	-0.40(0.47)	-0.60(0.53)	-0.72(0.82)	-0.11(0.34)
EXTRA_NAFTA	0.35*(0.14)	-0.11(0.12)	0.19(0.13)	0.13(0.09)
INTRA_SADC	1.65**(0.44)	2.15**(0.36)	2.17**(0.33)	2.19**(0.25)
EXTRA_SADC	0.33*(0.14)	0.41**(0.11)	0.30**(0.11)	0.40**(0.08)
Y94				-0.02(0.03)
Y98				-6.55**(0.26)
Number of included observations	7786	8185	8012	16269
Adjusted R ²	0.6	0.66	0.7	0.63
Std. error of regression	2.41	2.11	1.98	2.26

** , * , # denote significance at the 99 per cent, 95 per cent and 90 per cent levels respectively. Heteroskedastic-consistent standard errors are in parentheses.

predicted by all other gravity variables, suggesting an overall trade diverting effect.¹⁵

Coefficients for EXTRA_CARICOM were insignificant statistically throughout the period analyzed. In contrast, INTRA_CARICOM coefficients were highly significant. Their values suggest that trade between CARICOM countries was 10 times

higher in 1994 and 85 times higher in 1998 than that between otherwise similar countries in terms of GDP, GDP per capita, distance, common language and borders.

With the exception of 1994 EXTRA_NAFTA coefficient that was statistically significant and positive, in all other regressions both NAFTA dummies were statisti-

cally insignificant. The only instance when NAFTA shows a statistically significant coefficient at a 95 per cent level (EXTRA_NAFTA in 1994) predicts a 41 per cent increase in imports of a NAFTA country from a third partner, compared to what they would have been, had the importer not belonged to NAFTA. One explanation for these insignificant results is that the number of observations available for NAFTA countries compared to the entire sample is relatively small, due to its reduced membership. Other more focused studies on NAFTA have also found that NAFTA trade effects are mixed or insignificant, both in terms of intra- and extra-trade (Wall 2000; Krueger 1999)¹⁶.

For the European Union, apart from the 1998 INTRA_EU coefficient, all other coefficients are statistically significant. The European Union shows positive coefficients for both INTRA_EU and EXTRA_EU suggesting that the European Union was trade creating (the European trade bloc never becoming a 'Fortress Europe' during 1990s). Intra-European Union trade effects range between 20 per cent in 1998 and 30 per cent in 1994, while trade with third countries increased by 40 per cent in 1996 and 100 per cent in 1994.

EXTRA_ECOWAS effects were positive but insignificant statistically (with the exception of 1996 where the coefficient was significant at a 90 per cent level). However, with the exception of 1998 where the estimate is somewhat lower, in all other years two ECOWAS countries trade two times more than two otherwise similar non-ECOWAS countries. Overall, there is no evidence of trade diversion.

In all years examined, trade between COMESA members was more than two times the hypothetical trade level predicted without

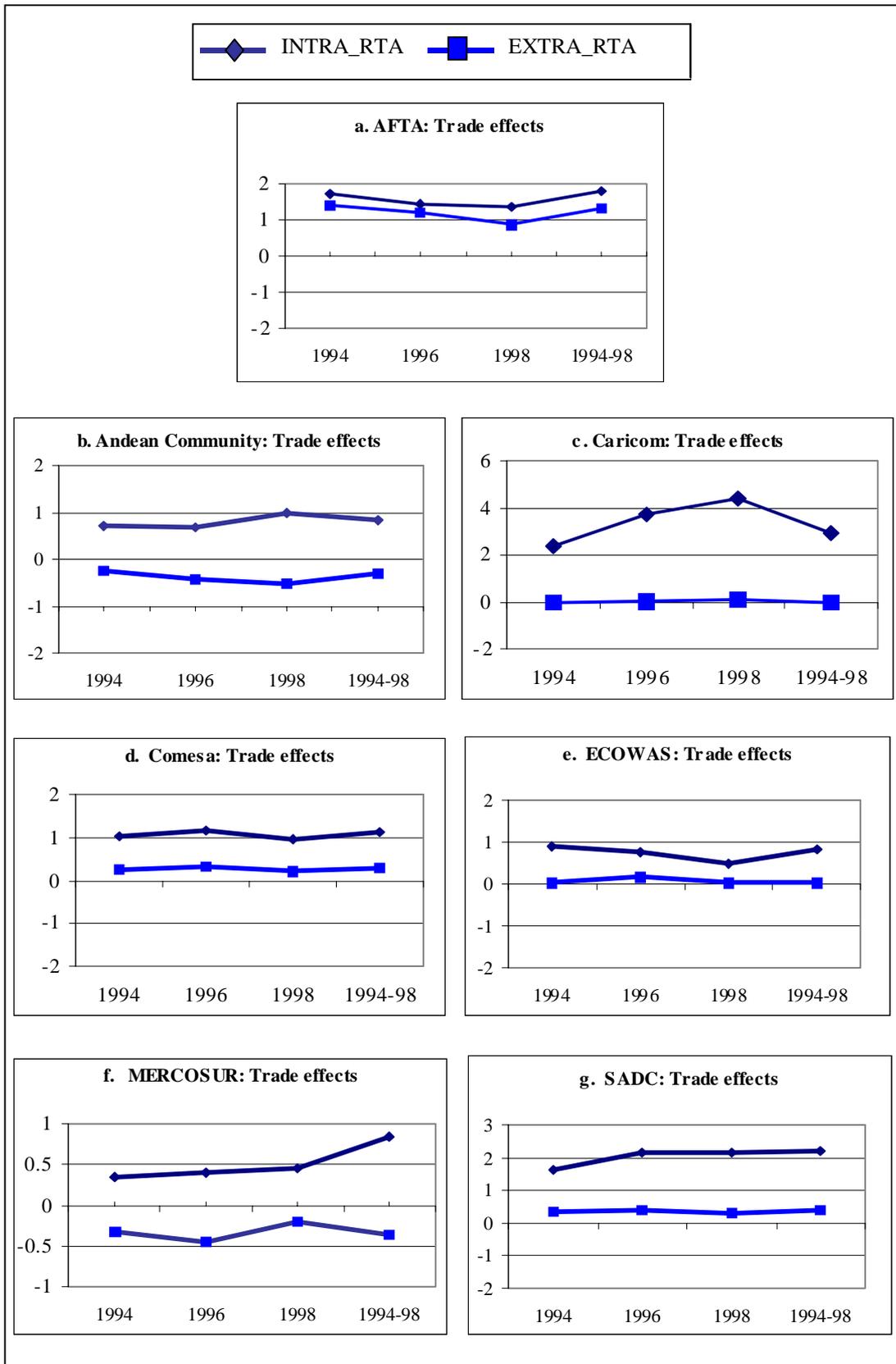
the INTRA_COMESA dummy. If an importer was in COMESA while the exporter was in the rest of the world, imports into COMESA members from the third countries were on average 30 per cent higher than those predicted without the trade diversion dummy variable. These results suggest that, as in the case of other RTAs examined, COMESA is overall trade creating.

As for SADC, both RTA effects were significant statistically and positive in all years examined. This suggests that in 1994 for instance both intra- and extra-regional trade increased five times and 40 per cent respectively. When data was pooled the effects were almost 9 times for INTRA_SADC and 50 per cent for extra-regional trade.¹⁷

Estimates have indicated that a significant number of South-South RTAs were actually trade creating during the period considered. These results are depicted in figure 1, for all South-South RTAs considered so far. As can be seen, all these gravity model estimates are positive (with the exception of Andean Community and MERCOSUR) and in all cases the overall effect is trade creation. The INTRA_RTA effects are higher than EXTRA_RTA effects, suggesting that throughout the period under scrutiny intra-RTA trade increased more than trade with non-members, as a result of RTA formation.

These estimates, especially for African RTAs are in stark contrast with the widespread expectations and theoretical considerations referred to at the beginning of this paper, with regard to the functioning of South-South RTAs. The next section discusses several explanations advanced for these results and suggests several factors that may be held accountable for these estimated effects.

Figure 1. South-South RTAs: Gravity Model Estimated Trade Effects



V. SOLVING THE AFRICAN PUZZLE

One puzzling effect identified by the gravity model used in this paper is the positive impact of several South-South agreements, in particular African RTAs, not only on intra-RTA trade but also on the absolute level of trade with the rest of the world. These findings contradict the widespread belief that South-South RTAs are notoriously prone to fail or end up in trade diversion.

One element behind this opinion is Africa's pattern of protection. Trade barriers in Africa prior to the Uruguay Round were far more restrictive than in any of the other country groups. Sub-Saharan Africa's tariffs averaged 26.8 per cent in mid-late 1990s, which was more than four times of the corresponding OECD average (6.1 per cent) (Yeats, 1998; UNCTAD, 2000). While OECD countries and many of the fast growing exporters also made important concessions, Africa's trade barriers remained significant. Such relatively high level of MFN protection coupled with the formation of RTAs should, according to the customs union theory, lead to trade diversion effects.

What then can explain these unexpected gravity model estimates of gross trade creation and diversion effects for African RTAs such as COMESA, SADC, and ECOWAS?

Kemp and Wan (1976) offered an interesting theoretical perspective on this issue. They argued that for any proposed customs union or free trade area there exists a set of common external tariffs that would leave the new trading bloc's trade with non-member countries unchanged, so that the welfare of the latter countries would not be affected and any improvement to the welfare of the integrating countries would strictly add to world welfare.¹⁸

Whether the Kemp-Wan theorem is valid for welfare effects or just for trade flows, the major argument behind it is an adjustment of the regional external tariff in such a way as to maintain the pre-RTA level of third country exports. Most likely, this requires a reduction in the MFN tariffs sufficient enough to reduce domestic prices and increase consumption. Reducing trade barriers both against RTA partners and rest of the world in the 1990s was a common feature of trade policies in many developing countries, as part of the Uruguay Round and policy advocacy from Bretton Woods institutions. However, the argument that all these South-South RTAs have found the optimal external tariff to avoid trade diversion remains questionable.

What is more likely to explain the absence of trade diversion is the fact that many of the South-South RTAs examined have not been able to fully implement the intra-RTA tariff elimination schedules proposed. This limited or lack of discrimination may explain why trade diversion did not occur. However this implementation failure in itself explains neither the increase in imports from third countries nor the increase in intra-regional trade.

An alternative explanation suggests that private sector adjustments in terms of trade reorientation are made in anticipation of regional trade agreements taking place. Winters (1984) for instance finds strong anticipatory effects in the case of Britain joining the European Union in 1972. Despite the importance of anticipatory effects of regional trade arrangements on trade and capital flows, empirical evidence that they are important in practice remains in short supply. Kreinin and Plummer (2000) for instance find no anticipatory effects

from the announcement of AFTA formation in ASEAN countries. Given the fragility of the policy environment in Africa, anticipatory effects that explain the increase in intra-regional trade as a result of announced but not fully implemented RTAs are unlikely.

That South-South RTAs faced implementation problems and delays in liberalizing intra-regional trade can hardly be contested. The gravity model estimates however suggest that the formation of these RTAs nevertheless removed certain trade barriers. In the absence of major tariff preferences, it results that South-South RTAs managed to remove some 'invisible' trade barriers. Trading across international borders encounters many other costs, apart from tariffs. First of all, international trade involves non-negligible transport costs. Border formalities, technical or health standards and all the measures that are captured by what is referred to as "trade facilitation" measures may also impose significant costs.¹⁹ All these 'invisible' cost-increasing elements may all be reduced through the formation of a South-South RTA. As pointed out in Baldwin (1994), eliminating such trade barriers implies no welfare loss since there are no tariff revenues forgone.

Another form of "trade facilitation" effect of RTA formation in the case of African RTAs is put forward by Glenday (1997). He argues that in theory RTAs can strengthen intra-regional cooperation among African countries to promote intra-regional trade and to allow more efficient border controls through sharing of import documents, common control system, and should make corruption and fraud and red tape more difficult.

Yet, in reality the effect can be significantly different. Taking into account that many African countries have notoriously porous borders with low levels of enforceability, the establishment of a regional free trade area (combined with relatively high external tariffs) exacerbates the incentives for export and transit frauds. Such frauds become simpler through intra-regional exports when import duties on

intra-regional trade are removed, and border controls on intra-regional trade are relaxed. Thus, RTA formation through these informal channels may reduce trade barriers, with positive effects on both intra- and extra-regional trade.

While these arguments assists in understanding the estimated results, two additional questions are raised by this explanation based on "invisible" trade costs. Firstly, can RTAs be held accountable for this outcome? Secondly, do RTAs eliminate these trade barriers in a discriminatory manner, so as to explain the wedge between gross trade creation and diversion estimates?

The answer to the first question can be found in the objectives of most South-South RTAs. Most of these trading arrangements involved regional cooperation in a number of areas with direct relevance for trade patterns: upgrading transport and communication, infrastructure, harmonization and simplification of custom procedures, trade facilitation measures for transit goods, etc. Such objectives and concrete initiatives have been carried out, more or less successfully by many of the South-South RTAs.²⁰

With regard to the second question, whether the elimination of such 'invisible' trade costs induces discrimination between RTA members and third countries is less straightforward. One can easily distinguish the complex set of regional initiatives aimed at fostering trade in discriminatory and non-discriminatory policies. Given the weak implementation record of most South-South RTAs, after their formation very few tariffs will be eliminated on intra-RTA trade. Yet, the RTA formation will reduce some of the non-tariff barriers on both intra-RTA trade and third country exports to the region. One can imagine a number of other costs that affect differently intra- and extra-regional exports, whose removal will introduce an implicit differentiation in total trade costs. The overall effect will be a slightly larger reduction of trade barriers on intra-RTA trade

(both tariff and non-tariff reduction) compared to non-members (only some 'invisible' non-tariff barriers reduced). Once these effects are

taken into account, one can more easily understand the "puzzling" results of African RTAs showing little evidence of trade diversion.

VI. CONCLUSIONS

This paper investigated the potential impact of South-South RTAs on both intra- and extra-trade flows. For this purpose an expanded gravity model was used to estimate the impact of nine RTAs (of which seven among developing countries) on trade patterns among members and between members and non-members. A particular emphasis was given to the estimation of gross trade creation and trade diversion effects, resulting from the creation of these RTAs.

Two issues deserving further research have been highlighted by this paper as critical for our understanding of the impact of South-South RTAs. Firstly, the empirical analysis undertaken in this paper indicates that, unlike widespread opinions and standard theoretical predictions, a large number of African RTAs

are not trade diverting but trade creating, both with regard to intra- and extra-RTA trade. Secondly, this paper argued that the explanation for these apparently puzzling results is to be found in the reduction of “invisible” trade barriers that hampered trade with both RTA members and third countries. Hence one major conclusion stemming from this paper is that further research is needed to evaluate the extent to which regional trade agreements among neighboring countries are technically necessary to eliminate these “invisible” trade barriers mentioned in this paper. The more this is so, the stronger the argument that regional trade agreements are fully justified if members acting together can reduce not only tariffs but also their overall trade barriers through trade facilitation measures.

ANNEX

Membership of regional trade arrangements

AFTA	Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam
Andean Community	Bolivia, Colombia, Ecuador, Peru, Venezuela
CARICOM	Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, Suriname, St. Vincent & Grenadines, Trinidad and Tobago
COMESA	Angola, Burundi, Comoros, D. R. Congo, Djibouti, Egypt, Ethiopia, Eritrea, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zimbabwe, Zambia
ECOWAS	Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Liberia, Mali, Mauritania (withdrawn in 1999), Niger, Nigeria, Senegal, Sierra Leone, Togo, Guinea-Bissau
EU	Austria, Belgium, Luxembourg, France, Germany, Sweden, Greece, Portugal, Spain, Netherlands, Denmark, UK, Italy, Ireland, Finland
MERCOSUR	Brazil, Argentina, Uruguay, Paraguay
NAFTA	USA, Canada, Mexico
SADC	Angola, Botswana, D. R. Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, United Republic of Tanzania, Zambia, Zimbabwe

NOTES

- ¹ For a review of the recent work on regional trade agreements and their welfare effects see for instance Pomfret (1997) and DeRosa (1998) .
- ² See for instance Viner's and Meade's pioneering work in 1950s on free trade areas and customs unions (Viner, 1950; Meade, 1955), which has been further elaborated, among others, by Lipsey (1960), Johnson (1965) and Balassa(1975). For a review of early empirical measurements of trade creation and diversion effects see for instance Corden (1975).
- ³ Owen (1983) for instance estimated empirically significant scale effects for some manufacturing sectors as a result of EU integration.
- ⁴ Bhagwati and Panagariya (1996) and Panagariya (1996) argue more plainly that RTAs will likely reduce welfare in member States and impede multilateral trade liberalization. Because RTAs give preferential treatment to member States, they divert trade from non-member, least-cost suppliers. They argue that this trade diversion is likely to dominate trade creation, so the RTA will reduce welfare in member States.
- ⁵ See for instance the debate on the trade effects of MERCOSUR in Yeats (1997) and Nagarajan (1998).
- ⁶ Apart from international trade flows, gravity models have achieved empirical success in explaining various types of inter-regional and international flows, including capital flows and labor migration (Vandekamp 1977).
- ⁷ See also Evenett and Keller (1998) who, along with Deardorff (1998), evaluate the usefulness of gravity models in testing alternative theoretical models of trade.
- ⁸ Apart from these dummy variables, other exogenous regressors used are dummies for wars, conflicts, natural catastrophes, etc. Krueger (1999) also includes a dummy for remoteness to take into account the fact that some countries are further away from most of their trading partners than other countries.
- ⁹ It should be noted however that, as Srinivasan (1995) pointed out, PPP values are subject to significant measurement errors. Yet, the risk of significant alterations of the regression estimates is small, as evidenced by Linemann (1966) and Frankel (1997).
- ¹⁰ A similar approach in constructing RTA dummy variables is followed by Krueger (1999). However, the dummy variables are given a slightly different interpretation. Endoh (1999) uses three dummy variables to capture apart from trade creation, import trade diversion and export trade diversion. Export trade diversion is defined as an increase in intra-RTA exports, at the expense of exports from RTA members to third countries. However, the usefulness of this third variable and its relationship with the other two is still a matter of debate.
- ¹¹ The 1994 and 1996 regressions are based on a trade matrix covering 104 exporting countries and 108 importing countries. This gives a number of 7,787 data points for 1994 and 8,186 for 1996, after omitting the pairs with zero trade. The 1998 and the 1994-1998 pooled data regressions are based on exports from 144 countries to 151 countries, resulting in 12,841 data points in 1998 and 28,811 data points for the pooled data.

- ¹² These findings are comparable with other gravity model estimates. Soloaga and Winters (1998), for instance, look at a wide range of RTAs and found little evidence of widespread trade diversion.
- ¹³ All the subsequent estimates of the impact of dummies on bilateral exports discussed in the following pages are based on an exponential transformation of the gravity model coefficients reported in table 2. For example, in the case of AFTA in 1994 the estimated effect of INTRA_AFTA is $\exp(1.73)=5.6$.
- ¹⁴ Other authors found weaker results for the Andean group in earlier periods. Frankel (1997) for instance found negative and insignificant trade creation coefficients for 1960s and 1970s and positive trade creation in 1992.
- ¹⁵ Amjadi and Winters (1997) look into more detail on MERCOSUR's trade trying to explain the trade diversion as a way to save on transportation costs facing exports by member countries. They investigate whether transportation costs between MERCOSUR countries and non-member countries (represented by the United States) are sufficiently high to afford significant gains to MERCOSUR countries under their new customs union. They found that transportation costs for exports destined for countries outside MERCOSUR were appreciably higher than intra-regional transportation costs. However, they concluded that the margin between the two costs is not sufficiently large to result in a net welfare gain for MERCOSUR countries.
- ¹⁶ Using a gravity model, Gould (1998) for instance found that unlike the United States-Mexico bilateral trade flows, the impact of NAFTA on Canada's trade with the United States and Mexico did not have perceptible effects. Also, Krueger (1999) concluded that NAFTA does not have a significant impact on North American trade flows, in addition to other changes in trade policies.
- ¹⁷ Coe and Hoffmaister (1998) also found that the average African country actually tends to 'overtrade' with third countries, when controlling access to the sea, composition of exports, and other factors.
- ¹⁸ Winters (1997) has objected to such interpretations of the Kemp-Wan theorem. He argues that the welfare of non-member countries is not monotonically related to their exports to member countries. Instead of looking at third-country export levels, a better welfare indicator for non-member countries would be, for instance, changes in their imports and changes in their terms of trade. This argument lies on the assumption that individuals fundamentally derive enjoyment from consuming rather than producing goods.
- ¹⁹ Hoekman and Konan (1999) found compelling evidence of such "invisible" costs. Thus, according to them, only redundant testing and idiosyncratic standards alone imposed extra-costs from 5 per cent to 90 per cent of the value of traded goods.
- ²⁰ For a detailed analysis of various trade facilitation initiatives taken within various regional integration schemes among developing countries, see UNCTAD (1996).

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