

MARKET IMPLICATIONS OF COMESA'S ACCESSION TO THE FREE TRADE AREA: A GRAVITATIONAL INVESTIGATION

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ABSTRACT

This paper derives and uses a variant of the gravity model to assess the market implications of the COMESA's accession to the Free Trade Area. The results show that the traditional explanatory variables of the gravity model are the significant determinants of trade flows in the COMESA region, and that belonging to this grouping fosters trade. Hence policy advice should focus on strengthening these factors, which are likely to enhance the possibility of greater intra-regional trade. This can contribute to drawing foreign direct investment to the region, enhancing policy credibility, and bringing greater economic and political stability. This paper also highlights the importance of a combination of unilateral and preferential economic reforms in the preferential trade arrangements in sub-Saharan Africa.

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Key words: Economic reforms, market integration, COMESA, Gravity model. JEL: F15 C21 O24**

INTRODUCTION

Until the late eighties, the liberalization of international trade on a multilateral basis was a great success story of the postwar era, and certainly contributed in a major way to the rapid economic growth of the international economy. However, starting from the mid-1980s, Preferential trading arrangements (PTAs) began mushrooming, spurred by the emergence of the EU and the extension of the US policy, under which the US changed from a total commitment to multilateral trade liberalization to both multilateralism and a “two-track” approach resorting to PTAs as a way to achieve trade liberalization. While some of these PTAs have been bilateral agreements between two countries, some have entailed the development of discriminatory trading arrangements between a greater number of countries.

In Africa, prominent among these new groupings has been the Common Market for Eastern and Southern Africa (COMESA) created in 1993. Right from the beginning, member states of this grouping engaged themselves to unilaterally eliminate quantitative restrictions and other non-tariff barriers in the context of SAP. By the end of 1999, only Zimbabwe still had quotas on certain products in the area of exports (World Bank, 1999). With regard to government monopolies, they were completely dissolved except in 9 countries for imports and 6 for exports.

The member countries also engaged themselves in the implementation of measures of reform related to the reduction of tariff barriers on intra-grouping import with the aim of becoming a Free trade Area (FTA) in 2000 and a customs union with a common external tariff in 2004. The calendar of preferential liberalization foresaw an elimination of tariff protection to intra-community trade for all the member states in the order of 60 % in October 1993, 70 % in October 1994, 80 % in October 1996, 90 % in October 1998, and 100 % in October 2000 (www.comesa.org).

Meanwhile, the application of this programme was very slow. As of 1st March 1999; only Egypt and Madagascar had succeeded to achieve 90 % reduction of tariff to internal trade. Seven countries namely Kenya, Comoros, Mauritius, Eritrea, Sudan, Uganda and Zimbabwe had attained 80 % of preferential tariff reduction. Malawi, Burundi, Rwanda and Zambia achieved between 60% and 70 % of tariff reduction and 5 countries¹ made no preferential reduction (World Bank, 1999). Following this slowness in the liberalization of internal trade, the COMESA treaty was revised with two innovations. The first is related to the concept of multiple speed or variable geometry that allows a group of countries to advance faster in the integration process than other member states. The second was the possibility of sanctioning the member economies who jeopardize the application of the terms of integration accords (Kasekende and Abukra, 1998). These innovations gave a push to the liberalization of trade within the COMESA and on the 31st October 2000 in Lusaka, this group became a Free Trade Area. From this date, nine of the member countries namely Djibouti, Kenya, Madagascar, Malawi, Mauritius, Sudan, Zambia and Zimbabwe had already eliminated up to 100 % their customs tariffs on COMESA originating products implicated in intra-community trade, in accordance with the tariff reduction schedule adopted in 1993. Five countries had reduced tariff between 60 % and 90 % while 4 other hadn't yet started to liberalize intra-comesa trade. On the 1st January 2004, Burundi and Rwanda joined the FTA (See Appendix II).

Beyond the FTA, the Customs Union is actively in preparation. A road map that outlines programmes and activities whose implementation are necessary before the launching of the Union was adopted by the eleventh Meeting of the Council of Ministers held in Cairo. It is expected that the launch will be achieved by the year 2008.

The unilateral as well as the preferential trade liberalization described above are according to the words of many authors, the prerequisite for trade creation among integrating markets

(Elbadawi, 1997; Jebuni, 1997; Kandogan, 2005). As pointed out by Collier and Gunning (1993), regional integration and unilateral trade liberalization are complementary in that regionalism strengthens unilateral liberalization through its threat-making capacity. There's also a good case for arguing that complementarity can work in the other direction. Unilateral trade liberalization makes regionalism-promoting trade policy more feasible. Jebuni (1997) argued that non-discriminatory reform is a fundamental stepping-stone to intensify regional trade in Africa.

Theoretically, the economic reforms described above are expected to boost trade within the sub-region. Also, if this increase in intra-regional transactions does not come at the expense of trade of the integrating area with the rest of the world, the welfare conditions of the member countries will be improved (Kemp and Wan, 1976).

In fact, three main direct and indirect positive outcomes of the economic reforms are underlined in the area of regional integration. The cost reduction effect, the demand expansion effect, and the external tariff effect. The first, the cost-reduction effect comes from tariff reduction within the region, which leads to specialization, replacing high cost domestic products with low-cost imports from the member countries. Therefore, tariff reduction leads to specialization and cost reduction, boosting the possibilities of intra-regional trade. This process results in substantial trade creation effects (Viner, 1958, Coulibaly, 2004). The second effect, the demand-expansion effect, occurs in the post-reform tariff reduction regime through a chain reaction of macroeconomic effects of cost reduction leading to higher output, income and employment, which in turn increases the region's demand for goods from member countries. Increase in demand in member countries stimulates investment activities and greater specialization in the entire community. Resultant output and income effects in an environment of intra-regional economic interdependence substantially enhances the potential for trade creation, and welfare (Kemp and Wan, 1976). With respect to the external effect, lower external tariffs on imports in the post-

reform regime will stimulate extra-regional trade and minimize any negative "Trade diversion" effect. Reduction in external tariff will further boost domestic production through technology transfer and increase imports of capital goods and industrial raw material from outside the region.

The net effect of the outcomes mentioned above is expected to reflect either "Trade creation" with shifts of production to locations with comparative advantage, or "trade diversion" with a shift from low-cost producers in the rest of the world to higher cost producers in the COMESA countries. The gravity model seems well defined to address this type of ex-post assessment for two reasons. First, arguably, the model represents a relevant counterfactual to isolate the effects of a Regional Trade Arrangement (RTA). When the sample of countries is appropriately selected, the gravity equation suggests a normal level of bilateral trade for the grouping. Dummy variables can then be used to capture the "atypical" levels resulting from a RTA. Second, thanks to the correct introduction of dummy variables in the model, one can isolate trade creation and trade diversion effects of a RTA.

Nearly ten years have passed since the COMESA countries undertook the economic reform programme and efforts made so far to study the likely effects of the policy measures on target variables such as intra-regional trade among member countries are rare.

For the purpose of economic policies, this paper seeks to answer two research questions. First, what are the determinants of intra-community trade in COMESA? Second, to what extent this trade will increase as a consequence of tariff cut within the grouping? More specifically, the paper focuses on estimating the determinants of market integration among the COMESA member states, and the extent to which the grouping accounts for the change in trade patterns.

The rest of the paper is structured as follows: section 2 presents the econometric model, sections 3 and 4 cover the empirical results and the conclusion.

THE GRAVITY MODEL

The gravity model is one of the greater success stories in empirical economics. It has established itself as a serious empirical tool for exploring regional trade patterns. However, until recently, its theoretical foundations were less clearly understood. Thanks to various modeling refinements and their application to debates about theoretical foundation, and to a recent flurry of theoretical work, the gravity equation has “gone from an embarrassment of poverty of theoretical foundations to an embarrassment of riches” (Frankel, 1998). For instance, Linnemann (1966) has shown how the gravity equation could be derived theoretically from a quasi-Walrasian general equilibrium model. Crucial to that derivation was an assumption of separate demand functions for imports for each trading partner, assumption that was not justified by Linnemann (Deardorff, 1984). Another critique to Linnemann’s theoretical explanation of the gravity model is presented by Anderson (1979). Linnemann saw the gravity equation as a reduced form from a four-equation partial equilibrium model of export supply and import demand. Prices are always excluded since they merely adjust to equate supply and demand. Anderson (1979) saw this explanation as loose, since it does not explain the multiplicative functional form of the gravity equation. He further presented an alternative theoretical model to explain the gravity equation based on a Cobb-Douglas expenditure system. He assumed identical homothetic preferences across regions, and products differentiated by country of origin. This theoretical explanation accounts for the multiplicative form of the gravity equation, allows for an interpretation of distance and identifies its coefficients, and presents an efficient estimator for the gravity model. However, Anderson’s approach left unresolved some issues. First, it does not explain the unidentified part of the equation; the function specifying that trade’s share of budgets is dependent on income and population. Further-

more, the explanation did not include price variables. Bergstrand (1985) extends this theoretical foundation of the gravity equation by incorporating price variables. He presented a general equilibrium world trade model from which a gravity equation is derived. This model is obtained from a utility and profit-maximizing agent behaviour in N countries assuming a single factor of production in each. Bergstrand (1989) further extends the theoretical foundations of the gravity equation by incorporating factor-endowment and non-homothetic taste variables. The model is a general equilibrium world trade model with two differentiated-product industries, two factors (capital and labour), and N countries.

Despite continuing discussions, one can summarize that the theoretical considerations of the gravity model base on micro-economic foundations (Tinbergen, 1962; Linneman, 1966, Anderson, 1979; Bergstrand, 1985, 1990), trade theories (Poyhinen, 1963; Deadorff, 1995; Krugman, 1979), and new economic geography (Steawart, 1940; Krugman, 1991a, 1991b, 1998).

Model Derivation

In this paper, we use a generalized version of the standard gravity model derived from a framework where firms maximize profits and consumers maximize utility according to Dixit-Stiglitz preferences. If the representative profit-maximizing firms in country j set product prices delivered to market i according to equation (2), one obtains the following equilibrium trade flow for each goods-producing firm in country j to market i (Baier and Bergstrand, 2002):

$$M_{ij} = A \frac{Y_j}{P_j} Y_i \left[\frac{P_j \theta_j}{P_i} \right]^{1-\sigma} \left[S_j (1+t_i) (1+t_j)^\sigma \right] \quad (1)$$

M_{ij} is the c.i.f value of the aggregate merchandise trade flow imported by country i from exporter j ;

A is a parameter that captures technology and taste parameters

which are assumed identical across countries and are absorbed in a constant term in the estimated equation.

$Y_{i(j)}$ is the gross domestic product of country i (j)

P_j is the exporter (country j) price level of its representative good.

The price level of this good in country i (c.i.f price) is given by:

$$P_{ij} = P_j \theta_{ij} \tag{2}$$

θ_{ij} is a barrier-to-trade function between i and j to be developed;

P_i is the output-weighted measure of the remoteness (in terms of trade costs) of country i;

$$P_i = \left[\sum_{k=1}^N n_k [P_k \theta_k (1 + t_k)]^{-\sigma} \right] \tag{3}$$

n_j is the number of varieties of goods produced in j;

t_{ij} is an ad valorem tariff rate by country i on the good produced in j ($t_{ij} = 0$ assumed);

s_j is the real share of goods output in national product in country j;

t_i is the share of tariff revenue relative to income;

Equation (1) is the currently accepted theoretical foundation for the gravity equation in the presence of transportation costs and tariffs (Feenstra, 2003). Assuming $t_i = 0$ (in most developing countries, tariff revenue is a trivial share of GDP), and following Anderson and Van Wincoop (2003) who have shown the implicit solution for p_j and p_i , it yields:

$$M_{ij} = \frac{A}{Y_w} s_j Y_i Y_j \theta^{1-\sigma} (1 + t_j)^\sigma [P_i^* P_j^*]^{-1} \tag{4}$$

Y_w is the world output of goods and P_i^* and P_j^* can be interpreted as “multilateral price resistance terms” (Anderson and Van Wincoop, 2003).

Equation (4) is close to the gravity model in empirical literature. It suggests that the proper specification should include:

- The logarithm of the product of the GDPs of countries i (Y_i) and j (Y_j);
- Per capita GDP or population of the exporting country, N_j , as a proxy for the capital endowment ratio (which determines the endogenous share of goods in national output i.e. s_j)
- a proxy for the term θ_j . It is obvious that it is crucial to get the best handle possible on what constitutes the "barriers-to-trade" function, which is usually proxied either by distance, D_{ij} between trading partners, and the presence of a common border and a common language (Elbadawi, 1997; Gbetnkom, 2002) or sometimes by the c.i.f / f.o.b price ratio (Baier and Bergstrand, 2001). These variables are not the only determinants of barriers to trade. The barrier-to-trade function between countries i and j can also be modeled as follows:

$$\theta_j = (D_j)^{\delta_1} (N_i)^{\delta_2} (N_j)^{\delta_3} \left[e^{\delta_4 L_{ij} + \delta_5 E_i + \delta_6 E_j} \right] \quad (5)$$

Where D_{ij} is the distance between countries i and j ($\delta_1 > 0$), L_{ij} takes 1 if i and j share a common border, otherwise 0 ($\delta_4 < 0$), $E_{i(j)}$ takes 1 if the country i (j) is land locked, otherwise 0 ($\delta_5 > 0, \delta_6 > 0$), $IN_{i(j)}$ the level of infrastructure of the country i (j), computed as an average of the density of road, railway and the number of telephone lines per capita ($\delta_2 < 0, \delta_3 < 0$) (Limao and Venables, 2001).

- The product of the multilateral resistance term for the country pair.

After taking into consideration the explanations discussed above, and substituting (5) in (4), the estimated reduced-form boils down to :

$$h M_j = \alpha_0 + \alpha_1 h Y_i + \alpha_2 h Y_j + \alpha_3 h N_i + \alpha_4 h N_j + \alpha_5 h D_j + \alpha_6 h N_i + \alpha_7 h N_j + \alpha_8 L_j + \alpha_9 E_i + \alpha_{10} E_j + \mu_j \quad (7)$$

Where $\frac{A}{Y_w}$ is absorbed in the constant term.

This is a variant of the standard gravity model that can be extended or reduced depending on the effects to be captured.

Model Specification

The model used in this study borrows from the specification derived in the above section and will be briefly described. Before commencing this exercise, it should be noted that all variables are expressed in log form except for the binary variables.

$$T_{ij} = \beta_0 + \beta_1 GDP_i + \beta_2 GDP_j + \beta_3 POP_i + \beta_4 POP_j + \beta_5 DIST_{ij} + \beta_6 TP_{ij} + \beta_7 ENG_{ij} + \beta_8 FREN_{ij} + \beta_9 COMESA1 + \beta_{10} ASEAN + \beta_{11} COMESA2 + \beta_{12} ECOWAS + \beta_{13} CEMAC + \varepsilon_i \quad (8)$$

Where T_{ij} is the average dollar value of exports supplied by country j to country i. For the two sub-periods under consideration, we measure this variable as amount of imports from country j as recorded by country i's import figure. This measurement takes care of transportation costs, as imports are recorded in CIF values. Moreover, countries tend to monitor their imports more than their exports; hence this procedure should be more accurate than an approach based on export from the origin. T_{ij} depends on potential supply factors in country j, on demand factors in country i, and on factors that either promote or restrain the specific flows. The supply factors in country j depend on its economic size, which is assumed to vary directly with outflows of international merchandise trade. The economic size is usually proxied by Gross Domestic Product (GDP). For the exporter, a high level of income indicates a high level of production, which increases the availability of goods for exports. Consequently, GDP_j is expected to be positively related to trade. The coefficient on GDP_i is also expected to be positive since a

high level of income in the importing country indicates an increase in both the importer's purchasing power and ability to absorb large imports. The variable Tp_{ij} is the difference in per capita income between importing and exporting countries. This variable can be interpreted in two ways. On the one hand, Linder (1961) hypothesised that trade is not solely driven by supply factors as in the Heckscher-Ohlin-Samuelson and Ricardian models and argued that countries with similar living standards could realize a higher level of intra-industry trade to the extent that they share a broader range of goods to trade. On the other hand, to the extent that GDPPC differences are highly correlated with differences in factor endowments, inter-industry trade driven by comparative advantage could be smaller between countries with similar levels of income. Thursby and Thursby (1987) tested the first proposition by assuming that similarities in per capita income reflect similarities in demand. This interpretation is consistent with theoretical trade models based on the assumption of identical and non-homothetic preferences across countries. In our models, Linder's hypothesis is maintained if the coefficient on Tp_{ij} is significantly negative, that is the larger the differences in per capita income between two countries, the lesser the expected value of trade between them.

An alternative interpretation of Tp_{ij} inspired by Bergstrand (1989) is to regard it as a proxy for differences in factor intensity (i.e capital / labour ratio) between trade partners. The appeal of this interpretation is that it provides a link between the Heckscher-Ohlin-Samuelson model and the value of trade.

The next set of variables reflects trade constraining factors. Basically, these factors can be classified into artificial barriers and natural impediments to trade respectively. These components can to a reasonable extent, be regarded as total costs of transaction which include among others, costs of transportation, distance between trading partners, trade policies, and non-tariff barriers to trade such as import restriction, import licensing, foreign exchange rationing, just to mention a few. Some of these variables can be

quantified while others are qualitative.

We first present the quantitative variables. Total cost of transport is proxied by distance between the trading partners ($Dist_{ij}$). The choice of distance as proxy for transportation costs deserves some explanation. Although most gravity models used distance instead of transportation costs (Bergstrand, 1989; Elbadawi, 1997), efforts at generating transportation cost met multiple constraints. Notwithstanding these constraints, the use of distance as a proxy for transportation costs may not significantly bias the empirical findings. Ogunkola (1994) estimated the relationship between distance and transport cost and the correlation coefficients indicated that transportation costs and distance are substitutable. It is hypothesized that shorter distance among integrating members reduces resistance or impediments to trade and should be associated with higher levels of trade, and vice versa. The second variable, the population has an ambiguous sign. For the exporting country, the coefficient estimate for population depends on whether the country exports less when it is big (absorption effect) (Leamer and Stern, 1970; Linneman, 1966), or whether a big country exports more than a small country (economies of scale) (Brada and Mendez, 1983). The coefficient of the importer population may also be positive or negative for similar reasons.

Another set of variables in this category (Promotion / resistance variables) that is not measurable is captured through the use of dummy variables. Two sets of such variables are distinguished as cultural or proximity variables and artificial trade barriers. The effect of historical ties is captured by two dummy variables. These historical ties are assumed to be reflected in the official languages of the trading partners (Eng_{ij} , $Fren_{ij}$). Each of them takes a value of one if both partners share a common language or zero otherwise. Finally, the dummies capturing the effects of economic integration COMESA1, ASEAN, ECOWAS, CEMAC are assumed to stimulate trade. They take one if the co-operating countries belong to the same regional integration scheme and zero if one or neither belongs.

However, COMESA2 takes a value of one if the importing country is a member of COMESA and zero otherwise. While COMESA1 captures trade creation within the community, COMESA2 captures how much imports from outside the COMESA sub-region decrease because of the formation of the grouping (trade diversion).

Estimation Techniques

Trade data may involve zero values. Given the log specification, these would translate into undefined values. This problem of a limited dependent variable in a censored sample, which results in inconsistent parameter estimates if ordinary least squares estimation is used, has been tackled in a number of ways. The zero values may simply be discarded from the sample. This may solve the statistical problem, but comprises the economic analysis since important information may be embodied in these zero values. A second alternative is to replace the zero values with arbitrary small values. While this again remedies the statistical problem, it introduces arbitrariness into the analysis, which may distort the results. A third solution is to use an estimation technique such as the Tobit, which explicitly recognizes and deals with the zero values in the censored sample. This estimation treats zero or unrecorded trade flows as unobserved data points. This last solution will be used in this paper.

Data Collection

This study covers a sample of 27 reporting countries of which 20 are in SSA, and 32 partner states. The analytical period of the paper is from 1993 to 2002. This period is divided into two sub-periods on the basis of the pace of reform within COMESA. The first sub-period is chosen to be the average figures for 1993 – 1996, and the second is the average for 1998 - 2002.

It is worth reminding that our emphasis is on two different but related issues. The first is whether the unilateral as well as the preferential reforms that allowed the grouping to access to the Free

Trade Area (FTA) in 2000 have improved the intra-COMESA trade. The coefficients on COMESA1 will help to answer this question. The second issue deals with identifying the variables that account for the change in trade patterns among COMESA economies.

Annual imports and exports flows expressed in US\$ million are extracted from IMF's Direction of International Trade, African Development Indicators published by the World Bank and from the COMESA annual statistic publications (<http://www.comesa.org>). GDP, GDP per capita, population are from the World Bank's Economic and Social database (BESD). The distance variable data was generously provided by Alexandro NICITA (Development Research Group, World Bank, Washington, DC). It is the straight-line distance between economic centres of gravity of the respective countries.

EMPIRICAL RESULTS

We report the estimation results for the augmented version of the gravity model for 1993-1996 and 1998-2002. These estimates help to follow the behaviour of COMESA1, which is our variable of primary interest, and to compare it to COMESA2 so as to calculate (if possible) the net effect on trade of the creation of the community.

For the period 1993-1996, most of the variables come out with expected signs. The income of both the exporter and the importer indicates a strong positive relationship with the average export flows between the trading partners. The estimated coefficients on these variables are statistically significant at 1%. The elasticities are 1.19 and 0.61 for the exporter and the importer respectively, implying that the effect of 1% change in the GDP of the exporter generates about 1.199% change in the supply of foreign goods. This elasticity is higher than the effect of a corresponding change in the GDP of the importer on the demand for foreign goods.

Table 1: Regression results for the average data for 1993-1996 and 1998-2002.²

Right hand side variables	1993 - 1996		1998 - 2002	
	Coefficient	t-statistic	Coefficient	t-statistic
Constant	- 14.6	- 13.65*	- 15.2	- 16.01*
Ln(GDPi)	1.19	16.01*	1.24	18.8*
Ln(GDPj)	0.61	8.3*	0.78	11.93*
Ln(Distij)	- 0.34	- 3.16*	- 0.43	- 4.31*
Ln(POPi)	- 0.18	- 2.44**	- 0.20	- 3.00*
Ln(POPj)	0.12	1.5	0.04	0.52
Ln(tpij)	0.61	1.21	0.47	1.42
CEMAC	0.74	1.36	1.16	2.49**
COMESA1	2.89	5.00*	3.36	6.34*
COMESA2	- 0.92	- 3.64*	- 0.60	- 2.69*
ECOWAS	1.99	6.04*	2.00	6.63*
ASEAN	2.75	5.09*	2.04	4.07*
Frenij	1.04	4.00*	1.24	5.42*
Engij	0.86	4.13*	0.64	3.45*
Number of observations	-	694	-	707
Pseudo- \bar{R}^2	-	0.91	-	0.96
loglikelihood		-1401.72		-1416.25

Note: t-statistics are in parentheses. *, ** and *** imply significance at the 1, 5 and 10% levels respectively.

As expected, exports decrease with the transportation cost (Distij). This variable has the expected sign and is significant at 1%.

The origin population has a negative sign and is significant at 5%. This means that in the COMESA sub-region, a country exports less when it is big. This phenomenon highlights the importance of the absorption effect that tends to support the Leamer and Stern (1970) and Linneman (1966) views that population size has a negative effect on trade flows between countries, while it contrasts with the Brada and Mendez (1983) conviction. This result shows that an increase in population size leads to less reliance on foreign trade. The destination population has a positive sign but is not significant.

The difference in per capita GDP between the exporting and the importing countries (Tp_{ij}) has a positive sign and is not significant. There might be a problem of multicollinearity between the income variables and Tp_{ij} . However, another possible explanation for the positive sign is that the Heckscher-Ohlin effect (differences in factor endowments) dominates the Linder effect.

Concerning COMESA1, it is positive, and for the period under consideration, its effect is statistically significant at 1%. This means that over 1993-1996, the unilateral reforms that member states started under the Preferential Trade Area (PTA) in the context of the World Bank and IMF Structural Adjustment Programmes (SAPs) were already boosting the internal trade in the grouping. COMESA2 has the expected sign and is also significant at 1%. This denotes the simultaneous importance of trade diversion in COMESA during this sub-period. However, the net effect of the grouping on the intra-community trade is positive.³ Thus, over the sub-period under consideration, COMESA accounts for the positive change in the trade patterns in the sub-region.

Other preferential arrangement variables ECOWAS and ASEAN fundamentally influence intra-grouping trade. They are all significant at 1%. However, CEMAC has no effect on the internal trade in central Africa.

Cultural attributes as proxied by language yield good results.

English as well as French speaking countries tend to trade more with each other than would be expected. These two variables are all statistically significant at 1%.

Globally our regression estimates during 1993-1996 show that the net effect of regional integration in COMESA is a trade creation. After 1996, the pursuance of preferential liberalization continued to move. These new measures are supposed to increase the effects observed in 1993-1996 of COMESA on intra-community trade.

The second compartment of table 1 reports the regression estimates for 1998-2002. The income of the exporting countries has the expected positive sign, and is significant at the 1% confidence level. This confirms the idea that the higher the income of the exporters, the greater will be their production capacity and the amount they can export. It also indicates a greater ability to produce and export at a lower cost, all else remaining constant. The income of the importing countries also has a positive relationship with the export flows. It is significant at 1%. The elasticities on these variables show that a 1% change in the GDP of the exporter generates 1.24% change in the supply of foreign goods, while a corresponding change in the GDP of the importer induce only 0.78% change in the purchasing power and ability to absorb foreign goods.

With regard to the effect of natural trade barriers, it turns out as expected. Intra-COMESA trade flows decrease with the increase of the distance between trading members. This variable is significant at 1%.

The population effect of the exporter is negative and significant at 1%. Again, the absorption effect emerges. The population of the partner is positive and not significant.

Concerning the per capita income difference variable, the empirical version of Linder's hypothesis, which postulates that the volume of trade between two countries is a decreasing function of the difference in the countries' per capita income is not supported by our data. In fact, the coefficient on tp_{ij} is positive and insignificant. This is not surprising, since the Linder hypothesis had been rejected in

several studies (Gruber and Vernon, 1970; Sattinger, 1978; Kennedy and McHugh, 1980). The alternative interpretation of tp_{ij} , which hypothesizes that there exists a strong correlation between differences in per capita income and differences in capital-labor ratios between trade partners might be relevant in explaining the sign of tp_{ij} in our model. It is worth mentioning that the behaviour of this variable has not changed from 1993-1996 to 1998-2002, and its introduction lowers the model performance.

The dummy variable for economic integration in the COMESA sub-region (COMESA1) which is the variable of primary interest comes out with positive sign, and is significant at 1%. This means that COMESA continues to be effective in creating trade after the wave of unilateral and preferential reforms in the sub-region. Intra-COMESA trade is about 1059.1%⁴ above what could be expected from the gravity model. These findings support the view that the failure of various regional integration groups in SSA to increase the trade flows among the integrating countries was due to the inability and / or unwillingness of these states to carry out the preferential trade liberalization measures that represent the prerequisite for trade creation among cooperating markets (Faroutan and Prichett, 1993). Concerning COMESA2, which is designed to capture trade diversion in the sub-region, it comes with a negative sign as expected, and is also significant at 1%. It appears therefore that trade creation and trade diversion simultaneously occur in COMESA. The net effect of COMESA on intra-grouping trade flows after the wave of economic reforms is a trade creation of about 1038.9%. Thus, compared to 1993-1996, the net increase of trade creation is 391.56%.

As concerns other regional integration dummies ASEAN, ECOWAS, CEMAC, they all exhibit a positive and strong relationship with the internal trade in their respective groups. With regard to the proxies used for "cultural similarities" they turn out to be positive and highly significant.

CONCLUSION

The aim of this paper was to assess the determinants of the internal trade in COMESA after the wave of unilateral and preferential economic reforms undertaken in almost all the countries of this sub-region in the first half of 1990s and during the early 2000s. We placed special emphasis on the effects of regional integration on the community trade flows.

The gravity model was applied to annual bilateral exports between 27 reporting countries and 32 partner states during 1993-1996 and 1998-2002. Our findings show that exporter and importer GDP as expected have a positive relationship with the bilateral trade flows during the two sub-periods under consideration. Income elasticities are close to unity as predicted by the theory. The exporter population both in 1993-1996 and in 1998-2002 has a negative effect on exports showing a positive absorption effect, whereas the importer population has a positive effect on exports, in the two sub-periods, but isn't significant. As expected, exports decrease with the increase of distance between the trading partners.

With reference to intra-COMESA trade, the preferential dummy variable (COMESA1) presents a positive sign and is statistically significant in the two sub-periods. This suggests that belonging to this preferential arrangement fosters trade. After testing intra-bloc trade in 1993-1996 and in 1998-2002, we find a statistically significant change in the propensity for internal trade in the grouping. The high level of significance of the regional integration dummy in the second period is a convincing evidence of trade creation. The second preferential dummy variable (COMESA2) designed to capture trade diversion has the expected sign and is significant in both sub-periods. This means that, over the period under consideration, both trade creation and trade diversion occur simultaneously in COMESA. However, the dominating effect of trade creation is

high. It comes from this development that the net effect of COMESA on intra-grouping trade flows after the wave of economic reforms is positive. These results support our hypothesis that unilateral and preferential suppression of tariff and non-tariff trade barriers increase the level of intra-grouping trade. Furthermore these findings support the view that the failure of various regional integration groups in SSA to increase the trade flows among the integrating countries was due to the inability and / or unwillingness of these states to carry out the preferential trade liberalization measures that represent the prerequisite for trade creation among cooperating markets (Faroutan and Prichett, 1993). With respect to the title of the paper, our results finally show that the accession of the COMESA to the Free Trade Area has increased the intra-community trade in the sub-region. Other preferential dummy variables, namely ASEAN, ECOWAS, fundamentally influence bilateral trade. However, CEMAC only positively impacts on trade among its member states in the second sub-period. The proxies used for "cultural similarities" have a positive effect on intra-COMESA trade flows since they are positive and highly significant.

One recent criticism of the gravity equation framework adopted in our paper that is similar to much previous work in the literature, is its failure to control for the 'multilateral Resistance' terms as pointed out by Anderson and Van Wincoop (2003). The idea is that

bilateral trade depends not only on the bilateral trading barriers between a pair of countries, but the barrier for that pair relative to the barriers with other trading partners. Anderson and van Wincoop (2003) derive a gravity equation that includes 'multilateral resistance' terms. These 'multilateral resistance' terms are country specific implicit price indexes, which depend on trade barriers. However, country specific price indexes are difficult to construct. Therefore, to check for robustness of our results we also estimated our equation with bilateral imports as the dependent variable and the results are qualitatively similar to those obtained with bilateral exports.

In general, this paper has amply demonstrated that the traditional explanatory variables of the gravity model are the significant determinants of trade flows in the COMESA region. Hence policy advice should focus on strengthening these factors, which are likely to enhance the possibility of greater intra-regional trade. This can contribute to drawing foreign direct investment to the region, enhancing policy credibility, and bringing greater economic and political stability. This paper has also highlighted the importance of a combination of unilateral and preferential economic reforms in sub-Saharan African preferential trade arrangements. This insight is particularly important in this era of increased economic regionalism and globalization.

ENDNOTES

¹ Angola, DRC, Ethiopia, Swaziland, Djibouti.

² Initial estimates indicated that it made little difference whether we used bilateral exports or imports as the dependent variable, so we report only results using exports.

$$^3 e^{(2.9 - 1)100} - e^{(-0.9 - 1)100} = 647.37\%$$

⁴ The model was estimated in logs. Thus the percentage equivalent for any dummy is: $\exp(\text{dummy coefficient} - 1) \times 100$. The intra-bloc coefficient for CEMAC is 3.36.

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APPENDIX I

Reporting Countries

Cameroon, Central African Republic (CAR), Chad, Republic of Congo, Gabon, Côte d'Ivoire, Benin, Burkina Faso, Ghana, Nigeria, Togo, Senegal, Burundi, Mauritius, Democratic Republic of Congo, Kenya, Zambia, Zimbabwe, Malawi, Uganda, Tanzania, Egypt, Indonesia, Malaysia, Thailand, India, Singapore.

Partner Countries

Cameroon, Central African Republic, Chad, Republic of Congo, Gabon, Côte d'Ivoire, Benin, Burkina Faso, Ghana, Nigeria, Togo, Senegal, Mali, Burundi, Mauritius, Democratic Republic of Congo, Kenya, Zambia, Zimbabwe, Malawi, Tanzania, Egypt, Indonesia, Malaysia, Thailand, India, Singapore, Morocco, Brazil, Mexico, Argentina

APPENDIX II

FTA COUNTRIES	NON-FTA COUNTRIES	
No duties or charges of equivalent effect	Country	Rate of Tariff Reduction
Burundi Djibouti Egypt Kenya Madagascar Malawi Mauritius Rwanda Sudan Zambia Zimbabwe	Comoros Eritrea Uganda Angola D. R. Congo Ethiopia Swaziland	80% 80% 80% Nil Nil 10% On derogation, pending Southern Africa Customs Union (SACU) agreement allowing country to join FTA

