Int Adv Econ Res (2009) 15:278–295
DOI 10.1007/s11294-009-9212-0

ORIGINAL PAPER

# Is Economic Integration the Solution to African Development?

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Published online: 12 May 2009


**Abstract** In the African continent, several regional initiatives have been launched or executed. These gave rise to several groupings including COMESA consisting of 19 countries, ECOWAS (15 countries), ECCAS (10 countries), and SADC with 15 countries. These groupings are not exclusive in that several countries belong to more than one regional group. The road to full integration clearly begins with a regional arrangement. The many groupings in Africa had the long term goal of creating an all inclusive African Economic Union. The objective is to promote the African continent's economic growth, political stability, and good governance. The paper examines the effectiveness of some of these regional grouping in the context of an all-inclusive African club with the aid of the club model. Using data for the period 1986–2005, costs and benefits of membership are evaluated using the gravity Model. The Helpman's size dispersion index is used to identify a potential anchor for a regional grouping.

**Keywords** Regional integration in Africa · The club model · The gravity equation

**JEL** G11 · F15

## Introduction

A new global order has emerged in the 20th century with national borders no longer defining economic interactions. Deep integration, both political and economic of states formally autonomous, did bear fruits. One needs only to recite the gains

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achieved by the EU to inspire other countries to follow suit. Yet, integration of countries in a continent as vast as Africa poses extreme challenges. With patience, will power, and determination, the answer to the elusive objective of the development of the continent may indeed be found.

Optimism about the future unification or full integration of the African continent aside, one has to look at current outlook and assess the prospects of integration in Africa. To do so, one needs to examine a bit closely the gains achieved by current efforts being exerted towards the goal of integration as well as the obstacles that have to be overcome to achieve the goals set up by regional groupings—this being the basis of the paper.

The organization of this paper is as follows: the first section "Initiatives Towards the Integration of the African Economies" provides a brief overview of two major regional blocks in the African continent and discusses the foundation of economic/political blocks referred to here as the club model. Section "Prospects for an all Inclusive African Club" discusses the club model and the gravity equation. Next, in Section "Empirical Results", a gravity model is estimated to ascertain the potential gains from regional membership. The Helpman dispersion index is used to identify a potential anchor for a regional group. The final section concludes.

## Initiatives Towards the Integration of the African Economies

### Initiatives

In the African continent, several initiatives have been launched or executed giving rise to several country groups. These grouping of members are not country exclusive in that a country can belong to more than one group—Angola, Burundi, D.R. Congo, Madagascar, Malawi, Mauritius, Seychelles, Swaziland, Zambia and Zimbabwe—(see Table A-1 in the Appendix).

To understand the selection process, belonging to one group or another, one has to look at the underlying philosophy that constitutes a regional group, henceforth, will be referred to as the club (see Ott et al. 2003). At the foundation of the club, arrangement is closer interaction for the benefit of members.

Africa is a vast continent with 56 countries where the majority of the countries (50) are in the Sub-Saharan region and the rest (6) in North Africa; hence, the formation of a club may not be easy (see Appendix Table A-2).

Nonetheless, the analysis that follows will focus on all of Africa, what we term the African Universe. In addition to the full sample, we take a look at two major regional groupings COMESA and ECOWAS to identify an anchor group to serve as the building block towards the establishment of an all inclusive African club. With this goal in mind, it is worthwhile to begin with a look at the membership of the two groups.

### Regional Arrangements as Clubs

James Buchanan (1965) was the first to formulate an economic theory of clubs. Buchanan provided a framework for analyzing a club good and the optimal

membership. Other notable contributions include Berglas (1976); Sandler and Tschirhart (1980); Sternberz and Sandler (1992) to name a few. In the context of African regional grouping, the two issues that we need to discuss are: the club good, hence the objective of the regional arrangement and secondly, the group membership.

As to the good, all regional groups aim (sooner or later) for the establishment of an economic union. Thus, one may ascribe to the club good, the character of a collective good (a la Buchanan), which is the attainment of full integration for its members. With respect to membership, it is less clear that the membership in any one of several regional groups such as COMESA or ECOWAS, is either optimal or beneficial to its members compared to an alternative arrangement. The political economy of club formation suggests that to pass a judgment on the success, actual, or potential requires an evaluation of the costs and benefits of membership. In the African context, one needs to extrapolate from the data these costs and benefits. The example of EU may give clues as to the benefit and costs of membership to the union.

## Costs and Benefits of Membership

The motives behind the formation of a club are clearly varied. In the African continent, the stated motive or objective is economic integration which is presumed to be the foundation for economic growth and prosperity. Other motives obviously cannot be ruled out: political stability, exercise of political power in the global economy, or improving the continent's image in the international arena. One can deduce the motive(s) from the pronouncement that usually accompanies the formation of the regional grouping, but the ultimate judgment is reached as time goes by. Aside from the underlying motive, a club arrangement cannot be viable unless it satisfies a communality of interests.

## Key Parameters in Club Formation

An analysis of a club or a regional grouping usually starts with identifying the costs and benefits of membership. The cost of belonging to one club and not another as well as the allocation of benefits of membership depend on the shared good. Thus, the size of the group is important for two reasons: the distribution of benefits and the cost of including an extra member. In a formal model, the size of the sharing group as well as the benefits of belonging enters in the group member's utility function. A cost function is spelled out in terms of conditions the member has to meet and the size of membership (negative externality). From the usual maximization conditions, the optimal group size is obtained. Here, it suffices to point out that the optimal choice for a country belonging to one group say COMESA versus ECOWAS entails country specific calculations of benefits and costs of membership. Rather than duplicating the excellent work that has been done with analyzing regional groupings in Africa as separate entities, the procedure followed here is to look at the African continent as one Universe, which consists of 49 members. Limiting the analysis to 49 countries rather than the 56 African nations is dictated by data availability.

## The African Universe: Attributes

The African Universe is marked by a high degree of diversity among its members. Sorting among these attributes enables us to determine optimal membership. Attributes are used as a proxy for the shared club good denoted here as communality of interest. A profile of selected attributes for the African Universe is given in Table 1. The table gives a summary of these attributes for the African Universe sample and the two regional groups. Table A-1 in the Appendix gives the attributes for individual countries. The data reported in Table 1 warrants a few comments.

First, countries in the African Universe sample share a communality of interest which is the development of the African continent. From the data in the table, the African Universe sample is clearly far from being homogenous. The African countries differ in several key attributes. To highlight their diversity, we focus first on the so-called fractionalization index. Calculated by Alesina et al. (2003), it depicts the likelihood that two individuals in a country (say Angola) selected at random would share the given attribute. Looking at one variable, ethnicity, within and between groups, the index tells us something about this aspect of diversity. The same goes for language and religion.

Examining first the Ethnic variable, the probability that two individuals in one country or region belong to the same ethnic group is calculated as *1—**index value.*** For ECOWAS, the probability is quite low (1–0.739); within COMESA, this probability is a bit higher (1–0.557). For individual countries, the probability varies, it is in the range of 0.94 (Swaziland), 0.82 (Egypt) and 0.71 for Burundi.

With respect to language and religion, there too has a great deal of diversity that exists within each country and for each group. Taken together, the fractionalization index data by itself does not provide information as to whether or not members in a particular regional group in the African universe share communality of interest.

Turning to the democracy variable, the rating shows diversity in the political structure. As shown in Table 1 nearly 42% of COMESA members are classified as

**Table 1** Summary profile of attributes

| Attributes | Universe (*n=49)* | COMESA (*n=19)* | ECOWAS (*n=15)* |
|---|---|---|---|
| Fractionalization: | | | |
| *Ethnic* | 0.642 | *0.557* | *0.739* |
| *Language* | 0.600 | *0.480* | *0.783* |
| *Religion* | 0.448 | *0.476* | *0.446* |
| Democracy: | | | |
| *Free* | 0.163 | *0.052* | *0.333* |
| *Partly free* | 0.448 | *0.526* | *0.466* |
| *Not Free* | 0.387 | *0.421* | *0.200* |
| Corruption ratings: | | | |
| 0.0–4.0 (corrupt) | 2.80 | 2.74 | 2.75 |
| Literacy rate: | 61.18 | 71.07 | 45.98 |

Not Free whereas only 20% are classified as such for ECOWAS. In the African universe the percentage is nearly 39%. The general observation is that the label Partly Free characterizes the majority of regimes in the African universe.

The last two variables, corruption scores and literacy rates deserve a great deal of attention as the social fabric of society depends critically on human infrastructure. A high literacy rate reduces the probability of both bad governance (corrupt rulers) and autocracy. As individual country data reveals except for a few cases (Ethiopia and Comoros), the literacy rate of members of COMESA ranges from 60% to 92%. This attribute provides at least a modicum of homogeneity among the population. Members of ECOWAS have by far the lowest literacy rates with more than half of the member countries reporting literacy rates below 50%. The corruption rating is also disheartening in that, with the exception of South Africa, none of the Sub-Saharan African countries had a rating exceeding 4, the cut-off point between corrupt and less corrupt.

To summarize: The profile of attributes presented by groups (Table 1) or by country (Appendix A-1) provides but a few clues to the basis for belonging to one regional group vis-à-vis another. The suitability of membership in a particular group may perhaps be a function of economics rather than social or political variables. This is not surprising in view of the fact that the ultimate objective of regional integration is the creation of an African Economic Union, a structure similar to the EU. Accordingly, we present in the next section data on key economic variables.

## Economic Indicators

The three economic variables that are commonly used as criteria for a regional membership are: the inflation rate ($\pi$), government deficit to GDP ratio ($g$) and government debt to GDP ratio ($d$). The growth rate of per capita GDP ($y$) is looked at to determine the growth prospects of an economy joining an economic club. The Maastricht treaty values for $\pi$, $g$ and $d$ are used as guidelines. In the African context, this may or may not be appropriate as the level of economic development is quite dispersed within the continent. Nonetheless, we will rely on these values not as the ultimate criteria for membership for the African countries but as a basis for comparing the economic path of a given country within a given regional group.

Except for data on the inflation rate and GDP growth, many countries in Africa are not forthcoming in reporting government budget numbers, budget balance as well as the levels of government debt. These two variables independent of whether or not they are criteria set by the Maastricht treaty are critical for predicting the growth path and the potential progress of an economy.[1] Concerted effort was made to fill as much of the gap in the data as possible on ($g$) and ($d$). In Table 2, average values for three variables over the period 1986–2005 are reported for 18 countries

[1] Maastricht criteria are *a*) $\pi \leq$ twice the average of the three lowest inflation rates of member countries or three percentage points of the average if it is greater than 3%; *b*) the budget deficit must not exceed 3% of GDP and *c*) total public debt $\leq$ 6% of GDP.

**Table 2** Criteria for membership in an economic club for the African countries (Averages for 1986–2005 and 2002–2005)

| Country | $g^a$ | | $\pi$ | | $y$ | |
|---|---|---|---|---|---|---|
| | 1986–2005 | 2002–2005 | 1986–2005 | 2002–2005 | 1986–2005 | 2002–2005 |
| Benin | −0.19 | −0.4 | 4.69 | **3.2** | 0.23 | 0.30 |
| Burkina Faso | −4.09 | −4.1 | 2.53 | 9.6 | 1.93 | 2.78 |
| Central African Republic | −0.46 | −0.5 | 2.70 | 8.8 | −1.58 | −2.73 |
| Congo, Dem. Rep. | −5.25 | 0.6 | 1,892.84 | 7.3 | −4.60 | 2.44 |
| Cote d'Ivoire | −0.25 | −1.0 | 4.13 | **2.2** | −1.38 | −1.66 |
| Egypt, Arab Rep. | −2.62 | −4.7 | 10.63 | 14.1 | 2.11 | 1.87 |
| Ethiopia | −7.93 | −7.9 | 4.41 | 5.7 | 1.53 | 2.56 |
| Ghana | −4.27 | −3.5 | 27.15 | 16.8 | 1.96 | 2.98 |
| Kenya | −0.82 | 0.0 | 11.01 | 10.9 | 0.24 | 0.90 |
| Madagascar | −2.15 | −1.7 | 15.82 | 27.7 | −0.69 | −1.07 |
| Mali | −3.12 | −2.8 | 3.70 | 9.9 | 1.84 | 1.86 |
| Mauritius | −1.66 | −3.1 | 7.19 | 3.9 | 4.45 | 2.88 |
| Namibia[b] | −3.45 | −3.9 | 9.55 | **2.7** | 1.02 | 3.95 |
| Seychelles | −6.49 | 0.6 | 2.93 | 8.4 | 2.18 | −2.11 |
| Sierra Leone | −7.39 | −5.5 | 43.63 | 11.2 | −0.72 | 8.08 |
| Swaziland | −2.59 | −2.6 | 11.30 | 7.4 | 1.91 | 1.11 |
| Uganda | −1.89 | −2.3 | 41.62 | 19.7 | 2.58 | 2.48 |
| Zambia | −0.70 | −0.8 | 54.70 | 280.1 | −0.50 | 2.85 |

[a] For some countries data were not available for each year in computing the average

[b] Namibia dropped from COMESA in 2004

where this information was mostly available for every year. Table A-3 in the Appendix gives average values for $\pi$, $y$, $g$, and $d$ for the African universe countries computed over the period 1986–2005.

Focusing on the inflation path reported in the table for the 2000–2005 period, we note that three countries: Benin, Cote d'Ivoire and Namibia record the lowest rates in the sample. The average of the lowest three countries is 3.76%. The Maastricht criterion is twice this average or 7.5%. Based on this value, we find four countries: Congo D.R., Ethiopia, Mauritius and Swaziland to have met the $\pi$ criterion, putting the total of countries at 7 or 40% of the sample countries for which data was available.

The second criterion (g) requires a deficit to GDP not in excess of 3%. From the 2000–2005 averages for this variable, 11 of the 18 countries in the table did meet it. Only one country, Ethiopia had a deficit to GDP ratio more than twice the criterion. Except for some trouble spots, Zambia ($\pi$=280%), Madagascar ($\pi$=27.7%), Uganda ($\pi$=19.7%) and Egypt ($\pi$=14.1%) the recent years have seen a great deal of improvements especially for Congo D.R. a reduction in the inflation rate from 1,892% to 7.3%.

## Prospects for an all Inclusive African Club

### The Club Model

The economic theory of club emphasizes two elements for the success of a shared arrangement: the size of the sharing group and the cost of membership. On the one hand, we may have a club size of one, no integration of economies, if the cost of membership exceeds the benefits. One can think of a case where trade diversion exceeds trade creation, that is when integration does not yield Pareto gain (Markusen (1981), Helpman (1984) and Feenstra (2004)). A club size in excess of one suggests that Pareto gain is feasible. The optimal arrangement for each country depends on many factors: the size of the country and the market structure for its industries. Since Graham (1923), the arrangement has been made that industries under monopolistic competition and increasing returns may give rise to losses from opening up trade. The size of the country also matters. According to Markusen (1981) for two countries that are identical except for their size, the smaller country would experience an increase in trade under monopolistic competition but not the large country. The welfare effects of regional arrangements are country specific—that is each country (just like every individual joining a club) needs individual assessment of cost and benefits as there is no one rule that fits all.

Given the nature of this calculus, whether or not a specific regional arrangement yields Pareto gain, predictions about potential benefits of membership employ the well known gravity model. With this framework, one makes an empirical assessment of the potential of a regional arrangement.

The gravity model has been used extensively to evaluate the EU and some regional groupings in Africa and elsewhere (McKay (1997), Nilsson (2000), Oguledo and Macphee (1994), Musila (2005), Carmignani (2006) and Harvey et al. (2001) to name a few).

Using the gravity equation we hoped that we might gain insight as to the critical parameters that signal potential success for regional membership in Africa. The empirical analysis provides tests of two key propositions: the welfare effects of regional arrangement depend on transportation costs, and that the value of intra country trade will be related to the relative size of countries.

Using the Helpman (1987) size dispersion index, we try to identify an anchor country or a regional group to be the nucleus for the integration of all Africa. The presence of a large and stable anchor country is said to be "a necessary condition for success" (Harvey et al. 2001).

### The Gravity Equation

The empirical formulation of the gravity equation is given in Leamer and Stern (1970). Since then, it has been subjected to serial revisions and empirical testing (for references see Feenstra (2004)). The basic idea of the gravity equation is that bilateral trade flows between two countries ($i$,$j$) are determined by three sets of variables: variables that indicate potential demand of the importing countries, variables that indicate potential supply of the exporting countries, and variables that aid or hinder trade (resistance). These later group of variables have gained importance in determining potential gain and loss from regional arrangements. Thus, country size,

market structure, transportation costs, scale effects, and so on are critical for the success of regional integration.

The original formulation of the gravity model takes the form:

$$X_{ij} = \alpha_{ij} Y_i^{\alpha_1} Y_j^{\alpha_2} YP_i^{\alpha_3} YP_j^{\alpha_4} R_{ij}^{\alpha_5} \tag{1}$$

Where

$X_{ij}$ Trade flows from country $i$ to country $j$
$Y_i$ gross domestic product of country $i$
$Y_j$ gross domestic product of country $j$
$YP_i$ per Capita GDP of country $i$
$YP_j$ per Capita GDP of country $j$
$R_{ij}$ resistance factors

The empirical specification takes the form given by Eq. (2). The equation posits a positive relationship between the volume of bilateral trade (between country $i$ and country $j$) and the product of the GDPs. Factors that aid or hinder trade ($R_{ij}$ in Eq. 1) includes: distance as proxy for transportation costs, whether or not they share a common border, common language and membership in a regional group. The empirical model is:

$$\begin{aligned} ln\, RVOL_{ijt} = {} & \alpha_0 + \alpha_1\, ln\left(RGDP_{it} \cdot RCDP_{jt}\right) + \alpha_2\, ln\left(RGDPP_{it} \cdot RGDPP_{jt}\right) \\ & + \alpha_3\, ln\, DIST_{ij} + \alpha_4 LANG_{ij} + \alpha_5 BORDER_{ij} + \alpha_6 ORG_{ijt} + \mu_t \\ & + \nu_i + \eta_j + \lambda_{ij} + \varepsilon_{ijt} \end{aligned} \tag{2}$$

An alternative specification is to replace ($RGDPP_{it} \cdot RGDPP_{jt}$) with the product of populations:

$$\begin{aligned} ln\, RVOL_{ijt} = {} & \beta_0 + \beta_1\, ln\left(RGDP_{it} \cdot RCDP_{jt}\right) + \beta_2\, ln\left(POP_{it} \cdot POP_{jt}\right) \\ & + \beta_3\, ln\, DIST_{ij} + \beta_4 LANG_{ij} + \beta_5 BORDER_{ij} + \alpha_6 ORG_{ijt} + \mu_t + \nu_i \\ & + \eta_j + \lambda_{ij} + \varepsilon_{ijt} \end{aligned} \tag{3}$$

In Eq. (3) specification, $\beta_1=(\alpha_1+\alpha_2)$ and the coefficient $\beta_2=-\alpha_2$.

In both equations, $\mu_t$ is the time-specific effect, $\nu_i$ is the country $i$ specific effect, $\eta_j$ is the country $j$ specific effect, $\lambda_{ij}$ is a random effect of a cross sectional unit (group of two countries), $\lambda_{ij} \sim$ idd $\left(0, \sigma_\varepsilon^2\right)$ and $\varepsilon_{ijt}$ is a purely random shock. Equations (2) and (3) are both estimated for the African universe sample.

To identify an anchor we calculate Helpman's size dispersion index. The index is given by:

$$\frac{Volume\ of\ trade\ in\ A}{GDP^A} = s^A \left(1 - \sum_{i \in A} \left(s^{iA}\right)^2\right) \tag{4}$$

Where

$$s^A = \frac{GDP^A}{GDP^U}$$

$GDP^A$ is the GDP in group A and $GDP^U$ is the GDP of the universe. The term in parenthesis is the size of the dispersion index. The index shows how the volume of trade is related to the relative size of countries.

## Empirical Results

Three sets of estimates are provided. The first is for the full sample, the African universe, and the other two are for the subsamples. The data covers the period of 1986–2005, a total number of observations of the dependent variable equals to 23,619.[2] Trade data comes from the Direction of Trade (DoT) CD-ROM data set provided by the International Monetary Fund (IMF). The sample of the African universe is censored since the dependent variable is left-truncated at the value of zero. Bilateral trade on FOB exports and CIF imports is collected in US dollars. Each of the values was deflated using the Consumer Price Index (CPI) for all urban consumers. Variables like population and GDP (in constant US dollars of 2000) were obtained from the World Bank's "World Development Indicators," the IMF's "International Financial Statistics" and the Penn World Table mark 6.2. The CIA's "World Fact book" was used as a source for some of the country-specific variables, which include: shared borders, languages, and organization membership. Finally, distances were measured using the great circle distance from capital city to capital city.[3]

The regression results presented in the next three tables (Tables 3, 4 and 5) include two estimates for each model: random effects and fixed effects. The gravity model was first estimated treating countries and time effects as fixed. The model was then tested for correlation of group-specific effects $\lambda_{ij}$ with explanatory variables using the Hausman test. The Hausman test did not reject the random effect specification. Both the random effect and the fixed effect estimates are given in the tables.

Table 3 gives the regression estimates for Eqs. 2 and 3 using the full sample while estimates given in Table 4 pertains to the ECOWAS grouping, and in Table 5 the estimates for COMESA are given. The gravity model estimates with country and time dummies are given in the Appendix Table A-4.[4]

We begin the discussion by looking at the estimates for the full sample. As may be seen for Table 3 (and Table A-4), the gravity model specified in Eqs. 2 and 3 performs quite well. The coefficients and the natural logarithm of the product of real GDPs have the correct sign and are significant at the 1% level. In Eq. 3 the coefficient on the logarithm of the product of per capita real GDP was negative and significant as would be expected but was positive and significant in the random effect estimate. The literature supports the positive coefficient, thus favoring the random effect estimation.

The other variables were performed as expected. Distance, a proxy for transportation cost, was negative and significant, common language was positive

[2] The number of observation is about one half of the 47,040 possible data points due to missing values.
[3] http://www.chemical-ecology.net/java/lat-long.htm
[4] Time and country dummies were taken out of the final presentation of Table A-4 due to space issues.

**Table 3** Estimation results: Gravity model the full sample 1986–2005

| Variables | Equation 2 | | Equation 3 | |
|---|---|---|---|---|
| | (1) Fixed | (2) Random | (3) Fixed | (4) Random |
| *lgdpij* | 0.847*** | 0.688*** | 0.574*** | 0.799*** |
| | (0.036) | (0.020) | (0.041) | (0.027) |
| *lgdp_pij* | −0.273*** | 0.111*** | | |
| | (0.058) | (0.031) | | |
| *border* | | 1.705*** | | 1.705*** |
| | | (0.200) | | (0.200) |
| *ldist* | | −1.315*** | | −1.315*** |
| | | (0.079) | | (0.079) |
| *language* | | 0.302*** | | 0.302*** |
| | | (0.098) | | (0.098) |
| *org1* | −0.130** | 0.115** | −0.130** | 0.115** |
| | (0.065) | (0.059) | (0.065) | (0.059) |
| *lpopij* | | | 0.273*** | −0.111*** |
| | | | (0.058) | (0.031) |
| *Constant* | −20.714*** | −9.668*** | −20.714*** | −9.668*** |
| | (1.175) | (0.899) | (1.175) | (0.899) |
| Observations | 23619 | 23619 | 23619 | 23619 |
| R-squared | 0.039 | 0.333 | 0.039 | 0.333 |
| ρ | 0.765 | 0.659 | 0.765 | 0.659 |
| Number of id | 1899 | 1899 | 1899 | 1899 |

Standard errors in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$

where

lgdpij= log of the product of GDP of country i and country j

lgdp_pij= log of the product of per capita GDP of country and country j

border=dummy that is equal to 1 if country i and country share a border and 0 otherwise

ldist= log of distance between the capital city of country i and the capital city of country j

language=dummy that equals 1 if country i and country j have at least one language in common

lpopij= log of the product of populations of country i and country j

and significant, and the sharing of common border was also positive and significant. Belonging to a regional group indicated by the variable ORG1 (either ECOWAS or COMESA), in the random effect, estimates had the correct sign—it enhances bilateral trade—and was significant at 5% level.

When the log of the product of populations (LPOPij) replaces the log of the product of per capita GDPs, the random effect estimates produce virtually the same results for the resistance variables. The coefficient of population as expected is negative; as stated by Frankel (1997, p. 57), this captures "the well known

**Table 4** Estimation results: Gravity model: subsample ECOWAS 1986–2005

| Variables | Equation 2 | | Equation 3 | |
|---|---|---|---|---|
| | (1) Fixed | (2) Random | (3) Fixed | (4) Random |
| *lgdpij* | 0.948*** | 0.762*** | 0.536*** | 0.834*** |
| | (0.060) | (0.036) | (0.076) | (0.052) |
| *lgdp_pij* | −0.412*** | 0.072 | | |
| | (0.105) | (0.061) | | |
| *border* | | 1.094*** | | 1.094*** |
| | | (0.328) | | (0.328) |
| *ldist* | | −1.603*** | | −1.603*** |
| | | (0.118) | | (0.118) |
| *language* | | 0.690*** | | 0.690*** |
| | | (0.162) | | (0.162) |
| *lpopij* | | | 0.412*** | −0.072 |
| | | | (0.105) | (0.061) |
| *Constant* | −23.369*** | −10.321*** | −23.369*** | −10.321*** |
| | (1.940) | (1.444) | (1.940) | (1.444) |
| Observations | 7715 | 7715 | 7715 | 7715 |
| R-squared | 0.048 | 0.387 | 0.048 | 0.387 |
| ρ | 0.755 | 0.614 | 0.755 | 0.614 |
| Number of id | 595 | 595 | 595 | 595 |

Standard errors in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$

phenomenon that larger countries tend to be relatively less open to trade as a percentage of GDP."

Turning to the subsample results (Tables 4 and 5), we find no significant difference to exist between model estimates from the full sample (African universe) and the ECOWAS regional grouping. For COMESA, the one variable that differed in terms of significance is language. This is not surprising as COMESA encompasses a more widespread geographical area than ECOWAS and hence more languages are spoken by the various populations (see profile of attributes by country, Table 1-A).

The results in totality confirm the hypotheses advanced earlier: gains from regional arrangements depend on transportation costs; that intra-country trade relates to the size of the member country.

Several researchers in the field of development as well as African scholars are currently participating in evaluating African countries membership in some of the many regional groups that have already been established. As mentioned earlier, Harvey et al. (2001) have argued that one condition for success is the presence of a large and stable anchor country. Another condition is that regional integration be a part of an overreaching strategy of global integration. The second condition was put to test in the paper in using the African Universe as the unit of analysis. As to the

**Table 5** Estimation results: Gravity model subsample COMESA 1986–2005

| Variables | Equation 2 | | Equation 3 | |
|---|---|---|---|---|
| | (1) Fixed | (2) Random | (3) Fixed | (4) Random |
| *lgdpij* | 0.884*** | 0.612*** | 0.797*** | 0.867*** |
| | (0.062) | (0.037) | (0.070) | (0.048) |
| *lgdp_pij* | −0.086 | 0.256*** | | |
| | (0.094) | (0.051) | | |
| *border* | | 1.754*** | | 1.754*** |
| | | (0.385) | | (0.385) |
| *ldist* | | −1.609*** | | −1.609*** |
| | | (0.155) | | (0.155) |
| *language* | | −0.080 | | −0.080 |
| | | (0.188) | | (0.188) |
| *lpopij* | | | 0.086 | −0.256*** |
| | | | (0.094) | (0.051) |
| *Constant* | −24.849*** | −5.712*** | −24.849*** | −5.712*** |
| | (2.143) | (1.795) | (2.143) | (1.795) |
| Observations | 8706 | 8706 | 8706 | 8706 |
| R-squared | 0.041 | 0.274 | 0.041 | 0.274 |
| ρ | 0.787 | 0.707 | 0.787 | 0.707 |
| Number of id | 686 | 686 | 686 | 686 |

Standard errors in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$

second condition, the presence of a large and stable anchor country, we explored this using the Helpman dispersion index. The index calculation did not provide us with an anchor country, rather it allows us to select a regional group (from the two studied) as the nucleus around which the full integration of Africa may proceed.

This would emulate the integration of the European region which began with the six original members of the Treaty of Rome.[5] Tracing the time path of trade to GDP over the period of 1986–2005 for the two groupings, ECOWAS and COMESA, the dispersion index suggests that ECOWAS may serve as the anchor for future integration of the African Universe.

Back in 1986, the value of trade to GDP was around 5.6% for ECOWAS and 3.6% for COMESA; the ratios of GDPs to the GDP of the full sample were 12.6% and 33.0 % respectively. Over the twenty years period, ECOWAS had made inroads both in terms of its intra-area trade and its share of the total GDP, the GDP ratio rising from 12.6% to 14,6%. Although COMESA had an increase of its intra-area trade, its share of the total GDP remained almost the same at 33%.

[5] The original members were: France, West Germany, Italy, Belgium, Netherlands and Luxembourg.

## Conclusion

The paper explored the prospects for an all inclusive African Economic Club using the economic theory of club and the EU criteria for membership. Given the success of the EU, it was natural to use said criteria. Unfortunately, lack of data, particularly for the government budget balance and the government debt, made it difficult to apply the criteria to the full sample. This deficiency clearly needs to be addressed so that the research efforts bear fruit. Next, we investigated the efficiency of regional arrangements using the gravity model. Model estimates are given for the full sample, a sample of 49 countries, and for two subsamples, ECOWAS and COMESA. As the empirical results suggest, ECOWAS seems to be gaining both in terms of the volume of trade and GDP relative to the full sample. Moreover, on the basis of the profile attributes of all the countries in the full sample, members of ECOWAS appear to be more homogeneous in terms of ethnicity, language, and religion than COMESA, although they lack significantly behind COMESA in the literacy rate. Unfortunately, the lack of economic and governance data for several African countries make judgment about the prospects for the full integration of the continent tenuous at best.

## Appendix

**Table A-1** Selected Attributes for the African Universe by Regional Groups

| Country/Regional group | | Fractionalization index | | | Democracy | Corruption score | Literacy rate |
|---|---|---|---|---|---|---|---|
| | | Ethnic | Language | Religion | | | |
| **Comesa** | | | | | | | |
| *1* | Burundi | 0.2951 | 0.2977 | 0.5158 | PF | 2.3 | 59.3 |
| *2* | Comoros | 0.000 | 0.0103 | 0.0137 | PF | … | 56.6 |
| *3* | Congo D.R. | 0.8747 | 0.8705 | 0.7021 | NF | 2.1 | 67.2 |
| *4* | Djibouti | 0.7962 | 0.6558 | 0.0435 | PF | … | 67.9 |
| *5* | Egypt | 0.1836 | 0.0237 | 0.1979 | NF | 3.4 | 71.4 |
| *6* | Eritrea | 0.6524 | 0.6530 | 0.4253 | NF | 2.6 | 58.6 |
| *7* | Ethiopia | 0.7235 | 0.8073 | 0.6249 | PF | 2.2 | 42.7 |
| *8* | Kenya | 0.8588 | 0.8860 | 0.7765 | PF | 2.1 | 85.1 |
| *9* | Libya | 0.792 | 0.075 | 0.057 | NF | 2.5 | 82.6 |
| *10* | Madagascar | 0.8791 | 0.0204 | 0.5191 | PF | 2.8 | 68.9 |
| *11* | Malawi | 0.6744 | 0.6023 | 0.8192 | PF | 2.8 | 62.7 |
| *12* | Mauritius | 0.4634 | 0.4547 | 0.6385 | F | 4.2 | 84.4 |
| *13* | Rwanda | 0.3238 | … | 0.5066 | NF | 3.1 | 70.4 |
| *14* | Seychelles | 0.2025 | 0.1606 | 0.2323 | PF | 4.0 | 91.8 |
| *15* | Sudan | 0.7147 | 0.7190 | 0.4307 | NF | 2.1 | 61.1 |
| *16* | Swaziland | 0.0582 | 0.1722 | 0.4444 | NF | … | 81.6 |
| *17* | Uganda | 0.9302 | 0.9227 | 0.6332 | PF | 2.5 | 66.8 |
| *18* | Zambia | 0.7808 | 0.8734 | 0.7359 | PF | 2.6 | 80.6 |
| *19* | Zimbabwe | 0.3874 | 0.4472 | 0.7363 | NF | 2.6 | 90.7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Ecowas** | | | | | | | |
| *1* | Benin | 0.7872 | 0.7905 | 0.5544 | F | 2.9 | 34.7 |
| *2* | Burkina Faso | 0.7377 | 0.7228 | 0.5798 | PF | 3.4 | 21.8 |
| *3* | Cape Verde | 0.4174 | … | 0.0766 | F | … | 76.6 |
| *4* | Cote D'Ivoire | 0.8204 | 0.7842 | 0.7551 | NF | … | 50.9 |
| *5* | Gambia | 0.7864 | 0.8074 | 0.097 | PF | 2.7 | 40.1 |
| *6* | Ghana | 0.6733 | 0.6731 | 0.7987 | F | 3.5 | 57.9 |
| *7* | Guinea | 0.7389 | 0.7725 | 0.2649 | NF | … | 29.5 |
| *8* | Guinea-Bissau | 0.8082 | 0.8141 | 0.6128 | PF | … | 42.4 |
| *9* | Liberia | 0.9084 | 0.9038 | 0.4883 | PF | 2.2 | 57.5 |
| *10* | Mali | 0.6906 | 0.8388 | 0.182 | F | 2.9 | 46.4 |
| *11* | Niger | 0.6518 | 0.6519 | 0.2013 | PF | 2.4 | 28.7 |
| *12* | Nigeria | 0.8505 | 0.8503 | 0.7421 | PF | 1.9 | 68 |
| *13* | Senegal | 0.6939 | 0.6961 | 0.1497 | F | 3.2 | 39.3 |
| *14* | Sierra Leone | 0.8191 | 0.7634 | 0.5395 | PF | 2.4 | 35.1 |
| *15* | Togo | 0.7099 | 0.8980 | 0.6596 | NF | … | 60.9 |
| **Other countries in the African universe** | | | | | | | |
| *1* | Algeria | 0.339 | 0.443 | 0.009 | NF | 2.8 | 69.9 |
| *2* | Angola | 0.7867 | 0.787 | 0.6276 | NF | … | 67.4 |
| *3* | Cameroon | 0.8635 | 0.8898 | 0.7338 | NF | 2.2 | 67.9 |
| *4* | Central African Republic | 0.8295 | 0.8334 | 0.7916 | NF | … | 48.6 |
| *5* | Chad | 0.862 | 0.8635 | 0.6411 | NF | 1.7 | 25.7 |
| *6* | Congo | 0.8747 | 0.6871 | 0.6642 | PF | 2.3 | 83.8 |
| *7* | Equatorial Guinea | 0.3467 | 0.322 | 0.1195 | NF | … | 85.7 |
| *8* | Gabon | 0.769 | 0.7821 | 0.6674 | PF | 2.9 | 63.2 |
| *9* | Mozambique | 0.693 | 0.813 | 0.675 | PF | 2.8 | 47.8 |
| *10* | Morocco | 0.484 | 0.468 | 0.003 | PF | 3.2 | 52.3 |
| *11* | Sao Tome and Principe | … | 0.2322 | 0.1866 | F | … | 84.9 |
| *12* | Somalia | 0.812 | 0.032 | 0.0028 | NF | 2.1 | 37.8 |
| *13* | South Africa | 0.752 | 0.865 | 0.860 | F | 4.5 | 86.4 |
| *14* | Tanzania | 0.7353 | 0.8983 | 0.6334 | PF | 2.9 | 69.4 |
| *15* | Tunisia | 0.039 | 0.012 | 0.014 | NF | 4.9 | 74.3 |

*Notes and Sources:*

The Fractionalization data (ethnic, language and religion) are calculated as indices given the probability of two randomly selected individuals share these attributes. For details see Alesina, Devleeschauwer, Easterly, Kurlat and Wacziarg (2003).

Data for democracy and corruption scores are for 2005. Literacy rates are for various years. Sources for democracy: Freedom House, "Free In The World, 2005"; corruption scores from Transparency International, "Corruption Perceptions Index, 2005"; literacy rates from CIA World Factbook, for various years.

Freedom House index ranges from 1 to 7, the higher the value the less democratic is the country.

Corruption scores ranges from 0 to 10, the higher the value the less corrupt the country.

The literacy rate is given as the percentage of population over 15 years for age that can read and write.

**Table A-2** Countries in Africa: By Geographic Locations

| North Africa | South Africa | Central Africa | Horn Africa | East Africa | West Africa | Indian Ocean Islands (includes Reunion) |
|---|---|---|---|---|---|---|
| Algeria | Angola | Burundi | Djibouti | Kenya | Benin | Comoro Islands |
| Egypt | Botswana | Cameroon | Eritrea | Tanzania | Ghana | Madagascar |
| Libya | Lesotho | Central African | Ethiopia | Uganda | Niger | Mauritius |
| Morocco | Malawi | Republic | Somalia | | Burkina | Seychelles |
| Tunisia | Mozambique | Chad | Sudan | | Faso | |
| Western Sahara | Namibia | Congo | | | Guinea | |
| | South Africa | Congo | | | Nigeria | |
| | Swaziland | D.R. | | | Cape Verde | |
| | Zambia | Equatorial | | | Guinea | |
| | Zimbabwe | Guinea | | | Bissau | |
| | | Gabon | | | Senegal | |
| | | Rwanda | | | Chad | |
| | | Sao Tome & Principe | | | Liberia | |
| | | | | | Sierra | |
| | | | | | Leone | |
| | | | | | Cote | |
| | | | | | d'Ivoire | |
| | | | | | Mali | |
| | | | | | Togo | |
| | | | | | Gambia | |
| | | | | | Mauritania | |
| | | | | | Western Sahara | |

**Table A-3** Selected Value of Variables Used as Criteria for Membership (1986–2005)[a]

| | | GDP per capita growth (annual %) | Inflation, GDP deflator (annual %) | Central government debt, total (% of GDP) | Cash surplus/ deficit (% of GDP) |
|---|---|---|---|---|---|
| **Country** | | **avg 86–05** | **avg 86–05** | **avg 86–05** | **avg 86–05** |
| *1* | Angola | 1.30 | 631.57 | … | … |
| *2* | Benin | 0.23 | 4.69 | … | −0.19 |
| *3* | Burkina Faso | 1.93 | 2.53 | … | −4.09 |
| *4* | Burundi | −1.83 | 9.34 | 127.61 | −4.75 |
| *5* | Cameroon | −1.54 | 3.38 | 81.63 | −1.76 |

| | | | | | |
|---|---|---|---|---|---|
| *6* | Cape Verde | 2.67 | 3.72 | … | … |
| *7* | Central African Republic | −1.58 | 2.70 | … | −0.46 |
| *8* | Chad | 2.13 | 5.29 | … | … |
| *9* | Comoros | −0.58 | 3.96 | … | … |
| *10* | Congo, Dem. Rep. | −4.60 | 1,892.84 | 180.18 | −5.25 |
| *11* | Congo, Rep. | −0.96 | 5.81 | 0.21 | −0.03 |
| *12* | Cote d'Ivoire | −1.38 | 4.13 | 125.59 | −0.25 |
| *13* | Djibouti | −2.54 | 3.29 | … | … |
| *14* | Egypt, Arab Rep. | 2.11 | 10.63 | 37.39 | −2.62 |
| *15* | Equatorial Guinea | 15.00 | 10.77 | … | … |
| *16* | Eritrea | *2.03* | *11.27* | ... | ... |
| *17* | Ethiopia | 1.53 | 4.41 | … | −7.93 |
| *18* | Gabon | −0.73 | 5.14 | … | … |
| *19* | Gambia, The | 0.04 | 10.85 | … | 0.13 |
| *20* | Ghana | 1.96 | 27.15 | … | −4.27 |
| *21* | Guinea | 1.04 | 15.47 | … | −3.32 |
| *22* | Guinea-Bissau | −0.95 | 38.05 | … | … |
| *23* | Kenya | 0.24 | 11.01 | 52.72 | −0.82 |
| *24* | Liberia | −3.57 | 194.09 | … | … |
| *25* | Madagascar | −0.69 | 15.82 | 104.32 | −2.15 |
| *26* | Malawi | −0.31 | 27.48 | … | … |
| *27* | Mali | 1.84 | 3.70 | … | −3.12 |
| *28* | Mauritania | 0.31 | 8.77 | … | … |
| *29* | Mauritius | 4.45 | 7.19 | 37.92 | −1.66 |
| *30* | Namibia | *1.02* | *9.55* | ... | *−3.45* |
| *31* | Niger | −0.80 | 2.90 | … | … |
| *32* | Nigeria | 1.35 | 26.31 | … | … |
| *33* | Rwanda | 0.91 | 8.79 | 48.70 | −4.77 |
| *34* | Sao Tome and Principe | 5.35 | 7.53 | … | … |
| *35* | Senegal | 0.52 | 3.20 | 79.97 | −1.28 |
| *36* | Seychelles | 2.18 | 2.93 | … | −6.49 |
| *37* | Sierra Leone | −0.72 | 43.63 | 124.75 | −7.39 |
| *38* | Sudan | 3.20 | 49.00 | 8.26 | −0.39 |
| *39* | Swaziland | 1.91 | 11.30 | … | −2.59 |
| *40* | Tanzania | 1.42 | 16.99 | … | … |
| *41* | Togo | −0.68 | 4.02 | … | … |
| *42* | Uganda | 2.58 | 41.62 | 49.45 | −1.89 |
| *43* | Zambia | −0.50 | 54.70 | 190.70 | −0.70 |
| *44* | Zimbabwe | −1.60 | 78.80 | 59.31 | −4.41 |

[a] Note: Data was not available for some countries in the African universe (Algeria, Libya, Morocco, Mozambique, Somalia, South Africa and Tunisia)

**Table A-4** Estimation Results: Gravity Model Equations 1986–2005

| Variables | Equation 2 (1) | Equation 3 (2) |
|---|---|---|
| *lgdpij* | 0.726*** | 0.742*** |
| | (0.029) | (0.030) |
| *lgdp_pij* | 0.016 | |
| | (0.037) | |
| *ldist* | −1.402*** | −1.402*** |
| | (0.072) | (0.072) |
| *language* | 0.567*** | 0.567*** |
| | (0.093) | (0.093) |
| *border* | 1.735*** | 1.735*** |
| | (0.176) | (0.176) |
| *org1* | 0.136** | 0.136** |
| | (0.059) | (0.059) |
| *lpopij* | | −0.016 |
| | | (0.037) |
| *Constant* | −9.502*** | −9.502*** |
| | (1.181) | (1.181) |
| Observations | 23619 | 23619 |
| R-squared | 0.452 | 0.452 |
| ρ | 0.586 | 0.586 |
| Number of id | 1899 | 1899 |

Note: Year and country-specific effects were taken out of the table for space issues

Standard errors in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$

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