MEASURING THE GAINS FROM CURRENCY UNION MEMBERSHIP IN SOUTHERN AFRICA[1]

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Abtract:
African countries have latched on to growing empirical evidence that creating a currency union may result in large trade gains. This is based on the belief that lower transaction costs would lead to large increases in intra-regional trade volumes, augmenting growth. Yet there is growing evidence that not all countries may benefit upon entering a currency union. This paper is an attempt to measure the gains from trade that are realised when entering a currency union. Using a standard gravity framework, we find that countries that decide to give up their currency and adopt an existing one or create a new common currency area stand to benefit significantly from a shared currency. However, these benefits are greater for a select few and the gains in terms of trade will depend on how open the country is and the intensity of trade flows with the other members of the currency union.

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[1] **We would like to present this paper to be awarded with the Young researchers ALdE Prize 2010. Both authors are under 35.**

1. Introduction

African countries have latched on to growing empirical evidence that creating a currency union may result in large trade gains. This is based on the work by Andrew K. Rose and others over the last ten years, showing that the adoption of a currency union can increase trade by a factor of up to three. The central idea is that a common currency implies more than an elimination of exchange rate volatility among its members. It also reduces transaction costs, information asymmetries and uncertainty and increases transparency relevant to international trade and provides a commitment device for macroeconomic policies. Given the theoretical and empirical support for entering currency unions, African countries have set goals along a linear approach of regional integration with the aim of establishing a single currency for Africa by 2021.

Yet Rose and others' results are mostly at the aggregated level, ignoring the diversity of countries that constitute a regional agreement. More recently, scholars have pointed to the large discrepancy in the potential gains from trade from establishing a currency union. In particular, McCarthy (2008) and Masson (2008) argue for a selective – rather than linear – approach in broadening integration in Africa. Apart from the political constraints in achieving the integration targets on time, these authors hypothesize that not all countries may benefit upon entering a currency union. The characteristics of the member countries, the co-movement of prices, the diversity of the export bundle, and the priorities of national governments are some of the reasons for this.

This paper is an attempt to measure the gains from trade that are realised when entering a currency union. Using a standard gravity framework, we find that many African countries stand to benefit significantly from a shared currency. We also report the trade gains for establishing a currency union within the five regional groupings within Africa. The results suggest that especially two of these – COMESA and SADC – would realise substantial gains, and these would be greater for a small number of countries within these groups. These results support McCarthy and Masson in advocating a selective approach to adopting a currency union, rather than the (politically untenable) objectives of the linear approach.

To that end, this paper is organised as followed. First, a brief review on the effect of currency unions on trade is presented. Second, specific papers that have analysed the impact of common currencies on trade are reviewed while Section three put in context the debate on the creation of an African single currency. Section four presents the data and methodology used while Section five presents the main results of the analysis. Finally, some conclusions are drawn in the last section.

2. Currency unions and trade

Given the complexity of regional arrangements proliferating across the globe – aptly named the spaghetti bowl-effect – it is maybe understandable that policy-makers are often lost within the myriad of possibilities when considering regional integration. Currency unions is an increasingly popular target for countries that wish to move to closer regional integration, yet there is some ambiguity on the definition of a currency union. Whereas the linear approach in economic

integration – moving from preferential trade agreements, followed by free trade agreements, customs unions, a single market, and economic and monetary union – implicitly assume a common currency to be part of the fourth step in the integration process, a currency union may occur much earlier in the process, as it may refer not to a common currency, but to a shared – or pegged – currency. In this case, a country would opt to link its currency to that of an anchor economy, i.e. a fixed exchange rate regime. For example, while Namibia and South Africa are part of the South African Customs Union, the Namibian dollar is linked to the South African Rand forming a Common Monetary Area (CMA) with Lesotho and Swaziland as the other two member states.

Two types of "currency union" are thus identified. The standard definition in the literature is that of a common (or single) currency, where the countries involved relinquish their monetary policy and unify under a common monetary institution with shared monetary policy, as in the case of the Euro system within the European Union. The second "currency union" refers to countries that link their own currencies to those of an anchor country, as in the case of the above Namibian example. The most extreme version of this is "dollarization". In the rest of this paper we will use the term "common currency" to refer to the former and "shared currency" to refer to the latter. "Currency unions" will encompass both types.

Textbook reasons for entering a currency union, proposed by Mundell (1961), include lower transaction costs, larger markets, increases in price transparency and less uncertainty. These microeconomic factors are all determinants of international trade. In that sense, high transaction costs, low transparency and great uncertainty increase trade costs which reduce trade flows (Anderson and Van Wincoop 2004). The high variability of exchange rates when freely floating – while good when offsetting inflation differentials or when negating a supply-side shock – can thus have detrimental consequences for the real economy when it discourages trade and investment.[2] The key benefit of a currency union between two countries may therefore not be the standard expectation of lower inflation but rather an increase in trade and, consequently, welfare.

Rose and various coauthors have investigated this hypothesis empirically. In a seminal paper, Rose (2000) finds that being member of a currency union increases trade three times more than would have been the case had the currency union not existed. Glick and Rose (2002), using a gravity equation of 217 countries from 1948 to 1997, find that, controlling for other variables, trade flows double between countries that adopt common currencies. Frankel and Rose (2002) provide further support, finding a strong link between adopting a common currency and income growth. Micco, Stein and Ordonez (2003) find that a common currency in the European Union increases trade, although not as much as in the case of Glick and Rose (2002). While some have doubted these large magnitudes, Rose (2000) offers two additional explanations to the above why the results may be theoretically plausible: Firstly, a currency union may induce financial integration, which results in higher trade. Secondly, a currency union may act as a signal to show a country's willingness to commit to long-term integration, which attracts investment, trade and growth. Revising his initial high estimates, Rose and Stanley (2004), in a meta-analysis of a large

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[2] The link between exchange rate fluctuations and trade and investment flows is still empirically ambiguous, also because it is difficult to use time-series data to compare exchange rate variability and trade statistics. See Edison and Melvin (1990) for an overview.

number of studies, calculates that the currency union effect is somewhere between 30 and 90 per cent.

So, an important issue could be which countries stand to gain most from entering currency unions? Rose (2000) acknowledges that his high estimates may be upwardly biased because of the inclusion of many developing countries in the analysis. This implies that the adoption of a common currency between developing countries would have a larger effect on trade than when developed economies adopt a common currency. Alesina and Barro (2002) find that countries with a history of high and volatile inflation and those with strong price co-movements with the anchor economy would gain the most from a common currency. These results suggest that smaller, developing economies may benefit more from entering currency unions than would industrial countries.

3. Currency unions in Africa

In contrast to the findings mentioned in the previous sections which hold that currency unions have a large impact on international trade, Masson and Patillo (2004) hypothesize that the costs of currency unions for African countries may outweigh the benefits. Because African countries are much less integrated than countries in Europe, these authors argue that the gains from economies of scale and lower transaction costs may not be similar to what is found in the rest of the world. African countries are also highly concentrated in their trade composition and can thus suffer large terms of trade shocks. Having given up monetary policy under a common currency, few alternative policy measures exist for African governments to facilitate adjustment to these shocks (Masson and Patillo 2004).[3]

However, the empirical results for African countries do not support these propositions. Masson and Patillo (2004) find that African countries experience the same increases in trade after adopting a currency union as the rest of the world, with membership of a currency union increasing trade by a factor of three. In this context, it is important to note that they combine the effects of entering a free trade agreement and currency union. Tsangarides et al. (2006) build on their analysis, differentiating between free trade agreements and currency unions and splitting the sample to verify whether African countries perform differently. They find that "African countries stand to benefit as much from currency union membership as countries in the rest of the world, and, therefore, currency benefits are not region specific". A further significant finding is that the longer a country participates in a currency union, the greater the benefits it derives.

Given this, African heads of state seem eager to adopt a single currency by the year 2021. To achieve this target, African countries will follow a linear process of integration to a common market. In the South African Development Community (SADC), for example, the plan is to have a free trade agreement by 2008, a customs union by 2010, a common market by 2015, a monetary union by 2016 and a single currency by 2018 (McCarthy 2008). Yet the history of African economic integration suggests that these expectations are pipe dreams. Masson and Patillo (2004) document the complexity of African monetary integration initiatives over the

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[3] Other measures would include labour mobility or intra-country fiscal transfers, both which are (either politically or economically) infeasible.

course of the previous century. It is a story marred by unfulfilled promises and few successes. It is important to note that the reasons for its failures are not only economic; in fact, Baldwin and Wyplosz (2004) suggest that political considerations may outweigh economic factors in most economic integration failures.

There is thus growing skepticism about the possibility of achieving the said targets, especially in Southern Africa. McCarthy (2008), a longtime advocate of greater regional integration in the SADC region, is critical of the linear approach chosen to attain a single currency, and the short deadlines imposed for achieving the targets. Adding to Masson and Patillo (2004), McCarthy points out that Southern African countries – with the exception of South Africa – specialise in the production and export of few commodities, mostly primary goods, with little policy tools available other than exchange rate fluctuations in case of asymmetric shocks. According to McCarthy (2008), a currency union "does not in itself create capacity to produce goods. Add to this the downside of reducing sovereignty with respect to monetary policy and the exchange rate for countries that face asymmetric external shocks and a single currency's benefits become doubtful, even if there are indicators that macro-economic convergence is occurring". He recommends adopting a gradual – or selective – approach, linking Southern African countries piecemeal to the South African Rand, for example, because of the independence and credibility of the South African Reserve Bank, thus in effect opting for a "shared currency" rather than a "common currency". While a gradual process of expanding the existing Common Monetary Area may be the only workable alternative to the linear approach, McCarthy (2008) warns that "only a supreme optimist" will expect the political changes required to deliver on these goals.

This is in line with more recent quantitative work by Masson (2008). While finding "potential doubling of trade", he argues that there are large asymmetries in the benefits across countries. The results also depend on the institutional guarantees of the central bank's independence as well as the priorities of national governments, particularly their financing needs. His recommendations are similar to those of McCarthy in stressing "selective expansion of existing monetary integration projects", rather than "an all-encompassing project of a continent-wide strategy" (Masson 2008:545).

This paper aims to identify quantitatively which countries may benefit in terms of trade-gains the most from joining an existing currency union, thus following the gradual or selective approach advocated by McCarthy (2008) and Masson (2008). To do this, we employ a standard gravity framework which has been traditionally used to study the determinants of trade flows across countries. Moreover, this specification is recognised for its good fit with the data.

4. Data and methodology

To quantify the potential gains in terms of trade for African countries of adopting a single currency, it is first required to estimate the effect of currency unions on bilateral trade flows. To than end, a standard gravity model for bilateral trade is estimated.

Gravity models represent trade between two economies as a function of their respective economic masses, commonly measured in terms of GDP, GDP per capital and/or population, the

distance between the two economies, and a variety of other factors. In accordance with earlier literature, we begin by investigating the effect of currency unions on trade by defining the following augmented gravity model:

$$\ln Trade_{ijt} = \beta_0 + \beta_1(\ln GDPpc_{it} \ln GDPpc_{jt}) + \beta_2(\ln Pop_{it} \ln Pop_{jt}) + \beta_3(\ln area_i \ln area_j)$$
$$+ \beta_4 \ln D_{ij} + \beta_5 Border_{ij} + \beta_6 Lang_{ij} + \beta_7 Colony_{ij} + \beta_8 ComCol_{ij} + \beta_9 Col45_{ij}$$
$$+ \beta_{10} FTA_{ij} + \gamma CU_{ij} + \lambda_t + \alpha_i + \eta_j + u_{ijt} \tag{1}$$

where ln denotes natural logarithms, i and j indicate each country in the pair and t is time. $Trade_{ijt}$ denotes the real bilateral trade in goods, as the sum of exports and imports, between countries i and j in year t; $GDPpc$ is the real GDP in per capita terms, Pop denotes the population; $area$ is the land area of the country, D_{ij} is the great circle distance between capital cities of countries i and j, $Border$ is a binary which is unity if the country of origin and the country of destination share a common land border and zero otherwise $Lang$ is a binary variable which is unity if both countries have a common language and zero otherwise; $Colony_{ij}$ is a binary variable which is unity if one country ever colonized the other or vice versa and zero otherwise, $ComCol$ is a binary variable, which is unity if i and j were colonies after 1945 of the same colonizer; $Col45_{ij}$ is a binary variable which is unity if countries have had a colonial relationship after 1945 and zero otherwise, FTA is a binary variable, which is unity if i and j belong to the same regional trade agreement, while CU is a binary variable related to currency union which takes value 1 if both countries in the pair share a common currency and 0 otherwise. Finally, β_0 is the constant α_i, η_j and λ_t refers to country i, country j and year fixed effects, γ is the parameter of interest and finally u_{ijt} is a well-behaved disturbance term.

The dataset includes 48 African countries as country i in the pair and 211 countries in the world, including the African countries, as country j in the pair for the period 1960-2006. Therefore, the dataset covers 10,128 pairs of countries with gaps over 47 years. By doing that, we can make comparisons between the estimated effect of currency unions for the total sample and the two sub-samples African countries and the rest of the world countries.

The trade variable is measured in millions of US$ and is obtained from *Direction of Trade* dataset of the *International Monetary Fund* and *complete with* the *OECD Statistics*. GDP per capita and trade need to be converted to real terms by using US GDP deflator. GDP per capita, population, area and US GDP deflator were obtained from the *World Development Indicators*. Distance and dummy variables *Lang*, *Colony, ComCol, Col45* and *Border* were collected from the *Centre d'Etudes Prospectives et d'Informations Internationales (CEPII)* dataset while *CU* and *FTA* were obtained attending to the classification presented in Tsangarides *et al.* (2006).

Moreover, GDP per capita is considered as a potential endogenous variable since trade might increase the market size of the countries promoting growth. Therefore, instrumental variable methods are required to deal with this problem and lagged value of the endogenous variable is considered as instrument[4].

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[4] Lagged values of the endogenous variable are commonly considered as valid instruments. Exogeneity tests to analyzing the validity of the instrument has been applied.

Gravity equations can be estimated by different econometric methods although the most common one is pooled Ordinary Least Squares (OLS). This method assumes that the error term is not correlated with the explanatory variables. This implies that only when there are neither cross-sectional nor temporal effects, we can pool data and run OLS. Despite its popularity, this method also has certain shortcomings. As an alternative, gravity equations can be estimated by fixed-effect (FE) because it avoids the inconsistent and inefficient estimates provided by OLS if unobserved heterogeneity exists. The fixed effect model is widely used when we want to control for omitted variables that are constant over the period of time and vary across the unit that is called unobserved heterogeneity of fixed effect.

However, the fixed effect approach does not allow for estimating coefficients on time-invariant variables such as distance, border or common language dummies. Thus, estimation by using country-pair fixed effects cannot be applied in this analysis since observations of interest disappear.[5] A way to overcome this problem is the introduction of individual country fixed-effects for the importers and the exporters in the gravity model. Several papers have estimated gravity models including individual fixed-effects for each country (Mathias 1997; Cheng and Wall 2005; Kandogan 2008).

In that sense an auxiliary equation in the FE model can be estimated in which the time-invariant explanatory variables are regressed on the estimated country pair intercepts by using OLS. For this reason, α_i, λ_j and μ_t are introduced as destination, origin and year fixed effects respectively.

This model is a special case of the FE model given that it has a unique value for each trading pair's intercept, with the restrictions that a country's fixed effect as an exporter or importer is the same for all of its trading partners.

5. Results

In this section, the results of the estimate gravity equation are presented. Eq. (1) is estimated for three different samples: the whole sample, intra-African trade and African trade with the rest of the world. The sum of these last two samples comprises the total sample.

[Table 1, here]

First, we compare our aggregated results to those found in the literature. Table 1 provides the complete regression results. For the whole sample, the estimate coefficient of the currency union is 1.3014 which implies that entering a currency union would increase trade by a factor of 2.67.[6] This closely approximates the factor of three that Rose (2000) estimates (for a large sample of countries) and the doubling of trade estimated by Glick and Rose (2002), Tsangarides et al. (2006) and Masson (2008). Related to the Africa trade with the rest of the world sample, a shared currency between an African and a non-African country yields much lower returns. The estimate

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[5] In other words, some currency unions cases in our sample remain time-invariant in many country pairs. For instance, the Economic and Monetary Community for Central Africa (CAEMC) and the West African Economic and Monetary Union (WAEMU) members belong to a currency union for the whole sample period.

[6] Because the dependent variable is expressed in logs, the way to obtain the elasticity of the CU dummy variables is by applying an exponential, in this case: exp(1.3014)-1=2.67.

coefficient is 0.68 which means that trade would increase by a factor of 0.97. Finally, related to the intra-African trade sample, the estimate coefficient of the currency union dummy variable is 1.13 which suggests that trade flows when entering an African currency union would increase by a factor of 2.2. This is consistent with Rose (2000) and Alesina and Bond's (2002) proposition that smaller, developing economies would benefit more from entering currency unions.

The estimate coefficient of the variable of interest, that is the currency union dummy variable, allows us to calculate the potential increase in trade associated with joining a currency union. Following the methodology proposed by Frankel and Rose (2002), we calculate the trade gains associated with adoption of a common currency. To that end, firstly we calculate the effect for African countries adopting the dollar or the euro. Secondly, we obtain the potential gains for each of the African countries which are not involved in a currency union of joining one of the existing African regional monetary unions. Finally, we calculate the potential effects in terms of a trade increase if the existing African free trade agreements decide to adopt a single currency.

Table 2 presents the predicted increase in African trade with non-African countries if the African countries decide to adopt the dollar or the euro. To calculate that, we need the percentage of trade carried out with countries of the dollar zone and the euro zone as well as the openness ratio of the African countries. We will observe how the magnitude of these trade gains will depend on who else is in the currency union and how open the economy is to trade.

[Table 2, here]

In order to illustrate the effect of common currency on trade, Algeria is taken as an example from Table 2. Algerian trade with the euro zone is 48.16% and with the dollar zone 19.77%. The trade to GDP ratio of the economy is 65.32%. The data is for 2007. Previously, from the results in Table 1, we obtain the estimate coefficient of the CU dummy variable for the non-African sample (0.68), which means that by adopting a single currency, countries would increase trade flows by around 97%. So, the potential effect of adopting the euro on Algerian trade is 30.51 [0.4816*0.6532*0.97]. Similarly, if Algeria decides to adopt the dollar the potential increase in trade would be 12.53% [0.1977*0.6532*0.97]. Algeria would thus benefit more if it decides to adopt the euro rather than the dollar because almost half of Algerian trade is with countries that belong to the EMU.

Table 3 reports the predicted percentage increase in trade flows for all African countries from entering one of three currency unions that currently exist in Africa. The results reveal large differences in potential gains between countries. Entering the currency union of the Economic and Monetary Community for Central Africa (CAEMC) and West African Economic and Monetary Union (WAEMU) yields potentially small gains for other African countries, with the highest a 3% increase in trade. Entering the Common Monetary Area (CMA) of South Africa, Namibia, Lesotho and Swaziland, however, can yield potentially large gains for a number of neighbouring Southern African countries. The Democratic Republic of the Congo (15.6%), Malawi (30.1%), Mauritius (13.7%), Mozambique (46.68%), the Seychelles (23.1%), Zambia

(47.56%) and Zimbabwe (111.13%) would all see trade rise substantially when adopting the Rand.[7]

[Table 3, here]

In the same vein, by mid-2009, Zimbabwean policy-makers were considering pegging the Zimbabwe dollar to the South African Rand (Cohn 2009; Doneva 2009).[8] The results reported in Table 2 and 3 shed some light on the possible trade gains from such a decision while also enabling a comparison between the predicted gains from adopting the US dollar, Euro or the South African Rand. As mentioned, adopting the Rand would result in predicted trade gains of 111.13%, while Table 2 reports that adopting the Euro would increase trade by 12.4% and 3.9% for the US Dollar. From a trade perspective, adopting the South African Rand would yield far greater benefits than either the Euro or the Dollar[9].

Tables 4, 5, 6, 7 and 8 report the currency union effects for each of the five economic communities in Africa. It is envisaged that these communities later unite under the umbrella of a single African currency. Potential gains are not depreciable in the Arab Monetary Union (with a maximum gain of 12.4%), the Common Market for Eastern and Southern Africa (with a maximum gain of 27.6%) and the Economic Community of Central African States (with a very low maximum of only 6.0%). In West Africa the predicted gains are larger, although again there are wide disparities between countries. The same trend is observed in SADC, where adoption of a "common currency" would increase trade for Malawi by 51.9%, Mozambique by 51.9%, Zambia by 64.2% and Zimbabwe by 149.9%. There would however be few gains for Angola (5.6%) or Botswana (4.4%). Factoring in the costs of relinquishing monetary policy, there is no indication that all SADC countries would immediately benefit from a "common currency".

[Table 4,5,6,7 and 8 here]

This lends credence to the selective approach advocated by McCarthy (2008) and Masson (2008). While we do not consider the costs of adopting a currency, the results indicate that the combined potential gains are substantial. However, these are limited to large gains for a select few within the group; a number of countries display only negligible trade gains. Factoring in their loss of monetary sovereignty, there seems to be no reason why these countries should enter a currency union. The linear approach over a short time-span would, therefore, yield relatively small gains above those of a selective approach. Moreover, the linear approach – requiring greater negotiation diplomacy given the small (or even negative) benefits for some countries – is politically untenable.

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[7] Botswana, although not part of the CMA, is part of SACU and is therefore excluded from the analysis because its trade statistics are aggregated with those of the CMA countries.

[8] There was also speculation that Zimbabwe might "dollarize" as the US dollar was widely accepted as medium of exchange within the country. However, as only notes (and not coins) are available in Zimbabwe, the US dollar would only be functional for larger transactions.

[9] There are of course many other reasons why Zimbabwe would want to peg the Zimbabwe dollar to a stable currency, not the least of which is lowering the exorbitant inflation ravaging the country.

6. Conclusions

Building on the glowing empirical results of early researchers, African governments – especially SADC countries – have embraced the linear approach to regional integration, setting exigent deadlines for each consecutive step in the integration process (which already concludes in 2018 with the adoption of a single currency).

Yet a growing number of scholars question whether these goals are, firstly, attainable, and secondly, worth pursuing. There is a growing skepticism about the large predicted gains from trade upon entering a currency union. The varied characteristics of countries, their vulnerability to asymmetric shocks, the reliance on a small number of export goods, and the political realities of losing monetary policy, a key policy tool in developing countries, point to divergent benefits when entering a currency union. Rather than following a linear approach to integration where countries are obliged to strictly adhere to predetermined goals, countries should selectively choose to enter a currency union when the gains (from trade or otherwise) outweigh the costs (of losing monetary sovereignty).

Our quantitative results support this view. Similar to the earlier literature, we show that, aggregated, countries stand to gain substantially from adopting a single currency. However, these benefits are greater for a select few. In the case of SADC, for example, Malawi, Mozambique, Zambia and Zimbabwe are countries that are predicted to benefit from larger trade flows with South Africa if they adopt the Rand. Other regions in Africa, apart from ECOWAS, show no real predicted gains from adopting a regional common currency. There are also relatively small gains from trade for African countries in "dollarization" while adopting the euro can bring significant gains for some African countries such as Algeria, Libya or Sao Tome and Príncipe.

The selective approach to integration as proposed by McCarthy (2008) and Masson (2008) is a better alternative than a strict linear approach. The results reported here provide some clue as to which countries may benefit more upon adopting a "shared currency". Even regional "common currencies" seems to yield few benefits. The case for a single African currency in the next decade is extremely tenuous.

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Appendix

Table 1: Currency union effects on trade

$$\ln Trade_{ijt} = \beta_0 + \beta_1(\ln GDPpc_{it}\ \ln GDPpc_{jt}) + \beta_2(\ln Pop_{it}\ \ln Pop_{jt}) + \beta_3(\ln area_i\ \ln area_j)$$
$$+ \beta_4 \ln D_{ij} + \beta_5 Border_{ij} + \beta_6 Lang_{ij} + \beta_7 Colony_{ij} + \beta_8 ComCol_{ij} + \beta_9 Col45_{ij}$$
$$+ \beta_{10} FTA_{ij} + \gamma CU_{ij} + \lambda_t + \alpha_i + \eta_j + u_{ijt}$$

	All Sample	Non-African countries	African Countries
lnGDPpc	0.5769	0.634	0.4131
	37.94	34.32	13.88
lnPop	0.2531	0.3128	0.5565
	6.64	8.11	3.75
lnarea	0.2094	-17.0708	0.0606
	2.42	-6.91	0.44
lnD	-1.0485	-1.0324	-1.1527
	-71.51	-45.69	-49.7
Border	1.2912	-	1.2277
	33.71	-	25.58
Lang	0.4403	0.4282	0.4375
	20.62	16.9	10.65
Colony	0.7358	0.6532	1.7246
	7.19	6.22	6.26
ComCol	0.4185	0.2502	0.4721
	16.92	7.34	10.87
Col45	0.9194	1.0028	-
	7.86	8.52	-
FTA	0.7894	0.1849	1.0674
	24.29	2.48	24.57
CU	1.3014	0.6767	1.1754
	30.39	4.24	20.74
NºObserv	95170	66554	28609
R^2	0.619	0.6681	0.5006

COUNTRY	% Trade Euro Zone	% Trade Dollar Zone	Trade (%GDP)	Euro effect	Dollar effect
ALGERIA	48.16%	19.77%	65.32%	30.43%	12.49%
ANGOLA	15.16%	31.48%	89.98%	13.19%	27.40%
BENIN	16.99%	3.38%	35.00%	5.75%	1.14%
BURKINA FASO	27.39%	1.20%	35.31%	9.36%	0.41%
BURUNDI	35.05%	2.35%	54.14%	18.35%	1.23%
CAMEROON	0.00%	0.00%	37.46%	0.00%	0.00%
CAPE VERDE	31.64%	1.03%	47.63%	14.58%	0.48%
CENTRAL AFRICAN REP.	45.41%	7.72%	24.44%	10.74%	1.83%
CHAD	8.32%	68.10%	74.86%	6.03%	49.32%
CONGO, DEM. REP. OF	40.43%	4.50%	59.22%	23.16%	2.58%
CONGO, REPUBLIC OF	13.05%	31.59%	105.47%	13.31%	32.23%
COTE D IVOIRE	37.83%	6.26%	79.72%	29.17%	4.83%
DJIBOUTI	10.96%	2.94%	50.84%	5.39%	1.45%
EGYPT	28.30%	11.32%	31.92%	8.74%	3.49%
EQUATORIAL GUINEA	26.03%	24.70%	126.52%	31.86%	30.23%
ETHIOPIA	18.46%	4.31%	38.52%	6.88%	1.60%
GABON	26.31%	21.46%	75.16%	19.13%	15.61%
GAMBIA, THE	11.58%	2.37%	53.33%	5.98%	1.22%
GHANA	25.00%	5.23%	80.26%	19.41%	4.06%
GUINEA	25.35%	4.76%	60.55%	14.85%	2.79%
GUINEA-BISSAU	25.91%	1.91%	65.36%	16.38%	1.21%
KENYA	14.79%	7.46%	47.81%	6.84%	3.45%
LIBERIA	11.91%	2.62%	102.07%	11.76%	2.58%
LIBYA	66.96%	5.86%	91.01%	58.94%	5.16%
MADAGASCAR	31.30%	10.11%	50.12%	15.18%	4.90%
MALAWI	16.49%	7.55%	55.37%	8.83%	4.05%
MALI	22.54%	2.04%	57.44%	12.52%	1.14%
MAURITANIA	40.43%	5.18%	95.15%	37.21%	4.77%
MAURITIUS	29.54%	4.41%	94.06%	26.88%	4.01%
MOROCCO	53.07%	3.82%	55.95%	28.72%	2.07%
MOZAMBIQUE	42.47%	1.35%	75.43%	30.99%	0.99%
NIGER	29.26%	17.89%	40.53%	11.47%	7.02%
NIGERIA	23.13%	34.94%	54.84%	12.27%	18.53%
REUNION	-	-	-	-	-
RWANDA	20.27%	2.61%	22.27%	4.37%	0.56%
SAO TOME & PRINCIPE	77.41%	4.51%	60.50%	45.31%	2.64%
SENEGAL	35.19%	2.12%	54.20%	18.45%	1.11%
SEYCHELLES	32.18%	1.67%	146.80%	45.70%	2.37%
SIERRA LEONE	32.96%	11.19%	43.58%	13.90%	4.72%
SOMALIA	1.51%	2.05%			
SOUTH AFRICA	25.99%	9.31%	52.68%	13.25%	4.75%
SUDAN	12.16%	0.64%	37.72%	4.44%	0.23%
TANZANIA	15.14%	3.46%	42.25%	6.19%	1.41%
TOGO	26.63%	3.99%	83.95%	21.62%	3.24%
TUNISIA	69.20%	3.08%	85.19%	57.02%	2.54%
UGANDA	20.60%	2.88%	37.61%	7.50%	1.05%
ZAMBIA	5.51%	1.14%	62.88%	3.35%	0.69%
ZIMBABWE	10.53%	3.29%	122.00%	12.43%	3.88%

Table 2: Predicted effect of adopting the dollar or the euro

CU effect on trade with non-african countries: 96.73%

Table 3: Predicted effect of entering one of the existing African currency unions

COUNTRY	% Trade CMA	% Trade CAEMC	% Trade WAEMU	Trade (%GDP)	CMA effect	CAEMC effect	WAEMU effect
ALGERIA	0.24%	0.04%	0.10%	65.32%	0.35%	0.00%	0.00%
ANGOLA	2.74%	0.03%	0.04%	89.98%	5.53%	0.00%	0.00%
BURUNDI	2.05%	0.82%	0.04%	54.14%	2.48%	0.05%	0.00%
CAPE VERDE	0.15%	0.25%	2.57%	47.63%	0.16%	0.00%	0.00%
CONGO, DEM. REP. OF	11.75%	1.13%	2.92%	59.22%	15.58%	0.39%	0.03%
DJIBOUTI	0.96%	0.00%	0.01%	50.84%	1.09%	0.00%	0.00%
EGYPT	0.21%	0.05%	0.11%	31.92%	0.15%	0.00%	0.00%
ETHIOPIA	0.77%	0.00%	0.00%	38.52%	0.66%	0.00%	0.00%
GAMBIA, THE	1.09%	0.31%	15.14%	53.33%	1.30%	0.01%	0.00%
GHANA	2.99%	0.86%	4.93%	80.26%	5.37%	0.10%	0.01%
GUINEA	1.18%	0.30%	4.01%	60.55%	1.61%	0.01%	0.00%
KENYA	4.94%	1.22%	0.11%	47.81%	5.29%	0.14%	0.00%
LIBERIA	2.61%	0.07%	1.57%	102.07%	5.97%	0.01%	0.00%
LIBYA	0.00%	0.00%	0.10%	91.01%	0.00%	0.00%	0.00%
MADAGASCAR	2.92%	0.06%	0.09%	50.12%	3.28%	0.00%	0.00%
MALAWI	24.30%	0.24%	0.07%	55.37%	30.13%	0.16%	0.00%
MAURITANIA	0.72%	1.21%	5.22%	95.15%	1.53%	0.04%	0.00%
MAURITIUS	6.51%	0.07%	0.13%	94.06%	13.72%	0.02%	0.00%
MOROCCO	0.48%	0.28%	0.55%	55.95%	0.60%	0.00%	0.00%
MOZAMBIQUE	27.63%	0.00%	0.00%	75.43%	46.68%	0.00%	0.00%
NIGERIA	2.41%	0.93%	3.41%	54.84%	2.96%	0.06%	0.00%
RWANDA	1.61%	2.61%	0.03%	22.27%	0.81%	0.05%	0.00%
SAO TOME & PRINCIPE	0.54%	4.33%	0.15%	60.50%	0.73%	0.07%	0.00%
SEYCHELLES	7.02%	0.03%	0.00%	146.80%	23.07%	0.02%	0.00%
SIERRA LEONE	3.49%	0.40%	8.54%	43.58%	3.40%	0.03%	0.01%
SOMALIA	0.07%	0.00%	0.07%				
SUDAN	0.68%	0.01%	0.00%	37.72%	0.57%	0.00%	0.00%
TANZANIA	8.63%	0.64%	0.14%	42.25%	8.17%	0.12%	0.00%
TUNISIA	0.08%	0.11%	0.52%	85.19%	0.15%	0.00%	0.00%
UGANDA	4.99%	0.91%	0.12%	37.61%	4.21%	0.09%	0.00%
ZAMBIA	33.78%	2.54%	0.01%	62.88%	47.56%	2.71%	0.00%
ZIMBABWE	40.67%	0.62%	0.02%	122.00%	111.13%	1.55%	0.00%

Common Monetary Area (CMA) members: Lesotho, Namibia, South Africa, and Swaziland

Economic and Monetary Community for Central Africa (CAEMC) members: Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea, and Gabon

West African Economic and Monetary Union (WAEMU) members: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo

Table 4: Currency union effects for members of
the Arab Monetary Union (AMU)

MEMBERS	% Trade	Trade(%GDP)	CU effect
ALGERIA	1.16%	65.32%	1.70%
LIBYA	2.77%	91.01%	5.64%
MAURITANIA	2.92%	95.15%	6.23%
MOROCCO	2.20%	55.95%	2.76%
TUNISIA	6.48%	85.19%	12.36%

Table 5: Currency union effects for members of the Common Market
for Eastern and Southern Africa (COMESA)

MEMBERS	% Trade	Trade(%GDP)	CU effect
ANGOLA	0.03%	89.98%	0.05%
BURUNDI	22.74%	54.14%	27.57%
CONGO	12.22%	31.04%	8.50%
CONGO, DEM. REP.	12.38%	59.22%	16.42%
DJIBOUTI	8.27%	50.84%	9.42%
EGYPT	1.62%	31.92%	1.16%
ERITREA	2.26%	40.22%	2.03%
ETHIOPIA	6.48%	38.52%	5.59%
KENYA	12.56%	47.81%	13.45%
MADAGASCAR	6.90%	50.12%	7.74%
MALAWI	17.89%	55.37%	22.19%
MAURITIUS	4.68%	94.06%	9.86%
NAMIBIA	0.81%	79.61%	1.44%
RWANDA	23.80%	22.27%	11.87%
SEYCHELLES	3.96%	146.80%	13.02%
SUDAN	5.31%	37.72%	4.48%
SWAZILAND	2.79%	182.68%	11.42%
UGANDA	32.31%	37.61%	27.22%
ZAMBIA	8.80%	62.88%	12.40%
ZIMBABWE	8.67%	122.00%	23.68%

Table 6: Currency union effects for members of
the Economic Communityof Central African States (ECCAS)

MEMBERS	% Trade	Trade(%GDP)	CU effect
BURUNDI	2.22%	54.14%	2.69%
CAMEROON	0.00%	37.46%	0.00%
CENTRAL AFRICAN REP.	10.93%	24.44%	5.99%
CHAD	3.56%	74.86%	5.97%
CONGO, DEM. REP. OF	1.76%	59.22%	2.34%
EQUATORIAL GUINEA	0.05%	126.52%	0.15%
GABON	1.82%	75.16%	3.07%
RWANDA	3.30%	22.27%	1.65%
SAO TOME & PRINCIPE	4.33%	60.50%	5.87%

Table 7: Currency union effects for members of the
Economic Community of West African States (ECOWAS)

MEMBERS	% Trade	Trade(%GDP)	CU effect
BENIN	10.13%	35.00%	7.94%
BURKINA FASO	28.88%	35.31%	22.84%
CAPE VERDE	2.35%	47.63%	2.51%
CÔTE D'IVOIRE	26.22%	79.72%	46.81%
GAMBIA, THE	14.17%	53.33%	16.92%
GHANA	15.87%	80.26%	28.53%
GUINEA	4.09%	60.55%	5.55%
GUINEA-BISSAU	22.45%	65.36%	32.87%
LIBERIA	1.60%	102.07%	3.66%
MALI	22.14%	57.44%	28.48%
NIGER	20.31%	40.53%	18.43%
NIGERIA	5.00%	54.84%	6.14%
SENEGAL	19.89%	54.20%	24.14%
SIERRA LEONE	9.05%	43.58%	8.83%
TOGO	15.20%	83.95%	28.59%

Table 8: Currency union effects for members of the
Southern African Development Community (SADC)

MEMBERS	% Trade	Trade(%GDP)	CU effect
ANGOLA	2.77%	89.98%	5.59%
BOTSWANA	2.85%	68.75%	4.39%
CONGO, DEM. REP. OF	19.13%	59.22%	25.37%
LESOTHO	0.51%	144.86%	1.67%
MALAWI	41.84%	55.37%	51.88%
MAURITIUS	7.38%	94.06%	15.55%
MOZAMBIQUE	30.73%	75.43%	51.91%
NAMIBIA	1.07%	79.61%	1.91%
SEYCHELLES	10.48%	146.80%	34.44%
SOUTH AFRICA	5.41%	52.68%	6.38%
SWAZILAND	1.89%	182.68%	7.72%
TANZANIA	15.59%	42.25%	14.75%
ZAMBIA	45.62%	62.88%	64.24%
ZIMBABWE	54.88%	122.00%	149.93%