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THE ROAD TO REGIONAL INTEGRATION IN AFRICA: MACROECONOMIC CONVERGENCE AND PERFORMANCE IN COMESA

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Abstract

COMESA (Common Market for Eastern and Southern Africa) aims at the establishment of a currency union in 2025. To this purpose, a policy harmonization program and a set of convergence criteria have been set up. A number of projects to foster trade, economic and financial integration have also been launched. Using time-series econometrics, this paper provides evidence on some of the dimensions involved by such a process. Some highlights are as follows. The monetary policy stance mildly converges across countries; fiscal stabilization is instead still problematic in several member states. In spite of a low level of intra-regional trade, the economic fundamentals in a bulk of member states share a common stochastic trend; this suggests that shocks might be symmetric and hence business cycles synchronized. The implications is that countries might indeed benefit from deep forms of monetary integration. The distribution of income across countries in the region is highly unequal and there is no sign of convergence. In fact, the gap between poorer and richer countries appears to be widening. Against these results, some policy implications can be drawn concerning the design of transition towards monetary unity, mechanisms for self-financing of regional projects and compensation, removal of barriers to trade integration.

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1. Introduction

Regional integration is a recurrent item in the development agenda of African policymakers. Most countries indeed participate into Regional Economic Communities (RECs) with the aim to achieve deep forms of integration, as for instance represented by a currency union. The entire project of a African Union has in these RECs its building blocs to realize continental political and economic institutions, including a common central bank.

The potential benefits of economic integration are widely acknowledged in the literature. But so are its costs and potential drawbacks, especially when participating countries are on average poor and at significantly different stages of economic development. The desirability of deep integration in Africa, the way to achieve it and its possible effects are the key themes of an increasing body of research. Attention so far has been mostly focused on West Africa, where the whole process of integration is admittedly more advanced[1].

The purpose of this paper is to expand the literature by turning attention also to what happens in Eastern and Southern Africa, and in particular in the Common Market for Eastern and Southern Africa (COMESA). This community is in fact an interesting case study: its programme of policy harmonization envisages a currency union among a large number of countries (covering 42.6% of total African surface and accounting for 44.6% of total population and 32% of total GDP) characterised by strong disparities in their economic and social background. Econometric evidence will be presented to shed light on different dimensions of the integration process: the degree of convergence of countries' macroeconomic policy stance, the existence of optimal currency area requisites, the evolving pattern of income inequalities.

Two previous valuable contributions on integration in Eastern and Southern Africa need to be mentioned. Harvery et al. (2001) report on pre-requisites for monetary integration in COMESA, thus focusing on the aspect of macroeconomic convergence. Mkenda (2001) instead addresses the question of whether the East African Community (EAC) is an optimal currency area. Relative to them, the value added of this paper is to extend the scope of analysis by considering a broader set of issues (and in the case of Mekenda's paper also a different, larger, sample of countries) and by applying various models for the econometric analysis of time-series data.

The rest of the paper is organised as follows. Section 2 briefly surveys the recent history of COMESA and summarizes key economic and social trends. Section 3 looks at the degree of convergence of macroeconomic policy across member states. Section 4 takes up the issue of whether COMESA is an optimal currency area. Section 5 investigates the time pattern of income dispersion. Section 6 concludes. The data-set is described in Appendix 1. Tables are reproduced in Appendix 2.

2. Basic facts and economic trends in COMESA

Macroeconomic integration is one of the core programs of COMESA since its creation in 1994. Before assessing progress and perspectives of this process it is worth reviewing its origins and the socio-economic framework within which it unfolds.

[1] See for instance, Fielding and Shields (1999), Masson and Pattillo (2001a,b), Dore' and Masson (2002).

2.1 *The Monetary and Fiscal Policies Harmonization Program of COMESA*

COMESA is the offspring of the Preferential Trade Area (PTA), which came into existence in 1982 to promote trade and factor mobility among its member states[2]. A trade liberalization program was launched in 1984 to achieve the elimination of tariffs on a selected list of commodities within eight years. The deadline was subsequently postponed to 2000 to give countries more time to adjust their budgets to changes in the flow of tariff revenues [3]. In 1989 the decision was made to strengthen integration efforts and to establish a monetary union. To this purpose, in 1992, the Authority of Heads of State and Government adopted a Monetary and Fiscal Policies Harmonization Program. This was then endorsed by COMESA when it replaced PTA in 1994.

The harmonization program envisages a gradual evolution towards full monetary integration. The transition is articulated in four stages, with a common currency to be issued in 2025. Before that, countries would first strengthen co-operation on macroeconomic policies (stage 1), introduce limited currency convertibility and set up an informal exchange rate union (stage 2), and finally participate into a formal system of fixed exchange rates with economic policies harmonized by a common monetary institution (stage 3). In 1995, the implementation of the program was reviewed and a set of convergence criteria for macroeconomic policy variables were introduced to guide harmonization (see COMESA, 1995 and Harvey et al. 2001).

Ancillary to the harmonization of macroeconomic policies are a number of initiatives in the field of financial and banking sector integration. These include the transformation of the Clearing House to facilitate regional payments and to deliver electronic financial services, the creation of regional financial institutions (such as the Eastern and Southern Africa Trade and Development Bank and the COMESA Reinsurance Company), and preliminary steps in the realization of a joint system of banking supervisions and regulation through the Meetings of Bank Supervisors (for details see COMESA, 2003).

2.2 *Socio-economic trends in the region*

Table 1 reports some basic socio-economic indicators for COMESA countries, various African RECs, and non-African aggregates. The regional averages show that COMESA is catching up with the rest of Africa, even though the gap with other non-African developing regions remains wide. However, at individual country level, trends are highly heterogeneous and eleven COMESA member states exhibit growth rates lower than the African average. Not surprisingly, the two indicators of human development (life expectancy at birth and child mortality) strongly correlate with income levels and, to a smaller extent, GDP growth.

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[2] As of December 2003, membership of COMESA is: Angola, Burundi, Comoros Islands, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, Zimbabwe.

[3] A Free Trade Area (FTA) has been effectively launched in October 2000. Originally, the FTA included: Djibouti, Egypt, Kenya, Madagascar, Malawi, Mauritius, Sudan, Zambia and Zimbabwe. Burundi, Rwanda and Swaziland joined in 2003. The implementation of a common external tariff, and hence the transformation of the FTA into a custom union, is planned for 2004.

INSERT TABLE 1 ABOUT HERE

Several factors contribute to the determination of such trends. One is certainly political instability and social unrest. Rwanda comes to mind as a clear example: the negative growth rates observed in the first half of the '90s (-4.4% annual growth of per-capita GDP, -3.85% annual growth of aggregate GDP) reversed since 1995 with the improvement in the socio-political context. A second important factor is the spread of HIV/AIDS. The pandemic is seriously eroding the social base of several countries. The increase in the HIV prevalence ratio explains the decrease in life expectancy in countries like Zimbabwe and Swaziland. The associated disruption of human capital then hampers future prospects for economic growth and human development. Finally, for most countries, negative trends result from the volatility of international agricultural prices and extreme climatic conditions. These also lead to growing external imbalances and debt sustainability problems.

The expectation of member states is that macroeconomic integration can generate significant efficiency and dynamic gains and hence contribute to improving such trends. More generally, as widely discussed in ECA (2004), the whole process of regional integration and co-operation is now regarded as a pivotal component of a development strategy addressing issues of peace and security, health, poverty reduction, and macroeconomic stability.

3. The convergence of macroeconomic policy variables

The process of macroeconomic integration in COMESA requires the harmonization of policies and hence the convergence of macroeconomic indicators across countries. This section presents some evidence from time-series data on this form of convergence.

3.1 *Cross-country convergence of macroeconomic indicators*

Preliminary evidence on the degree of convergence of policies can be obtained by comparing the levels of macroeconomic variables across member states to see whether their dispersion increases or decreases over time. To this purpose, Table 2 reports for the period 1980-2002 basic summary statistics of eight key indicators. These are the variables targeted by the convergence criteria introduced in 1995 as a part of the policy harmonization program of COMESA. Data are averaged over sub-periods, with the latest observation including the early 2000s, up to the latest available information (usually 2002). Convergence would be signalled by a decreasing standard deviation as well as a lower percent of countries falling in the tails of the distribution (last two columns of the table).

INSERT TABLE 2 ABOUT HERE

With the exception of domestic credit, for all variables the standard deviation evolves non-linearly over time. This makes it particularly difficult to identify a common general pattern of convergence/divergence. For six variables, standard deviation in early '2000s is smaller than in the first half of the '80s. However, for only three variables, the 2000s value is the lowest ever. For another two, standard deviation

exhibits a recent tendency to increase after hitting the minimum in the period 1995-99. All in all, the aggregate picture is quite mixed.

Focusing on individual variables, a few interesting experiences emerge. Starting with monetary indicators, inflation is one of the two variables whose standard deviation in 2000s is larger than in 1980-84. Yet, after the peak in 1985-89, dispersion has been significantly reduced throughout the '90s. The slight increase reported for the latest sub-period is mostly due to sporadic high inflation episodes in a few member states against a decreasing regional average. Indeed, in only four countries, mean inflation in 2000-02 is above 10% (Madagascar, Malawi, Zambia, and Zimbabwe). Money growth data display a similar pattern, even though relative to inflation the extent of convergence in the '90s is milder and the increase in divergence in 2000s is stronger. The large number of countries falling in the tails of the distribution is a consequence of the fast decrease in the regional average. Finally, there is evidence of convergence in the degree of central bank financing of government deficit, which however remains on average high.[4]

Turning to fiscal indicators, the regional dispersion of fiscal deficit exhibits wide fluctuations around a moderately decreasing trend. Still, deficit levels remain generally high, in spite of the progress observed during the '90s, thus placing fiscal stabilization among top macroeconomic priorities for the region. To some extent, fiscal imbalances arise from difficulties in collecting revenues through the tax system. A limited economic base and inefficient tax administrations have forced countries to rely on taxes on international trade to raise a consistent share of their budget revenues. As the process of trade liberalization unfolds, progressing from early to late liberalization, such revenues will be reduced and reliance on domestic taxation ought to increase. For this reason, a target of 10% (to be risen to 15%) on the tax revenues to GDP ratio has been imposed. The data in the table show that taxes are fairly stable and above the target, while dispersion is low and on a decreasing trend. The persistent fiscal stabilization problems however suggest that a more ambitious threshold should be set to provide governments with incentives to reform the tax policy.

The data also suggest that debt service ratios are generally converging towards more sustainable levels. Progress in this area has been facilitated by participation of several member states into the Highly Indebted Poor Countries (HIPC) initiative. In fact, as projected by IMF, upon completion of the procedure, the average benefit for a country in the initiative can be quantified as a 50% reduction of debt service. It must also be stressed that the picture emerging from the table might be overoptimistic since the data on debt service only include paid debt. Unpaid debt however is likely to be large, at least for some countries (see Harvery et al. 2001).[5]

3.2 *Time-series evidence on convergence of monetary variables*

[4] Consider that the target imposed by the harmonization program is that CB financing should be at most equal to 20% of previous year tax revenues. The level observed in 2000-02 is more than three times higher than such target.

[5] COMESA countries participating into HIPC are: Angola, Burundi, DRC, Ethiopia, Kenya, Madagascar, Malawi, Rwanda, Sudan, Uganda and Zambia. For a comprehensive discussion of debt sustainability issues in Africa and an assessment of the HIPC initiative see ECA (2003) and references therein.

The time-series properties of macroeconomic data allow for an econometric test of convergence based on a simple first-order autoregressive process:

$$(1) \quad y_t = \alpha_0 + \alpha_1 y_{t-1} + \varepsilon_t$$

where y is a macroeconomic variable observed at time t in a generic country, ε is a white-noise, and the αs are parameters to be estimated. When the null hypothesis is specified as $H_0 : \alpha_1 = 1$, then its rejection can be taken as evidence that the series is converging. Estimated model parameters can then be used to compute the value to which the series tends to converge and the speed of convergence.

There are well-know econometric issues involved in the estimation of equation (1). First of all, statistical inference must be based on corrected standard errors, as the normal ones do not account for the distortion arising from having a lagged dependent variable on the right hand side (Dickey and Fuller, 1979 and 1981). Second, if the series includes a structural break, then model (1) is inadequate as it tends to be biased towards non-rejection of the null hypothesis. Indeed, the introduction of convergence criteria and the participation into a policy harmonization program could, and to some extent should, determine a sharp policy change and hence a structural break in the series. For this reason, the test of convergence will be based on the following expanded equation (see also Perron, 1990):

$$(2) \quad y_t = \alpha_0 + \alpha_1 y_{t-1} + \alpha_2 D_\tau + \alpha_3 (y_{t-1}) D_\tau + \varepsilon_t$$

where D is a dummy variable taking value 1 in year τ and in any subsequent year $t > \tau$, and all the other variables and parameters are defined as in equation (1). The dummy variable accounts for the possibility that the behaviour of the series in terms of both intercept and slope is structurally different after τ. For the purpose of assessing convergence in COMESA it therefore makes sense to code the dummy as 1 starting in 1994, when COMESA replaced the PTA (this dummy is referred to as D1994). An alternative coding assigns value 1 starting in 1995, when the policy harmonization was revised with the adoption of criteria (this dummy is referred to as D1995) [6]. The robustness of results to changes in the definition of D is discussed later.

The estimation of equation (2) requires a sufficiently long string of observations on variable y to be available. For most of the countries in the sample, this is the case only for inflation and money growth. Fiscal data are instead available only annually and for a period of maximum 30 to 35 years. Therefore, the bulk of the analysis focuses on the two monetary variables. Results for the other variables, to be taken with great caution because of the limited sample size, are eventually available upon request from the author.

Table 3 summarizes the results of estimating equation (2) on quarterly data for inflation and monetary growth (results using annual data are qualitatively similar). For each country for which data are available, the table reports whether or not the series is converging and eventually to which value. The letter S indicates that the speed and/or the value of convergence are significantly affected by the dummy D. Estimates

[6] As noted below, the dummy however does not allow to separate the effect of participation into COMESA from the effect of other events taking place in the same period or year.

obtained using D1994 are not significantly different from those obtained using D1995. The table displays results using D1995. As a test of robustness, dummies taking value 1 starting in 1997, 1998, 1999, 2000, 2001 have also been used. They are generally much less significant than either D1994 or D1995. Similarly, pulse dummies for each individual year (since 1990) are significant only for a few countries and only for years 1994, 1995 and occasionally 1996.

INSERT TABLE 3 ABOUT HERE

In reading the table it is useful to keep in mind that single digit inflation and money growth in the range of 10% to 20% can be considered as the reference values targeted by the convergence criteria. Two critical features emerge. First, for several countries, the null hypothesis of no convergence cannot be rejected. Second, in the countries where the null can be rejected, series appear to converge to values that are consistent with the targets. A corollary to this latter observation is that for the countries with converging series, the estimated values of convergence fall in a rather small range. Hence, for those countries there is evidence of systematic regional convergence of monetary variables.

The evidence of convergence is stronger for money growth. In fact, all countries with convergent inflation also have convergent rates of money growth, whilst the opposite is not true. Some significant structural breaks are also detected in 1994 and 1995. For some countries, however, it is difficult to disentangle between the impact of participation in COMESA and in its policy harmonization program from the impact of other socio-political and economic events taking place in those years. This is for instance the case of Rwanda, where the observed structural breaks are more likely to be associated with the end of the most violent phase of the ethnic war than with adhesion to the regional economic community.

The caveats in applying the procedure to other macroeconomic variables have already been noted. Keeping them in mind, the general finding is that convergence is even milder than what observed for the two monetary variables. In no country fiscal deficit appears to converge in the long-run. Debt service converges in Ethiopia, Mauritius, Sudan and Swaziland, with evidence of structural breaks around mid-90s. Central bank financing of deficit is converging only in Kenya, and to a level which is projected to be about 2.5 times higher than the target value set by the COMESA criterion. Finally, total claims on government in percent of GDP show convergence in Ethiopia, Sudan and Rwanda, but only in this latter one the value to which the series converges is below 10%.

3.3 *Summary of evidence on convergence of macroeconomic variables*

There is evidence that some monetary variables are converging, both within and across countries, to levels which are consistent with the target set by the policy harmonization framework. This evidence however is not systematic and relates only to some countries. Yet, progress in stabilizing inflation must be acknowledged. For the other variables, evidence of convergence is weaker. In particular, while the cross-national dispersion of deficit is on a decreasing pattern, fiscal stabilization and consolidation still appear to be far from being achieved by the large majority of member states.

4. Is COMESA an optimal currency area ?

The question of whether a given region is an optimum currency area has been posed several times, especially (but not exclusively) with respect to Europe. Two factors that have been pointed out as critical dimensions to optimality are intra-regional trade and symmetry of shocks (De Grauwe, 2003). Evidence on those two factors is therefore investigated in this section.

4.1. *The degree of trade integration among member states*

The evidence on intra-COMESA trade flows is summarised in Table 4. For each country the table reports trade with other COMESA members in percent of GDP (Column 1), in percent of trade with all African states (Column 2), and in percent of total international trade (Column 3). The information is given for two sub-periods: the '80s and the '90s, including the early 2000s (data are normally available up to 2001 for most countries). Summary statistics for COMESA and for other regions are also reported.

INSERT TABLE 4 ABOUT HERE

It appears from the table that COMESA countries trade mostly with partners outside Africa. Intra-regional trade is small if compared against the standards of other communities of developing and emerging countries outside Africa. Over the past two decades, internal trade in the region increased by on average 1% of GDP (with more significant growth in countries like Djibouti, Malawi and Zambia), but intra-African trade increased by a greater proportion. As a result, the share of intra-regional trade on total intra-African trade considerably decreased.

It has to be stressed that several other African RECs display patterns of trade similar to those of COMESA, even though intra-regional trade usually accounts for a greater share of total international trade of member states. Moreover, with the exception of the two CFA zones, this share has increased at a faster rate than what achieved by COMESA. In particular, the cumulative growth rate of intra-regional trade between the two sub-periods was 62% in ECOWAS and 88% in SADC, resulting in an increase of 22% and 66% respectively in the regional trade share of total trade. For COMESA the corresponding figures are 37% and 20%.

The empirical literature on the determinants of trade provides indications on possible explanations for the low levels of regional trade in COMESA. Gravity equations show that bilateral trade flows between any two countries are positively affected by aggregate economic size, per-capita income levels, density and efficiency of infrastructures, participation into economic arrangements (such as free trade areas and currency unions). A negative effect can instead be traced back to geographical distance and to the levels of tariff and non-tariff barriers[7]. Now, most COMESA countries are economically small and poor, separated by large distances and with inefficient infrastructures which reduce the degree of physical integration. Tariff barriers persist in spite of the implementation of the free trade area, whilst significant non-tariff barriers emerge from lack of harmonization of rules and payment systems

[7] Among the many studies in this area, two that are particularly popular are Rose (2000) and Glick and Rose (2001).

as well as from the high costs of transportation and telecommunication. Therefore, low regional trade integration should not come unexpected.

One way to measure the trade performance of COMESA against structural determinants of trade is to compute predicted flows by fitting a gravity model and then compare them against actual flows. Column 4 of Table 4 summarizes the result of this exercise. The gap between actual intra-regional trade and intra-regional trade predicted from the gravity estimates of Glick and Rose (2001) is reported for each country [8]. The gap is almost always positive. This means that whilst internal trade in COMESA is low by international (and even African) standards, it is already higher than what the structural (economic and geographical) factors prevailing in the region would sustain. That is, regional trade can be expected to boost only endogenously with economic growth and further progress on physical, legal and macroeconomic integration.

4.2. *Shock asymmetries and convergence of business cycles*

A number of methods have been proposed to measure econometrically the degree of shock asymmetry across countries in a cluster. Bayoumi and Eichengreen (1993) and Korhonen and Fidrmuc (2001) apply the Blanchard-Quah decomposition to estimate supply and demand shocks from output and price data. Unfortunately, the data requirements involved by such a method are not met by several COMESA countries.

A valuable alternative route makes use of the Generalized Purchasing Power Parity (G-PPP) hypothesis. G-PPP holds when the bilateral real exchange rates (RERs) between pairs of countries in a region are cointegrated. Following Enders and Hurn (1994), who first proposed the hypothesis, positive evidence of G-PPP can be interpreted as evidence that the economic fundamentals across countries share a common stochastic trend, and hence that shocks are symmetric. Therefore, the test of shocks convergence takes the form of a test of cointegration in the following equation:

$$(3) \quad r_{12,t} = \beta_0 + \beta_{13} r_{13,t} + \beta_{14} r_{14,t} + \ldots + \beta_{1m} r_{1m,t} + \varepsilon_t$$

where $r_{1j,t}$ denotes the RER between the reference country 1 and a generic country j in a cluster of m countries (j = 2, 3, ……, m), t denotes time, ε is a stationary stochastic disturbance and βs are the parameters. Because of its relatively accessible data requirement, this procedure is applied below to the group of COMESA countries [9]

The first step is the construction of bilateral quarterly RER series for all COMESA member states. To this purpose, three different anchor countries are chosen, so that for each member state three different series are computed (clearly for the three anchors, one of the series is a sequence of ones). The three anchors are Egypt, Kenya and Zimbabwe. They have been chosen because of their economic size

[8] Findings do not qualitatively change if other gravity estimates are used. The full set of results (also including those generated from a gravity equation estimated only on the sample of African countries) are available from the author upon request.

[9] See Hong Liang (1999) and Mkenda (2001) for an implementation of the procedure using different samples of developing economies.

and extent of trade with COMESA partners. They are also commonly recognised as the centre of the three sub-regional groupings in which COMESA can be partitioned[10]. Between the anchor country *i* and the generic country *j*, the RER is computed as the nominal bilateral exchange rate times the Consumer Price Index (CPI) in *i* divided by CPI in *j*. Angola, Comoros, Djibouti, Eritrea, Namibia, and Zambia are dropped from the sample because of lack of data.

The analysis of cointegration obviously requires RERs to be non-stationary and integrated of the same order. The Augmented Dickey-Fuller (ADF) test of stationariety yields the following results. When Egypt is the anchor, then the series integrated of order 1 (I(1)) are[11]: Burundi, DRC, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Sudan, Swaziland and Zimbabwe. Malawi and Uganda are instead stationary. When Kenya is the anchor all the series are I(1). When Zimbabwe is the reference, the I(1) series are: Burundi, Egypt, Ethiopia, Kenya, Malawi, Mauritius, Rwanda, Seychelles, Sudan and Uganda. Swaziland is I(2) whilst DRC and Madagascar are stationary. All of these results are robust to changes in the lag structure and in the specification of the ADF equation. The same results are obtained when the Phillips-Perron test of stationariety is used.

Testing for cointegration is problematic when equation (3) includes too many endogenous variables. A rule of thumb that is sometimes used indicates in 10 their maximum acceptable number. Consequently, the Generalized-PPP method is first applied to sub-groups of countries within COMESA separately. Then, the test will be run for the entire group. In this case, however, some adjustments will be made to the sample in order to have at most 10 endogenous variables. Details on the composition of groups are provided as notes to Table 5.

The test of cointegration is performed through the Johansen Vector Autorgression (VAR) method. The null hypothesis of the test is that there is no cointegration in equation (3). Therefore, rejection of the null means that the series are cointegrated and hence that there is evidence of shock convergence across countries. Table 5 summarises the findings of the test. For each sub-group and group, the table reports the likelihood ratio (LR) test statistic and the critical values at 5% and 1% confidence levels. The estimated number of cointegrating vectors is also reported in the last column of the table. Results have been generated assuming a liner deterministic trend in the data and one-two lags in the VAR equation. Sensitivity of results to those assumptions are discussed below.

INSERT TABLE 5 ABOUT HERE

For geographical sub-groups, the null hypothesis can be always rejected at 5% confidence levels, and in the case of the central sub-group also at 1% confidence level. However, these results are sensitive to the type of trend assumed and to the number of lags in the VAR. The sub-group of large countries includes the four economies with largest aggregate GDP. The evidence on the existence of at least one

[10] Geographical groups are identified as follows (see for instance Harvey et al. 2001).
North: Egypt, Ethiopia, Eritrea, Djibouti, Sudan;
Centre: Kenya, Burundi, Rwanda, Uganda, Seychelles, Comoros, Mauritius, DRC;
South: Zimbabwe, Zambia, Malawi, Swaziland, Madagascar, Namibia, Angola.

[11] Throughout the rest of this section, the name of a country is used to indicate the series of the bilateral real exchange rate between that country and the anchor country.

cointegrating vector for this sub-group is generally robust and does not depend on the specifications of the test. Moreover, when Ethiopia (the fifth largest country in COMESA) is added, results are almost identical to those reported in the table. Finally, within the sub-groups based on per-capita income levels, cointegration is detected only for poorer countries.

As already noted, for the full COMESA group some adjustments have to be made to limit the number of endogenous variables. The group with Egypt as anchor includes 11 I(1) series. But one of them (Swaziland) is in fact barely stationary. It can therefore be dropped. The test suggests that there is cointegration and that actually more than one cointegrating vector can be identified. For the group with Kenya as anchor there are 13 endogenous variables. Eight of them are also I(1) series with the other two anchors. Therefore, a core group is formed with these eight series. The test shows that among them there is more than one cointegrating vector. The remaining five I(1) series are then added one at the time to the core group and the test is re-run. However, results are largely unaffected, with the only difference being represented by a change in the estimated number cointegrating vectors. Finally, the group with Zimbabwe as anchor has exactly 10 endogenous variables and hence no adjustment is needed. Again, the test suggests that there is cointegration among the RERs.

4.3 *Discussion*

The analysis in this section provides mixed evidence on the optimality of COMESA as a currency area. Following a typical pattern in Africa, intra-regional trade in COMESA is low. Two factors contributing to such a pattern are the small economic size and low incomes of most economies in the region and the persistence of barriers to trade. Low trade integration reduces the degree of interdependence of economies and hence increases the likelihood of shock asymmetries. This in turn can increase the costs of adopting a common currency.

A more optimistic picture emerges from the implementation of the G-PPP test. The fundamentals of the four largest economies in the region (Kenya, Egypt, Zimbabwe and Sudan) appear to share a common stochastic trend. The result is confirmed, perhaps to a less robust extent, for the three regional sub-groups in which COMESA can be partitioned. The large number of countries in the region, and hence the large number of endogenous variables, limits the reliability of a test of cointegration for the full sample of COMESA. Yet, after adjusting the sample to account for that problem, evidence is obtained which is consistent with the hypothesis that shocks in the region are somehow convergent.

That economic fundamentals tend to co-move while countries do not trade much between each other is consistent with the high degree of similarity of industry structures in the region. In COMESA, agriculture on average accounts for 44% of value added GDP, services for 25% and industry for 22% (with an 11% component of manufacturing). Such shares have remained fairly stable over the past two decades Moreover, data are characterised by a low dispersions: the average figures for the region as a whole in fact match quite closely country-specific figures in the majority of member states. The implication is that many of the countries tend to produce, and hence sell, the same commodities, with heavy reliance on primary products. Therefore, on one hand they lack the complementarity required to generate large trade volumes. On the other hand, they tend to experience similar shocks (i.e. changes in

international commodity prices) and hence their business cycles exhibit synchronized fluctuations.

Then the question remains of whether COMESA is an optimal currency area. As suggested by recent theoretical and empirical work (Frankel and Rose, 1998 and Corsetti and Pesenti, 2002), trade flows are likely to be endogenous to the process of monetary integration. That is, the process of policy harmonization and the transition towards a currency union should stimulate greater trade flows through its impact on macroeconomic stability, market size and microeconomic efficiency. In this sense, the currency area would be self-validating even though at the beginning of the process not all of the requisites for optimality indicated by the traditional theory (such as large trade flows between perspective members) were in place. Yet, in the case of COMESA, many countries need to complete structural adjustment. Moreover, regional economic institutions must be carefully designed and agreed upon by al members before they become operational. All this suggests that the transition to a currency union should be gradual (see also ECA, 2004).

5. Income convergence

Regional economic integration is expected to strengthen trade links and hence to facilitate technological spillovers across borders. To the extent that this effectively happens, income levels should converge and the initially poorer member states will catch up with the richer ones. Strong evidence of convergence does exist for the European Union. Still, the same type of evidence is hardly available for other RECs. It has been suggested that income convergence is the likely outcome only in North-North (or at most North-South) integration. On the contrary, South-South integration could easily lead to income divergence and unequal distribution of welfare gains (see for instance Venables 2002).

This section analyses the extent of per-capita GDP convergence/divergence in COMESA. Following the literature in the field, two measures of convergence are computed. The first one (sigma convergence) is the standard deviation of per-capita real GDP across member states. The second one (beta convergence) is the estimated coefficient on initial (or lagged) per-capita GDP in a regression of the rate of per-capita GDP growth. Results are reported in Table 6.

INSERT TABLE 6 ABOUT HERE

The top part of the table displays average standard deviation of per-capita GDP levels in five sub-periods and for different groups of countries. For the whole of COMESA there is no evidence of convergence. On the contrary, income dispersion appears to increase over time. The same is true for other clusters, even though in the North sub-group the rate of increase of the standard deviation is quite moderate. The group of higher income countries includes the ten member states whose per-capita income at the beginning of the sample period was above the regional median. The group of lower income countries instead includes the member states with income below the median. Incidentally, the composition of these two groups would be almost the same if income in 2000s (rather than in early ‘60s) were taken as reference. The only change would be that one country would move up from lower to higher income (Kenya) and one down from higher to lower income (Angola). Whilst there is no evidence of convergence among higher income countries, disparities are on a

decreasing trend in the lower income group. But this is certainly not good news. In fact, convergence appears to be taking place to the bottom. Average income of this group has been constantly decreasing since mid-70s and the gap with the rest of COMESA is widening. Such patterns are consistent with (albeit do not necessarily prove) the hypothesis that some COMESA member states are trapped into poverty.

The lower part of the table reports the estimate of the coefficient β_1 in the following growth regression:

$$(4) \quad g_{it} = \beta_0 + \beta_1 y_{it-1} + \boldsymbol{\beta}_2 \mathbf{W}_{it} + \varepsilon_{it}$$

where g is the annual growth rate of per-capita GDP in country i in period t, y is the log of per-capita GDP level in period t-1 (that is, at the beginning of period t), **W** is a vector of controls, ε is a non-spherical disturbance and βs are parameters to be estimated. The equation is estimated by Generalized Method of Moments (Arellano and Bond, 1991). The set of controls includes: lagged values of primary and secondary enrolment rate, an index of political instability, the trade to GDP ratio, infrastructures (roads, railways, ports, telephone lines) density by surface and population. Estimates of β_1 are qualitatively unaffected by inclusion of the rate of physical capital accumulation and are also robust to experimentation with the set of controls.

The estimated coefficient on lagged per-capita income does not ever pass a zero restriction test. This means, that there is no significant evidence of relative convergence (or even divergence). As a point of comparison, consider that the same regression estimated for the European Monetary Union over the period 1960-2000 yields a coefficient of beta convergence of –0.0153 with a p-value of 0.02. For other African RECs instead, results are pretty similar to that observed for COMESA, with the exception of UEMOA where the coefficient β_1 is negative (-0.033) and different from zero at 10% confidence level in the period 1980-2000.

To sum up, income does not appear to converge across COMESA member states. On the contrary, the gap between poorer and richer countries in the region is widening and overall distribution is probably evolving towards a bi-modal configuration. Thus, the experience of COMESA so far conforms to the general pattern observed in several South-South regional integration agreements.

6. Conclusions

A few results from the analysis in the previous sections can be highlighted.

- Some macroeconomic variables do display a tendency to converge across countries. However the general picture, especially for what concerns the fiscal stance, is still characterised by substantial divergence.
- Intra-regional trade flows are relatively low, even though on average higher than what a standard gravity model would predict.
- The economic fundamentals of a bulk of countries in the region tend to share a common stochastic trend and hence there is evidence that shocks might be symmetric.
- Sharp disparities in the distribution of income across countries persist, with a widening gap between richer and poorer member states.

A few policy implications then emerge. Cross-country differences in the level of macroeconomic variables certainly reflect the competence of different governments in managing economic policy and reforms. But they are also likely to reflect different preferences over macroeconomic outcomes; that is, different targets on the output-inflation trade-off as well as different views on the role of monetary and fiscal policy. Preferences across member states can differ for a number of reasons, including the ideological orientation of the government and the socio-political background of the country. In any case, the very existence of these differences, eventually coupled with asynchronised business cycles, can generate tensions that can lead to the collapse of the entire process of integration. Whilst convergence criteria are embedded in the policy harmonization program as a tool to facilitate the development of a common policy stance, even greater attention in the transition to a currency union ought to be dedicated to the design of institutions. These include the mechanisms to ensure effective decision making of the common monetary authority as well as its independence and autonomy, the definition of surveillance procedures for banking and credit sectors, the identification of a lender-of-last-resort (which should be the common central bank), the development of common formats for data-collection and analysis.

At the same time, countries should strengthen efforts to remove barriers to intra-regional trade. In fact, as already noted, trade integration reduces divergences and hence facilitates the adoption of a common policy stance. The elimination of tariffs and the realization of a free trade area is only one of several initiatives that should be undertaken. To promote trade, countries need to harmonize rules and regulations, establish a system of regional payments, co-operate on the realization of infrastructures to increase physical connectivity, speed up custom procedures, develop regional markets, and strengthen the flow of information across borders. Corollary initiatives pertain to the mobility of labour across borders and the harmonization of education systems. Most of these are in fact already mentioned in the treaties and protocols signed by member states. However, as reported in ECA (2004), progress on paper often is not matched by effective implementation.

In the progress towards deep forms of integration, COMESA will face the critical issue of how to finance the process of integration itself. There are two relevant dimensions here. The first concerns the mobilization of resources to cover the budget of the secretariat and of other regional agencies. The second dimension is instead related to the establishment of a regional system of fiscal transfers to compensate income disparities and facilitate the development of less favoured areas in the region. In principle, regional institutions and projects should be self-financed. This is a widely accepted idea explicitly recalled in the COMESA Treaty (Article 168). However, the poor economic conditions of many member states clearly limit the extent of contributions from national budget, thus calling for the identification of alternative mechanisms. A possible solution is to set a levy based on imports of member states of goods originating from third countries (see, for instance, ECA 1997 and 1998). The exact rate should be computed from projections of import values and spending needs. A preliminary estimate elaborated by the Economic Commission for Africa is that for COMESA a rate of 0.7% should generate a sufficient flow of resources. This mechanism would also smooth the possible conflicts over the allocation of regional funds that arise when these are paid from national budgets. The experience from other RECs where this levy is already effective (UEMOA, CEMAC, ECOWAS) is that customs administrations should be in charge of its implementation

(that is computation of the tax-base and collection of funds). Funds should then be deposited directly in accounts at Central Banks and opened in the name of the Secretariat. Such funds should be fully available to the community (as it is the case in the European Union). Monitoring and surveillance procedures ought to be handed to the Executive Secretary of COMESA and to the regional policy organs.

Finally it is worth pointing to some directions of future research. On the institutional side, given the prominence attributed to regional integration in Africa, it would be interesting to study the effectiveness and efficiency of the relationships between RECs and their link with the Africa Union. This involves, for instance, the issue of overlapping membership; that is, of countries that join more than one REC at the time and hence benefit from an escape clause which reduces their commitment to the process of integration in each region. On a political-economic ground, it is necessary to understand the factors that determine the speed of integration. There is little question that some RECs tend to integrate faster than others and that even within the same REC, some countries appear to be more committed than others. A potential driving force behind those differences is the way in which costs and benefits of integration are allocated across socio-economic groups, or at least the perception that groups have of the economic consequences of integration. A theoretical and empirical assessment of such forces would help assess the popular and political support that the process is likely to receive in the long-run. On a stricter economic ground, the question of how to achieve fiscal stabilisation is particularly relevant for COMESA and hence it will be important to evaluate whether the composition of fiscal adjustment has any impact in terms of duration and macroeconomic consequences of the adjustment itself. This would in turn create the basis for a critical assessment of the soundness of the fiscal convergence criteria currently imposed.

Appendix 1. Description of the data-set.

Sources and variables

The data-set used for this analysis consists of quarterly and annual observations on a number of macroeconomic variables. The sample period is generally set to 1970-2002, with occasional extensions to 1965 for some variables. Exceptions include Eritrea (data generally start in 1993/1994), Namibia (data start in 1990) and DRC (data end in 1998). Different sources have been used in the compilation of the data set. However, series from different sources have been combined only after checking for the consistency of definitions and the correspondence of the values reported for overlapping countries/periods. As detailed below, the main sources of raw data are: International Financial Statistics (IFS), World Development Indicators (WDI), World Bank Africa Database (WBADB), African Development Banks Selected Statistics (ADB). Variables definition is as follows.

GNI per capita	Gross national income per-capita at PPP in US dollars. Source: ADB and WDI
Aggregate real GDP	GDP at constant prices in local currency and USD. Base year is 1995. Source: WBADB and WDI
Real GDP per-capita	GDP per-capita at 1995 prices expressed in USD and local currency. Source: WBADB and WDI.
Life expectancy	Number of years that a newborn is expected to live. Source: WDI
Child mortality	Number of children who die before reaching age 5 (per 1000 newborns). Source: WDI
Inflation	Annual/quarterly rate of change of CPI. Source: IFS, WBADB
Fiscal balance	Overall budget balance of central governments. Budget balance includes current and capital revenues net of grants less total expenditure minus repayments. It is expressed in percent of GDP Source: WBADB, WDI
CB financing	Central bank financing of budget expressed in percent of previous years' tax revenues. CB financing is defined as line 12 AZF of IFS. Source: IFS and WBADB
Claims on government	Total claims on central government in percent of GDP. Total claims on government is defined as line 32 AN of IFS. Source: IFS, WBADB.
Money growth	Annual/quarterly percent change in money stock (lines 34 ZF and 35 ZF of IFS). Source: IFS and WBADB

Domestic credit	Domestic credit to the private sector in percent of GDP. Source: IFS and WBADB.
Debt service	Total domestic and external debt service in percent of exports. Source: WDI and WBADB.
Tax revenues	Total tax revenues in percent of GDP. Source: WDI and WBADB.
Intra regional trade	Total trade (imports plus exports) of a country with the other member states. It is expressed in percent of GDP, of total trade with African countries, and of total international trade. Source: Direction of Trade Statistics
Real exchange rates	Period average of real exchange rate between anchor country *i* and generic member state *j*. Anchor countries are Egypt, Kenya and Zimbabwe. Quarterly frequency of observations. The real exchange rate is computed using the formula: $RER_{ij,t} = e_{ij,t} \frac{P_i}{P_j}$ where *e* is the nominal exchange rate between *i* and *j*, *P* denotes the consumer price index and *t* is a generic quarter. Source: IFS.

Regional aggregates and membership

Membership of the regional communities and regional aggregates used in the paper are as follows.

COMESA (Common Market for Eastern and Southern Africa): Angola, Burundi, Comoros, Djibouti, Democratic Republic of Congo (DRC), Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, Zimbabwe.

CEMAC (Central African Economic and Monetary Community): Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea, Gabon.

EAC (East African Community): Kenya, Tanzania, Uganda.

ECOWAS (Economic Community of West African States): Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo.

SADC (Southern African Development Community): Angola, Botswana, Democratic Republic of Congo, Leshoto, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe.

UEMOA (West African Economic and Monetary Union): Benin, Burkina-Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo.

EU (European Union): Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

EMU (European Monetary Union): Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain.

MERCOSUR (Common Market of the South America): Argentina, Brazil, Uruguay, Paraguay.

ASEAN (Association of South-East Asian Nations): Brunei Darussalam, Cambodia, Indonesia, Lao's people Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam.

INDUSTRIAL COUNTRIES: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

MIDDLE EAST: Bahrain, Egypt, Iran, Israel, Jordan, Kuwait, Lebanon, Saudi Arabia, Syria, United Arab Emirates, Yemen.

SOUTH AMERICA: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Trinidad and Tobago, Uruguay, Venezuela.

EAST ASIA: Cambodia, China, SAR Hong Kong, Indonesia, Lao's People Democratic Republic, Malysia, Macao, Philippines, Singapore, South Korea, Thailand, Vietnam.

Appendix 2. Tables

Table 1. Macroeconomic and social indicators

Country/ Region	GNI p.c. (PPP, USD)	Aggregate real GDP growth (average annual %)		Life expectancy		Child Mortality	
	2000s	**1990-1995**	**1996-2002**	**1990s**	**2000s**	**1990s**	**2000s**
Angola	240	-2.8	5.73	45.46	46.58	131	207.8
Burundi	110	-1.27	-0.78	43.59	41.96	180	175.8
Comoros	380	0.35	0.97	55.97	60.97	120	80
DRC	100	-7.03	-1.2	51.55	45.75	155	162.53
Djibouti	840	-1.78	-0.1	47.77	45.81	175.1	178.04
Egypt	1490	3.79	5.44	62.80	67.46	85	52.15
Eritrea	170	3.40	2.23	48.94	52.03	139.6	102.92
Ethiopia	100	2.6	5.28	45	42.29	213.4	178.92
Kenya	360	2.04	1.78	57.11	46.97	97	119.8
Madagascar	260	0.29	3.85	52.76	54.66	170	143.9
Malawi	170	3.88	4.03	44.61	38.8	234	193.04
Mauritius	3800	5.31	5.76	69.64	71.67	25	20.12
Namibia	2050	4.55	3.84	57.52	47.15	84	112.08
Rwanda	230	-3.85	9.92	40.19	39.94	202	202.9
Seychelles	7310	3.95	2.32	70.3	72.34	21	13.98
Sudan	320	7.33	6.66	52.17	56.17	125	81.2
Swaziland	1290	3.75	3.42	56.64	45.62	115	119.46
Uganda	310	4.58	5.61	46.75	42.13	165	161
Zambia	300	-1.11	2.70	49,15	37.97	194	186.46
Zimbabwe	480	2.33	2.07	56.16	39.93	77	115.84
COMESA	477	2.87	4.71	51.99	49.61	147.11	134.93
CEMAC	589	0.08	4.28	50.95	49.13	153.03	155.59
ECOWAS	308	2.85	3.27	48.86	47.52	163.19	162.67
SADC	891	0.88	2.63	52.5	44.67	146.03	146.1
UEMOA	374	1.86	4.30	47.67	46.73	208.5	188.21
AFRICA	650	1.98	3.71	52.55	50.22	144.21	135.18
Ind. Countries	28316	1.98	3.04	76.28	78.15	9.16	7.01
S. America	2946	5.71	4.12	64.34	68.43	72.27	44.04
Mid. East	3634	3.32	2.11	67.34	69.21	50.45	33.51
East Asia	1229	8.82	6.66	67.7	69.7	39.07	30.48

Notes: Own computations from data-base described in the Appendix. Regional averages are computed as weighted averages of national data, using shares of population and shares of GDP as weights. 1990s denotes year 1990 or nearby, depending on availability. 2000s denotes the latest possible observation (2001 or 2002 for most countries).

Table 2 Convergence of macroeconomic variables

Variable	Period	Average Unweight	Average weight.	Min	Max	Std. Dev.	Tails (%)
Inflation							
(annual %	80-84	15.36	16.20	3.63	56.20	13.46	41.17
Change	85-89	23.15	23.91	1.42	155.25	40.46	58.82
Of CPI)	90-94	25.47	24.54	2.46	112.19	35.71	50.00
	95-99	15.33	12.79	1.63	56.19	18.67	44.44
	00-02	13.75	9.00	-1.97	89.03	22.91	47.06
Fiscal							
Balance	80-84	-5.87	-6.72	-19.15	7.01	7.93	64.70
(% of	85-89	-8.49	-10.04	-24.00	-0.29	6.96	44.44
GDP)	90-94	-10.07	-9.03	-29.48	-0.87	9.41	35.00
	95-99	-9.27	-4.70	-39.10	-0.07	9.84	70.00
	00-02	-7.42	-5.01	-67.61	-0.93	7.40	47.36
CB							
Financing	80-84	7.00	6.40	0.28	34.97	9.83	46.67
(% of 0.2	85-89	6.03	7.47	0.00	31.00	9.33	75.00
Tax rev.)	90-94	7.58	8.97	0.04	58.85	12.79	76.47
	95-99	5.39	5.18	0.02	31.99	7.76	61.11
	00-02	3.30	4.94	0.00	27.32	4.21	55.56
Claims							
On gov	80-84	18.65	17.12	-6.24	49.46	34.07	62.50
(% of	85-89	16.84	15.58	-7.49	46.40	32.45	52.94
GDP)	90-94	17.38	24.68	-17.51	81.92	30.95	66.67
	95-99	13.04	19.38	-16.47	68.76	17.60	68.42
	00-02	11.77	22.37	-18.81	102.59	19.34	77.78
Money							
Growth	80-84	18.27	18.63	7.20	56.61	24.45	33.33
(Annual %	85-89	27.83	31.76	8.42	128.3	26.03	50.00
Change)	90-94	26.96	27.33	1.38	85.32	26.85	47.05
	95-99	18.48	17.10	-2.93	45.93	15.68	41.17
	00-02	23.51	33.18	4.33	129.7	20.70	68.75
Dom							
Credit	80-84	16.57	21.15	2.23	29.74	8.67	18.75
(% of	85-89	17.38	24.68	2.20	55.31	12.82	52.94
GDP)	90-94	19.51	23.48	1.15	46.80	13.37	38.89
	95-99	21.40	34.00	1.06	51.81	17.11	52.63
	00-02	22.16	40.14	2.08	61.36	18.13	55.56
Debt							
Service	80-84	17.91	10.54	2.05	32.03	19.54	70.58
(% of	85-89	23.99	15.22	5.04	49.12	25.00	52.94
Exports)	90-94	19.17	15.71	3.23	59.54	19.62	66.67
	95-99	15.96	18.14	0.66	54.70	15.11	60.00
	00-02	14.41	12.63	1.53	35.82	12.25	65.00
Tax							
Rev.	80-84	20.24	27.39	5.64	42.70	9.88	25.00
(% of	85-89	21.78	26.14	4.10	47.03	10.61	22.22
GDP)	90-94	21.52	25.91	4.83	48.40	11.65	30.00
	95-99	22.39	24.31	5.31	45.19	11.17	35.00
	00-02	22.49	21.35	9.80	41.83	9.68	15.79

Notes: Own computations from data-base described in the Appendix. Shares of GDP used as weights in the computation of weighted regional averages. Data on inflation and money growth exclude the two war-torn countries with hyperinflation (DRC and Angola). Data on CB financing exclude DRC. Standard deviation (Std. Dev.) measures the average dispersion of each variable across countries in a given period. Tails indicate the percent of countries in the sample falling outside the range of ± 50% of the weighted mean.

Table 3 Time series analysis of inflation and money growth

	Inflation	Money growth rates
Burundi	8.775 S	14.708
DRC	No convergence	No convergence
Egypt	No convergence	18.994
Ethiopia	No convergence	12.886
Kenya	2.261 S	16.069 S
Madagascar	No convergence	No convergence
Malawi	No convergence	No convergence
Mauritius	No convergence	No convergence
Rwanda	3.408 S	20.083 S
Seychelles	No convergence	13.821
Sudan	9.227 S	No convergence
Swaziland	No convergence	17.017
Uganda	No convergence	No convergence
Zambia	No convergence	No convergence
Zimbabwe	No convergence	No convergence

Notes: Own computations from data-set described in the Appendix. No convergence means that the null hypothesis cannot be rejected at usual confidence levels. Critical values for the test of significance are drawn from Monte-Carlo simulations (Dickey and Fuller, 1979 and 1981, and Perron, 1990). S denotes that the coefficients on the dummy in model (2) are significant. Sample period is generally set from Q1/1970 to Q4/2002.

Table 4 Trade statistics

	Column 1 (% of GDP)		Column 2 (% Int.-Afr. Trade)		Column 3 (% of total trade)		Gap from predicted flows		
	'80-'90	**'91-'01**	**'80-'90**	**'91-'01**	**'80-'90**	**'91-'01**	**1980**	**1990**	**2001**
Angola	0.107	0.179	22.607	7.234	0.218	0.191	0.065	-0.002	-0.132
Burundi	2.518	3.104	84.940	68.498	9.422	11.210	2.285	1.648	3.203
Comoros	3.500	3.179	92.996	43.535	6.708	6.944	n.	n.	n.
DRC	0.349	1.139	26.580	18.192	1.549	3.065	0.044	1.223	0.173
Dijbouti	8.354	12.953	69.564	57.616	12.476	11.878	n.	n.	n.
Egypt	0.334	0.250	67.415	38.045	0.903	0.975	0.095	0.183	-0.523
Ethiopia	0.739	1.632	97.322	92.449	3.581	6.604	0.762	0.932	1.470
Kenya	4.068	5.452	84.758	55.990	10.067	10.671	4.865	4.613	6.011
Madagascar	0.292	1.062	55.988	39.023	1.113	3.587	0.151	0.499	2.902
Malawi	4.490	7.187	26.808	27.947	8.990	12.394	3.828	5.357	10.469
Mauritius	1.648	2.877	23.021	27.408	1.855	3.030	2.786	1.950	2.796
Rwanda	3.758	3.538	93.438	66.980	15.526	14.965	7.381	1.321	3.383
Seychelles	3.326	2.025	32.311	22.128	4.725	2.942	3.214	1.094	0.377
Sudan	0.687	0.934	82.795	37.257	4.558	4.330	0.099	0.107	-4.281
Uganda	4.110	5.201	92.311	86.191	17.237	24.072	5.366	4.696	6.074
Zambia	3.124	5.446	34.942	31.887	5.869	10.652	1.704	5.145	5.084
Zimbabwe	2.190	3.588	21.653	17.208	6.528	6.318	2.377	3.330	3.419
COMESA	2.564	3.514	59.379	43.388	6.549	7.872	2.335	2.140	2.695
				Memorandum items					
CEMAC	2.824	3.069	47.736	43,063	6.354	5.039	N.A.	N.A.	N.A.
EAC	3.052	4.193	76.414	60.046	10.450	13.611	N.A.	N.A.	N.A.
ECOWAS	4.953	8.024	79.192	80.053	11.622	14.199	N.A.	N.A.	N.A.
SADC	5.881	11.091	71.408	81.408	12.142	20.203	N.A.	N.A.	N.A.
UEMOA	4.137	5.317	56.956	53.426	10.816	10.730	N.A.	N.A.	N.A.
EU-15	29.011	36.652	N.A.	N.A.	57.261	62.614	N.A.	N.A.	N.A.
MERCOSUR	5,614	10.721	N.A.	N.A.	25.489	39,363	N.A.	N.A.	N.A.
ASEAN	17.359	27.378	N.A.	N.A.	19.051	25.423	N.A.	N.A.	N.A.

Notes: Own computations from data-set described in the Appendix. N.A. stands for Not Applicable, n. stands for not available. Data for Eritrea, Namibia and Swaziland are not available. Trade of each country with the other COMESA member states is expressed in percent of intra-regional trade (Column 1), intra-African trade (column 2) and total international trade (Column 3). Column 4 reports the

difference between actual trade flows and predicted trade flows from gravity models (see text) and it is expressed in percent of GDP.

Table 5 Cointegration test of Real exchange rates

	L. R. T-stat.	Critical values		N. of coint. vectors
		5%	1%	
Sub groups by geographical location				
Northern group (Egypt anchor)	19.63	18.17	23.46	2
Central group (Kenya anchor)	110.25	94.15	103.18	1
Southern group (Zimbabwe anchor)	35.02	29.68	35.65	1
Sub groups by economic size (aggregate GDP)				
Large countries (Egypt anchor)	57.60	47.21	54.46	1
Large countries (Kenya anchor)	57.21	47.21	54.46	1
Large countries (Zimbabwe anchor)	54.27	47.21	54.46	1
Sub groups by p.c. income levels				
Higher income (Egypt anchor)	28.85	47.21	54.46	NONE
Lower income (Kenya anchor)	150.23	124.24	133.57	1
Higher income (Zimbabwe anchor)	27.77	47.21	54.46	NONE
Full COMESA group				
Group 1 (Egypt anchor)	338.08	233.13	247.18	3
Group 2 (Kenya anchor)[a]	225.30	156.00	168.36	3
Group 3 (Zimbabwe anchor)	306.00	233.13	247.18	2

Source: Own computations from data-set described in the Appendix. Sample period is Q1/1980-Q4/2002 The composition of groups is as follows. Northern group: Egypt, Ethiopia, Sudan. Central group: Kenya, Burundi, DRC, Mauritius, Rwanda, Seychelles, Uganda. Southern group: Zimbabwe, Malawi, Swaziland, Madagascar. Large countries: Egypt, Kenya, Sudan, Zimbabwe, (Ethiopia). Higher income countries: Egypt, Mauritius, Seychelles, Swaziland, Zimbabwe. Lower income countries: Kenya, DRC, Ethiopia, Madagascar, Malawi, Rwanda, Sudan, Uganda. COMESA group 1: Egypt, Burundi, DRC, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Sudan, Zimbabwe. COMESA group 2: Zimbabwe, Burundi, Egypt, Ethiopia, Kenya, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Uganda. COMESA group 3: Kenya, Burundi, Egypt, Ethiopia, Mauritius, Rwanda, Seychelles, Sudan, Zimbabwe.

[a] The following countries are added, one at the time, to the basic group indicated above: DRC, Madagascar, Malawi, Swaziland, Uganda. Results when including such countries (available from the author upon request) are qualitatively identical to that reported for the basic group and displayed in the table.

Table 6 Test of income convergence

	Sigma convergence				
	1960-69	**1970-79**	**1980-89**	**1990-99**	**2000-02**
COMESA	716.72	991.30	1181.64	1626.89	1735.96
Large countries	140.43	203.75	288.34	362.12	425.30
North	n.a.	n.a.	452.66	460.7	475.45
Central	n.a.	n.a.	1773.8	2600.04	2769.64
South	n.a.	n.a.	763.80	754.21	840.52
Higher income	n.a.	1251.09	1459.36	2057.30	2193.40
Lower income	n.a.	192.66	178.53	134.91	139.40

	Beta convergence				
	1960-69	**1970-79**	**1980-89**	**1990-02**	**1960-02**
Coefficient	-0.26	-0.46	0.33	0.45	-0.17
Standard error	0.41	5.38	0.56	0.67	0.50
T-ratio	-0.62	-0.85	0.59	0.68	-0.34
p-value	0.54	0.41	0.56	0.51	0.74

Source: Own computations from data-set described in the appendix. Sigma convergence data are period average of regional standard deviation of per-capita GDP. Beta convergence data are estimated coefficients of initial per-capita GDP in a panel growth regression (see text for details). Groups are as follows. COMESA: all member states. Large countries: Egypt, Kenya, Sudan, Zimbabwe, (Ethiopia). North: Egypt, Sudan, Djibouti, Ethiopia, Eritrea. Central: Kenya, Burundi, Comoros, DRC, Mauritius, Rwanda, Seycelles, Tanzania, Uganda. South: Zimbabwe, Angola, Madagascar, Malawi, Namibia, Swaziland, Zambia. Higher icome: Comoros, Sudan, Djibouti, Egypt, Mauritius, Namibia, Seychelles, Swaziland, Zimbabwe, Angola. Lower income countries: Kenya, Burudi, DRC, Eritrea, Ethiopia, Madagascar, Malawi, Rwanda, Zambia, Uganda.

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