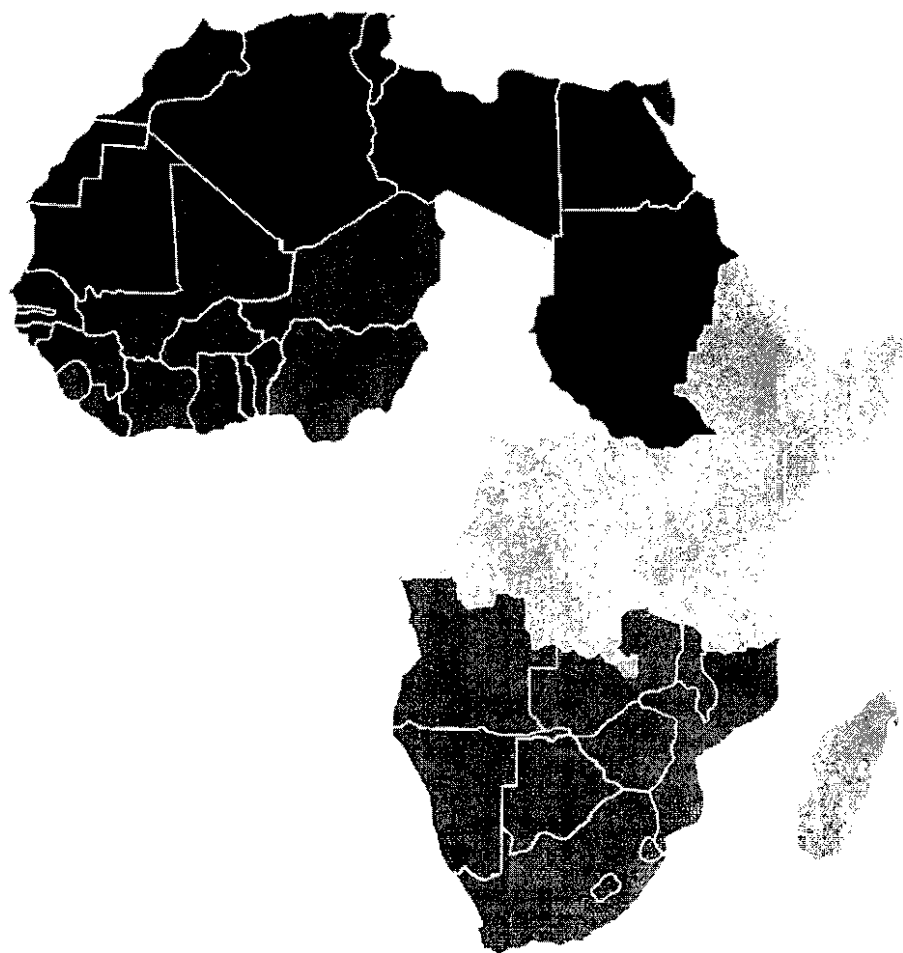# MACROECONOMIC AND MONETARY CONVERGENCE IN SELECTED REGIONAL INTEGRATION GROUPINGS
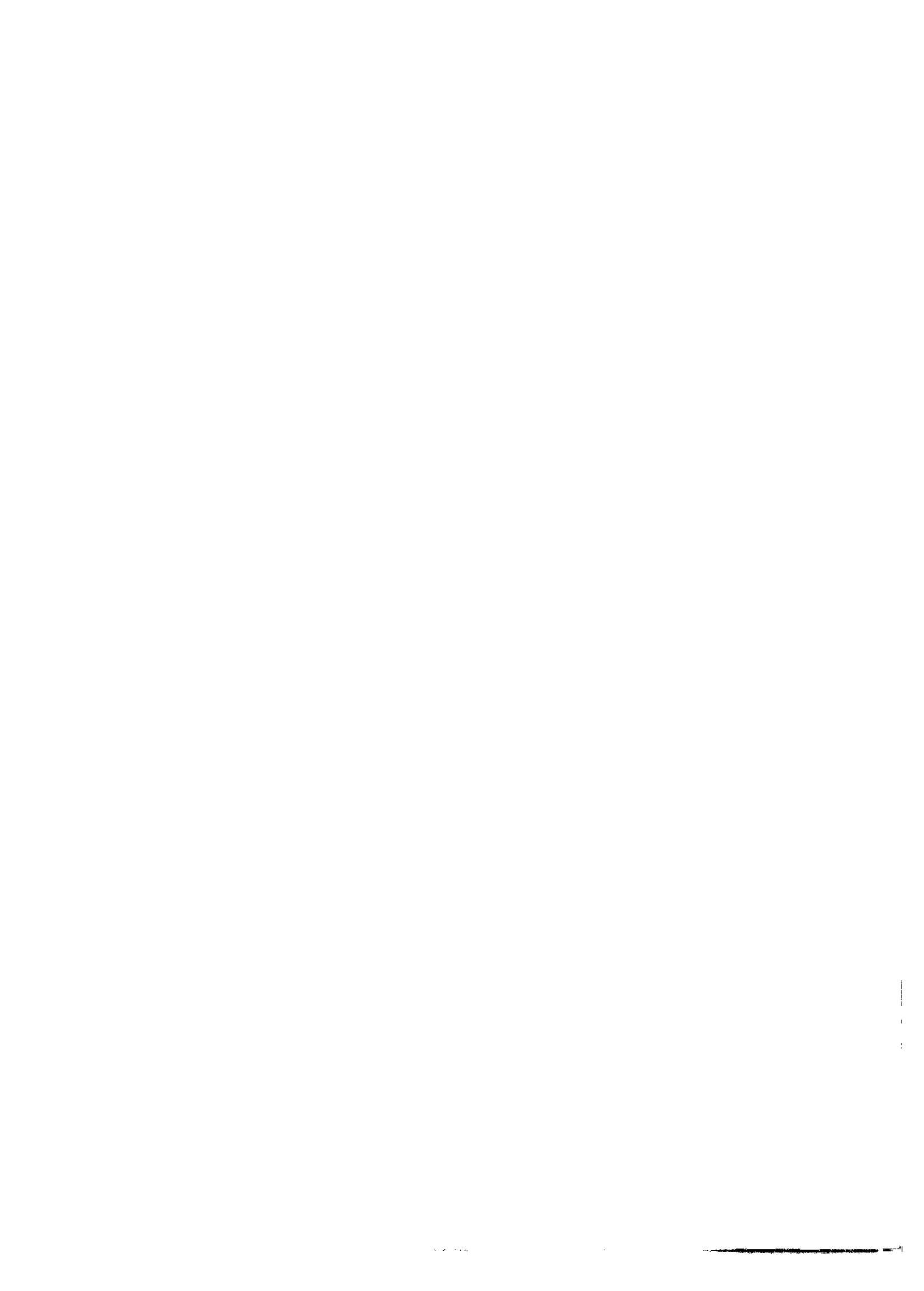
Trade and Regional Integration Division *

September 2003

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List of Acronyms and Abbreviations

ADB	African Development Bank
ADF	Augmented Dickey-Fuller Test
AEC	African Economic Community
ASEAN	Association of South-East Asian Nations
CEMAC	Central African Economic and Monetary Community
CFA	Colonies Françaises de l'Afrique
CMA	Common Monetary Area (Rand Area)
COMESA	Common Market for Eastern and Southern Africa
CPI	Consumer Price Index
DRC	Democratic Republic of Congo
EAC	East African Community
ECA	Economic Commission for Africa
ECCAS	Economic Community of Central African States
ECOWAS	Economic Commission of West African States
EMU	European Monetary Union
EU	European Union
FDI	Foreign Direct Investment
FTA	Free Trade Area
GDP	Gross Domestic Product
GNI	Gross National Income
HIPC	Heavily Indebted Poor Countries Initiative
IMF	International Monetary Fund
MERCOSUR	Common Market of the South
OECD	Organization for Economic Co-operation and Development
PTA	Preferential Trade Area of Eastern and Southern African States
RECs	Regional Economic Communities
RERs	Real Exchange Rates
SADC	Southern African Development Community
SADCC	Southern African Development Coordination Conference
UEMOA	West African Economic and Monetary Union
USD	United States Dollar

List of abbreviations for data sources

ADB	African Development Bank – Selected Statistics
DOTS	Direction of Trade Statistics – IMF
EIU	Economist Intelligence Unit – Country database
IFS	International Financial Statistics – IMF
WBAD	World Bank Africa Database
WDI	World Development Indicators – World Bank

EXECUTIVE SUMMARY

Background, motivation and structure of the report

Several African Regional Economic Communities (RECs) pursue deep forms of monetary and macroeconomic integration, such as the establishment of a system of fixed exchange rates, the formation of a monetary union, or even the creation of full economic communities. This process of deep integration is expected to generate substantial micro- and macro-economic benefits for the countries involved. The relevant literature points to both efficiency and dynamic gains. The increased stability of exchange rates and the reduced degree of economic uncertainty will favor the integration of goods and capital markets and the exploitation of economies of scale. At the same time, the more stable macroeconomic environment will stimulate investments, financial development and private sector activities, thus contributing to the growth potential of Member States.

Deep integration however also has costs. A system of fixed exchange rates, and even more a currency or an economic union, implies that countries will have to adopt a common monetary policy. That is, national authorities will progressively give up the possibility to employ monetary policy as a tool for domestic stabilization purposes. This loss of control over monetary policy is particularly costly for national policymakers to the extent that shocks are asymmetric and macroeconomic preferences/objectives differ across countries in the region. Furthermore, the expected benefits from integration might not be equally distributed among participating countries. The likelihood that a group of "winners" from integration will emerge against a group of "losers" increases the larger the cross-country heterogeneity of industrial structures, economic size and stage of development, initial macroeconomic conditions, and financial depth.

To strike a more positive balance between benefits and costs, both at regional and national level, it therefore appears that countries should converge on three critical dimensions:

    (i)   macroeconomic policy stance (preferences and objectives),
    (ii)   shocks and economic disturbances,
    (iii)   macroeconomic outcomes.

It must be stressed that lack of convergence on those dimensions does not necessarily mean that deep integration is economically unfeasible or undesirable. It does however mean that specific attention should be devoted to realizing conditions and institutions for absorbing divergences.

The purpose of the report is to provide systematic empirical evidence on how countries in different African RECs tend to perform along the three forms of convergence above mentioned. The methodological approach is based on the analysis of time-series data using statistical and econometric procedures. The time-series perspective permits a broad assessment of convergence and its evolution as integration unfolds. Six African RECs are selected for the analysis: the Central African Economic and Monetary Community (CEMAC), the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC), the Economic Community of West African States (ECOWAS), the Southern African Development Community (SADC), and the West African Economic and Monetary Union (UEMOA). They have been selected on the basis of broad criteria concerning size, geographical distribution of membership, and practical relevance of macroeconomic integration efforts. Among those six, COMESA represents an interesting case-study. On the one hand, COMESA vast membership implies that a broad set of heterogeneous macroeconomic performances are being integrated through the regional program of policy harmonization. On the other hand, lack of data has often limited the breadth of the empirical analysis that in the past it was possible to perform on most of the countries in the region. In this respect, the application of time-series models constitutes an innovative contribution. The second part of the report is therefore dedicated specifically to the analysis of convergence in COMESA.

Evidence on convergence in CEMAC, EAC, ECOWAS, SADC and UEMOA

For each of the selected RECs, the report provides an assessment of convergence based on the longest possible string of time-series data. The discussion is organized by dimensions of convergence.

Convergence of the macroeconomic policy stance

Each of the RECs selected for this report has established a set of macroeconomic convergence criteria to guide its process of integration. Such criteria are specified as target values on key macroeconomic variables. They can therefore be used as a benchmark for the assessment of convergence of macroeconomic policy stance. Convergence is identified with a situation where countries in a REC, on average, approach the targets set by the criteria and where the cross-national dispersion of macroeconomic variables becomes smaller over time.

The evidence emerging from the analysis of the trends and standard deviation of macroeconomic variables in the various RECs is rather mixed and heterogenous. In all RECs a broad trend of convergence of the monetary policy stance can be identified, with inflation generally dropping to one digit levels in most countries. However, much more divergent appears to be the trends of the other macroeconomic variables, and of fiscal policy in particular. In fact, fiscal consolidation still has to be achieved by the majority of countries in each REC and fiscal deficit data confirm that the targets imposed by the fiscal criteria so far have not successfully driven the convergence of fiscal stance.

There are various reasons that can explain the observed lack of strong convergence. One is that formal programs of policy harmonization have been launched on average quite recently and hence countries might need more time to adjust their policy stance. This is true not only for EAC, SADC and the ECOWAS, but also for the two CFA zones. In fact, while monetary policy in those zones has been in common practically since independence, the lack of regional co-ordination on other macroeconomic policies, and on fiscal policy in particular, has been at the roots of the crises that led to the 1994 devaluation of the currency. Since then, UEMOA and CEMAC have been formally established as the institutional frameworks for achieving economic co-operation. Another possible cause of lack of convergence is that even when established, convergence criteria are not enforced and hence the entire framework of convergence and policy stance harmonization is not fully credible. As a result, countries have a weaker incentive to comply.

Convergence of shocks, cyclical variation in economic activity and trade patterns

The procedure to assess the degree of convergence of shocks (and business cycles) is to estimate, for each pair of countries in each region, bilateral correlations of economic fundamentals. The economic fundamentals are identified by a set of macroeconomic indicators such as GDP per-capita, terms of trade, money and inflation. Large and positive correlations are then taken as evidence of convergence.

The exercise suggests that in general, shocks are quite asymmetric in each region and the cycles of economic activity across countries are not strongly synchronized. In UEMOA and CEMAC there are strong positive correlation of monetary variables (inflation and money growth), but this is not surprising given the type of monetary arrangements that have existed in those RECs since independence. But the non-monetary variables are very mildly correlated, especially when compared against correlations observed in the European Monetary Union. Of the group of five RECs, EAC is the one displaying highest correlations of non-monetary variables. However, even in that region, correlations remain low in statistical terms denoting a substantial divergence of national business cycles and shocks. For both non-UEMOA ECOWAS and SADC generally low correlations appear to be caused to some extent by the

presence of outliers; that is of countries which clearly diverge from the other partners in the region. Outliers are often represented by conflict-affected and politically unstable countries.

The economic literature has emphasized that intra-regional trade can facilitate the synchronization of national business cycles and compensate shock asymmetries. In this respect, large intra-regional trade flows are expected to increase the benefits of deep integration relative to its costs. It is therefore important to assess the size of trade in each REC. The data say that in each of the five communities, the average level of intra-regional trade in percent of GDP is small, ranging between 3 % (in CEMAC) and 11 % (SADC), against the 36% observed in Europe and the 27% in ASEAN. Intra-regional trade is small also in percent of total international trade, suggesting that major trading partners of most African countries are non African. At the root of such low propensity to trade regionally there are two factors. One is the lack of physical connectivity and the persistence of trade and non-trade barriers in spite of the efforts to establish free trade areas. The second factor is the lack of complementarity of production across countries. Most member states have similar industry structures and hence tend to produce the same type of goods. Similar productions in turn reduce the scope for trading.

Convergence of macroeconomic outcomes

The key macroeconomic outcome used for empirical analysis is the level of per-capita GDP. The standard deviation of GDP levels across countries is therefore a measure of dispersion of macroeconomic outcomes. A decreasing standard deviation over time can the thus taken as evidence of increasing convergence of outcomes. Such form of convergence is observed in UEMOA and CEMAC throughout the '80s and the '90s. In both regions, however, the pace of converge is slowing down. The other RECs appear to be characterized by increasing divergence. For instance, in SADC the cross-national dispersion of per-capita GDP levels increased by 89% between 1960 and 2001. In ECOWAS the increase is only slightly smaller (86%). For EAC data are available only for the period 1980-2001, over which an increase of 19% in dispersion is observed.

Evidence from the case-study on COMESA

The policy harmonization program of COMESA has been in place since 1992 and it aims at the establishment of a monetary union by 2025. The relevance of this case study is twofold. First, COMESA is one of the largest RECs in terms of population, number of Member States and aggregate economic size. Its vast membership is characterized by rather heterogeneous socio-economic conditions and hence it will be interesting to see how those differences can be harmonized in a common macroeconomic stance. Second, the large-data set that has been assembled for this study permits the use of time-series econometric techniques that so far have not been very much applied to the economies in the region.

Convergence of macroeconomic policy stance in COMESA

Inspection of the trends of macroeconomic variables reveals that several countries still have difficulties in converging towards the targets established by the criteria set out in the policy harmonization program. However, some progress must be acknowledged. On the monetary side, countries do exhibit convergence. The fiscal policy stance instead significantly diverges. Fiscal deficits generally overshoot the target values and tax revenues in percent of GDP do not grow fast enough to permit countries to stabilize the budget.

A more rigorous test of convergence exploits the time-series properties of the data. Such a test is implemented for each country and each macroeconomic variable targeted by the convergence criteria. The test allows (i) to assess the tendency of those variables to revert to stationary values and (ii) to estimate the expected value at which variables eventually revert. Convergence requires that variables revert to a value which is in line with the threshold established by the criteria.

The results of the test suggest that macroeconomic time-series in COMESA countries are generally divergent in the sense that they do not display any tendency to revert to a stationary value. However, the time-series of inflation and monetary growth appear to converge in several Member States, and they converge to values which are in line with the norms of the criteria (i.e. one digit inflation and M2 growth in the range of 10% to 20%). The time-series of fiscal policy variables instead are clearly non-stationary, as it could be expected from the simple visual inspection of the data. Finally, the test shows that while some of the converging series in fact started converging independently from the participation of the country in the policy harmonization program of COMESA, the formal adoption of such program did induce convergence of otherwise divergent series in a few countries. This is for instance the case of Debt Service to export earnings ratio in Ethiopia, Sudan and Swaziland, of M2 growth in Kenya and Rwanda, and of total claims on government in percent of GDP in Ethiopia (even though the value of convergence still overshoots the target) and Seychelles.

Convergence of shocks, fundamentals and business cycles in COMESA

Similarly to what is observed for the other five RECs, cross-country bilateral correlations of fundamental economic variables in COMESA are rather low and often not statistically different from zero. This piece of evidence is coupled with the observation that average intra-regional trade flows in percent of GDP accounts for only 3.5% of GDP and less than 8% of total international trade.

To qualify the above picture, again more rigorous econometric tests are applied to time-series data. One test consists in estimating the extent to which bilateral real exchange rates (RERs) in the region tend to move together. In fact, if countries are hit by symmetric shocks, then their fundamentals will display synchronized fluctuations. Since RERs are influenced by fundamentals, synchronized fluctuations of those latter-ones will imply that RERs co-move. Using a simple model of cointegration, the report finds that RERs in the COMESA region effectively share a common trend and hence that shocks are more symmetric than what bilateral correlations of economic variables would suggest.. The source of such convergence is most probably the high degree of similarity of industry structure across countries, as confirmed by the data on sectors contribution to GDP.

The second tests aims at assessing the intra-regional trade potential of COMESA. To this purpose, a gravity model of bilateral trade is fitted using actual data from COMESA countries. A series of predictions concerning the size of intra-regional trade flows are thus obtained. Those predictions can be interpreted as a measure of the potential for trade in the region and hence they can be compared with actual trade flows. Findings are straightforward. With the exception of Angola, Egypt and Sudan, all of the other member states trade with other COMESA countries more than what is predicted from the gravity model. That is, intra-regional trade in the region is already above the predicted potential. The interpretation of this finding is that low trade in the region is not just a consequence of bad physical connectivity or persistent barriers, but also, and probably primarily, of very limited economic potential. The small economic size of most of the countries and the low income levels imply that demand (and supply) for intra-regional trade are small. Intra-regional trade can be therefore expected to boost only endogenously with economic growth.

Convergence of macroeconomic outcomes in COMESA

Per-capita GDP data in COMESA suggest that two important forces are affecting the cross-national distribution of income in the region. First, the overall dispersion is increasing: between 1960 and 2001-2002 it has more than doubled. Second, while income dispersion among richer countries in the region is growing (75% increase between1960 and 2001-2002), the poorer countries are experiencing some form of convergence to the bottom. For these poorer countries, in fact, the measure of dispersion of income levels has gone down since early '70s. But this trend is associated with a decrease in the average income level. That is, already poorer countries appear to cluster around the poorest of them. Such a finding might be

consistent with (albeit it does not prove) the existence of a poverty trap in which some of the COMESA countries are trapped. However, it appears that during the second half of the '90s the forces leading to dispersion and convergence to the bottom have weakened.

Policy recommendations

Based on the evidence produced for the six RECs under investigation, the report advances a set of policy recommendations for the way forward.

The design of macroeconomic convergence criteria

To ensure the effectiveness of the criteria as an instrument to guide the convergence of the macroeconomic policy stance across countries, the following is required:

- Criteria must be accompanied by a credible enforcement mechanism to provide countries with a strong enough incentive to comply. A credible enforcement in turn requires that a regular framework for monitoring countries' progress is established and that sanctions are defined for countries that do not comply at the specified deadlines. A regional agency, independent from national governments, should be in charge of managing the monitoring process and charging sanctions where required. All the elements of this framework (deadlines, penalties and activities of the agency) must be clearly specified ex-ante. Once the framework is established, its credibility can only be ensured by the continuous and non-arbitrary application of its rules.

- Convergence criteria must be defined in terms of a few key macroeconomic variables, avoiding redundancy and inconsistencies. The rationale underlying the adoption of criteria suggests that they can be used primarily to achieve convergence towards: (i) low inflation and (ii) fiscal stability. Accordingly, the three basic variables that need to be targeted are inflation, fiscal deficit and public debt. Target values should be specified at 2% for inflation, 3% of GDP in the medium-term and 0% in the long-term for deficit, and 70% of GDP for public debt (with a 35% limit on external debt). Corollary criteria should be specified to prevent the accumulation of payment arrears, to ensure a sufficiently high level of international reserves, and to achieve positive real interest rates without that nominal interest rates are too high. Targeting other variables would appear redundant.

- While convergence criteria must be credibly enforced, countries must be granted some degree of flexibility in dealing with shocks. Flexibility can be granted in two ways. First, by establishing that penalties for non-compliance are not charged if a country has faced particularly adverse economic conditions. Those latter can be specified as a given percent decline of GDP relative to its average level of the previous years. Second, three-year moving averages (rather than individual annual observations) should be used to assess the performance of countries against the targets.

Economic institutions

Some reforms of economic institutions need to be put in place to facilitate sound macroeconomic policy management

- Countries must delegate monetary policy to an autonomous and independent central bank. Autonomy and independence must be granted along the following lines:

  o Members of the central bank's governing board should be appointed by representatives of the central bank itself rather than by the government. Members also ought to be appointed

for relatively long periods of time, without any association between their term of office and the term of office of the government.

- o No mandatory participation of a government representative to the board of the central bank must be imposed. Moreover, monetary policy decisions should not be subject to the preventive approval of the government.

- o Low inflation and price stability must be the statutory objectives of the central bank. There must be formal provisions to resolve conflicts between the government and the central bank to avoid undue interferences of the former. The government must have a limited influence in determining how much of fiscal deficit is to be monetised. Thus, there must be strict limitations on direct credit facilities at the central bank available to the government. In addition, there should be no obligation for the central bank to participate in the primary market as buyer of government bonds. Finally, the central bank should be given the exclusive right to se the discount rate.

The same type of autonomy and independence will be granted to the regional common central bank, once RECs have achieved the stage of currency or monetary unions.

- Budgetary procedures should avoid a situation where-decentralized spending decisions are financed from a common pool of centralized resources. In a weak budget process, spending ministers, public enterprises and local governments predate the common pool of resources originated from taxation. The result is the persistence of fiscal imbalances and the inefficient allocation of public resources. Especially in a context where the pool of resources is limited, it is important to design budgetary institutions so that all agents participating in the process of budget formation correctly perceive the existence of an hard budget constraint. If resources are centralized, then the formulation of the budget should follow a hierarchical process, where spending decisions are centralized in the hands of a strong prime minister (or the minister of finance) who represents the populace as a whole against the interest of specific constituencies. Moreover, to avoid that legislative bargaining can lead to over-spending, it is desirable to structure the legislative approval of the budget with a vote on its global size at the beginning of the debate, limiting the subsequent number of amendments that can be introduced.

- Credible regional surveillance agencies must be established to manage the institutional framework of convergence. Such agencies will monitor progress of countries on convergence criteria and eventually charge penalties. In doing that, it is essential that regional agencies operate independently from national governments. While the creation of such agencies can be difficult in the absence of political integration, the efforts that countries will put in facilitating their work will be a clear signal of since commitment towards the process of integration.

Shock asymmetries and compensation mechanisms

Asymmetric shocks imply an unequal distribution of costs and benefits of macroeconomic integration and might even cause policy conflicts among member states. It is therefore important to create the conditions and institutions for mitigation and compensation of such asymmetries.

- Labor must be mobile across countries in a region. The mobility of labor will facilitate the re-equilibration of demand and supply of labor and goods following asymmetric shocks. While labor mobility is included in the protocol and objectives of several African RECs, including those investigated in this report, many practical obstacles still hamper its effective realization. To enhance labor mobility at regional level political initiatives must be pushed forward to abolish

entry visas, to adopt common travel documents, to harmonize education and training policies across member states, and to establish common regional labour standards.

- A sustainable system of fiscal transfers based on regional funds must be set up to promote regional initiatives and to compensate disfavored countries or areas. The irregularity and generally limited size of contributions from national budgets suggests that member states should agree on an alternative mechanism for financing the system. The report, in line with previous studies undertaken by ECA), proposes to establish a levy based on imports of member states of goods originating from third countries. In fact, UEMOA, CEMAC and ECOWAS have already adopted such a type of mechanism, with levy set at 1%, 1% and 0.5% respectively. Recommended levy for COMESA is 0.3% or 0.7% depending on the compensatory objectives of the regional fund. The existence of a regional fund will also play a relevant role in enforcing the countries' commitment to convergence criteria and harmonization programs. In fact, a possible sanction is to exclude non-complying countries from regional finance and from accession to the funds redistributed through the system of fiscal transfers.

- Tariff and non-tariff barriers must be removed in order to promote intra-regional trade. Countries must adhere to the timetables for the launch of free trade areas and common external tariffs. As discussed in the report, the low levels of intra-regional trade in Africa largely depend on a lack of potential. Hence, intra-regional trade can boost only endogenously with economic growth. However, the persistence of tariffs and quotas, the lack of physical connectivity, the heterogeneity of policies and trade rules pose a significant burden on the extent of regional trade flows. Lifting those obstacles and barriers will in itself contribute to fostering intra-regional trade and to enhance its action as a buffer for shock divergences.

Exchange rate arrangements

The process of macroeconomic integration will imply that countries in each REC will have to move towards system of fixed, and later irrevocable, parities (of course, this stage has already been achieved by UEMOA and CEMAC). However, their starting positions, both across and within RECs, differ considerably and hence a path of convergence of exchange rate arrangements must be designed. The report advances the following recommendations.

- The process of implementation of a system of fixed exchange rates in a REC must be gradual. For countries struggling with fiscal adjustment, shock asymmetries and vulnerability, a too early move to fixed exchange rates might produce considerable distortions. Some basic conditions ought to be in place before a country can adopt a peg:

  o Domestic inflation must have been stabilized to a relatively low level, comparable to that of the chosen reference country, so to avoid negative real exchange rate consequences.

  o Fiscal stabilization must have been achieved.

  o A sufficiently large stock of international reserves should have been accumulated

  o Economic institutions such as an independent central bank and strong budgetary procedures must have been established. It is also desirable that appropriate instruments for banking supervision and surveillance have been put in place.

- Once the conditions above mentioned have been realized, the country should peg its currency to a major international currency; that is, Euro, USD or Yen. The pattern of international trade flows suggests that most African economies might find it more desirable to peg to the Euro, especially

if Great Britain will join the European Monetary Union. Alternatively, a basket of the three major currencies can be adopted as anchor.

- Countries in a REC will all move toward the adoption of a fixed parity against an international currency. Of course, the speed at which this process unfolds will differ from country to country. The adoption of bilateral pegs against the international reference will *de facto* produce a system of fixed exchange rates within the REC. In this system, parities between members of the REC are determined by the bilateral exchange rate against the international reference.

- The system of fixed parities must remain at work for several years (seven to ten years) before moving to the next stage of a currency union. This long transition will also allow RECs and Member States to set up the institutional and technical arrangements required by a currency union. These include the design of an integrated system of central banks, with a common central bank that will be in charge of monetary policy, lending-of-last-resort and supervision over the over the system itself.

- At the end of the transition, only countries that for the last three years have been able to maintain the parity without the need to impose restriction on the free flow of foreign exchange must be admitted to the currency union (provided that they are in line with the macroeconomic convergence criteria). Countries that did not initially qualify for participation in the union can be subsequently admitted once they have satisfied the convergence criteria and have maintained a stable parity against the reference international currency for a period of at least three years.

A hard-peg arrangement against an international currency is to be adopted by the common central bank as an anchor for regional monetary policy. Countries in the union should be continuously monitored in their adherence to convergence criteria, with sanction applied to non-complying countries

1. Introduction

The objective of this study is to generate empirical and econometric evidence for the analysis of macroeconomic convergence in selected African regional economic communities (RECs). The relevance of this analysis stems from the fact that for most RECs the establishment of deep forms of economic integration, such as currency unions and full economic unions, is a primary objective incorporated in their treaties (see ECA, 2003). Therefore, macroeconomic convergence and policy harmonization are pivotal components of the broader strategies of regional integration in the continent.

Relative to the existing literature, the value added of this report can be summarised as follows. First, the paper investigates different RECs jointly, covering a large spectrum of country and experiences, and therefore facilitating cross-regional comparisons. Second, evidence is proposed for three dimensions of convergence relating to policy stance, shocks and business cycles, and income. Third, data are analysed in the longest possible time-series perspective to highlight historical trends and to detect significant changes of pattern over time. In addition to that, a case study will discuss the evidence obtained from econometric time-series models estimated for COMESA. The relevance of COMESA as a case study is twofold. On the one hand, its vast membership implies that a broad set of heterogeneous macroeconomic performances have to be integrated through the policy harmonization program. On the other hand, lack of data has often limited the breadth of the empirical analysis performed for most countries in the region. In this respect, the application of time-series models constitutes an innovative contribution.

The report is structured as follows. Section 2 presents a theoretical framework to explain the three dimensions of convergence which are relevant within the context of regional macroeconomic integration. The evidence on convergence in five selected African RECs is presented and discussed in Section 3. Section 4 contains the case study on COMESA, with the evidence generated from both the indicators used for the other RECs and some additional econometric models. Discussion and recommendations follow in Section 5. Section 6 concludes. Tables and variables description are reported in the Appendix.

2. Dimensions of convergence

Economic convergence is a multi-dimensional concept. It is therefore important to identify those dimensions that are more relevant for the process of deep monetary and macroeconomic integration. This is done below using both intuitive and formal arguments.

2.1. *An informal discussion of convergence issues in monetary and macroeconomic integration.*

The process of monetary and macroeconomic integration undertaken by several African RECs is aimed at the establishment of systems of fixed exchange rates and at the formation of monetary unions (and eventually full economic unions). Such a deep form of integration is expected to generate substantial micro-economic and macro-economic benefits. A first source of these benefits is represented by efficiency gains. More stable exchange rates and lower economic uncertainty should stimulate the integration of goods and capital markets. Moreover, lower uncertainty on the riskness of investment should induce dynamic effects, and hence contribute to faster economic growth. Additional benefits are likely to be generated in terms of increased macroeconomic stability. Disinflation and stabilisation of fiscal deficits should in fact create a more conducive environment for long-term development, financial integration and private sector growth[1].

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[1] There is a vast literature on the benefits and costs of monetary integration. De Grauwe (2000), European Commission (1990) and ECA (2003) provide summaries. Masson and Pattillo (2001) provide a specific discussion of the effectiveness of a monetary union as an agency of restraint for fiscal policy.

Benefits however do not come as a free lunch. In the process of integration, countries will progressively give up the possibility to set monetary policy autonomously. This in turn is costly to the extent that shocks are asymmetric across countries and preferences and/or macroeconomic objectives are heterogeneous. To see why, consider the case of monetary integration involving two countries, A and B. Country A is hit by a positive shock, and hence it experiences increasing output and employment. Country B is hit by a negative shock and hence it enters a recession. Assuming that policymakers in both countries are concerned with output stabilization and price stability, the optimal monetary policy response will be a contraction in country A and an expansion in country B. That is, in the presence of asymmetric shocks, the two countries tend to implement different monetary policies. But this conflicts with the idea of deep economic integration, where monetary policy should be the same (or at least very similar) for all countries in the region. A similar argument can be developed to explain the role of heterogeneous preferences/objectives. Suppose that policymakers in country A are relatively more concerned with inflation, while policymakers in country B are relatively more concerned with output and employment. Even assuming no shocks, hence ruling out the impact of shock asymmetries, the difference in preferences/objectives will imply different monetary policies: country A will tend to implement more conservative monetary policies, country B will instead choose more expansionary policies. Again, this difference clashes with deep macroeconomic integration.

The previous argument thus suggests that the costs of macroeconomic integration decrease with convergence in shocks and in the macroeconomic policy stance[2]. An additional potential source of cost of integration is represented by the unequal distribution of benefits or, more generally, by the discrepancy in the macroeconomic outcomes of the member-states. This can in turn arise as a consequence of differences in industrial structure, size and level of development, foreign trade patterns, initial macroeconomic conditions, degree of financial depth. Shock divergence and heterogeneous policy stance themselves can drive distributional effects. For instance, in the example of integration between country A and country B under asymmetric shocks, if the common monetary policy is conservative, then the cost of not being able to set monetary policy independently is greater for country B than it is for country A. Country B will in fact be forced to undertake a tight monetary policy while being hit by a negative shock, with the result that domestic output and employment will be further depressed. For country A, instead, the common monetary policy is similar to what it would set under autarchy, leading to output stabilization and price stability. It is clear that if such inequalities persist, conflicts among member states on the definition of the common policy will arise and a country like B will be tempted to drop out of the process, unless appropriately compensated.

The balance between costs and benefits of monetary integration is therefore likely to be affected by convergence along three dimensions: macroeconomic policy stance, shocks, and macroeconomic outcomes. Increasing convergence on each of these dimension is likely to strike a more favourable balance for individual countries and for the region as a whole. It is to be noted that the lack of convergence does not necessarily implies that macroeconomic integration is unfeasible or even undesirable. It means however that specific attention in the integration process must be devoted to creating the conditions and institutions for the compensation and absorption of divergences.

To buffer divergences in the monetary policy stance, convergence criteria are often adopted. Following the example of the European Monetary Union, these criteria are specified as target values on key macroeconomic variables (i.e. inflation, fiscal deficit, public debt). If credible and enforced, they can effectively induce countries to commit to homogeneous policy positions. Flexible prices and wages and mobile labour across countries can instead compensate shock divergences by facilitating the re-equilibration of demand and supply (prices and wages) or of the labour market (labour mobility). A

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[2] By macroeconomic policy stance it is meant the set of objectives and preferences to which policymakers in each country respond.

system of fiscal transfers across countries might play an analogous buffer function, also contributing to smoothing the distributional impact of the integration process.

Sections 3 and 4 of the report provide an empirical assessment of convergence in African RECs. The rest of this Section 2 presents a simple formalization of the concepts expressed above. Readers non interested in the technical model can skip Subsections 2.2 through to 2.5.

2.2. *Basic model*

The dimensions of convergence can be defined in the context of a model of optimal monetary policy with random disturbances. The supply side of the economy in generic country i is described by the relation:

$$(2.1) \quad y_i = \pi_i - \pi_i^e + \varepsilon_i$$

where y is the actual level of output, π denotes the rate of inflation, π^e denotes the rational expectation of π and ε is a random disturbance (a shock) with zero mean a finite variance. Equation (2.1) incorporates the basic features of the Phillips trade-off augmented by a stochastic component. To increase output above its natural level, which is implicitly set to zero, policymakers must generate inflation surprises. Random fluctuations of output are then determined by non-zero realizations of the shock ε. The objectives of the domestic policymaker are summarised by a welfare loss function which penalizes deviation of output and inflation from given targets:

$$(2.2) \quad L_i = (y_i - \tilde{y})^2 + \theta_i \pi_i^2 \qquad \text{with } \tilde{y} \geq 0 \text{ and } \theta_i \geq 0$$

where $\tilde{y}$ denotes the target level of output and θ is the relative weight attached to the inflation objective relative to the output objective. Note that for simplicity, the target level of inflation is set to zero.
The optimal monetary policy (also referred to as equilibrium inflation) is defined as the value of π_i which minimizes (2.2) subject to (2.1).[3] This is determined as:

$$(2.3) \quad \pi_i = \frac{\tilde{y}}{\theta_i} - \frac{\varepsilon_i}{1 + \theta_i}$$

A few critical features of (2.3) can be highlighted. First, for any value of θ_i and any realization of the shock, optimal monetary policy is increasing in the target level of output. The terms $\tilde{y}/\theta_i$ represents the inflation bias of policymakers, that is, the incentive that they have to generate inflation surprises in order to raise output above its natural level. Clearly, when the target level of output is set equal to its natural level, the inflation bias disappears and equilibrium inflation is lower for any θ_i and ε_i. When $\tilde{y} > 0$, the inflation bias is increasing in the gap between target and natural level of output and decreasing in the weight attached to the zero inflation objective. Second, the optimal monetary policy is stochastic, as it depends on the realizations of the random component. A positive shock reduces equilibrium inflation. This is because policymakers try to stabilize output around a given target. A positive shock causes output to increase above its target and hence calls for restrictive monetary policy. The opposite happens when a negative shock hits the economy. The term $-\varepsilon_i/(1+\theta_i)$ represents this stabilization component of optimal monetary policy. The extent of stabilization is decreasing in the weight attached to the inflation objective. This follows from the fact that any intervention to stabilise shocks implies deviations of inflation from the

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[3] Thus, the model assumes that the policymaker perfectly control inflation. While in real world situations policymakers directly control the money base, but not inflation, the assumption is widely used in the theoretical literature and does not affect the generality of results.

zero target level. Plugging (2.3) into (2.1), and taking rational expectations over inflation, the equilibrium level of output is obtained:

$$(2.4) \quad y_i = \varepsilon_i \frac{\theta_i}{1 + \theta_i}$$

According to (2.4) actual output is above or below its natural level depending on whether positive or negative shocks hit the economy. [4]

2.3 *Macroeconomic integration: the convergence of macroeconomic policy stance and the convergence of shocks*

The essence of monetary and macroeconomic integration is that countries will be required to adopt similar, if not at all identical, policies. Therefore, as a general rule, where national optimal policies are more divergent, it becomes more difficult and costly to achieve the harmonization required by the integration process. For this reason it is crucial to understand the sources of divergence (or convergence) of country optimal policies. To illustrate this concept, consider the attempt to harmonize policies between country i and country j. The optimal policy of j is defined by (2.3) and (2.4) with θ_j replacing θ_i and ε_j replacing ε_i.

Convergence of macroeconomic policy stance

Suppose first that the two countries share common shocks; that is, $\varepsilon_j = \varepsilon_i = \varepsilon$. Optimal policies reduce respectively to:

$$(2.5.a) \quad \pi_i = \frac{\tilde{y}}{\theta_i} - \frac{\varepsilon}{1 + \theta_i} \quad \text{and} \quad (2.5.b) \quad \pi_j = \frac{\tilde{y}}{\theta_j} - \frac{\varepsilon}{1 + \theta_j}$$

Inspection of (2.5.a) and (2.5.b) reveals that differences in the preferences of the two policymakers lead to divergent macroeconomic policies. The policymaker attaching more importance to output stabilization delivers a higher rate of inflation, even when there is no inflation-bias. A similar result would be obtained if one assumed that policymakers in the two countries share the same weights but not the same targets. The implication is that the heterogeneity of the macroeconomic policy stance (preferences and/or targets) of the countries involved clashes with monetary integration.

Cross-country differences in the macroeconomic policy stance can originate from differences in the preferences of the electorate and/or of the key powerful interest groups. They can also be traced back to differences in the way in which the preferences of the electorate and lobbies are aggregated into a welfare loss function for the policymaker. In practical terms, to ensure some degree of homogeneity, macroeconomic convergence criteria are imposed in the form of thresholds on a few key macroeconomic variables. Depending on the way in which they are designed, such criteria can be regarded as constraints imposed on the weights and targets in the national loss functions or even as constraints directly imposed on the policies that countries must adopt.

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[4] This analytical framework is largely used in the literature on monetary policy theory, see Walsh (2003) for a comprehensive survey.

Convergence of shocks

Now, let the two countries be characterised by the same macroeconomic policy stance ($\theta_i = \theta_j = \theta$) and differ in terms of the realization of the stochastic component; that is, $\varepsilon_i \neq \varepsilon_j$. Optimal policies become:

$$(2.6.a) \quad \pi_i = \frac{\tilde{y}}{\theta} - \frac{\varepsilon_i}{1+\theta} \qquad (2.6.b) \quad \pi_i = \frac{\tilde{y}}{\theta} - \frac{\varepsilon_j}{1+\theta}$$

From (2.6.a) and (2.6.b) it is clear that different shocks induce different monetary policy responses, even in the absence of any inflation-bias. Note that differences arise not only when shocks are negatively correlated (that is, when one country is hit by a positive shock and the other country by a negative shock), but also when shocks are positively correlated as long as they are of different magnitude. The more divergent shocks are, the more different policies will be. It then follows that the monetary integration is more difficult the more asymmetric shocks are across countries. This is an instance of the theory of optimal currency areas, which identifies the convergence of shocks as a critical pre-requisite for the adoption of fixed exchange rate regimes and for the formation of currency unions (Mundell, 1961). Shock asymmetries may arise from cross-country differences in the structure of production as represented by the contribution of various sectors to GDP. Another possible source of asymmetries are differences in the mechanisms through which disturbances are transmitted across the economy. For instance, there is now a rather large body of empirical evidence suggesting that the same supply shock affects output and employment differently in different countries depending on the degree of centralization of wage bargaining and, more generally, on the type of labour market institutions (Bruno and Sachs, 1985; Calmfors and Driffil, 1988).

A related issue is whether trade integration leads to more divergence or convergence. On theoretical grounds, both hypothesis are plausible. More convergence would occur if trade in the region is substantially intra-industry trade and industrial structures do not differ too much across countries. If instead integration leads to local concentration of industries, then trade integration will be more likely to lead to greater divergence. On empirical grounds, however, the evidence suggests that trade integration is associated with smaller shock asymmetries. Building on this result, recent work has emphasized the endogeneity shock convergence to the process of economic and monetary integration.[5]

2.4 Convergence of macroeconomic outcomes

The adoption of common, or harmonized (that is, similar), monetary policies in the context of macroeconomic integration can have relevant distributional consequences. Again, to illustrate the point, consider the case of monetary harmonization between country i and country j. In the absence of any process of harmonization, the divergence in *ex-post* output between i and j is given by:

$$(2.7) \quad (y_i - y_j) = \varepsilon_i \left(\frac{\theta_i}{1+\theta_i} \right) - \varepsilon_j \left(\frac{\theta_j}{1+\theta_j} \right)$$

which can be positive or negative depending on the realization of shocks and on the weights in the loss functions.

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[5] For an overview of the issue see De Grauwe (2000, Chap. 1). Artis and Zhang (1995) and Frankel and Rose (1998) report evidence that divergence and trade integration are inversely correlated. Frenkel and Rose (1998) and Corsetti and Pesenti (2002) discuss the endogeneity of monetary integration and optimal currency unions.

Integration is represented by a common/harmonized monetary policy determined on the basis of an aggregate regional shock ε_m and an aggregate weight θ_m:

$$(2.8) \quad \pi_m = \frac{\tilde{y}}{\theta_m} - \frac{\varepsilon_m}{1+\theta_m}$$

The stochastic term ε_m is broadly defined as a region-wide shock that affects countries symmetrically. Its correlation with country-specific shocks ε_i and ε_j can be positive or negative.[6] The aggregate weight θ_m instead reflects the way in which individual country preferences are combined into a regional loss function. The political economy literature has explored various approaches to the determination of aggregate policy parameters in the context of international co-operation. In general, θ_m can be determined either as the result of a bargaining process, where each country tries to obtain a θ_m as close as possible to its own specific θ_i, or as the outcome of majority voting. Obviously, discrepancies between the harmonized policy and the country-specific policy will be larger for those countries whose specific weight θ_i is more different from the aggregate regional weight θ_m.[7]

Given (2.8), the divergence of output across the two countries reduces to:

$$(2.9) \quad (y_i - y_j) = \varepsilon_i - \varepsilon_j$$

To compare outcome divergence in the two situations, consider that the ratio of two perfectly convergent outcomes would be 1. Thus, deviations of the outcomes ratio from 1 reflect some degree of divergence. An index of divergence can be therefore constructed for the case of no integration (autarchy) as follows:

$$(2.10) \quad Divergence_{autarchy} = \left[1 - \frac{\varepsilon_i}{\varepsilon_j} \frac{\theta_i(1+\theta_j)}{\theta_j(1+\theta_i)} \right]^2$$

The index is squared to penalize both deviations above and below 1. For the case where countries harmonize their policies the index is:

$$(2.11) \quad Divergence_{integration} = \left[1 - \frac{\varepsilon_i}{\varepsilon_j} \right]^2$$

To assess whether integration increases or decreases the divergence of outcomes one needs to compare (2.10) and (2.11). As it can be seen, there is no unambiguous pattern a priori. The change in divergence will depend upon the degree of correlation of shocks and the relative size of weights. Clearly, an increase in divergence due to the adoption of the harmonized policy would imply that specific attention to compensation mechanisms must be given in designing the integration process.

The effect of integration on outcomes is therefore a matter to be assessed empirically. This is normally done in the literature by looking at the standard deviations of output levels in the region. Complementary information is also obtained by estimating the correlation between income levels and subsequent rates of

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[6] Technically, the correlation depends on the assumptions concerning the structure of shocks. A possible approach is to assume that the country specific shock is defined as $\varepsilon_i = \eta + \phi_i$ and $\varepsilon_j = \eta + \phi_j$, where both η and ϕ are random variable with zero mean and finite variance. In that case, the regional shock is represented by the common part η.

[7] Alesina and Grilli (1992) discuss the issue of choosing a common policy parameter in a theoretical setting that can be related to the European Monetary Union. Most of their results can be extend to a more general case of monetary integration. Drazen (2000, Chp.12) surveys the political economy literature on international policy cooperation and integration.

growth. Positive correlations will imply convergence of income and output, with initially poorer countries catching up the richer ones.

2.5 Extension: monetary integration as an anti-inflationary policy device

When the loss function of policymakers incorporates a positive inflation-bias (i.e. a positive $\tilde{y}$ in equation 2.2), then optimal monetary policy defined according to (2.3) leads to inefficient domestic equilibrium. To see why, consider that inflation is certainly higher when $\tilde{y} > 0$ than when $\tilde{y} = 0$, but output is the same in the two cases. That is, a positive inflation bias implies higher inflation without any higher output. The problem is that the inflationary bias leads policymakers to try to engine inflation surprises. But as agents perfectly anticipate this incentive, the real impact of inflationary policies is zero. At the same time, because the inflationary bias is incorporated into his loss function, the policymaker cannot credibly commit to non-inflationary policies.

The problem of how to get rid of the inflation-bias is a widely debated one in the monetary theory literature. Increasing the weight on the inflation target, θ, would reduce the extent of the inflation bias, but at the cost of greater output volatility. However, as shown by Rogoff (1985), there is a value θ^* such that if monetary policy is determined from this θ^*, then the social loss is smaller for any θ_i than what it would be were monetary policy determined from θ_i. This θ^* turns out to be larger than θ_i for any value of θ_i, but it is always finite. The implication is that the inflation-bias is not completely removed and the resulting equilibrium is a second best solution. To achieve such an equilibrium, monetary policy must be delegated to a conservative central bank whose loss function is given by (2.2) with θ^* replacing θ_i. The problem is that for this arrangement to work, the central bank must be granted independence and autonomy from the fiscal policymaker, and this is not always feasible.

The monetary integration process can then work as a substitute for delegation to the independent and autonomous central banker. If the harmonized monetary policy in the region is determined from a weight θ_m that is larger than the domestic weight θ_i, then the inflation-bias effect on domestic equilibrium will be reduced. This represents an important benefit of monetary integration, which to some extent can compensate the cost due to the loss of monetary policy as a stabilization tool. There are however two important caveats. First, national policymakers can decide at any time to abandon the process of integration. Therefore, effective anti-inflationary effects are most likely to be realized only once countries have credibly committed to deep macroeconomic integration. Second, as shown by Alesina and Grilli (1992), net welfare effects from deep monetary integration will be unambiguously positive only if shocks across countries are identical. In fact, with shock asymmetries, the possibility that the costs generated by a too restrictive/expansionary common monetary policy will more than compensate the benefits of anti-inflation cannot be ruled out.

2.6 Wrap up

This Section has identified three dimensions of convergence which are relevant in the context of macroeconomic integration: convergence of macroeconomic policy stance, convergence of shocks and convergence of macroeconomic outcomes.

Integration requires countries to move toward the adoption of common or harmonized policies. Differences in the policy that countries would determine under autarchy thus clash with the integration process. Two key sources of such differences have been identified. The first one is divergence in the general macroeconomic policy stances, as represented by macroeconomic objectives and weights in the national welfare loss function. The macroeconomic convergence criteria that have become popular after the European experience to some extent try to induce convergence along this dimension. The second source of divergence is represented by shock asymmetries. This in turn arises from differences in the

production structures of countries and in the transmission mechanisms of disturbances across the economy. While the theory suggests that trade integration does not necessarily reduce shock asymmetries, empirical evidence is supportive of the view that divergence and trade integration are inversely correlated. Monetary integration can also produce divergent macroeconomic outcomes across countries. Relative to a situation of autarchy, the cross-national dispersion of outcomes will increase or decrease depending on the degree of correlation of domestic-specific shocks and on the extent of differences in policy preferences. The matter is thus to be settled empirically. However, evidence of increasing divergence will call for the definition of mechanisms to smooth the distributional implications of the process.

3. Macroeconomic convergence in selected African regional economic communities

Regional economic integration has been on the agenda of African policymakers for quite sometime, with the first experiment, the Southern African Customs Union, dating back to 1910. At present, there are fourteen regional economic communities (RECs), which represent the building blocks of the African Economic Community (AEC).[8] These RECs differ in terms of size, objectives and effective status of integration and co-operation[9]. Six of them are selected to investigate the extent of intra-regional macroeconomic convergence along the three dimensions outlined in Section 2. The selection responds to broad criteria concerning size, geographical distribution of membership, and practical relevance of macroeconomic integration efforts.

The six RECs are: (i) the Central African Economic and Monetary Community (CEMAC), (ii) the Common Market for Eastern and Southern Africa (COMESA), (iii) the East African Community (EAC), (iv) the Economic Community of West African States (ECOWAS), (v) the Southern African Development Community (SADC), and (vi) the West African Economic and Monetary Union (UEMOA). Among these, COMESA represents an interesting case-study that will be investigated in greater details in Section 4. Country membership of each REC is given in the Appendix.

3.1. *Background information and some basic facts*

The six RECs selected for this study all share a common focus on monetary and macroeconomic integration as a step towards the achievement of an economic union. This focus is incorporated into programs of policy harmonization and, in particular, into the definition of convergence criteria for macroeconomic variables. Before turning to the econometric investigation of convergence, however, it is appropriate to provide some basic information concerning the economic and social situation in each group.

<u>Brief sketch of RECs' profiles[10]</u>

CEMAC and UEMOA are two currency unions that originate from the monetary arrangements set up by France with its colonies (Colonies Françaises d' Afrique, or CFA) during the colonial era. Following independence, the CFA franc continued to serve as the common currency for the countries in the two African zones (West and Central), with value pegged to the French franc. In 1994, the prolonged

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[8] The 1991 Abuja Treaty establishes the African Economic Community with the ultimate objective to realize an African monetary and economic union. The Treaty sets the terms of a gradual transition process, articulated in six stages, that involves first strengthening of intra-RECs integration and subsequently the achievement of inter-RECs integration. For details see ECA (2002).

[9] For a comprehensive assessment of the status of regional integration in Africa, see ECA (2003).

[10] It is not the purpose of this paper to discuss in length all the objectives and activities of the RECs. Attention will be therefore concentrated on macroeconomic issues. A more comprehensive analysis of integration in African regional communities can be found in ECA (2002, 2003).

economic and financial crises associated with the overvaluation of the currency and with a situation of fiscal distress in some of the larger countries made it necessary to devaluate the exchange rate by a factor of two. Having realized that maintaining the parity would require sound and co-ordinated fiscal policies, the countries in the two zones decided to strengthen economic co-operation and to extend it to banking supervision and regional trade. CEMAC and UEMOA have thus been formally established as the institutional frameworks for the achievement of such co-operation and formal criteria for the convergence of macroeconomic policies have been adopted.

ECOWAS is a regional group formed in 1975 with the objective to promote economic integration among its members and to set up a full monetary union. Eight of its members are the UEMOA countries, and hence already participate in a monetary union since the colonial period. To accelerate the pace of integration, the non-UEMOA countries took the initiative in 2000 (Accra declaration) to set up a second monetary zone and to this purpose agreed on a set of macroeconomic convergence criteria as well as institutional arrangements. The ECOWAS-wide monetary union would be then achieved by merging the two monetary zones. The date initially established for the launch of the second monetary zone was 2003, but this has now been postponed to 2005.

COMESA has been created in 1994 from the transformation of the Preferential Trade Area for Eastern and Southern Africa (PTA), previously constituted in 1981. Already in 1989 the decision was made to form a monetary union within PTA. In 1992, the Authority of Heads of State and Government adopted a Monetary and Fiscal Harmonization Programme towards the establishment of a monetary union in 2025 through a gradualist transition articulated in four stages. The program has been subsequently reviewed in 1995 (see Section 4 for more details).

SADC is the offspring of the Southern African Development Coordination Conference (SADCC), that existed between 1980 and 1992 as a common front against the adverse effects of the apartheid policy undertaken by South Africa. In 1992, with the end of apartheid, the conditions were in place to transform the organization into a regional community focused on objectives of sustainable development and policy co-ordination. Since then, SADC includes South Africa. A sub-group of four SADC countries are members of the Common Monetary Area (CMA), which has evolved from the monetary arrangements of the colonial period into a monetary union dominated by South Africa, with the Rand used as the common currency. In 2003, SADC countries have agreed on a Memorandum of Understanding on macroeconomic policy convergence. This memorandum designs the framework of monetary and economic integration in the region and highlights the economic variables that must be included in a set of macroeconomic policy convergence criteria to be defined in the future.

Lastly, EAC was established in 1999 to revive a former East Africa Community created in 1967 and subsequently collapsed in 1977 (and officially dissolved in 1983) as a result of enduring economic and ideological conflicts. The new EAC objectives are incorporated into a five-year integration strategy for the period 2001-05. This strategy covers co-operation in a broad range of areas, including monetary and fiscal policy. A set of macroeconomic convergence criteria has also been recommended to facilitate the process of economic integration among member states.

Key economic and social indicators

Table 1 and Table 2 report some basic economic and social indicators for the six selected RECs and for the entire continent. As a point of comparison, data are also reported for non-African groups of countries.

Table 1. Basic Economic Indicators for selected African RECs

	Area	Population	GNI p.c.	Aggregate GDP growth		Per capita GDP growth		GINI	Gross capital formation/GDP			CA balance/GDP		
	(thou)	(thou)	(USD)	1990-95	1996-01	1990-95	1996-01		1990	1995	2000	1990	1995	2000
CEMAC	2975	31003	589.345	0.084	4.283	-2.666	1.721	N.A.	18.071	20.410	20.164	-2.206	-4.178	-1.915
COMESA	11480	348166	477.185	2.876	4.709	0.609	2.460	43.97	22.848	17.149	20.305	-3.749	-3.098	-3.272
EAC	1653	85998	315.741	3.024	3.670	0.717	1.112	40.03	19.161	17.777	15.810	-9.254	-7.303	-6.318
ECOWAS	4936	230886	308.220	2.857	3.276	-0.066	0.878	46.17	14.233	16.991	20.427	3.324	-7.206	4.000
SADC	9067	199790	891.004	0.879	2.634	-1.361	0.797	50.77	14.471	18.913	16.144	0.381	-2.337	-0.710
UEMOA	3465	70603	374.565	1.866	4.291	-1.062	1.421	47.24	12.965	16.532	17.231	-8.049	-6.406	-4.471
AFRICA	26886	779429	650.042	1.982	3.709	-0.342	1.860	44.70	18.715	19.842	20.306	-1.402	-4.623	-0.657
Industrial countries	30281	850534	28316.008	1.979	3.042	1.263	2.292	30.72	23.194	21.302	21.937	-0.392	0.166	-0.880
South America	5701	203088	2946.466	5.712	4.125	2.617	0.609	34.21	23.621	21.260	18.883	0.438	-1.364	6.462
Middle East	17081	345888	3634.183	3.325	2.115	1.700	0.882	50.73	18.197	21.546	18.873	0.963	-2.508	-2.510
East Asia	13110	1786810	1229.895	8.828	6.665	7.227	4.097	40.61	34.095	37.307	29.780	1.086	-0.770	4.386

Notes. Own computation from WDI, WADB and IFS. Data for Area, Population and Gross National Income (GNI) per-capita refer to base year 2000. Growth rates are measured for the period 1990-2001 (2002 where data are available). GINI is computed from the latest possible observations. Regional averages are computed as weighted averages of national data, with weights given by shares of GDP and shares of population. GINI regional data are instead computed as un-weighted averages of national data. For list of countries in non-African groupings see Appendix.

In five of the six RECs, average Gross National Income (GNI) per-capita is below the African average, which in turn falls much short of the other developing areas worldwide. The dynamics of real GDP suggest that in the first half of the '90s, aggregate growth has not matched population growth, determining negative (or barely positive) per capita growth rates. The performance improves in the second half of the '90s and early 2000s, with growth rates that are higher than those observed in South America and Middle East, but still generally lower than those achieved in industrial countries and East Asia. COMESA comes out as the only exception, with per-capita growth at the level of industrial countries. These trends broadly confirm the hypothesis advanced by several economists (see for instance Durlauf and Quah, 1997) that worldwide income distribution is becoming bi-modal, with a widening gap between a relatively smaller group of richer countries and a larger group of poorer ones. The not particularly strong growth performance is coupled with a degree of inequality of domestic income distribution that for most RECs is significantly greater than in the rest of the world, with the exception of Middle East. Together, the two elements indicate the persistence of poverty as a fundamental development challenge in the regions. Some RECs are also characterised by a general external disequilibria, as reflected by large deficits of the current account. Such deficits, unless compensated by a surplus of the capital account, are likely to put pressure on the exchange rates, thus making it more difficult and costly to eventually peg domestic currencies to external anchors.

Table 2. Basic Social Indicators for Selected African RECs

	Life expectancy		Infant Mortality		Young female illiteracy		Young male illiteracy		Female sec enrol		Male sec enrol		Tertiary enrol		Population growth	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	1998	1990	1998	1990	1998	1990-95	1996-01
CEMAC	50.951	49.135	153.032	155.595	31.934	19.220	18.868	11.950	19.065	23.170	31.338	36.455	2.738	4.696	2.772	2.460
COMESA	51.986	49.607	147.110	134.932	34.998	24.638	21.964	16.507	23.468	28.559	28.656	33.064	2.696	4.678	2.513	2.535
EAC	51.668	44.693	146.299	141.709	25.173	15.240	12.647	8.380	11.423	14.097	16.780	19.087	1.013	1.430	3.001	2.589
ECOWAS	48.862	47.529	163.190	162.674	59.969	46.024	39.172	29.018	11.649	17.727	21.478	27.785	1.708	2.300	2.865	2.622
SADC	52.505	44.670	146.036	146.100	23.028	15.666	16.568	11.778	31.006	40.826	32.299	41.727	3.090	4.247	2.707	2.411
UEMOA	47.673	46.731	208.508	188.214	71.329	57.274	47.160	36.079	7.954	11.630	18.001	23.170	1.825	2.786	2.850	2.772
AFRICA	52.554	50.227	144.209	135.185	41.044	29.626	26.285	19.410	21.296	28.455	28.081	34.420	3.039	4.583	2.579	2.427
Industrial countries	76.285	78.147	9.164	7.011	0.338	0.200	0.443	0.220	97.112	116.177	95.127	115.006	37.682	53.436	0.698	0.624
South America	64.339	68.433	72.279	44.040	22.162	13.914	11.066	7.335	58.390	69.827	68.272	73.934	15.033	23.434	8.382	7.117
Middle East	67.340	69.216	50.458	33.518	4.868	2.894	4.185	2.827	58.489	70.848	54.171	64.905	20.862	24.047	4.357	3.659
East Asia	67.704	69.700	39.073	30.482	11.731	7.408	5.854	3.944	51.313	67.500	56.003	73.764	14.163	22.666	1.393	1.112

Notes. Own computation from WDI, WBAD and ADB. Regional averages are computed as weighted averages of national data, with weights given by shares of population, for the following variables: life expectancy, infant mortality and population growth. The other variables are obtained as non-weighted averages of national data. Composition of non-African groupings is given in the Appendix.

Social indicators closely correlate with economic ones. Life expectancy in the RECs is generally more than 25% shorter than in industrial countries. The gap has actually increased over the '90s, reflecting the enduring economic and health problems in the continent. The effects of the HIV/AIDS pandemic in this respect are particularly strong. Infant and child mortality are three to four times higher than in the other developing areas, suggesting an overall lack of medical infrastructures and assistance. The data on primary health care and mortality rates reported by ADB (2003) broadly confirm this interpretation. In terms of future economic growth prospects, the data on illiteracy and school enrolments, typically used as proxies for human capital formation, are not particularly promising. In all RECs the high illiteracy of the young goes together with enrolment rates in basic schooling (primary and secondary) that are substantially below those observed in the rest of the world. Furthermore, as shown by the empirical evidence, tertiary education plays a pivotal role in pro-poor growth as it allows developing countries to make the most out of technological spillovers arising from FDI. With enrolment rates in higher education of less than 5%, RECs, and Africa in general, are likely to continue lagging behind the rest of the world in terms of technological gap. An additional negative feature emerging from the data is the discrimination between male and female population. Uneven access to education implies future inequalities in the distribution of human capital and hence in job and development opportunities. The result is likely to be the persistence of gender inequalities, with adverse effects on economic and social progress.

Clearly, aggregate data sometimes may hide significant differences across countries in each region. Some more information on such differences will be given in the econometric analysis to follow. Still, the overall picture that results from the basic data is one of widespread critical economic and social conditions. Against this background, RECs pursue regional economic integration as a development strategy with potentially high benefits in terms of macroeconomic stability, increased flows of trade and investment, increased scale and competition, and in the end better growth prospects. Monetary and macroeconomic integration are components of this broader process of integration. As discussed in Section 2, there are three notions of convergence that are relevant in the context of macroeconomic integration: convergence of macroeconomic policy stance, convergence of shocks and business cycles, and convergence of outcomes. Each of these three dimensions is investigated for each of the selected RECs. The evidence for COMESA is postponed to Section 4.

3.2. Convergence of macroeconomic policy stance

RECs have mostly centred their monetary and macroeconomic harmonization programs around the definition of a set of macroeconomic convergence criteria. These are specified as target values on key macroeconomic variables (both outcomes, such as inflation, and instruments, such as the stock of money) to be achieved within given deadlines. Table 3 reports the criteria adopted by the six RECs in this study. For SADC no specific parameters are reported as the memorandum of understanding on macroeconomic convergence only indicates the variables that ought to be incorporated into a set of future criteria. It appears however that the Committee of Central Bank Governors of SADC has already agreed on some reference values: inflation should be below 10% for the period 2004-08 and then below 5% for the subsequent period 2009-12, budget deficit should be no more than 5% in 2004-08 and no more than 3% in 2009-12, external reserves should be at least equal to 3 months of imports in 2004-08 and then rise to 6 months of imports in 2009-12, an upper limit of 10% (to be reduced to 5%) on central bank credit to government as ratio to previous year's tax revenues should also be maintained. For COMESA instead two sets of criteria are reported. One refers to the criteria as spelled out in the review of the implementation of the Monetary Harmonization Program of 1995. The other one states the criteria as spelled out in a recent brief on the monetary integration program issued by COMESA.[11]

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[11] For UEMOA, CEMAC and ECOWAS secondary criteria are reported only if they also constitute primary criteria for any of the other RECs. See also notes at the bottom of Table 3.

Table 3. Convergence Criteria in Selected African RECs						
	UEMOA	CEMAC	ECOWAS 1	EAC	SADC 2	COMESA	
						1995	2003
Inflation	<3%	<3%	<5%	<5%	memo	< 10%	
Fiscal balance (excluding grants)	>0%	>0%	<4%	<5%	memo	<10%	<3%
External reserves (in months of imports)			> 6 months	> 6 months			
CB financing of deficit (in % of tax revenues)			<10%			<20%	<20%
Debt service (in % of export earnings)				<15%		<20%	
Payment arrears (external and domestic)	0	0					
Tax revenues (in % of GDP)	>17% *	> 17*	>20% *				>10%
Total claim on CG (in % of GDP)							<10%
Broad money growth (% rate)						<10%	GDP gr + inflation +
Real interest rate			> 0 *			> 0	
Domestic saving rate				> 20%			
Total debt (% of GDP)	<70%	<70%			memo		
CA deficit (excluding grants in % of GDP)	< 5%*	<5%*			memo		
Domestic credit to to private sector							Adequate Flow

Notes. For ECOWAS, those reported are the norms for end 2003. Norms for end 2000 are as follows: inflation below 10%, fiscal deficit below 5%, external reserves greater than 3 months of imports. For SADC *memo* means that those are the variables mentioned in the Memorandum of Understanding on Macroeconomic Convergence adopted in 2003 (see text for details). * denotes secondary criteria. For additional details on COMESA see Section 4 of the report.
Sources: IMF (2002), Masson and Pattillio (2001b), ECA (2002), COMESA (1995), COMESA (2003), RECs' web-sites.

A glance at Table 3 shows that there is a significant degree of cross-RECs variation in terms of both the variables chosen as reference and the target values selected for those variables. It is therefore worth devoting some attention to the analysis of the structure of these criteria, trying to highlight the rationale beyond their design. Then, the empirical evidence on the performance of RECs *vis-à-vis* the criteria will be presented

The design of macroeconomic convergence criteria

A specific theoretical framework for the optimal design of macroeconomic convergence criteria does not exist. Therefore, the selection of variables and definition of parameters must be guided by the more general rationale underlying the need for their adoption. As noted in Section 2, this rationale is to ensure that countries participating into the integration process develop a sound, common, macroeconomic policy stance. The implication is that convergence criteria should be designed in terms of prudent values of some key variables which summarize the overall macroeconomic policy stance of a country. Then, different economic contexts and preferences, by leading to discrepant interpretations of what constitutes a sound

stance, generate different specifications of the criteria. Even the best-known example of convergence criteria, namely those spelled out in the Maastricht Treaty establishing the European Monetary Union (EMU), have been criticised for being ad-hoc and arbitrary.[12]

While the above argument suggests that it should not be surprising to observe variation in the design of criteria across RECs, it must be pointed out that inflation and fiscal deficit are two variables targeted in all regions. This reflects the general consensus that the success of monetary integration requires commitment towards anti-inflationary policies and fiscal stability to avoid pressure on monetary authorities for the monetization of deficit. Less clear-cut is the interpretation of their target values. There is no agreement in the economic literature on the optimal level of inflation. As a point of reference, consider that the European Central Bank, an institution strongly committed to price stability and anti-inflation, targets inflation between 0% and 2%. The Maastricht parameter on inflation was instead set at 2.7%, which was the average of the three lowest inflation rates in EMU plus a margin of 1.5%. Based on this, one can argue that the 3% limit on inflation in UEMOA and CEMAC is probably a good proxy for low inflation. The higher targets in ECOWAS and EAC reflect the fact that in those two regions inflation has typically been higher than in the CFA zones, also as a consequence of different exchange rate arrangements. A 10% inflation level is instead more difficult to justify, unless it is adopted as a first step in the stabilisation of very high inflation. For the case of COMESA, Harvey et al. (2001) already recommend to progressively reduce the target.

The norm on fiscal deficit must be assessed in terms of its consistency with other fiscal policy targets. The financing constraint of the public sector in fact implies that there is a maximum limit of deficit which can sustain a given level of debt to GDP ratio, given the growth rate of nominal GDP. For instance, a 5% deficit coupled with a growth rate of nominal GDP of 6% allows to maintain debt at around 80% of GDP, assuming negligible seignior-age revenues, as it should be under low inflation. If the desired level of debt is smaller than 80%, or the rate of nominal GDP growth is lower than 6%, then the 5% target on deficit would be inconsistent, unless the difference can be compensated through grants. The deficit targets of UEMOA and CEMAC are clearly consistent with the limit of 70% on total debt. ECOWAS, EAC and COMESA (and of course SADC) do not specify any limit on total debt, but still they need to take into account the mathematics of the budget constraint. Assuming that 70% is a sustainable level of debt, then countries in ECOWAS should achieve a 6% growth rate of GDP for the 4% limit on deficit to be consistent with debt stability. Similar simple computations show that the growth rate of GDP should be more than 7% in EAC and 14% in COMESA (if the 10% limit is considered, otherwise the required growth rate of GDP drops to 4.5%). In the absence of grants, lower growth rates would lead to accumulation of debt, with adverse consequences on interest rates and negative budgetary feedback. Again, as a reference, consider that the Maastricht Treaty required a 3% deficit with a 60% upper ceiling on government debt. These figures are consistent with an expected 5% growth rate of GDP[13].

Moving on to the other criteria, it can be observed that an upper ceiling on central bank (CB) financing of deficit and lower limit on tax revenues are adopted by most of the six RECs (even though for UEMOA, CEMAC and ECOWAS the tax revenues to GDP ratio is a secondary criterion). Both criteria respond to the need to impose a sound fiscal policy stance on the government while granting monetary authorities a sufficient degree of independence to commit to low inflation. Inflationary financing of deficit, especially where monetary authorities are not autonomous from the government, can be a major source of inflation. Moreover, when the government knows that the CB will finance a more or less large share of its deficit, it has a greater incentive to spend in excess to expected revenues. Imposing a limit on CB financing is

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[12] Buiter et al. (1993) and Buiter (1995).

[13] Section 5 provides some reccomendations on target values for a debt criterion separating external from domestic debt. In fact, for many African countries, the external component of debt represents the most relevant burden on the economy. This situation is clearly different from the one faced by European countries, where the predominant component of debt is domestic.

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therefore a mean to enforce the overall anti-inflationary stance of the country and to harden the budget constraint faced by the government. The norm on tax revenues can be rationalized in terms of incentive for the government to promote the efficiency of the tax system, and in particular of tax collection. This is seen as instrumental to achieving fiscal stability, since tax revenues are the primary source of finance for the public sector. It is however to be stressed that the norms of 10%, 17% and 20% for tax revenues do not appear to be particularly ambitious, if one considers that 15% is now one of the thresholds for eligibility in the HIPC initiative of World Bank and IMF (it used to be 20%)[14]. On the other hand, in setting targets for tax revenues, one has to account for the possibility that too high tax rates can distort economic activity, reducing the incentive to invest and hence limiting economic growth prospects.

Four of the six RECs have also established criteria on either the level of debt or the debt service. High levels of debt are a burden on developing economies since they imply that a considerable amount of financial resources are devoted to debt service, rather than being used for poverty reduction and development policies. Debt and debt service criteria are meant to prevent a situation where the poverty-debt cycle hampers the growth prospects of countries and forces them into fiscal and financial distress. In this respect, a debt service to exports ratio of between 20% and 25% is generally regarded as sustainable. The sustainable level of debt will instead depend upon the relative size of real interest rates and growth rate of GDP and on the size of external component of the total stock. For instance, the average external debt to GDP ratio of countries in the HIPC initiative was 57% as of 1999, falling to a projected 29% by end 2003 (IMF 2001). It is thus more difficult to judge the consistency of the 70% threshold in UEMOA and CEMAC. Again as a point of reference, consider that in a study on macroeconomic convergence in COMESA, Harvey et al (2001) set a 100% limit on total debt with a 50% external component as desirable outcomes.

Specifically devoted to the enforcement of external equilibrium are the criteria adopted by some RECs on the size of external reserves and of current account deficit. In particular, a minimum amount of reserves is normally regarded as a necessary condition to adopt and maintain fixed exchange rate arrangements. Additional restrictions to enforce a sound fiscal stance are imposed by UEMOA and CEMAC in the form of non-accumulation of domestic and external payment arrears, and by COMESA in the form of an upper limit on total claims on the central government. The criterion on the rate of broad money growth in COMESA goes instead in the direction of imposing tight monetary policies, even though the way in which it is specified in the 2003 version of the criteria accounts for the necessity to provide the system with sufficient liquidity in the presence of sustained economic growth. The need to provide financial resources to an adequate extent to support growth is also incorporated into the general provision of COMESA concerning the size of domestic credit to the private sector. The target of positive interest rates, adopted again by COMESA and as a secondary target by ECOWAS, reflects the more recent evolution of economic thinking which identifies negative real rates as a distortion of the financial system. Finally, the target on the saving rate in EAC originates from the belief that factors accumulation is the engine to economic growth, even though such a view has been challenged by recent econometric findings (see Easterly and Levine, 2000).

To summarise, two basic primary criteria appear to be adopted by all the RECs: inflation and fiscal deficit. For both these criteria, a clear economic rationale does exist. The other criteria also respond to the general economic argument of enforcing internal (fiscal and monetary) and external equilibrium, although some of them might appear redundant or inconsistent. This is the case, for instance, of money growth and inflation in the 1995 version of COMESA criteria. A country with inflation at 10% (the limit set by the inflation criterion) could meet the money growth criterion of 10% only if GDP growth were 0% and assuming that there is no monetization of deficit. Given that a zero growth is unlikely, either the threshold on money growth must be increased, or the one on inflation must be decreased. In fact, the 2003 version

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[14] HIPC stands for Highly Indebted Poor Countries.

of the criterion does not include a criterion on inflation and the only restriction is placed on money as the primary instrument under the direct control of the central bank.

Performance of RECs vis-à-vis convergence criteria: inflation and fiscal deficit

The macroeconomic convergence criteria set by each REC represent the obvious benchmark against which the degree of convergence in policy stance can be assessed. Specific attention is first devoted to inflation and fiscal deficit, as these two variables are incorporated into the criteria of practically all RECs[15]. The period considered for this assessment starts in 1985. Even if some of the RECs were formed (and/or established criteria) later than 1985, it is important to assess convergence in a time-series perspective to see whether the unfolding of the integration process over time has determined significant changes in the historical trends. To facilitate this analysis, the sample period is divided into sub-periods. Data and assessment for COMESA are postponed to Section 4.

Inflation

Table 4 reports data by country in each REC starting in 1985 up to the latest possible observation (2002 in most cases). Inflation is measured as the annual percent change in the Consumer Price Index. Annual data are averaged over sub-periods of five years, with the exception of the latest sub-period which includes only three years. For each country, the most recent annual observation is also reported. Weighted and un-weighted regional averages of country data are displayed to assess the overall performance in the REC. Finally, the standard deviation of country observations in each sub-period provides information upon the overall dispersion of inflation across member-states and hence it can be interpreted as an indicator of overall convergence of inflation in the region. Ideally, one would like to observe a decreasing standard deviation matched by a decreasing average of inflation in the region. This would indicate that countries are effectively converging towards low inflation levels. A decreasing standard deviation associated with an increasing average would instead suggest an undesirable convergence pattern away from low inflation.

Starting with CEMAC, there is clear evidence of convergence, as shown by the steady reduction in the standard deviation. Overall, the dispersion of inflation levels across the region has been reduced from an initial normalized value of 1 in 1986 to a current value of 0.2. Most of this compression appears to have taken place in the second half of the '80s, with subsequent fluctuations around a downward-sloping trend in the '90s. The regional average, while remaining relatively low throughout the period of observation, displays a marked increase around the mid-90s and the first years of the second half. This reflects the inflationary impact of the 1994 CFA franc devaluation. The inflationary push however seems to be reverted in the early 2000s, even though four countries still remain above the 3% norm.

EAC shows a particularly positive performance in reducing both inflation levels and standard deviation across countries. The stabilisation efforts of Uganda in the second half of the '90s are noteworthy and have a statistically significant impact on the pattern of regional convergence. All the three member states are in line with the 5% target and there is evidence of progressive convergence.

The data reported for ECOWAS refer to the group of non-UEMOA countries (excluding Liberia for which no data are available). Again, there is evidence of regional convergence towards the 10% norm set for 2000. The 5% norm set for 2003 has been also already achieved by some of the countries. Because of its dominant economic size, Nigeria heavily affects the weighted regional average and this explains the

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[15] CEMAC and UEMOA are integrated monetary areas. This means that countries in the region have a common monetary policy; that is, their policy stance converges by definition. In this respect, possible divergence of inflation rates should not be regarded as divergence in monetary policies across countries, but rather as divergences in the monetary outcomes generated by the common policy (possibly due to country asymmetries in transmission mechanisms).

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discrepancies between weighted and un-weighted averages. In fact, together with Ghana, Nigeria is the only country in the region with inflation still at two-digit level, even though one must highlight the significant stabilisation undertaken since 1995 (in that year inflation was at 72.81% in Nigeria).

SADC offers quite a variegate picture. In the region there are two clear statistical outliers. These are the two war-torn countries, Angola and Democratic Republic of Congo (DRC), where inflation actually explodes into hyperinflation throughout the '90s. Therefore, their inclusion in the computation of regional data implies a massive increase in both divergence and average inflation between the first and the second sub-period. To separate the underlying regional patterns from the outliers, aggregate data are therefore re-computed excluding the two countries. Interesting, the standard deviation fluctuates around an upward-sloping trend. This can be taken as evidence of progressive divergence. Still, it is important to stress that over the second half of the '90s most countries in the region do converge towards lower inflation levels. Zimbabwe however follows the opposite trend, with a fast increase in inflation since 1997-98. The consequence is an increase in the regional standard deviation. If Zimbabwe is removed, the standard deviation exhibits a steady decrease since 1994. Nevertheless, inflation levels in the countries remain generally higher than those observed in the other RECs.

Table 4. Inflation in selected RECs

	Sub periods				Latest
	85-89	90-94	95-99	2000-03	
CEMAC					
Cameroon	5.88	2.02	8.06	3.27	4.50
Central African Republic	0.48	3.57	4.22	3.02	3.39
Chad	-0.66	7.04	4.64	6.41	3.00
Congo Rep	3.60	9.67	7.38	1.61	4.38
Equatorial Guinea	-5.61	7.89	5.88	6.00	6.00
Gabon	2.13	4.63	2.76	-0.65	-1.80
Standard deviation	6.93	6.20	4.54	3.16	2.24
Weighted average	2.63	4.20	6.09	2.42	1.09
Simple average	1.40	5.80	5.49	3.61	2.30
EAC					
Kenya	10.05	28.00	6.85	5.87	1.90
Tanzania	30.54	28.95	17.23	5.22	4.60
Uganda	155.25	25.89	5.61	1.51	-0.30
Standard deviation	78.66	12.65	6.71	2.68	2.00
Weighted average	59.82	27.68	9.93	4.36	2.13
Simple average	65.28	27.61	9.96	4.20	2.07
ECOWAS					
Cape Verde	5.75	6.50	6.35	0.63	3.74
Gambia	23.68	7.69	3.16	0.84	0.84
Ghana	26.26	23.04	32.19	24.31	14.82
Guinea	24.08	16.15	4.04	6.80	6.80
Nigeria	25.69	35.83	25.08	13.45	12.88
Sierra Leone	86.25	65.11	26.74	-0.66	-3.29
Standard deviation	33.69	28.67	16.30	11.61	4.63
Weighted average	42.33	31.91	23.48	9.57	11.61
Simple average	32.35	25.72	16.26	9.47	4.31
SADC					
Angola	N.A.	677.72	1480.74	195.48	108.89
Botswana	9.56	12.64	8.74	7.77	8.14
Congo DRC	64.41	6424.98	314.68	301.79	31.52
Lesotho	13.85	13.57	8.87	-1.75	-9.62
Malawi	19.22	21.12	40.92	24.27	16.00
Mauritius	6.14	8.59	6.63	5.33	6.40
Mozambique	60.45	46.16	22.93	12.85	16.78
Namibia	13.19	12.19	8.32	9.96	11.35
Seychelles	1.42	2.46	1.63	4.14	0.18
South Africa	15.72	12.44	7.37	6.89	10.60
Swaziland	15.36	11.07	8.01	9.08	5.94
Tanzania	30.54	28.95	17.23	5.22	4.60
Zambia	62.91	122.19	31.32	23.20	22.20
Zimbabwe	11.12	26.52	30.62	89.03	134.50
Standard deviation 1	23.10	1728.04	400.83	98.19	43.54
Standard deviation 2	20.17	33.60	15.18	25.53	39.67
Weighted average	18.50	328.19	95.32	32.32	20.21
Simple average 1	23.60	520.79	142.00	50.82	30.93
Simple average 2	20.15	26.51	16.05	17.41	23.08
UEMOA					
Benin	N.A.	9.62	5.85	3.56	2.50
Burkina Faso	1.08	5.08	3.97	2.30	2.18
Cote d'Ivoire	5.29	6.67	5.26	3.28	3.11
Guinea-Bissau	70.54	44.69	30.20	5.25	3.75
Mali	-0.08	3.82	4.55	3.18	5.03
Niger	-3.01	4.35	4.21	3.18	2.63
Senegal	2.73	6.03	2.84	2.01	2.23
Togo	0.27	8.19	6.05	2.96	3.07
Standard deviation	14.39	16.57	9.61	1.55	0.95
Weighted average	2.78	6.60	4.88	2.98	2.99
Simple average	5.57	11.06	7.86	3.21	3.06

The UEMOA region, similarly to CEMAC, is characterised by relatively low inflation throughout the period 1985-2002. The only exception is Guinea-Bissau, which joined UEMOA later in the '90s and where inflation has been brought under control since 1997. Most of the countries are in line with the 3% norm. The inflationary effects of the January 1994 devaluation appear to have been stabilised faster than in CEMAC. Annual data show a generalised dramatic increase in inflation between 1993 and 1994, thus confirming that the devaluation did have relevant inflationary consequences. However, already in 1995 inflation rates drop to around half their 1994 level in all countries and by 1996 they return to single-digit level. This quick anti-inflationary response explains why sub-period average data do not pick in the second half the '90s[16], as instead it is observed in CEMAC. The region also has a positive performance with respect to overall convergence, as shown by the steady decrease of the standard deviation since the first half of the '90s.

The general picture emerging from the analysis of inflation dynamics is quite positive. Albeit in some regions there are several countries still struggling to meet the targets, a broad disinflationary process has taken place almost everywhere. Perhaps even more important is the observation that for most RECs, there is evidence of significant cross-country convergence towards lower inflation levels. The only exception, in this respect, is SADC, where however results are driven by the presence of a few outliers. It should be pointed out that in some cases the process of convergence appears to initiate before the formation of the RECs and/or the adoption of convergence criteria. This is because most countries have undertaken inflation stabilization as a part of World Bank and IMF sponsored programs of structural adjustment. In such circumstances, the role of the criteria goes in the direction of strengthening (or locking-in) the existing trend. Two reasons of concern are left. First, maintaining low inflation is as much difficult as it is to bring it down. It will require the continued implementation of tight monetary policies, resisting the temptation to generate inflationary surprises (to stimulate output) and to monetize the deficit. It is therefore desirable that countries develop an institutional framework where monetary policy is delegated to credible monetary authorities that are autonomous and independent from fiscal authorities. Second, in some countries, the observed decrease in inflation might be driven not much by coherent policy stances, but rather the consequence of prolonged recessions. In this respect, negative inflation rates might be particularly worrying.[17]

Fiscal deficit

Data on fiscal balance are reported in Table 5. In accordance with the criteria established by the RECs, the data exclude grants. Information is organised along the same lines of Table 4. Data are averaged for sub-periods of five years. For each sub-period, regional weighted and un-weighted averages are reported together with the standard deviation as an indicator of the degree of cross-country convergence. A problem with fiscal deficit data is that different sources follow different definitions and hence series are not always comparable. For this reason, Table 5 reports data from a unique source (World Bank Africa Database), where fiscal balance is defined as current and capital revenues (excluding grants) minus total expenditure and lending minus repayments. However, available data from that source do not extend beyond 2001 (and sometimes 2000). This is why the last sub-period covers only two years. In the Appendix, additional data from a different source are reported for the UEMOA countries, covering the period 1995-2002.

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[16] The pattern holds whether or not Guinea-Bissau is included in the computation of regional averages.

[17] As it is well known, the macroeconomic theory suggests that inflation and output are independent in the long-term, when inflationary expectations are correct. However, before that expectations are fully adjusted, the Phillips trade-off holds and inflation is positively correlated with output growth. The speed of adjustment of expectations is in turn an empirical matter.

The data for CEMAC suggest that fiscal balances across countries tend to diverge. The regional weighted and un-weighted averages steadily decrease throughout the sample period, eventually approaching balance. At the same time, however, the standard deviation increases. This reflects the diversity of national experiences since the first half of the '90s. Still in 1994, all the six countries scored a deficit between 2% (Gabon) and 15% (Central African Republic), with an un-weighted average of around 6.6%. Subsequently, four countries have been able to revert the trend and achieve balance, or even surplus, whilst the other two, after a period of initial adjustment, have seen their deficit raise again since 1997-98. Incidentally, the four countries achieving balance are the crude-oil producers (Cameroon, Congo, Equatorial Guinea and Gabon). This suggests that much of their performance might be driven by movements in the terms of trade. Correcting for terms of trade shocks would therefore yield lower dispersion across countries, but also higher regional averages.

In EAC, all the three countries remain in deficit for the entire sample period. The only exception is a slight positive balance for Tanzania at the beginning of the '90s. The 5% norm is achieved only by Kenya, with Tanzania slightly above (following a deficit upsurge in 2000-01) and Uganda more distant. The dynamics of the standard deviation are quite intriguing. Overall, the pattern seems to be one of fluctuations around an almost flat trend. However, since 1999; that is, since the date of formation of the new EAC, a mild but still significant decrease in dispersion can be observed. This convergence effect is matched by an increase in the regional average level of deficit — in fact, deficit in any of the three countries increases between 1999 and 2000, reflecting the worsening state of the economy.

Table 5. Fiscal deficit in selected RECs

	Sub periods			
	85-89	90-94	95-99	2000-01
CEMAC				
Cameroon	-5.23	-7.56	-2.31	1.22
Central African Republic	N.A.	-14.95	-7.99	-9.18
Chad	-16.02	-13.02	-10.32	-12.29
Congo Rep	-8.05	-12.26	-9.78	0.78
Equatorial Guinea	N.A.	-9.86	-4.37	8.92
Gabon	-7.57	-4.03	-1.48	0.62
Standard deviation	N.A.	4.93	5.28	7.76
Weighted average	N.A.	-8.89	-4.06	-0.63
Simple average	-7.98	-9.38	-6.04	-1.65
EAC				
Kenya	-6.15	-5.94	-1.67	-4.61
Tanzania	-6.70	-1.15	-3.30	-5.47
Uganda	-4.66	-9.88	-6.01	-10.23
Standard deviation	1.55	4.94	2.28	2.01
Weighted average	-5.89	-5.54	-3.49	-6.66
Simple average	-5.84	-5.66	-3.66	-7.20
ECOWAS				
Cape Verde	-24.54	-20.84	-18.45	-24.56
Gambia	-10.46	-4.05	-7.36	-3.64
Ghana	-5.06	-7.76	-8.96	-10.00
Guinea	-8.47	-7.40	-5.56	-5.67
Nigeria	N.A.	1.90	0.64	2.22
Sierra Leone	-13.96	-8.58	-9.99	-18.17
Standard deviation	7.38	7.08	7.51	9.87
Weighted average	N.A.	-1.99	-2.17	-1.55
Simple average	-11.84	-9.31	-8.28	-9.97
SADC				
Angola	-11.13	-29.48	-20.84	0.17
Botswana	12.55	6.98	0.88	1.91
Congo DRC	N.A.	N.A.	N.A.	N.A.
Lesotho	-11.35	-1.80	-2.52	-13.84
Malawi	-9.83	-13.04	-10.75	-14.39
Mauritius	-3.19	-2.89	-4.84	-7.34
Mozambique	-13.41	-16.25	-11.68	-15.37
Namibia	-7.51	-3.48	-3.99	-2.96
Seychelles	N.A.	-5.10	-11.34	-16.77
South Africa	-4.36	-6.10	-5.00	-3.69
Swaziland	N.A.	-2.55	-0.68	-2.63
Tanzania	-6.70	-1.15	-3.30	-5.47
Zambia	-11.98	-13.32	-8.34	-13.15
Zimbabwe	-8.96	-7.77	-8.88	-22.45
Standard deviation	8.85	10.38	6.70	7.50
Weighted average	-5.30	-7.39	-6.04	-4.70
Simple average	-6.90	-7.45	-7.02	-8.92
UEMOA				
Benin	-15.49	-10.35	-4.00	-3.64
Burkina Faso	N.A.	-9.09	-10.92	-13.92
Cote d'Ivoire	-8.20	-11.34	-3.31	-1.61
Guinea-Bissau	-38.42	-29.59	-20.69	-21.71
Mali	-10.51	-11.25	-9.06	-9.41
Niger	-9.42	-10.27	-7.50	-6.70
Senegal	-3.40	-3.46	-3.34	-1.94
Togo	-6.86	-9.83	-4.73	-5.97
Standard deviation	13.01	7.95	6.14	6.84
Weighted average	-10.18	-9.65	-5.16	-4.45
Simple average	-12.84	-11.90	-7.94	-8.11

Notes: Weighted averages are computed using share of real GDP as weights. Source: WBAD.

In ECOWAS, Nigeria is the only country able to maintain a positive balance over a significant period of time, with the exception of 1998 and 1999. As noted for the oil-producer countries in CEMAC, this might reflect sharp movements in the terms of trade. For the other non-UEMOA members of the group, the deficit does not display any specific trend, neither in terms of average level nor in terms of standard deviation dynamics. Once Nigeria is removed from the sample, the regional un-weighted average deficit exhibits fluctuations around a flat trend of roughly 11% (weighted averages are slightly lower). Similarly, the standard deviation does not show any systematic pattern of convergence: after 1994 an initial reduction of the degree of dispersion is more than compensated by a widening of cross-country differences towards 1999-2001.

To some extent SADC presents a situation similar to ECOWAS, with no clear systematic pattern in either deficit levels or standard deviation. The discrepancy between the weighted and the un-weighted average towards the end of the sample period is due to the different evolution of deficit in South Africa relative to most of the other member states. While deficit decreases between 1998 and 2000-2001 in South Africa, it increases in other nine countries (in a tenth country, Botswana, there is a decrease of the surplus). Since South Africa has a large weight in the aggregate GDP of SADC, the weighted average deficit goes down, whilst the un-weighted one goes up. These divergent trends clearly cause an increase in overall dispersion.

The picture for UEMOA appears to be more optimistic, as both standard deviation and average level of deficit are on a decreasing path. However, there are reasons of concern. First of all, the target of balanced budget is still quite some distance away. The World Bank data in Table 5 suggest that none of the countries in 2000-2001 actually met the target. The IMF data reported in the Appendix show instead that Ivory Coast and Senegal in 2002 achieved slightly positive balances. Second, the decrease in the regional average of deficit is significantly affected by the progressive deficit reduction in Ivory Coast. However, as noted by Doré and Masson (2002) this reduction is not much the result of fiscal adjustment or of budgetary discipline imposed by the macroeconomic convergence criteria, but rather the consequence of the political crises that lead to a drying up of external financing and hence pushed the government to cut capital expenditure. Third, annual data show that in most countries progress towards fiscal stabilisation is more marked in the first three to four years following the 1994 devaluation and the subsequent adoption of regional surveillance procedures. The end of the '90s and the beginning of the new decade instead witness increasing difficulties for most countries and persistent imbalances[18].

To wrap up, it is clear that regional convergence of fiscal balances is quite weak. Actually, for some RECs, the trend is more one of divergence than one of convergence. Even in the two monetary unions, the evidence of increasing budgetary discipline is not strong. On the contrary, some of the apparently positive results might be driven by factors that do not constitute any form of sound fiscal stabilisation. This is in line with the point made by Masson and Pattillo (2001a) that a monetary union in itself does not automatically work as an "agency of restraint" for fiscal policy. For several countries in all RECs the gap between actual deficit and target is still large. Because of the potentially relevant negative effects of persistent deficits on the anti-inflationary stance of a country, and hence on the overall success of monetary integration, it will be desirable in the future to develop efficient mechanisms to enforce and monitor the progress of countries on this criterion (See also Section 5).

Performance of RECs vis-à-vis the other criteria

Table 6 summarizes the data for the other criteria reported in Table 3. For each REC, regional average level and standard deviation of the relevant macroeconomic variables are reported for the four sub-periods up to the latest possible observation.

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[18] This piece of evidence is familiar from the analysis of Doré and Masson (2002).

In CEMAC, the average debt level is significantly higher than the 70% target. According to the latest available information, only one country (Chad) meets the criterion. However, some considerable progress in reducing debt has been achieved since the second half of the '90s.[19] Current account balances are instead more in line with the 5% deficit norm. Annual data show that following the devaluation of the currency, the average current account deficit decreases between 1994 and 1995. This stems from the external competitivity effect of the realignment of the exchange rate. However, deficit subsequently increases, peaking above its pre-devaluation levels between 1996 and 1998. The sharp adjustment in external accounts thus occurs in 1999-2000. Changes in the stock of domestic payment arrears at the end of 2002 are negative in Cameroon and Chad, almost zero in Equatorial Guinea, and positive in Congo and in the Central African Republic. Turning to the standard deviations, there is some significant evidence of convergence in debt levels for the entire sample period and in current account balances for the post-1994 period. For the case of payment arrears, convergence is not much a situation where absolute values of changes in the stock are similar, but rather one where these changes are of the same sign. Thus, the standard deviation is not the appropriate statistical indicator. The evidence based on the direction (positive or negative) of changes across countries shows increasing divergence.

For EAC countries, the data provide a composite picture. Two of the three macroeconomic variables appear to converge to some extent, at least starting from 1993-1994. However, while debt service levels actually converge towards the target value of 15%, the gap between target and actual level of domestic savings in percent of GDP (used to proxy the domestic saving rate) widens. This latter negative trends reflects the contraction of savings in Uganda and, more importantly, in Kenya. For the third macroeconomic variable, external reserves, a generalized increase coupled with increasing dispersion is observed. Still, the regional average falls short of the norm stated in the criterion. These dynamics are due to the stagnation in the level of reserves held by Kenya between the second half of the '90s and the first years of the 2000s.

The striking feature emerging from the data for the non-UEMOA ECOWAS countries is the very large level of central bank financing of deficit. The norm of 10% of tax revenues is met only by Gambia, with Nigeria approaching 12% in 2000 but then experiencing an increase throughout 2001 and 2002. In Ghana and Guinea the ratio hits

three digit level. For these two countries it is particularly in the second half of the '90s that CB financing appears to go out of control. However, over the same period, no systematic patterns are observed in either inflation or fiscal deficit. In fact, in Ghana, the sharp increase in CB financing that takes place in 1998-1999 is accompanied by progressive stabilisation of inflation. In Guinea, inflation remains relatively low (below 5%) even when CB financing peaks. In both countries deficit fluctuates over a flat trend over the period of highest financing. Thus, at least for those two countries, it appears that high CB financing does not produce the expected large negative effects on inflation (and deficit). The standard deviation across countries significantly increases during the '90s, reflecting the divergence between Guinea and Ghana on one side and average financing in the other countries on the other side. The other criterion set for ECOWAS concerns the level of external reserves. The overall picture is encouraging. Most countries have been able to raise their reserves to meet the norm of three months set for 2000 and appear to be on the way to achieve the level of 6 months. There is however no strong evidence of convergence, with standard deviation practically constant throughout the observation period.

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[19] Most of the CEMAC countries are effectively in the HIPC initiative for debt relief.

Table 6. Convergence of macroeconomic variables in selected RECs											
	Weighted averages				Simple averages				Standard deviation			
	1985-89	1990-94	1995-99	2000-02	1985-89	1990-94	1995-99	2000-02	1985-89	1990-94	1995-99	2000-02
CEMAC												
Payment arrears	-5429.09	17879.99	-27304.35	-13524.50	-6364.37	20073.84	23271.61	33700.00	N.A.	N.A.	N.A.	N.A.
Public debt	N.A.	85.47	114.87	94.99	N.A.	84.99	119.21	93.78	N.A.	88.88	62.49	29.03
*Current Account**	-8.32	-5.29	-6.14	-0.74	-5.00	-11.09	-17.68	-4.39	13.03	13.71	25.21	10.14
EAC												
External reserves	0.99	1.58	3.06	3.73	0.95	1.60	3.14	3.82	0.74	0.70	1.06	1.48
Debt service	40.77	40.88	22.13	16.72	41.15	41.90	21.89	16.75	7.58	15.97	3.98	0.54
Domestic saving	9.11	7.50	7.81	6.96	8.53	6.68	7.52	7.01	8.08	11.81	4.88	1.61
ECOWAS												
External reserves	1.99	2.36	3.65	4.14	3.09	2.70	2.84	3.20	2.90	1.66	1.73	1.69
CB financing	62.48	92.90	96.52	67.92	78.20	77.56	104.04	103.82	55.98	48.30	92.05	116.03
SADC												
External reserves	1.37	1.42	1.77	4.06	2.87	3.70	4.52	4.98	4.09	5.58	6.64	5.44
CB financing	12.64	15.98	13.74	11.65	61.55	40.36	32.93	29.93	93.81	42.57	38.62	36.26
Public debt	27.52	35.42	49.96	54.08	30.05	33.39	64.32	78.95	23.62	31.04	61.79	68.39
UEMOA												
Payment arrears	N.A.	21821.63	-13228.82	-33162.44	19633.64	7224.82	12591.61	23200.00	N.A.	N.A.	N.A.	N.A
Public debt	59.73	56.21	78.38	111.37	106.22	116.88	112.71	113.65	82.33	112.11	70.00	33.24
*Current Account**	-8.51	-8.54	-6.17	-7.26	-9.99	-9.07	-8.11	-9.79	7.57	6.41	3.68	4.99

Notes. Own computation from data in WDI, WADB, IFS, ADB. Weighted averages are computed using shares of real GDP.   * denotes secondary criteria.

Most SADC countries display a rather low level of CB financing, with significant convergence taking place towards the end of the '80s and early '90s. Seychelles and Zambia are the only two countries whose CB financing ratios are significantly higher than the regional average. Again, inflation data suggest that this high CB financing has had negligible inflationary effects. In Seychelles, inflation CB financing grows significantly between 1993 and 1997. Over the same period inflation slightly decreases from 1.29% to 0.62%. In Zambia, CB financing is generally high over the entire period; however the peak observed in the mid-90s corresponds to a period of inflation stabilisation. A positive correlation appears instead to exist between the size of deficit and the extent of CB financing, at least in Seychelles. Less comforting is the regional performance on public debt, with both average ratios and standard deviation that increase over time. Wider dispersion is mostly driven by the growing stock of debt in Malawi, Seychelles, Zambia, and to a smaller extent, Lesotho. In fact, by 2001 Malawi and Zambia were admitted to the HIPC procedure. The data on the current account balance are heavily affected by the weight of South Africa in the region, as it is clear from the difference between weighted and un-weighted averages. While Namibia stands out as the only country with a surplus position at the beginning of 2000s, the average dispersion of current account deficit is on a decreasing trend. Finally, external reserves increase on average, but the cross-country dispersion does not display any significant reduction.

UEMOA countries are characterised by generally high, and more importantly growing, debt to GDP ratios. The fact that the standard deviation is decreasing does not represent much of good news, since it clearly means that all countries are following similar upward sloping trends. Coupled with the previous observations concerning the pattern of fiscal deficit, it appears that further efforts to achieve fiscal consolidation are a priority for the region. All of the member states are in the HIPC initiative and this should help improving debt indicators in the future. The current account scores a negative balance in almost all countries throughout the entire period. The 1994 devaluation has not much affected the external balance. Real effective exchange rate data show that the external competitiveness of UEMOA countries has been marginally eroded since the devaluation. Still, the region appears to be quite vulnerable to external shocks, including fluctuations of terms of trade. This might be at the root of both the generalised deficit of the current account and the decline in the pace of growth in 2000-2001 (IMF, 2002). The standard deviation of the current account balance is relatively low if compared to the case of CEMAC, denoting generally harmonized situations. However, no significant increase in convergence has taken place since 1994. Overall, the stock of payment arrears is diminishing, thus conforming to the norm of the convergence criterion. However, at country level, the picture is quite heterogeneous. In particular, it seems that Ivory Coast and Togo have accumulated domestic and external arrears to partially finance the fiscal deficits of the end of the '90s and 2000. In both countries, and also in Guinea-Bissau, the stock of arrears is still increasing in 2002.

Wrap up: convergence of macroeconomic policy stance in the RECs

The evidence emerging from the analysis of the trends and standard deviation of macroeconomic variables is rather mixed. A broad indication of convergence in monetary policies and outcomes can be derived from the inflation data. Certainly less convergent are fiscal policies. Fiscal consolidation and debt control still are a priority in several countries in different RECs. A glance at the standard deviations reported in Table 6 again highlights a significant heterogeneity of experiences, both across RECs and across macroeconomic variables. Probably, in CEMAC and UEMOA, because they have been integrated monetary areas for a long time, one would expect to observe a greater degree of convergence –aside from monetary policy that converges by definition - than what actually results from the data. In SADC, actual convergence might be limited to some extent by the presence of conflict affected outliers with distorted economic policy stances. In ECOWAS, in addition to fiscal deficit, the major source of divergence is the size of CB financing of deficit. However, it appears that the inflationary effects of high financing are small. In EAC negative convergence (that is, convergence away from the targets), positive convergence and divergence co-exist.

Two additional comments are in order. First, the time-series perspective allows to identify a few situations where convergence increases following the formal launch of a REC and/or the adoption of criteria. Still, because most RECs are quite recent, the small number of annual observations does not permit to run a specific econometric test of structural break in the macroeconomic time-series. The convergence observed from the inflation data appears to have started, for most RECs, before their actual formation. In this respect, the adoption of formal macroeconomic convergence frameworks has worked in the sense of strengthening, more than creating, convergence. Second, the effectiveness of criteria as a device to effectively induce convergence of policies is strictly linked to the credibility of the criteria themselves and of the general institutional framework of macroeconomic convergence. Therefore, in designing convergence criteria attention should also be paid to establishing enforcement mechanisms that create an incentive for countries to comply with the numerical norms. This issue is investigated in more details in Section 5.

3.3 *Convergence of shocks, cyclical variation in economic activity and trade patterns*

Shock asymmetries and low correlation of business cycles across countries can complicate the process of macroeconomic integration, as discussed in Section 2. Based on this result derived from the theory of

optimal currency areas, a number of papers have identified more or less sophisticated econometric techniques to measure the degree of shocks and business cycles convergence in a regional cluster.[20] Most of this literature focuses on the case of Europe, exploiting the relatively long and complete time-series that are normally available for those countries. Some of the more advanced techniques will be used in the analysis of the COMESA case study in Section 4. To gain some insights on the degree of shock and business cycles convergence in the other five RECs, a good starting point is to look at the correlations between key indicators reflecting the fundamentals of the economy. A second relevant piece of evidence comes from trade patterns and the extent of intra-regional trade. Again, it has been noted in Section 2 that some empirical evidence, backed by theoretical arguments, is now available suggesting that the degree of "real" divergence in a region is smaller the more countries in that region trade with each other. A high share of intra-regional trade would therefore increase the expected benefits from deep forms of economic integration.

Cross-country correlations

Cross-country bilateral correlations for four macroeconomic variables are computed for each pair of countries in each region. If shocks are convergent and business cycles synchronized, then one should observe positive and statistically significant correlations. On the other hand, close to zero or even negative correlations are a symptom of divergence. Table 7 reports the basic summary statistics of the set of correlations computed in each REC. Data are averaged over the entire sample period (1965-2002) and over a shorter sub-period (1985-2002) to capture variation over time. As a point of comparison, the summary statistics of correlations in the EMU are also displayed, including a third sub-period to isolate the pre-Maastricht period. The variables considered for this exercise are those indicated by the existing literature as those more likely to reflect the fundamentals of the economy. Masson and Pattillio (2001b) note that an important source of shocks is the terms of trade. Therefore correlations in terms of trade changes are likely to incorporate shock symmetries or asymmetries. Angeloni and Dedola (1999) focus on correlations in real GDP growth and inflation. Mkenda (2001) adds correlations to her analysis of covariation of cycles.

A broad interpretation of the data in Table 7 is that, with a few exceptions, low correlations are the norm. This means that there is little evidence of systematic co-variation of shocks and cyclical economic activity within the RECs. The extent of divergence can be grasped by looking at how correlations in the RECs compare with correlations in the EMU, before and after the launch of the Maastricht Treaty. Only UEMOA and CEMAC display correlations that for inflation are comparable with EMU, but this should not be surprising since the two regions have been monetary unions since independence. The highest correlations in real aggregate GDP growth are observed in EAC and SADC, but fall short of ½ (and more) of the correlation observed in the pre-Maastricht EMU.

As just noted, CEMAC and UEMOA are characterised by high correlations of inflation across their member states. Bilateral correlations are in fact statistically significant at usual confidence levels for most pairs in each region. This result is a clear consequence of the monetary arrangements existing in the two zones. The fact that monetary policy is common also explains the positive correlation in money growth. Still, one might wonder why in monetary integrated areas money growth is significantly less correlated than inflation. A possible explanation has to do with differences in money demand across countries. Since national money supply in a monetary union is determined endogenously, variations in money demand would induce different money growth rates. Over the entire sample period, correlations of changes in the terms of trade and real GDP growth are generally not different from zero in both zones. There is however some weak evidence of non-zero positive correlations in the sub-period 1985-2002. Bilateral data suggest that in CEMAC the degree of correlation of each country with the others is quite uniform, perhaps with

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[20] See, inter alia, Bayoumi and Eichengreen (1993 and 1997), Angeloni and Dedola (1999), Martin and Velazquez (2001). For specific analysis of African regions see Fielding and Shields (1999) and Mkenda (2001).

Cameroon slightly diverging apart. In UEMOA, instead, Guinea-Bissau appears to be characterised by substantially non-synchronized cycles and asymmetric shocks with the rest of the region. In fact, the correlations computed between this country and the other member-states are generally low and often significantly negative.

Aside of the two monetary zones, the highest correlations are displayed by EAC. In particular, EAC is the only REC where correlations of terms of trade changes are often significantly different from zero. An interesting aspect emerging from the data for EAC is the existence of very strong correlations of the rate of money growth , which however do not appear to translate into significant correlations of inflation. Cross-country differences in transmission mechanisms of monetary policy and disturbances (stemming for instance from differences in the development of the financial sector and from market rigidities) may be the reason for this discrepancy.

Table 7: Summary of correlations between macroeconomic variables in selected RECs

		Terms of trade		Inflation		GDP growth		Money growth	
		1965-2002	1985-2002	1965-2002	1985-2002	1965-2002	1985-2002	1965-2002	1985-2002
CEMAC									
	Average	0.0488	0.0491	0.6440	0.6361	0.0893	0.1161	0.4384	0.4562
	Std. Deviation	0.2621	0.2742	0.1842	0.2092	0.2009	0.2358	0.1251	0.1741
	Min	-0.3015	-0.3015	0.2201	0.2201	-0.2261	-0.2238	0.2448	0.0355
	Max	0.4856	0.6525	0.8318	0.8395	0.5632	0.5632	0.7097	0.7097
EAC									
	Average	0.1359	0.1489	0.0993	0.0868	0.1952	0.1775	0.8595	0.2931
	Std. Deviation	0.2164	0.2113	0.3813	0.3784	0.2804	0.3019	0.1072	0.2224
	Min	-0.0384	-0.0384	-0.3124	-0.3124	-0.0235	-0.0764	0.7827	0.0363
	Max	0.3780	0.3780	0.4402	0.4402	0.5113	0.5113	0.9820	0.4241
ECOWAS									
	Average	0.0490	0.0042	0.2038	0.2055	0.0063	0.0630	0.0745	0.0351
	Std. Deviation	0.2089	0.3090	0.4409	0.4539	0.2229	0.2567	0.2711	0.3197
	Min	-0.5043	-0.7435	-0.4333	-0.4069	-0.4660	-0.4927	-0.4598	-0.5526
	Max	0.6190	0.6258	0.9840	0.9840	0.4713	0.6037	0.7450	0.7768
SADC									
	Average	0.0005	-0.0074	0.0922	0.0975	0.1211	0.1230	0.0290	0.0571
	Std. Deviation	0.2719	0.3029	0.3381	0.3462	0.2267	0.2758	0.2837	0.3172
	Min	-0.6479	-0.6479	-0.8334	-0.8573	-0.4571	-0.5907	-0.7655	-0.7655
	Max	0.6380	0.6380	0.7556	0.8510	0.6485	0.7574	0.7854	0.7854
UEMOA									
	Average	0.0911	-0.0173	0.5657	0.5859	0.0956	0.1235	0.2540	0.2677
	Std. Deviation	0.1927	0.3112	0.5171	0.5249	0.1872	0.2918	0.3196	0.3595
	Min	-0.4001	-0.7435	-0.3102	-0.3102	-0.2568	-0.4927	-0.3693	-0.3693
	Max	0.4596	0.6258	0.9840	0.9840	0.4713	0.5590	0.7450	0.7768
Memorandum Items									
		Inflation						**GDP growth**	
		1960-2002	1985-2002	1960-1991			1960-2002	1985-2002	1960-1991
EMU									
	Average	0.6827	0.4857	0.6027			0.4610	0.4674	0.4708
	Std. Deviation	0.1897	0.3263	0.2441			0.2406	0.2585	0.2185
	Min	0.0611	-0.2485	-0.1146			-0.0793	-0.0406	0.0443
	Max	0.9467	0.9380	0.9393			0.8163	0.8877	0.8037

Notes. Own computations from WDI and WBAD data. Average is the average of bilateral correlations in the region. Std. Deviation is the standard deviation of bilateral correlations in the region. Min and Max are respectively the lowest and the highest of all correlations in the region.

The two larger regions, ECOWAS and SADC, display correlations that are hardly different from zero in statistical terms. The relatively high correlation of inflation in ECOWAS is mostly driven by UEMOA

countries. For non-UEMOA countries, the average value drops by more than 50%. A few countries (Guinea-Bissau, Liberia and Sierra Leone) in particular appear to diverge from the rest of the group. SADC incorporates the CMA monetary area based on the Rand. As a matter of fact, bilateral correlations between South Africa, Lesotho, Swaziland and Namibia are very high for inflation. As for CEMAC and UEMOA, correlations of monetary growth in the CMA sub-group are still significant, but considerably smaller than those of inflation. Again, differences in money demand may explain the gap. The war-torn countries, Angola and DRC, which are outliers in terms of macroeconomic policy stance, do not seem to diverge particularly from the rest of SADC in terms of correlation of fundamentals. More divergent are instead the positions of Malawi, Seychelles, Zimbabwe and, with the exception of the CMA zone, Namibia.

Trade patterns

Table 8 reports trade data for the five RECs. Intra-regional, intra-African and total trade are all expressed in percent of GDP. Trade index 1 (T1) is the share of intra-regional trade on total intra-African trade, trade index 2 (T2) is the share of intra-regional trade on total trade.

Data generally confirm that intra-regional trade in the RECs is low. This is evident from the comparison with the statistics available for EU, MERCOSUR and ASEAN. In particular, whilst intra-regional trade appears to be a relatively large share of African trade, it is only a small percentage of total trade. Thus, countries tend to trade significantly more with the rest of the world than with their partners in a REC. In fact, in most of the cases Europe appears to be the largest trading partner.

Table 8: Trade statistics for selected RECs										
	Intra-regional trade		Intra-African trade		Total trade		Trade index 1		Trade index 2	
	1980-1990	1991-2001	1980-1990	1991-2001	1980-1990	1991-2001	1980-1990	1991-2001	1980-1990	1991-2001
CEMAC	2.824	3.069	3.788	5.474	45.695	61.440	47.736	43.063	6.354	5.039
EAC	3.052	4.193	3.731	7.315	30.448	35.512	76.414	60.046	10.450	13.611
ECOWAS	4.953	8.024	6.198	9.618	50.308	55.978	79.192	80.053	11.622	14.199
SADC	5.881	11.091	6.888	12.474	47.689	59.326	71.408	81.408	12.142	20.203
UEMOA	4.137	5.317	7.570	11.611	44.400	53.831	56.956	53.426	10.816	10.730
EU	29.011	36.652	N.A.	N.A.	50.621	58.475	N.A.	N.A.	57.261	62.614
MERCOSUR	5.614	10.721	N.A.	N.A.	22.018	27.258	N.A.	N.A.	25.489	39.363
ASEAN	17.359	27.378	N.A.	N.A.	89.723	109.649	N.A.	N.A.	19.051	25.423

Notes. Own computation from DOTS data. Intra-regional, Intra-African and Total trade are expressed in percent of GDP. Trade Index 1 is the share of intra-regional trade on intra-African trade. Trade Index 2 is the share of intra-regional trade on total trade. Sample period ends in 2001 because this is the latest available information for most of the African countries. For composition of the non-African groupings see Appendix.

Intra-regional trade exhibits a modest increase over time in all RECs. However, intra-African trade grows faster and T1 does not increase. The only exception is SADC, for which the share of intra-regional trade on intra-African trade does grow. Much of this growth is to be associated with the entry of South Africa and the transformation of the old SADCC. T2 exhibits a positive trend in EAC and ECOWAS and SADC. Still, this might be a reason of concern as movements appear to be the result of progressive isolation of African economies from global trade. In UEMOA and CEMAC, instead, the share of intra-regional trade on total world trade is stagnant or even decreasing.

A point that would deserve attention is whether intra-regional trade is endogenous to the process of macroeconomic integration. Empirically, endogeneity would imply that the series of regional trade exhibits a structural break following the formal launch of a convergence framework (in the form of either a policy harmonization program or a set of macroeconomic convergence criteria). The problem in testing

for a structural break is that RECs have generally launched formal convergence frameworks quite late in the '90s. Thus, there are very few observations for the "post-convergence" period, even assuming to have trade data up to the current year (which is not the case since for most countries data available from the Direction of Trade Statistics of the IMF end in 2001). A test focused only on CEMAC and UEMOA would also present difficulties. The two areas have been currency unions since independence, thus in this respect there is no variation in the type of monetary arrangement. Convergence criteria in turn have been formally introduced in 1999, and this leaves only two or three observations for the post-convergence period. Still, the overall attempt to harmonize macroeconomic (and in particular fiscal) policies can be dated back to 1994, after the devaluation. Using the seven observations from 1995 to 2001 and the 16 observations from 1980 to 1994, regional averages of regional trade can be computed for both areas and compared to gain some kind of crude evidence. In CEMAC intra-regional trade grows from 2.75% to 3.33% between the two sub-periods. At the same time, intra-African trade increases from 4.07% to 5.83% and world trade from 46.13% to 69.49%. The effect in terms of intra-regional trade shares is almost negligible, with T1 and T2 practically unchanged between the pre and the post-convergence period. An analogous pattern is observed in UEMOA. Intra-regional trade goes from 4.02% to 6.22%, intra-African trade from 7.78% to 13.45% and total trade from 44.16% to 59.7%, but T1 hardly changes, while T2 somehow decreases. Thus, it appears that the relative weight of regional trade in the two zones has not been significantly affected by the macroeconomic integration process. These evidence is fully consistent with that reported in Table 8 for the period 1991-2001. In fact, it is tempting to try to explain trade patterns in the CFA zones in the second half of the '90s in terms of the external competitiveness effect of the 1994 devaluation, more than in terms of endogeneity to macroeconomic convergence. Annual data disaggregated for imports and exports are consistent with the following explanation. The devaluation has initially increased the rate of growth of extra-bloc exports, without much affecting the growth of imports. As a result extra-bloc trade has grown faster than regional trade, causing a contraction of T1 and T2 in 1995 and 1996. However, the greater margin of external competitiveness gained in 1994 has been subsequently eroded. Hence, both extra-bloc exports and trade have soon reverted to pre-1994 trends, and the initial weight of regional trade on African and world trade has been re-established. The averages of T1 and T2 for the '90s therefore incorporate the contraction of the period 1994-1997 and this explains the decrease (or stagnation) observed from the figures in Table 8.

Wrap up: cyclical covariation and trade patterns

The analysis of bilateral correlations suggests that countries' fundamentals in the five RECs do not tend to move very much together. This can be interpreted as evidence that business cycles are not synchronised and countries are hit by substantially asymmetric shocks. Intra-regional trade is low and does not appear to be on a sustained growth path. In spite of the efforts devoted to forming free trade areas and custom unions, several factors concur to limiting the size of trade flows within RECs: non-tariff barriers, lack of physical integration and infrastructures, low product diversification across countries, lack of complementarity and supply-side bottlenecks.

The divergence of shocks and cyclical economic activity is likely to determine an unequal distribution of the costs and benefits of the monetary integration process across countries. To compensate inequalities, labour mobility and a system of regional fiscal transfers are desirable items to be incorporated into the integration agenda. As discussed in Section 5, however, there are clear political-economic problems in promoting such items within the context of African RECs. While these problems need to be addressed and solved in the long-run, it will be important in the meantime to focus on the development of intra-regional trade as a buffer that can mitigate the extent of shocks asymmetries and divergence.

3.4 *Convergence of outcomes: income convergence*

The third dimension of convergence that is relevant in the context of macroeconomic integration is the convergence of outcomes. In a theoretical framework, outcomes substantially refer to the arguments of

the welfare function. As an empirical proxy, the literature has generally considered convergence in per-capita income levels. Two basic approaches have been adopted. *Sigma* convergence measures dispersion as the standard deviation of income levels across countries. Clearly, convergence is represented by a decreasing value of the standard deviation. *Beta* convergence instead refers to the statistical correlation between the level of per-capita income at the beginning of the sample period and its subsequent average rate of growth. In this context, there is convergence if the correlation coefficient is negative. The formal test of this type of convergence involves estimating a growth regression. Then, two different notions of beta convergence can be identified. If the growth regression does not include any explanatory variable other than initial per-capita GDP, then a form of *absolute* beta convergence is being tested. If instead other explanatory variables are added to model, then the resulting test is one of *relative* beta convergence. The difference is that whilst absolute convergence assumes that countries share the same steady state and differ only in terms of their starting point, relative convergence accounts for the possibility that countries move to different steady states.

The literature on convergence of income is voluminous, being essentially constituted by the whole of the empirical literature on growth. Several econometric issues contribute to making the debate quite lively. A rather unanimous conclusion is that there is no convergence of income levels across large cross-section of countries. This result also appears from the simple indicators reported in Table 1, where industrial countries display generally higher growth rates than developing countries. In other words, world-wide per-capita income dispersion is increasing, and the gap between rich and poor countries is widening up. However, some authors have found evidence of convergence within smaller and more homogenous clusters of countries. That is, in groups of countries that are characterised by similar fundamentals and steady states, it appears that the initially poorer grow faster and catch up with the initially richer. This result, which particularly shows up for high-income OECD countries, might however be driven by sample selection bias. In testing for convergence, one needs long time-series of growth data. These series are normally more easily available for rich countries. Thus, if samples are selected on the basis of the data availability, they will end up including mostly rich countries; that is, they will include countries that from wherever they departed, have in the end achieved similar (high) income levels. The consequence is that convergence of income levels in these clusters is a result of the way in which the sample is constructed.[21]
The evidence on income convergence within regional integration agreements (RIAs) is quite mixed. Probably the most popular result is the convergence taking place within the European Union (see, for instance, Ben David, 1993 and 1996). However, for RIAs constituted by low income countries, there is evidence of divergence (Venables, 2002). Table 9 reports some evidence on convergence of per-capita income levels in the five selected African RECs. Data are averaged over four decades. The latest observation refers to the period 2000-2002. EMU is reported as a comparison. It must be stressed that because of the low number of countries in each REC (especially UEMOA, CEMAC and EAC), the test of beta convergence is based on a very small number of observations. Therefore, the little number of degrees of freedom makes statistical inference rather weak. A more appropriate interpretation of the test can be thus given in terms of scatter plots. A negative correlation coefficient summarises a broadly downward sloping scatter plot of initial income and subsequent growth. This in turn is taken as evidence of beta convergence.

There is evidence of sigma convergence only in UEMOA and CEMAC throughout the '80s and the '90s. In both regions, however, the pace of convergence seems to slow down in the '90s. The other regions, including EMU, appear to be characterised by increasing dispersion of income levels. The scatter plots broadly confirm this result. For the case of EMU, however, the correlation coefficient is heavily negative, suggesting that significant beta-convergence is taking place.

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[21] For surveys on convergence see Durlauf and Quah (1997). Easterly (2001, Chapter 3) surveys the issue of convergence in clubs. The seminal contribution on convergence clubs is due to Baumol (1986). De Long (1988) points out the problem of sample selection bias.

A question that deserves further analysis in future work is whether or not the convergence displayed by the two CFA monetary zones is generated by the tighter links they have with the richer European countries. In fact, large trade flows and a fixed exchange rate arrangements with the French franc, and later the Euro, may constitute a form of surrogate de facto North-South RIA that does not exist for the other RECs. The spillovers from such a North-South RIA would then benefit the poorer countries allowing them to catch up.

Table 9: Test of Sigma and Beta Income convergence for selected African RECs					
Sigma convergence					
	1960-69	**1970-79**	**1980-89**	**1990-1999**	**Latest**
CEMAC	927.76	2167.35	1835.23	1674.29	1565.18
EAC	N.A.	N.A.	71.76	84.30	85.78
ECOWAS	189.48	238.80	250.52	287.29	352.56
SADC	1157.70	1485.32	1597.86	2032.01	2194.84
UEMOA	216.12	290.66	241.49	191.05	197.58
EMU	4328.27	5483.70	6878.67	9400.78	11649.88
Beta convergence					
		Correl.	Std.Err.	t-ratio	P-value
CEMAC					
	1960-2000	-0.0147	0.0846	-0.1741	0.8702
	1980-2000	-0.0323	0.0471	-0.6871	0.5298
	1990-2000	-0.0480	0.0750	-0.6406	0.5566
ECOWAS					
	1960-2000	-0.0156	0.0131	-1.1933	0.2633
	1980-2000	0.0006	0.0238	0.0264	0.9794
	1990-2000	0.0239	0.0255	0.9373	0.3671
SADC					
	1960-2000	-0.0007	0.0206	-0.0324	0.9750
	1980-2000	0.0151	0.0137	1.1062	0.2923
	1990-2000	0.0157	0.0149	1.0505	0.3142
UEMOA					
	1960-2000	-0.0213	0.0152	-1.4011	0.2201
	1980-2000	-0.0337	0.0180	-1.8691	0.1108
	1990-2000	-0.0155	0.0253	-0.6111	0.5636
EMU					
	1960-2000	-0.0153	0.0057	-2.7087	0.0240
	1980-2000	-0.0104	0.0187	-0.5591	0.5884
	1990-2000	-0.0122	0.0256	-0.4754	0.6447
EAC					
	1990-2000	-0.0487	0.1387	-0.3512	0.7850

Notes. Own computation from data in WDI and WBAD. Sigma convergence is the standard deviation of per-capita GDP across countries in a REC. Beta convergence is the estimated correlation coefficient between average growth rate of per-capita GDP and log level of per-capita GDP at the beginning of the sample period (see text for details). EAC is reported after EMU because the very small number of member states makes statistical inference quite difficult in the test of beta convergence.

Macroeconomic convergence has been assessed along three dimensions: convergence of the macroeconomic policy stance, convergence of shocks and cyclical variations in economic activity, convergence of per-capita income levels. All three dimensions are relevant since they influence the balance between costs and benefits of the macroeconomic integration process and contribute to determining its distributional effects.

The convergence of policy stances is analysed in terms of the cross-country dispersion of those macroeconomic variables that in each REC are targeted by macroeconomic convergence criteria. A few general results emerge. Within each REC there appears to be some significant degree of convergence in inflation and hence in the overall monetary policy stance. Fiscal policy stances are instead much less convergent and there is a clear indication that fiscal consolidation is still to be achieved in several countries in most RECs. The trends and standard deviations of other macroeconomic variables provide a rather mixed and heterogeneous picture. The general impression, however, is that often divergence tends to overcome convergence.

The convergence of shocks and business cycles is assessed by looking at cross-country correlations of variables representing the fundamentals of the economy. Such correlations are generally low and statistically not significant, especially if one excludes the correlations of inflation in CEMAC and UEMOA. Comparison with a European benchmark confirms the broad picture. A further piece of evidence comes from the analysis of trade patterns. It is argued that increasing intra-regional trade flows might mitigate the actual degree of divergence of shocks. However, intra-regional trade in all RECs is low, both as a share of GDP and as a share of extra-regional trade. Moreover, it seems that intra-regional trade flows are not growing particularly fast.

The convergence of per-capita income is measured as the dispersion of income levels across countries and as the correlation between initial level of income and subsequent growth rates. There is some evidence of convergence over the '80s and the '90s for the two CFA monetary zones, whilst per-capita GDP in the other RECs tend to diverge.

Even though one has to bear in mind the existence of differences across RECs, the general conclusion is that there is not strong evidence of macroeconomic convergence. Often, the evidence points more to divergence than to convergence. Certainly, the fact that RECs have only recently launched formal frameworks for convergence and macroeconomic integration may to some extent justify the weak performance so far. At the same time, different degrees of success across countries in reforming the economy and in undertaking structural adjustment contribute to existing intra-regional discrepancies. The divergence of shocks and business cycles originates from structural differences (sectoral composition of the economy, endowment of resources, market rigidities) that are more difficult, and take a long time, to harmonize. It is therefore important that over the shorter term RECs focus on the convergence of macroeconomic policy stances and on trade-integration as means to compensate, and possibly endogenously reduce, shock asymmetries. Section 5 will address these issues in more details.

4. Macroeconomic convergence in COMESA: case study

There are three basic elements that makes COMESA a relevant case study. The first one is its geographic, demographic and economic dimension. The region comprises 20 countries, accounting for 42.68% of total African land, 44.66% of total population, and about 32% of total GDP in the continent. The second element is the heterogeneity of its membership. Economic and social conditions in the region considerably vary across countries. In COMESA there are five countries with GNI per-capita income above USD 1000 in 2001 (including the two economies with the highest per-capita income in the continent, Seychelles and Mauritius) and five countries with GNI per-capita below USD 200 in 2001

(including the two poorest African countries, out of those for which data are available, Ethiopia and Burundi). Similar differences are observed on human development indicators. For instance, the region includes the country with the longest life expectancy in Africa (Mauritius, almost 72 years) and the country with the shortest one (Malawi, barely 39 years). Under five year mortality rates range between a maximum of 20.8% (Angola) to a minimum of 2.1% (Mauritius, the lowest in Africa). Third, in spite of this heterogeneity, which could imply significantly different policy preferences and disturbances, COMESA countries have engaged in a broad process of regional economic integration. This process, aiming at the formation of a monetary union in the long term, has unfolded for a few years now and it is therefore important to assess the progress of transition.

The structure of the case study follows the analysis of the previous section. First a few basic economic and social facts are surveyed. Then, each of the three dimensions of macroeconomic convergence is investigated empirically. However, for COMESA, evidence is produced from a variety of econometric techniques in addition to those introduced in Section 3. The flow of information generated with such techniques facilitates the interpretation of basic descriptive statistics and hence it is of critical support in the analysis of policies and in the formulation of recommendations[22].

4.1. COMESA: basic facts and economic trends

The fundamental rationale of macroeconomic and monetary integration in COMESA is to create the conditions for the sustained economic development of the sub-region. The objective of the process is thus to achieve deep forms of integration, and most notably to establish a monetary union and a full economic community. To this purpose, the thrust of implementation activities focuses on: (i) liberalization of the exchange system of member states to promote intra-regional trade and cross-border capital flows, (ii) harmonization of national policies to correct misalignments, strengthen macroeconomic adjustment and performance, (iii) achievement of currencies convertibility, (iv) mobilization of financial resources to expand trade and support development projects (COMESA, 2003).

The predecessor of integration efforts in Eastern and Southern Africa was the Preferential Trade Area (PTA) which came into effect in 1982 with the purpose to promote trade and factor mobility among member states. A trade liberalization program was launched in 1984, with a target period of eight years for the complete elimination of tariffs on a selected list of commodities. The deadline was subsequently postponed to 2000 to give countries more time to adjust their budget structures to changes in the flow of tariff revenues. The decision to create a monetary union within PTA dates back to 1989. It was essentially motivated by the consideration that trade integration is endogenous to broader economic integration and that the co-ordination of macroeconomic policies would reduce the costs of transition and stabilization. In 1992 the Authority of Heads of State and Government adopted a Monetary and Fiscal Policies Harmonization Program that constituted the framework of economic integration in the region. The program takes a gradualist approach articulated in stages and spanning over a period of more than 30 years:

- *Stage 1* (1992-1996). Consolidation of existing instruments of monetary co-operation and implementation of policy measures aimed at achieving macroeconomic convergence.
- *Stage 2* (1997-2000). Introduction of limited currency convertibility and informal exchange rate union.
- *Stage 3* (2000-2024). Formal exchange rate union and co-ordination of economic policies by a common monetary institution.
- *Stage 4* (2025 onwards). Full monetary union involving the use of one common currency issued by a common central bank.

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[22] For the implementation of these additional techniques, a data-set of time-series for a large number of macroeconomic variables has been assembled. Variables are described in the Appendix.

PTA was officially transformed into COMESA in 1994 and its Treaty envisages a comprehensive program of co-operation in a variety of fields extending beyond trade and macroeconomic policies (i.e. research in science and technology, peace and security, physical infrastructures development). As of July 2003, members of COMESA are: Angola, Burundi, Comoros Islands, Democratic Republic of Congo (DRC), Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe.

The four-stage program of economic integration adopted by PTA has been endorsed by COMESA and its implementation reviewed with the definition of specific criteria to lead the process of macroeconomic convergence (COMESA, 1995 and Harvey et al. 2001). Following the recognition that the achievement of a monetary union does necessarily require the integration of financial and banking systems, COMESA has engaged in interventions to strengthen, transform and update its institutions of financial co-operation. For instance, the Clearing House set-up in 1984 to enable member states to trade in national currencies, is being transformed to focus its activity on the establishment of a regional payment system, on the delivery of electronic financial services, and on the provision of trade insurance. Steps to developing regional banking have been undertaken through the Meetings of Bank Supervisors (in the area of harmonization of banking supervision and regulation) and the COMESA Banker's Association (in the area of exchange of information on banking practices). Other relevant regional financial agencies are The Eastern and Southern Africa Trade and Development Bank (PTA Bank), which provides business capital and trade finance to the private sector, and the COMESA Reinsurance Company (ZEP-RE), which provides insurance and re-insurance services.

Over the last few years, COMESA has also achieved some important progress in the sphere of trade liberalization. The COMESA free trade area (FTA) has been launched in October 2000, with Djibouti, Egypt, Kenya, Madagascar, Malawi, Mauritius, Sudan, Zambia and Zimbabwe trading among themselves on a zero tariff. Burundi, Rwanda and Swaziland joined the FTA in 2003. Furthermore, the implementation of a common external tariff, and hence the transformation of the FTA into a custom union, is planned for 2004.

Tables 10 and 11 report some basic economic and social information on COMESA countries. This information is directly comparable with that reported in Tables 1 and 2 for the other five African RECs and for non-African groupings.

Table 10. COMESA: Basic Economic Indicators													
	Area	Population	GNI p.c.	Aggregate GDP growth		Per capita GDP growth		GINI	Gross capital formation/GDP			CA balance/GDP		
	(thou)	(thou)	(USD)	90-95	96-01	90-95	96-01		1990	1995	2000	1990	1995	2000
Angola	1247	12717	240	-2.80	5.73	-5.79	2.66	N.A.	11.71	21.00	28.27	-2.30	-5.85	-0.05
Burundi	26	6807	110	-1.27	-0.78	-3.70	-2.75	33.30	14.54	9.58	8.96	-6.13	1.04	-7.09
Comoros	2	558	380	0.35	0.97	-2.23	-1.54	33.90	19.67	21.42	10.44	-4.19	-8.18	-0.50
DRC	2267	51390	100	-7.03	-1.20	-10.13	-4.25	N.A.	9.05	9.37	7.12	-7.89	-8.23	-10.44
Djibouti	23	660	840	-1.78	-0.10	-6.49	-1.80	38.63	20.86	8.44	12.87	-18.62	-4.62	-2.80
Egypt	995	63819	1490	3.79	5.44	1.62	3.46	28.90	28.81	17.21	23.89	-1.47	0.64	-1.19
Eritrea	101	4097	170	3.40	2.23	0.75	-0.53	N.A.	0.00	19.25	38.00	0.00	-5.43	-34.21
Ethiopia	1000	64298	100	2.60	5.28	0.44	2.60	39.96	11.83	16.44	14.15	-3.56	-1.56	-5.24
Kenya	569	30092	360	2.04	1.78	-0.71	-0.63	44.54	19.70	17.53	12.70	-6.18	-4.43	-2.30
Madagascar	582	15523	260	0.29	3.85	-2.39	0.69	46.00	16.97	10.94	16.14	-8.60	-8.73	-6.72
Malawi	94	11042	170	3.88	4.03	1.98	1.70	62.00	23.04	17.01	13.09	-4.58	-30.34	-30.84
Mauritius	2	1186	3800	5.31	5.76	4.14	4.59	36.70	30.88	25.78	25.71	-4.51	-0.55	-0.76
Namibia	823	1740	2050	4.55	3.84	1.36	1.72	N.A.	34.68	21.70	23.80	1.09	5.02	5.86
Rwanda	25	8508	230	-3.85	9.92	-4.40	3.88	N.A.	14.65	15.00	15.20	-3.32	4.47	-0.38
Seychelles	1	81	7310	3.95	2.32	2.56	0.78	N.A.	24.57	30.34	29.30	-3.52	-10.61	-9.74
Sudan	2376	29677	320	7.33	6.66	4.88	4.41	N.A.	13.99	13.59	14.30	-9.86	-20.55	-8.46
Swaziland	17	1045	1290	3.75	3.42	0.56	0.38	60.90	20.03	20.28	19.58	6.03	-2.28	-2.71
Uganda	200	22210	310	4.58	5.61	3.48	3.06	37.40	12.70	16.42	18.19	-9.97	-7.72	-13.95
Zambia	743	10089	300	-1.11	2.70	-3.93	0.34	52.60	17.28	15.95	18.27	-18.08	-4.20	-8.50
Zimbabwe	387	12627	480	2.33	2.07	-0.12	0.13	56.83	17.38	19.66	12.59	-1.59	-6.17	2.15
COMESA	11480	348166	477.185	2.876	4.709	0.609	2.460	43.97	22.848	17.149	20.305	-3.749	-3.098	-3.272

Notes. Own computation from data in WDI, WADB, IFS and ADB. Additional notes are in Table 1.

The data on GDP growth present an almost bi-polar situation. On one extreme there is a group of seven countries that have achieved sustained per-capita growth rates over the sub-period 1996-2001, actually outperforming the average of industrial countries. Of these seven, four (Angola, Egypt, Ethiopia and Rwanda) exhibits a significant increase in the pace of growth since the previous sub-period 1990-95 [23]. The other three (Mauritius, Sudan and Uganda) have substantially maintained their trend. The group is clearly non homogenous in terms of per-capita income levels. In fact, four out of these seven fast growing countries still have GNI per-capita well below both the African and the COMESA average. On the other extreme, there are eleven countries (Burundi, Comoros, DRC, Djibouti, Eritrea, Kenya, Madagascar, Seychelles, Swaziland, Zambia and Zimbabwe) that in the latest quinquennium have experienced negative growth or stagnation (growth below 1%). Badly enough, all of these eleven countries would be classified in the same group also on the basis of 1990-95 data, even though one has to highlight that two of them (Madagascar and Zambia) have moved from significantly negative to barely positive rates. Thus, there appears to be some persistence of poor economic performance. For some countries such persistence is particularly worrying since it is coupled with income levels that are already below the USD 300

[23] For Angola a critical factor boosting GDP, in spite of continued internal conflicts, is oil production. In fact, Angola's GDP could be among the world's fastest growing economies in the years to come if oil production meets the predicted levels (CIA, 2003).

threshold. Two countries remain outside these groups (Malawi and Namibia). They appear to be on a constant growth pattern at around 1.7% with minor fluctuations since 1990-95.

Turning to social indicators, as already noted, the picture is certainly variegated. Probably, the most striking feature is the high negative correlation between life expectancy and infant mortally (-0.9 for 1990 data and –0.88 for 2000 data), which emphasizes the extent of human development challenges faced by several countries.

Table 11 COMESA social indicators																
	Life expectancy		Infant Mortality		Young female illiteracy		Young male illiteracy		Female sec enrol		Male sec enrol		Tertiary enrol		Population growth	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	1998	1990	1998	1990	1998	90-95	96-01
Angola	45.46	46.58	131.00	207.80	N.A.	N.A.	N.A.	N.A.	9.77	13.15	14.99	18.79	0.77	0.76	3.14	2.94
Burundi	43.59	41.96	180.00	175.80	55.17	37.99	41.53	34.10	4.12	6.22	7.13	8.33	0.73	0.96	2.48	2.01
Comoros	55.97	60.97	120.00	80.00	50.35	48.16	36.19	34.60	13.76	22.19	21.20	27.36	0.46	1.03	2.60	2.52
DRC	51.55	45.75	155.00	162.53	42.35	25.09	19.69	11.57	14.06	12.52	29.37	24.06	2.36	1.41	3.39	3.00
Djibouti	47.77	45.81	175.10	178.04	35.75	20.61	17.76	11.33	9.37	13.16	14.38	18.59	0.00	0.32	4.94	1.72
Egypt	62.80	67.46	85.00	52.15	48.92	37.30	29.11	23.57	68.12	77.87	83.80	84.01	15.85	38.84	2.12	1.90
Eritrea	48.94	52.03	139.60	102.92	50.72	39.60	27.48	19.88	N.A.	19.40	N.A.	28.18	N.A.	1.24	2.67	2.73
Ethiopia	45.00	42.29	213.40	178.92	66.07	51.58	48.40	38.85	12.54	13.05	15.87	21.10	0.80	1.02	2.27	2.58
Kenya	57.11	46.97	97.00	119.80	13.29	5.78	7.16	3.98	20.65	29.24	27.56	32.02	1.58	1.46	2.73	2.40
Madagascar	52.76	54.66	170.00	143.90	33.41	23.45	22.18	16.39	17.85	15.68	18.23	15.76	2.96	2.34	2.70	3.09
Malawi	44.61	38.80	234.00	193.04	48.81	39.05	24.28	18.97	4.92	12.29	10.62	22.19	0.57	0.19	1.84	2.26
Mauritius	69.64	71.67	25.00	20.12	8.84	5.64	8.80	6.62	53.08	71.17	52.72	70.35	3.52	7.26	1.13	1.11
Namibia	57.52	47.15	84.00	112.08	10.95	6.66	14.15	10.06	49.04	64.04	38.61	54.82	N.A.	7.29	3.10	2.06
Rwanda	40.19	39.94	202.00	202.90	32.83	18.61	21.90	14.70	6.88	9.28	9.14	14.95	0.50	0.92	-0.99	5.69
Seychelles	70.30	72.34	21.00	13.98	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	1.36	1.52
Sudan	52.17	56.17	125.00	81.20	45.95	28.51	24.31	17.11	21.11	27.90	26.91	29.60	2.97	7.26	2.29	2.13
Swaziland	56.64	45.62	115.00	119.46	14.51	8.76	15.31	10.39	43.41	55.17	45.15	56.30	4.11	5.06	3.12	2.99
Uganda	46.75	42.13	165.00	161.00	39.51	27.89	20.08	14.45	9.53	12.56	16.95	19.60	1.17	2.17	3.30	2.89
Zambia	49.15	37.97	194.00	186.46	23.90	14.54	13.63	9.21	18.22	23.13	30.07	29.79	2.29	2.66	2.90	2.33
Zimbabwe	56.16	39.93	77.00	115.84	8.63	4.26	3.40	1.35	45.99	44.61	53.10	52.42	5.20	6.70	2.42	1.91
COMESA	51.99	49.61	147.11	134.93	35.00	24.64	21.96	16.51	23.47	28.56	28.66	33.06	2.70	4.68	2.51	2.54

Notes. Own computations from data in WDI, WBAD and ADB. Additional notes are as in Table 2.

However, a comforting trend still emerges. The data show that the pace of human capital formation is increasing in almost all countries. As a matter of fact, female and male illiteracy decrease between 1990 and 1998 (latest possible observation) everywhere and school enrolment rates in any grade increase in all but two countries (DRC and Madagascar, plus a slight decrease in tertiary enrolment in Malawi). What is probably even more important is that this increase tends to be uniformly distributed across the population, with female schooling progressing at a rate roughly equal to that of male schooling.

A few critical economic and social development issues emerge from the experiences of the past decade. First, political instability has been in several countries at the root of macroeconomic mismanagement and negative growth performances. The adverse effects of social unrest and conflicts are evident from the case of Rwanda. The ethnic war of the first half of the '90s is associated with a –4.4% growth rate of per-capita GDP, -3.85% growth of aggregate GDP and negative population growth. The poverty effect seems

to have been particularly heavy for women. Since 1994, the improved political context has made possible a partial economic recovery, as witnessed by the sharp growth of GDP and inflation reduction. Examples of this sort are quite common across the region and the association between political instability and poor socio-economic achievements is strong also in econometric terms. Second, most countries rely on agriculture both for subsistence and exports. Therefore they are quite vulnerable to external shocks (such as fluctuations of prices of agricultural products) and extreme climatic conditions. For instance, the deterioration of world coffee prices affects the economic performance of countries like Madagascar, Burundi, Ethiopia and Uganda. External vulnerability also shows up in the sharp fluctuations of the generally large current account deficits. Droughts, erratic rainfalls and soil deterioration severely limit growth prospects in the agricultural sector and reduce food security across the region. Third, the HIV/AIDS pandemic is rapidly eroding the social base in most countries. The statistical correlation between changes in life expectancy between 1990 and 2000 and prevalence ratios is negative and highly significant (-0.76). The extent of the problem is clear from a few examples. In Zimbabwe, the adult prevalence ratio has achieved 25%, and life expectancy is now falling below 40 years when it was 56 in 1990. In Swaziland, the prevalence ratio is estimated to be 35.6% in 2002 and over the '90s life expectancy decreased from 56.64 to 45.62. The problem also has a clear economic dimension as it implies disruption of human capital and hence deterioration of future growth prospects. Furthermore, because only very limited budget resources are available in most countries, medical care is very much unlikely to keep up the pace with the spread of the disease. The consequence is increasing dependence on foreign assistance and/or domestic fiscal distress.

4.2. Convergence of macroeconomic policy stance across COMESA countries

Convergence of macroeconomic policy stance is assessed against the set of criteria adopted as a part of the macroeconomic harmonisation program. For the case of COMESA, two sets of criteria are considered (see Table 3). One stems from the proposal following the review of the implementation of the harmonisation program in 1995 (COMESA, 1995 and Harvey et al., 2001). The other is instead the set of agreed criteria as they are reported by COMESA (2003). A discussion of the rationale and possible inconsistencies of the criteria is given in Section 3.

Evidence from basic statistics on macroeconomic variables

The first piece of evidence is based on the analysis of historical trends and some basic summary statistics for the macroeconomic variables covered by the criteria. This analysis is thus the counter-part of the one performed in Section 3 for the other five RECs. To start with, consider inflation and fiscal deficit. For each country, five year averages starting in 1980 are reported in Table 12. Weighted and unweighted regional averages are also shown, together with the cross-national standard deviation in each sub-period. As notes in Section 3, this latter is an indicator of dispersion in the levels of the macroeconomic variables..

Table 12. Inflation and fiscal deficit in COMESA									
	Inflation					**Fiscal deficit**			
	1980-84	1985-89	1990-94	1995-99	2000-02	1980-84	1985-89	1990-94	1995-99	2000-02
Angola	N.A.	N.A.	677.72	1480.74	195.48	N.A.	-11.13	-29.48	-25.85	-4.67
Burundi	8.60	5.75	8.47	18.54	10.78	5.40	-5.98	-9.66	-7.48	-3.88
Comoros	7.39	2.11	6.07	4.28	2.58	-19.15	-24.00	-17.44	-12.99	-6.11
DRC	49.50	64.41	6424.98	314.68	301.79	0.00	-1.65	-6.82	-4.71	N.A.
Djibouti	3.63	6.56	5.79	3.69	N.A.	N.A.	N.A.	-19.76	-8.27	-10.40
Egypt	15.78	18.92	14.08	6.96	2.55	-10.48	-13.84	-8.28	-1.73	-3.88
Eritrea	N.A.	N.A.	8.08	8.75	19.90	N.A.	N.A.	-23.34	-39.10	-67.61
Ethiopia	4.85	4.34	12.51	3.56	-1.97	-7.84	-9.41	-10.25	-8.36	-14.76
Kenya	13.56	10.05	28.00	6.85	5.87	-5.48	-5.78	-5.94	-1.67	-4.61
Madagascar	21.95	15.18	16.77	17.89	11.63	0.96	-0.96	-8.38	-8.78	-6.42
Malawi	13.79	19.22	21.12	40.92	24.27	-12.57	-9.83	-13.04	-10.75	-11.10
Mauritius	16.17	6.14	8.59	6.63	5.33	-10.67	-3.19	-2.89	-4.84	-7.34
Namibia	12.85	13.19	12.19	8.32	9.96	-17.22	-7.51	-3.48	-3.99	-3.02
Rwanda	7.65	1.75	13.55	12.85	3.08	-5.15	-7.74	-8.79	-10.79	-12.55
Seychelles	6.68	1.42	2.46	1.63	4.14	N.A.	-12.58	-5.11	-11.34	-16.77
Sudan	28.08	44.38	104.63	56.19	7.13	-8.24	-12.12	-9.67	-1.73	-0.93
Swaziland	14.81	15.36	11.07	8.01	9.08	-3.88	-0.29	-0.87	-0.07	-3.30
Uganda	56.20	155.25	25.89	5.81	1.51	-3.26	-2.84	-8.02	-6.43	-11.50
Zambia	15.56	62.91	122.19	31.32	23.20	-14.07	-15.09	-11.35	-5.18	-3.97
Zimbabwe	14.49	11.12	26.52	30.62	89.03	7.01	-8.96	-7.77	-8.88	-22.45
Un-weighted average	15.36	23.15	25.47	15.33	13.75	-5.87	-8.49	-10.07	-9.27	-7.42
Weighted average	16.20	23.91	24.54	12.79	9.00	-6.72	-10.04	-9.03	-4.70	-5.01
Standard deviation	13.46	40.46	35.71	18.67	22.91	7.93	6.96	9.41	9.84	7.40

Notes. Own computation from IMF, EIU and WADB data. For Eritrea there is only one observation in the period 1990-94. Regional averages for inflation exclude Angola and DRC. Data including Angola and DRC are as follows: Un-weighted average: 1980-84: 17.42%, 1985-89: 25.45%, 1990-94: 375%, 1995-99: 103.9%, 2000-02: 39.84%. Weighted average: 19980-84: 19.52%, 1985-89: 27.51%, 1990-94: 363.26, 1995-99: 85.135, 2000-02: 22.69%. Standard deviation: 1980-84: 16.4, 1985-89: 41, 1990-94: 1456.6, 1995-99: 337.9, 2000-02: 87.8.

Excluding the two outliers Angola and DRC, which are affected by hyperinflation, the number of countries with single digit inflation significantly increases between the first and the second half of the '90s. According to the latest available information (sub-period 2000-02) in addition to Angola and DRC, there are only other four countries with inflation above 10% (Madagascar, Malawi, Zambia and Zimbabwe). This disinflationary trend is reflected by the pattern of regional averages. The overall regional dispersion of inflation appears to be on a decreasing trend since mid '90s, even though the upsurge of inflation in Zimbabwe since 1998 has driven the standard deviation up in the last sub-period.

Of the six countries above 10% in 2000-02, Madagascar, Malawi and Zambia have in fact been able to curb inflation relative to the previous sub-period. In particular, Zambia has sharply corrected its inflationary stance, which was degenerating into hyperinflation between 1992 and 1993. Angola and DRC are both conflict-affected countries and the need to finance high levels of fiscal spending through the inflation tax significantly contributes to explaining hyperinflation. The case of Zimbabwe is particularly worrying, since the country is driving away from the regional trend and ramping inflation is coupled with a variety of other emerging problems, including large budget deficits.

Data on deficit suggest that fiscal stabilization still has to be achieved in most countries. The regional average is decreasing, even though the behaviour of the weighted average suggests that problems persist

for some of the larger countries. The standard deviation also shows some evidence of convergence across the region. However, in 2000-02 there is only one country with deficit below 3% (Sudan) plus five with deficit below 4% (Burundi, Egypt, Namibia, Swaziland and Zambia). Fiscal imbalances are generally the result of spending growing faster than revenues. For the entire sample, correlation coefficients suggest that problems might be more on the revenues side. While the association between changes in spending levels and deficit is not statistically significant, the one between changes in tax revenues and deficit is equal to –0.35 and significant at 5% level of confidence. Of course, simple correlation coefficients do not provide conclusive evidence. However, they point to a direction for future analysis. The effect of fiscal deficit on inflation appears instead to be limited. While the association between the two variables is evident for some countries (i.e. Zimbabwe), for the entire sample the computed correlation coefficient is negative (-0.03), but not statistically different from zero[24].

Table 13 reports the data for Central Bank (CB) financing of the budget deficit and total claims on central government in percent of GDP. The table is organised as Table 12, with country-data for sub-periods, regional averages and standard deviation. Note that the figures for CB financing are already expressed as ratio to 20% of one period lagged tax revenues. This means that to meet the criterion, a country should have a ratio of at most 1.

CB financing is generally larger than the target value. However, the regional trend is decreasing and over the second half of the '90s and the early 2000s there is evidence of increasing convergence across countries. In some cases, the high levels of the ratio are explained more by the very slow increase of tax revenues over time than by accumulation of new lending or non repayment or previous lending. The most interesting feature of the data is the strong correlation with inflation. This partially contradicts what is observed for some countries in ECOWAS and SADC, where inflation does not appear to respond to peaks in CB financing (see Section 3). For the group of COMESA countries, the correlation coefficient is very close to unity and significant at 1% confidence level. A formal test to assess the direction of causality confirms that the effect works from CB financing to inflation.[25] That is, countries that can keep CB financing under control are more likely to be successful on curbing inflation. On the other hand, excessive CB financing will drive inflation up. In this respect, the effort of Angola to reduce CB financing is likely to translate into further stabilisation of inflation in the future. By the same token, the disinflationary process in Zambia and even more in DRC will benefit from additional reduction in CB financing. The next question is whether CB financing increases with fiscal deficit. Here, however, there is no evidence of a statistically significant relationship, with correlation coefficient practically equal to zero. This might also explain why in the COMESA sample fiscal imbalances seem to have a negligible effect on inflation.

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[24] Harvey et al. (2001) suggest that the fiscal deficit data for DRC and Zimbabwe might actually be underestimated since military expenditures would not be fully reported.

[25] The formal test implemented is the test of Granger causality.

Table 13. CB financing and claims on government in COMESA										
	Central Bank financing					Total claims on central government				
	1980-84	1985-89	1990-94	1995-99	2000-02	1980-84	1985-89	1990-94	1995-99	2000-02
Angola	N.A.	N.A.	N.A.	31.99	0.38	N.A.	N.A.	N.A.	11.82	-16.77
Burundi	3.38	3.52	1.67	2.03	3.45	8.32	9.24	2.54	6.79	7.60
Comoros	N.A.	0.99	1.24	1.61	1.63	4.09	3.83	4.74	3.42	2.65
DRC	139.25	76.72	6917.99	43.99	N.A.	35.93	34.89	81.92	1.09	N.A.
Djibouti	N.A.	0.00	0.04	0.35	0.68	N.A.	-7.49	0.12	6.21	2.64
Egypt	6.53	7.14	8.25	3.97	6.93	49.46	46.40	38.45	23.60	28.30
Eritrea	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Ethiopia	4.17	9.12	8.48	7.49	N.A.	15.99	22.89	33.01	21.40	28.19
Kenya	2.20	2.70	3.11	2.25	1.01	13.34	12.21	12.26	12.53	10.53
Madagascar	8.43	14.61	12.56	6.02	3.61	26.94	19.45	12.25	5.96	7.29
Malawi	3.97	3.97	3.14	1.83	0.90	15.00	15.14	8.43	2.27	2.39
Mauritius	7.69	2.31	0.75	0.61	0.42	36.98	21.88	15.48	18.83	13.55
Namibia	N.A.	N.A.	0.68	0.44	0.00	N.A.	N.A.	1.76	3.16	0.50
Rwanda	0.85	1.40	5.37	9.82	2.99	-0.57	3.49	10.88	3.92	2.31
Seychelles	N.A.	1.10	1.19	3.00	2.50	6.19	25.23	35.13	68.76	102.59
Sudan	9.53	13.51	16.64	6.78	3.55	14.95	14.12	12.16	5.60	3.61
Swaziland	0.28	0.32	0.04	0.02	0.03	-6.24	-3.06	-17.51	-16.47	-18.81
Uganda	34.97	31.00	22.28	11.88	9.03	15.78	15.33	6.10	-0.31	4.69
Zambia	11.23	26.69	58.85	29.61	27.32	48.06	40.74	50.22	47.28	48.23
Zimbabwe	1.14	0.75	1.66	6.75	5.16	9.05	6.30	6.06	12.51	15.36
Unweighted average	7.00	6.03	7.58	5.39	3.30	18.65	16.84	17.38	13.04	11.77
Weighted average	6.40	7.47	8.97	5.18	4.94	17.12	15.58	24.68	19.38	22.37
Standard deviation	9.83	9.33	12.79	7.76	4.21	34.07	32.45	30.95	17.60	19.34

Notes. Own computations from WBAD and IFS data. For Eritrea there is only one observation in the period 1990-94.

A general assessment of the regional trend of total claims on central government is complicated by the large discrepancy arising between the un-weighted and the weighted averages towards the end of the sample period. In fact, whilst most countries do appear to be on a decreasing trend, approaching the 10% threshold, some of the large countries are moving in the opposition direction (Egypt, Zimbabwe and Ethiopia). The standard deviation decreases steadily until the latest sub-period. Then, a slight increase is observed mostly driven by the presence of Seychelles as a clear outlier. In fact, when Seychelles is dropped from the sample, cross-national dispersion continue to decrease also in 2000-02. Not surprisingly, total claims highly correlate with CB financing and inflation.

Data on debt service to export earnings ratio and tax revenues to GDP ratio are shown in Table 14. The structure of the table is as usual.

Table 14. Debt service and tax revenues in COMESA										
	Debt service					Tax revenues				
	1980-84	1985-89	1990-94	1995-99	2000-02	1980-84	1985-89	1990-94	1995-99	2000-02
Angola	2.05	8.35	7.55	23.81	23.89	N.A.	32.32	32.13	36.60	41.83
Burundi	12.01	31.19	37.44	39.25	35.82	18.04	17.93	17.33	18.08	21.29
Comoros	7.57	5.04	6.41	3.88	4.64	17.61	12.86	15.16	13.15	10.21
DRC	18.29	21.42	6.37	1.69	2.13	N.A.	9.26	4.83	5.31	N.A.
Djibouti	N.A.	N.A.	4.81	4.19	5.50	N.A.	N.A.	28.27	26.76	22.32
Egypt	18.25	23.17	17.45	10.89	8.61	42.70	33.19	33.63	28.59	21.33
Eritrea	N.A.	N.A.	N.A.	0.66	1.53	N.A.	N.A.	29.28	36.44	34.06
Ethiopia	14.26	37.55	24.45	19.69	16.41	17.68	20.05	13.58	17.96	18.24
Kenya	27.89	38.27	31.97	25.84	16.20	24.88	22.38	26.18	26.12	22.27
Madagascar	25.25	45.03	20.70	15.18	34.38	16.82	13.61	10.72	9.97	11.69
Malawi	32.03	38.60	24.62	16.00	12.60	19.99	22.42	19.20	16.68	17.54
Mauritius	18.59	14.17	7.89	8.32	12.60	23.42	24.84	22.81	20.85	18.78
Namibia	N.A.	N.A.	N.A.	2.84	1.77	21.87	27.73	31.08	31.31	31.86
Rwanda	5.57	12.87	14.93	20.00	26.85	11.93	13.26	8.69	9.32	9.80
Seychelles	11.21	9.19	7.74	5.76	3.13	40.16	47.03	48.40	45.19	40.48
Sudan	22.12	14.54	4.47	8.50	3.26	11.53	8.68	7.88	7.44	11.67
Swaziland	5.17	7.75	3.23	2.63	2.92	31.38	27.72	31.43	31.60	28.30
Uganda	22.65	49.12	59.54	20.59	16.89	5.64	4.10	6.41	10.45	11.27
Zambia	29.10	22.42	31.86	54.70	25.52	23.60	20.35	20.01	20.74	20.77
Zimbabwe	26.19	29.09	26.67	26.33	14.47	18.45	26.61	26.51	28.24	27.45
Unweighted average	17.91	23.99	19.17	15.96	14.41	20.24	21.78	21.52	22.39	22.49
Weighted average	10.54	15.22	15.71	18.14	12.63	27.39	26.14	25.91	24.31	21.35
Standard deviation	19.54	25.00	19.62	15.11	12.25	9.88	10.61	11.65	11.17	9.68

Notes. Own computations from data in WBDI, EIU, IFS. For Eritrea, the period 1990-94 includes only one observation.

Debt service is on a decreasing trend at regional level since the mid'80s. There are only five countries (Angola, Burundi, Madagascar, Rwanda and Zambia) that in 2000-02 do not meet the target. Out of these five, however, Zambia and to a smaller extent Burundi are on a decreasing trend over the last few years. Several COMESA countries participate, or expect to participate, in the HIPC initiative for debt relief. This is likely to have a significant impact on debt service statistics both at national and at regional level. As projected by IMF for the period 2001-03, debt service as percentage of GDP in countries with debt relief arrangements in place is expected to be 50% lower than otherwise. A similar effect is predicted for debt service in percent of export earnings. To some extent, data stretching to 2001-02 already incorporate some of this relief effect. Further improvements are likely to show in the statistics in the immediate future. Still, the optimistic picture might somehow be driven by the fact that the data on debt service refer to paid debt and hence do not include the unpaid stock. This latter in turn might be large, as for instance it seems to be the case in DRC (see Harvey et al. 2001). The standard deviation displays some significant pattern of convergence starting in 1996-97.

Tax revenues in percent of GDP, as already noted, do not display any significant tendency to increase over time. On the contrary, following the sharp decrease of revenues in Egypt, the weighted regional average decreases from 27.39% to 21.35% over the entire sample period, whilst the un-weighted average is practically unchanged since the mid-90s. Fourteen countries (Angola, Burundi, Djibouti, Egypt, Eritrea,

Ethiopia, Kenya, Malawi, Mauritius, Namibia, Seychelles, Swaziland, Zambia and Zimbabwe) all meet the target value in 2000-02. However, it is important to stress that none of them was below the target at the beginning of the sample period. The other six countries remain above 10%, with the exception of DRC. Given the essentially flat trend that characterise most countries, it is not surprising that the standard deviation exhibits little fluctuations, denoting a relatively constant degree of cross-country divergence. A tendency to greater dispersion shows up in annual data around 1992-93 but is then reversed towards the end of the decade. In light of the previous discussion on fiscal deficits being apparently driven by low tax revenues, it can be argued that the target value of the criterion is too low: most countries are able to meet it and still they do not balance their budget. The definition of a higher target for taxation however must take into account the potentially adverse effects of over-taxation on the incentive to invest. Section 5 will further discuss this point.

Table 15 reports the data on nominal interest rates and inflation. Unfortunately, time-series on nominal interest rates are not complete for most countries. For this reason it is preferable to compute regional trends only on the basis of un-weighted averages.

Two basic features are immediately evident. First, for several countries and for the aggregate regional average, real interest rates switch from negative to positive around mid'90s. This is the result of an increase in nominal rates, especially on the lending side, and even more significantly of the decrease in inflation. In 2000-02, real interest rates remain negative in Angola, DRC and Zimbabwe, namely the three countries with highest inflation, and, only on the deposit side, in Namibia, Swaziland and Zambia. The second important feature is that nominal interest rates tend to be quite high, and the gap between lending and deposit rates is large (10 percent points on average in the last sub-period). While it is recognised that positive real interest rates are beneficial to the economy, it is also pointed out that high nominal rates distort the allocation of resources

in the financial market by increasing the risk faced by borrowers. Thus, it is desirable that positive real rates are achieved through continued reduction of inflation, so as to allow a further cut in nominal rates. In this respect, a target level for nominal interest rates might be imposed as an additional criterion. The gap between lending and deposit is a clear indicator of inefficiencies in the financial system. Increasing competition in the banking sector, combined with appropriate supervision and regulation to avoid the crises that are often observed in transition economies, should contribute to curbing the spread. In terms of policy stance, the convergence trend over the second half of the '90s is apparently reversed in the last sub-period. In fact, the pattern of the standard deviation matches quite closely the one observed for inflation. Therefore, it appears that while countries are generally cutting nominal rates, the extent to which they do it varies across countries in a more or less synchronized fashion with inflation dispersion.

Table 15. Nominal interest rates

	Angola		Burundi		Comoros		Congo		Djibouti		Egypt	
	deposit	*lending*	*deposit*	*lending*	*deposit*	*lending*	*deposit*	*lending*	*deposit*	*lending*	*deposit*	*lending*
1980-84	N.A.	N.A.	4.20	12.00	7.50	15.00	N.A.	N.A.	N.A.	8.50	10.27	14.67
1985-89	N.A.	N.A.	4.95	12.00	7.00	14.00	N.A.	N.A.	N.A.	9.30	11.13	16.33
1990-94	N.A.	N.A.	N.A.	13.35	N.A.	N.A.	60.00	398.25	N.A.	10.50	11.97	18.53
1995-99	75.15	117.43	N.A.	15.25	N.A.	N.A.	60.00	165.81	N.A.	N.A.	9.97	14.37
2000-03	45.11	98.82	N.A.	17.35	N.A.	N.A.	N.A.	133.24	2.81	11.46	9.42	13.43

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	Angola	Burundi	Comoros	Congo	Djibouti	Egypt
1980-84	N.A.	8.60	7.39	49.50	3.63	15.78
1985-89	N.A.	5.75	2.11	64.41	6.56	18.92
1990-94	677.72	8.47	6.07	6424.98	5.79	14.08
1995-99	1480.74	18.54	4.28	314.68	3.69	6.96
2000-03	195.48	10.78	2.58	301.79	N.A.	2.55

	Eritrea		Ethiopia		Kenya		Madagascar		Malawi		Mauritius	
	deposit	*lending*	*deposit*	*lending*	*deposit*	*lending*	*Deposit*	*lending*	*deposit*	*lending*	*deposit*	*lending*
1980-84	N.A.	N.A.	N.A.	N.A.	10.37	13.55	N.A.	N.A.	9.82	17.70	10.69	13.47
1985-89	N.A.	N.A.	6.49	6.75	11.03	14.85	17.75	22.25	13.15	20.43	9.88	14.67
1990-94	N.A.	N.A.	6.81	9.67	13.67	25.01	20.10	26.36	17.57	24.70	10.88	17.68
1995-99	N.A.	N.A.	8.04	12.12	15.17	28.94	15.04	31.05	25.22	42.43	10.46	20.42
2000-03	N.A.	N.A.	5.92	10.14	7.37	20.15	13.50	25.88	32.26	53.49	9.76	20.96

Memorandum Item: Inflation

	Eritrea	Ethiopia	Kenya	Madagascar	Malawi	Mauritius
1980-84	N.A.	4.85	13.56	21.95	13.79	16.17
1985-89	N.A.	4.34	10.05	15.18	19.22	6.14
1990-94	8.08	12.51	28.00	16.77	21.12	8.59
1995-99	8.75	3.56	6.85	17.89	40.92	6.63
2000-03	19.90	-1.97	5.87	11.63	24.27	5.33

	Namibia		Rwanda		Seychelles		Sudan		Swaziland		Uganda	
	deposit	*lending*	*deposit*	*lending*	*deposit*	*lending*	*deposit*	*lending*	*deposit*	*lending*	*deposit*	*lending*
1980-84	N.A.	N.A.	6.25	14.80	9.15	N.A.	10.43	N.A.	9.78	14.99	9.94	15.18
1985-89	N.A.	N.A.	6.26	14.04	9.84	15.52	N.A.	N.A.	8.54	14.88	23.40	33.40
1990-94	10.73	19.66	7.09	16.25	9.42	15.63	N.A.	N.A.	9.05	15.01	24.90	36.54
1995-99	11.97	19.41	9.21	N.A.	8.20	14.65	N.A.	N.A.	10.86	18.43	10.03	20.85
2000-03	7.33	14.55	8.72	N.A.	4.87	11.23	N.A.	N.A.	6.90	14.17	7.96	21.51

Memorandum Item: Inflation

	Namibia	Rwanda	Seychelles	Sudan	Swaziland	Uganda
1980-84	12.85	7.65	6.68	28.08	14.81	56.20
1985-89	13.19	1.75	1.42	44.38	15.36	155.25
1990-94	12.19	13.55	2.46	104.63	11.07	25.89
1995-99	8.32	12.85	1.63	56.19	8.01	5.81
2000-03	9.96	3.08	4.14	7.13	9.08	1.51

	Zambia		Zimbabwe		Unweighted Average		Standard deviation	
	deposit	*lending*	*deposit*	*lending*	*deposit*	*lending*	*deposit*	*lending*
1980-84	6.78	11.21	9.71	21.36	8.72	14.70	2.51	3.43
1985-89	13.84	20.79	9.69	13.83	10.68	15.89	4.95	6.71
1990-94	40.10	68.38	21.56	23.63	15.18	22.59	9.50	14.23
1995-99	28.04	43.67	26.73	39.79	14.64	25.17	8.55	11.94
2000-03	22.33	43.41	32.06	53.11	12.23	23.35	9.94	15.15

Memorandum Item: Inflation

	Zambia	Zimbabwe	Unweighted Average	Standard deviation
1980-84	15.56	14.49	15.36	13.46
1985-89	62.91	11.12	23.15	40.46
1990-94	122.19	26.52	25.47	35.71
1995-99	31.32	30.62	15.33	18.67
2000-03	23.20	89.03	13.75	22.91

Notes. Source: IMF and WBAD. Regional averages are un-weighted and exclude Angola and DRC.

The last two variables that are incorporated into the set of convergence criteria are money growth and domestic credit. Data are reported in Table 16. For money growth, the target value is defined as a function of the growth rate of GDP and the tolerable rate of inflation, plus a spread of 5%. Clearly, what level of inflation is to be considered tolerable might be subject to discussion. If one takes the 10% norm of the 1995 version of the criteria, then the threshold for money growth would be around 20%, with some cross-country differences due to different growth rates of GDP. If instead one takes an inflation target corresponding to "price stability", as for instance identified by the European Central Bank, then the appropriate norm for money growth drops to around 10%. In the analysis to follow, the range 10%-20% will be maintained as the reference target. For domestic credit instead, no specific numerical parameter is set. The target is to provide an adequate flow of credit to the private sector. Probably, the best way to assess the performance on this criterion is to compare credit to the private sector in COMESA countries with credit in other economies. Now, the size of credit to the private sector is a function of the degree of financial development of a country. In this sense, it would be probably unfair to compare COMESA with the standards of industrial countries, or even emerging and developing economies already well integrated into global financial markets. Eastern European transition economies and lower income developing countries in Latin America and Asia are therefore a more reasonable benchmark. The average level of credit to GDP for such a sample in the second half of the '90s oscillates between 30% and 40% depending on the actual composition of the benchmark. These will be the reference values to measure adequacy in COMESA.

Money growth in 2000-02 is above 20% in 6 countries (Angola, Comoros, Malawi, Sudan, Zambia and Zimbabwe – DRC should be added to the list, even if data for the last sub-period are not available) and below 10% in only four (Djibouti, Namibia, Swaziland). Certainly, one would expect that countries whose GDP is growing faster also exhibits higher rates of money growth. However, the correlation for the entire sample is not statistically different from zero. There is instead a strong correlation between inflation and money growth and between changes in inflation and money growth (0.46 and 0.64 respectively, both significant at 5% confidence level). The Granger test of causality shows that inflation determines money growth and not vice-versa[26]. This is interesting as it suggests that the money growth criterion might be redundant once an inflation criterion is imposed.

The regional averages and the standard deviation of money growth appear to increase between the last sub-period and the previous one. This result is almost entirely driven by Zimbabwe. When this country is excluded from the sample, both the average and the standard deviation remain in 2000-02 on a decreasing trend. As a matter of fact, annual data by country suggest that starting in 1995 there has been a significant reversion of the trend of monetary growth across the region. The econometric analysis of the next sub-section will highlight this structural break.

It is difficult to discern a regional pattern for domestic credit to the private sector. The weighted and unweighted regional averages suggest that there is an overall positive trend, probably more marked in larger countries (and this is particularly true for Egypt).

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[26] Casual inspection of annual data also confirms that inflation picks before money growth in most of the high-inflation countries in the sample.

Table 16. Money growth and domestic credit										
	Money growth					Domestic credit				
	1980-84	1985-89	1990-94	1995-99	2000-02	1980-84	1985-89	1990-94	1995-99	2000-02
Angola	N.A.	N.A.	1162.40	1250.94	208.83	N.A.	N.A.	N.A.	3.94	2.08
Burundi	11.93	11.70	15.06	13.23	16.80	11.18	9.89	16.21	18.43	23.50
Comoros	9.31	15.80	4.56	0.75	30.64	13.54	11.80	15.69	12.26	11.95
DRC	244.18	76.58	3240.08	357.63	N.A.	2.23	2.20	1.15	1.06	N.A.
Djibouti	N.A.	8.42	1.38	-2.93	4.33	N.A.	55.31	46.80	42.80	31.97
Egypt	30.99	19.85	18.39	9.59	12.48	28.04	35.30	28.72	47.77	59.31
Eritrea	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Ethiopia	10.45	11.94	17.36	7.10	12.45	13.84	15.79	14.67	22.13	28.97
Kenya	9.74	14.23	27.63	15.49	6.22	29.74	30.43	33.12	32.87	30.11
Madagascar	13.67	22.69	26.92	15.67	16.29	18.64	18.43	16.52	9.75	9.20
Malawi	18.34	18.10	25.74	37.04	24.14	19.18	11.06	14.18	6.54	6.16
Mauritius	15.00	26.90	17.66	13.81	10.87	22.08	29.64	38.66	51.81	61.36
Namibia	N.A.	N.A.	26.36	17.91	8.13	N.A.	N.A.	32.39	46.66	44.70
Rwanda	7.20	8.88	4.48	23.73	13.30	6.06	8.35	6.79	8.22	10.07
Seychelles	8.05	14.82	11.84	22.07	11.79	15.89	9.51	11.21	18.58	21.90
Sudan	30.97	42.96	82.26	45.93	33.54	12.93	8.64	4.18	2.49	2.41
Swaziland	15.36	22.19	13.27	13.62	5.74	23.90	18.41	23.86	17.25	14.16
Uganda	56.61	128.30	54.28	17.84	17.46	3.35	3.15	4.27	5.22	6.26
Zambia	15.52	59.60	85.32	33.77	33.46	19.56	9.96	6.80	8.08	9.51
Zimbabwe	15.17	18.83	27.12	29.44	129.70	23.33	16.70	27.25	34.14	25.18
Un-weighted average	18.27	27.83	26.96	18.48	23.51	16.57	17.38	19.51	21.40	22.16
Weighted average	18.63	31.76	27.33	17.10	33.18	21.15	24.68	23.48	34.00	40.14
Standard deviation	24.45	26.03	26.85	15.68	20.70	8.67	12.82	13.37	17.11	18.13

Notes. Own computations from data in IMF, EIU and WBAD. Regional averages for money growth do not include Angola and Congo.

Country data show that the sample is almost equally partitioned between countries where domestic credit is increasing and countries where it is decreasing. The standard deviation confirms the substantial divergence of cross-country experiences. Based on the latest possible observation, there are five countries where the ratio is above 30%. These five countries have achieved the current position from very different starting points in the early '80s. In Djibouti the ratio has actually decreased steadily since 1985, in Kenya it has essentially remained constant, whilst in Egypt and Mauritius it has grown fast. In Namibia an initial quick growth has been followed in the late '90s by a stagnation. In addition to those five, there are other five countries (Burundi, Ethiopia, Seychelles, Uganda and Rwanda since 1995) where the ratio is on a positive growth path, even though the slope of this path is quite differentiated across countries. The other COMESA members present either fluctuations around a constant trend or a sustained decrease. As mentioned, the level of domestic credit to private sector is an indicator of financial development. Combined with the evidence on the large interest rates spread, these data on domestic credit present a picture of underdevelopment of the financial system, and of the banking system in particular, for many countries in the region. This underdevelopment in turn translates into a tight constraint on the possibility to create strong domestic private entrepreneurship and to allocate resources efficiently to profitable investment projects.

Econometric test of convergence of macroeconomic policy variables

Using time-series data it is possible to implement a more rigorous econometric test of convergence. The details of the procedure are described in Box 1. In a nutshell, for each country and each of the

macroeconomic variables included in the set of convergence criteria, lagged dependent variable regressions are estimated. Dummy variables are used to account for possible structural breaks in the relationship, in particular policy changes associated with formal adoption of a policy convergence framework. The coefficients estimated from these regression can be used to see if variables display any tendency to converge to some mean value and eventually to estimate this value.

Box 1. A procedure to test for convergence of macroeconomic variables

The procedure is based on a simple first-order autoregressive process (AR(1)):

(A1) $y_t = \alpha_0 + \alpha_1 y_{t-1} + \varepsilon_t$

where y denotes a generic macroeconomic variable (i.e. inflation), ε is a white-noise disturbance, αs are parameters (to be estimated) and t denotes time.

Based on (A1), the sequence $\{y_t\}$ converges if $\alpha_1 < 1$. A statistical test can therefore be formulated with the null hypothesis specified as $H_0 : \alpha_1 = 1$. Rejection of the null hypothesis is then evidence that the series converge. The framework could thus be characterised as a sort of Dickey-fuller test in levels. There is however a complication. The introduction of a policy harmonization program, to the extent that it induces a once for all change in the policy stance of a country, may generate a structural break in the time-series. In the presence of such a structural break, model (A1) is inadequate as it tends to be biased towards non-rejection of the null-hypothesis. That is, if the harmonization program effectively leads countries to change their policy stance, then the econometric test would be more likely to predict non-convergence of the macroeconomic variables. Following Perron (1989), it is therefore appropriate to extend (A1) as follows:

(A2) $y_t = \alpha_0 + \alpha_1 y_{t-1} + \alpha_2 D_\tau + \alpha_3 (y_{t-1}) D_\tau$

where D is a dummy variable taking value 1 in year τ and in any subsequent year $t > \tau$ (alternatively, it can be defined as taking value 1 only in year $t = \tau$).
The role of the dummy in (A2) is to account for the possibility that the slope and/or the intercept of the relationship are affected by some event taking place in year τ. If the two estimated coefficients α_2 and α_3 are not statistically different from zero, then it means that the structure of the relationship does not change significantly and hence that there is no structural break. If instead the two parameters are significant, then it means that there is a structural break: the intercept shifts from α_0 prior to the break to $(\alpha_0 + \alpha_2)$ after the break, the slope shifts from α_1 to $(\alpha_1 + \alpha_3)$. Note that the structural break might determine convergence in a series otherwise non convergent or vice-versa make a convergent series non stationary. Similarly, the value to which the series eventually converge might increase or decrease.

Table 17 summarizes the results of the test. The table reports the estimated value to which each series converge, if converging at all. NONE indicates that there is no evidence of convergence. When the null hypothesis of no convergence (see Box 1) is rejected at the critical values computed by Perron (1990) from Monte-Carlo simulations, the associated estimate is indicated by a star[27]. The values that incorporate a significant structural break associated with either the adoption of the harmonisation program or the launch of COMESA are reported in black.

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[27] The critical values computed by Perron are generally higher than those normally used in testing for convergence. Therefore, rejection of the null hypothesis under Perron's critical values is less likely.

Table 17. Test of convergence of macroeconomic policy variables							
	Inflation	Fiscal deficit	CB financing	Total claims	Debt Service	Tax revenues	M2 growth
Burundi	8.775*	NONE	NONE	NONE	17.268	18.613	14.078*
DRC	NONE	0.000	NONE	NONE	15.234	NONE	NONE
Egypt	10.934	-7.736	NONE	41.857	15.682	NONE	18.984*
Ethiopia	7.754	-6.565	NONE	22.759	17.171*	18.124	12.886*
Kenya	2.261*	-3.507	2.422*	NONE	NONE	22.57	16.069*
Madagascar	14.079	n.a.	n.a.	NONE	21.840	n.a.	16.00
Malawi	NONE	NONE	NONE	NONE	NONE	20.56	43.58
Mauritius	9.999	NONE	1.041	NONE	27.123	21.265*	18.544
Rwanda	3.408*	-11.017	NONE	3.334*	5.286	11.708*	20.083*
Seychelles	NONE	n.a.	NONE	NONE	6.267	n.a.	13.821*
Sudan	9.227	n.a.	n.a.	13.270	8.348*	NONE	35.653
Swaziland	11.602	-2.381	n.a.	NONE	2.274	29.643	17.017*
Uganda	NONE	NONE	19.654	9.684	NONE	5.695	59.163
Zambia	NONE	-13.434	36.208	47.484	23.057	23.603	36.933
Zimbabwe	NONE	NONE	NONE	NONE	NONE	24.728	NONE

Notes. Own computations form WBAD, WDl and IFS data. Table reports the estimated value to which series converge in each country. NONE denotes that the hypothesis of no convergence cannot be rejected at standard critical values. A * denotes rejection of the hypothesis of no convergence at Perron's critical values. In black are estimates that incorporate significant structural breaks associated with the adoption of a policy harmonization framework.

There are many cases where macroeconomic series do not converge, even taking into account the possibility of structural breaks. The test based on Perron's critical values reduces the number of convergent series to 16 out of 77 checked (no series is tested for Angola, Comoros, Djibouti, Eritrea and Namibia since there are not enough observations available). Most of convergence cases are observed with respect to the growth rate of money. The values to which M2 growth rate is estimated to revert fall between a maximum of 20.8 % in Rwanda to a minimum of 12.8% in Ethiopia. These values are consistent with a target between 20% and 10%. Inflation converges in a few countries at a level below (or slightly above) 10%. The exception is Madagascar, where the estimated value of convergence is 14%. However, this is a case where Perron's critical values would reject the hypothesis of convergence. The impression that fiscal stabilization is not achieved in COMESA is confirmed: in several countries the null cannot be rejected even at usual critical values and for no country the null is rejected at Perron's critical values. Similar lack of convergence is observed for CB financing and total claims on government.

Out of the 15 countries included in the table, Rwanda is, perhaps surprisingly, the one where macroeconomic series tend to converge the most, and to values that are in line with the norms established by the criteria. The structural break associated with 1994 and 1995 in this country is probably more related to the evolving internal political conditions than to the effect of adopting the macroeconomic harmonization framework. Kenya is a second country where some series significantly converge. However, the estimated value of 2.422 in CB financing is not consistent with the target value of 1.

The adoption of the harmonization program and the formal establishment of COMESA only occasionally produce significant structural breaks. A statistical problem is that there are relatively few observations covering the period after these events. This shortage of information increases the likelihood that the estimated coefficients α_2 and α_3 are not significantly different from zero. However, when significant, the COMESA structural breaks lead to the rejection of the null hypothesis for series that would be otherwise non-stationary. Two exceptions are the money growth rates series of Rwanda and Kenya, that converge independently from the structural break. In these cases, the effect of the adoption of the harmonization program is to bring down the value at which series converge. For both countries, the result is probably driven by the significant impact that structural breaks have on inflation (otherwise non convergent).

To check whether results are sensitive to the number of lags used in the regression model, the test has been performed assuming different lag-structures and introducing moving average terms. In fact, no qualitative change is observed relative to the results reported in Table 17. The impact of structural breaks associated with COMESA initiatives is slightly less relevant the larger the number of lags of the dependent variable, probably as a consequence of the fact that critical values for the rejection of the null hypothesis tend to increase. Still, evidence remains that at least for some series in some countries those structural breaks do induce convergence in series otherwise non convergent.

Wrap up: macroeconomic policy convergence in COMESA

The econometric test suggests that macroeconomic time-series are mostly divergent in COMESA countries, in the sense that they do not exhibit a tendency to revert to some given value. Where convergence exists, however, it appears to lead to outcomes that are in line with the norms established by the criteria. Another way to look at this result is to say that there are small sub-groups of countries where macro-economic variables converge and the estimated values of convergence are rather similar across countries. The statistical impact of the adoption of the monetary harmonization program and of the launch of COMESA is not systematic. In a few countries, these events effectively generate a structural break that strengthens convergence both within and across countries. However, the number of cases is limited, even though the long-term effects of those events might not yet have shown up in the time-series.

These results summarise and clarify the evidence obtained from the analysis of historical trends, regional averages and cross-sectional standard deviation. The overall picture is that while some progress must be acknowledged, COMESA countries still constitute a rather heterogeneous bunch in terms of macroeconomic policy stance. More specifically, the monetary side (inflation, monetary growth) is showing consistent signs of convergence, but the fiscal side (deficit, tax revenues) is lagging much behind. Fiscal deficits overshoot the target and tax revenues in percent of GDP do not grow fast enough to allow countries to stabilize the overall balance. Finally, it is to be pointed out that in some cases regional trends are negatively affected by the presence of outliers with a record of particularly poor macroeconomic performance.

4.3. Convergence of business cycles and shocks asymmetry

The assessment of convergence of cyclical economic activity and shocks across countries is conducted as follows. First, as it is done in Section 3 for the other RECs, the bilateral correlations of the macroeconomic variables representing the fundamentals of the economy are estimated. High and positive correlations will be evidence of convergence. Second, divergence of shocks is more likely the more dissimilar is the production structure of countries in the region. Data on sector contributions to GDP are therefore analysed to gain an insight on the extent of such dissimilarities. Third, trade data are considered. Intra-regional trade can work as a buffer for shocks divergence. Thus large flows of trade are likely to favour the process of policy harmonization, and make it more beneficial. In addition to what is done in Section 3, the actual data are compared with the estimated trade potential for each country. This trade potential is obtained from fitting a gravity equation of bilateral trade. Fourth, an econometric test of convergence of fundamentals is implemented using quarterly data on real exchange rates (RERs).

Evidence from bilateral correlations

Table 18 reports for each country in COMESA the average value of bilateral correlations with each of the other member states for four key variables (see Section 3) in two periods (full sample period from 1965 to 2002 and short sample period from 1985 to 2002). Regional summary statistics are also shown at the bottom of the table.

The correlations are generally quite low and not very different from zero. They also do not display any tendency to increase over time. In fact, the regional averages show that for three of the four variables considered, the second half of the sample period is characterised by even weaker correlation. Coefficients tend to be slightly higher for inflation, while changes in terms of trade are largely asymmetric across countries. The absence of systematic correlation is also spread uniformly across countries. None of them stands out as displaying particularly high (or low) coefficients on average. Seychelles possibly looks like the most divergent country, with four out of six average correlations which are negative. However, bilateral coefficients are always very close to zero.

A first interpretation is thus that the COMESA group as a whole is not characterised by systematic convergence of cycles and shocks. However, as it also appears from the statistics on the minimum and the maximum of coefficients in the sample, there are cases of bilateral correlations being statistically very high and significant. That is, there are pairs of countries, and in some cases even groups of countries, where macroeconomic variables tend to move together. An example is represented by the sub-group comprising Burundi, Kenya, Madagascar, Rwanda and, more marginally, Namibia and Zimbabwe. For these six countries, bilateral correlations of changes in terms of trade are always statistically different from zero. The sub-group also displays some relevant degree of correlation in real GDP growth, whilst inflation and monetary growth move independently. More systematic evidence on the existence of sub-groups of convergence will be provided with econometric test of cointegration below.

Table 18. Correlations of key macroeconomic variables in COMESA								
	Change in ToT		Inflation		Real GDP growth		Money growth	
	1965-2002	1985-2002	1965-2002	1985-2002	1965-2002	1985-2002	1965-2002	1985-2002
Angola	-0.072	-0.072	0.104	0.104	0.107	0.129	0.098	0.098
Burundi	0.144	0.110	0.066	-0.041	0.001	0.013	0.047	-0.004
Comoros	-0.018	-0.050	0.104	0.112	-0.049	0.006	-0.034	-0.027
DRC	-0.145	-0.177	0.131	0.139	0.064	0.171	0.121	0.050
Djibouti	N.A.	N.A.	0.061	-0.012	0.013	0.013	0.035	0.035
Egypt	-0.026	-0.042	0.185	0.109	0.008	0.085	0.048	0.067
Eritrea	0.091	0.091	-0.126	-0.126	0.074	0.074	N.A.	N.A.
Ethiopia	-0.072	-0.080	0.038	0.033	-0.045	-0.046	0.132	0.153
Kenya	0.032	0.013	0.174	0.110	0.083	0.184	0.163	0.183
Madagascar	0.096	0.066	0.217	0.164	0.008	0.067	0.147	0.150
Malawi	-0.116	-0.103	0.034	0.040	0.041	0.057	-0.005	-0.120
Mauritius	-0.064	-0.059	0.114	0.026	-0.066	0.040	0.073	0.074
Namibia	0.070	0.033	0.039	0.047	-0.060	-0.143	0.204	0.204
Rwanda	0.092	0.053	0.158	0.103	0.097	0.136	-0.029	-0.089
Seychelles	-0.015	-0.015	-0.089	-0.143	0.010	0.022	-0.136	-0.181
Sudan	N.A.	N.A.	0.229	0.199	0.024	-0.034	0.165	0.134
Swaziland	0.053	N.A.	0.193	0.035	0.106	0.164	0.012	0.079
Uganda	0.204	0.150	-0.026	-0.043	-0.007	-0.020	0.039	0.114
Zambia	0.070	-0.026	0.027	0.096	0.010	0.066	0.125	0.150
Zimbabwe	0.136	0.020	-0.101	-0.207	0.033	0.049	-0.095	-0.137
Average	0.025	-0.005	0.077	0.037	0.023	0.052	0.058	0.049
Standard deviation	0.264	0.277	0.288	0.304	0.259	0.292	0.320	0.333
Minimum	-0.625	-0.625	-0.779	-0.779	-0.654	-0.737	-0.612	-0.680
Maximum	0.692	0.672	0.694	0.807	0.852	0.852	0.746	0.876

Notes. Own computations from WBAD data. The table reports for each country the average of the bilateral correlations with the other member states of COMESA. Average, standard deviation, minimum and maximum at the bottom of the table refer to the full sample of bilateral correlation for all countries. There are some countries for which data are available only from 1985. For these countries the correlation coefficient in the two sub-period coincides.

Evidence from sector contributions to GDP

Shock asymmetries and divergence of business cycles are more likely to occur the more different is the industry structure across countries. Table 19 reports sector contributions to GDP in COMESA countries and in three regional aggregates (EMU, MERCOSUR and ASEAN) that can be used as reference. Data are presented for three years, 1985, 1995 and the latest possible observation (2000 for most countries).

Since they measure the dispersion of shares across-countries, regional standard deviations are a good starting point for the analysis. It is clear that COMESA is characterized by greater dispersion than EMU and MERCOSUR, but almost equal dispersion as ASEAN. Differently from ASEAN and MERCOSUR in COMESA dispersion is increasing, meaning that industry structures in aggregate tend to become more different over time.

Table 19. Sectors contribution to GDP

	Industry			Manufacturing			Agriculture			Services		
	1985	1995	Latest	1985	1995	Latest	1985	1995	Latest	1985	1995	Latest
Angola	43.270	66.260	76.120	9.700	4.010	2.890	43.180	26.430	18.220	13.550	7.310	5.660
Burundi	11.820	16.800	16.380	7.330	10.540	8.380	23.150	28.460	27.360	55.950	42.040	45.010
Comoros	14.070	12.810	13.060	3.670	5.330	5.430	49.810	48.540	47.530	36.120	38.650	39.410
DRC	29.200	16.860	16.860	9.870	6.840	N.A.	40.880	26.590	25.200	29.920	56.540	57.930
Djibouti	N.A.	13.380	12.580	N.A.	2.450	2.380	N.A.	71.240	72.860	N.A.	2.980	3.300
Egypt	27.540	30.250	31.970	13.030	16.340	18.190	49.620	47.680	46.390	19.270	15.710	15.610
Eritrea	N.A.	20.460	26.520	N.A.	12.960	13.510	N.A.	59.740	48.810	N.A.	10.090	15.560
Ethiopia	11.850	10.330	10.180	6.730	6.530	6.430	31.800	33.940	33.440	49.480	48.600	47.880
Kenya	16.750	13.560	15.960	10.290	8.360	11.150	42.450	44.730	52.270	28.520	26.350	16.990
Madagascar	11.860	12.740	12.000	10.030	10.820	10.280	45.910	49.700	47.660	31.310	30.490	31.960
Malawi	19.490	18.120	17.370	12.850	14.830	12.550	31.270	45.960	35.870	38.130	28.020	37.860
Mauritius	24.410	29.030	28.410	17.230	20.820	21.620	46.340	50.340	54.680	12.780	8.480	5.300
Namibia	40.830	24.710	26.130	10.090	11.510	9.840	44.840	52.470	50.690	8.080	10.730	11.390
Rwanda	22.690	16.510	19.810	13.720	9.990	10.740	26.960	33.730	32.730	41.840	44.190	40.710
Seychelles	18.360	22.660	21.610	9.660	12.650	12.530	75.890	73.170	75.390	5.750	4.170	2.990
Sudan	15.490	14.430	17.510	8.090	N.A.	8.500	46.860	N.A.	43.370	31.470	N.A.	36.040
Swaziland	21.600	35.030	31.100	13.440	25.780	23.220	43.310	32.680	27.300	17.150	12.640	11.800
Uganda	9.060	13.110	17.670	5.330	6.230	8.420	34.280	33.310	35.570	48.380	45.300	39.300
Zambia	42.030	31.570	21.790	22.860	9.920	11.470	34.670	40.220	44.040	13.080	16.240	24.750
Zimbabwe	25.640	25.700	22.010	18.150	19.260	13.920	45.050	49.220	49.800	20.730	13.470	16.290
Average	22.553	22.216	22.752	11.226	11.325	11.129	42.015	44.639	43.459	27.862	24.316	25.287
Standard deviation	10.667	12.665	14.043	4.751	6.031	5.513	11.533	13.662	14.650	15.042	17.030	16.852
Minimum	9.060	10.330	10.180	3.670	2.450	2.380	23.150	26.430	18.220	5.750	2.980	2.990
Maximum	43.270	66.260	76.120	22.860	25.780	23.220	75.890	73.170	75.390	55.950	56.540	57.930
EMU												
Average	34.861	30.350	29.025	N.A.	20.929	19.872	6.364	4.144	3.102	58.776	65.507	67.875
Standard deviation	2.024	3.928	4.540	N.A.	4.348	4.449	3.756	2.615	1.844	3.114	4.541	4.919
Minimum	30.460	23.090	20.090	N.A.	13.350	12.040	1.870	1.220	0.700	52.620	54.760	60.290
Maximum	38.470	37.850	35.940	N.A.	29.760	27.690	13.250	10.150	7.920	62.820	73.400	79.220
MERCOSUR												
Average	35.778	29.875	27.730	26.748	19.208	18.228	15.425	12.030	9.690	48.800	58.095	62.578
Standard deviation	9.619	4.702	0.609	8.600	3.470	4.107	9.338	8.634	7.326	4.210	7.702	7.223
Minimum	22.570	25.910	27.300	14.200	15.200	14.370	7.630	5.700	4.760	43.150	49.300	52.000
Maximum	45.310	36.670	28.630	33.750	23.580	24.020	28.930	24.790	20.560	53.090	66.300	67.680
ASEAN												
Average	33.120	30.938	33.138	17.800	19.100	20.806	27.345	26.191	23.158	39.537	42.871	43.703
Standard deviation	16.636	12.815	12.440	7.949	9.104	9.796	19.602	22.201	20.469	11.530	11.555	12.011
Minimum	13.070	9.800	8.940	9.270	5.100	6.190	0.990	0.190	0.140	26.030	25.080	24.290
Maximum	71.810	48.190	47.250	32.530	28.360	32.760	60.550	60.100	59.910	62.980	65.940	65.580

Notes. Own computations from data in WBAD and WDI. Data are in percent. The year of the latest available observation is different for different countries and different variables. In most cases however it is 2001.

Since they measure the dispersion of shares across-countries, regional standard deviations are a good starting point for the analysis. It is clear that COMESA is characterized by greater dispersion than EMU and MERCOSUR, but almost equal dispersion as ASEAN. Differently from ASEAN and MERCOSUR, in COMESA dispersion is increasing, meaning that industry structures in aggregate tend to become more different over time.

Comparing the ranking of sectors in each country, however, one still obtains a rather homogenous picture. For the majority of COMESA economies agriculture provides the largest contribution to GDP. According to the latest possible observation, agriculture is dominant in twelve countries (Comoros, Djibouti, Egypt, Eritrea, Kenya, Madagascar, Mauritius, Namibia, Seychelles, Sudan, Zambia and Zimbabwe). In seven of these countries the second sector is industry, whilst in other five the second sector is services. Services, perhaps surprisingly, are the first sector in six countries (Burundi, DRC, Ethiopia, Malawi, Rwanda, Uganda), even though one has to keep in mind that most of population in those countries is still employed in agriculture at subsistence level. For all of these six countries, agriculture comes as the second largest contributor to GDP. Industry is top contributor only in Angola and Swaziland, and again for both of them agriculture is second. The share of manufacturing is rather low by international standards in all COMESA countries. Notice also that for manufacturing the cross-country dispersion hits the minimum. Rankings in 2000s are substantially similar to rankings at the beginning of the period of observation, with agriculture dominating in 13 countries and coming second in all the others. Between 1985 and 2000 individual sector' shares do change in some countries, without however significantly altering the ranking. One exception seems to be DRC, where agriculture is the first sector in 1985, whilst in 2000s services sector comes first. In Zambia, industry is largest in 1985, but its share is halved by 2000s and agriculture becomes the largest one. In Swaziland manufacturing grows consistently and contributes to GDP for more than services and quite as much as agriculture in 2000s.

Evidence from trade data

Trade statistics for COMESA are reported in Table 20. Intra regional trade, trade index 1 (T1) and trade index 2 (T2) are defined as in the corresponding Table 8 of Section 3. The gap from potential is defined below.

The data suggest that the level of intra-regional trade is quite low, even by the standards of other RECs. From Table 8, in fact, it can be seen that regional trade flows in percent of GDP in COMESA are smaller than in EAC, ECOWAS, SADC and UEMOA, and roughly equal to those recorded in CEMAC. Similarly to the other RECs, T1 and T2 indicate that COMESA countries mostly trade with non-African countries. Again, Europe appears to be the primary trading partner. Over time, there is a slight increase in total intra-regional trade, which however does not match the increase in intra-African trade. The degree of cross-national dispersion is low, denoting a broad similarity of experiences. Based on this evidence, it can be argued that at present, intra-regional trade is unlikely to contribute mitigating possible shock asymmetries and lack of covariation in cyclical economic activity. However, the data still do not permit to assess the impact of the FTA launched in 2000. The FTA could in fact boost trade more than what appears to have happened in the '90s with the adoption of the policy harmonization program and the formal launch of COMESA.

Table 20. Trade statistics for COMESA	Intra regional trade		Trade index 1		Trade index 2		Gap from potential		
	1981-90	1991-2002	1981-90	1991-02	1981-02	1991-02	1980	1990	2000
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.A.	N.A.	N.A.
DRC	0.349	1.139	26.580	18.192	1.549	3.065	0.044	1.223	0.173
Djibouti	8.354	12.953	69.564	57.616	12.476	11.878	N.A.	N.A.	N.A.
Egypt	0.334	0.250	67.415	38.045	0.903	0.975	0.095	0.183	-0.523
Eritrea	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
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
Namibia	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
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
Swaziland	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
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
Average	2.564	3.514	59.379	43.388	6.549	7.872	2.335	2.140	2.695
Standard deviation	2.151	3.157	30.004	24.467	5.134	6.068	2.273	1.946	3.486
Min	0.107	0.179	21.653	7.234	0.218	0.191	0.044	0.107	-4.281
Max	8.354	12.953	97.322	92.449	17.237	24.072	7.381	5.357	10.469

Notes. Own computations from DOTS data. Intra-regional trade data are in percent of GDP. Trade Index 1 is the share of intra-regional trade on intra-African trade (in percent). Trade Index 2 is the share of intra-regional trade on total trade (in percent). Gap from potential is obtained by comparing actual intra-regional trade flows, with predicted trade flows from the gravity model (see Box 2 and text): a positive figure indicates that actual trade flows are larger than predicted trade flows. The gap is expressed in percent of GDP. For Djibouti and Comoros predicted trade flows are not computed.

An obvious question is whether small trade flows are the result of low potential for trade in the region. It may be the case that because of their economic size or geographical location COMESA countries cannot be expected to generate trade flows larger than some given threshold. To answer this question, one needs a norm representing the potential for international trade. Gravity models are the best candidate to serve the purpose. In short, gravity equations explain the bilateral trade flows between any pair of countries as a function of their economic size (both aggregate and per-capita), geographical distance, membership in the same regional integration arrangements, and a variety of other historical, demographic and economic factors. The parameters of these equations are estimated from large sample of countries and the resulting model can be fitted with actual data from individual pairs to generate a set of predictions on the expected level of bilateral trade. This approach can be used to compute the trade potential for the COMESA region. The trade potential will be therefore defined as the expected level of intra-regional trade obtained from the aggregation of the bilateral trade flows predicted for COMESA countries by gravity models. For details on the procedure see Box 2.

As it can be seen from the last three columns in Table 19, COMESA countries trade with each other more than what is predicted. Thus, intra-regional flows appear to be already above potential. This suggests that the reason why regional trade flows are low is that the potential for trade is low. Such a result should not be surprising. Gravity estimates attach a considerable weight to aggregate and per-capita GDP. The underlying intuition is that for trade to take place, there must be a sufficiently large demand (and supply) of goods across countries. But the potential size of the market is smaller the smaller the economic size of trading partners and the lower their level of per-capita GDP. Most COMESA countries can effectively be classified as small in economic size and poor in per-capita GDP terms. The consequence is a small potential for bilateral trade. The model also suggests that the FTA will increase the potential for trade by a factor of roughly two and a half. Since FTA was launched on October 2000, the corresponding dummy is not coded as 1 for year 2000 and hence the gap between actual trade and trade potential in the future is likely to be smaller than what is reported in the table for year 2000.

A possible weakness of the exercise above is that the gravity equation used to predict trade flows is obtained from a large sample of heterogeneous countries. This might imply that the estimated parameters do not reflect the specificity of African conditions. For instance, given the lack of physical infrastructures in Africa in general, and in COMESA in particular, the limiting effect of distance on trade is likely to be underestimated. If that is the case, then the gap between actual flows and potential would be even larger. To check the sensitivity of results, a gravity model has been re-estimated on the sample of African countries and major non-African trading partners. The predicted trade flows obtained from fitting this alternative model are however very close to those obtained from the original equation. Thus, gaps from potential are not qualitatively different from what is reported in the table and the general conclusion that COMESA countries actually trade above potential carries through.

To summarize, development of infrastructures to increase physical connectivity and removal of tariff and non tariff barriers are important steps to be taken. However, intra-regional trade cannot be expected to boost significantly if economic growth does not pick. This implies that trade integration is endogenous to broader development strategies.

Evidence from econometric test of cointegration of RERs series

A systematic test of shocks convergence can be implemented using the series of bilateral real exchange rates (RERs). The idea is simple: since RERs are influenced by the economic fundamentals, if countries are hit by symmetric shocks, then RERs will tend to move together. Conversely, in a region where shocks are asymmetric, RERs will not display any common stochastic trend. Formally, a test of cointegration of RERs is to be implemented: if at least one cointegrating vector exists, then there is evidence of shock symmetry (Enders and Hum, 1994; see Box 3 for a more detailed description of the procedure).

The test thus requires that for each COMESA country quarterly series of bilateral RER against a reference country are constructed. Three reference countries are in fact identified, so that for each member states there are three series of RER. The three references are Egypt, Kenya and Zimbabwe. They have been chosen because of their economic size and extent of trade with COMESA partners. They are also the centre-points of sub-regional groupings (see below). The test of cointegration requires a minimum number of observations for each country. For this reason, only countries for which quarterly data are available starting in 1980 are considered. This implies dropping Angola, Comoros, Djibouti, Eritrea, Namibia and Zambia from the sample.

The result of the test are reported in Table 21. For each set of RER series, cointegration is tested within the full group of COMESA countries (see Box 3 for notes on the construction of full groups) and in sub-groups. These sub-groups are defined along three dimensions. First is a geographical dimension. Following Harvey et al (2001), the COMESA region is partitioned in three areas: northern (Egypt reference), central (Kenya reference) and Southern (Zimbabwe reference). The second is an economic size criterion to isolate the five economies with largest aggregate real GDP. Third is a per-capita income criterion. Two groups are defined under this criterion: the sub-group of countries where per-capita GNI is above the regional average, and the sub-group of countries where per-capita GNI is below the regional average. Cointegration in the sub-group of richer countries cannot be tested with Kenya as reference, since Kenya falls in the poorer sub-group. In the same way, cointegration within the sub-group of poorer countries cannot be tested with Egypt and Zimbabwe as reference since they both fall in the richer sub-group. Composition of groups and sub-groups is detailed in the notes to Table 21.

Table 21. Test of cointegration of log Real Exchange Rate of COMESA countries	Eigenvalue	LR	Critical value		N. of C.E.s
			5%	1%	
Reference: Egypt					
1 - *COMESA group*	0.64	338.08	233.13	247.18	3
2 - *Geographical sub-group*	0.12	19.63	18.17	23.46	2
3 - *Large countries*	0.35	57.60	47.21	54.46	1
4 - *Higher income countries*	0.17	28.85	47.21	54.46	NONE
5 - *Lower income countries*	N.A.	N.A.	N.A.	N.A.	N.A.
Reference: Zimbabwe					
1 - *COMESA group*	0.64	306.00	233.13	247.18	2
2 - *Geographical sub-group*	0.26	35.02	29.68	35.65	1
3 - *Large countries*	0.33	54.27	47.21	54.46	1
4 - *Higher income countries*	0.17	27.77	47.21	54.46	NONE
5 - *Lower income countries*	N.A.	N.A.	N.A.	N.A.	N.A.
Reference: Kenya					
1 - *COMESA group*	0.54 225.30	156.00	168.36		3
DRC	0.59	286.89	192.89	205.95	3
Madagascar	0.67	290.87	192.89	205.95	2
Malawi	0.61	272.16	192.89	205.95	3
Swaziland	0.58	269.81	192.89	205.95	2
Uganda	0.55	250.82	192.89	205.95	2
2 - *Geographical sub-group*	0.49	110.25	94.15	103.18	1
3 - *Large countries*	0.34	57.21	47.21	54.46	1
4 - *Higher income countries*	N.A.	N.A.	N.A.	N.A.	N.A.
5 - *Lower income countries*	0.55	150.23	124.24	133.57	1

Notes. Own computations. For technical notes see Box 3. Composition of groups and sub-groups is as follows. **COMESA group**: (1) Egypt reference: Burundi, DRC, Ethiopia, Kenya Madagascar, Mauritius, Rwanda, Seychelles Sudan, Zimbabwe; (2) Zimbabwe reference: Burundi, Egypt , Ethiopia, Kenya, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Uganda; (3) Kenya Reference: Burundi, Egypt, Ethiopia, Mauritius, Rwanda, Seychelles, Sudan, Zimbabwe (then to this core group DRC, Madagascar, Malawi, Swaziland and Uganda are added one at the time). **Geographical sub-groups**: (1) Egypt reference: Ethiopia, Sudan; (2) Zimbabwe reference: Malawi, Swaziland, Madagascar; (3) Kenya reference: Burundi, DRC, Mauritius, Rwanda, Seychelles, Uganda. **Large countries sub-group**: For any of the three reference countries: Egypt, Kenya, Sudan, Zimbabwe, Ethiopia. **Higher income countries sub-group**: (1) Egypt reference: Mauritius, Seychelles, Swaziland, Zimbabwe; (2) Zimbabwe reference: Egypt, Mauritius, Seychelles, Swaziland. (3) Kenya reference: not defined since Kenya is not classified as higher income country. **Lower income countries sub-group**: (1) Egypt reference: not defined since Egypt is not classified as a lower income country; (2) Zimbabwe reference: not defined since Zimbabwe is not classified as a lower income country, (3) Kenya reference: DRC, Ethiopia, Madagascar, Malawi, Rwanda, Sudan, Uganda.

Box 3. Test of cointegration of bilateral real exchange rates (RERs) in the COMESA region

The fundamentals that determine bilateral RERs tend to be non-stationary. The consequence is that bilateral RERs are non-stationary too. However, if countries experience symmetric shocks, then their fundamentals will move together, implying that bilateral RERs exhibit common stochastic trends. If non-stationary RER series share common stochastic trends, then there must be at least one linear combination of these series that is stationary. Therefore, it is possible to test for the convergence of shocks by testing for cointegration in the following equation:

$$(A4) \quad r_{12t} = \alpha_0 + \alpha_{13}r_{13t} + \alpha_{14}r_{14t} + \ldots + \alpha_{1m}r_{1m} + \varepsilon_t$$

where r_{1it} denotes the bilateral RER in period t between reference country 1 and country i, αs are parameters to be estimated and ε is a stationary stochastic disturbance term. This approach has been originally proposed by Enders and Hurn (1994).

To implement the test, the first step is to construct series of RERs for all COMESA countries. RER between the reference country and country i is defined as the nominal bilateral exchange rate time the ratio of the consumer price index in the reference country to the consumer price index in country i. Three different references are chosen: Egypt, Kenya and Zimbabwe (see text). Angola, Comoros, Djibouti, Eritrea, Namibia and Zambia are dropped from the sample because of insufficient data.

The second step is to test for the stationariety of the series. A cointegrating vector can exist only among series that are non-stationary and integrated of the same order. The Augmented Dickey Fuller (ADF) test of stationariety yields the following results. When Egypt is the reference, the series integrated of order 1 are: Burundi, DRC, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Sudan, Swaziland and Zimbabwe. Malawi and Uganda are instead stationary and hence cannot be included in equation (A4). When Kenya is the reference, all the series are integrated of order 1. Finally when Zimbabwe is reference, the series integrated of order 1 are: Burundi, Egypt, Ethiopia, Kenya, Malawi, Mauritius, Rwanda, Seychelles, Sudan and Uganda. Swaziland is integrated of order 2 whilst DRC and Madagascar are stationary, thus none of them can be added to equation (A4). Results on stationariety are robust to changes in the lag structure and in the specification of the ADF equation. Moreover, the same results are obtained when using the Phillips and Perron test of stationariety instead of ADF.

The final step is to test for cointegration in equation (A4) using only the series which are integrated of order 1. The methodology used is the VAR (Vector Autoregression)-based cointegration tests developed by Johansen (1988). The null hypothesis of the test is that there is no cointegrating vector. Therefore, rejection of the null means that the series are cointegrated. Table 21 table reports the value of the Likelihood Ratio (LR) test statistic and the critical values at 5% and 1% confidence level. The last column displays the number of cointegrating vectors for each group or sub-group based on rejection of the null hypotheses at 1% level of confidence.

The test of cointegration is reported for each reference for the full group of COMESA countries and for sub-groups (see the notes to Table 21 for composition of groups and sub-groups). Because testing for cointegration with more than ten endogenous variables can be problematic, the following adjustment to the sample are required to test for cointegration in the full COMESA group. When Egypt is reference, there are 11 series integrated of order one. However, one of them (Swaziland) is non-stationary only at the 10% level of confidence and hence it can be considered as barely-stationary. Therefore, it is not included in (A4). When Zimbabwe is reference, the number of endogenous variables is exactly ten. When Kenya is reference, there are 13 endogenous variables. It has been therefore decided to select a base-group of eight series and then add each of the remaining five series one at the time. The base-group consists of eight series that appear in both the full group with Egypt as reference and the full group with Zimbabwe as reference.

The results reported in Table 21 have been generated assuming a linear deterministic trend in the data and a lag structure 1, 2 for the VAR. For the COMESA group, with any reference, the null hypothesis of no cointegration can always be rejected. The result holds when any of the five additional countries is added to the group with Kenya as reference. Similarly, including Swaziland and dropping any of the other ten endogenous variables from the group with Egypt as reference does not change the outcome of the test. Finally, all of the above findings are robust to changes in the lag structure of the VAR and in the type of trends in the data.

For regional sub-groups, the rejection of the null-hypothesis is instead sensitive to changes in lags and trends. For the northern sub-group (Egypt, Ethiopia and Sudan), the null hypothesis can be rejected at the 5% critical value only under the assumption that data incorporate a quadratic deterministic trend. For the southern sub-group (Zimbabwe, Malawi, Madagascar and Swaziland), the null can be rejected only by increasing the number of lags in the VAR from 2 to 4. The same is true for the central sub-group (Kenya, DRC, Uganda, Rwanda, Burundi, Seychelles and Mauritius). Results for the other sub-groups are robust to assumptions and specification of the test.

The crucial piece of information provided by Table 21 is the number of cointegrating equations in the last column. As noted, symmetry of shocks requires the existence of at least one cointegrating vector. Overall, results are supportive of the idea that shocks and fundamentals tend to converge. For the COMESA group, whatever the reference country is, more than one cointegrating vector can actually be identified. For regional sub-groups at least one cointegration vector can always be identified, but this result is sensitive to changes in the assumption underlying the econometric test (for details see Box 3). There is robust evidence that the fundamentals in large countries tend to move together. There is instead little evidence of cointegration within the sub-groups based on levels of per-capita GNI. In particular, for higher income countries, there is no cointegrating vector, while for poorer countries there is at most one cointegrating vector.

To check the robustness of results, the cointegration test has been performed dropping DRC and including Zambia in the sample. The RER series for DRC display a significant structural break in association with the hyperinflation of the '90s. It is therefore appropriate to verify that cointegration results hold independently from its inclusion. Zambia is excluded from the original sample because data are not available from 1980, but a string of RER observations can be constructed starting in mid '80s. This change in the overall sample affects the composition of the COMESA group, of the southern and central sub-group and of the poor countries sub-group. However, statistical results do not change relative to those reported in Table 21.

<u>Wrap up: convergence of cycles, shocks and fundamentals</u>

The implementation of a test of cointegration of real exchange rate series suggests that shocks and fundamentals within the COMESA region tend to move together; that is, they converge. Unfortunately, the test cannot be extended to some of the countries because of the lack of data. The same test also shows the existence of convergence within sub-groups, and in particular within the sub-group of the largest economies in the region.

Convergence of fundamentals and shocks is probably due to the fact that industry structures are rather similar across countries, with agriculture still playing a dominant role in terms of contribution to GDP. One would expect such similarities also to show up in bilateral correlations of key macroeconomic variables, but this does not seem to be the case, at least for the entire sample of 20 countries. Significant bilateral correlations do exist for pairs and sub-groups of countries.

Intra-regional trade contributes to increasing shock symmetries and convergence (or at least it contributes to mitigate asymmetries). However, the trade flows among COMESA member states are low, even by the standard of other African RECs. The estimation of a gravity model highlights that actual flows are in fact greater than their predicted potential. The rationale behind this result is that most countries in the region are small and poor and hence they are unable to generate sustained demand (and supply) for international trade. The increase in intra-regional trade is therefore endogenous to the growth of incomes and GDP.

4.4. Income convergence in COMESA

As discussed in Section 3, there are two basic approaches to test convergence of per-capita income levels. Sigma convergence looks at the time changes in the dispersion of per-capita GDP across countries in the region. A decrease in the standard deviation is interpreted as evidence of convergence. Beta convergence is instead identified by a negative correlation between the level of per-capita GDP at the beginning of the sample period and the subsequent average rate of per-capita GDP growth. Table 22 reports results from both approaches. The test is conducted for sub-periods. Each sub-period is represented by a decade. The latest sub-period for sigma convergence goes from 2000 up to the latest possible observation (2001 or 2002). For beta convergence, since growth rates ought to be computed over a sufficiently long spell, the

latest sub-period 2000-2002 is not reported. However, results for the entire period 1960-2002 are reported under the heading "full" in the last column of the bottom half of the table.

Table 22. Income convergence in COMESA					
	Sigma convergence (standard deviation of p.c. GDP)				
	1960-69	1970-79	1980-89	1990-99	Latest
COMESA	716.72	991.30	1181.64	1626.89	1735.96
Large countries 1	140.43	203.75	303.99	376.59	432.65
Large countries 2	140.43	203.75	288.34	362.12	425.30
Northern group	N.A.	N.A.	452.66	460.70	475.45
Central group	N.A.	N.A.	1773.80	2600.04	2769.64
Southern group	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	1990-99	Full
Estimated correlation	-0.2601	-0.4591	0.3309	0.4555	-0.1711
Standard error	0.4162	5.3873	0.5601	0.6724	0.5014
t-ratio	-0.6249	-0.8522	0.5909	0.6774	-0.3412
p-value	0.5460	0.4123	0.5624	0.5068	0.7369

Notes Own computations from data in WDI, WBAD, EIU. Groups are as follows. **Large countries 1**: Egypt, Kenya, Sudan, Zimbabwe, Ethiopia. **Large countries 2**: Egypt, Kenya, Sudan, Zimbabwe. **Northern group**: Egypt, Sudan Djibouti, Ethiopia, Eritrea. **Central group**: Kenya, Burundi, Comoros, DRC, Mauritius, Rwanda, Seychelles, Tanzania, Uganda. **Southern group**: Zimbabwe, Angola, Madagascar, Malawi, Namibia, Swaziland, Zambia. **Higher income countries** (ten countries with 2000 per-capita GNI above the median): Comoros, Kenya, Sudan, Djibouti, Egypt, Mauritius, Namibia, Seychelles, Swaziland, Zimbabwe. **Lowe income countries** (ten countries with 2000 per-capita GNI below the median):Angola, Burundi, DRC, Eritrea, Ethiopia, Madagascar, Malawi, Rwanda, Zambia, Uganda. Because data for several low income countries are not available period to 1970-1980, for some of the groups the standard deviation in the first two decades is not computed.

The standard deviation is characterized by a significant upward sloping trend. Thus, there is evidence of sigma divergence. The result holds for the full group of COMESA countries and for some sub-groups. The only notable exception is represented by the sub-group of poorer countries, where there is evidence of convergence. In fact, the definition of sub-groups on the basis of their per-capita income levels at the end of the sample period might induce sample selection bias in the results. However, it should be noticed that the composition of the two income groups is practically unchanged between the beginning and the end of the sample period, the only exception being Kenya and Angola that switch their position. In this sense, sample selection bias is unlikely to significantly drive the results.

The situation of the poorer countries group is particularly worrying. First of all, the gap between the average income in this group and the average income of the richer countries group increases over time. Second, but perhaps more important, the average income of the poorer countries sharply decreases over the period of observation. That is, there is negative convergence, or convergence to the bottom, with countries clustering around the lowest income levels in the sub-group. This result might be consistent (albeit it does not prove it) with the idea that some countries in the region are locked into a poverty trap.

The estimated correlation coefficients between per-capita income and subsequent rate of growth never pass a zero restriction test. Hence there is no evidence of systematic, statistically significant, beta convergence in the sample. The relatively low number of degrees of freedom might contribute explaining the high p-values, leading to the non-rejection of the hypothesis that coefficients are equal to zero. Still, the pattern of signs on the coefficients is worth a mention. In the first two decades of the sample period, the negative correlation indicates convergence, with poorer countries catching up with the richer. The

third and the fourth decade are instead characterized by progressive divergence. The switch in the sign of the coefficient might be due to the fact that since 1980 some poor countries are added to the sample. As discussed for sigma convergence, poor countries tend to diverge significantly from richer ones and hence their presence could well determine a structural break in the income-growth relationship.

4.5 *Wrap up: convergence in COMESA*

For the COMESA region, in addition to the evidence generated from the indicators introduced in Section 3 for the other RECs, some results on the extent of macroeconomic convergence are produced by applying econometric tests that exploit the time-series properties of the data.

The basic indicators provide a general picture which is not particularly different from the one discussed in Section 3 for other RECs. Macroeconomic policy stances are still divergent in spite of the adoption of a policy harmonization framework with a set of convergence criteria. Divergence is more marked with respect to fiscal policy, with several countries struggling to achieve the target values on deficit. Monetary policy is more convergent, especially for what concerns the rate of money growth. Correlations of fundamental macroeconomic variables are generally close to zero, denoting a substantial divergence of shocks and business cycles in the region. However, there are sub-groups of countries where correlations tend to be high and positive. Intra-regional trade flows remain low, even by African standards, suggesting that trade among member states is unlikely to mitigate shock asymmetries as macroeconomic integration unfolds.

More advanced econometric tests qualify the above general picture. Testing for convergence of macroeconomic time-series shows that many variables in most countries do not display any long-term tendency to revert to the mean. However, when series do revert, they normally converge to values that meet the norms established in the criteria. The largest number of convergence cases is observed for monetary variables (inflation and money growth). A few structural breaks that induce converge in otherwise non-convergent series are observed in connection with the launch of the COMESA harmonization program. But indeed this latter piece of evidence is quite scattered across the sample. To some extent, the long-term effects of the program are still not incorporated into the time-series, and this explains why the number of significant structural breaks is limited. Turning to convergence of shocks and cycles, a test of cointegration of real exchange rates series reveals that country's fundamentals in the region tend to move together to a much greater degree than what appears from the analysis of simple bilateral correlations. Probably, this tendency of fundamentals to move together is the consequence of economic structures being quite similar across countries, with agriculture playing a dominant role. Finally, a gravity equation is fitted to obtain predictions about the size of intra-regional trade flows. These predicted trade flows represent a sort of potential level of trade in COMESA and can be used as a benchmark for the assessment of actual flows. It turns out that actual flows are significantly greater than predicted flows. The explanation is that most countries in the region are of limited economic size and poor in per-capita terms. Thus, they are unable to generate a sustained demand (and supply) for international trade, and this in turn reduces the potential for trade. In this sense, intra-regional trade cannot be expected to boost in the absence of sustained economic growth.

The last piece of evidence proposed concerns the degree of convergence of per-capita incomes. It appears that income levels tend to become more and more dispersed across countries. The only exception is for a subgroup of poor countries, where there is evidence of convergence to the bottom. The statistical evidence on the catching up effect (beta convergence) is very weak, with estimated correlation coefficients that do not significantly differ from zero.

5. Discussion and recommendations

The analysis in Sections 3 and 4 suggests that RECs are characterised by a significant degree of macroeconomic divergence on any of the three dimensions considered. Of course, this general picture needs to be qualified to account for differences within each REC and across RECs. Furthermore, as shown by the COMESA case study, the conclusions drawn from the evidence of econometric time-series models might differ from those based on less sophisticated statistical indicators. Nevertheless, it appears that there is the potential for more convergence, especially on the macroeconomic policy stance.

Macroeconomic convergence criteria

The evidence from Sections 3 and 4 is that most countries struggle to meet the targets and that the patterns of macroeconomic policy variables are quite dispersed. To some extent, the fact that formal policy harmonization frameworks have been adopted only recently might explain the persistence of divergence. That is, countries may need more time to adjust their policy stance to meet the targets. However, failure to converge is also likely to reflect deficiencies in the design of criteria. In order to increase the effectiveness of criteria as a convergence device, the following is proposed.

- Criteria must be accompanied by a credible enforcement mechanism to provide countries with a strong enough incentive to comply. In the absence of other technologies for credible commitments, sanction-based mechanisms can be used. A framework for regular monitoring of countries' progress must be established. This monitoring framework will specify deadlines for compliance. Countries that fail to comply at the specified deadline must incur into a penalty. Such a penalty might be designed as a monetary sanction to be paid as extra-contributions to regional financial institutions (discussed later). Another possible penalty is the suspension of the non-complying country from the process, and hence from the benefits of integration (including access to regional financial support). Taking into account the differences of initial conditions across countries, the target values to be met at each deadline can vary from country to country, as long as they eventually converge to the same common value. What is crucial is that the elements of the monitoring framework (deadlines, targets and penalties) and the agency in charge of managing it (see below recommendations on "economic institutions") must be clearly designed ex-ante. Once the framework is established, its credibility can only be ensured by the continuous and non ad-hoc application of its rules [28].

- Convergence criteria must refer to a few key macroeconomic variables, avoiding redundancy and inconsistencies. The rationale underlying their adoption suggests that they should be designed to facilitate the convergence of national policy stances towards (i) low inflation and (ii) fiscal stability. This does not mean that inflation and fiscal stabilisation are the only two, or even the first two, priorities of economic policy. It only means that those are the two objectives that criteria can contribute to achieve within the context of a formal program of macroeconomic integration. Against this background, three key variables need to be targeted: inflation, fiscal deficit and public debt. Low inflation can be identified with an inflation rate at 2% or below, corresponding to a commonly accepted notion of price stability. Fiscal stability is generally defined by the combination of overall fiscal balance and sustainable debt levels. Given the current situation of most African countries, it can be desirable to set a medium-term target of arbitrarily low fiscal deficit (say 3% of GDP), while maintaining 0% as a long-term target. In both cases the balance must be intended net of grants. The determination of sustainable debt levels depends on factors that are likely to differ across countries. Furthermore, in the context of developing economies, it

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[28] An enforcement mechanism based on sanctions is not a new idea. For instance, the Maastricht Treaty and the Growth and Stability Pact in Europe impose penalties on non-complying countries. The Convergence, Stability, Growth, and Stability Pact of UEMOA includes similar penalty mechanisms.

makes sense to set limits for both the external and the domestic component of debt. For the external component, a reference value can be obtained by looking at the average external debt to GDP ratio in developing countries not included in the HIPC initiative; that is, countries that are apparently able to sustain their debt. This average is around 35% and hence this value is taken as the norm for external debt. The domestic component can then be determined from the definition of a steady state value of total debt to GDP ratio. Assuming negligible seignior-age (as it should be in a regime of low inflation) and a growth rate of nominal GDP in line with average past growth, 35% domestic debt would be sustainable even during the transition to overall fiscal balance. Total debt to GDP ratio would therefore be at 70%.

- The above mentioned targets ought to be accompanied by a few more ones. The accumulation of payment arrears is a possible way to finance deficit and hide fiscal distress. Hence, following the example of UEMOA and CEMAC, there should be a criterion imposing zero accumulation of arrears, both domestic and external. In a currency union perspectives, it would be also desirable to impose a no bail-out condition to avoid that the consequences of default crises in a member state generate negative externalities on fiscal stability and anti-inflation commitment in the rest of the region. Given the vulnerability of most countries to external shocks, a minimum amount of international reserves is desirable. A stock of reserves is also required to maintain a stable peg against external currencies. The proposal is to set a target level of reserves of 6 months of imports, to be then increased once countries move to fixed exchange rate arrangements (see below). Finally, to facilitate the efficient allocation of financial resources and risk, countries need to maintain positive real interest rates, with a nominal lending (prime) rate not exceeding 10% (this 10% ceiling is originally proposed by Harvey et al., 2001). Given the objectives to be achieved with convergence criteria, other criteria appear to be redundant.

- While convergence criteria must be credibly enforced, countries must be granted some degree of flexibility in dealing with shocks. A preliminary consideration is that convergence criteria need not to be an obstacle to the implementation of other development policies. On the contrary, to the extent that they are effective mechanisms for inflation and fiscal stabilization, they contribute to structural reforms and overall macroeconomic adjustment. The issue of flexibility still arises because of the vulnerability of African economies to external, exogenous, shocks (often asymmetric across countries). Two possible solutions can be designed. One follows the approach taken by the Growth and Stability Pact of the European Monetary Union and, more recently, by the Convergence, Stability, Growth and Solidarity Pact of UEMOA. The idea is that penalties for lack of compliance are charged unless a country has faced particularly heavy adverse economic conditions, this latter being defined as a given decline of GDP relative to its average level in the preceding years. Thus, with this mechanism in place, countries facing temporary recessions are exempted from meeting the targets. Countries are clearly required to comply as soon as the economic cycle is reversed. The second approach follows the recommendation of Harvey et al. (2001). The performance of countries in meeting criteria should be assessed on the basis of moving averages of the relevant macroeconomic variables. That is, the target established in the criteria must be compared with moving-averages of the macroeconomic variables (rather than single annual observations) to assess whether countries are complying or not. Moving averages smooth the impact of the business cycle relative to the case where single annual observations are used as reference. Countries can thus undershoot or overshoot the target in negative years, as long as they recover in positive years. The period covered by the moving average should be long enough to allow countries to deal with short-term shocks. However, setting a too long period would have the potentially negative effect to delay action for recovery. A three-year moving average is probably a good compromise. The two approaches (exemption for temporary recession and moving-averages) are not inconsistent with each other and can be eventually merged. In any case, whatever the two is applied, it is necessary that rules are clearly specified in advance, to avoid arbitrary interpretations and application.

<u>Economic institutions</u>

In general, institutional quality is an important determinant of economic performance. Especially in a context of socio-political instability, reforms to set up high quality institutions are a strategy yielding a large growth pay-off [29]. On a more specific ground, there are economic institutions that need to be put in place to facilitate sound macroeconomic policy management.

- In each country, monetary policy should be delegated to a central bank which is independent and autonomous from fiscal authorities. The experience of industrial countries clearly shows the benefits of this type of delegation: the independent central banker can focus on the low inflation target and resist pressure from the government to finance fiscal deficit. Obviously, for benefits to be realized, it is necessary that independence is effective and not just on paper. Effective independence can in turn be evaluated along the following lines[30]. First, members of the central bank's governing board should be appointed by representatives of the central bank itself rather than by the government. Members also ought to be appointed for relatively long periods of time, without any association with the term of office of the government. Second, no mandatory participation of a government representative to the board of the central bank must be imposed. Moreover, monetary policy decisions should not be subject to the preventive approval of the government. Third, low inflation must be a statutory objective of the central bank. There must be formal legal provisions to resolve conflicts between the government and the central bank to avoid undue interferences of the former. More technical arrangements are also desirable. Independence will exist to the extent that the government has limited influence in determining how much of the fiscal deficit is monetized. In this respect, there must be strict limitations on direct credit facilities at the central bank available to the government. In addition to that, there should be no obligation for the central bank to participate in the primary market as buyer of government bonds. Finally, the central bank should be given exclusive right to set the discount rate (as primary monetary policy instrument). The issue of delegation of monetary policy to an independent central bank is also relevant in the context of monetary union formation. The common central bank of the union must be granted the type of independence and autonomy just described above. Its establishment will be therefore facilitated to the extent that the delegation process has been already successfully undertaken at national level.

- Budgetary procedures should prevent a situation where decentralised spending decisions are financed from a common pool of centralized resources. Budgetary procedures (or institutions) are defined as the whole set of arrangements that govern the process of budget formulation and implementation. In a weak budget process, spending ministers, public enterprises and local governments predate the common pool of resources generated from taxation. The implication will be the persistence of fiscal imbalances and the inefficient allocation of public resources. It is therefore important to design budgetary institutions so that all agents participating in the process of budget formation correctly perceive the existence of an hard budget constraint, especially in a context where the pool of resources is small. If resources are centralised, then the formulation of the budget ought to follow a hierarchical process, where spending decisions are centralised in the hands of a strong prime minister (or minister of finance) who represents the populace as a whole against the interest of specific constituencies. Moreover, to avoid that legislative bargaining can lead to over-spending, it is desirable to structure the legislative approval of the budget with a vote on its global size at the beginning of the debate, limiting the subsequent number of amendments that can be introduced.

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[29] See for instance the results in Easterly (2000).
[30] See also Grilli et al. (1991) and Cukierman (1992).

- Credible regional surveillance agencies are required for effectiveness of convergence mechanisms. A critical point made above is that convergence criteria need to be accompanied by enforcement mechanisms. The proposal is made to create a monitoring framework based on clear targets, deadlines and sanctions for non-compliance. To run this framework, regional surveillance agencies must be constituted and granted sufficient power to monitor progress and charge sanctions. The credibility of the entire framework depends on the credibility of such agencies; that is, on their ability to monitor, sanction and remain independent from national pressures. In the absence of a political union, or more simply of political cohesion in the region, setting up such regional institutions might be difficult. However, the efforts that countries put in facilitating their effective working is a clear signal of sincere commitment towards the integration process.

Shock asymmetries and compensation mechanisms

Bilateral correlations of fundamental macroeconomic variables suggest that the degree of cyclical covariation in economic activity across countries is low in most RECs. Hence, shocks appear to be asymmetric. Shock asymmetries imply an unequal distribution of costs and benefits of macroeconomic integration, causing potential policy conflicts among member states. It is therefore important to consider mechanisms to mitigate and compensate the impact of such asymmetries.

- Labour must be mobile across countries in a region. When asymmetric shocks hit two countries, adjustment can initially come through national stabilisation policies and exchange rate realignments. The evolution of RECs towards deep forms of economic integration (i.e. a system of fixed exchange rates or a monetary union) will however limit the possibility to use those two instruments. Adjustment can thus occur through price and wage movements. This however requires a high degree of nominal (and real) flexibility in the labour and goods markets. Lacking such a degree of flexibility, a third adjustment mechanism works through the mobility of labour. Workers in countries where unemployment increases as a consequence of a negative shock will move to countries where unemployment is decreasing following the realization of a positive shock. The labour demand and supply effects in the two countries will lead to re-equilibration of aggregate demand and supply in the region. While labour mobility is a part of the protocols and objectives of several RECs, including COMESA, EAC, ECOWAS, SADC and UEMOA, many practical obstacles hamper its effective realization. To enhance labour mobility at regional level ECA (2003) provides a set of recommendations and proposals that ought to be quickly implemented by the RECs. These include the abolition of entry visas and the adoption of common travel documents, the harmonization of education and training policies, and the establishment of common regional labour standards.

- Countries must consider setting up a regional system of fiscal transfers. Where labour is not mobile, the impact of asymmetric shocks can be absorbed by establishing a system for the monetary compensation of disfavoured countries. In its simplest version, the system could work as follows. A regional financial institution is established. Countries pay to this institution a contribution fixed in percent of their GDP. When a country faces particularly negative economic conditions (to be defined in terms of percent reduction in GDP), it is entitled to receiving a transfer from the regional financial institution. The mechanism basically implies that transfers to disfavoured countries are financed by contributions from favoured countries. An obvious extension would be to transform the regional institution into a structural fund, where national contributions are used to finance infrastructure investment in member states. Contributions would be linked to economic conditions, with exemptions granted in case of particularly strong recessions. In such a way, a country going through a sharply negative cycle will still receive financing, without contributing, for the period, to the structural fund. The existence of such a structural fund would also play an important role to enforce compliance of countries with the convergence criteria. If non complying countries are excluded from accessing the structural funds,

then an incentive is provided for them to meet the targets. Two caveats need to be considered. One is that a system of fiscal transfers, whatever form it takes, might be quite difficult to sustain from the political point of view, especially in a context where political unification is very far from being achieved. The other caveat is that the possibility for member states to contribute to a regional fund is limited, given the low levels of GDP and the shortage of revenues. To ensure that the fund can receive resources to perform its function, contributions from national budgets can be integrated by finance levied on imports from third countries (see Box 4). In addition, the regional fund can be financed by donors, even though this will imply that smaller flows of international aid will be left available for other uses.

- Intra-regional trade is to be promoted by removing tariff and non-tariff barriers and by adhering to the timetables for the launch of free trade areas and common external tariffs. Intra-regional trade can mitigate the extent of shock divergences within RECs. In fact, the larger the trade flows between two countries, the more synchronized their national business cycles will be. The result is that a positive/negative shock taking place in one of the two will be shared to a greater extent by the partner. As discussed in this study, intra-regional trade is generally very low in all RECs. The limited economic size and the low levels of per-capita income in most countries are two crucial factors constraining potential, and therefore also actual, trade. However, even assuming constant GDPs, some considerable gains in the size of trade can be obtained from the removal of tariffs, quantitative restrictions, and non-tariff barriers to trade. For this reason it is recommended that RECs stick to the scheduled timing for the realization of free trade areas and custom unions (where these have not yet been implemented). Removal of non-tariff barriers will instead call for an increase in the degree of physical connectivity, harmonization of regulations and classifications, adoption of trade facilitation measures (i.e. simplification of custom procedures and trade documents, regional insurance schemes), establishment of regional market facilities. Again, a full set of proposals is spelled out in ECA (2003).

Box 4. A mechanism for self-financing of regional institutions

Mechanisms for self-financing of regional institutions and regional initiatives in Africa have been discussed since the mid '80s. In fact, the principle to establish self-financing mechanisms to fully or partially finance the running of REC Secretariats as well as Community Programmes is embodied in the Treaties of most RECs. For instance, the issue is referred to in Article 72 of the revised Treaty of ECOWAS, in Article 168 of the Treaty establishing COMESA, in Article 82 (2) of the Treaty establishing the African Economic Community, and in Articles 54 and 55 of the Treaty of UEMOA.

Given the limited size and irregularity of contributions from national budgets, alternative strategies must be designed to mobilize substantial and regular finance to cover: (i) the budgets of the secretariats of RECs, (ii) compensatory mechanisms, (iii) regional projects, and (iv) regional development funds. International aid and contributions from donors would certainly represent an important source of funds. However, if donors finance is used to support regional initiatives, then less international aid will be available for other uses. In this sense, it would be desirable to make African regionalism more autonomous vis-à-vis the external aid.

The issue has been also investigated by the Economic Commission for Africa (ECA) in a series of studies (inter alia, ECA, 1997 and ECA 1998). In general, those studies suggest that a mechanism for self-financing can be established as a levy based on imports of member States of goods originating from third countries. The rate of this levy should be determined taking into account the financial needs of each specific REC. For instance, for COMESA it is recommended a levy on imports value at the rate of 0.3% or 0.7%, depending on the decision on implementing or not a compensation fund. For other RECs the recommended levy on imports are as follows: UEMOA 1%, ECOWAS 0.5%, CEMAC 1%, ECCAS (Economic Community of Central African States) 0.7%. UEMOA, CEMAC and ECOWAS have effectively adopted and implemented the mechanism. ECCAS also made the decision to adopt a Community Contribution for Integration based on imports from non-African countries at the recommended rate (implementation scheduled for 2003).

In terms of bureaucratic and technical procedures for the implementation of the mechanisms, the following suggestions can be advanced, again based on the ECA studies. Customs administrations should be in charge of the levy implementation by determining the base (value of imports), calculating the amounts paid and collecting the funds. These funds would then be deposited directly in accounts at Central or National Banks and opened in the name of REC secretariats. The full availability of the collected funds to the Community is required for the credibility of the process and to ensure effectively autonomous financing. Full availability means that funds are entirely property of the Community (this is for instance the case in the European Union) and hence that eventual surplus relative to the Community budget are not returned to member States. However, a test or transition period can be considered during which member states agree on limited availability of funds. Finally, procedures for monitoring the collection as well as the management of funds should be designed. In particular it is recommended that the Executive Secretariat of RECs annually report to the policy organs of the Community on all operations related to the working of the mechanism.

Exchange rate arrangements

With the exception of the two currency unions, exchange rate arrangements in the RECs tend to vary considerably across countries. This heterogeneity reflects different beliefs about the relative merits and disadvantages of fixed and flexible regimes. In any case, whatever the starting position might be, the process of economic integration, aiming at the formation of currency unions, will imply that all countries

must move towards a system of fixed, and later irrevocable, parities. The following recommendations are made.

- The process of implementation of a system of fixed exchange rates in a REC must be gradual. Flexible exchange rates have the advantage to smooth the impact of fiscal adjustment. They are also an instrument to absorb exogenous shocks. Pegging the exchange rate is a strategy to lock-in the progress achieved on macroeconomic stabilization. Furthermore, the risk that the peg would be a target of speculative attacks is still quite limited, since most African countries are not significantly integrated into global financial markets. However, to avoid distortions of the path of domestic development, countries are advised to move to a peg only once some basic conditions are realized: (i) domestic inflation must have been stabilized to a relatively low level, so to avoid the negative real exchange rate consequences of the inflation gap vis-à-vis the reference country, (ii) fiscal stabilization must have been achieved, (iii) a consistent stock of international reserves must exist, (iv) the economic institutions above mentioned (independent central bank, strong budgetary procedures) must have been established. It is also desirable that appropriate instruments for banking supervision and surveillance have been put in place.

- The domestic currency should be pegged to a major international currency; that is, Euro, USD or yen. The consistency of international trade flows suggests that most African countries ought to peg to the Euro, especially if Great Britain will join EMU. However, to avoid that fluctuations among the major currencies generate undesirable appreciations or depreciations of the domestic currency, the peg can be referred to a composite basket.

- All countries in each REC should move towards the adoption of a stable peg against an international reference currency. This will occur at different speed for different countries depending on their initial situation and on the time required to achieve the conditions for the sustainability of the peg. The adoption of bilateral peg against the international reference will de facto produce a system of fixed exchange rates within the REC. In this system, parities between members of the REC are determined from the bilateral exchange rates against the international reference.

- Before moving to the next stage (the formation of a currency union) it would be desirable to let the system of fixed exchange rate work for several years (seven to ten years are advised). The long transition period will also allow RECs and member-states to set up the institutional and technical arrangements required by a currency union (see footnote 31). Eventually, following the example of the European Monetary System, fluctuations bands (in the range of at most ±15% around the central parity) can be established to provide a minimum margin for stabilisation. Only countries that for the last three years have been able to maintain the parity without the need to impose restrictions on the free flow of foreign change must be admitted to the currency union. This exchange rate stability criterion will prevent endgame devaluations to gain permanent competitive advantage [31].

- A hard peg arrangement against an international currency (or a basket) is also to be adopted by the common central bank as an anchor for regional monetary policy. Countries in the union should be continuously monitored in their adherence to convergence criteria, with sanctions applied to non-complying countries. Mechanisms for flexibility of the type previously discussed should however

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[31] There are various additional institutional arrangements that need to be defined before a regional common central bank can be effectively launched. The common central bank should be given the role of lender-of-last-resort (which is normally played by national central banks in a decentralized setting), as well as supervision functions over the system of national central banks. Other requirements that can be fulfilled during the long transition period include: (i) strengthening country frameworks for the collection of monetary and financial statistics, (ii) harmonization of formats for data analysis, (iii) strengthening regional payment systems, (iv) harmonization of accounting rules and standards. See also ECA (2003).

remain in place. Countries which did not initially qualify for participation in the union, can be subsequently admitted once they have satisfied the convergence criteria and have maintained a stable parity against the reference international currency for a period of at least three years.

6. Conclusions

Macroeconomic convergence, in its multidimensional definition, is an important item in the economic integration process undertaken by the RECs. This report has provided some empirical and econometric evidence on the progress realized by six regional communities. Two basic conclusions emerge. First, on macroeconomic policy stance, the bulk of convergence still has to be achieved for most variables in practically all of the RECs surveyed. Particularly critical is the situation of fiscal variables. Second, regions are likely to be characterized by asymmetric shocks. However, the application of econometric time-series models to a specific case study (COMESA) suggests some qualifications. In particular, it is the second conclusion that might be too pessimistic. While the basic correlation statistics for COMESA, similarly to what happens for the other five RECs, suggest that fundamentals across countries do not move together, the existence of cointegration among the series of bilateral real exchange rates rejects the non-convergence hypothesis. This suggests an important avenue for future research. With sufficiently long strings of time-series data now becoming available for most countries, time-series models originally developed for the analysis of convergence in industrial countries can now be extended to African RECs. The COMESA case study is thus an example that ought to be extended to other regions. In fact, a cointegration technique analogous to the one in Section 4 has been applied to EAC with findings that are similar to those of the COMESA case study (Mkenda, 2001). A different approach, based on the estimation of a structural VAR, has generated more ambiguous results on the degree of shock convergence in West Africa (Fielding and Shields, 1999). More of this type of econometrics is needed for a better understanding of economic integration prospects in the continent.

Appendix

A.   Variables description

Variables	Description
Table 1 and table 10	
Area	Land area in thousands sq. Km
Population	Total population in thousands
GNI per capita	Gross National Income per capita measured in current USD (base year 2000)
Aggregate GDP growth	Period average of annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 1995 USD
Per capita GDP growth	Period average annual percentage growth rate of GDP per capita based on constant local currency. GDP per capita is gross domestic product divided by midyear population
GINI	The GINI index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a GINI index of zero represents perfect equality, while an index of 100 implies perfect inequality
Gross capital formation/GDP	Gross capital formation consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories
Current account balance/ GDP	Current account balance is the sum of net exports of goods, services, net income, and net current transfers
Table 2 and Table 11	
Life expectancy	Number of years a newborn is expected to live.
Infant Mortality	Expected probability that a newborn will die before reaching age 5 (expressed in rate of 1000)
Young female illiteracy	Percentage of illiterate female population aged between 15 and 24
Young male illiteracy	Percentage of illiterate male population aged between 15 and 24
Female secondary enrolment rate	Gross enrolment rate of female population into secondary school
Male secondary enrolment rate	Gross enrolment rate of male population into secondary school

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Total tertiary enrolment rate	Gross enrolment rate of total population into tertiary school
Population growth	Period average rate of annual total population growth

Tables 4 to 6 and 12 to 17

Inflation (Table 4, 12 and 17)	Annual percentage change in Consumer Price Index
Fiscal balance (Table 5, 12 and 17)	Overall budget balance: current and capital revenues excluding current grants less total expenditure and lending minus repayments
Basic Fiscal balance (Appendix)	For UEMOA countries basic fiscal balance is defined following IMF as total revenues excluding grants, minus total expenditures, excluding foreign-financed investment outlays
External reserves (Table 6)	Official external reserves (including gold) expressed in months of imports
CB financing (Table 6, 13 and 17)	Central bank financing of budget expressed as percentage of tax revenues. Definition of Central Bank financing follows line 12 AZF of International Financial Statistics
Debt service (Table 6)	Total domestic and external debt service in percent of GDP
CA balance (Table 6)	Current account balance in percent of GDP. Current account balance is the sum of net exports of goods, services, net income, and net current transfers
Gross domestic savings (Table 6)	Gross domestic savings in percent of GDP
Total claims on government	Claims on central government in percent of GDP. Definition of total claims follows line 32 AN of International Financial Statistics

Table 13 and 17

Tax revenues (Table 14 and 17)	Total tax revenues (net of grants) in percent of GDP
Interest rates (Table 15 and 17)	Nominal interest rate on deposit and lending
Money growth (Table 16 and 17)	Growth rate of broad money (M2). Broad money is the sum of money (line 34 ZF of International Financial Statistics) and quasi-money (line 35 of International Financial Statistics)
Domestic credit (Table 16 and 17)	Domestic credit to the private sector in percent of GDP

Table 7 and Table 18

Terms of trade	Change in log terms of trade between two consecutive years
Inflation	Annual percentage change in CPI

| GDP growth | Rate of growth of aggregate GDP in constant 1995 USD |

| Money growth | Rate of growth of broad money |

Table 8 and 20

| Intra-regional trade (Table 8 and 20) | Total exports and imports of a country with its   partners in a region (percent of GDP) |

| Intra-African trade (Table 8) | Total exports and imports of a country with African trade partners (percent of GDP) |

| Total trade (Table 8) | Total exports and imports (percent of GDP) |

| Trade index 1 (Table 8 and 20) | Intra-regional trade share of intra-African trade (percent) |

| Trade index 2 (Table 8 and 20) | Intra-regional trade share of total trade (percent) |

| Growth rate (Table 20) | Average annual growth rate of intra-regional trade |

| Gap from potential | Gap (in percent of GDP) between actual intra-regional trade flows and intra-regional trade flows predicted from the gravity model |

Table 9 and 22

| Sigma convergence | Standard deviation of per-capita GDP levels across countries in a region or in a group |

| Beta convergence | Estimated correlation coefficient between average per-capita real GDP growth and initial level (in logs) of per-capita GDP |

| Standard error | Standard error of the estimated correlation coefficient |

| T-ratio | Test-statistic for a test of significance of the estimated correlation coefficient |

| P-value | Probability value associated to the T-ratio
Note: because of the low number of degrees of freedom, statistical inference is not particularly informative in this case |

Table 19

| Industry | Industry value added in % of GDP. Industry corresponds to ISIC divisions 10-45 and includes manufacturing (ISIC divisions 15-37). It comprises value added in mining, manufacturing (also reported as a separate subgroup), construction, electricity, water, and gas |

| Manufacturing | Manufacturing value added in percent of GDP. Manufacturing refers to industries belonging to ISIC divisions 15-37 |

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Agriculture

Agriculture value added in percent of GDP. Agriculture corresponds to ISIC divisions 1-5 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production

Services

Services value added in percent of GDP. Services correspond to ISIC divisions 50-99 and they include value added in wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services. Also included are imputed bank service charges, import duties, and any statistical discrepancies noted by national compilers as well as discrepancies arising from rescaling

B. **Membership of the RECs and composition of non African groupings mentioned in the report** (for full names of regional communities see list of acronyms).

<u>African RECs</u>

CEMAC: Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea, Gabon.

COMESA: Angola, Burundi, Comoros, Djibouti, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, Zimbabwe.

EAC: Kenya, Tanzania, Uganda.

ECOWAS: Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo.

SADC: Angola, Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe.

UEMOA: Benin, Burkina-Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo.

<u>Other groupings</u>

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

EMU: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain.

MERCOSUR: Argentina, Brazil, Uruguay, Paraguay.

ASEAN: 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, Islamic Republic of Iran, Israel, Jordan, Kuwait, Lebanon, Saudi Arabia, Syria, United Arab Emirates, Popular Democratic Republic of Yemen.

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

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

C. Fiscal deficit in UEMOA countries (alternative data)

	Sub-periods		Latest
	95-99	2000-02	
	UEMOA		
Benin	1.74	0.80	-0.20
Burkina Faso	1.72	-2.37	-4.50
Cote d'Ivoire	-0.62	0.60	0.30
Guinea-Bissau	-6.80	-3.87	-7.30
Mali	0.92	-1.20	-1.50
Niger	-3.44	-1.53	-2.10
Senegal	1.58	1.47	1.60
Togo	-2.78	-2.10	-1.00
Standard deviation	3.69	2.11	2.85
Weighted averages	-0.14	-0.02	-0.41
Simple averages	-0.96	-1.03	-1.84

Note: Basic Fiscal balance is equal to total revenue, excluding grants, minus total expenditures; excluding foreign-financed investment outlays. Source: IMF (2002).

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