Regional integration, growth and convergence[1]
Analytical techniques and preliminary results

Draft note

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Abstract

This note is **work in progress** and examines empirically whether and how regional integration leads to convergence and growth amongst developing countries. Using standard growth models for nearly 100 developing countries over 1970-2004 we cannot establish robust **growth effects of regional integration** at the aggregated level of analysis even after using alternative measurements of regional integration. Yet, country-specific growth diagnostics do suggest that regional integration can be a key if not **binding constraint to growth** as "deep" regional approaches can help to address crucial rail, road, air and energy links amongst countries (e.g. in the EAC).

Preliminary findings further suggest that initially high levels of **regional income disparities** will lead to greater decreases in disparities. Whilst the level of intra-regional trade and incomes do not explain changes in income disparities, the presence of a regional DFI (e.g. CABEI, EADB) with a relatively high loan exposure to GDP ration tends to reduce regional income disparities suggesting a useful role for deeper integration in achieving regional cohesion. A one percentage point increase in **development finance** (DFI) exposure leads to a drop of of about one percentage point.

Finally, while the macro economic literature on regional integration tends to highlight only limited expected effects of African regional integration, our work at the firm level in three African countries (Benin, Malawi and South Africa) is indicative of **significant dynamic effects of RI for firm level productivity in Africa**. We suggest that further growth analytical work is undertaken which combines the **development of methods** to examine the effects of regions and **measurement of the various types of regional integration**.

[1] The paper is emerging from work for the World Bank and is led by Dr Dirk Willem te Velde (dw.tevelde@odi.org.uk). He is grateful to Steven Thompson and Chris Jones for research assistance.

1 INTRODUCTION

This note is work in progress and examines empirically whether and how regional integration leads to convergence and growth amongst developing countries. The empirics will focus on developing country regions and Africa in particular. There is a large literature on the economic welfare effects of regional integration (Viner, 1950) and an emerging one on convergence in regions. But there are gaps in the empirical literature examining the relationship of different types of regions and different types of economic performance at macro and micro effects.

The note attempts to address a number of different but interrelated observations on research on regions. Not all regions are formed for economic reasons, yet politicians in all regions are interested in growth effects. Whilst a significant amount of research on regional integration is on the effects at regional level, individual countries are concerned with impacts at the level of the country especially as it is unlikely that the benefits are same across all countries in the region. Much empirical research focuses on regions at entities that do not change and treats regions as similar, while we know that no region is the same. Much of the earlier work on regions considers static allocative effects at the macro level, yet the literature on new regionalism emphasises dynamic effects at the micro level. In short, we aim to apply a number of analytical techniques to the study of regional integration, growth and convergence.

This note is structured as follows. Section 2 provides a very brief background on the theories of regional integration, growth and convergence and highlights the main hypotheses. Section 3 describes the growth analytics used to understand the effects of regional integration. Section 3 describes the performance of regions on the basis of a number of variables. Section 4 provides preliminary empirical results. Section 5 discusses possible implications of the research.

2 REGIONAL INTEGRATION, GROWTH AND CONVERGENCE: THEORETICAL CONSIDERATIONS

This section introduces a number of aspects of the literature on regional integration relating to this study.

Trade diversion or trade creation

The literature on regional integration dates back to at least Viner (1950) who suggested that the effects of regional integration on trade can be either *trade creating* when trade replaces or complements domestic production, or *trade diverting* when partner country production replaces trade from the rest of the world. If a country becomes a member of a region that "diverts" trade to its members it would have been better to liberalise globally.

Narrow and deep integration

Regions classifying as Regional Trade Agreements (RTAs) under Article XXIV of the GATT (trade in goods) or Article V of the GATS (trade in services) will have to liberalise *substantially all* trade. There are exceptions under each when it concerns regions amongst least developed or developing countries. The mere reduction or elimination of tariffs on intra-regional trade will have fewer effects if the potential for intra-regional trade is small. For instance, Te Velde (2006) argues that intra-regional trade in Africa covers only a small percentage of total trade, in part because economic and trade (in final products) structures are similar (but perhaps also because of underreporting), so any trade (and hence economic) effect of lower tariffs is likely to be small. Instead, researchers have argued that deep integration covering trade rules, trade standards and institutional co-operation would be better for regions, see e.g. Gasiorek and Holmes (2008).

Regional trade provisions or providing regional public goods

There are other roles for regional integration, beyond trade provisions. First, regions can support the provision of regional governance public goods. Effective international economic governance promotes economic development. Some challenges are best met at the national or multilateral level, but some policy-making occurs at a regional level in parallel with national trade policy-making. There has been an increase in regional policy-making and in the number of regional trade agreements over the past decades. As these evolve to consider deeper regional integration, particularly the liberalization of sensitive service sectors or the provision of social projects (which make sense in a regional context) (te Velde, 2006), there is a need for regional institutional development and regional governance. Second, regions can support the provision of regional knowledge public goods. A regional approach facilitates learning and sharing of information related to trade development and trade policy or other areas of functional co-operation such as agriculture and food security, environmental (e.g. water) and health (communicable diseases) governance. Finally, regions can overcome other market and coordination failures and coordinate activities with strong regional externalities. Many competitiveness challenges are regional in nature; for instance, a landlocked country is dependent on appropriate infrastructure in other countries for trade in goods. Some externalities are not geographically limited to a region, but others relate to neighbouring states only. National development programmes will not normally consider activities with strong international externalities as benefits cannot be fully appropriated nationally. IMF/World Bank (2006) discusses a power project benefiting Malawi, but with a need for financing in Mozambique.

Static or dynamic effects

RTAs can affect growth through dynamic output and productivity effects such as through competition and scale. Many argue that important effects of RTAs are dynamic, with competition creating a more efficient industry and growth. Lower intra-regional tariffs

would lead to increased competition (Neary, 2001). The new trade theory emphasises long-run productivity effects of trade (Grossman and Helpman, 1991). Productivity spillovers can occur via importing and exporting (Coe and Helpman, 1995; Coe, Helpman and Hoffmeister, 1997). Not only does a country's efficiency increase due to allocation effects, trade helps actors to learn from each other and appropriate R&D spillovers. These learning effects can be translated into long-run efficiency gains. Blomstrom and Kokko (1997) argue that regional integration leads to efficiency gains and higher growth. Increased FDI can actually be such a catalyst through spillovers in terms of technology transfer and other linkages with local firms. There can thus be long-lasting effects on growth and productivity in addition to a one-off effect based on a more efficient allocation of resources.

Unfortunately, there is little evidence for these dynamic effects. Schiff and Wang (2003) find that "there has been no empirical evidence of the dynamic effects of RIAs based on their impact on technology diffusion from partner and non-partner countries". They then go on to show that NAFTA imports has raised productivity (between 5.5-7.5%) in Mexico through imported foreign knowledge stocks, while extra-regional imports did have no effects. These are long-lasting effects that can in the long-run benefit the poor. There can also be long-lasting effects on productivity through learning by-exporting, and such effects may be appropriated particularly when dealing with more developed partners and these tend to be extra-regional.

Micro or macro effects

Much of the early literature on regional integration or integration more generally emphasizes the allocative effects at the macro level: some sectors with a comparative advantage gain at the expense of other sectors. However, the discussion on dynamic effects suggests that effects work at the firm level (although dynamic effects might be due to entry and exit of firms).

Convergence or divergence

The benefits of regional integration may not be evenly spread amongst members of a region. Ethier (1998) suggests that smaller countries may have incentives to form a region in order to attract investment away from other members, particularly extra-regional FDI. This may be the case when regional tariff preferences allow foreign investors to set up beachhead locations in a small (or poor) country to serve the entire regional market. Venables (1999) on the other hand argues that South-South agreements will tend to lead to divergence of income levels of members states, while North-North agreements may lead to convergence of income levels. The explanation of this is based on the position of countries in a region compared to those outside the region. Countries with a comparative advantage (e.g. in manufacturing) closer to the world average do better in a region than do countries that are at the extreme position as the latter are more likely to switch import suppliers (of manufactures) and face trade diversion costs. Possible divergence due to relocation effects may put RIAs under strain. While peripheral countries to the EU such as Ireland have caught up in terms of productivity levels with

other members of the EU apparently through trade and FDI spillovers, there was a degree of divergence and agglomeration in developing regions such as East African Community and the Central American Common Market both dating back to the 1950s and 1960s.

Te Velde and Bezemer (2006) estimate a model for the real stock of UK and US FDI in developing countries during 1980-2000 and find that membership of a region as such is not significantly related to inward FDI, but crucially, when a country is a member of a region with a sufficient number and level of the trade and investment provisions (e.g. describing treatment of foreign firms, large trade preferences), this will help to attract more inward FDI to the region. Important for the debate on convergence and divergence within regions, they find that the relative size of a country's economy within a region matters for attracting additional FDI, as does a central location in relation to the largest market. Countries that have larger economies or are geographically closer to other, larger countries within the region can expect a larger increase in FDI as a result of joining than those of countries that have smaller economies or are located in the periphery.

3 REGIONAL INTEGRATION, GROWTH AND CONVERGENCE: GROWTH ANALYTICAL TECHNIQUES

There is a wide variety of growth analytical techniques to examine the effects of regional integration on economic performance. General equilibrium modeling could form an important part of analytical work, however this paper refer to econometric and statistical techniques only.

3.1 GROWTH ANALYTICAL TECHNIQUES AT THE MACRO LEVEL

Measuring and describing RI at the macro level

A key challenge is to "measure" regional integration. There are at least three broad aspects of regions that need measuring: narrow integration, deep integration and functional co-operation. Measuring is easiest for narrow integration (level of intra-regional tariffs), followed by deeper integration (e.g. adoption of common rules on investment) and then functional co-operation (e.g. presence of regional development finance institutions). Table 1 below measures regional integration on trade and investment rules extending the measures in Te Velde (2006).

Table 1 Regional Integration Index

	Investment provisions			Trade provisions		
RTA (date of establishment)	1970s	1980s	1990s -	1970s	1980s	1990s -
NAFTA (1994)	0	0	3 (1994)	0	0	2 (1994)
MERCOSUR (1991)	0	0	2 (1994)	0	0	3 (1991)
CARICOM (1973)	0	1 (1982)	2 (1997)	1 (1973)	2	3 (1997)
ANDEAN (1969)	-1(1970)	1 (1987)	2 (1991)	1	1	2 (1993)
ASEAN	0	1 (1987)	2 (1996), 3 (1998)	1	1	1
SADC (1992)	0	0	1 (1992)	0	0	1 (1992)
COMESA (1994)	0	0	1 (1994)	0	0	1 (1994)
EAC	0	0	0	0	0	0
SACU (1969, 1992)	0	0	0	3	3	3
CEMAC (1999)	0	0	1 (1999)	0	0	2 (from 1998)
WAEMU (1994, 2000)	0	0	0	0	0	1 (1994) 2 (2000)
SAARC (1985)	0	0	0	0	0	1 (1995) 2 (2005)
GCC (1981)	0	0	0	0	1 (1981)	2 (2003)
CACM (1991)	0	0	0	0	0	2 (1993)

Source: Te Velde (2006); years between parentheses indicate when certain provisions were announced.

Investment Index
= 0 if not member of group
= 1 if some investment provisions in region (as in COMESA, SADC),
= 2 if advanced investment provisions in region (e.g. improved investor protection in ASEAN)
= 3 if complete investment provisions in region (e.g. Chapter XI of NAFTA)
= -1 if more restrictive provisions (restrictions on foreign investors in ANDEAN in 70s)

Trade Index
= 0 if not member of group
= 1 if some trade provisions (e.g. tariff preferences),
= 2 if low MFN tariffs, (close to) zero intra-reg tariffs
= 3 if high MFN tariffs , (close to) zero intra-reg tariffs

There are several stages in the regional economic integration process, ranging from the formation of a trade bloc to the establishment of an economic and monetary union. One important step in the integration process is the formation of a customs union which not only eliminates tariffs and quotas on trade between member countries, but also establishes a common external tariff applying to non-members. In Africa, the four major customs unions are divided by region and include the East African Community (EAC), the Economic and Monetary Community of Central Africa (CEMAC), the South African Customs Union (SACU), and the West African Economic and Monetary Union (WAEMU). Just under half of Africa's fifty three nations are members of a customs union, making these partnerships an important part of the economic and political landscape. The members in WAEMU and in CEMAC share a common currency, and were formed after the devaluation of the CFA franc in 1994. The South African Customs Union is the oldest group dating back to 1910, although it has been altered under revision agreements in 1969 and 1994. A recent customs union to form is the EAC on 2002 after the collapse of a similar group in 1977. But many more are being planned, see table 2.

Table 2 Summary of key characteristics of regions

	Members (considered, in 2006)	Level of integration, current and planned	Intra-regional trade (2006)	GDP (bn USD, 2006)
EAC	3 (Rwanda and Burundi have joined)	CU operational from 2005 Common market by 2012	12.8	43..3
CEMAC	5	UDEAC CET in 1994 Full FTA, customs union and common market planned	1.9	44.5
WAEMU	8	CU since 2000	10.7	49.4
COMESA	20	Free trade area by 2000, CU planned by 2008	4.0	331
SADC	15	Free trade area by 2008, CU planned by 2010	7.7	380
SACU	5	New CET agreed by 2002		276
MERCOSUR	4	Customs union	16.2	2160
CARICOM	15	Customs union	9.6	62.7
NAFTA	3	No	43.8	15300
ANDEAN	4	Customs union	9.6	281
ASEAN	10	No	24.1	1040
SAARC	7	No	5.4	1140

Measurement of regions goes beyond narrow and deep trade integration and should also cover functional co-operation. Table 3 below shows one such example. It highlights whether a region has established a sub-regional development finance institution specifically aimed at providing finance to that region. There are five such regions, and the final column measures the total size of the portfolio of loans/finance outstanding as a ratio to regional GDP.

Table 3 Sub-regional development finance institutions

	Presence and name of Sub-regional DFI	Exposures – loan portfolio (USD mn)	Regional GDP (USD mn)	Exposure / GDP
MERCOSUR	No			
CARICOM	CDB	702	74840	0.009
ANDEAN	CAN	4188	162711	0.026
ASEAN	No			
SADC	No			
COMESA	No			
EAC	EADB	179	46512	0.004
SACU	No			
SADC	No			
CEMAC	No			
WAEMU	BOAD	1953	28465	0.069
SAARC	No			
CACM	CABEI	4538	108616	0.042
GCC	No			

Source: annual reports of DFIs

Table 4 provides recent performance of regions with respect to trade, FDI and convergence.

Table 4 Development of economic performance of regions over time (last decade)

	Convergence (sigma) (1997-2006)	Did export/GDP increase (1997-2006)	Did FDI stock /GDP increase (1997-2006)	Did intra-regional trade increase	Did regional FDI as % of developing country FDI increase? (1997-2006)
EAC	√	√	√	-	√
CEMAC	-	√	√	-	√
WAEMU	-	-	-	√	-
COMESA	-	√	√	-	√
SADC	-	√	√		√
SACU	-	√	√		√
MERCOSUR	-	√	√	-	-
CARICOM	-	√	√	-	√
NAFTA	-	-	√	√	**Na**
ANDEAN	-	√	√	-	-
ASEAN	√	√	√	√	-
SAARC	-	√	√	√	√

Growth and convergence

Two types of convergence are normally tested in empirical research.

- □ convergence is tested for to determine whether or not poor countries are growing faster than richer countries (a negative correlation between initial per capita income and growth in per capita income);
- □ convergence tests whether or not the dispersion between per capita income levels declines over time.

We examine unconditional and conditional □ convergence across a number of developing countries. Unconditional □ convergence, which disregards all other possible impacts on growth, suggests that overtime countries with differing levels of initial GDP per capita will converge with one another over the long run. However, in practice we do not seem to observe this strict adherence to growth and convergence paths as emphasized in the traditional growth literature. Researchers have begun to test growth models by looking at particular groups of countries and regions. For example, do developing countries growth rates converge with one another in a region? And does joining a Customs Union result in growth and enhanced convergence?

We can use standard growth models and test for unconditional convergence by estimating

$$g_{it} = \alpha + \beta Y_0 + \varepsilon_{it} \quad (1)$$

Where g_{it} is the first difference of real per-capita GDP, it is therefore the growth rate; and Y_0 is the logarithm of the initial level of real GDP per-capita. The subscripts *i* and *t* represent countries and time respectively. As stated above, for the first approach *t* is annual data, but it also possible to use *t* as time periods. The null hypothesis of convergence is accepted if is negative, so that countries with lower initial values of GDP per capita should have higher growth rates.

To test for conditional convergence we estimate:

$$g_{it} = \alpha + \beta Y_0 + \delta X_{it} + \varepsilon_{it} \quad (2)$$

Where the vector X contains other explanatory variables such as population, trade and gross capital fixed formation (these as % of GDP and then logged). The data come from World Development Indicators. The null hypothesis of (conditional) convergence is accepted if is negative. We estimate econometric models to tests for unconditional convergence. We also include measures of regions to isolate the effects of regions on growth. The regions are defined by membership of a Customs Union (CU) or Free Trade Area (FTA).

The Appendix reviews 15 studies related to convergence and divergence of incomes in developing county regions. For each study the table summarises which regions are covered, evidence on convergence, methods used, factors affecting convergence and divergence and policy suggestions. The research covers a wide variety of regions: SACU, ECOWAS, COMESA, WAEMU, CEMAC, EAC and SADC and covers convergence and divergence in GDP from 1960. The following findings (see appendix for references) have emerged from the studies:

- Convergence in SADC over 1960-2000 (Holmes, 2005);
- No convergence in ECOWAS over 1960-2000 (Holmes, 2005);
- Convergence in ECOWAS over 1960-1990 (Jones, 2002);
- No convergence in ECOWAS over 1985-2003 (Dufrenor and Sannon, 2005);
- No convergence in COMESA over 1980-2002 (Carmignani);
- Limited convergence across WAEMU, 1990-2003 (Van de Boogaerde and Tsangarides, 2005);
- Convergence across WAEMU, 1965-2002 (Aziz Wane, 2004); and
- Divergence in EAC, in the 1970s (Venables, 2003).

The methods used are either statistical (describing income levels) or econometric (using standard growth models). The studies discuss the following factors behind convergence and divergence of incomes within regions:

- The size of the group does not matter (Holmes, 2005);
- Integration of monetary policy, harmonisation policy, different institutions and trading rules (Carmignani);
- Labour mobility (Van de Boogaerde and Tsangarides, 2005; Konseiga, 2005);
- Macro economic convergence (Rossouw, 2006); and
- Competitive advantage (Venables, 2003).

Measuring and explaining dispersion of incomes

Researchers have also been interested in convergence testing whether or not the dispersion amongst per capita income levels in the region declines over time.

$$\Delta\sigma_{it} = \alpha + \beta\sigma_{i0} + \gamma X_{it} + \varepsilon_{it} \quad (3)$$

Where is the standard deviation in real per capita incomes, and X is a set of explanatory variables including measures describing the type of region, which varies across regions and in some cases over time. This could include regional infrastructure, regional cohesion policies, intra-regional trade and migration or income levels. There are of course different ways of describing the variability of incomes in a region.

Regional constraints in growth diagnostics

The Hausmann-Rodrik-Velasco growth diagnostics framework is one approach aimed at identifying the binding constraint to growth. The framework focuses on two key factors behind growth: the return to investment; and the cost of financing that investment. Faster growth involves higher private returns to investment than the costs of financing it. Private returns depend both on the returns to investment, and the appropriability of those returns by the investor. In its simplest form, if the cost of borrowing is high but borrowing is also high, it suggests profitable investment opportunities exist, but private investors are credit constrained and hence the cost of financing is the problem. On the other hand, if the cost of finance is not excessive, but borrowing is low, the constraint to growth is not the cost of financing, but low returns to investment. Chart 1 shows these two options – cost of finance, or low return to investment - in a tree structure.

Chart 1 The growth diagnostic tool

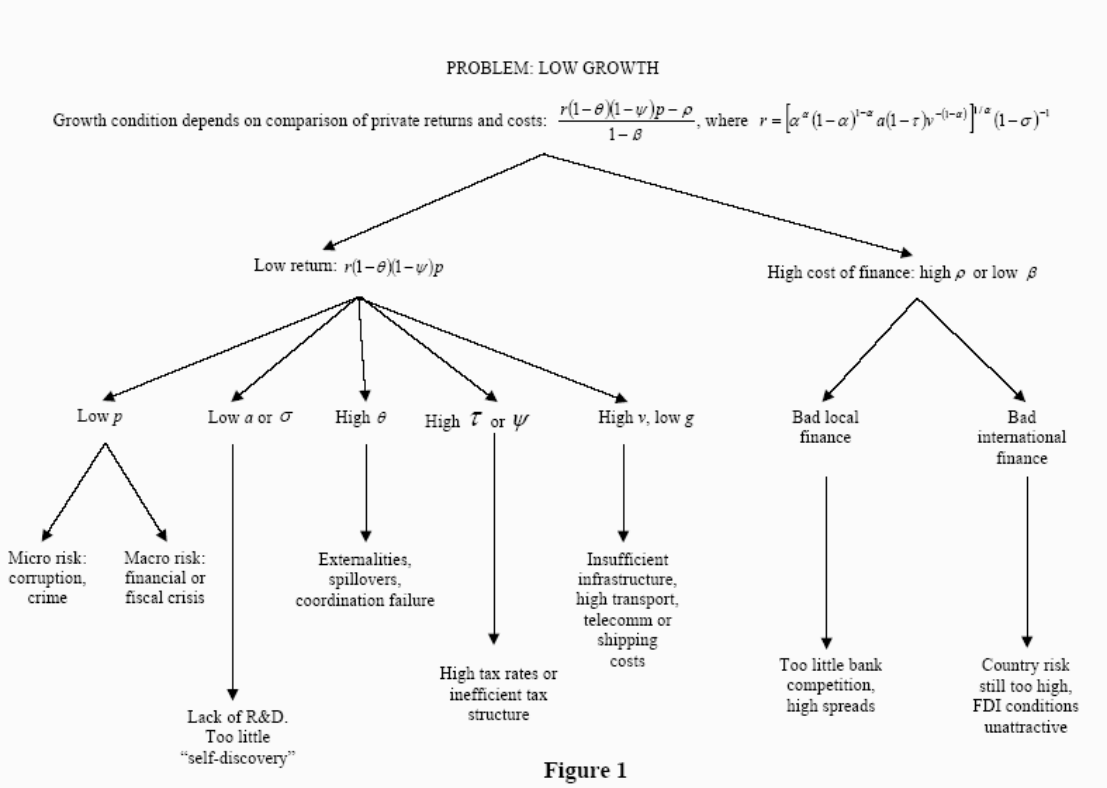

Figure 1

The framework can then be used to move along the tree structure to find the *binding* constraint. For instance, high cost of financing can be due to limited access to international capital or weak domestic capital markets. Low returns to investment can be due to low economic returns (e.g. due to poor infrastructure, weak labour markets, market failures, regulatory constraints etc.) or whether the ability of the investor to appropriate these returns is the problem (e.g. due to macroeconomic risks, insecure property rights, high taxes, regulatory uncertainty, corruption etc.). It is likely that growth diagnostics e.g. for landlocked countries confirm that regional infrastructure is a key, if not binding, constraint to growth.

3.2 GROWTH ANALYTICAL TECHNIQUES AT THE MICRO LEVEL

Several researchers have shown that regional integration leads to faster trade, especially intra-regional trade.[2] They have also shown that (deeper) regional integration attracts

[2] Frankel (1997) found that the regional integration raised intra-regional trade by 65 per cent in the EC and 150% in Mercosur and Andean. Frankel and Rose (2001) show that RTAs have a big average effect on intra-regional trade. Soloaga and Winters (2001) show that the effects can differ amongst RTAs, with some positive and others negative effects. They show that the new wave of regionalism in the 1990s (new blocks and revamping of old blocks) has not led to further intra-regional trade. Further, they show that only the EU and EFTA may have led to trade diversion and the other blocks to trade creation.

FDI.[3] While trade and FDI can lead to improved allocative efficiency, authors emphasise dynamic effects. The dynamic effects of FDI and trade can be tested at the macro level, using growth regressions. However, a more direct way of testing dynamic effects is by using firm level data and examining whether regional trade and FDI (which researchers have shown to be promoted by regional integration in the case of several regions) affects productivity of the firm. Exporting and ownership[4] is associated with higher productivity, but how does this

We use results of background research for Qureshi and Te Velde (2007). To examine firm performance, they use a simple Cobb-Douglas production function which links output with inputs and the firm's productivity, as follows:

$$y_i = \alpha_0 + \alpha_L L_i + \alpha_K K_i + \varepsilon_i, \qquad (4)$$

where y_i is log of output measured in value added terms of firm *i,* and *L* and *K* are logs of labour and capital inputs, respectively. ε_i is the unobserved error term that represents the log of the productivity shock or total factor productivity (*TFP*) of firm *i* and captures any effects in total output not caused by inputs or productivity. Some suggest that *TFP* estimated in this way suffers from a simultaneity bias as TFP shocks and inputs move together.

Olley and Pakes (1996) propose to overcome the simultaneity problem by using the firm's investment decision to proxy unobserved productivity shocks. Their technique, later modified by Levinsohn and Petrin (2003), is commonly used to obtain consistent estimates of the production function.[5] They divide ε in into two components, η which is a part of the productivity shock that influences a firm's decisions relating to factor inputs, and ξ which is an independent and identically distributed random component. *L* and *K* are treated as free and state variables, respectively, and investment is defined as a function of *K* and η. This gives us:

$$y_i = \alpha_0 + \alpha_L L_i + \alpha_K K_i + \eta(I_i, K_i) + \xi_i \qquad (5)$$

Now defining $\varphi(I_i, K_i) = \alpha_0 + \alpha_K K_i + \eta(I_i, K_i)$, we obtain:

$$y_i = \alpha_L L_i + \varphi(I_i, K_i) + \xi_i \qquad (6)$$

[3] Te Velde and Bezemer (2006) and Levy *et al* (2002) find that regional integration leads to extra-regional FDI and in some case intra-regional FDI.

[4] A significant body of evidence (e.g. Haddad and Harrison, 1993; Aitken and Harrison, 1999; Djankov and Hoekman, 2000) finds that the productivity level of foreign firms is higher than in domestic firms although but that the effects on productivity levels and growth in domestic firms are mixed.

[5] Levinsohn and Petrin (2003) use intermediate inputs, such as material inputs, as a proxy instead of investment. This is because most datasets contain significantly less zero-observations in materials than in firm-level investment.

A first stage estimator that is linear in L and non-parametric in φ is used to obtain a consistent estimate of α_L.[6] To identify α_K, two assumptions are made. First, η follows a first-order Markov process and, second, K does not respond immediately to ψ, defined as the innovations in productivity over last period's expectation, that is, $\psi_{it} = \eta_{it} - E[\eta_{it} \mid \eta_{it-1}]$. Putting ψ in (5) and defining y^* as output net of labour's contribution, we get:

$$y_i^* = y_i - \alpha_L L_i = \alpha_0 + \alpha_K K_i + E[\eta_{it} \mid \eta_{it}] + \xi_i^*, \qquad (7)$$

where $\xi_i^* = \psi_i + \xi_i$. Since ψ and ξ are both uncorrelated with K, regressing y^* on K and $E[\eta_t|\eta_{t-1}]$ produces a consistent estimate of α_K. Having obtained consistent estimates for both parameters of interest, α_L and α_K, we can construct the individual error term ε_i from (4) which will give us unbiased estimates of *TFP*.

To examine the effect of regional integration on firm performance we estimate *TFP* using Levinsohn and Petrin and estimate the effect of exporting and foreign ownership (to and from the region, and to and from outside the region) and other characteristics of the firm (F) and others characteristics (X), and estimate:

$$\log(TFP_i) = \beta_0 + \beta_S EXP_{i,region} + \beta_S EXP_{i,outsideregion} + \sum_k \beta_{F_k} F_{ik} + \sum_j \beta_{X_j} X_{jk} + \nu_i, \qquad (8)$$

where ν_i is a white noise error term, F includes firm characteristics such as the age, size and ownership of the firm, and X comprises a number of other factors.

4 REGIONAL INTEGRATION, GROWTH AND CONVERGENCE: EMPIRICAL RESULTS

4.1 MACRO GROWTH EFFECTS OF REGIONAL INTEGRATION

Table 5 presents the regression results of the growth models a explained before, based on nearly 100 developing countries (see appendix) over 1970-2004. Model 1 provides evidence for conditional convergence. Model 2 includes regional dummies showing that growth experiences differ across regions. Model 3 introduces dummies for Customs Unions (when a country was part of CU) and there are no clear growth effects, even when accounting for idiosyncratic regional growth experiences (model 4). Models 5-7 include the trade provisions index discussed previously, without showing clear growth effects, with or without time dummies and additional explanatory variables. The story is that it is hard to find growth effects of region integration at this level of analysis and the present way of measuring regions. This may not come as a complete surprise because all regions differ and the growth effects depend on a host of factors, and growth depends on lots of other factors.

[6] Olley and Pakes (1996) employ a fourth-order polynomial in I and K to approximate $\varphi(.)$, estimating (2) using OLS, with output regressed on labour and the polynomial terms.

Table 5 Regional integration and growth

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	Coef.	t	Coef.	t	Coef.	T	Coef.	t	Coef.	t	Coef.	t	Coef.	t
(ln) Initial per capita GDP	-0.006	-4.880	-0.007	-5.310	-0.007	-4.930	-0.007	-5.340	-0.007	-5.420	0.000	-0.120	-0.008	-6.000
(ln) Trade as % of GDP	0.002	4.570	0.002	3.810	0.002	4.250	0.002	3.810	0.002	3.920			0.002	5.100
(ln) FDI as % of GDP	0.003	4.120	0.003	4.300	0.003	4.190	0.003	4.250	0.003	4.460			0.003	4.770
(ln Inv as % of GDP	0.034	9.000	0.034	8.970	0.034	8.600	0.034	8.930	0.034	8.960			0.034	9.010
Population growth	-0.009	-3.850	-0.008	-3.030	-0.008	-3.240	-0.008	-3.040	-0.008	-3.090	-0.007	-2.620	-0.010	-3.760
Regional dummies (geographically based)														
Gcc			0.027	3.780			0.027	3.770	0.030	4.050	-0.017	-1.830	0.031	4.040
Eac			0.004	0.700			0.005	0.770	0.004	0.740	-0.009	-1.760	0.006	0.950
Cemac			-0.001	-0.080			-0.001	-0.070	0.001	0.070	-0.012	-2.000	-0.001	-0.110
Waemu			-0.007	-1.780			-0.010	-1.900	-0.006	-1.300	-0.019	-4.850	-0.005	-1.240
Can			-0.001	-0.330			-0.001	-0.320	-0.001	-0.320	-0.008	-2.290	-0.001	-0.300
Caricom			0.005	0.770			-0.011	-0.930	0.010	1.380	-0.013	-2.110	0.002	0.300
Mercosur			0.005	1.100			0.010	1.530	0.008	1.550	-0.011	-2.120	0.003	0.620
Cacm			0.001	0.240			0.001	0.260	0.003	0.750	-0.017	-3.830	0.001	0.300
Sacu			0.003	0.580			0.003	0.610	0.010	1.440	0.004	0.600	0.000	0.020
Regional Integration dummies (1 from year if region formed)														
GCC					0.025	3.560								
EAC					-0.003	-0.470	-0.009	-0.960						
CEMAC					0.001	0.090	0.001	0.060						
WAEMU					-0.001	-0.210	0.007	0.940						
CAN					-0.001	-0.360								
CARICOM					0.006	0.920	0.016	1.420						
MERCOSUR					-0.002	-0.260	-0.010	-1.170						
CACM					0.001	0.280								
SACU					0.003	0.710								
Regional trade provisions index									-0.002	-1.410	0.003	1.420	0.001	0.800
Time dummies											Yes		Yes	
Constant	-0.111	-6.140	-0.101	-4.920	-0.111	-5.950	-0.102	-4.930	-0.102	-4.950	0.038	4.260	-0.108	-5.130
R-2		0.127		0.133		0.130		0.135		0.134		0.064		0.190
No obs		1992.000		1992.000		1992.000		1992.000		1992.000		2934.000		1992.000

*** indicate significance at 10%, 5% and 1% levels respectively, the estimated standard errors are robust;.

4.2 EXPLAINING CONVERGENCE WITHIN REGIONS

Chart 2 shows developments in the disparities of incomes in the key regions. On this measure, only the incomes of members of EAC and ASEAN have converged over the past decade although over the longer-run WAEMU and SACU have also converged somewhat.

Chart 2 Dispersion of incomes, by region

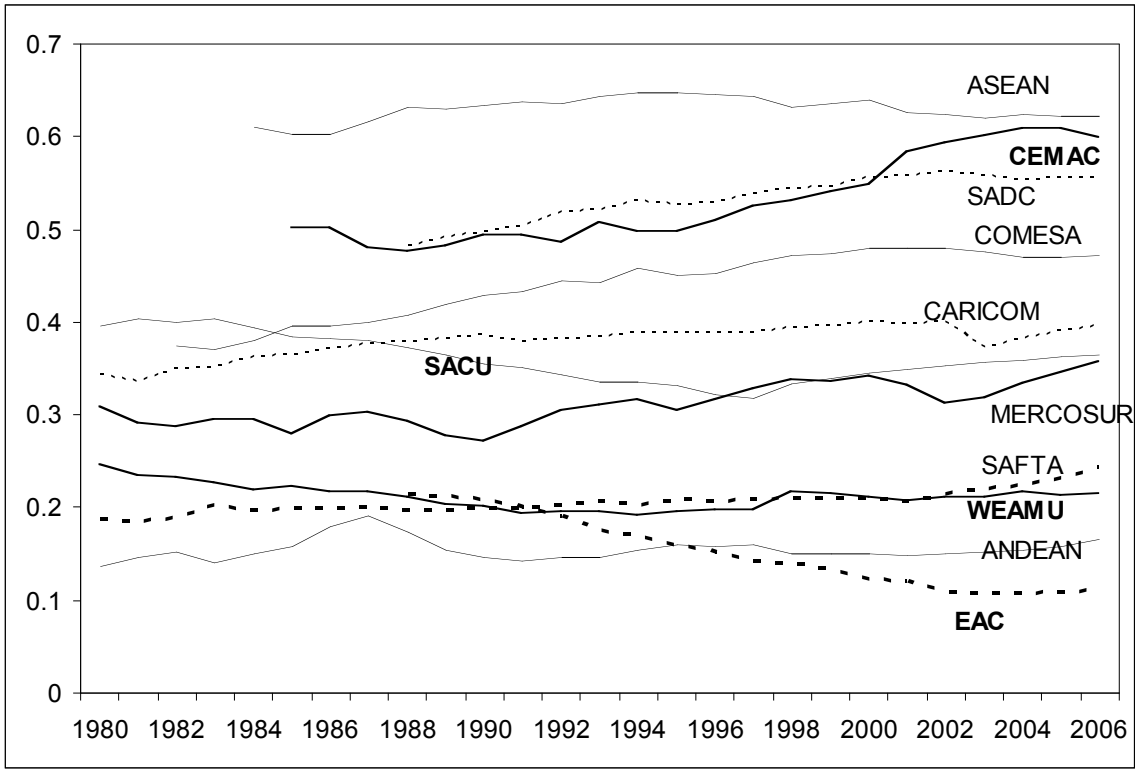

Table 6 presents the estimation results for explaining divergence and convergence within regions. Our study is hampered by the lack of good measures of the explanatory variables such as intra-regional migration or regional infrastructure. However, it is clear that regions with a higher initial □ will experience more decreases in □ later on. The level of intra-regional trade and income levels do not explain changes in □. However, the presence of a regional DFI with relatively high loan exposure does reduce regional income disparities. A one percentage point increase in DFI exposure will lead to a drop of □ of about one percentage point.

Table 6 Explaining changes in convergence of incomes (□ □)

	Coefficient	T-stat
□ lagged one period	-0.076	-2.63***
Development Finance Institutions (loan exposure over regional GDP)	-1.215	-2.05**
Share intra-regional trade (% of total)	0.000	0.92
Cemac	0.006	0.74
Waemu	0.055	2.03**
Mercosur	-0.018	-1.79
Caricom	-0.002	-0.56
Comesa	-0.005	-0.55
Eac	-0.034	-2.74***
Safta	-0.024	-1.7
Constant	0.041	2.01
Observations	152	
F-statistic	6.11****	
R2	0.23	

*** indicate significance at 10%, 5% and 1% levels respectively, the estimated standard errors are robust;.

4.3 REGIONAL INTEGRATION AND GROWTH DIAGNOSTICS

The World Bank's country economic memorandum (World Bank, 2007; p. 126) undertakes a growth diagnostic for Uganda. It concludes the following:

- Under-investment in infrastructure is the binding constraint to growth in Uganda;
- Electricity is the number one priority – with major investments needed in towns outside of Kampala to expand job creation;
- Trunk roads and main roads around Kampala need to be better maintained and expanded at key bottlenecks;
- The costs of power and fuel are too high;
- Financial intermediation is a future constraint that could quickly bind if infrastructure constraints are removed; and
- Coordination gaps are leading to inefficiencies in infrastructure, and seemingly skills training.

Most of these key growth constraints have a regional dimension. There have been various studies examining the economic rates of return on infrastructure projects concluding that these rates tend to be high – but a regional functional approach is often needed to materialize the gains. For example, there is at present a severe shortage of electricity-generating capacity in Uganda. This could have been overcome through the use of effective regional electricity grids. Instead, to overcome these shortages, Uganda currently imports oil using pipelines from Kenya.

There are also regional constraints to rail. Uganda's imports and exports make heavy use of the port in neighbouring Mombassa. The Uganda-Kenya railways operate under a private franchisee which needs more effective regional approaches towards safeguarding a stable investment environment in order to stimulate more investment. The rail link was broken at the time of conflict in Kenya with big effects for Uganda.

Finally, road connections are poor including in a regional context. Selassie (2008) records an impressive increase in manufactured exports to regional markets in Rwanda, Sudan and DRC which have risen over the past decade from zero due to conflict to over US$20 million per month in 2006. With better roads and other transportation links, even more exports would be possible.

4.4 MICRO EFFECTS OF REGIONAL INTEGRATION

We use the estimation results for the production function using Levinsohn-Petrin techniques as provided in Qureshi and Te Velde (2007) and derive TFP measures which are then used as the endogenous variable in table 7. We examine whether exporting firms have higher productivity, and whether the destination of exporting matters. Narrow and deep integration should increase regional exports (as well as imports) – and this has been shown to be the case.

Regressions for Benin, Malawi (to a lesser extent) and South Africa indicate that exporting firms have higher productivity (although the present regressions cannot be used to argue whether good firms export or exporting firms become good firms). We also distinguish between whether the main exports of the firm go to the region (UEMOA for Benin, and Eastern and/or Southern Africa for Malawi and South Africa) or elsewhere. Exporters to the region and exporters to outside are statistically associated with the same productivity levels (see F-test and then regressions Benin-2 and Malawi-2) – but they might be slightly lower for regional exporters in Benin and higher for regional exporters in Malawi. In the case of South Africa, regional exporters are statistically more productive than world wide exporters.

This research complements Schiff and Wang (2003) on imports in the case of NAFTA and shows that regional integration can be associated with the same or better dynamic effects compared to all other integration. This is slightly surprising and highlights the presence of dynamic effects of RI in Africa, which stands in stark contrast with the low static/allocative effects expected from integration of countries with similar production structures as in Africa.

Table 7: Explaining firm level productivity

	Benin (1)	Benin (2)	Malawi (1)	Malawi (2)	South Africa
Age	0.005 (1.04)	0.005 (1.04)	0.013 (2.19)**	0.012 (2.27)**	0.014 (5.64)***
Size (employment)	-0.000 (-0.26)	-0.02 (-0.34)	0.001 (3.40)***	0.001 (3.35)***	0.001 (4.83)***
Foreign	0.003 (0.95)	0.003 (0.93)	0.006 (2.23)**	0.007 (2.61)**	0.58 (4.09)***
Export		0.74 (2.23)**		0.32 (1.43)	
Main export to region (UEMOA/SADC)	0.67 (1.78)*		0.46 (1.65)*		0.65 (4.47)***
Main export to outside region	0.77 (2.28)**		0.16 (0.69)		0.50 (4.47)**
Constant	1.79 (15.4)***	1.79 (15.7)***	4.03 (24.3)***	4.04 (24.3)***	7.02 (89.2)***
Observations	118	118	128	128	405
F-statistic	2.08**	2.36**	10.45***	13.04***	43.99***
F-test (coeff region = coeff outside region)	0.16		1.06		15.4***
R2	0.10	0.10	0.15	0.15	0.39

Notes: Dependent variable in all specifications is log of total factor productivity obtained from the levinsohn petrin technique; *, **, *** indicate significance at 10%, 5% and 1% levels respectively, the estimated standard errors are robust;.
Data from World Bank Enterprise Surveys used by Qureshi and Te Velde (2007).

5 PRELIMINARY INSIGHTS AND FURTHER RESEARCH

This note is work in progress and has examined empirically whether and how regional integration leads to convergence and growth amongst developing countries. Using standard growth models for nearly 100 developing countries over 1970-2004 we have not been able to find robust growth effects of regional integration at the aggregated level of analysis even after using alternative measurements of regions. Yet, country-specific growth diagnostics do suggest that regional integration can be a key if not binding constraint to growth as "deep" regional approaches can help to address crucial rail, road, air and energy links amongst countries (e.g. in the EAC).

Preliminary findings further suggest that initially high levels of regional income disparities will lead to greater decreases in disparities. Whilst the level of intra-regional trade and incomes do not explain changes in income disparities, the presence of a regional DFI (e.g. CABEI, EADB) with a relatively high loan exposure to GDP ration tends to reduce regional income disparities suggesting a useful role for deeper integration in achieving regional cohesion. A one percentage point increase in development finance (DFI) exposure leads to a drop of of about one percentage point.

Finally, while the macro economic literature on regional integration tends to highlight only limited expected effects of African regional integration, our work at the firm level in three African countries (Benin, Malawi and South Africa) is indicative of significant dynamic effects of RI for firm level productivity in Africa. We suggest that further growth analytical work is undertaken which combines the development of methods to examine the effects of regions and measurement of the various types of regional integration.

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APPENDICES

Countries for Annual Data for growth equations

Algeria	Iran, Islamic Rep.
Argentina	Kenya
Bangladesh	Lesotho
Benin	Madagascar
Bolivia	Malawi
Brazil	Malaysia
Burkina Faso	Mali
Cameroon	Mauritania
Chad	Mexico
Chile	Morocco
Colombia	Nicaragua
Congo, Dem. Rep.	Nigeria
Congo, Rep.	Pakistan
Costa Rica	Paraguay
Cote d'Ivoire	Peru
Dominican Republic	Philippines
Ecuador	Rwanda
Egypt, Arab Rep.	Senegal
El Salvador	Sri Lanka
Gabon	Sudan
Gambia, The	Swaziland
Ghana	Thailand
Guatemala	Togo
Guinea-Bissau	Trinidad and Tobago
Guyana	Tunisia
Honduras	Uruguay
India	Zambia
Indonesia	

Which RTAs are included?

In Africa we include:
EAC: Kenya, Tanzania, Uganda (Burundi and Rwanda joined in 2007)
CEMAC: Cameroon, Gabon, Central African Republic, Chad, Equatorial Guinea, Congo, Rep.
WAEMU: Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal,Togo
COMESA: Angola, Burundi, Comoros, Congo, Dem Rep, Djibouti, Egypt, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Uganda, Zambia, Zimbabwe
SADC: Botswana, Lesotho, Namibia, South Africa, Swaziland, Angola, Malawi, Mozambique, Tanzania, Zambia, Zimbabwe, Mauritius, Congo, Dem Rep, Madagascar, Seychelles
SACU: Botswana, Lesotho, Namibia, South Africa, Swaziland.

In Latin America:
MERCOSUR: Brazil, Argentina, Uruguay, Paraguay
CARICOM: Bahamas, Belize, Barbados, Jamaica, Guyana, Saint Vincent and the Grenadines, Saint Lucia, Saint Kitts and Nevis, Grenada, Dominica, Trinidad and Tobago, Suriname, Haiti, Grenada, Dominica, Montserrat.
NAFTA: United States, Mexico, Canada
ANDEAN: Bolivia, Columbia, Ecuador, Peru,

In Asia:
ASEAN: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam
SAARC: Afghanistan, Bangladesh, India, Maldives, Nepal, Pakistan, Sri Lanka

Developing country customs unions:

Africa
EAC: Kenya, Tanzania, Uganda (Burundi and Rwanda joined in 2007)
CEMAC: Cameroon, Gabon, Central African Republic, Chad, Equatorial Guinea, Congo, Rep.
WAEMU: Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal,Togo
SACU: Botswana (not in CU), Lesotho, Namibia, South Africa, Swaziland.

Other:
MERCOSUR: Brazil, Argentina, Uruguay, Paraguay
CARICOM: Bahamas, Belize, Barbados, Jamaica, Guyana, Saint Vincent and the Grenadines, Saint Lucia, Saint Kitts and Nevis, Grenada, Dominica, Trinidad and Tobago, Suriname, Haiti, Grenada, Dominica, Montserrat.
ANDEAN: Bolivia, Columbia, Ecuador, Peru.
GCC Cooperation Council of Arab States for the Gulf): Baharain, Saudi Arabia, Oman, Kuwait, Qatar , UAE.
CACM: Guatamala, El Salvador, Honduras, Nicaragua

Country experiences of implementing CETs based on WTO TPRs

The implementation of CETs in African custom unions on the basis of WTO trade policy reviews leads to the following emerging points:

- The introduction of the CET in WAEMU has narrowed the dispersion of duties (**Burkina Faso)** and rationalised tariff structures**,** and in some limit the maximum customs union (**Mali**);
- The implementation of the CET has not had a major impact on the structure of trade, but it has increased intra-WAEMU trade (**Benin, Togo**);
- Many countries apply rates that are lower or higher than the CET in WAEMU. Derogations are sometimes a response to social concerns (**Gabon**);
- The introduction of the CET often coincides with a lower MFN rate; but this is not always the case (EAC). In **Uganda** duties went up, and fiscal revenues as well;
- In SACU, countries have used special protection due to infant industry reasons: **Botswana** (3 times), **Swaziland** (from time to time) and **Namibia** (3 times).

Overview of analytical studies on growth and convergence in regional groupings

Study	Regions covered, time period	Evidence on convergence or divergence in regions	Method used to establish this	Factors affecting convergence and divergence in regions	Policy options / suggestions
Winners and Losers from Regional Integration Agreements Anthony J. Venables Pages 747-761 The Economic Journal Volume 113 October 2003	East African Common Market Collapse in 1977; Econ Community of West Africa 1972-1997; Generally includes all low income countries.	Divergence in customs unions with low income countries. An example is given between Kenya and Uganda where one country will gain more than the other. Cote d'Ivoire and Senegal saw a huge increase in manufacturing value added in their agreement over other nations.	Three models with two small countries and the rest of the world are used. 1) Diagrammatic analysis including competitive advantage and trade creation/diversion 2) Multi-good Ricardian trade model 3) Heckscher-Ohlin structure with production differentiation.	-The level of competitive advantage between member countries; a few nations will have an extreme competitive advantage while others will have an intermediate advantage.	Low per capita income countries should join customs unions/agreements with more development countries that possess a highly skilled workforce ('North-South' Agreements).
Global Trade Integration and Economic Convergence of Developing Countries William Amponsah, Dale Colyer, and Curtis Holly P 1142-48, Vol. 81, No 5 1999 American Journal of Agricultural Economics	Botswana, Kenya, and Ghana mentioned; main focus between developing countries and developed countries since the 1960's.	Convergence may be occurring between high income/low income nations if the low income nations have a faster growth rate (rather than a higher real GDP/income level). African nations are the exception because there has been little sustainable growth.	-Growth rates, Income levels, and Governing Structures among various regions are referenced. -Limited econometric data is used; paper is a survey of previous literature and is more background information.	-Governance: Stability and transparency are needed for growth and thus convergence with more developed countries -Investment in human capital and a skilled labour force -Financial Market stability- ease of investment -Agriculture a deterrent because of volatile commodity prices	-Developing countries have to establish stable governments and pro-growth policies (open economies) -Integration into the high skill global economy vital

Study	Regions covered, time period	Evidence on convergence or divergence in regions	Method used to establish this	Factors affecting convergence and divergence in regions	Policy options / suggestions
Regional Integration Agreements: A force for convergence or divergence? AJ Venables World Bank and LSE Prepared for the Annual Bank conference on Development Economics in Paris, June 1999	In general focuses on FTA's involving different income levels.	Divergence is re-emphasized for FTA's involving low income nations because of competitive advantage and also agglomeration of economic activity. Graphical evidence is provided to show the benefit of a 'North-south' agreement.	-Convergence/divergence is demonstrated through differences in skilled labour and in national income -Agglomeration is based on centripetal and centrifugal forces in industrial economics, and what FTA's do to the existing model.	See previous sections.	Emphasis on FTA's between rich and poor countries instead of partnerships within poor countries.

*Economic Integration and Convergence of Per Capita Income in West Africa Basil Jones Pages 18-47 Volume 14 Issue 1 June 2002 African Development Review	Convergence is tested in ECOWAS countries between 1960 and 1990, although comparisons to other regions are made.	Convergence is occurring within ECOWAS both in terms of a comparison to rich nations and a look at income equality between the members. However, the speed at which poor countries are catching up to rich countries is slow. A convergence club is forming which ECOWAS represents, but it's at the lower end of the convergence spectrum.	Two types of convergence are tested based on previous empirical research. convergence is tested for to determine whether or not poor countries are growing faster than rich countries (a negative correlation between initial per capita income and growth in per capita income). convergence tests whether or not the dispersion between per capita income levels declines over time.	The homogenous nature of the countries can affect whether or not convergence occurs. The author explains the population of the country, its economies' relative size, its natural resources, and its returns on capital all affect the speed of integration. An overview is given of different convergence theories, including the Solow Model and the convergence hypothesis.	Policy makers should look at whether or not real economic convergence is occurring. While the nominal convergence indicators can be justified, it is more difficult to rationalize them on an empirical basis.

*Regionalism in West Africa: Do Polar Countries Reap the Benefits? A Role for Migration Adama Konseiga Center for Development Research and IZA Bonn Discussion Paper No. 1516 March 2005	Countries in West Africa are mentioned, specifically Cote D'Ivoire and Burkina Faso. All of the literature cited is recent, and the data covers different parts of the last 30 years.	Convergence is found within the Union and the convergence path benefits more than the polar counties. This paper also focuses on the migration of skilled labour both in and out of the Union and finds that migration out of the Union to France and other developed countries leads to a 'brain gain,' while internal migration to Cote d'Ivoire is not as beneficial ('brain drain').	A modified version of the Solow growth model is used along with panel data and educational information from each of the member countries. The model is used with and without migration data to see its affect on convergence. The author has taken great care to remove bias through the use of first differences, etc.	Convergence and economic growth are affected by migration of the workforce, and a good background on migration theory is presented. In this background literature it is found that human mobility unambiguously speeds up convergence of product levels. A lot depends on which countries have the educated work force and where it migrates too, as the location greatly affects the benefits.	Poor countries losing parts of their workforce should develop irrigation and agricultural investments that will optimize their rural labour force. Of course, education is important for these countries because most of the brain drain is occurring at the secondary schooling level.
* Growth and Convergence in WAEMU Countries Abdoul Aziz Wane IMF Working Paper *Views not representing IMF October 2004	Convergence and growth is measured in WAEMU countries between 1965 and 2002.	This study finds convergence occurring across the WAMEU both absolutely and conditionally. When country-specific variables are omitted, the economies tend to converge at 6 percent a year. The growth is even faster when countries have similar investment ratios. The difference between factor accumulation and TFP growth is also explored.	Panel data models are used in this empirical testing because of its advantages over pure cross sections or time-series data. The author explains how estimates are more difficult to establish with panel data, and uses mean group and pooled mean group estimates. The Solow model is also examined and the convergence in the WAEMU does not fit the traditional 'catch-up' prediction.	Different convergence groups are explained, including the idea of 'club convergence' where the initial conditions of countries are the same. The paper found that investment in human capital is an important determinant of per capita output growth	For countries like Cote d'Ivoire and Senegal, there should be less emphasis on macroeconomic adjustment, and other countries should focus on political stability and sound government spending.

African Convergence Clubs: The Effects of Colonialism and Trade Dan Ben-David and Michael W Brandl University of Texas Graduate School for Business July 1996	Africa countries are analyzed in terms of regional blocks, colonial ties, and trading partnerships. Most of the research on convergence is between 1960 and 1988.	There is evidence of convergence among states on some levels. When looking at regions, the authors found statistically significant convergence in pooled results in West Africa and East/Central Africa. There was no significant convergence between countries who shared the same colonial dictator, but countries that open up their trading to multiple partners see more convergence than countries who stick to past colonial powers.	The paper tests convergence using the traditional neoclassical model and time series data. A lot of the regression results do not appear to be statistically significant, although there are enough results to reach general conclusions. All of the hypothesis testing is found in the back tables.	The focus of this paper is the effects of trade on convergence. The author argues there are 'convergence clubs' on different levels across Africa. Much emphasis is placed on the history of each region and how that has developed into these convergence clubs of today.	The authors argue that former colonial rulers need to loosen their ties to former states because trading exclusively with these countries makes them too dependent and does not allow for convergence.
Testing Real Convergence in the ECOWAS countries in Presence of Heterogeneous Long-Run Growths: A Panel Data Study Gilles Dufrénot and Gilles Sanon Centre for Research in Economic Development and International Trade, University of Nottingham October 2005	ECOWAS countries are analyzed from 1985-2003 for convergence emphasizing differences between countries.	No real convergence is found among the members, and there is even divergence. The model shows that countries have both short and long term structural heterogeneity, and thus follow their long-run growth paths. This is different from previous studies that assume a homogenous long-run growth path.	Panel data techniques are used in an error correction model that takes into account the latent heterogeneities across countries. Results are compared using the mean group estimator and results obtained with slope heterogeneity only in the long-run.	Niger, Nigeria, and Togo are said to lag behind because of the 'poverty trap' issue. Everything from membership in an economic and monetary union to peer pressure and regional surveillance can make countries more homogenous in the short-term, but they are one different growth paths because of different economic structures, aid spending, etc.	The author says the only way to eliminate structural heterogeneity is through a coordination of policies, which is already on the agenda for WAEMU and ECOWAS countries and their conditions for nominal convergence.

Study	Regions covered, time period	Evidence on convergence or divergence in regions	Method used to establish this	Factors affecting convergence and divergence in regions	Policy options / suggestions
The Road to Regional Integration in Africa: Macroeconomic Convergence and Performance in COMESA Fabrizio Carmignani United Nations Economic Commission for Europe Volume 15, Number 2, Pages 212-250	Covers more than a dozen countries that fall within COMESA, an economic agreement attempting a common currency by 2025. Data is from the last 10-20 years (1980-2002).	Generally speaking, there is no evidence of significant convergence in the COMESA countries. In fact, substantial divergence and heterogeneity still exist. There appears to be a group of countries converging near the bottom of the income measurement, making the overall disparity larger. Despite this, there is evidence that business cycles are synchronizing in some member states.	Testing models are based on past literature and include both time-series and panel data. The income convergence is tested to determine the existence of a □ convergence.	There are indications that monetary policy stances are integrating, which should make convergence more likely in the future. The author states that harmonization policy, different institutions, and trading rules all affect convergence among the countries. There is a need to 'break up' countries at the bottom of the spectrum.	The author lists four major policy suggestions based on the research: 1) Design effective mechanisms for monitoring and enforcement. 2) Realize a preferred trading area with the elimination of certain barriers. 3) Creation of efficient communitarian institutions, including an integration system of central banks. 4) Full consideration of institutional and economic factors.
Is Long-Run Output Convergence Associated with International Economic Integration? Some new evidence for Selected African Countries Mark L. Holmes Waikato University Journal of African Economies Development Volume 30, Pg. 67-86, Number 2, December 2005	CFA, SACU, and ECOWAS countries are tested for long run per capita income convergence between 1960 and 2000.	There is strong long-run convergence in both CFA and SACU, with the latter having most convergence. However, there was no evidence of long-run convergence in ECOWAS. It appears that monetary unions did better than trade agreements in convergence. There are also different levels of convergence within the groupings; for example, countries that were originally stationary in the CFA did not experience strong convergence.	This test is based on whether the first largest principal component, based on benchmark deviations from base country output, is stationary or not. The author claims that unit root testing of the first LPC based on income differentials offers a number of advantages over existing tests of convergence because the choice of base country is not as important (where it is using panel data).	The size of the group does not appear to greatly affect convergence; larger groups did just as well as the smaller groups. It is important to know whether or not a country was initially stationary, as this affects how great the convergence is. The paper focuses more on the model than on factors surrounding his results.	The groupings that exhibit little or no evidence of convergence may require additional regional development policies that facilitate closer integration among member states. Researchers should also reflect on why some regional agreements are better at producing convergence than others.
Ten Years After the CFA Franc Devaluation: Progress Toward Regional Integration in the WAEMU Nicolas van den Boogaerde and Charalambos Tsangarides African Department- IMF Working Paper July 2005	WAEMU countries are investigated in three different sub-periods after the devaluation of the CFA franc to test for convergence and integration. The first period is from 1990 to 1993, the second from 94-98, and the third is from 99-03.	Convergence tests for a number of different indicators show limited convergence across WAEMU countries. Neither the sources of GDP growth nor its uses indicate progress towards convergence. The 'gravitational pull' from WAEMU to poorer countries was absent during the periods. In addition, fiscal convergence is also limited, even though the homogeneity of countries' tax revenues and expenditures have improved.	A wide variety of testing methods are used here, testing for □ convergence, □ convergence, and some measure of rank concordance (γ convergence). Other 'cointegrating' relationships among variables are also analyzed.	For the financial variables, a highly divergent evolution in the level of investment outlays and in debt service costs has explained the lack of convergence. The difference between country-specific and regional policies also affects who sees the benefits from the agreements. The decrease in labor mobility has also hindered economic growth and convergence.	The author states that reversing the lack of convergence will be difficult, and the monetary union will need a significantly stronger political drive to overcome the narrowness of their economies and lessen structural rigidities.

[illegible]	[illegible] discussing economic shocks and whether they are uniform between countries.	[illegible] countries, there is high variation when there is a demand shock. In general, shocks are mostly asymmetric.	[illegible] tariff reduction and reduction of external tariffs through implementation of the common external tariff of CEMAC. Estimates are done with a comparative statistics model, although estimated gains from free trade will be larger in a dynamic model with endogenous growth. The quantitative analysis	[illegible] though important is only one aspect forming a monetary union.	[illegible] economic and political features.
Pages 161-290 December 2000 African Development Group			incorporates the welfare changes of all goods.		
Banking Sector Integration and Competition in CEMAC Samar Saab and Jerome Vacher IMF Working Paper January 1st 2007	Retail banking integration in the CEMAC is considered in this paper and whether or not convergence is occurring there. Data are from 2000 to 2004/5.	There is some evidence of price convergence in average interest rate spreads. However, the empirical evidence is not supposed by an increase of cross-border flows in retails loans and deposits. Price convergence may merely reflect excess liquidity in the region. Bank competition in CEMAC is limited, which limits further integration.	Various methods allow a quantitative assessment of the degree of financial integration and are based on interest rate data, bank structure data, mergers and acquisitions data, and bank concentration data. convergence is tested for in the interest rate spreads.	A number of factors could affect convergence in the financial markets. 1) Increase in bank deposits because of settlement of government arrears. 2) A scarcity of investment opportunities has lead to high liquidity. 3) Limited lending opportunities exist.	Price convergence implies that price differentials for the same financial service should be reduced, down to a level explained mostly by the existence of arbitrage or transportation costs.

An Analysis of Macro-Economic Convergence in SADC Jannie Rossouw University of Pretoria/ SA Reserve Bank September 2006	Countries in SADC are analyzed to determine whether or not a monetary union can exist if all of the macro-convergence criteria are not met. The author compares the current situation to that of the EU.	It appears that SADC countries have mixed results in meeting their goals for a monetary union, which must be met by 2008. Some countries achieved their goals in 2004 and have maintained this progress, while others have not been as successful. The author argues that meeting these criteria are not vital to establishing the union, and cites the EU as an example.	Simple data on inflation rates and GDP are presented and compared to the required benchmarks.	The author argues that macro-economic convergence goals have to be viewed properly in order for true convergence to occur. Instead of thinking of them as a condition to enter an agreement, they should be viewed as a constant goal, even in the EU.	A monetary union is still possible in SADC even if all the countries do not need their goals.