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Real and conditional convergence in Africa: The case of the Franc zone Countries

Latif Dramani

Agence Nationale de la Statistique et de la Démographie, Rue de Diourbel X Rue de Saint Louis BP, 116 Dakar RP, Sénégal. E-mail: dramaniarmel@yahoo.fr. Tel: (221) 77 514 84 40.

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Using the convergence theory inspired by models of endogenous growth, this paper analysed convergence in the economies of the Franc Zone countries in Africa. With an econometric validation based on cross-sectional and panel data, the paper tested a number of hypotheses, the main ones being the convergence of the economies of the UEMOA and CEMAC zones through per capita income, the existence of spillover effects, as well as the search for a common growth path for the economies of the two zones. The study's findings show that the convergence process, and hence that of integration has not been carried out uniformly in the Franc Zone: the process has been given greater emphasis in UEMOA than in CEMAC. Further, the conditional convergence model highlights the existence of key variables that help to maximize the convergence speed. A more refined convergence approach, which used similarities related to production factors and those related to natural advantages highlight the presence of a convergence club. The study found a period-related convergence in the cotton-producing countries, coffee-producing countries and coastal countries. This shows that the hypothesis of a common convergence path in the Franc Zone has not been borne out by our study.

Key words: Beta convergence, stochastic convergence, panel data, cointegration, economic integration.

INTRODUCTION

Even before the big push towards globalization in the last decades of the 20th century, some countries in west and central Africa had begun the process of integration, in particular by setting up monetary unions in a common monetary zone - the Franc Zone - as well as establishing economic communities. With these monetary unions, the African countries in the Franc Zone experienced a relatively stable monetary situation for a fairly long period. At the economic level, however, the results were less exciting, especially in the 1980s. This is because during this period the economies of these countries were marked by huge macroeconomic imbalances aggravated by a slowdown in economic activity. With a view to restoring macroeconomic balance and stimulating growth, governments set up stabilization policies that were later strengthened by the implementation of structural adjustment programmes recommended by the several years into the implementation of these International Monetary Fund (IMF) and the World Bank.

Programmes, the results were hardly satisfactory. So, faced with persistent economic imbalances, the Franc Zone countries decided to devalue the CFA franc, with the aim of improving the competitiveness of their economies by stimulating exports so as to achieve sustainable economic growth. This devaluation, which in January 1994, enabled the African countries in the Franc Zone to see their economies grow once again, strengthen their monetary unions, and speed up the integration process by setting up economic and monetary unions, the West African Economic and Monetary Union (UEMOA) and the Economic and Monetary Community of Central Africa (CEMAC). The organization of the two bodies was greatly inspired by the strengthening of the European Union.

This integration goal is part of a plan of reforms that rests on four main actions: the harmonization of the legal and regulatory framework, the setting-up of a common market, the multilateral monitoring of macroeconomic policies, and the coordination of sector-based national policies in the main areas of economic activity. In order to achieve a successful economic integration, however,

JEL: F15, O12, O47, C31, C32, C33

Table 1. Convergence Criteria.

Criteria	Standards
Basic budgetary balance over the GDP	0
Average annual inflation rate	<3%
Ratio of the total outstanding public debt to the nominal GDP	70%
Running costs arrears	(Days)
Domestic	<120
Foreign	<120

certain conditions must be met, key among them being the convergence of economic performance and policies. To this end, convergence criteria were devised within the framework of the multilateral monitoring envisioned by the Convergence, Stability, Growth and Solidarity Pact set up to facilitate the process of the nominal convergence of the countries in the two zones. As part of this multilateral monitoring, convergence criteria were instituted within the two blocs; if the criteria were observed, that could lead to nominal convergence and it is assumed that this nominal convergence would lead to a real convergence of the economies concerned (Loufir and Reichlin, 1993).

In each zone, the nominal convergence criteria can be grouped into two distinct sets. In the UEMOA zone, the structure of convergence criteria was greatly inspired by the model in force in the Euro zone. There are eight criteria that are classified into first-order and second-order criteria. The first-order criteria have to do with:

- The ratio of the base budgetary balance to the nominal GDP; it has to be positive or zero.
- The annual average inflation rate, which must not exceed 3%.
- The ratio of the outstanding domestic and foreign debt to the GDP; it must not exceed 70%.
- Sub-criteria of non-accumulation of domestic arrears and non-accumulation of foreign arrears.

The second-order criteria comprise the following:

- The ratio of the wage bill to tax revenues must be lower than or equal to 35%.
- The ratio of financed public investment to domestic resources and to tax revenues must be at least 20%.
- The ratio of the current external balance to the GDP must be higher than or equal to 5%.
- The rate of tax pressure must at least be equal to 17%.

In the CEMAC zone, there are nine convergence criteria that are subdivided into basic criteria and indicators. The former are similar to-orderthecriteria UEMOA zone's first and are expressed as in Table 1.

These convergence criteria, which are constantly monitored as part of the multilateral monitoring mechanism, produced mitigated results after several years of being in force. It is necessary to carry out a descriptive analysis of certain variables that determine the nominal convergence of the economies of the countries in the UEMOA and CEMAC zones. This paper conducted an analysis of per capita income to show the profile of the convergence of economies.

MATERIALS AND METHODS

The economic situation and structure of the franc zone (Tables A1, A2 and A3 in the annex)

Covering a total area of 6,529,271 sq km, the franc zone had a population of 112.27 million people in 2000. In total, these countries represent close to 22% ttleofoverAfrica's12%of its population. On its own, UEMOA covers 53.7% of the area and shelters about 70% of zone's popul conditions vary across the region from Sahelian to forest and equatorial areas. These climatic conditions have a big influence on the economic activities of the countries in the zone.

Basic commodities such as agricultural products, oil, ore and timber, are the main exports of the countries of the Franc Zone, with the first twos sharetaking.Agriculture therepresentslion'alittle less than one-third of the zone's GDP (30% in some countries of the zone is largely dependent on rainfall. In countries like Congo-Brazzaville and Gabon, the share of agriculture in overall GDP was below 10% in 2000. For many countries, however, especially Mali and the CAR, the share of the agricultural sector is greater than one -third, representing 41.2 and 55.2%, respectively, in 2000 (Table 2).

The zone's manufacturingeak:it representssector i a quarter of its GDP (25% in 1994 and 26% in 2000). In countries like Benin and Chad, the sector is still at an embryonic stage, as it represents only about 14% of GDP. However, the oil subsector is growing in some countries of the zone: oil production reached 370 million barrels in 2000, which represented 21% of the total oil production in sub-Saharan Africa. Most of this production comes from Gabon, Congo-Brazzaville and Equatorial Guinea. The growth of this subsector accounts for the relatively high share of the industry in Gabon's and Congo's GD 72.2% for the latter.

Integration and convergence: Lessons from the different models

The concept of economic integration emphasizes the optimal allocation of resources. According to the classical theory of international trade, integration gains are related to differences in terms of aptitude, factor endowment, and consumer preferences or collective preferences. There are two types of integration: institutional integration and spontaneous integration. The former rests on binding agreements aimed at reducing and, ultimately, eliminating trading or regulatory obstacles to the trade in goods, services and factors. It imposes a harmonization of regulations that ensure at the least, the viability of this reciprocal liberalization. The latter, for its part, is characterized by the lack of a formal framework of the nature of a free-trade treaty, as well as the lack of a deliberate will to discriminate against non-members. Within the framework of the present study and of the Franc Zone countries,

historical facts indicate that it is the institutional integration that is in force. Because of this, it is worth wondering whether regional integration is conducive to the achievement of a real convergence

Table 2. Evolution of the economic structure of the countries in the franc zone.

	Share of agriculture (%) of the GDP			Share of the manufacturing sector (%) of the GDP		
	1993	**1994**	**2000**	**1993**	**1994**	**2000**
Benin	33.8	33.5	36.5	13.4	14.7	13.9
Burkina Faso	34.0	35.0	39.7	21.4	27.5	19.1
Central A R	45.6	44.9	55.2	21.5	22.0	20.0
Côte d'Iv	34.9	27.7	24.2	20.7	18.5	22.2
Cameroon	27.9	39.6	42.6	24.6	23.5	19.7
Congo Brazzaville	11.2	10.2	5.3	35.3	45.5	72.2
Gabon	8.5	9.1	6.4	43.0	51.4	53.2
Mali	44.5	46.4	41.2	16.3	18.9	21.3
Niger	38.5	40.8	37.8	17.9	17.3	17.8
Senegal	19.0	18.8	18.2	19.1	21.0	26.9
Chad	32.5	37.8	39.2	14.1	11.9	13.8
Togo	44.1	34.9	37.8	20.7	21.2	22.1

Evolution of the Franc zone's growth rate

Year	**1993**	**1994**	**2000**
Growth rate (in the CFA Franc Zone)	-1.4	1.8	2.3

of economies. The issue of regional integration in French-speaking Africa of necessity involves the integration of countries that have achieved different levels of development. The existence of the Franc Zone links a developed country, France, to developing countries, many of which belong to the category of least developed countries. In addition, the attempts at regional integration, which were given new impetus by the devaluation of the CFA franc, involve African countries that are themselves heterogeneous. The originality of the Franc Zone lies in the fact that the monetary union functionedas theculmination integration. It obviously did not correspond to any of the criteria of an optimal monetary zone, because of the highly asymmetrical nature of most of the shocks that were likely to arise either in France or in the African countries. The countries in the CFA zone thus benefited from a stable, common and totally convertible currency owing to the involvement of France. Until 1985, the economic performance of these countries was better than that of the other African countries in terms of growth and inflation rates (Guillaumont and Guillaumont, 1988; Heidhues and Michelsen, 1995). Actually, research findings by Lelart (2003), which point out the failure of very many regional integration agreements on the African continent, clearly demonstrate that the CFA zone remains an example of successful integration in Africa. Finally, while the type of integration in force in the Franc Zone seems to be very original, both the UEMOA treaty and the CEMAC treaty aim to create an institutional type of integration like that of the European Union. There is little wonder then if Lelart's criticisms against reforms remind us of those made in Europe against their monetary union: the too high priority accorded to monetary stability and the insistence on nominal convergence rather than on real convergence.

Overall economic weight and socioeconomic indicators (Table A3 annex)

Following a period of deep macroeconomic imbalances characterized by deficits in their budgets, trade balance and outstanding debt. The CFA devaluation of January 1994 was designed to boost export and economic growth. Even though this devaluation did not bring about very satisfactory results, it enabled the Franc Zone to experience growth once again. Indeed, in 1994, the growth rate in the Zone rose to about 2%. This was maintained until 2000, and rose further to 3 balance deficit was absorbed from 1995. However, the level of certain social indicators is an indication that the results were not sufficient overall.

The balance of current transactions remained negative during the post-devaluation period. The level of per capita GDP, which was US$459 in 2000, is still very low, well below that of the USA (US$31,843), East Asia (US$946) and sub-Saharan Africa (USof$563)an.But behind"institutional"thisaveragefigurethereare big disparities:regional In 2000, Gabon, Congo-Brazzaville, Côteonandd'Ivoi Senegal recorded a per capita GDP average. Gabon and Equatorial Guinea have the highest per capita GDPs: US$4,378 and US$1,599, respectively. Guinea Bissau, Chad and Niger have the lowest GDPs of the Zone. With regard to social indicators, the illiteracy levels are generally very high. They are highest in Niger and Burkina Faso, with rates of 84 and 76.1%, respectively. Equatorial Guinea and Congo-Brazzaville have made notable efforts to improve literacy levels: They have managed to reduce illiteracy levels to relatively low rates of 16.8% and 19.3%, respectively.

This rather average growth recorded in the zone after the CFA franc devaluation remains lower than the threshold recommended by the World Bank for a substantial reduction of poverty - which has now reached worrying proportions in the zone. To eradicate poverty, higher growth rates must be targeted as part of a strategy for accelerated growth and poverty reduction, and the integration process must be deepened so as to achieve a better convergence of economies.

Analysis of per capita income

The aim of this analysis is to establish whether economies tend to converge towards the same levels of per capita income and to examine the phenomena that are likely to contribute to this convergence. This section therefore explores the average profile (within one constant) of the -Fran comes over the 1970 - 2000 periods, by using the correspondence factor analysis. The projection, on the first factor pattern of this analysis of the annual distributi incomes, enables the zone to capture about three- quarters of the

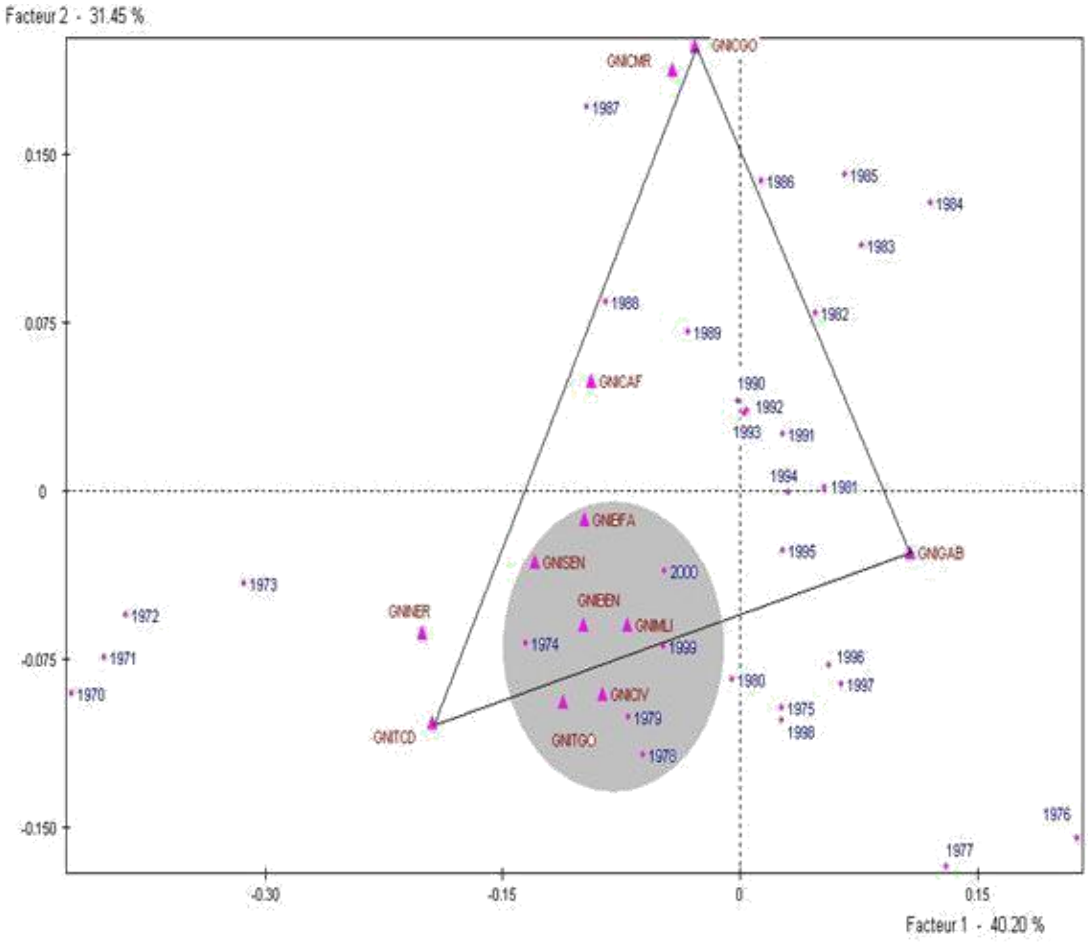

Figure 1. Per capita income for the Franc Zone countries estimated using factor analysis approach.
Key: GNI = Per capita gross national income; BEN= Benin; BFA= Burkina Faso; CAF=Central African Republic; CIV= Côte d'Ivoire; CGO= Congo Brazzaville; CMR= Niger; SEN= Senegal; TCD= Chad; TGO= Togo

variables of this distribution. In general, the UEMOA countries present a quasi-homogeneous situation that manifests itself in their tendency to form one grouping, while the CEMAC countries present a very heterogeneous structure that manifests itself in the three apexes of the triangle described by the projection of all the countries in the Franc Zone (Figure 1).

With regard to the UEMOA countries, their tendency to come together into one grouping has been made possible especially by the similarity of the adjustment of their economies over three periods:

- 1974: The first oil shock, which was characterized by the most notable increase in this ratio in all the countries in the zone.
- 1978/79: The second oil shock, which was much more advantageous for Côte d'Ivoire, Togo and Nigerc.eationThus, ofin the1978francd zone's monet then in 1979, Côte d'Ivoire recordedanyof thelevelscriteriaofan inoptimalthemonetaryincreasezonebecause ofinthe the capita income that corresponded to the levels recorded by Burkina Faso and Mali put together in 1978.
- 1999/00: This period, unlike the two preceding ones, was characterized by a fall in this indicator in all the countries of this zone.

As for the CEMAC zone, Congo and Cameroon on the one hand (1985 - 1987), and the Central African Republic (CAR) on the other (1987 - 1989), seem to have benefited from the structural adjustment programmes that enabled them to improve their per capita incomes. In the specific case of Gabon, this indicator saw a significant improvement only in one to two years (in 1985, 1980 and 1996/97) after the three major disruptions (the two oil shocks and the 1994 CFA devaluation) that all the franc zone countries underwent.

The factor analysis carried out on certain nominal convergence variables shows that the economic integration process launched to back up the franc zone's monetar convergence and, as a result, a convergence in the levels of development. This convergence of national or regional economies is one of the dominant subjects that have been dealt with in the macroeconomic literature for about a decade. In addition, the strongly asymmetrical nature of most of the shocks likely to arise in France and the African countries concerned. The many years of functioning of this zone and the setting-up of economic areas raise questions about the existence of an optimal monetary zone and the spreading of shocks through other countries and their impact on the convergence. Would the possible gains of integration enable a convergence of the integrated economies in the franc zone? Indeed, according to Pritchett (1995), in the long term it is rather a

general divergence phenomenon that may emerge. However, this means neither an absolute impoverishment of the poorest countries in the zone, nor a lack of a convergence club. Thus, at the time when countries wonder about the future of the CFA franc and anticipate the expansion of the economic and monetary unions by allowing other countries to join them, testing economic convergence and convergence clubs existence within WAEMU and CAEMC is necessary.

Research framework

One fundamental question that is often asked in the economic literature is to know whether economies tend to converge towards the same levels of income or production per capita; in other words, whether there exists a mechanism that allows a given economy to catch up with the level of the per capita income of a more developed economy (Baumol, 1986; Barro and Sala-i-Martin, 1991, 1992). Many empirical studies seeking to test this hypothesis at the international or regional level have had to face econometric difficulties that rendered the interpretation of results very difficult. This issue is more than ever before a topical one for the Franc Zone African countries especially in light of the 1994 CFA franc devaluation and the establishment of UEMOA and CEMAC on the model of the European Union. The Maastricht Treaty, as the underlying reference provides that participation in the economic and monetary union, as well as in the single currency mechanism, is subject to the observance of certain standards. Often known as convergence criteria, these standards are of a monetary, budgetary and financial nature, in order to ensure a nominal convergence of the economies of the member countries. This convergence concerns nominal variables and not real ones.

The principal goal of the Maastricht Treaty is to stimulate growth and economic integration by stabilizing the exchange rate and prices. This implies that countries whose objective is to achieve the same nominal targets will see their economies converge, thus eventually fostering the evolution towards an economic union. The nominal convergence of potential members will thus lead to their real convergence (Loufir and Reichlin, 1993). However, being part of a process of nominal convergence can be very costly for very poor countries that are usually far from the set nominal objectives, but this situation could actually lead to a process of real divergence. It thus clearly appears that the approach used for the Maastricht Treaty has non-negligible limitations, which were actually raised within the European Union, with regard to the costs and benefits that are to be expected from an economic and monetary union. Such concerns are important for the countries of UEMOA and CEMAC, since they want to add an economic union to a monetary union that is already more than 40 years old. It would be legitimate to ask whether the UEMOA zone countries would not gain by following a process that was more in line with the specific nature of their economies, instead of trying to copy the exact model of the Maastricht Treaty.

The results of the factor analysis reported above allowed us to note that as far as the factor patterns of the subperiods studied (the pre devaluation period), it was not possible to observe the beginning of a convergence process whatever the criterion considered. Those patterns were thus left out of the document. Nevertheless, a look at the three factor patterns presented in the introduction reveals the existence of a beginning of convergence depending on the criteria taken into account. As a result, it would be interesting to test the phenomena of real and conditional convergence observed in factor analyses by conducting an econo-metric study, in light to contribute on the lack of a recent study on the convergence of the franc zone countries.

The various elements identified (shocks and specificities of each country) in this study, as well as other structures specific to the economies under study, will be taken into account in order to measure their effect on the convergence speed.

Objectives and hypotheses

The aim of this study is to examine whether there exists a robust and systematic convergence trend in the levels of income in a homogeneous group of countries in the Franc Zone. Here the term homogeneity refers to similarities in macroeconomic features. Recent theories on growth and development have suggested that the per capita distribution of income in regions and/or countries can serve as a basis for forming convergence clubs. This means a tendency for stationary countries to come together into a small number of growth areas. This tendency could arise from these countries' having similarities in government policies and strategic production factors.

The study contributes to the various research and analytical studies on various aspects of convergence. To my knowledge, no study has yet taken into consideration the spatial phenomenon in the UEMOA and CEMAC zones. The specificity of the study lies in the fact that it has extended the research field and has addressed the issue of convergence using a new approach - that of using panel data and new tools of spatial econometrics. The study was thus designed to fill a gap in the area of research on convergence in the Franc Zone African countries. Its specific objectives are:

- To conduct a comprehensive study of the convergence of the economies of the zone.
- To achieve these objectives, the methodological approach revolves around three main points:

(1) A theoretical model of convergence that presents the economic and institutional environment in which activities take place.
(2) An exploratory analysis of trends that involves many indicators of nominal convergence.
(3) An explanatory approach that consists of estimating and interpreting the results of the convergence models implemented.

The study considers three hypotheses:

- H_1: The Franc Zone countries follow a level convergence in accordance with the rate of the per capita GNI.
- H_2: The convergence speed is identical for the Franc Zone countries.

Two series of tests were used to test hypotheses 1 and 2; first, the classical convergence tests based on the beta-convergence were used. In this particular case model (6) and (7) were calculated for each variable used.

Convergence: Sources of the theory

It is considered in this study that the production function in the UEMOA and CEMAC zone is of the Cobb-Douglas type, as shown in Equation 1, where *Y(t), K(t), A(t),* and *L(t)* represent, respectively, production, capital, level of technology and the labour of a country considered at time *t* while *A.L* represents the countr as an efficiency unit.

$$Y(t) = K(t)^{\alpha} \left(A(t)L(t)\right)^{1-\alpha} \quad (1)$$

The parameters α and *1* - α are the elasticities of the production of capital and labour. On competitive markets, production factors are valued at their marginal costs. Labour *L* and level of technology *A* are assumed to increase at exogenous growth rates *n* and *g*. While the growth rate of technology *g* is assumed to be constant for

all the countries, the growth rate for populations, *n*, generally differs from one country to another. The accumulation of the factor is described by the following equation:

$$K(t) = s_k \bullet Y(t) - k \bullet K \quad (2)$$

Where *sk* is the investment ratio and k the rate of depreciation of the stock of physical capital. Finally, level of technology *A* and labour *L* change at given exogenous growth rates *g* and *n*. The resolution of the per capita stationary state *(y * = Y/L)* implies that there is under a logarithmic form:

$$\ln y^{*} = \ln A + gt + \frac{\alpha}{1-\alpha}\ln s + \frac{\alpha}{1-\alpha}\ln(n+g+k) \quad (3)$$

The standard convergence specification is obtained by an approximation of the Taylor series around the stationary state, which finally leads to:

$$\ln y_t = (1-e^{-\lambda\theta})\frac{\alpha}{1-\alpha}\ln s_k - (1-e^{-\lambda\theta})\frac{\alpha}{1-\alpha}\ln(n+g+k) - (1-e^{-\lambda\theta})\ln y_{t-\theta} + (1-e^{-\lambda\theta})A_0 + g(t-e^{-\lambda\theta}(t-\theta)) \quad (4)$$

Where refers to the period of time to which Equation 4 applies, and is the convergence rate.

This cross-sectional specification was extended to the case of panels by Islam (1995); it offers several advantages. And even more important, it makes it possible to control the differences in the initial stages of technology *A0*, which are reflected in the countries' specific fixed effects*n*and *sk* are constant during the period are more realistic when they are applied to shorter periods. Finally, a panel approach makes it possible to have a greater number of observations.

By using the conventional notation in the literature on panel data, Equation 4 can be rewritten as:

$$\ln y_{it} = \gamma \ln y_{i,t-1} + \beta_1 \ln s_{it} + \beta_2 \ln(n+g+k) + \mu_i + \eta_t + \omega_{it} \quad (5)$$

With $\gamma = e^{-\lambda\theta}$; $\beta_1 = 1 - \frac{\alpha}{\alpha(1-e^{-\lambda\theta})} = \beta$; $\beta_2 = -\beta$ $\mu_i = (1-e^{-\lambda\theta})\ln A_0$ = specific effect "region" (invariant time)

$\eta_t = g(t_2 - e^{-\lambda\theta}$

ω_{it} = the term of error is habitually assumed to be $IID(0, \sigma^2)$

Imposing restrictions on β_2 in Equation 5 gives the final empirical model:

$$\ln y_{it} = \gamma \ln y_{i,t-1} + \beta \ln x_{it} + \mu_i + \eta_t + \varpi_{it}$$

Where the regressive variables are illustrated by $x_{it} = s_{it} / (n+g+k)_{it}$

The foundations of convergence

Convergence theory is based on the neoclassical growth model (Solow, 1956; Swan, 1956) and implies a tendency over the long term to level the rate of income growth or that of per capita production in different geographical zones. In other words, there is convergence when a "poor" economy rapidly than a "rich" economy, in the long term catch up with the level of income or per capita production of the "rich" country. referred to as the -convergence (Barro and Sala-i-Martin, 1995).

This type of convergence can be absolute (that is, unconditional) or conditional. It becomes absolute when it is independent of initial conditions. It becomes conditional when, additionally, the economies concerned are assumed to be identical in terms of preferences, technologies and economic policies.

The absolute -convergence hypothesis is usually tested on the cross-sectional model given below:

$$(1/T)\ln(y_{i,t}/Y_{i,0}) = + \ln(y_{i,0}) + {}_i \quad (6)$$

Where $y_{i,t}$ is the per capita GDP of region *i* (1 ,..., *N*) at the date *t*; *T* is the length of the period of study; a and are unknown parameters to be estimated, and $_i$ is a random error term. We say that there is – convergence when β is negative and statistically significant, because in this case the average growth rate of per capita GDP between the dates *0* and *T* is negatively correlated with the initial level of the per capita GDP. Estimating β enables us to calculate

the speed of convergence, $\theta = -\frac{\ln(1+T\beta)}{T}$, and

the necessary duration required for the economies to make up for half of the distance that separates them from their stationary state;

this duration is called half-life: $\tau = -\frac{\ln(2)}{\ln(1+\beta)}$.

. Thus, the assumptions that

Conditional convergence

The neo-classical model of growth (Solow, 1956) predicts that an economy's growth rate is positivel separates it from its own stationary state. This is the concept known as the conditional beta convergence. There is beta conditional convergence if the estimation of beta is significant negative once the *Xi*'s are held constant. The tes conditional beta-convergence is based on the following model:

$$1/T)\ln(y_{i,t}/y_{i,0}) = + \ln(y_{i,0}) + Xi + {}_i \quad (7)$$

Where *X* is the vector of variables that makes it possible to keep as constant the stationary state of economy *i*. It can comprise state variables, like stock of physical capital and stock of human capital; or control or environmental variables, like the proportion of public consumption in GDP (Barro and Sala-i- Martin, 1995). We can test the conditional convergence hypothesis in another way, still based on Equation 7, but using subsamples of economies for which the hypothesis of states of stationary equilibrium seems acceptable (setting up convergence clubs, for instance, as in Jean Pierre, 1999). We eventually derive the differential effect on convergence by taking into account, in relation to variable *Xi,* first the economic structure and second the institutional variables.

RESULTS

The convergence was studied over three subperiods

- 1965 to 1979(Owing to the availability of data related to

the ratio of external debt to GDP, this subperiod runs from 1970 to 1979 and has simply been left out in relation to the ratio of the current external balance to the GDP.), which corresponds to the existence of the UMOA and UDEAC monetary unions.- 1980 to 1993, which corresponds to the coexistence of structural adjustment policies and the two monetary unions.
- 1994 to 2000, which corresponds to the coexistence of economic policies such as the CFA devaluation and the establishment of institutions charged with implementing economic and monetary polices in the Franc Zone countries (UEMOA CEMAC).

Here the paper mainly looks at the behaviour of per capita income under different angles: absolute convergence and conditional convergence. All in all, the analysis reveals that the Franc Zone countries experienced absolute convergence only after the post-devaluation period. This period was characterized by a cohabitation of a monetary union and an economic one within the same organization, as well as the existence, within this organization, of convergence clubs.

Econometric analysis of the phenomenon of absolute convergence based on per capita income

One of the objectives of this study is to examine whether economies tend to converge towards the same levels of per capita income and another is to examine the phenomena that are likely to contribute to this convergence. The results of the various econometric estimations carried out for the four subperiods show that the Franc Zone countries experienced this type of convergence only during the post-devaluation period, even though neither of the two blocs (CEMAC and UEMOA) that compose the zone experienced such a convergence. Table 3 summarizes the findings.

The 1970 - 2000 periods

During this period, convergence was recorded only in the OA member countries and the cotton-producing countries, with the convergence speed in the latter group being seven times higher than that in the former. This high speed linked with cotton stems from the special position that this product occupies in the economy of most of the Franc Zone countries. For instance, cotton is one of the main export products for Mali, Burkina Faso and Benin, while cotton farming is a source of employment for a big proportion of the population.

The 1970 - 1979 periods

Only cotton-producing countries converged at a speed (of 2.60% per year) that is clearly lower than that (of 3.28%) recorded during the 1970 - 2000 periods. In other words, the establishment of economic unions had less impact on these countries' convergence was cotton production still in its initial stages, but also,
and most importantly, because it is dependent upon climatic conditions and the largely fluctuating cotton prices on the world market.

The 1980 - 1993 periods

Not all the Franc Zone countries experienced the convergence phenomenon, even though either bloc did. In the West African CFAF countries there was greater convergence: their convergence speed (1.22%) was three times higher than that recorded in the CFAF countries of Central Africa. In such conditions, the SAP-related economic measures, in conjunction with measures recommended by the CEAO, had a greater impact on reducing disparities within the Franc Zone of West Africa than in those of Central Africa. Moreover, the oil-producing countries of the Franc Zone and cotton-producing countries experienced convergence, with a higher speed in the latter countries. These results seem to provide evidence for the importance of the role played by the two export products in bringing about convergence in terms of similarities of economies.

The 1994 - 2000 periods

This is the period during which, unlike the other three subperiods, coastal countries, coffee-producing countries and Franc Zone countries in general all experienced convergence. This was highest in the coffee-producing countries, where the convergence speed (1.81%) was more or less three times those recorded in coastal countries (0.67%) and in Franc Zone countries (0.58%). This high performance achieved by coffee-producing countries could be partly attributed to the CFAF devaluation and to the economic measures recommended by UEMOA and CEMAC with a view topromoting exports and the free movement of goods and services which made coffee very competitive on the markets of the two blocs as well as on those outside.

The results obtained for this subperiod corroborate those found by Pritchett (1995): indeed, during the other, relatively long, subperiods the Franc Zone countries did

- An administrative disorganization through its negative impact on public expenditure and receipts (Gang and Khan, 1991; Khan and Hoshino, 1992).
- A negative impact on agricultural production if it is in the form of food aid.
- Various distortions that would arise from making available "capital without co

With regard to the export rate, on the one hand its increase by 1% leads to a 1.52% increase in the per

Table 3. Absolute convergence looked at in terms of institutions and similarities.

Log (Gnitete)	Franc zone	Geopolitical situation			Similarity in terms of goods		
		UEMOA zone	CEMAC zone	Coastal countries	Oil-producing countries	Cotton-producing countries	Coffee-producing countries
				1970 - 2000			
Log(Gnitete0)	0.005*	-0.004**	0.015*	0.012*	0.01*	-0.021*	0.002
Constant	0.001	0.047*	-0.046*	-0.034*	-0.018	0.121*	0.019
Wald Chi(2)	11.17	5.00	43.25	32.83	8.90	52.42	0.41
Prob(Chi2)	0.0008	0.025	0.000	0.0000	0.0029	0.000	0.52
Convergence speed	No convergence	0.46%	No convergence	No convergence	No convergence	3.28%	No convergence
(1/14)*Log (Gnitete)				**1970 - 1979**			
Log(Gnitete0)	0.011	-0.006	0.036*	0.025**	0.029	-0.023***	0.017
Constant	-0.013	0.073	-0.138**	-0.078	-0.100	0.149**	-0.033
Wald Chi(2)	1.98	0.39	7.71	3.72	2.44	2.64	1.00
Prob(Chi2)	0.1595	0.5330	0.01	0.054	0.118	0.1041	0.32
Convergence speed	No conve-rgence	No conver-gence	No conver-gence	No conver-gence	No convergence	2.60%	No conver-gence
Log (Gnitete)				**1980 - 1993**			
Log(Gnitete0)	0.000	-0.011*	-0.004*	0.000	-0.011*	-0.023*	-0.006
Constant	-0.006	0.055*	0.036*	-0.005	0.085*	0.127*	0.044
Wald Chi(2)	0.10	15.16	7.56	0.02	25.89	16.61	1.61
Prob(Chi2)	0.75	0.000	0.006	0.89	0.0000	0.000	0.204
Convergence speed	No convergence	1.22%	0.42%	No convergence	1.15%	2.82%	No convergence
Log (Gnitete)				**1994 - 2000**			
Log(Gnitete0)	-0.006*	0.000	0.000	-0.006**	0.004	-0.000	-0.017**
Constant	0.028**	0.001	-0.020	0.035***	-0.042	0.002	0.092**
Wald Chi(2)	7.72	0.00	0.01	5.00	0.80	0.00	5.80
Prob(Chi2)	0.01	0.99	0.918	0.025	0.37	0.96	0.02
Convergence speed	0.58%	No convergence	No convergence	0.67%	No convergence	No convergence	1.81%

capita income, while, on the other hand, its absence from the model, with the other conditions remaining unchanged, gives to the model thus obtained a convergence speed of 0.22% per year, which corresponds to about one-third of the speed of the optimal model. This conclusion is in line with that generally drawn in the literature. Indeed, an increase in this rate means competitiveness on the part of the exports from the Zone, which brings about a significant earning of foreign currency and leads to an improvement in the per capita wealth. Since such an increase in exports is possible only by diversifying and/or increasing the quantity and quality of exports, one can easily understand the positive effect of the investment rate on the per capita income. When this investment aims at capacity building, it can lead either to a redeployment of labour and hence a direct enrichment of the working population, or to a mechanization of production which, in addition to boosting exports, will improve production and, as a result, the per capita income. During the 1970 - 2000 periods, the investments made led to an additional increase in per capita income of 3.2%. Moreover, its absence from the optimal model raises the convergence of the new model, everything else being equal, to 0.44% per year, which

represents a 30.2% reduction compared with the speed of the optimal model.

The positive effects brought about by the variables per capita aid, export rate and investment rate were clearly weakened by the effect of the exchange value, which was unfavourable for the Franc Zone countries. This variable is actually the one that has the most significant impact (in absolute value) on the per capita income. A 1% decline in this ratio leads to a fall that is three times that of the per capita income (2.67%) . This finding seems to confirm the hypothesis formulated by Prebisch and Singer (Prebisch, 1950) during the 1940s - 1950s that the countries that are specialized in the export of primary products - as is the case for almost all the Franc Zone countries - would suffer a deterioration of the exchange value, which would in the long run lead to a fall in their per capita income. In terms of impact on the convergence speed, the absence of this ratio from the optimal model, with all the other conditions remaining unchanged, reduces the convergence obtained by more than one-third (that is, by 36.4%) of the optimal convergence speed. The stock of capital, which is the second significant variable having the same effect on individual wealth as exports, makes it possible to increase the optimal convergence, even though the poorest countries in the zone saw their level of per capita income increase. As Pritchett has pointed out, these periods saw the formation of convergence clubs, even if all the countries experienced no convergence. That is the case, for instance, of cotton-producing countries (1970 - 2000, 1979 - 1979, and 1980 - 1993) and the Franc Zone countries of West Africa (1970 - 2000 and 1980 - 1993).

Conditional convergence

Generally, for all four periods studied, the behaviour of the Franc Zone in terms of speed of optimal convergence is similar tothat of the CEMAC zone. UEMOA's specificity stems from the fact that, contrary to the response and that of the zone as a whole, the convergence speed recorded during the pre-SAP period (1970 - 1979) was higher than that recorded during the SAP period.

The 1970 - 2000 periods

During this period the conditional convergence phenomenon, estimated on the basis of its speed, was the least perceptible. Thus, the optimal convergence speed, of 0.63% per year, is 0.1% lower than that of the CEMAC zone (0.73%) and half than that recorded in the UEMOA zone (0.34% per year). This optimal speed is also 5.7 and 2.7% lower than speeds recorded before and during the SAP period (1970 - 1979 and 1980 - 1993), respectively. This optimal speed is achieved by successively bringing to bear the per capita aid, the stock of labour, the investment rate, the exchange value and the rate of exports. Of the optimal mode variables (at the 15% threshold), the exchange value and the stock of labour have a negative impact on the per capita income, while per capita aid, the export rate and the investment rate contribute to its improvement.

In addition to having a positive impact on income, per capita aid seems to be one of the variables that influences convergence. This finding seems to be corroborated by one of the five conclusions extracted from *Assessing Aid: What Works, What Doesn' and why"t*, carried out by the World Bank in 1998. The conclusion in question suggests that aid has a positive effect only in the context of a good policy environment. However, the positive effect obtained with this variable seems not to be in line with the findings of other studies such as Naudet (1994), which demonstrated that there was a negative relationship between development aid and per capita GDP and, hence, per capita income. Ifwe put this disagreement aside, the issue is to clearly specify the nature and quantity of aid so as to avoid: convergence speed by model's not experience 28.5% (Table 4).

The 1970 - 1979 periods

Unlike the preceding period, during these years the optimal convergence speed was the highest. This observation also applies to the case of CEMAC and that of UEMOA even though their respective speeds were about 3 times and 11 times higher, respectively. The model is arrived at through the combined effect of six macroeconomic aggregates: the per capita aid, the rate of investment, the quality of labour estimated using the student-teacher ratio at primary school level, the public expenditure-GDP ratio, the export rate and the exchange value. As in the preceding period, three of these variables (per capita aid, the export rate and the investment rate) had a positive effect on per capita income with a much higher incidence. The most significant of these variables is per capita aid, because a 1% increase in it leads to a sixfold increase (5.7%) in the level of income. Its absence from the optimal model, with all other conditions remaining unchanged, takes away from the limited model thus obtained 92.8% of the speed of the optimal model.

All other conditions remaining unchanged, the respective effect on the convergence speed of the export rate and the investment rate - two of the opti variables that have significantly positive effects on per capita income - is about half (44.6%) and about one-third (31.5%), respectively, of the impact of the per capita aid ratio. These three variables seem once again to indicate the dynamism of the production that materialized in an increase in quantity and/or quality (through investment

Table 4. Conditional convergence in the CFA Zone (optimal model).

Overall period			Pre-SAP period		
	Coefficient	**Student's t**		**Coefficient**	**Student's t**
Gnitete0	-0.0057291	-3.52	Gnitete0	-0.03041	-5.08
Aid	0.0164757	20.02	AID	0.0569796	17.86
LAB	-0.0016	-1.64	CAP	0.0318069	5.33
CAP	0.0132	9.37	QLAB	0.0052354	0.57
EDU	-0.0004	-0.18	DPU	-0.039509	-5.33
INF	-0.005	-0.84	EXP	0.0462327	4.73
TRADE	-0.0267	-6.04	TRADE	-0.06471	-4.66
EXP	0.01517	4.86	CONS	0.1449885	3.43
CONS	0.0729	2.04	Wald(Chi-2)	498.49	
Wald(Chi-2)	524.43		Prob Wald(Chi-2)	0	
Prob Wald(Chi-2)	0		Log Likelihood	303.3353	
Log Likelihood	1177.564		Convergence speed	3.63%	22 years
Convergence speed	0.63%	120 years			

SAP period			Post-devaluation period		
Gnitete0	-0.014944	-6.7	Gnitete0	-0.013649	-6.28
AID	0.0022304	-6.74	PRE	0.002338	1.06
CAP	0.011847	8.97	AIDE	0.01345	4.66
INF	-0.0224809	-1.65	CAP	0.021859	7.11
SEC	-0.057696	-3.63	DPU	-0.013272	-2.21
EXP	0.069863	9.87	TRADE	0.003561	0.71
TRADE	-0.0949636	-10.65	SEC	0.05253	2.72
DETTE	-0.0193055	-7.89	EDU	-0.03276	-5.45
CONS	0.5969676	5.45	CONS	-0.133564	-1.56
Wald(Chi-2)	270.82		Wald(Chi-2)	108.99	
Prob Wald(Chi-2)	0		Prob Wald(Chi-2)	0	
Log Likelihood	484.9978		Log Likelihood	248.817	
Convergence speed	1.68%	46 years	Convergence speed	1.43%	51years

	Log (Gni per cata)	**CFA Zone Overall period Convergence speed (%)**	**Diminution of the speed (%)**	**Half-life**
	No Conv			
LAB	-0.0042113	0.50	0.20	164.2
CAP	-0.0041024	0.40	0.20	168.6
EDU	-0.0056883	0.60	0.00	121.5
INF	-0.0056331	0.60	0.00	122.7
TRADE	-0.0037736	0.40	0.20	183.3
EXP	-0.0021883	0.20	0.40	316.4
DPU	-0.0055235	0.60	0.00	125.1
DEBT	-0.0023557	0.20	0.40	293.9
SEC	NO CONV			
SAP period				
AID	-0.0100482	1.10	0.006	68.6
CAP	-0.007099	0.70	0.90	97.3
INF	-0.0141554	1.60	0.10	48.6

Table 4. contd.

INF	-0.0141554	1.60	0.10	48.6
SEC	-0.014421	1.60	0.10	47.7
EXP	NS			
TRADE	-0.0061105	0.60	1.00	113.1
DEBT	-0.0124789	1.40	0.30	55.2
PRE	-0.0147469	1.70	0.00	46.7
DPU	-0.0141994	1.60	0.10	48.5
EDU	-0.0078761	0.80	0.80	87.7
	Pre-SAP period			
AID	-0.0025824	0.30	3.40	268.1
CAP	-0.0219899	2.50	1.10	31.2
QLAB	-0.0300066	3.60	0.10	22.8
DPU	-0.0282128	3.30	0.30	24.2
EXP	-0.0181981	2.00	1.60	37.7
TRADE	-0.0242549	2.80	0.80	28.2
PRE	-0.0303697	3.60	0.00	22.5
INF	-0.029769	3.50	0.10	22.9
EXD	-0.0242745	2.80	0.80	28.2
SEC	NO CONV			
	Post-devaluation period			
PRE	-0.0133035	1.40	0.00	51.8
AID	-0.0124554	1.30	0.10	55.3
CAP	-0.0116457	1.20	0.20	59.2
DPU	-0.0130244	1.40	0.10	52.9
TRADE	-0.0128685	1.30	0.10	53.5
SEC	-0.0090682	0.90	0.50	76.1
EDU	-0.0116297	1.20	0.20	59.3
INF	-0.0134694	1.40	0.00	51.1
EXD	-0.0132291	1.40	0.00	52
EXP	-0.007398	0.80	0.70	93.3

On the other hand, as during the 1970 - 2000 periods, the exchange value is the main variable that reduced the and aid, the two main forms of financing the Franc Zone economies) and an increase in the effect of exports on the populations'g. Thesestandardencouraging results were partially due to the quality of labour, even though this is not a significant level of individual incomes. However, its incidence (23.growth4% ofthe ratiotheof publicoptimalexpenditure tomodel'sGDPhada speed) on the optimal convergence speed was weaker than those of each of the three variables having a positive influence on per capita income. For instance, this incidence was about one-fourth that of the per capita aid variable. Regarding the public expenditure–GDP ratio, a 1% increase in it led to a fall of 3.95% in per capita income. The negative effect of this variable on income would stem from an excessive increase that would arise from the abundance of investments needed for social sectors such as education, health (the funding for which was higher for demographic reasons than the wealth created) and infrastructure on the one hand, and, on the other hand, from the government take- over of the manufacturing sector, which was suffering from a pro-ofgressivelivinwithdrawal of foreign investors. These findings corroborate those from empirical studies on African countries by Savvidès (1995) who showed that the significant and negative impact on economic growth and, hence, on per capita income.

In sum, during this period the optimal model, whose convergence speed was about three times that of the 1994 - 2000 period and six times that of the 1970 - 2000 periods, is characterized by three variables (per capita aid, export rate and investment rate) with a significant and positive effect on per capita income, and two variables (exchange value and the share of the public expenditure in the GDP) with a positive effect on the

endogenous variable.

The SAP period (1980 - 1993*)*

Convergence speed reached its second highest level during this period. Seven variables account for the maximal speed estimate at 1.68% per year for a half-life of 46 years. Three of the seven per capita aids, the investment rate and the export rate - had a significant and positive effect on per capita income, while the other four had a negative effect. As during the 1970 - 1979 periods, the export rate had a positive effect on the endogenous variable. In the SAP model, a 10% increase in export leads to a 0.7% increase in revenues. This increase in the effect of the export rate on income followed from the implementation of adjustment policies that were oriented towards boosting exports and reducing imports in order to restore the competitiveness of the countries in the Zone.

As for inflation, it behaved the way it did during the 1970 - 2000 subperiod. Nevertheless, the effect of this variable was greater during the SAP period than during the overall period: a 1% increase in inflation led to a 0.02% fall in per capita income. In relation to the other periods, the effect of the variables per capita aid and rate of investment on income deteriorated in this model. The drastic cutback in public spending led to a reduction in public investment. The exchange value deteriorated once again during the SAP period, and the negative effect on income became greater, as it did in the preceding periods. A 1% falls in the exchange value led to a 0.09% decline in income. This period was actually characterized by a lack of competitiveness on the part of the countries in the zone, which explains the results obtained. Furthermore, the public expenditure–GDP ratio was not taken into account in obtaining the optimal model.

The post-devaluation period (1994 - 2000)

This is the subperiod with the third highest convergence speed. During these years the speed of the maximal (conditional) convergence was achieved by successively bringing in the variables of relative working population, per capita aid, investment rate, share of public expenditure in the GDP, exchange value, current external balance and pupil-teacher ratio in primary school. With the exception of quality of labour and public expenditure, which in this model maintained a negative sign, the other five variables tended to increase the level of income. In this respect, it should be noted that during this sub-period the share –of – public –expenditure –in GDP variable had a sign that was the opposite of the one expected. However, its effect during this period substantially diminished. An increase in this ratio came with a more – than proportional reduction in per capita income (a 1% increase in the ratio led to a 0.01% reduction in the income). Is this not a positive outcome from the various multilateral monitoring measures envisaged by UEMOA and CEMAC as part of the criteria for nominal convergence following the devaluation? Indeed, two of the second-order criteria in force in the UEMOA bloc, for instance, define a certain margin in the management of public expenditure. The first criterion stipulates that the ratio of the wage bill to the tax receipts must be 35% at most. The second stipulates that the ratio of the public investment financed with domestic funds to the tax receipts must be at least 20%.

As in the case of public expenditure, the quality of labour (estimated using the pupil-teacher ratio in primary school) had a negative impact on per capita income: A 1% increase in this ratio led to a 0.03% fall in the income. This finding is contrary to those reported in studies by Horowitz and Sherman (1980), Mairesse and Sassenou (1989), Sevestre (1990), and Bensaid et al. (1997), which showed that an increase in the quality of labour, when looked at from a different angle, had a strongly positive impact on overall factor productivity and thus on the per capita income. This unexpected finding may have arisen from policies of mass layoffs that were the order of the day during the SAP period, leading to a reduction in the number of teachers and the emergence of new forms of teaching, such as using part-time and voluntary teachers.Unlike the case of the other subperiods, here even though the results were not significant. A 1% increase in the exchange value led to a 0.003% increase in income. This was due to the effects of devaluation, which enabled products from Franc Zone countries to be more competitive on foreign markets. With regard to inflation, it was not used as an explanatory variable during this subperiod because its contribution - in the form of a positive effect generally less than that of the public expenditure- GDP ratio in each of the models used for this subperiod - was not, like the results of the pre-SAP period (of 1970 - 1979), in line with the conclusion reached by Savvidès (1995) on this variable.

DISCUSSION

A quick glance at Table 5 shows that the performance achieved by UEMOA countries is strongly linked to the economic growth in this zone, compared with CEMAC. On the other hand, a closer analysis of the table reveals the importance of intra-regional trade and a net increase in the share of intra- regional trade in UEMOA over the 1996 - 2005 periods, corresponding to 12.3% compared with CEMAC, which recorded only 1.56% over the same period. Likewise, the percentage of intra-zone exports was denser in UEMOA (10%) than in CEMAC (7%).

Table 6 shows that foreign direct investment is more present in CEMAC than UEMOA. For instance, in 1998 FDI represented 4.82% of UEMO

Table 5. Rate of economic growth.

	1980 - 1985	1986 - 1990	1991 - 1995	1996 - 2000	2001 - 2005
Benin	4.7	0.9	4.3	5.4	4.1
Burkina Faso	4.2	2.6	3.8	4.3	5.1
Cote d'Ivoire	0.3	1.2	1.5	3.2	0.1
Mali	-2.3	3.9	3.0	5.2	6.4
Niger	-2.3	2.6	0.8	2.9	4.0
Senegal	3.2	3.2	1.5	4.4	4.7
Togo	-0.2	2.5	0.6	4.5	2.5
Average	1.1	2.4	2.2	4.3	3.8
Chad	9.2	1.9	2.4	2.7	13.8
Cameroon	9.4	-2.2	-1.9	4.8	3.7
CAR.	2.3	0.0	1.1	2.4	-0.7
Congo	10.6	-0.3	0.7	2.5	4.4
Gabon	2.6	1.7	3.1	1.8	1.7
Average	6.8	0.3	1.1	2.8	4.6

Table 6. Investment in the two zones.

	1985	1990	1995	1998
		Foreign direct investment as a percentage of GDP		
UEMOA	4.54	0.88	2.14	4.82
CEMAC	7.23	10.58	6.81	15.98
		Gross private investment as a percentage of GDP		
UEMOA	32.56	54.12	62.17	77.25
CEMAC	47.96	57.20	56.65	70.72
		Gross public investment as a percentage of GDP		
UEMOA	40.55	49.38	44.28	47.43
CEMAC	22.86	37.60	31.19	35.06

Source: Author's calculations.

but three times more, almost 16%, in CEMAC. However, the economic performance recorded in terms of convergence is not necessarily linked to the dynamics of FDI flows in the different zones. If that was indeed the case, one would expect the convergence in the UEMOA to have gone in the same direction as the FDI flows. The performance in the UEMOA zone is to be linked to other types of investment. In this respect, it can be observed that on average private investment rose from 32.5% of the GDP in the UEMOA zone over the 1980 - 1985 period to 77.25% on average over the 1996 - 2000 period, while in the CEMAC zone it rose from 48% over the 1980 - 1985 period to 70.7% over the 1996 - 2000 period. Public investment also rose: it fluctuated around 45% during the 1980 - 2000 periods in the UEMOA zone and was at 31.7% in the CEMAC zone.

Beyond these conclusions, a number of constraints to convergence can be considered:

- Sachs and Warner (1995) referred to the possibility that the low convergence observed among African countries was due to their slow economic growth. The authors maintain that this stems from limited investment, which in turn is reflected in a weak accumulation of capital. Empirical studies have demonstrated that productive activity in Africa depends more on the work factor than on the capital factor or total factor productivity. Baumol (1986) observed that the least developed countries received relatively little in terms of public investment and investment innovations from other countries.
- The weak growth is considered to be one of the possible

explanations slowforconvergenceAfrica'.Butthe slowness of growth is dependent upon the evolution of the capitalistic intensity of factors and upon the contribution of total factor productivity. Using the results of growth accounting, Ben Hammouda et al. (2006) demonstrate that in each of the regional economic zones there was a weak deepening of capital and employment, as well as a weak growth of the total productivity of factors. The effect of this has been weak output, reflected in the lack of dynamism in the convergence of per capita incomes. Moreover, the contribution of total factor productivity to production was weak, an indication of inefficient production technology.

- The slow convergence of income can also be attributed to the failure of both UEMOA and CEMAC to improve their intra-regional trade. Not only is sub-Saharan Africa's contribution to world trade is minimal, the intra-zone trade in Africa is also marginal. Regional integration finds it difficult to increase the volume of products to be traded within the region. This comes from a wrong focusing on trading poor quality manufactured products that are essentially produced from crude processing of raw materials. Thus, trade within the region is made more difficult by the minimal value-added of the products traded, products that are still non-finished.
- The limited level of FDI flows in the Franc Zone restricts accumulation of capital and the accompanying spin-off effects, notably the acceleration of growth.

In view of these constraints, the success of regional integration and of the narrowing of differences in income seems to hinge on the way in which the countries in the region would improve trade by opening up borders with neighbouring countries, given the marginal contribution of the region's rldtrade.Theretois nothedoubt wo that the institutional framework in place has an important role in facilitating regional integration. However, spontaneous and rapid integration that is firmly in keeping with market phenomena and a sustained economic will are needed in both the UEMOA and CEMAC zones in order to attract foreign direct investment, development aid and more investment in education, all of which are key variables in the strengthening of integration and boosting of member countries' economiesthus.a

Conclusion

The aim of this study was to analyse the status of convergence in the Franc Zone by identifying its specificities during three subperiods that corresponded to the establishment and functioning of monetary and economic integration institutions. This convergence was considered in its two principal forms: nominal convergence and real convergence. It transpired from the findings that nominal convergence led to real convergence, even though over certain periods this was just conditional convergence. This means that the convergence criteria and institutions put in place in the zone were effective. The stability pact has often accelerated the alignment of certain member countries, especially with regard to nominal criteria. In the case of the Franc Zone, such results can be explained by the monetary discipline imposed on member countries by the BCEAO and the BEAC. The presence of convergence clubs was also highlighted in the CFA Zone. It was indeed observed that similarity effects, whether in relation to the specialization of economies dependent on cash crops (cotton and coffee), to the natural advantages (for coastal countries), or to mining resources (for oil countries), led to convergence processes in countries that had enjoyed certain advantages during some of the periods studied.

Three major facts have emerged from the study: First, the integration process is more advanced in UEMOA than in CEMAC, irrespective of the subperiod studied. This means that the institutional effect within UEMOA is much greater. The discrepancy in level of integration reflects the difficulty in coordinating macroeconomic policies and meeting convergence criteria in a union where economies are constantly exposed to external asymmetrical shocks. In this connection, Masson and Doré (2002) have demonstrated the influence of the exchange value and the cycle of economic acti performance vis-à-vis the convergence criteria. They showed that over the 1994 - 1997 periods, favourable exchange values and economic activity cycles had enabled the countries to achieve good performance. Conversely, over the 1998 - 2001 periods the reversal of the situation led to a degradation of this economic performance. These results show that the difficulty in coordinating budgetary policy in a monetary zone is still a topical issue. Authors like Cohen (1989) have suggested that the coordination of budgetary policies is not necessary if the monetary policy is credible, as this leads to an optimal budgetary response. This is a legitimate concern for the unions, where the two banks (BCEAO and BEAC) strive to achieve a credible monetary policy. An analysis of the structure of the economies of the Zone shows that achieving coordination of budgetary policies is delicate enterprise. It would therefore be preferable to strengthen the monetary discipline, which seems to give better results, as the analysis of inflation-rate-related performance, coupled with the experience of more than 40 years of common monetary policy, has shown. If jointly pursued with a growth promotion policy, monetary discipline could actually consolidate the budgetary situation.

Second, it has been observed that the overall process of real convergence requires homogeneity among the countries involved. In this respect, absolute convergence was observed to be more manifest in UEMOA than in either the Franc Zone or CEMAC. In addition, the findings about conditional convergence, to which this study was often directed, have brought to the fore the importance of

the economic policies in force in each subzone compared with the entire zone. This phenomenon can be explained by the fact that the levels and dynamics of convergence vary between countries, as a result of the likely structural differences between the economies of the Franc Zone. Thus, in the presence of asymmetrical shocks, the economies would react differently, as a result of a divergence in economic policy preferences. With the budgetary policy being the only instrument of economic policy available for those countries, it is necessarily prone to divergences. Decaluwé, Dissou and Patry (2001) revealed that the application of external common tariffs causes painful adjustments to the public finances of many countries in the UEMOA zone.

Third, the study shows that there exists a hard core of variables that strongly condition performance. Public development aid, stock of human capital, rate of investment and inflation are the key variables that integration policies must emphasize if satisfactory results are to be achieved in the area of convergence, that is, if the process of convergence and integration is to be accelerated in the Franc Zone.

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Appendix A: Basic indicators for Franc zone countries

Table A1. Basic indicators for the year 1993.

Country	Population	Total area (Km^2)	GDP		Illiteracy rate
			Total in CFA	Per capita in 1000 CFA	
Benin	5,185,890	115,762	1,840,320,943	355	70.5
Burkina	9,527,900	274,000	2,059,977,354	216	81.6
Central African Rep.	3,150,180	622,984	997,669,472	317	62.9
Ivory Coast	13,036,540	322,462	9,161,815,006	703	58.4
Cameroon	12,621,800	475,422	7,908,540,695	627	37.9
Congo Brazzaville	2,444,760	341,821	2,132,524,258	872	28.4
Gabon	1,020,870	267,667	4,480,681,838	4389	
Mali	9,164,100	1,240,192	2,301,000,808	251	79.3
Niger	8,495,380	1,267,000	1,762,454,440	207	87.3
Senegal	7,859, 850	197,000	4,131,341,140	526	69.0
Chad	6,248,250	1,284,000	1,295,541,433	207	68.3
Togo	3,710,170	56,785	1,055,918,692	285	52.0
Guinea Bissau	1,028,250	36,125	235,714,306	229	69.7
Equatorial Guinea	378,500	28,051	136,527,367	361	24.3
Franc Zone	83,872,440	6,529,271	39,500,027,753	471	

Source: World Bank database (1993).

Table A2. Basic indicators for the year 1994.

Country	Population	Total area (Km^2)	GDP		Illiteracy rate
			Total in CFA	Per capita in 1000 CFA	
Benin	5,345,530	115,762	1,920,788,158	359	69.5
Burkina	9,755,030	274,000	2,088,927,094	214	80.9
Central African Rep.	3,242,010	622,984	1,046,555,276	323	61.6
Ivory Coast	13,456,700	322,462	9,342,677,486	694	57.4
Cameroon	12,950,000	475,422	7,710,827,178	595	36.5
Congo Brazzaville	2,522,280	341,821	2,015,235,424	799	27.1
Gabon	1,049,480	267,667	4,635,014,127	4,416	
Mali	9,393,740	1,240,192	2,321,990,038	247	78.6
Niger	8,798,150	1,267,000	1,833,033,070	208	86.9
Senegal	8,076,780	197,000	4,253,157,804	527	68.1
Chad	6,463,870	1,284,000	1,426,825,604	221	66.9
Togo	3,807,030	56,785	1,214,120,806	319	50.7
Guinea Bissau	1,053,060	36,125	243,257,164	231	68.6
Equatorial Guinea	388,590	28,051	143,511,592	369	23.0
Total	86,302,250	6,529,271	40,195,920,819		

Source: World Bank Database, 1994.

Table A3. Basic indicators for the year 2000.

Country	Population	Total area (Km^2)	GDP		Illiteracy rate
			Total in CFA	Per capita in 1000 CFA	
Benin	6,272,000	115,762	2,597,648,923	414	62.6
Burkina	11,274,900	274,000	2,736,348,548	243	76.1
Central African Rep.	3,717,000	622,984	1,258,457,728	339	53.3
Ivory Coast	16,013,000	322,462	11,833,398,585	739	51.4
Cameroon	14,876,000	475,422	10,043,553,302	675	28.7
Congo Brazzaville	3,018,000	341,821	2,387,610,785	791	19.3
Gabon	1,230,000	267,667	5,384,938,329	4,378	
Mali	10,840,000	1,240,192	3,189,157,632	294	74.4
Niger	10,832,000	1,267,000	2,163,494,863	200	84.0
Senegal	9,530,000	197,000	5,806,050,468	609	62.6
Chad	7,694,000	1,284,000	1,676,049,284	218	57.4
Togo	4,527,000	56,785	1,460,548,061	323	42.9
Guinea Bissau	11,990,000	36,125	251,498,951	210	61.6
Equatorial Guinea	457,000	28,051	730,540,215	1,599	16.8
Franc Zone	112,270,900	6,529,271	51,519,295,675	459	

Source: World Bank database, 2000.

Appendix B: Variables and test results

Table B1. Sources and availability of variables.

Abbreviation	Description	Period	Source	Type
Gnitete	Per capita income	1970-2000	World Bank Database	Endogenous
Inflation	GDP deflator (index)	1970-2000	World Bank Database	Mixed
Aidtete	Per capita aid	1970-2000	World Bank Database	Exogenous
SEC/PIB [GDP]	Current external balance	1970-2000	World Bank Database	Mixed
Debt Ext/PIB [GDP]	Ratio of external debt to the GDP	1970-2000	World Bank Database	Mixed
Qltelabor	Pupil-teacher ratio in primary school	1970-2000	World Bank Database	Exogenous
FBCF/PIB [GDP]	Gross investment rate	1970-2000	World Bank Database	Exogenous
G/PIB [GDP]	Share of expenditure in the GDP	1970-2000	World Bank Database	Exogenous
Relative working population	Ratio of the working population to the total population	1970-2000	World Bank Database	Exogenous
Export/PIB [GDP]	Export rate	1970-2000	World Bank Database	Exogenous
Trade	Exchange value	1970-2000	World Bank Database	Exogenous
Labour	Stock of labour	1970-2000	World Bank Database	Exogenous
Coastal countries	Benin, Côte d'Ivoi Congo, Gabon, Senegal, Togo	1970-2000	World Bank Database	Endogenous
Oil exporting countries	Côte d'Ivoire, Cam Gabon	1970-2000	World Bank Database	Endogenous
Cotton-producing countries	Benin, Burkina-Faso, Central African Rep., Mali, Niger, Chad, Togo	1970-2000	World Bank Database	Endogenous
Coffee-producing countries	Central African Re Cameroon, Congo, Togo	1970-2000	World Bank Database	Endogenous

*The variables "relative working population" and "labour" are exclusiv