DETERMINANTS OF TRADE AND GROWTH PERFORMANCE IN AFRICA: A Cross-Country Analysis of Fixed versus Floating Exchange Rate Regimes

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ABSTRACT

The purpose of this study is to assess the economic performance of African countries according to their exchange rate regimes The methodology is based on the estimation of an empirical growth model that controls for labor productivity, investment share, initial income per capita, and changes in the external environment (i.e., terms of trade and real exchange rate). Membership of a specific group of the exchange rate regime is represented by a dummy variable. The study distinguished among fixed exchange rate regimes, monetary unions, currencies pegged to a single external currency, and currencies pegged to a group of foreign currencies or to Special Drawing Rights (SDR). Floating exchange rate regime countries are divided into two groups: those with managed floating rates and those that float independently. Estimate results revealed the inherent costs of the monetary union membership in terms o the rate of real GDP or income per capita because all nonmember nations registered better performance. In other words, low inflation in monetary unions did not offset the cost of overvalued exchange rates. In countries with unpegged currencies, the hypothetical gains from isolation are statistically null. For the group of countries that switched to more flexible exchange rate regimes, the subsequent adjustment in the level of the real exchange rate helped increase the growth rate of export share. The study's main recommendation is that African countries with fixed exchange rate regimes should endeavor to liberalize or manage their exchange rates as a means of fostering economic development. A devaluation of the national currency at the right moment can be equivalent to floating the national currency while a monetary union does not seem to be the better solution for African economies.

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1. INTRODUCTION

Since the 1980s, international financial institutions have supported the introduction of structural adjustment programs (SAPs) in many African countries to correct market and price distortions. The SAPs, under which most countries now operate, involve policy measures that call for reducing the level of taxes, shifting from quantitative restrictions to tariffs, producing greater uniformity of tariff structures and levels, eliminating quotas on trade, eliminating price controls, and liberalizing output and input markets. The programs emphasize growth-oriented export strategies that involve exchange rate policy reform. Thus, many African countries have switched to floating exchange rate regimes. Table 1 shows the evolution of exchange rate regimes in Africa.

Table 1. Evolution of Exchange Rate Regimes in Africa since 1980

Pegged Currencies	**Pegged to**	**1980**	**1987**	**1990**	**1993**	**1995**
	U.S. Dollar	9	6	5	3	3
	French Franc	14	14	14	14	14
	Other Currency	4	2	2	3	3
	SDR	11	6	5	3	2
	Other Composite	7	9	13	10	5
	Total Pegged Regimes	45	37	39	33	27
Unpegged Currencies	Independently Floating	NA	8	7	12	18
	Managed Floating	NA	4	5	7	8
	Total Floating Regimes	4	12	12	19	26

Source: *International Monetary Fund: International Financial Statistics.*

The table shows an increasing number of floating exchange rate regimes and a decreasing number of fixed regimes in Africa since 1980. From 1980 to 1995, 19 countries shifted from pegged currencies to more floating exchange rate regimes. A few countries shifted from a floating exchange rate regime to a fixed regime. Such was the case for Nigeria (naira pegged to the U.S. dollar) and Equatorial Guinea (which has replaced Madagascar in the franc zone). In 1995, only 27 countries were still operating under pegged currencies, with 14 of them members of the French franc zone. Most single-pegged currencies, 11 countries in this case, are linked to the SDR or other composite currency baskets.

The exchange rate regime movements are most interesting if analyzed case by case (see table in Appendix A). From Table 1, we can characterize the exchange rate regime policy of African countries by four main features as follows:

Stable exchange rate regime policy countries: The CFA zone, the South African rand zone (except for Namibia), and four single countries (Botswana and Cape Verde, whose currencies are pegged to a basket, and Djibouti and Liberia, whose currencies are pegged to the U.S. dollar);

Gradual shift from fixed to floating exchange rate regime countries: Algeria, Angola, Ethiopia, the Gambia, Guinea-Bissau, Kenya, Madagascar, Mauritius, Morocco, Rwanda, Sao Tome and Principe, Tanzania, Tunisia, Zaire, and Zimbabwe;

Uncertain shift from fixed to floating exchange rate regime countries: Ghana, Guinea, Mauritania, Mozambique, Sierra Leone, Somalia, Sudan, Uganda, and Zambia (countries that ended with a flexible exchange rate regime after one or more returns to a fixed exchange rate during the period); and

S*hift from floating to fixed exchange rate regime countries:* Morocco (from managed to currency pegged to a basket), Namibia (from independently floating to pegged to a basket), Nigeria (from managed to independently floating and finally to currency to pegged to the U.S. dollar).

Variants of the floating exchange rate regime are more common among the leading industrial countries while fixed exchange rate regimes are mainly found among developing countries, including those in Africa. Industrial nations are characterized by two main factors that are favorable to floating exchange regimes. First, industrial countries have a well-developed international market for their domestic currencies; second, their internal capital markets are equally well developed. Industrial economies can thus control the money supply and the real exchange rate level through these various markets. In many developing countries, the situation is different. The countries lack an outside market for their domestic currencies, and their internal capital markets are weak (Helmers, 1988). The money supply is often a function of the government deficit in that the central bank is unable to exercise much independent control over the supply of money and credit. Several questions arise. How do exchange rate regimes affect economic performance in African economies? In other words, do countries with fixed exchange rate regimes perform better or worse in trade and growth than countries with floating exchange rate regimes?

The purpose of this study is to seek answers to these questions. For countries that altered their exchange rate regimes, it will be interesting to see to what extent the switch in exchange rate regime improved economic performance. More specifically this study intends to shed light on exchange rate policies for African countries, mainly CFA countries facing European monetary union. The results should be of interest to other African countries that are still uncertain about their exchange rate policy. The problem is whether all African countries should liberalize their exchange rate regimes. For those nations that have already altered them, did the decision bring about the desired effect? The study is divided into five main parts. The first two parts discuss theoretical arguments in favor of fixed or floating exchange rate regimes. The third part describes earlier works in the field of African economic performance. The fourth analyzes the impact of the exchange rate regime on the growth rates of per capita output and real GDP. The final section emphasizes the impact of exchange rate regime on trade performance in the context of export ratios and current account balances.

2. ARGUMENTS IN FAVOR OF FIXED VERSUS FLOATING EXCHANGE RATE REGIMES

Despite the large body of literature on exchange rate theory and policy, the number of studies comparing exchange rate regimes—floating versus fixed—is limited. Studies of the history of international monetary finance try to explain why countries switch repeatedly between fixed

and floating exchange rates. Such history, for example, has been the main concern of Eichengreen (1995), who attempts to explain changes over time in the dominant exchange rate regime but does not try to illuminate cross-country variations. Other authors have described the expectations concerning the floating exchange rate regime instituted in the early 1970s. Frankel and Dornbusch (1993) are among those observers and present the experience and alternatives for the flexible exchange rate system since 1973. They focus on how the system was supposed to work in theory, how it apparently worked in practice, and, finally, the alternatives. As emphasized by Eichengreen in his conclusion, there is a need for cross-country studies to analyze the choice of exchange rate regime. The following discussion is thus more theoretical than empirically based. It considers three main points that are central areas of disagreement between proponents of fixed and floating exchange rates: exchange rate stability, international cooperation, and macroeconomic adjustment.

2.1 Exchange Rate Stability

2.1.1 Theoretical Hypotheses

Proponents of fixed exchange rate regimes worry about the possible effects of speculation in a floating rate system. Nurkse (1944) was first to highlight the possible market instability of a floating exchange rate regime. Others thought that speculation would lead to wild gyrations in currency values (excessive disturbance in exchange markets) and that uncertainty due to possible exchange rate fluctuations would impede international trade and investment (Froyen 1983).

To counter the argument over speculation, advocates of floating exchange rates have proposed four ways in which exchange rate variability should not matter. First, Friedman (1953) defended the floating exchange rate regime by stating that speculation would have a stabilizing rather than destabilizing effect and that movements in the exchange rate would be smaller than they would have been otherwise in the absence of speculation. Second, some defenders of floating exchange rates believe that expectations are rational. In other words, the exchange rate should not jump discontinuously except in response to news about current money supplies or expected future money growth rates and real output. According to these proponents, the forward discount or interest differential should be a conditionally unbiased forecast of the future change in exchange rate. Traders and investors should also develop hedging mechanisms by making transactions in the forward market (Frankel and Dornbusch op. cit.). Third, the exchange rate should be as stable as macroeconomic fundamentals since the exchange rate is linked to monetary policy. Finally, there is a belief that relative price levels (purchasing power parity) will determine floating exchange rates over the long term.

Advocates of a fixed exchange rate regime reply that prices respond extremely slowly to conditions of excess supply and that the return of the real exchange rate to long-run equilibrium would not occur rapidly. Defenders of the fixed exchange rate regime counter that the policy regime in place shapes the way the private sector sets wages and prices in the economy.[1] Domestic price setters (in this case, the private sector) take into account policy makers' incentives to alter the nominal exchange rate in order to achieve some real objective. As policy incentives undercut price setters' desire to maintain their relative prices, their clear foresight will nullify the expected effect of the policy. Because of rational expectations, the economy will permanently observe a high inflation rate, with no guarantee of achieving the real targets. Therefore, a fixed exchange rate regime seems superior, for it would inhibit speculation and expectation.

2.1.2 Empirical Evidence and Issues for African Economies

In practice, there is no strong empirical evidence to support any of the aforementioned theories. Most short-term variability in floating exchange rates seems unrelated to observable disturbances but is instead related to other unknown economic variables or to irrelevant noise. Furthermore, speculation proved to be nonstabilizing: expectation may not be rational and rational expectation may not in fact be stabilizing. These results confirm the way of thinking of a third group of researchers and emphasize what Frankel and Dornbusch (op. cit.) call the "decentralized national rules."[2] For supporters of decentralized national rules, empirical evidence suggests that the exchange rate regime plays little role in macroeconomics. The third group even thinks, "monetary policy (other than unanticipated changes) has no effect on the real equilibrium...."[3]

The above discussion suggests that exchange rates in floating exchange rate economies can move inexplicably, with no significant link to monetary policy. Moreover, floating exchange rate regimes necessitate two main conditions if they are to work. First, a country needs to have a well-developed international market for its domestic currency. Second, its internal capital markets must be well developed, so that the country can control the money supply and the real exchange rate level through the markets. Thus, a floating system gives rise to two questions. What imperfections exist in the capital market and are the risks of a floating system? What has happened to the real exchange rates when countries have shifted from fixed to floating regimes? Moreover, assuming that floating exchange rate regimes spur the development of forward exchange markets and instruments for hedging exchange risk, how do exporters, importers, and international investors in Africa deal with the problem of exchange rate risk?

2.2 Independence versus Cooperation

2.2.1 Theoretical Hypotheses and Empirical Evidence

Independence is a crucial objective for the defenders of a floating exchange rate regime. The logic behind the idea relies largely on sovereignty, both political and economic. According to Mussa (1995, p. 98), "all of the world's nations assert and express their sovereign authority by maintaining a distinct national money and protecting its use within their jurisdictions, ... money is like a flag; each country has to have its own." In the economic area, such sovereignty is maintained by letting each individual act independently in his or her self-interest, so that countries evidence divergent policies and inflation rates. The outcome is to be favored over the alternative of subjecting all members to the control of a more centralized political process. Proponents of floating exchange rate regimes believe that "a system of truly fixed exchange rates forces countries to keep their price levels in line, and therefore to keep their macroeconomic policies in line."[4] Therefore, they are likely to bear the penalty of a trade deficit if they follow a more expansionist policy than their neighbors do. The penalty is supposed to be smaller under a floating exchange rate regime. Moreover, a floating exchange rate means less
transmission of disturbances internationally and thus reduces need for international coordination of divergent policies.

In fixed exchange rate regimes, international cooperation and intellectual consensus are often required to adjust to macroeconomic disturbances. Such cooperation and consensus usually require a strong economy to act as leader. Historically, balance of payment and global credit crises have been the main conditions dictating cooperation. The international monetary system provides many examples of international cooperation. Eichengreen draws examples of

international cooperation from the gold standard system, in which, during a credit crunch, the most prominent central bank might take the initiative by lowering its discount rate and signaling the need for cooperative action; the other central banks would then respond in kind. During balance of payment crises, the other central banks might help by encouraging reserves to flow out of their economies. Other examples of monetary cooperation may be seen in Europe, with the former European Payments Union (which provided balance of payment financing and other services) and the existing European Monetary System (systematized international cooperation for a strong currency, credit facilities, and reciprocal cooperation). The Organization for Economic Cooperation and Development (OECD) and the International Monetary Fund (IMF) are also institutions that mobilize and monitor cooperative ventures over wide areas.

2.2.2 Empirical Evidence and Issues for African Countries

In a test of both hypotheses (independence and cooperation) for industrial countries, the empirical results show, on the one hand, greater coordination of policies (e.g., G-7 Summit Meetings in 1986 and 1987 pressed for more coordination rather than divergence by shifting to a convergence of inflation rates around the German level). On the other hand, although the results demonstrate that international cooperation remains incomplete in practice. The failures of both floating and fixed exchange rate systems have spurred some observers to adopt the middle road position and to explore other directions that relate to the central idea of an optimum currency area as stated by Mundell (1961) and McKinnon (1963). These directions include forms of coordination by policy makers, establishment of target zones, world monetarism, or an independent intervention fund.

An optimum currency area is an area composed of several countries that have a single currency regime or fixed exchange rate systems with guaranteed convertibility of currencies. The area is considered optimal if it achieves the following objectives: low unemployment, balanced international payments, and a stable international average price level. For monetary union members, an optimum currency area means price stability and full employment, foreign reserve savings, low speculative capital movements, and less costly adjustment. In Mundell's view, factor mobility is the main condition if a currency area is to yield the highest economic benefits. Boundaries of currency areas should be determined by factor mobility within the areas, although factors should be immobile among currency areas. A continuum of national activities is assumed to maximize the number of employment opportunities for each specialized variety of labor. Given, however, that labor mobility often remains unrealized, this assumption has come under considerable criticisms.[5] For example, Kenen (1969) argued that diversification in a nation-product mix may be more relevant than labor mobility. Product diversification strengthens the economy against shocks in the terms of trade and limits unemployment in the case of a decreased demand for the nation's principal exports. Finally, the link between exports and investment weakens with product diversification.

The question for African economies is whether international cooperation is preferable to independence. What are the costs and advantages of both systems for economic performance in Africa? These questions could primarily be addressed to the 14 countries that constitute the French franc zone, currently the most important monetary area in Africa, but it is also addressed to the members of the South African rand area and possibly other integrated economies in the field of monetary policy. The necessary condition for cooperation, in the sense of the optimum currency area (Mundell, 1961), is factor mobility. Factors should be mobile within the zone and immobile among zones. Do African countries in the CFA zone[6] satisfy this condition? Devarajan and Rodrik found that mobility is limited in CFA zone countries. They believe that a common language, the institutions inherited from the French, and the lack of natural barriers between countries in the zone should increase factor mobility

between countries.

Created during the early 1940s, the franc zone grouped together all French colonies and overseas territories. The main initial characteristics of the zone were centralized control of foreign trade and unity of foreign exchange policy. These characteristics were achieved through a common account for foreign reserves (the central banks had to deposit 65 percent of their foreign reserves into "the operation account") and unlimited convertibility of the colonies' currency to the French franc and vice versa (Morel, 1983). This policy conferred two main advantages on members. First, countries benefited from an unlimited ability to draw on foreign exchange reserves. Second, central banks could obtain automatic short-term credit in foreign exchange. After gaining their independence, many countries—Morocco, Tunisia, Algeria, Guinea, Mauritania, and later, Madagascar—left the franc zone to create an independent currency. In 1985, Equatorial Guinea joined the CFA zone. Currently the zone includes 14 African countries while the status of the franc zone has undergone certain modifications. The most important change is that countries can deposit their foreign reserves in places other than the operation account (held by the French Treasury) and can modify exchange parity between the French franc and CFA franc. Trade flows with France, however, remain most important among the members, although CFA countries no longer have any legal obligation to maintain these flows.

Furthermore, the franc zone is divided into two independent areas: West Africa and Central Africa, each of which has a central bank: BCEAO and BEAC, respectively.[7] The BCEAO and BEAC zones evidence little economic or monetary cooperation, and within each, a single economy dominates. Cameroon in Central Africa and the Ivory Coast in West Africa remain the pillars of the CFA zone. Cameroon represents a quarter of the total GDP of the entire franc zone and more than half of the total GDP and money supply of the BEAC area. Until 1994, the main benefits for countries belonging to the franc zone were common language (French) and common currency (CFA franc). Since the CFA franc devaluation of January 1994, the first in 40 years, convertibility has been limited between the BCEAO CFA franc and the BEAC CFA franc. CFA zone countries show fairly small short-run benefits of monetary integration: their import share of GDP is 35 to 41 percent while their share of regional trade is only 7 to 8 percent of the regional GNP. Thus, the operation account can be seen as the sole effective instrument of international cooperation. Each country benefits from the operation account but not from its individual reserve account. Given that the overall advantages of CFA zone membership appear limited, it is questionable whether some countries enjoy more advantages than others do. In central Africa, for example, Cameroon seems to reap the lion's share of benefits from the BEAC zone. It would be interesting to determine each country's relative advantages and disadvantages franc zone membership.

2.3 Macroeconomic Adjustment

2.3.1 Balance of Payment: Equilibrium versus Stability

A floating exchange rate regime is supposed to yield three main macroeconomic advantages: equilibrium in the balance-of-payments, no need for foreign exchange reserves, and internal as well as external equilibrium. The first advantage is smaller trade imbalances and therefore less political pressure for protectionism. The assumption is that nonintervention of the central bank in the foreign exchange market will lead to zero overall balance-of-payments through automatic adjustment of the exchange rate at the level that equates supply of and demand for foreign exchange. Second, the central bank's commitment to nonintervention in the exchange market

means less need to hold foreign reserves. The third advantage is no conflict between the balance-of-payments equilibrium and domestic policy goals. Automatic adjustment of the exchange rate to equate demand for and supply of foreign exchange will lead to zero balance-of-payments constraints on domestic policy instruments that are used to pursue domestic goals. For example, a country can face a situation of balance-of-payments equilibrium despite high levels of unemployment. To increase employment, policy makers can undertake an expansionary monetary policy that will result in reduced domestic interest rates and an increase in domestic income as well as in the general price level. In turn, these changes will yield, on the one hand, an increase in imports (due to both increases in income and the domestic price level), and, on the other hand, an increase in the demand for foreign assets for domestic investors and a decrease in the demand for domestic assets for foreign investors (due to a decline in domestic interest rates). The result is an increase in demand for and a decrease in supply of foreign exchange. In a floating exchange rate regime, the exchange rate will rise so that a new equilibrium equalizes supply and demand in foreign exchange. With a fixed exchange rate, a country will end up with a balance-of-payments deficit or excess demand for foreign exchange when the official exchange rate is lower than the equilibrium rate.

To counter floating exchange rate proponents, advocates of fixed exchange rates argue that fixity of the exchange rate provides a more stable environment for the growth of world trade and international investment. For a specific country, that means growth of international trade and foreign investment flows. The main argument relies on certainty of investment returns for business managers who do not have to worry about exchange rate fluctuations. Concerning the conflict between internal and external equilibrium, advocates of fixed exchange rate regimes argue that the balance-of-payments constraint on the internal equilibrium must be taken "as an asset of the system... the discipline which the balance-of-payments places on policy makers acts as an effective counterweight to the otherwise overly inflationary tendencies of modern democratic governments."[8] Some supply-side economists even ask for a return to a gold standard system, as in the nineteenth century. A gold standard system is assumed to provide monetary freedom, long-run stability of prices and business, rapid growth, and prosperity. However, the opposite camp thinks that factors that in the past promoted the international gold standard are no longer favorable (Frankel and Dornbusch, 1993).

Empirically observed results conflicted with those described above for the trade balance under floating exchange rate regimes: the large trade imbalance in the United States, for example, and new protectionist pressures. Moreover, some countries under floating exchange rates continue to hold and use foreign exchange reserves. One possible explanation is higher capital mobility and higher elasticity of expectations on the rates of return in financial investments. More likely, countries are attempting to manage their float.

2.3.2 Internal Balance: Real Target versus Nominal Target

On the internal balance side, it is believed that a flexible exchange rate regime insulates a country from certain shocks. When a country's balance-of-payments is in equilibrium, a recession abroad or foreign income decline will lead to a decline in export demand. The falling demand for their goods will cause exporters to decrease production. In a fixed exchange rate regime, such a decline in export supply will yield a balance-of-payments deficit. The country will also experience a fall in domestic income through the multiplier effect of export changes. Subsequently, the home country faces a recession as well. With a market-determined exchange rate, the exchange rate level increases to equate supply and demand on the foreign market and to eliminate the balance-of-payments deficit, thus dampening the impact of the external disturbance

on exports and aggregate demand.

Advocates of fixed exchange rate regimes believe that such insulation is not sufficient. They state that although a country can be isolated from foreign demand shocks, such is not be the case for supply shocks. The best policy would be expenditure reduction or expenditure switching for maintaining the balance-of-payment equilibrium. Expenditure cutting or switching can be achieved through devaluation of the home currency. The external and internal equilibrium could then be achieved by means of fiscal policy that calls for government consumption and investment reduction or private sector expenditure reduction through increasing taxes, wages, and private bank loan restrictions. According to Helmers (1988) and Krugman (1988), both devaluation and fiscal policy must be combined because fiscal policy aims to cut expenditure levels and is not always socially sustainable. Moreover, expenditure cutting is likely to lead to a home recession because the GDP would decline and unemployment would increase. On the contrary, a devaluation of the home currency would lead to lower economic and social costs through expenditure switching. Such a policy is likely to result in expansion of exports and import-substitution industries. With prices and wages likely to increase, fiscal policy is then necessary to prevent appreciation of the real exchange rate and the ensuing vicious circle. Corden (1988) called this a "real target approach" of exchange rate policy as opposed to a "nominal target approach" supported by proponents of floating exchange rates.

Supporters of floating exchange rates (nominal target supporters) reject the efficiency hypothesis of the nominal exchange rate adjustment. They mistrust the effectiveness of a nominal devaluation to achieve real depreciation. Moreover, they believe that even if nominal policy can be effective in the short to medium run, inflationary costs would be high enough to outweigh economic gains. The best solution to passing through the fluctuations in the exchange rate to domestic prices is openness and effective indexing of domestic-good prices to the value of the currency. Here, advocates of fixed exchange rates argue that domestic goods prices have upward and downward rigidities. They do not trust the macroeconomic environment to generate on its own the exchange rate changes required by shocks to the system. They believe that a nominal devaluation will have a real effect, at least in the short to medium run.

Some moderate observers, such as Frankel and Dornbusch (1993), believe that a flexible exchange regime would be more attractive in countries where the government expenditure share of GNP is lower and more variable. They state that a higher GNP share of government spending implies higher expected inflation under floating rates and, consequently, greater gains from fixity. Furthermore, when the government-spending share of GNP is variable, authorities want to smooth the time profile of distortionary taxes, mainly by seigniorage. Therefore, a floating exchange rate regime is superior.

2.3.3 Macroeconomic Issues for African Economies

A wide set of questions related to macroeconomic adjustment is pertinent to fixed versus floating exchange rate regimes for African countries. However, we cannot answer all the questions in a single study. The present study aims specifically at assessing certain macroeconomic aspects of exchange rate policy in Africa; it is not concerned with questions related to exchange rate stability or speculation and does not try to solve problems related to exchange rate risk or hedging mechanisms in Africa. The main concern of the present study is to analyze growth and trade performance among African countries under different exchange rate regime hypotheses.

3. BACKGROUND STUDIES

Many studies undertaken in the field of foreign exchange rate regimes and macroeconomic performance in Africa, mainly in sub-Saharan Africa concentrate on the CFA zone. The set of studies concerning other African countries is limited.

3.1 About the CFA Zone

Many economic researchers have emphasized the problem of economic performance of the CFA zone as compared with other developing countries in sub-Saharan Africa and elsewhere. Common empirical results show that franc zone countries register lower growth rates than nonAfrican developing countries, but, when compared with other African countries, those in the franc zone have experienced slightly higher growth in total GDP (P. and S. Guillaumont 1988; Devarajan and De Melo 1987 and 1991; and Devarajan and Rodrik 1991).

The Guillaumonts showed that from 1962 to 1981, franc zone members benefited from stability of the exchange rate, less overvaluation, and no foreign exchange controls. Consequently, GDP growth, openness, and export promotion indicators showed higher growth rates than in other Sub-Saharan African countries. Taking the 1980s data into their model, Devarajan and de Melo found, on the one hand, that the slightly higher GDP growth rate was not statistically significant and that, on the other hand, exports growth and investment levels were lower. In their analysis, Devarajan and Rodrik explained the causes of the poor results of fixed exchange rates in the 1980s in the CFA zone countries. The benefits from low inflation, they argued, had not offset the costs of terms of trade shocks. Rather, they believed that a more flexible exchange rate regime would have led to better results and that rigid pegging had weakened the insulation from external shocks through relative price rigidities and distortionary taxes.

A more recent study by P. and S. Guillaumont (1994), assessing economic performances of ACP (Africa, Caribbean, Pacific) and nonACP countries according to their exchange rate policy, indicates strong differences among countries. The Guillaumonts examined economic performance among countries according to the levels of their exchange rate depreciation. Their main finding was that from 1979 to 1989 the growth rates of total real GDP and per capita GNP were lower with the lowest and highest levels of depreciation. This means that, during that period, there was no difference in growth performance between strongly fixed exchange rate regime countries and those with independently floating exchange rate regimes. Medium levels of exchange rate depreciation led to better results. However, data for 1985–1989 and earlier studies indicated that countries with lower rates of depreciation showed worse results (but with no statistical significance for such a difference).

Other studies on African economies have not rejected these findings.[9] Elbadawi (1996) examined the economic performance of the CFA franc zone versus nonCFA countries over the period 1982-1989. He used a probity method to estimate a modified control group approach model, testing for whether zone membership was random. Findings from that study showed that the randomness assumption was valid only for the cases of GDP growth and inflation. For savings, investment, and export ratios to GDP, the decision to participate in the zone was endogenous and related to the expectation of improved economic performance.

M'bet and Niamkey (1993) were especially concerned with the future of the franc zone and the CFA franc after European monetary integration. They assessed the impact of a unified monetary authority in Europe on the franc zone of Africa. They also looked at the possible options in relation to the current CFA monetary arrangement.

Devarajan (1997) measured real exchange rate misalignment in 12 countries of the CFA franc zone before and after the 1994 devaluation of the CFA franc. Using a method that explicitly incorporated terms of trade shocks and the distinction between tradable and nontradable goods, he found that the real exchange rate was on average about 30 percent overvalued before devaluation, with sharp differences among the 12 countries. The larger oil producers (Cameroon and Gabon) were the most overvalued while some of the smaller or landlocked countries (Chad and Burkina Faso) were much less so. One year after devaluation, the real exchange rate was undervalued in most countries.

Azam (1997) was concerned with the monetary policy aspect of the CFA zone. He analyzed the macroeconomic policy reforms enacted in the CFA zone in the 1980s and 1990s within a theoretical framework that emphasized the trade-off between seigniorage and external debt as alternative ways of financing the fiscal deficit. He found that debt problems and misdirected policy decisions led to the devaluation of January 1994, the first since the 1948 creation of the franc zone.

Fiscal policy coordination has been Stasavage's (1997) main interest. He concentrated on the problem of fiscal discipline promotion in the CFA zone. He based his analysis on the assumption that a monetary union, like a fixed exchange rate with full convertibility, might either strengthen or weaken fiscal discipline in member states. He concluded that fiscal promotion failure in the CFA zone has been attributable, in part, to serious problems in institutional design involving the establishment of two central banks in the franc zone, the monetary rules with which the central banks operate, and, finally, the relationship between the CFA states and France.

Furthermore, other studies on the CFA zone examine the exchange rate policy effect on the economic performance of individual countries. The most recent works are those of Ajab Amin (1996) and Njinkeu and Bamou (1996) for Cameroon; Devarajan and de Melo (1991) for Cameroon, the Ivory Coast, and Senegal; and Salinger and Stryker (1994) for Senegal, Mali, and the Ivory Coast. Very often, these studies concluded that the CFA franc was overvalued before the 1994 devaluation. Fouda (1997) assessed the interaction between economic decisions and political motivations of incumbent Cameroonian governments from 1960 to 1992 within the framework of the monetary cycle. He aimed to analyze the causes of such cycles and their consequences for the independence of the central bank of the monetary union to which Cameroon belongs.

3.2 About Other African Countries

Rouis, Razzak, and Mollinedo (1994), and Dordunoo and Njinkeu (1995) have recently paid attention to some other African countries. Their common aim was to assess the economic performance across African countries with respect to their exchange rate regimes.

The former set of authors proposed a practical division of sub Saharan countries into eight groups, namely those with

currency pegged to the U.S. dollar: Angola, Djibouti, Ethiopia, Liberia, and Sierra Leone;

currency pegged to the French franc: Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Congo, Ivory Coast, Equatorial Guinea, Gabon, Mali, Niger, Senegal, and Togo;

currency pegged to the South African rand: Lesotho, and Swaziland;

currency pegged to SDR: Burundi, Rwanda, Seychelles, and Zambia;

currency pegged to a basket of currencies other than SDR: Botswana, Cape Verde, Kenya, Malawi, Mauritius, Mozambique, Sao Tome and Principle, Tanzania, Uganda, and Zimbabwe;

managed floating exchange rate: Guinea, Guinea-Bissau, Madagascar, and Mauritania;

independently floating exchange rate: The Gambia, and Zaire; and

multiple exchange rates: Ghana, Nigeria, Somalia and Sudan; and Cape Verde, Kenya, Malawi, Mauritius, Mozambique, Sao Tome and Principle, Tanzania, Uganda, Zimbabwe;

The studies showed that from 1976 to 1991 the percentage of countries pegging to one currency fell from 77 to 45 percent while that of countries pegging to a basket of currencies increased from 19.6 to 23.9 percent. In 1976, no sub Saharan African country was under a flexible exchange rate regime. By 1991, 30.4 percent of the countries had shifted to regimes that are more flexible.

The studies also underscored that the major shift within the period was a move from pegging currency to the U.S. dollar to what the IMF describes as flexible arrangements, which largely include various forms of crawling pegs, as well as some limited instances of flexible exchange rate regimes. Nevertheless, some countries remained pegged to the U.S. dollar but devalued their currencies at one time or another within the period. Moreover, the move of many SSA countries from pegging to a single currency to pegging to a basket of currencies is likely to have been an indirect result of the adoption of floating rates among industrial countries. Basket pegs reflect an attempt to dampen the impact of external sources of real exchange instability arising from the large fluctuations among the real exchange rates of the advanced industrial countries in the post-Bretton Woods era.

As for Dordunoo and Njinkeu, they grouped the SSA countries into two main categories as follows:

Flexible exchange rate zones, which include countries with basket pegs, crawling peg regimes, managed floating exchange rate regimes, and independent float; and

Fixed exchange rate, especially including the CFA franc zone.

Their main finding was that regime selection is not an issue; regime management is more important.

In addition to these two studies, other country specific analyses address exchange rate policy. Egwaikhide, Chete, and Falokun (1994) examined the Nigerian experience in exchange rate depreciation according to the budget deficit and inflation. Adjakaiye et al (1994) explored exchange depreciation and the structure of sectoral prices in Nigeria under an alternative pricing regime for the period1986 to 1989. Odubogun (1995) focused on institutional reforms and management of exchange rate policy while Ogiogio (1996) assessed the exchange rate behavior in Nigeria's auction. Jebuni, Sowa, and Tutu (1991) emphasized exchange rate policy and macroeconomic performance in Ghana.

All these studies yielded nearly the same conclusion; that is, flexible exchange rate regimes are the best way to overcome macroeconomic disturbances and increase the level of economic growth. In studies involving several African countries over a long period, however, researchers faced the challenge of dealing with instability in frequently switched exchange rate regimes. None of the studies took these changes into account. Therefore, one of the main objectives of the present work is to appraise the effect of switching exchange rate regimes.

4. AN OVERVIEW OF ECONOMIC PERFORMANCE AND POLICY INDICATORS

Beginning in the 1970s, the economic performance of many African countries started to decline, reaching its lowest levels in the 1980s. The state of aggregate economic performance in Africa since the early 1980s has been characterized by sluggish growth of real output and a decline in real income per capita, both of which are related to a decrease in investments and savings, the drop in export performance, and the deterioration of the current account balance (Lyakurwa, 1991, Barry and Beltchika, 1996).

Accordingly, with a few exceptions like Gabon, Mauritius, and South Africa, many African countries fall into the categories of lower-income economies. The annual average per capita income of sub Saharan Africa (SSA) was estimated at $572 from 1975 to 1984, and $503 from 1985 to 1989. Since 1990, per capita income has been even lower than that of the preceding periods and has been estimated at less than $500. Compared with other developing countries, particularly those in Southeast Asia, the per capita incomes of SSA lag behind.

Facing the economic crisis of the 1980s, many African countries chose to alter their exchange rate regime. Of the 39 African countries with fixed exchange rates in 1980, 16 switched to more floating exchange rate regimes by 1994. The main purpose of this section is to compare economic performance and policy indicators across African countries under different exchange rate regime policies.

Countries are grouped according to their exchange rate regimes for comparing economic performance and policy indicators. The following seven groups are identified:

monetary unions;

currencies pegged to SDR;

currencies pegged to a basket of money;

isolated currencies pegged to one money;

independently floating exchange rates;

managed floating exchange rates; and

changed exchange rate regimes.

The monetary union group is made up of CFA members (currencies pegged to the French franc) and the South African rand zone.[10] Most isolated currencies are pegged to the U.S. dollar, except for the cases of Gambia (pegged to the English pound before 1985) and Equatorial Guinea, (pegged to the peseta until 1984). The group of unpegged-currency countries increased with the number of countries leaving the SDR (basket of currencies). At the end of the period, only three African currencies were pegged to the SDR (Rwanda, the Seychelles, and Libya). Moreover, the group of countries with currencies in isolation, that is, pegged to a single money, had disappeared and switched to basket or more flexible exchange rate regimes (Burundi, Egypt, Ethiopia, Liberia, Libya, Rwanda, Somalia, and Sudan).

Some countries have frequently switched their exchange rate regimes and sometimes have even returned to the first regime after one, two, or three years or more. It is difficult in this case to range such countries into a given group of stable exchange rate regimes. Such was the case for Uganda (eight shifts from 1980 to 1994) Zambia and Somalia (seven shifts), Sudan and Mozambique (six shifts), and Sao Tome, Madagascar, Guinea, and Ghana (four shifts). Burundi, Kenya, Mauritius, Nigeria, Zaire, and Rwanda showed fewer shifts and altered their exchange rate regimes only three times from 1980 to 1994. All countries that have switched from fixed to floating exchange rate regimes form the CHANGING group. They permit an assessment of the impact of exchange rate regime alteration on growth performance.

Because of sharp variations in the exchange rate regimes of countries, it is not possible to develop an average value of performance indicators over the entire period 1980-1995. Thus, the overall period (1980–1994) is divided into three subperiods: 1980–1984, 1985–1989, and 1990–1994. Except for the members of monetary unions, groups are not homogeneous from one subperiod to another. (See Appendix for the classification of countries within each exchange rate regime group.)

4.1 Economic Performance Indicators

In broad overview, since the 1980s, African economies have experienced sluggish growth in real output and a decline in real per capita income as related to a downturn in investments and savings, a drop in export performance, and deterioration of the current account balance. Table 2 presents the evolution of selected performance indicators for all countries and for each specific group of the exchange rate regime. It shows that, in terms of output growth, countries with currencies pegged to a basket of currencies recorded the highest growth rates, followed by the group with single pegging. Monetary union members are generally characterized by a deep decline in the rate of output growth over the three subperiods. In the group of unpegged currencies, the rate of total output growth improved somewhat. At the end of the period, a noticeable gap appears between the group of unpegged currency countries and all the others, except for countries with currencies pegged to a basket, which also had good performances.

Table 2. Comparison of Economic Performance Indicators			
	1980–1984	**1985–1989**	**1990–1994**
Average annual real GDP growth rate (percent)			
All Countries	3.43	3.15	1.47
Monetary Unions (MU)	3.29	2.57	1.22
Pegged to SDR	2.28	2.30	-3.40
Pegged to a Basket	4.84	4.82	2.19
Pegged Outside MU[11]	4.25	2.91	—
All Floating Regimes	1.65	3.12	2.19
Changing Countries	2.75	3.46	1.03
Average annual growth rate of real exports ratio to GDP (percent)			
All Countries	-1.18	-0.07	-0.19
Monetary Unions (MU)	-0.38	0.46	0.09
Pegged to SDR	-2.05	-0.47	-0.44
Pegged to a Basket	-0.36	-1.37	-0.56
Pegged outside MU	-0.31	0.28	—
All Floating Regimes	-2.25	0.19	-0.26
Changing Countries	-1.21	-1.02	-0.55
Investment/GDP ratio (percent)			
All Countries	23.68	20.17	21.60
Monetary Unions (MU)	24.94	20.76	20.64
Pegged to SDR	23.57	18.30	16.80
Pegged to a Basket	28.80	25.61	24.97
Pegged outside MU	18.80	15.50	14.00
All Floating Regimes	18.00	18.23	21.16
Changing Countries	20.49	19.23	23.3
Domestic savings/GDP ratio (percent)			
All Countries	9.92	9.56	8.48
Monetary Unions (MU)	6.88	3.27	6.74
Pegged to SDR	9.88	12.9	0.85
Pegged to a Basket	12.08	15.83	14.70
Pegged outside MU	14.15	9.03	—
All Floating Regimes	14.54	12.05	-6.17
Changing Countries	5.07	8.76	4.36
External debt/GDP ratio			
All Countries	0.24	0.71	0.75
Monetary Unions (MU)	0.27	0.66	0.61
Pegged to SDR	0.26	0.37	0.35
Pegged to a Basket	0.20	0.37	0.49
Pegged outside MU	0.22	1.19	—
All Floating Regimes	0.14	0.97	1.16
Changing Countries	0.32	1.02	1.12

Source: *Computed from the series of the World Bank World Tables, 1995.*

The erosion of competitiveness in African countries is evident by declining export performance. The average annual growth rate of the exports ratio is negative throughout the period: -1.18 percent from 1980 to 1984; -0.07 percent from 1985 to 1989; and -0.19 percent from 1990 to 1994. The poorest export performances are observed in the SDR and the unpegged groups, with
-2.05 percent and -2.25 percent, respectively, at the beginning. However, the initial gap narrowed at the end of the period for all groups.

On average, the share of investment also dropped during the 1980s. For all countries, the rates are 23.68 percent between 1980 and 1984, 20.17 percent between 1985 to 1989, and only 21.6 percent between 1990 and 1994. The highest investment rates are evident in the basket-pegging group (28.8 percent, 25.61 percent, and 24.97 percent), followed by the monetary union members group (24.94 percent, 20.76 percent, and 20.64 percent). While the share of investment decreased over the entire period in all other groups, unpegged and changed-regime countries finished with higher investment shares: 18 percent, 18.23 percent, and 21.16 percent in unpegged-currency countries and 20.49 percent, 19.23 percent, and 23.3 percent in the group that changed regimes.

The lowering of investment rates in African countries resulted from the decline in domestic savings. The average annual rate of domestic savings for all SSA counties was 9.92 percent between 1980 and 1984, 9.56 percent between 1985 and 1989, and 8.48 percent between 1990 and 1994. Countries that changed regimes registered the lowest performance in domestic savings, with 5.07 percent from 1980 to 1984, 8.76 percent from 1985 to 1989, and 4.36 percent from 1990 to 1994. Unpegged-regime countries experienced a severe reduction in domestic savings, falling from 14.54 percent in the first period to 12.05 percent in the second period to -6.17 percent in the final period. To overcome deteriorating macroeconomic conditions, many countries had to resort to more external borrowing, which resulted in a debt overhang in the late 1980s. The percentage shares of debt to GDP, as an average for all countries selected, increased from 0.24 (1980–84) to 0.71 (1985–89) to 0.75 (1990–94). Obviously, unpegged-currency countries and countries that shifted from fixed to more floating currencies recorded the highest ratios and growth rates of external debt to GDP.

4.2 Policy Indicators

The extent to which the policy instruments adopted by the respective governments were responsible for the worsening of economies depends in part on the fiscal and monetary instruments and their implications for the government budget deficit and inflation. Table 3 depicts changes in policy indicators among each group of countries. The most important policy indicators analyzed here are resource balance, domestic credit expansion, and government deficit (all as percentages of the GDP), as well as inflation, real effective exchange rate variation, and terms of trade changes during each subperiod.

Table 3 shows relative improvement in the resource balance for both monetary union members (from -18.13 percent between 1980 and 1984 to -17.48 percent between 1985 and 1989 to -13.89 percent between 1990 and 1994) and the basket group (from -16.77 percent to -9.77 percent to -10.02 percent). With exports declining during the period, the improvement in resource balance for the monetary union members suggests a drastic curtailing of imports. Such curtailment may have adversely affected output growth rates within the period by reducing capacity utilization. The other exchange rate regime groups show a worsening of resource balance, particularly among unpegged and altered regimes.

One main advantages of monetary union is fiscal and monetary discipline. Monetary union members showed lower budget deficits (-3.84 percent, -7.96 percent, and -8.85 percent), lower domestic credit expansion (19.38 percent, 3.5 percent, and 1.7 percent), and lower inflation

Table 3 Comparison of Policy Indicators			
	1980–1984	**1985–1989**	**1990–1994**
Median of annual inflation (percentage)			
All Countries	12.80	8.9	12.2
Monetary Unions (MU)	11.95	1.00	3.30
Pegged to SDR	14.7	1.9	7.15
Pegged to a Basket	12.1	9.4	13.2
Pegged outside MU	12.15	8.9	—
All Floating Regimes	15.25	23.2	26.2
Changing Countries	15.4	40.30	27.00
Domestic credit expansion (percentage)			
All Countries	24.07	17.34	12.43
Monetary Unions (MU)	19.38	3.50	1.76
Pegged to SDR	26.83	12.75	10.66
Pegged to a Basket	25.00	20.87	19.37
Pegged outside MU	23.28	15.75	—
All Floating Regimes	31.60	30.61	24.81
Changing Countries	26.2	37.40	25.57
Resource balance /GDP ratio			
All Countries	-3.78	-10.61	-13.07
Monetary Unions (MU)	-8.13	-17.48	-13.89
Pegged to SDR	-3.66	-5.40	-15.95
Pegged to a Basket	-6.77	-9.77	-10.02
Pegged outside MU	-4.67	-6.46	—
All Floating Regimes	-3.48	-6.21	-15.41
Changing Countries	-5.43	-10.96	-18.93
Government deficit GDP ratio			
All Countries	-6.88	-8.49	-9.48
Monetary Unions (MU)	-3.84	-7.96	-8.85
Pegged to SDR	-17.2	-9.70	-13.00
Pegged to a Basket	-6.10	-6.35	-3.41
Pegged outside MU	-7.86	-11.30	—
All Floating Regimes	-6.16	-8.73	-11.92
Changing Countries	-6.00	-10.71	-14.29
Real effective exchange rate variation (percentage)			
All Countries	-4.96	-5.55	-14.56
Monetary Unions (MU)	-1.15	-3.80	-18.91
Pegged to SDR	-	-5.93	-15.12
Pegged to a Basket	270.50	-9.47	-16.33
Pegged outside MU	-38.56	-4.80	—
All Floating Regimes	-28.16	-5.16	-9.56
Changing Countries	-111.4	-0.74	-5.43
	-180		
Terms of trade variation			
All Countries	1.28	-1.87	-0.14
Monetary Unions (MU)	0.47	-0.40	0.54
Pegged to SDR	-0.13	-8.95	-2.26
Pegged to a Basket	4.49	-4.25	-1.12
Pegged outside MU	1.53	-0.18	—
All Floating Regimes	-3.30	-3.84	-3.77
Changing Countries	-2.77	-2.30	-4.09

Source: *Computed from the series of the World Bank World Tables, 1995*

(11 percent, 3 percent, and 1 percent) as compared with the other groups over the period. Given the need for financial stability and fiscal policy commitment in the face of the external negative shocks of the late 1980s, monetary union members have continued to observe a declining rate of domestic credit expansion since 1985. Conversely, central government budget deficits increased during the same period. Unpegged-currency countries and those that shifted to floating exchange rate regimes had the highest inflation rates of between 15.25 and 40 percent. They also experienced the highest rates of domestic credit expansion: 31.6 percent, 30.61 percent, and 24.81 percent for the unpegged-currency group and 26.2 percent, 37.4 percent, and 25.57 percent for changing countries. Central government budget deficit seems to be even more important within the SDR group, with -17 percent from 1980 to 1984 and -13 percent from 1989 to 1994 followed by single-pegging countries: -7.86 percent, -8.73 percent, and -11.92 percent for the same periods.

Table 3 also shows that monetary union countries enjoyed a relatively stable real effective exchange rate from 1980 to 1989. The exchange rate's variation was estimated at only -1.15 percent from 1980 to 1984, and -3.8 percent from 1985 to 1989, as compared with -270.5 percent for the SDR group and 111 percent for unpegged-currency countries for the same period. Variations in the real exchange rate show the adjustment to its equilibrium level, as countries pursued more rigorous adjustment policies, including devaluation. To a large extent, the devaluation of nominal exchange rates by countries outside monetary unions appears to have been an appropriate response to correcting and reversing the countries' earlier dramatic overvaluation. This is the case, for example, for Ghana, Nigeria, the Gambia, and Zaire. Between 1990 and 1994, floating exchange rate regime countries evidenced more stabilized real effective exchange rates while monetary union members experienced a devaluation, as shown in Table 3. However, the data used here are based on 1987, which coincided with the early period of massive devaluations in the process of adjustment by several SSA countries. As a result, the substantial devaluations that took place after 1987 are not particularly pronounced in the data. In addition, relative movements in the inflation rates between a country and its trading partners may diminish the impact of a devaluation, especially if inflationary tendencies are stronger domestically than abroad, as is the case for unpegged-currency or shifting exchange rate regime countries.

The terms of trade measure the relative movement of export and import prices. With a base year of 1987, they are calculated as ratios of each country's export unit values or prices to its import unit values or prices. Table 3 also gives the rate of changes in terms of trade. Figures show relatively high levels of terms of trade deterioration, mainly in unpegged-currency countries, but also in basket and SDR groups. The terms of trade are more stable among monetary union members.

This section has been descriptive. The following section analyzes the main determinants of economic performance in African countries for each group of exchange rate regimes.

5. THE DETERMINANTS OF THE GROWTH RATE OF TOTAL OUTPUT AND OF INCOME PER CAPITA

This section presents, first, the empirical determinants of economic growth and, second, the

results of the econometric analysis.

5.1 Empirical Determinants of Output Growth

The empirical determinants of output growth are derived from the theoretical framework based on the neoclassical growth model, including, on the one hand, capital and labor productivity, and, on the other hand, the influence of macroeconomic environment and policy variables.

5.1.1 Basic Neoclassical Assumptions

According to the neoclassical growth model, steady-state growth depends on technological progress and population growth, both of which are exogenous to the model (Solow, 1956). Technological progress, as well as an increase in the investment rate, can raise output in the short term, but, assuming diminishing return to scale, output in the long term grows at the rate of exogenously given technological progress. As such, economic policies do not affect steady-state economic growth in the neoclassical framework. They can simply affect the level of output or its growth rate during the transition from a steady state to another state. In this sense, the growth rate of each country is supposed to be determined by the natural growth rate of the population and investment rate. Thus, the growth rate of the total population (or of the labor force) is supposed to positively affect the growth rate of real GDP, and negatively influence the growth rate of per capita income. This basic model is intended to take into account structural variables of the starting period and the macroeconomic environment.

The neoclassical model also yields the prediction that output levels of countries with similar technologies converge at a given level in the steady state (Barro, 1984). In other words, the growth rates of output of less developed economies are expected to converge with those of advanced economies. The relevant assumption is that marginal returns to capital continue to diminish. The marginal product of capital falls with capital accumulation. Poor countries have a lower capital-output ratio than richer countries. Hence, the marginal productivity of capital in poor countries is expected to exceed that in rich countries. Consequently, higher returns to capital in developing nations are expected to attract capital from industrial countries, making rapid growth possible. Therefore, per capita income is assumed to be negatively correlated with the growth rates of each country for both total and per capita output.

The neoclassical theory also assumes that the macroeconomic environment is one of the main determinants of economic growth. Africa's poor growth performances have been shown to result, to a large extent, from poor macroeconomic environments both internally (real exchange rate appreciation) and externally (terms of trade deterioration) (P. and S. Guillaumont, 1994; Hadjimichael et al., 1995). In this study, likewise, the variation of both the real exchange rate and terms of trade will be entered into the model.

In the theoretical literature, the effects on economic growth of changes in terms of trade are ambiguous (Hadjimichael et al., 1995). In the short term, an improvement in terms of trade could either lower or raise growth. In terms of increasing growth, an improvement in the terms of trade could reduce input prices relative to output prices and lead to increases in supply quantities in the short term. For two reasons, however, this assumption does not always hold for African countries. On the one hand, the manufacturing and infrastructure bases are weak, limiting the capacity of economic agents to respond adequately to improvements in the terms of trade in the short term. On the other hand, most African countries rely heavily on one or two primary commodities that have long gestation cycles and whose response to price incentives in the short term is limited. As for decreasing growth, an improvement in terms of trade could

lower growth in the short term through an appreciation of the real exchange rate equilibrium, which would lower the profitability of tradable goods. Similarly, a deterioration of the terms of trade would cause a depreciation of the real exchange rate equilibrium. Nonetheless, the effect of changes in the terms of trade on the real exchange rate is still ambiguous. This study assumes that the economic growth rate of countries is positively related to an improvement in the macroeconomic environment, mainly in terms of trade.

Although the present study aims to measure the effect of the exchange rate arrangement on growth, it is still necessary to control for the real exchange rate variation. The basic explanation is that a fixed exchange rate regime with frequent devaluations is the equivalent to a floating exchange rate regime. Thus, the specific effect of the exchange rate regime might be sized only after introducing a control for real exchange rate changes. The theoretical literature is equally ambiguous about the direction of the effect of real exchange rate changes on the rate of investment. Actually, a real depreciation raises the cost of imported capital goods, and since a large amount of investment goods is imported in African countries, domestic investment would be expected to fall with a real depreciation. Besides, an appreciating real exchange rate would be expected to lower the profitability of exportable goods and thus of export volume. The resulting decline in export earnings might induce the authorities to impose exchange restrictions on imports, including imports of capital goods, in order to economize in foreign exchange reserves. In addition, movements in the real effective exchange rate would be expected to capture the effects of outward-oriented trade strategies. By raising the profitability of activity in the tradable goods sector, a real depreciation would be expected to stimulate private investment in that sector. In conclusion, it is not possible to predict the sign of the coefficient of the real effective exchange rate variation in the estimated growth equation.[12]

Finally, according to neoclassical theory, flexible exchange rates lead to higher rates of economic growth by insulating the domestic economy from external disturbances. To test this hypothesis, different dummy variables have been built, as follows:

Single takes the value of one if and only if the country had its money pegged to a single currency outside a monetary union, and takes zero in all other cases. This group is made up chiefly of U.S.-dollar-pegged currencies. *Single* aims to catch the specific effect of fixed exchange rate regimes outside the monetary unions. The coefficient is expected to be negative.

SDR and *Basket* take the value of one if and only if the country kept its currency repeatedly pegged to SDR or to another composite and the value of zero in all other cases. *SDR* and *Basket* aim to approximate the individual effect of pegging to a composite rather than to a single currency.

Union and *CFA* are two dummy variables that measure the consequences of membership in a monetary union or the special effect of the French franc zone on growth. *Union* takes the value of one if the country is a member of a monetary union, including the CFA zone, and zero if the country is not a member. CFA is given the value of one if the country exists as a CFA member, and zero in all other cases. Like *Union,* the *CFA* dummy variable coefficient is supposed to be negative.

Free and *Managed* are the dummy variables that intend to catch the outcome of

floating exchange rate regimes' impact on economic performance. *Free* takes the value of one if the country often experienced an independently floating exchange rate regime within the period, and zero for all the other cases. *Managed* is identically defined for countries that undertook managed floating exchange rate regimes. Their coefficients are expected to be positive.

Frequent changes in the exchange rate regimes of countries do not allow us to undertake the analysis for a long period. Thus, several subperiods are examined: 1980–1986 and 1987–1993 or 1980–1984, 1985–1989, and 1990–1994.[13] Taking into account all these hypotheses, we derived several equations from the empirical model above.

5.1.2 Structural Assumptions

Structural factors of the initial period are also supposed to affect the economic growth of countries. Here, we are mainly interested in education (human capital), geographic location, country size, level of economic development (per capita income is a proxy), and physical location (landlocked or access to the international market).

Human capital is considered a domestic source of endogenous growth. In the endogenous growth framework, economic and social policies can affect growth in the steady state. Technological changes can be made endogenous through human capital investment (Lucas, 1988). A country's scarcity of trained local managers and entrepreneurs is linked to the lack of education among the labor force. Differences in labor force education in the initial period should result in differences in economic growth rates. More educated populations should generate higher rates of growth of total and per capita output. Previous studies have distinguished primary, secondary, tertiary or total school enrollment for human capital proxies. For example, many studies use primary school enrollment to control for a country's human capital accumulation. The theoretical assumption gives this variable a positive coefficient, but empirical evidence for African countries shows that primary school enrollment is negatively correlated with growth performance (Pritchett, 1995). For that reason, this study uses the initial secondary school enrollment variable.

Population is taken as a proxy for economic size. It is considered an indicator of labor force availability and of high possibilities for labor force specialization. Thus, population is supposed to influence the production structure through possibly higher participation in industrial production, and hence, higher rates of savings (Patrick and Sylviane Guillaumont, 1988). The result should be higher economic growth. Total population, though, like population growth, should be correlated negatively with per capita output; population should grow faster than output outside the steady-state growth.

Geographic location is another important structural factor that can determine a country's economic performance. Research has shown that countries without access to the international market, landlocked countries, and countries with a seacoast but no container port have lower growth and trade performance (Sachs, 1996; Guillaumont 1988). These studies also showed that many African countries are landlocked. Accordingly, the present study considers the physical structure as one of the main determinants of growth.

By controlling for all the above neoclassical and structural factors, this section tests the hypothesis that a flexible exchange rate regime insulates a country from external disturbances.

That is, given their initial structure, labor efficiency, and terms of trade variations, countries with more flexible exchange rate regimes should have higher growth rates of total output and per capita income. Most structural variables have proven to be not highly significant, and thus were dropped from the equations. Finally, the empirical equation includes the basic factors of production (investment rate and population growth rate), the external environment variation (terms of trade variation), and the internal environment changes (real effective exchange rate variation).

The model's estimated equation is:

$$y_i = b_0 i + \underset{(+)}{b_1 GDI_i} + \underset{(+/-)}{b_2 POPg_i} + \underset{(+)}{b_3 DTTR_i} + \underset{(+/-)}{b_5 DRER_i} + \underset{(+)}{b_6 DUM_i} + \underset{(-)}{b_7 PCGNP_0},$$

where:

the subscript (0) indicates the starting period and (i) represents the observation;

y is the average annual rate of growth of per capita GNP or total output of country i;

Ui is the random error that represents country characteristics or missing variables and is assumed to have zero mean and constant variance;

GDI is the investment share to GDP;

POPg stands for the natural rate of growth of the total population;

DTTR measures variations in the terms of trade within the study period;

DRER represents the rate of change in the real effective exchange rate;

$PCGNP_0$ is per capita GNP in the initial period; and

DUMi is the dummy variable for exchange rate regime. This variable takes the value of one if the country employs a specific exchange rate regime (*Single, SDR, Basket, Union, CFA, Free,* or *Managed,* as defined above) or zero if it does not.

5. 2 Estimate Results

The above equation has been estimated by using the ordinary least square estimation method on a cross-section sample of 52 African countries for the period 1980 to 1994. Before we undertake the analysis of the results, we must perform some statistical tests. One of the most relevant problems on a cross-section analysis is heteroscedasticity. The theoretical model assumes that disturbances have a constant variance and are uncorrelated. Nonetheless, empirical data across countries are likely to violate this assumption. Thus, for each estimated equation, the White heteroscedasticity test was performed. Though some of the equations did not lead to rejection of the null hypothesis, the White heteroscedasticity-consistent standard errors and covariance are systematically computed for all. The second possible problem is multicollinearity among independent variables. To test for linear correlation among independent variables, the Variance Inflation Factors (VIF) method was used.[14] The results of the VIF test did not show strong collinearity among any of the model's independent variables.

All VIFi are far lower than the maximum required level of ten. All the explanatory variables are taken as logarithms except for the rate of growth variables. Estimation from the above equation yields the following results under several hypotheses concerning exchange rate regimes of countries. Equations are estimated both for per capita income growth as well as for total output growth. [15]

5.2.1 Impact of the Exchange Rate Regime on the Rate of Growth of Per Capita Income.

Since countries frequently switch exchange rate regimes, it is difficult to catch the real effect of a specific exchange rate regime on economic performance. Consequently, we assume that both current and earlier exchange rate regimes may affect the rate of growth of per capita income. Estimating the empirical equation under these two hypotheses (that is, with the current exchange rate regime dummy variable) yields the following results.

a) Estimated Equations, Including the Current Exchange Rate Regime

Table 4 shows the results of the income per capita equation under the current exchange rate regime. The equations are satisfactory in terms of their explanatory power and fit, and the signs of the controlled variables are as expected.

Most controlled variables have the expected signs at a high level of significance. The coefficients for labor force growth, investment rate, and income per capita are highly significant, at a 1 percent level. According to the convergence hypothesis, countries with lower initial output per capita are supposed to grow faster than richer ones. Table 4 shows nonrejection of this hypothesis at a 5 percent level of significance. Environmental variables are not significant. The coefficients of the terms of trade variation and the real effective exchange rate changes have the expected sign but are not statistically significant.

Our main interest is the exchange rate dummy variable. The equations show no strong impact of the current exchange rate regime on the rate of growth of income per capita. The only variables that are significant in the equations are the dummy variables for monetary union and CFA which are negative and consistently significant, indicating that total output is lower for countries in the CFA zone and other monetary unions relative to countries with other exchange rate regimes.

All the other exchange rate regimes, however, yielded a null effect, at a 5 percent level of significance. That means, for these countries, the current exchange rate regime did have a large effect on the growth of per capita income from 1987 to 1993. Only the countries with stable exchange rate regimes during the period in question (CFA zone countries and monetary union members) showed a significant impact of the exchange rate regime on the rate of growth of their income per capita. Unfortunately, the impact is negative. They experienced declining per capita income over the period due to the overvaluation of their nominal exchange rate and the lack of adjustment of their real effective exchange rate. The growth of income per capita was determined mainly by other factors not controlled by this model; the intercept is positive at a 5 percent level of significance.

In floating exchange rate regime countries, the investment rate and unobserved factors have

contributed to increases in per capita revenue. For all of them, neither the external

environment (DTTR) nor policy tools (DRER) helped increase the national revenue per capita. However, considering instead the former exchange rate regime of each country, the impact seems to be greater than that of current policy.

Table 4. Dependent Variable: Growth of Income per Capita, Average Annual Rate (percent) 1987–1993 (OLS) Current Exchange Rate Regime: 1987–1993				
Variable[16]	**Monetary Unions & Single Currencies**	**Independently & Managed Floating Currencies**	**Pegged to SDR & Other Composite Currencies**	**CFA Zone**
Constant	10.889 (0.948)	17.929 (2.066)**	15.971 (1.681)*	20.145 (2.455)**
Growth of Population	-2.212 (-2.232)**	-2.763 (-2.834)***	-2.211 (-2.435)**	-2.474 (-3.013)**
Investment Rate	2.119 (1.776)*	3.251 (3.046)***	2.505 (2.552)**	1.040 (0.903)
Per-Capita Income 1987	-2.892 (-2.025)**	-3.434 (-2.523)**	-3.702 (-3.071)***	-2.956 (-2.383)**
Terms of Trade Variation	0.034 (0.883)	0.020 (0.659)	0.045 (1.011)	0.059 (1.607)
Real Exchange Rate Variation	-0.673 (-0.360)	-2.708 (-1.967)*	-1.809 (-1.240)	-1.772 (-1.256)
CFA (CFA Zone Countries)				-3.585 (-2.990)***
Union	-2.442 (-2.002)**			
Single	1.469 (0.675)			
Managed		0.714 (0.796)		
Free		3.439 (1.686)*		
Basket			0.258 (0.244)	
SDR			2.712 (1.068)	
Observations	35	35	34	35
R-Squared	0.472	0.469	0.389	0.530
Adjusted R-Squared	0.335	0.332	0.224	0.430
F-statistic	3.456	3.415	2.365	5.280

Key: **** : 1% level of significance; ** : 5% level of significance ; * : 10% level of significance; t-statistics in parentheses.*

b) Estimated Equations, Including the Former Exchange Rate Regime

Now we make the assumption that the exchange rate regime of the initial period determines the economic performance of the current period. The exchange rate policy of a country is supposed to influence its rate of investment through private and foreign direct investment. The exchange

rate regime policy should also affect the quantity and quality of financial institutions. Thus, we assume that institutions, savings, and capital stocks in the initial period may affect the rate of investment and policy variables in the current period. Therefore, the equation for income per capita growth is estimated by including the exchange rate regime of the initial period. Estimating the equations yields the results in Table 5.

Table 5. Dependent Variable: Growth of Income per Capita, Average Annual Rate (percent) 1987–1993 (OLS)			
Former Exchange Rate Regime: 1980–1986			
Variable[17]	**Monetary Unions & Single**	**Independently & Managed Floating**	**Pegged to SDR and Other Composite**
Constant	18.398 (1.964)*	10.875 (1.184)	19.547 (1.732)*
Growth of Population	-2.309 (-2.373)**	-2.581 (-2.787)***	-2.435 (-2.614)**
Investment Rate	2.498 (1.910)*	2.963 (2.498)***	2.353 (1.987)*
Per Capita Income 1987	-3.706 (-2.268)*	-3.693 (-2.048)**	-3.635 (-2.160)**
Terms of Trade Variation	0.035 (0.711)	0.038 (0.914)	0.028 (0.650)
Real Exchange Rate Variation	-1.994 (-1.178)	-0.764 (-0.502)	-2.553 (-1.079)
Union	-2.679 (-2.185)**		
Single	-1.974 (-1.801)*		
Managed		2.962 (2.268)**	
Free		-0.827 (-0.555)	
Basket			1.726 (0.886)
SDR			1.817 (1.289)
Observations	34.	34.	34.
R-Squared	0.444	0.384	0.375
Adjusted R-Squared	0.294	0.218	0.207
F-Statistic	2.966	2.318	2.235

Key: **** : 1% level of significance; ** : 5% level of significance ; * : 10% level of significance; t-statistics in parentheses.*

Table 5 clearly shows that the exchange rate management of the early 1980s had been a good policy tool and helped increase the income per capita. As seen in Table 4, the coefficient for the managed floating dummy variable is positive and significant at a 1 percent level. Accordingly, countries that started with more flexible exchange rate regimes improved their economic growth in the second period, probably because of increasing in investment share under managing floated. The coefficient of investment rate is consistently significant in the

present table and only in the equation including the managed floating exchange rate dummy variable (1 percent level). The monetary union dummy variable is still significant and negative as in Table 4; nothing has changed for that group.

To summarize the results, the CFA zone and the other monetary union members, which are good examples of strict pegging, have faced severe difficulties and have performed poorly in terms of per capita income growth. The same model has been estimated for the average annual rate of total output growth.

5.2.2 Impact of the Exchange Rate Regime on the Growth Rate of Total Output.

Estimating the above model for the rate of growth of total output showed that single-pegged currency countries had higher rates of growth of total output from 1980 to 1984 compared with all the other groups. The single-pegged countries benefited mainly from adequate variations in the real effective exchange rate as well as from their domestic investment ratios. The real effective exchange rate adjustment in these countries favored the rate of growth of total output during the four-year period. The coefficients for policy tools (DRER) and investment rate are positive and significant at a one percent level. Table 6 shows the results of only those output equations with satisfactory explanatory power and fit.

For 1980 to 1994, the results show consistently significant coefficients for CFA zone countries and for countries whose money was pegged to a single external currency. These coefficients are negative for the CFA dummy and positive for SINGLE. Consequently, it can be stated that for monetary union members, the combination of low inflation, a lower budget deficit, and low domestic credit expansion was not sufficiently profitable to offset the inherent cost of overvaluation of their nominal exchange rate during that period. Facing the external disturbances of the late 1980s, monetary union economies experienced a contraction of their total output. Their real effective exchange rate variation prevented economic growth. In African economies, pegging to a single external currency is revealed as superior to a monetary union. That is, it implies no cooperation commitment and no leadership responsibilities. Obviously, nonpegged currency countries are likely to suffer from the exchange rate risk and other problems related to their internal and external financial markets. Thus, the eventual benefits from flexible exchange rates—isolation from external disturbances—are canceled.

6. CHANGES IN THE RATE OF GROWTH OF REAL GDP, EXPORT SHARE, AND CURRENT ACCOUNT BALANCE

The current section addresses the question of whether the pace of economic growth in African countries facing the external shocks of the 1980s could be explained by the choice of exchange rate regime. In other words, this section analyzes the behavior of the rate of growth of real GDP, the rate of growth of exports share, and the behavior of the current account balance when countries shift from fixed to floating exchange rate regimes. For the purposes of this study, the group of affected countries is referred to as the DREG countries in this study.

According to Aghevli et al. (1991), many developing countries, including African countries, have increased their reliance on more flexible exchange rate regimes for the purpose of competitiveness. For African economies, the deterioration of the international environment on the basis of traditional trade during the 1980s has increased the countries' need for competitiveness. With the exchange rate regime policy as an instrument of competitiveness,

many African countries have altered their exchange rate regimes.

Table 6 Dependent Variable: Growth Rate of Real GDP, cross-section times series (GLS): 1980-1984 ; 1985-1989 ; 1990-1994					
Average rates					
Variable[18]	**Pegged currencies**			**Pegged currencies and inflation rate**	**Floating currencies**
Constant	-0.063 (-5.578)***	-0.057 (-6.37)***	-0.056 (-8.46)***	-0.062 (-4.458)***	-0.058 (-4.893)***
Investment Rate	0.030 (9.523)***	0.030 (8.933)***	0.029 (11.94)***	0.032 (7.821)***	0.029 (8.141)***
Growth of Population	0.006 (0.439)	0.0006 (0.067)	0.005 (0.687)	-0.005 (-0.255)	-0.0016 (-0.135)
Terms of Trade Variation	0.0008 (2.366)**	0.0007 (1.741)*	0.0008 (2.062)**	0.0004 (0.834)	0.0006 (1.623)
Real Effective Exchange Rate Variation	3.76E-05 (1.006)	6.45E-05 (2.047)**	6.75E-05 (2.086)**		5.97E-05 (1.906)*
CFA		-0.011 (-4.137)***	-0.012 (-4.621)***	-0.012 (-2.118)**	
Single	0.021 (2.749)***		0.016 (3.414)***	0.026 (2.009)**	
SDR	-0.010 (-1.531)			-0.012 (-1.349)	
Basket	-0.001 (-0.430)		(-0.005) (-1.399)	-0.006 (-0.897)	
Free					0.008 (1.723)*
Managed					0.004 (0.923)
Inflation Rate				-5.18E-05 (-0.568)	
R-Squared	0.702	0.585	0.862	0.563	0.556
Adjusted R-Squared	0.678	0.562	0.851	0.509	0.527
F Statistic	29.53	25.66	78	10.496	18.82
Panel Observations	96	97	96	74	97

Key: *** : 1% level of significance; ** : 5% level of significance ; * : 10% level of significance; t-statistics in parentheses.

Therefore, the year 1980 is the correct breakup period in the history of exchange rate regimes in African economies. In particular, most African countries were operating under fixed exchange rate regimes before that date. Since then, many African countries started to shift to more floating exchange rate regimes, as is clearly shown in Table 1. It is thus interesting to assess the state of improved economic performance in such countries as compared with the African countries that did not switch exchange rate regimes. The overall period studied is 1970–1993 divided into two subperiods: the basic or initial period (1970–1980) and the current period (1980–1993). The model is the standard controlled group approach.

6.1 The Model

To study the specific impact of the exchange rate regime alteration on the economic growth of countries, we use a "modified group control approach" method developed by the authors to measure the effectiveness of the IMF and World Bank adjustment programs among countries during the 1980s. It postulates that changes in the value of each performance indicator depend on changes in the environment (external or internal environment), the nature of the environment of the preceding period, changes in the normal policy (lagged value of economic performance indicator), and the membership of a specific group. These hypotheses can be translated into an empirical equation as following[19]:

$$y = a0 + \underset{(+)}{a_1 DENV} + \underset{(-)}{a_2 ENV(-1)} + \underset{(-)}{a_3 Y(-1)} + \underset{(+)}{a_4 DREG} + u$$

where:

y represents the average rate of change in the economic performance indicator;

DENV measures changes in the environment between the current period and the initial period (-1);

ENV(-1) represents the conditions of the environment and the structure of the country at the starting period. (structural variables are assumed to influence the economic results and consequently the target levels;

Y(-1) is the economic result of the initial period, and is a proxy for autonomous policy change as in the modified control group approach; and

DREG represents the membership of a specific group of countries that shifted from a pegged currency to a more flexible one.

The shock variable indicator (SHOCK) measures the external environment disturbance (DENV). The shock variable is defined as a weighted average of changes in world real interest rates, the export price index, and the import price index for each country. The environment disturbance equation can be written as following:

$$SHOCK = -(R1-R0)(D/Y)_0 + (PX1/PX0-1)(X/Y)_0 - (PM1/PM0-1)(M/Y)_0,$$

where:

subscripts 0 and 1 refer to initial (or base) period and current period, respectively;

R is the average real interest rates computed as the ratio of total interest paid on the public and private debt to total outstanding public and private debt;

(D/Y) represents the ratio of gross outstanding debt net of reserves (*D*) to total GDP (*Y*), the weighting coefficient for real interest rate changes. Values are averages over the initial period; and

PX, *PM* are export and import prices, respectively, deflated by the US GDP deflator.

In this study, the external disturbances are measured by taking average values for 1981–1993 over the base period of 1970–1980. Country subscripts are omitted from the formula. The U.S. GDP deflator helps deflate the obtained interest rates. Changes in export and import prices are weighted by the respective shares in GDP of exports and imports, which are average values of the initial period.

The variable SHOCK was estimated for the 35 countries where data were available. The results show an average value of the welfare loss due to lower terms of trade and higher interest rates during 1981–1993 of -6.92 percentage points of GDP, with the median at -4.42. These results are close to the findings of the preceding studies given differences in the periods studied. Fiani et al. (1991), for example, found an average value of the shock over the period 1982–1986 (compared with 1978–1981) of -3.82 to -4.5 percentage points of GDP for 93 developing countries participating in the IMF-WB adjustment program. Concerning Sub-Saharan African countries, the estimates yield the average values of 0.1 to -5.3 percentage points of GDP over 1982–1985 (Elbadwi, 1992).

6.2 Estimate Results

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Equations were estimated with the White heteroscedasticity correction. Furthermore, the Hausman-Wu test examined exogeneity of certain independent variables, but it did not allow us to reject the null hypothesis a 5 percent level, mainly due to the presence of own lagged variables. Therefore, the Two Stage Least Squares method (TSLS) was chosen, using instrument variables[20]. Table 7 gives the results.

All the controlled variables have the expected signs with consistently significant coefficients. In addition, the shock variable is consistently significant in all the equations and is positive (at a one percent level). Countries that faced positive changes in the external environment, such as decreased real interest rates or improvement in terms of trade, improved their current account balance, the rate of growth of their exports share, and the pace of total output growth. The coefficient of the own–lagged variable is significant too, expected to be negative at a 1 percent level.

However, the dummy variable CHANGING, which represents countries that shifted to more floating exchange rate regimes during the 1980s, does not have a consistently significant coefficient, except in the export share equation. Thus, countries that moved from fixed to floating exchange rate regimes benefited from an improvement in the rate of growth of export

share to GDP as compared with all other countries that did not make the same shift. Such growth in exports may be the result of adjusting the real effective exchange rate to its equilibrium level after the initial period, where the exports of these countries were hindered by an overvalued currency. Nothing, though, can be said about the effect of the exchange rate regime alteration on the speed of real GDP growth or on the current account balance.

To summarize the results, the benefits to African economies – mainly monetary union members - of fixed exchange rates (low inflation, financial stability, lower budget deficit) did not offset the costs of their overvalued exchange rates amid the external shocks during the period 1987 to 1993 or 1980 to 1993. Floating exchange rate regime and single-pegged

Table 7. Dependent Variable: Average Annual Changes in the Growth Rate of Real GDP (TSLS)

Variable[21]	Changes in Growth Rate of Real GDP	Changes in Growth Rate of Export Share	Changes in Current Account Balance Ratio
C	0.323 (1.185)	-0.005 (-2.487)**	-0.282 (-1.209)
SHOCK	0.047 (2.854)***	0.003 (3.763)***	0.023 (6.793)***
GRGDP80	-0.121 (-4.276)***		
CAB80	0.025 (1.917)*		-0.048 (-3.348)***
XSHARE80	-0.032 (-1.684)	-0.032 (-5.523)***	0.005 (0.214)
GDI80	0.014 (0.961)	0.002 (1.245)	
CHANGING	-0.112 (-0.485)	0.004 (2.170)**	-0.389 (-1.213)

*Key: *** : 1% level of significance; ** : 5% level of significance ; * : 10% level of significance; t-statistics in parentheses.*

currency countries showed better growth performance in terms of total output and income per capita. Strict pegging has weakened the insulation from external disturbance through relative price rigidity and distortionary taxes that contributed to the overvaluation of the nominal exchange rate. Besides, countries with flexible exchange rates benefited form an adjustment of their real effective exchange rates to the equilibrium level, yielding more growth in total output and an improvement in the rate of growth of their exports share. Nevertheless, countries with pegged currencies outside monetary unions experienced better economic performances than monetary union members.

Even though we use a different methodology, the findings are consistent with and complete those of the earlier studies concerning the CFA zone and the other African countries. The earlier studies show that a fixed exchange rate regime was a bad bargain in the CFA zone. The present study confirms these results and even adds that a fixed exchange rate regime can lead to good economic performance, but outside a monetary union.

7. CONCLUSION

The purpose of this study has been to assess the economic performances of African countries according to their exchange rate regime arrangements. The methodology used two different approaches. The first was based on the econometric estimation of an empirical neoclassic growth model that controlled for labor productivity, investment rate, initial income per capita, terms of trade variations, and changes in the real effective exchange rate. The OLS econometric method allowed us to estimate the rate of growth of total output and per capita GNP over several periods between 1980 and 1993. The second approach estimated a controlled group model by using the TSLS method to appraise the speed of growth of real GDP and exports share and the current account balance variation in countries that switched to more flexible exchange rate regimes. This model controlled for the average external shock and initial policy variables to test for whether the exchange rate alteration had an impact on the level of the economic indicators.

The two approaches yielded the same broad results: the choice of the exchange rate regime was significant in affecting growth and trade performances in African economies. The fixed effect proved statistically most significant, with a negative sign for monetary union members and a positive sign for nonmembers with pegged currencies. That is, currencies pegged to a single money outside monetary unions yield better economic performance. Moreover, the exchange rate regime alteration helped the real effective exchange rate adjust to its equilibrium level, improving the growth of exports ratio to GDP.

The main recommendation is that African countries should liberalize and manage their exchange rate regimes for the purpose of economic development. More flexible exchange rate regimes are superior to fixed regimes, but if countries prefer to maintain fixed exchange rate regimes, a monetary union seems not to be the better solution.

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NOTES

1. See Devarajan and Rodrik (1991) for a summary.

2. Frankel and Dornbusch (1993), p. 23.

3. Ibid.

4. Ibid., p. 6.

5. See Allechi M'bet and A.M. Niamkey (1993) for a summary of criticisms of the optimum currency area theory.

6. The CFA zone (Communauté Française d'Afrique) is a part of the French franc zone.

7. BCEAO: Banque Central des Etats d'Afrique de l'Ouest; BEAC: Banque des Etats d'Afrique Centrale.

8. Froyen, Richard T. (1983), Ch. 7, p. 503.

9. See mainly: M'bet and Niamkey, 1993; Devarajan, 1997; Azam, 1997; and Stasavage, 1997.

10. The CFA zone comprises Benin, Burkina Faso, Cameroon, the Central African Republic, Chad, Comoros, Congo, the Ivory Coast, Equatorial Guinea, Gabon, Mali, Niger, Senegal, and Togo. Lesotho, Namibia, and Swaziland are the members of the South African rand zone.

11. This group does not include currencies pegged to SDR or to a basket of money.

12. In this study, we use the real effective exchange rate index from the IMF, IFS Database. It gives a measure of price competitiveness of the country's exports relative to its trading partners. A decline in the index indicates real depreciation of the exchange rate; an increase represents real appreciation.

13. Many countries frequently shifted from one exchange rate regime to another during the period. In such cases, we simply considered the most predominant exchange rate regime. See tables in Appendix for the exchange rate arrangement movements between 1980 and 1995 and the list of countries ranged behind the different dummies.

14. The VIF (Variance Inflation Factors) are the diagonal elements of the inverse of the correlation matrix. The VIF represents the coefficient of determination obtained by regressing one dependent variable on all the others. A high coefficient of determination suggests collinearity. The problem is solved by replacing the collinear variable by the residual of its regression on all the other dependent variables.

15. Explanatory variables with lower levels of significance have been dropped. The sample includes 52 African countries, but is adjusted for missing data. Data are taken from the *World Bank World Tables, 1995* and from *World Development Indicators, 1997*. Information is missing mainly for Tanzania, Zaire, Libya, Liberia, Eritrea, Equatorial Guinea, Angola, and Somalia, among others.

16. The dependent variable is taken as percentage. Thus, the size of the coefficeints is not

normalized.

17. The dependent variable is taken as percentage. Thus, the size of the coefficients is not normalized.

18. The dependent variable is taken as percentage. Thus, the size of the coefficients is not normalized.

19. This formula is taken from Fiani et al., 1991.

20. The TSLS method uses instrument variables. Here, the Durbin method of choosing instrument variables was used. It consists of ranking the explanatory variable and giving its corresponding rank value to each observation. That yields a new variable, which is highly correlated to the independent variable and not correlated to the dependent one. See Kennedy, 1992.

21. Variables: C = constant; shock = average external disturbances; GRGDP80 = initial rate of growth of real GDP; CAB80 = initial current account balance ratio to GDP; XSHARE80 = initial rate of growth of export ratio to GDP; GDI80 = initial investment ratio to GDP, CHANGING = dummy variable taking the value of one if the country shifted from a fixed to a floating exchange rate regime, and, if not, the value of zero.

APPENDICIES

Appendix A. Movements in the Exchange Rate Arrangements of Countries: 1980–1996						
Countries	**Currencies Pegged to**				**Unpegged Currencies**	
	U.S. Dollar	**French Franc**	**SDR**	**Other Currencies or Composite**	**Managed Floating**	**Independent Floating**
Algeria				1980–1994	1995–1996	
Angola (1)	1989–1993				1994–1996	
Benin		1980–1996				
Botswana				1980–1996		
Burkina Faso		1980–1996				
Burundi	1980–1982		1983–1991	1992–1996		
Cameroon		1980–1996				
Cape Verde				1980–1996		
Central African Republic		1980–1996				
Chad		1980–1996				
Comoros		1980–1996				
Congo		1980–1996				
Ivory Coast		1980–1996				
Djibouti	1980–1996					
Egypt, Arab Rep. of	1980–1986				1987–1996	
Equatorial Guinea (2)		1985–1996		1980–1984		
Ethiopia	1980–1992					1993–1996
Gabon		1980–1996				
Gambia, The (3)				1980–1985		1986–1996
Ghana	1986–1987				1982–1985	1980–1981 1987–1996
Guinea			1980–1985		1988–1994	1986–1987 1995–1996
Guinea–Bissau			1980–1984		1985–1996	
Kenya			1980–1987	1988–1993		1994–1996
Lesotho (4)				1980–1996		
Liberia	1980–1996					
Libya	1980–1985		1986–1996			
Madagascar		1980–1981		1982–1986	1987–1993	1994–1996
Malawi			1980–1984	1985–1993		1994–1996
Mali		1980–1996				
Mauritania				1980–1986 1992–1995	1987–1991	1996
Mauritius			1980–1982	1983–1994	1995–1996	
Morocco				1990–1996	1980–1989	
Mozambique (5)	1987–1988			1985–1986 1990	1989 1991	1992–1996
Namibia (6)				1992–1996		1991
Niger		1980–1996				

Appendix A. Movements in the Exchange Rate Arrangements of Countries: 1980–1996						
Countries	**Currencies Pegged to**				**Unpegged Currencies**	
	U.S. Dollar	**French Franc**	**SDR**	**Other Currencies or Composite**	**Managed Floating**	**Independent Floating**
Nigeria	1994–1996				1980–1985	1986–1993
Rwanda	1980–1982		1983–1994			1995–1996
Sao Tome & Principe			1980–1986	1987–1990	1991–1994	1995–1996
Senegal		1980–1996				
Seychelles			1980–1995	1996		
Sierra Leone	1983–1984 1988–1989		1980–1982 1985			1986–1987 1990–1996
Somalia	1980–1981		1982	1988–1990	1983–1986 1991–1993	1987 1994–1996
South Africa						1980–1996
Sudan	1980–1984 1988–1991			1985–1987	1994–1995	1992–1993 1996
Swaziland (4)				1980–1996		
Tanzania				1980–1992		1993–1996
Togo		1980–1996				
Tunisia				1980–1987	1988–1996	
Uganda	1987–1989		1980	1990–1991	1982–1984 1986	1981, 1985 1992–1996
Zaire			1980–1982		1983	1984–1996
Zambia	1987–1988		1980–1982 1989–1990	1983–1984	1991–1992	1985–1986 1993–1996
Zimbabwe				1980–1993		1994–1996

Source: *International Monetary Fund: International Financial Statistics.*

Legend

1. Angola: 1980–1989: NA.
2. Equatorial Guinea: pegged to the Spanish peseta from 1980–1984.
3. The Gambia: pegged to the British pound.
4. Lesotho and Swaziland: pegged to the South African rand.
5. Mozambique: 1980–1984: NA.
6. Namibia: 1980–1990: NA; 1991: independently floating; 1992–1996: pegged to South African rand.

Appendix B. Definition of Dummy Variables: 1980–1986							
	Single	**Basket**	**SDR**	**Union**	**CFA**	**Free**	**Managed**
Algeria	0	1	0	0	0	0	0
Angola	NA	NA	NA	NA	NA	NA	NA
Benin	0	0	0	1	1	0	0
Botswana	0	1	0	0	0	0	0
Burkina Faso	0	0	0	1	1	0	0
Burundi	0	0	1	0	0	0	0
Cameroon	0	0	0	1	1	0	0
Cape Verde	0	1	0	0	0	0	0
Central African Republic	0	0	0	1	1	0	0
Chad	0	0	0	1	1	0	0
Comoros	0	0	0	1	1	0	0

Congo	0	0	0	1	1	0	0
Ivory Coast	0	0	0	1	1	0	0
Djibouti	1	0	0	0	0	0	0
Egypt, Arab Republic of	1	0	0	0	0	0	0
Equatorial Guinea	1	0	0	0	0	0	0
Ethiopia	1	0	0	0	0	0	0
Gabon	0	0	0	1	1	0	0
Gambia, The	0	1	0	0	0	0	0
Ghana	0	0	0	0	0	1	0
Guinea	0	0	1	0	0	0	0
Guinea-Bissau	0	0	1	0	0	0	0
Kenya	0	0	1	0	0	0	0
Lesotho	0	0	0	1	0	0	0
Liberia	1	0	0	0	0	0	0
Libya	1	0	0	0	0	0	0
Madagascar	0	1	0	0	0	0	0
Malawi	0	0	1	0	0	0	0
Mali	0	0	0	1	1	0	0
Mauritania	0	1	0	0	0	0	0
Mauritius	0	1	0	0	0	0	0
Morocco	0	0	0	0	0	0	1
Mozambique	NA	NA	NA	NA	NA	NA	NA
Namibia	NA	NA	NA	NA	NA	NA	NA
Niger	0	0	0	1	1	0	0
Nigeria	0	0	0	0	0	0	1
Rwanda	0	0	1	0	0	0	0
Sao Tome & Principe	0	0	1	0	0	0	0
Senegal	0	0	0	1	1	0	0
Seychelles	0	0	1	0	0	0	0

Equatorial Guinea	0	0	0	1	1	0	0
Ethiopia	1	0	0	0	0	0	0
Gabon	0	0	0	1	1	0	0
Gambia, The	0	0	0	0	0	1	0
Ghana	0	0	0	0	0	1	0
Guinea	0	0	0	0	0	0	1
Guinea-Bissau	0	0	0	0	0	0	1
Kenya	0	1	0	0	0	0	0
Lesotho	0	0	0	1	0	0	0
Liberia	1	0	0	0	0	0	0
Libya	0	0	1	0	0	0	0
Madagascar	0	0	0	0	0	0	1
Malawi	0	1	0	0	0	0	0
Mali	0	0	0	1	1	0	0
Mauritania	0	0	0	0	0	0	1
Mauritius	0	1	0	0	0	0	0
Morocco	0	0	0	0	0	0	1
Mozambique	NA	NA	NA	NA	NA	NA	NA
Namibia	NA	NA	NA	NA	NA	NA	NA
Niger	0	0	0	1	1	0	0
Nigeria	0	0	0	0	0	1	0
Rwanda	0		1	0	0	0	0
Sao Tome & Principe	0	1	0	0	0	0	0
Senegal	0	0	0	1	1	0	0
Seychelles	0	0	1	0	0	0	0
Sierra Leone	0	0	0	0	0	1	0
Somalia	NA	NA	NA	NA	NA	NA	NA
South Africa	0	0	0	0	0	1	0
Sudan	1	0	0	0	0	0	0
Swaziland	0	0	0	1	0	0	0
Tanzania	0	1	0	0	0	0	0
Togo	0	0	0	1	1	0	0
Tunisia	0	0	0	0	0	0	1
Uganda	1	0	0	0	0	0	0
Zaire	0	0	0	0	0	1	0
Zambia	0	0	0	0	0	1	0
Zimbabwe	0	1	0	0	0	0	0
TOTAL	7	8	4	16	14	7	7

Appendix B. Definition of Dummy Variables: 1980–1985							
	Single	**Basket**	**SDR**	**Union**	**CFA**	**Free**	**Managed**
Algeria	0	1	0	0	0	0	0
Angola	NA	NA	NA	NA	NA	NA	NA
Benin	0	0	0	1	1	0	0
Botswana	0	1	0	0	0	0	0
Burkina Faso	0	0	0	1	1	0	0
Burundi	1	0	0	0	0	0	0
Cameroon	0	0	0	1	1	0	0
Cape Verde	0	1	0	0	0	0	0
Central African Republic	0	0	0	1	1	0	0
Chad	0	0	0	1	1	0	0
Comoros	0	0	0	1	1	0	0
Congo	0	0	0	1	1	0	0
Ivory Coast	0	0	0	1	1	0	0
Djibouti	1	0	0	0	0	0	0
Egypt, Arab Republic of	1	0	0	0	0	0	0
Equatorial Guinea	1	0	0	0	0	0	0

Ethiopia	1	0	0	0	0	0	0
Gabon	0	0	0	1	1	0	0
Gambia, The	0	1	0	0	0	0	0
Ghana	0	0	0	0	0	0	1
Guinea	0	0	1	0	0	0	0
Guinea-Bissau	0	0	1	0	0	0	0
Kenya	0	0	1	0	0	0	0
Lesotho	0	0	0	1	0	0	0
Liberia	1	0	0	0	0	0	0
Libya	1	0	0	0	0	0	0
Madagascar	0	1	0	0	0	0	0
Malawi	0	0	1	0	0	0	0
Mali	0	0	0	1	1	0	0
Mauritania	0	1	0	0	0	0	0
Mauritius	0	1	0	0	0	0	0
Morocco	0	0	0	0	0	0	1
Mozambique	NA	NA	NA	NA	NA	NA	NA
Namibia	NA	NA	NA	NA	NA	NA	NA
Niger	0	0	0	1	1	0	0
Nigeria	0	0	0	0	0	0	1
Rwanda	1	0	0	0	0	0	0
Sao Tome & Principe	0	0	1	0	0	0	0
Senegal	0	0	0	1	1	0	0
Seychelles	0	0	1	0	0	0	0
Sierra Leone	0	0	1	0	0	0	0
Somalia	NA	NA	NA	NA	NA	NA	NA
South Africa	0	0	0	0	0	1	0
Sudan	1	0	0	0	0	0	0
Swaziland	0	0	0	1	0	0	0
Tanzania	0	1	0	0	0	0	0
Togo	0	0	0	1	1	0	0
Tunisia	0	1	0	0	0	0	0
Uganda	0	0	0	0	0	0	1
Zaire	0	0	1	0	0	0	0
Zambia	0	0	1	0	0	0	0
Zimbabwe	0	1	0	0	0	0	0
TOTAL	9	10	9	15	13	1	4

Appendix B. Definition of Dummy Variables: 1986–1990							
	Single	**Basket**	**SDR**	**Union**	**CFA**	**Free**	**Managed**
Algeria	0	1	0	0	0	0	0
Angola	1	0	0	0	0	0	0
Benin	0	0	0	1	1	0	0
Botswana	0	1	0	0	0	0	0
Burkina Faso	0	0	0	1	1	0	0
Burundi	0	0	1	0	0	0	0
Cameroon	0	0	0	1	1	0	0
Cape Verde	0	1	0	0	0	0	0
Central African Republic	0	0	0	1	1	0	0
Chad	0	0	0	1	1	0	0
Comoros	0	0	0	1	1	0	0
Congo	0	0	0	1	1	0	0
Ivory Coast	0	0	0	1	1	0	0
Djibouti	1	0	0	0	0	0	0
Egypt, Arab Republic of	0	0	0	0	0	0	1
Equatorial Guinea	0	0	0	1	1	0	0
Ethiopia	1	0	0	0	0	0	0
Gabon	0	0	0	1	1	0	0

Gambia, The	0	0	0	0	0	1	0
Ghana	0	0	0	0	0	1	0
Guinea	0	0	0	0	0	0	1
Guinea-Bissau	0	0	0	0	0	0	1
Kenya	0	1	0	0	0	0	0
Lesotho	0	0	0	1	0	0	0
Liberia	1	0	0	0	0	0	0
Libya	0	0	1	0	0	0	0
Madagascar	0	0	0	0	0	0	1
Malawi	0	1	0	0	0	0	0
Mali	0	0	0	1	1	0	0
Mauritania	0	0	0	0	0	0	1
Mauritius	0	1	0	0	0	0	0
Morocco	0	0	0	0	0	0	1
Mozambique	1	0	0	0	0	0	0
Namibia	NA	NA	NA	NA	NA	NA	NA
Niger	0	0	0	1	1	0	0
Nigeria	0	0	0	0	0	1	0
Rwanda	0		1	0	0	0	0
Sao Tome & Principe	0	1	0	0	0	0	0
Senegal	0	0	0	1	1	0	0
Seychelles	0	0	1	0	0	0	0
Sierra Leone	0	0	0	0	0	1	0
Somalia	NA	NA	NA	NA	NA	NA	NA
South Africa	0	0	0	0	0	1	0
Sudan	1	0	0	0	0	0	0
Swaziland	0	0	0	1	0	0	0
Tanzania	0	1	0	0	0	0	0
Togo	0	0	0	1	1	0	0
Tunisia	0	0	0	0	0	0	1
Uganda	1	0	0	0	0	0	0
Zaire	0	0	0	0	0	1	0
Zambia	0	0	0	0	0	1	0
Zimbabwe	0	1	0	0	0	0	0
TOTAL	7	8	4	16	14	7	7

Appendix B. Definition of Dummy Variables: 1991–1995							
	Single	**Basket**	**SDR**	**Union**	**CFA**	**Free**	**Managed**
Algeria	0	1	0	0	0	0	0
Angola	1	0	0	0	0	0	0
Benin	0	0	0	1	1	0	0
Botswana	0	1	0	0	0	0	0
Burkina Faso	0	0	0	1	1	0	0
Burundi	0	1	0	0	0	0	0
Cameroon	0	0	0	1	1	0	0
Cape Verde	0	1	0	0	0	0	0
Central African Rep.	0	0	0	1	1	0	0
Chad	0	0	0	1	1	0	0
Comoros	0	0	0	1	1	0	0
Congo	0	0	0	1	1	0	0
Ivory Coast	0	0	0	1	1	0	0
Djibouti	1	0	0	0	0	0	0
Egypt, Arab Rep. of	0	0	0	0	0	0	1
Equatorial Guinea	0	0	0	1	1	0	0
Ethiopia	0	0	0	0	0	1	0
Gabon	0	0	0	1	1	0	0
Gambia, The	0	0	0	0	0	1	0
Ghana	0	0	0	0	0	1	0
Guinea	0	0	0	0	0	0	1

Guinea-Bissau	0	0	0	0	0	0	1
Kenya	0	1	0	0	0	0	0
Lesotho	0	0	0	1	0	0	0
Liberia	1	0	0	0	0	0	0
Libya	0	0	1	0	0	0	0
Madagascar	0	0	0	0	0	0	1
Malawi	0	1	0	0	0	0	0
Mali	0	0	0	1	1	0	0
Mauritania	0	1	0	0	0	0	0
Mauritius	0	1	0	0	0	0	0
Morocco	0	1	0	0	0	0	0
Mozambique	0	0	0	0	0	1	0
Namibia	0	0	0	1	0	0	0
Niger	0	0	0	1	1	0	0
Nigeria	0	0	0	0	0	1	0
Rwanda	0	0	1	0	0	0	0
Sao Tome & Principe	0	0	0	0	0	0	1
Senegal	0	0	0	1	1	0	0
Seychelles	0	0	1	0	0	0	0
Sierra Leone	0	0	0	0	0	1	0
Somalia	0	0	0	0	0	0	1
South Africa	0	0	0	0	0	1	0
Sudan	0	0	0	0	0	1	0
Swaziland	0	0	0	1	0	0	0
Tanzania	0	0	0	0	0	1	0
Togo	0	0	0	1	1	0	0
Tunisia	0	0	0	0	0	0	1
Uganda	0	0	0	0	0	1	0
Zaire	0	0	0	0	0	0	1
Zambia	0	0	0	0	0	0	1
Zimbabwe	0	1	0	0	0	0	0
TOTAL	4	10	3	17	14	10	9

Appendix B. Definition of Dummy	
	DREG (1980–1993)
Algeria	0
Angola	0
Benin	0
Botswana	0
Burkina Faso	0
Burundi	0
Cameroon	0
Cape Verde	0
Central African Republic	0
Chad	0
Comoros	0
Congo	0
Ivory Coast	0
Djibouti	0
Egypt, Arab Republic of	0
Equatorial Guinea	0
Ethiopia	0
Gabon	0
Gambia, The	0
Ghana	0
Guinea	1
Guinea-Bissau	0
Kenya	1

Lesotho	0
Liberia	0
Libya	0
Madagascar	1
Malawi	0
Mali	0
Mauritania	1
Mauritius	1
Morocco	0
Mozambique	1
Namibia	0
Niger	0
Nigeria	0
Rwanda	1
Sao Tome and Principe	1
Senegal	0
Seychelles	0
Sierra Leone	0
Somalia	1
South Africa	0
Sudan	1
Swaziland	0
Tanzania	0
Togo	0
Tunisia	0
Uganda	1
Zaire	1
Zambia	1
Zimbabwe	0
TOTAL	13