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EXCHANGE-RATE MANAGEMENT AND MANUFACTURED EXPORTS IN SUB-SAHARAN AFRICA

by

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RÉSUMÉ

L'évolution des régimes de change en Afrique entre 1970 et 1992 est examinée dans ce document. Les effets de la politique de change sur les exportations de produits manufacturés de l'Afrique sub-saharienne sont également examinés de manière empirique. Trois indicateurs de la politique de change sont plus particulièrement étudiés: les variations du taux de change réel effectif, la volatilité du taux de change réel et son défaut d'alignement (mesuré à partir d'un modèle). Des fonctions d'exportation ont été estimées pour trois branches de l'industrie manufacturière (textile, chimie, métallurgie), ainsi que deux régimes de change: un régime de taux de change fixes, représenté par six pays de la zone CFA, et un second, plus flexible, représenté par cinq pays n'appartenant pas à cette zone. Il en ressort que la politique de change influe largement sur les performances à l'exportation du fait des conséquences importantes des variations du taux de change réel effectif et de l'incidence négative de ses distorsions. Ces résultats permettent de proposer des estimations des pertes d'opportunités d'exportation dues au défaut d'alignement des taux de change. Ainsi, les économies africaines qui ont réussi à promouvoir leurs exportations de produits manufacturés sont celles qui ont mis en place des politiques de change prudentes ayant conduit à une diminution progressive de la surévaluation de leurs monnaies.

SUMMARY

This paper presents an overview of the evolution of exchange-rate regimes in Africa and then attempts to assess empirically the impact of exchange-rate policy on manufactured export performance on a panel of major Sub-Saharan Africa countries over the 1970-92 period. We examine the impact of three exchange-rate policy indicators: real effective exchange-rate changes, real exchange-rate volatility, and (model-based measures of) real exchange-rate misalignment. Export supply functions are estimated for three manufacturing industries (textile, chemicals, and metals) and two exchange-rate regimes: a fixed rates regime including six CFA Franc countries, and a more flexible regime represented by five non-CFA countries. Our findings show that exchange-rate management matters for export performance. This is evidenced both by the significant impact of changes in the real effective exchange rate and by the negative influence exerted independently by real exchange-rate misalignment. On the basis of this evidence we provide estimates of the losses in export shares induced by exchange-rate misalignment. It is shown that African countries that have been successful in promoting manufactured exports have implemented cautious exchange-rate policies, leading to steadily declining real exchange-rate overvaluation.

PREFACE

Achieving a better integration of Africa into the global economy to spur economic growth is a major development policy challenge facing the international community. The experience of successful industrialising countries shows that export diversification through the promotion of manufactured exports helps to expand ties to the international economy and is conducive to sustained economic growth. If they are to strengthen current trends of economic recovery, sub-Saharan African countries need to make further progress in promoting core manufacturing activities, according to their comparative advantage. This would involve a substantial improvement in international competitiveness, especially since the steady progress in export manufacturing of the "Big Five" is expected to put considerable competitive pressure on the markets for unskilled labour-intensive goods.

Export performance depends on appropriate exchange rate management, which in turn affects relative costs and therefore international competitiveness. During the past decades, most sub-Saharan African countries have experienced substantial real exchange rate misalignment due to misconceived macroeconomic and trade policies. This has reduced competitiveness and has weakened the incentives for exporters to increase their penetration of foreign markets. The present study confirms the harmful incidence of exchange rate mismanagement on the export performance of three key manufacturing industries in Sub Saharan Africa. It also provides an assessment of the magnitude of real exchange rate overvaluation and of the export share losses that have resulted from it. The study shows that those African countries that have been successful in promoting manufactured exports have implemented cautious exchange rate policies that have prevented serious real exchange rate overvaluation.

This paper is the result of work carried out under the Development Centre's 1996-98 research programme on "Economic Policy and Growth: Factors of Manufacturing Competitiveness". This analysis of the effectiveness of recent exchange rate policy reform in Africa will contribute to a better assessment of the expected benefits of further policy reform in this area.

Jean Bonvin
President
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I. INTRODUCTION

Over the last two decades manufactured exports have become a major factor of economic growth in developing countries. Initially most of the developing world's manufactured exports originated in a small number of countries in East Asia, namely South Korea, Hong Kong, Singapore, and Chinese Taipei. Subsequently, however, more developing countries have successfully entered world markets for manufactured goods. Malaysia, Mexico, Indonesia, Thailand, and Turkey are examples of countries which experienced a sustained increase in their manufactured exports since the beginning of the 1980s. For these five "latecomers", the share of manufactured exports in total exports in 1993 was respectively 70, 75, 53, 73, and 72 per cent, against 19, 12, 2, 28, and 27 per cent in 1980. The only Northern African and Sub-Saharan Africa (SSA) countries that showed a similar rising trend in manufactured exports were Mauritius and Tunisia. In the case of these two countries the share of manufactured exports in total exports had reached 90 and 75 per cent respectively in 1993, starting from 27 and 36 per cent in 1980[1].

Export diversification through promotion of manufactured exports is generally viewed as an important factor of sustained economic growth. This is so for at least three reasons:

— income elasticity of demand is higher for manufactured goods than for primary products. This means that growth prospects for a country's exports along with growth in foreign income can be expected to improve by specialising in manufacturing;

— both price elasticity of demand and price elasticity of supply are presumed to be higher for manufactured goods than for primary commodities. As a consequence, expected variability in the price of manufactured goods following changes in demand is comparatively lower than for primary products. This involves a stabilising effect on the terms of trade and, therefore, a more stable growth of export earnings over time;

— there are substantial prospects for dynamic productivity gains, linked to the development of the manufacturing sector, which are important for stimulating growth. These gains potentially arise from economies of scale, learning effects, and externalities among firms and industries[2]. Moreover, manufacturing for export provides a unique opportunity to realise such dynamic gains in the case of relatively small economies which lack a domestic market of sufficiently large size; and

— in addition, in most developing countries, expanding manufactured exports made a valuable contribution in the 1980s to providing foreign exchange to service external debt. This was all the more welcome in a period of depressed world markets for many primary commodities — on which most of those countries exports mainly rely.

Exchange-rate policy plays a crucial role in providing increased incentives for exporting. All countries which have been successful in promoting manufactured exports experienced real exchange-rate (RER) depreciation, leading to a significant increase in the domestic relative price of tradeable to non tradeable. The responsiveness of exports of goods and services to real-exchange-rate-related price incentives has been demonstrated in a panel of 16 Sub-Saharan African countries by Balassa (1990)[3].

However, an export-promoting exchange-rate policy cannot be sustained unless monetary and fiscal policies are fully consistent with it. In many developing countries mismanagement of macroeconomic and trade policies led to real exchange-rate misalignment — that is to a substantially overvalued RER with respect to its market clearing level. Real exchange-rate misalignment is damaging to economic performance — and especially to manufactured exports, as it decreases the profitability of production of tradeable. All successful East and Southeast Asian countries have kept the RER close to its market clearing level, while Sub-Saharan Africa and Latin American countries experienced serious RER overvaluation[4]. The damaging influence of RER misalignment has been shown by Edwards (1988), as well as by Cottani, Cavallo, and Khan (1990) for various groups of developing countries. Ghura and Grennes (1993) showed a negative influence of RER misalignment on total exports for a panel of 33 SSA countries.

Moreover, inconsistent macroeconomic, trade, and exchange-rate policies increase the variability of the real exchange rate. In turn, higher RER volatility sends conflicting signals to economic agents and increases uncertainty of long-term investments as well as of the profitability of producing tradable goods. The negative influence of RER variability on economic performance of SSA countries has been demonstrated by Ghura and Grennes (1993). Its negative impact on manufactured exports has been also established by Grobar (1993) on a panel of ten developing countries excluding Sub-Saharan Africa.

In this paper we present evidence on the impact of exchange-rate policy on manufactured exports of Sub-Saharan African countries. Our analysis of the link between exchange-rate policy and manufactured export distinguishes between three different impacts: the impact of effective real exchange rate changes, the impact of volatility and the impact of misalignment. Among existing studies, Balassa (1990) focused only on the first impact. Moreover,

previous empirical studies (Froot and Klemperer, 1989; Sapir and Sekkat, 1995) documented that the impact of exchange-rate policy varies across sectors and exchange-rate regimes and that aggregation over sectors or regimes may lead to wrong inferences. Hence our investigation is conducted at a *sectoral level* and distinguishes between CFA countries (*fixed rates*) and non-CFA countries (more *flexible rates*). In contrast, previous studies, such as Cottani *et al.* (1990) or Ghura and Grennes (1993), did not adopt such distinctions.

Our panel includes eleven SSA countries observed over the 1970-92 period: six in the CFA zone and five in the non CFA zone. We undertake a comprehensive examination of: the responsiveness of manufactured exports to real exchange rate changes; the effect of RER misalignment (using various measures); and the influence of RER volatility. We decompose manufactured exports, focusing in particular on three SITC categories: Textile products, Chemicals, and Metal products. Our findings show a significant responsiveness of SSA manufactured exports to RER-induced incentives. Moreover, RER misalignment exerts a significantly negative influence on export performance. However, real exchange rate volatility does not seem to exert a systematic negative influence on manufactured export performance.

The rest of the paper is organised as follows: In Section II we present an overview of the way exchange rate regimes have evolved in Africa over the past 20 years and provide some evidence on RER misalignment and variability. Section III is devoted to the construction of a reliable measure of misalignment, because the quality of the measure of misalignment is crucial to the analysis of the link between exchange-rate management and export performance. Our measure is based on a model of exchange-rate determination which distinguishes between equilibrium movements in the RER and misalignment induced by misconceived macroeconomic policies. The estimates draw from a large panel of 22 African countries over the 1970-95 period. Section IV presents evidence on the growth of the manufacturing sector in a broad sample of African countries, as well as on manufactured exports performance. For the sake of comparison, the first four sections of the study present evidence on both Sub-Saharan and Northern African countries. In Section V we discuss the theoretical issues involved in the relationship between export performance and exchange-rate management and present an brief overview of the findings of existing empirical studies. Section VI presents our empirical findings on the impact of real exchange rate management on manufactured exports of our sample of SSA countries. Section VII concludes by drawing the main policy implications of this study.

II. EXCHANGE-RATE REGIMES IN AFRICA AND REAL EXCHANGE RATE BEHAVIOUR

A number of African countries have been obliged to undertake substantial exchange-rate policy reform during the 1980s and the 1990s. The macroeconomic background against which these reforms were undertaken was characterised by rapid demand expansion during the 1970s, due to the boom in most primary commodities prices, and by failure to adjust to declining terms of trade during the 1980s successfully. Rather than attempt to stabilise the economy, most SSA governments responded to the deteriorating economic environment by increasing trade protection and exchange controls in order to avoid balance-of-payments crisis, while maintaining the unsustainable trend in aggregate demand. The worsening macroeconomic imbalances led to capital flight, to substantial real exchange-rate overvaluation, and to the emergence of parallel markets for foreign exchange.

In the case of the CFA zone, currency convertibility initially prevented the emergence of parallel foreign exchange markets. However, as restrictions in convertibility were introduced in order to contain capital flight, parallel markets of a relatively small size have emerged in most CFA countries. Moreover, thanks to monetary stability provided by the peg to the French franc, as well as the relative weakness of the latter during the first half of the 1980s, CFA countries escaped serious real exchange-rate overvaluation over this period. However, starting from the second half of the 1980s, serious negative terms of trade shocks, coupled with the strengthening of the French franc, led to substantial real overvaluation. The monetary authorities responded to this disequilibrium by a 50 per cent devaluation of the CFA Franc in January 1994.

In the past, an overvalued real exchange rate was often seen by governments in Sub-Saharan African countries not so much as an obstacle to growth, but, rather, as a convenient means to achieve two objectives: as a complement to quotas and tariff barriers, to increase protection of highly import-dependent industries, as part of import substitution strategies of industrialisation; and to reduce the need to print money to cover the budget deficit, in so far as buying foreign exchange from the private sector at an official rate substantially below its market-clearing level implicitly involves taxing the foreign exchange-earning export sector of the economy[5].

Exchange-rate policy reforms implemented in Africa since the end of the 1980s[6] emphasized the need for an appropriate exchange-rate policy to achieve a relative price of tradeable that creates enough incentives for expanding production of exports. Specific measures adopted by adjusting countries — supported by World Bank and IMF programmes — have consisted in: *a)* unifying the official and parallel market exchange rates so as to correct misallocation of resources resulting from parallel market premiums;

b) achieving substantial real depreciation of the exchange rate through a move to a crawling peg regime in which the currency is devalued steadily over time; and *c)* reforming the allocation of foreign exchange through implementation of auctions procedures.

Table 1. **Exchange-rate Regimes according to IMF Classification**
(number of African countries)

		1980	1985	1990	1996
Pegged to:	$US	10	7	6	3
	FF	14	13	14	14
	Other currency	5	4	2	3
	SDR	9	4	4	1
	Other basket	7	11	11	4
Managed floating		4	6	8	6
Independently floating		0	2	5	19
		49	**47**	**50**	**50**

Source: International Financial Statistics, IMF (various issues).

Exchange-rate policy reform involved in most cases a clear move towards more flexible exchange-rate regimes. Table 1 shows that the number of African countries with an independently floating currency has increased drastically, from zero in 1980 to 19 in 1996. South Africa and Zaire were the first SSA countries to implement an independently floating currency in the first half of the 1980s, followed by the West African English-speaking countries, Ghana, the Gambia and Nigeria. The increase in the number of independently floating currencies was mainly offset by a decrease in currencies pegged to the US dollar and to the SDR and other composite baskets of currencies. Of the 10 countries whose currency was tied to the US dollar in 1980, four have converted to freely floating and one to managed floating exchange rates. The number of African currencies tied to the SDR has also decreased markedly. On the other hand, the number of countries whose currency is tied to the French franc has remained stable throughout this period.

To assess the magnitude of real exchange-rate adjustments following exchange-rate policy reform we computed a series of effective real exchange rates for a number of African countries. The effective real exchange rate (E) is defined as the ratio of the price of tradable goods to non tradable goods. An increase (decrease) in E denotes real effective exchange rate depreciation (appreciation). For a given country, E is computed as:

$$\log E = \sum_{j=1}^{N} s_j \log\left(\frac{e_j \; wp_j}{cp}\right) \qquad (1)$$

where

e_j is the bilateral nominal exchange rate vis-à-vis country *j*,

wp_j is the wholesale price index of country *j,*

cp is the consumer price index of the home country

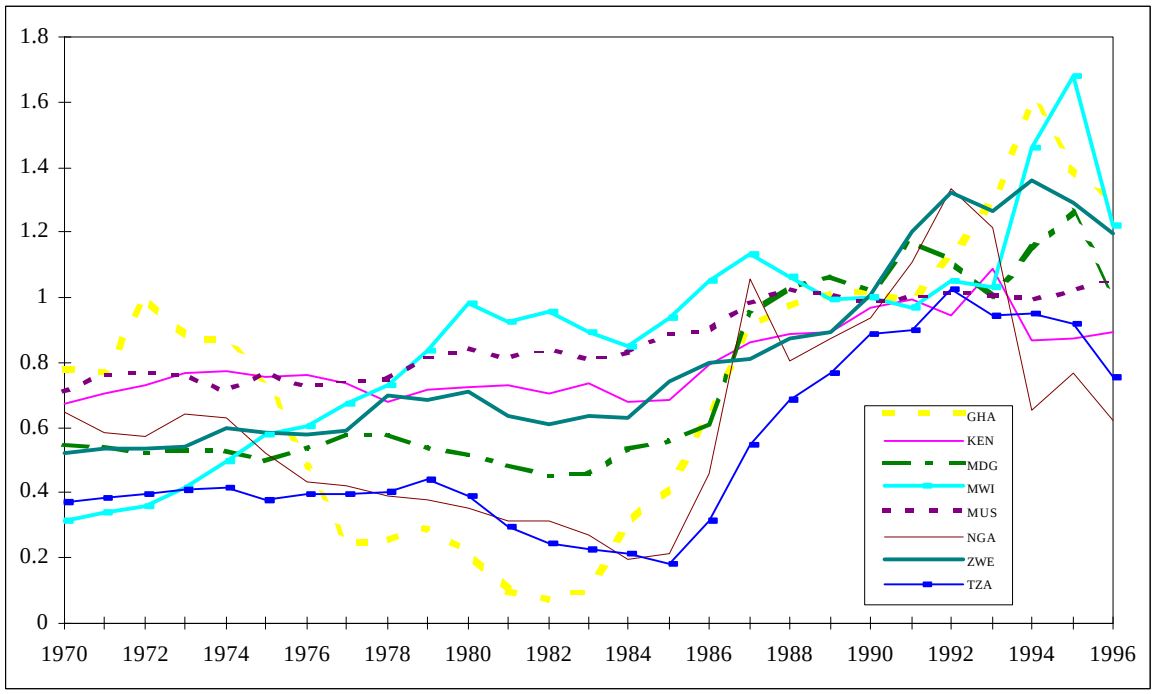
s_j is the weight of country *j* in home country's exports

N is the number of trading partners.

The measure used here is suitable because *wp* includes mostly tradable goods while *cp* includes both tradable and non tradable goods and services. For a given country, equation (1) is computed using data of its 10 major trading partners (N=10). The weights s_j denote the average share of partner *j* in the country's exports between 1975 and 1985. Bilateral exchange rate data, wholesale price indexes and consumer price indexes are drawn from IMF's International Financial Statistics. The weights are calculated using data from the International Trade Statistics Year book[7].

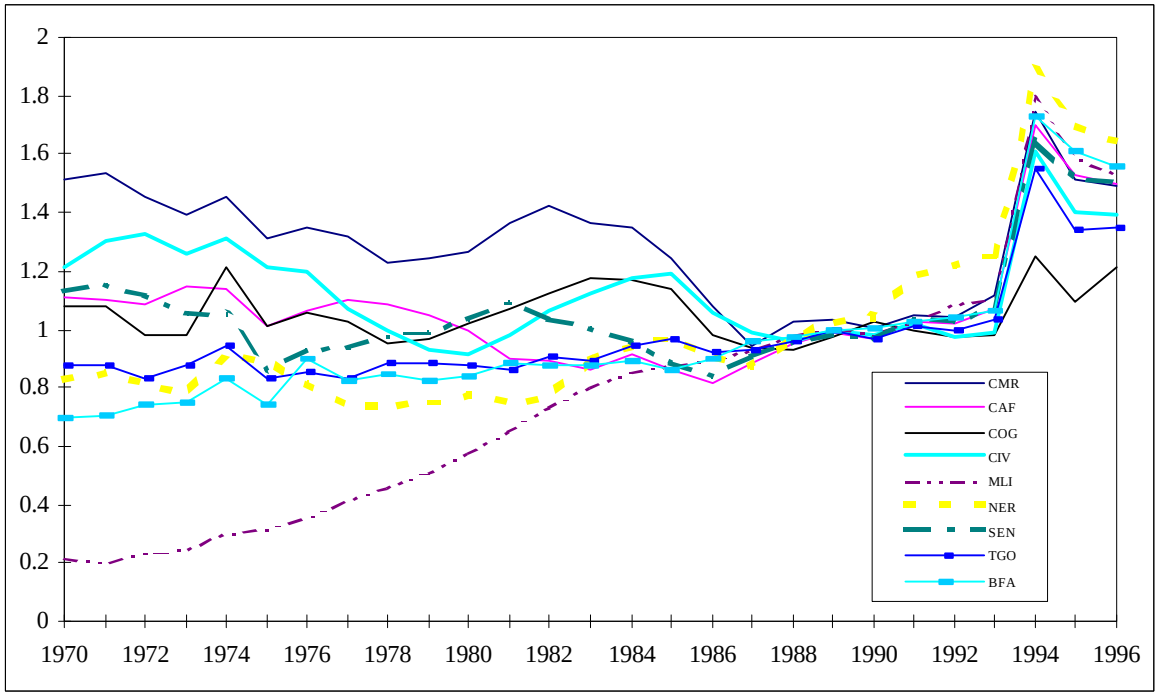
The move towards more flexible exchange-rate regimes enabled most non-CFA countries to achieve substantial real exchange rate depreciation. This is shown in Figure 1 which depicts the observed movements in the real exchange rate as previously defined. As can be seen, most countries experienced real depreciation, starting in 1984-85. A noticeable exception is Malawi which had a depreciating real exchange rate throughout the 1970s, and again in the second half of the 1980s. Ghana, Nigeria, and (to a lesser extent) Tanzania are also interesting examples of countries which experienced considerable real appreciation up to 1982 (in the case of Ghana) or 1985 (in the case of the other two countries). Substantial devaluation and adoption of a floating exchange-rate regime enabled those countries to achieve real depreciation ranging from 320 per cent (Tanzania, Nigeria) to 1200 per cent (Ghana) in a very short period of time. However, in some cases, like in Nigeria and — to a lesser extent — in Kenya, this movement has been reversed in the 1990s, leading to an appreciating RER.

Figure 1. **Real Effective Exchange Rates, Non-CFA Sub-Saharan African Countries**



Source: Authors' calculations

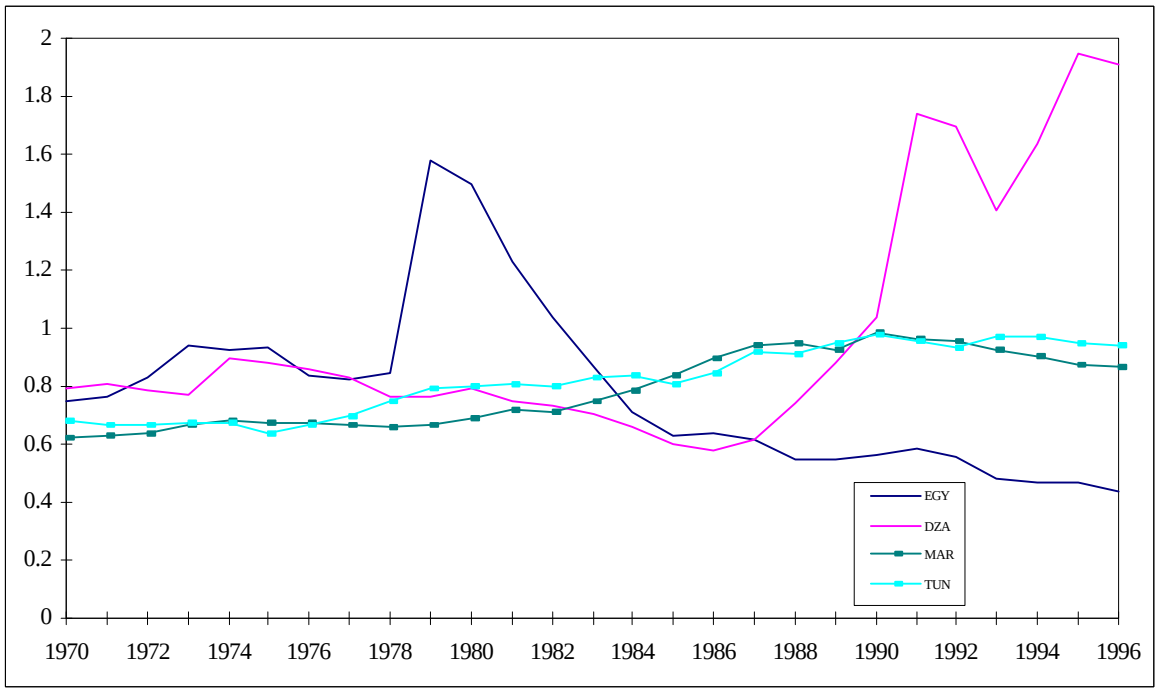
Figure 2. **Real Effective Exchange Rates, CFA Sub-Saharan African Countries**



Source: Authors' calculations

In most CFA countries (see Figure 2) real effective exchange rates have been subject to smaller swings. In some cases, the RER appreciated throughout the whole period, as for example in Cameroon. One noticeable exception to these trends is Mali which experienced steady real depreciation throughout the whole period under review[8]. As can be seen, the devaluation of the CFA Franc in 1994 lead to substantial RER depreciation, which was only partially reversed in the two years that followed, thanks to the good inflation performance of these countries.

Figure 3. **Real Effective Exchange Rate, North African Countries**



Source: Authors' calculations

Finally, as shown in Figure 3, among Northern African countries, Morocco and Tunisia exhibit a slight but steady trend of real effective rate depreciation. In the 1990s the RER seems to have been stabilised in the case of these two countries. On the contrary, Algeria and Egypt seem to have suffered from exchange-rate mismanagement. Algeria had a steadily appreciating real exchange rate from 1975 to 1986. Then it experienced a sharp real depreciation, followed by erratic RER movements over the 1990s, that increased the variability of the RER. Egypt experienced a sharp real depreciation following a devaluation in 1979, and then continuous real appreciation up to the 1990s.

Despite exchange-rate policy reforms which in some cases have been successful in helping achieve real depreciation, exchange-rate regimes are still characterised by pervasive capital controls in most African countries. This is depicted in Table 2 which classifies African countries in four groups, according to the extent of capital and exchange controls.

Table 2. **Extent of Capital Controls**
(number of African countries)

	Free	Liberal	Strict	Dictatorial	Total
1985	2	14	31	3	50
1995	3	16	31	0	50

Note: The definitions follow those of the World Currency Yearbook.

Source: International Financial Statistics, IMF (various issues).

These four groups are defined as follows:

— Free: International financial transfers are generally not subject to official permission. Hence, there are no parallel exchange market transactions;

— Liberal: Black market premiums exist and are often substantial, but ownership of foreign banknotes, bank balances abroad or gold is either legal or tolerated and infractions of currency legislation carry only minimal penalties;

— Strict: The currencies are the objects of active black market transactions, have multiple official rates, are surrounded by voluminous protective legislation and cannot be transferred abroad without special authorisation. Ownership of foreign bank notes, bank balances abroad or gold is illegal or tolerated and infractions of currency legislation carry severe penalties, such as confiscation, heavy fines or prison sentences; and,

— Dictatorial: Official rates are unrealistically high and are enforced by severe legislation. Black market premia are extremely high.

According to these groupings, there was no drastic change in the level of currency controls between 1985 and 1995. The liberal countries are dominated by the CFA countries. The free exchange-rate regime countries are Djibouti and Liberia in 1985, joined by the Gambia in 1995.

Exchange controls are used by many SSA governments to ration scarce foreign exchange to the private sector. The excess demand for foreign exchange arises in turn typically from the official exchange rates being kept below their market clearing levels, resulting in real exchange-rate overvaluation. It can be expected that the more overvalued the real exchange rate, the tighter will be the control on foreign exchange and, as a result, the higher will be the premia observed in the black market for foreign exchange. Therefore, the black market premium on foreign exchange can be thought off as a crude measure of real exchange-rate misalignment, although it probably captures also the influence of other distortions in the foreign exchange market (see Pinto, 1990).

Table 3 shows the average levels of this measure of RER misalignment (black market rate as percentage difference from official rate) for successive five-year periods from 1970 to 1996. Not surprisingly — because of convertibility at a fixed rate guaranteed by France — the black market premium in the CFA zone is on average almost nil throughout the entire period and uniform among countries.

On the contrary, the black market premium in the non CFA countries was substantial throughout the whole period, reflecting important real exchange-rate misalignment. Noticeable exceptions are Morocco, Tunisia (after 1975), and Mauritius (after 1985), where exchange controls have been to some extent lessened. The misalignment is most obvious in SSA countries like Ghana, Nigeria, and Tanzania, which exhibit the highest levels of black market premia. As can be seen in conjunction with Figure 1, in these three countries the increase in the black market premium clearly coincides with periods of real appreciation, which very likely led to overvaluation of the real exchange rate. In most of the other countries, the pattern of black market premia exhibits a clear upward trend during the 1975-84 period and a subsequent fall during 1985-90, indicating that policy reform was to some extent successful in correcting RER misalignment. This was confirmed in the first half of the 1990s, when continuing RER depreciation lead to a substantial fall in the average level of the black market premium. Clearly, the most successful country in this respect was Ghana.

Table 3. **Average Black Market Premium on Official Exchange Rate**
(in per cent)

		Country	1970-74	1975-79	1980-84	1985-89	1990-96
CFA countries			-0.5	0.4	2.2	0.5	2.3
Non CFA	North Africa	Algeria	51.2	95.8	241.8	379.0	194.3
		Egypt	82.8	61.2	39.4	159.6	9.1
		Morocco	4.8	7.3	5.2	2.6	3.8
		Tunisia	14.9	5.2	8.3	4.6	4.0
	North Africa (average)		31.9	31.9	38.7	58.4	25.7
	Sub-Sahara	Ghana	43.5	239.6	523.7	53.1	3.6
		Kenya	34.2	11.4	19.3	10.2	16.3
		Madagascar	-0.5	n.a.	75.1	18.5	10.0
		Malawi	26.0	68.4	75.0	22.5	21.5
		Mauritius	n.a.	n.a.	20.7	2.2	5.9
		Nigeria	30.3	57.7	103.7	73.1	46.1
		Tanzania	78.0	108.1	228.0	168.8	20.8
		Zambia	69.3	130.2	46.1	106.5	19.6
		Zimbabwe	35.4	128.1	93.2	52.9	18.1
	Sub-Sahara (average)		36.9	85.5	89.0	43.1	16.5
Non CFA Average			**35.2**	**62.1**	**68.3**	**47.5**	**19.2**

Source: World Currency Yearbook, Wood (1988) and World Bank, African Development Indicators 1997.

Quite apart from the effects of RER misalignment, increased volatility of the RER can exert adverse effects on macroeconomic performance and especially production for export (see Section V). RER volatility arises from inconsistent macroeconomic, exchange-rate, and trade policies. We use as a measure of RER volatility the standard deviation of monthly changes in real effective exchange rates presented in Figures 1 to 3. Table 4 shows five-year averages of this measure of volatility for CFA and non CFA countries up to the end of the 1980s.

Table 4. **Average Volatility Of Real Exchange Rates**

		Country	1970-74	1975-79	1980-84	1985-90
CFA		Burkina Faso	4.01	5.85	3.38	2.23
		CAF	0.89	1.41	1.29	0.71
		Cameroon	1.45	1.62	2.44	2.46
		Congo	2.16	2.91	1.81	1.65
		Côte d'Ivoire	2.52	2.51	2.43	1.29
		Mali	0.95	0.94	0.91	0.87
		Niger	2.66	2.97	3.39	2.90
		Senegal	3.39	2.61	1.69	1.87
		Togo	2.78	2.78	2.68	1.64
CFA Average			2.31	2.62	2.22	1.73
Non CFA	North Africa	Algeria	1.23	2.35	2.87	2.72
		Egypt	2.28	4.67	2.84	4.58
		Morocco	1.05	1.08	1.45	1.40
		Tunisia	1.74	1.34	1.50	2.71
	North Africa (average)		1.58	2.36	2.17	2.85
	Sub-Sahara	Ghana	6.63	7.21	15.13	6.94
		Kenya	1.45	1.79	2.74	1.62
		Madagascar	1.47	1.41	2.69	4.30
		Malawi	1.21	0.92	3.41	3.88
		Mauritius	1.31	1.92	1.93	1.49
		Nigeria	2.64	2.11	2.50	10.26
		Tanzania	2.53	2.45	4.72	6.83
		Zambia	1.20	3.05	2.14	12.50
		Zimbabwe	1.28	2.36	2.82	2.11
	Sub-Sahara (average)		2.19	2.58	4.23	5.55
Non CFA Average			**2.00**	**2.51**	**3.60**	**4.72**
Total Average			**2.13**	**2.56**	**3.03**	**3.50**

Source: Authors' calculations.

CFA countries and non-CFA North African countries exhibit a similar degree of RER volatility, although specifically in the CFA zone volatility has been decreasing during 1985-90. On the contrary, non-CFA countries have experienced a continuous increase in RER volatility, which during 1985-90 has been on average three times higher than in CFA countries[9]. Increasing RER volatility in the non-CFA countries can be seen as the joint outcome of the move towards more flexible exchange-rate mechanisms throughout the 1980s and the internal inconsistencies of macroeconomic policies which failed to deliver stable economic conditions.

III. A MODEL-BASED MEASURE OF REAL EXCHANGE RATE MISALIGNMENT

In order to get a more reliable measure of RER misalignment, we follow the model-based approach to measuring deviations of RER from its equilibrium level first suggested by Edwards (1988). This approach makes it possible to distinguish among two main sources of RER variations: First, changes in external or domestic "fundamentals" which bring about changes in the *equilibrium RER*. These can be either changes in exogenous non policy variables (international terms of trade, international transfers, technological progress), or smooth changes in trade policies. Second, misconceived domestic policies which may create *"policy-induced misalignment"* in the RER (excess domestic credit creation, excessive foreign borrowing, excessively inward-oriented trade policies). In estimating the impact of these factors on the RER we use an empirical model similar to the one suggested by Cottani *et al.* (1990) and by Ghura and Grennes (1993)[10].

It is assumed that, for each country *i*, the RER is determined according to the following equation:

$$\log(E_{i,t}) = a_i + a_1 \log(P_X / P_Q)_{i,t} + a_2 \log\left[(Y/(X+Q)\right]_{i,t} + a_3 (C/Y)_{i,t} + a_4 EXC_{i,t} + a_5 EXDEV_{i,t} + a_6 t + u_{i,t} \quad (2)$$

where,

E = the real effective exchange rate as measured by equation 1;

P_x/P = the terms of trade, measured as the ratio of export to import prices (in dollars);

Y/(X+Q) = an inward orientation indicator, computed as the ratio of GDP to the sum of exports (*X*) and imports (*Q*);

C/Y = net capital inflow (net change in reserves minus trade balance, *C*) scaled by GDP;

EXC = excess domestic credit expansion, measured as the difference between growth in domestic credit and real GDP growth;

EXDEV = changes in the official nominal exchange rate in per cent;

t = time index;

u = an independently distributed random term.

We expect a rise in the terms of trade to appreciate the equilibrium RER to the extent that it improves the trade balance (the income effect dominating the substitution effect). Hence, the coefficient associated to P_x/P_Q in the RER equation should be negative. The inward orientation indicator is a proxy for the effect of trade policies (import tariffs, quotas, exchange controls) on the RER. It is expected that restricted openness would exert downward pressure on the relative price of tradable to non tradable goods, thereby leading to an appreciation in the equilibrium RER. An increase in net capital inflows may result from: *a)* an autonomous increase in foreign aid, foreign voluntary lending, or FDI; *b)* an increase in borrowing due to the removal of domestic capital controls; *c)* a fall in the world real interest rate; or *d)* an increase in public borrowing to finance the fiscal deficit. Higher capital inflows involve stronger demand for both tradeable and non tradeables. They therefore lead to a higher relative price of non tradeable (RER appreciation), as needed for domestic resources to be diverted toward production in the non tradeable sector so as to meet increased demand.

Excess domestic credit creation induces inflation in the economy and hence appreciates the RER by leading to a rise in the price of non tradable goods. Moreover, the change in the official nominal exchange rate is included in the regression to capture the strong temporary effect devaluations may exert on the RER due to price rigidities. Finally, a time trend is included in the regression to capture the effect that uneven technological progress may exert on the relative prices of tradable and non tradable goods (the Balassa-Samuelson effect).

Equation (2) was estimated on an unbalanced panel comprising 22 African countries over the 1970-95 period[11]. When estimating equation 2, a model with a country-specific coefficient for the time trend turned out to fit the data better. The estimation results of this model (using the White estimator to correct for heteroscedasticity bias) are shown below[12]. The equation was estimated by the fixed-effects method. This is supported by the data, as shown by the Fisher test for equality of intercepts across countries and is preferable to the random effects method, as shown by the value of the Hausmann test.

$$\log(E_{i,t}) = \underset{(6.89)}{-0.38}\log(P_X / P_Q)_{i,t} \; \underset{(4.75)}{-\; 0.37}\log\left[(Y/(X+Q)\right]_{i,t} \; \underset{(1.9)}{-\; 0.34}(C/Y)_{i,t} \\ \underset{(2.23)}{-\; 0.12}\,EXC_{i,t} \; + \; \underset{(1.27)}{0.38}\,EXDEV_{i,t} \; + \; \sum_{i=1}^{22} b_i t \qquad (3)$$

Fisher test: 23.9 Hausmann test: 216.9 No obs: 532 Adjusted R^2 = 0.66

The estimated regression explains a fairly large amount of the observed variation in real exchange rates. This is quite satisfactory, given the substantial volatility of real exchange rates in Africa. Improving terms of trade, restrictive trade policies, increased net capital inflows, and excessive domestic credit expansion have the expected effect in appreciating the RER and are statistically significant. Nominal devaluations exert a short-run impact

on the RER which, although in the expected direction, is not strong enough to be significant. Finally, in most cases the time trend points to a significant real depreciation trend in RER, which is contrary to what could have been expected on the basis of the Balassa-Samuelson effect. This could be just an outcome of the widely documented weakness of productivity trends in manufacturing in most African countries, which resulted even in negative rates of growth of TFP in some cases[13]. Such a weak productivity performance of the tradeables sector compared to the services sector is mirrored by the depreciating trend of the real exchange rate ¾ after controlling for the influence of the other policy and exogenous factors included in equation (3).

Policy-induced RER misalignment can be computed from equation 3 as resulting from three sources: excessive trade protection leading to inward orientation of the economy; excessive foreign borrowing; and excess domestic credit expansion. Excessive trade protection leads to a higher level of *Y*/(*X*+*Q*) in comparison to normal trends in the economy. As a rule of thumb, RER misalignment arising from excessive trade protection (*TPM*) can be measured by the ratio of *Y*/(*X*+*Q*) to the average of its three lowest values (j=1,2,3) over the observation period:

$$TPM = \left[Y/(X+Q)\right]_t \Big/ \left((1/3)\sum_j \min\left[Y/(X+Q)\right]_j\right).$$

Foreign borrowing can be shown to be sustainable as long as it does not exceed $(g-r^*)f$, where *g* is the long-run rate of growth; *r** is the foreign real interest rate; and *f* is the desired stock of foreign debt as a share of GDP[14]. On the basis of this criterion, if *g>r** positive values of *C/Y* (net borrowing) were considered to be sustainable — negative values (net lending) being by definition sustainable. However, if *g<r**, positive values of C/Y were considered unsustainable, so that in these particular years the country is said to have overborrowed. It is assumed that sustainable borrowing involves equilibrium RER appreciation, as implied by equation 3, but does not lead to RER misalignment. Therefore, in these particular years *C/Y* is set equal to 0 in the RER misalignment equation (to be specified below). On the contrary, unsustainable borrowing as defined above, leads to RER misalignment and is taken into account through the observed value of *C/Y*. The variable measuring the contribution of net capital inflows to RER misalignment (*CM*) is therefore defined as follows:

$$CM = \begin{cases} 0 & if \quad g \rangle r^* \\ C/Y & if \quad g \langle r^* \quad and \quad C/Y \rangle 0 \end{cases} \qquad (4)$$

Excess domestic credit expansion, leading to RER misalignment is assumed to have occurred in years showing positive values of EXC. In years in which EXC≤0 the variable measuring the contribution of misconceived

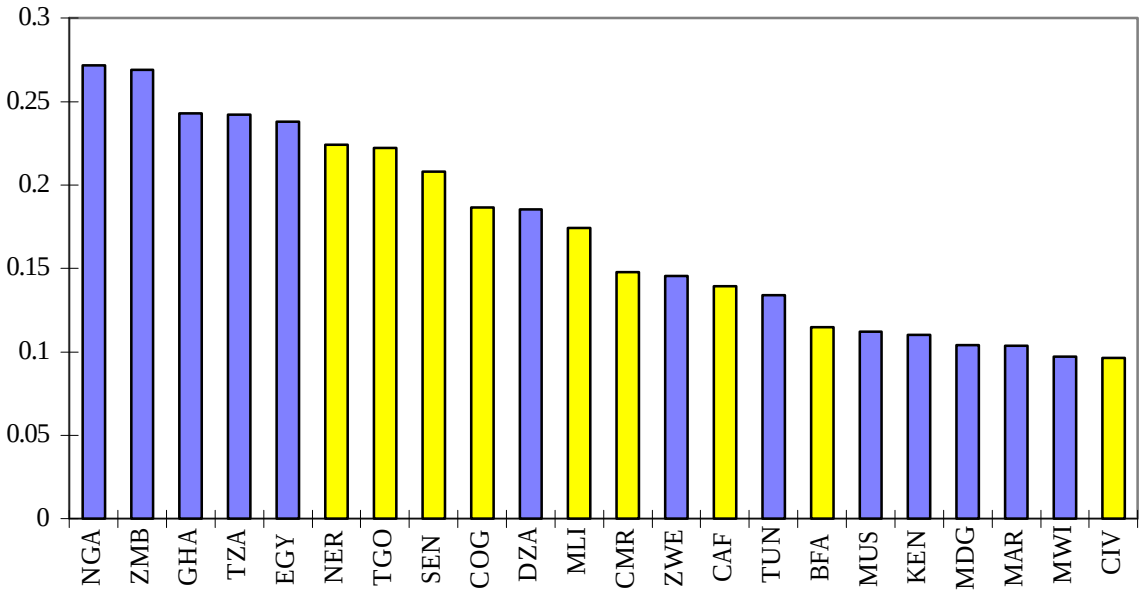
macroeconomic policies to misalignment (*EXCM*) is simply set to 0. Using the estimated coefficients from equation 3, the index measuring policy-induced RER misalignment was thereby defined as follows:

$$RERMIS_{i,t} = e^{-MIS_{i,t}} - 1 \qquad (5a)$$

where, $$MIS_{i,t} = -0.37\, TPM_{i,t} - 0.34\, CM_{i,t} - 0.12\, EXCM_{i,t} \qquad (5b)$$

A summary picture of policy-induced RER misalignment, as measured by the above index, is given in Figure 4, which depicts the average value of the index for each country of the sample over the 1970-95 period. RER misalignment has been substantial in African countries, exceeding 15 per cent on average over the period for more than half the countries of the sample. Such a large distortion in an important relative price of the economy, which persists for such a long period of time, can have lasting adverse effects on the sectoral allocation of resources and on the productive capacity of the exporting sectors of the economy[15].

Figure 4. **Average RER Misalignment: 1970-95**



Source: Authors' calculations.

The countries that seem to have suffered most from RER persistent overvaluation are Nigeria and Zambia, followed by Ghana and Tanzania. The fact that the following group — Niger, Togo, Senegal, and Congo — are CFA countries demonstrates that, despite the monetary policy discipline it involves, CFA zone membership did not prevent the emergence of substantial policy-induced RER misalignment. Among Northern African countries, Egypt experienced the highest level of RER misalignment, comparable to that of SSA countries.

Changes in RER misalignment over time are shown in Figures A.1 to A.3 of the Appendix (part A) for the three groups of African economies we have been considering so far. In the case of Non-CFA Sub Saharan African countries (Figure A.1), the index shows a sustained increase in RER misalignment from the early to mid 1980s, which mainly corresponds to over borrowing that occurred during the debt crisis period. RER overvaluation is especially noteworthy in Ghana, Tanzania, and Nigeria. In the case of the first two countries, our index shows that overvaluation substantially exceeded 50 per cent. Real depreciation achieved during 1985-95 led to a reversal of this trend, which is especially noteworthy in Mauritius, Malawi, and Zimbabwe. Ghana initially made considerable progress in correcting RER rate misalignment, but this effort was interrupted in the beginning of the 1990s. The same irregular progress can be observed in the case of Tanzania and Nigeria. Zambia is a unique case where RER misalignment exhibited substantial swings in the 1990s, leading to a clear worsening of the situation.

In the case of CFA countries (Figure A.2), the observed pattern looks to be the opposite to the one of non-CFA countries. Estimated RER misalignment was substantial — exceeding 20 per cent — at the beginning of the 1970s. It has been declining over the first half of the observation period, up to the beginning of the 1980s. However, misalignment shows an upward trend as from 1983-84, which is sustained up to 1993. Estimated misalignment is comparatively stronger in the case of Cameroon, Niger, Togo, and Senegal. Contrary to non-CFA countries which made some (yet unequal) progress in reducing RER overvaluation towards the end of the period, CFA countries seem to have been converging toward an average level of RER misalignment of around 20 per cent. CFA Franc devaluation in 1994 has been effective in correcting RER misalignment in most cases. However, according to our estimates, substantial misalignment still remains in Togo and Senegal.

Northern African countries (Figure A.3) show a pattern of declining RER misalignment which is quite similar to the one of CFA countries up to the beginning of the 1980s. During the 1980s they exhibit substantial RER misalignment, which is, however, quickly reversed in the case of Tunisia and Morocco. Misalignment remained substantial during the 1990s in the case of Egypt and Algeria, approaching or even exceeding the levels observed in the worst performing SSA countries.

IV. MANUFACTURED EXPORTS PERFORMANCE IN AFRICA

Given its low level of development, manufacturing contributes comparatively little to GDP in Sub-Saharan Africa. In 1994 the weighted share of manufacturing in GDP in SSA countries was 15 per cent (against 13 per cent in 1980), which is much lower than the corresponding shares of 21 per cent and 30 per cent in, respectively, Latin American and East Asian countries[16].

Table 5 shows movements in the average share of MVA over the 1970-95 period for selected SSA countries and the four North African countries we considered in the previous section. No clear pattern of MVA shares emerges from this table. Some countries have been quite successful in promoting manufacturing industries, as evidenced by the continuous rise in the share of MVA in GDP. This is true particularly in the case of Côte d'Ivoire in the CFA zone, of Malawi, Mauritius, and Zimbabwe among the non CFA countries, and of Tunisia in Northern Africa.

Most other SSA countries have witnessed a stationary trend of manufacturing production as a share of GDP. Some countries have experienced a downward trend during the 1980s, resulting in de-industrialisation. Typical examples are Senegal and Tanzania. An important factor contributing to de-industrialisation in SSA countries was import compression, which induced sharp cuts in industrial production. A key reason was the fact that in most SSA countries industrialisation after independence was achieved through import substitution, which led to a decline in export capacity. Combined with the deterioration in the terms of trade, the limited export capacity induced a drastic fall in import capacity of intermediate inputs that severely constrained manufacturing capacity expansion[17]. Other factors that hampered the development of the manufacturing sector especially in CFA zone countries have been non competitive labour costs — against particularly East Asian competitors — labour market rigidities, and a poor regulatory and institutional environment[18].

Table 5. **Average Share of Manufacturing Value Added in GDP**

		Country	1970-79	1980-84	1985-89	1990-95
CFA		Burkina Faso	18.91	15.97	16.28	16.41
		Cameroon	9.71	7.42	12.59	12.54
		Central African Rep.	7.33	7.87	7.00	n.a.
		Congo	8.91	5.79	7.86	7.67
		Côte d'Ivoire	12.15	14.16	18.37	19.34
		Mali	6.99	5.55	8.37	7.53
		Niger	5.13	4.33	7.02	n.a.
		Senegal	16.85	11.93	12.97	12.39
		Togo	7.49	7.08	7.78	9.58
Non CFA	North Africa	Algeria	11.54	10.32	12.94	10.85
		Egypt	15.73	12.98	14.83	16.44
		Morocco	16.57	17.82	17.86	18.09
		Tunisia	9.86	12.76	15.95	17.42
	Sub-Sahara	Ghana	11.09	5.53	10.43	7.45
		Kenya	11.95	12.21	11.67	10.96
		Madagascar	7.40	10.91	11.80	12.14
		Malawi	11.94	12.63	16.06	18.35
		Mauritius	15.12	16.09	23.27	23.32
		Nigeria	4.83	9.66	10.01	6.82
		Tanzania	10.17	9.12	7.73	8.22
		Zambia	14.69	19.81	26.60	29.86
		Zimbabwe	22.69	25.34	25.56	28.64

n.a. = not available
Source: World Bank.

A similar phenomenon was observed in Ghana in the first half of the 1980s, before the implementation of the Economic Recovery Program. Economic liberalisation and increased capital inflows induced, in a first stage, a positive response of the industrial sector whose share in GDP almost doubled in the second half of the 1980s. However, due to limited technological capabilities, as trade liberalisation became widespread, large parts of the manufacturing sector were seriously damaged by import competition, leading to a reversal in the trend of manufacturing capacity expansion[19].

Table 6. **Average Share of Manufactured Exports in Total Exports**

		Country	1970-79	1980-84	1985-89	1990-94
CFA		Burkina Faso	5.81	5.73	5.22	6.22
		CAF	26.67	35.36	42.95	65.33
		Cameroon	3.45	2.75	2.76	2.64
		Congo	12.94	5.97	8.58	20.89
		Côte d'Ivoire	4.35	6.11	7.63	10.43
		Mali	7.14	10.45	12.39	22.84
		Niger	14.90	79.41	90.33	86.73
		Senegal	9.69	12.63	14.19	12.52
		Togo	4.85	10.53	4.67	7.86
Non-CFA	North Africa	Algeria	1.91	0.75	2.63	2.92
		Egypt	15.41	6.68	14.06	27.32
		Morocco	14.49	28.72	45.86	58.19
		Tunisia	27.32	44.98	62.04	75.60
	Sub-Sahara	Ghana	3.87	5.65	8.77	18.24
		Kenya	16.15	17.17	14.49	18.57
		Madagascar	6.54	7.14	9.62	18.04
		Malawi	4.02	7.98	4.86	7.01
		Mauritius	13.83	32.36	59.46	67.61
		Nigeria	0.92	0.42	1.27	2.00
		Tanzania	10.18	11.39	10.41	13.74
		Zambia	2.16	3.23	3.99	4.47
		Zimbabwe	33.08	30.42	28.19	31.29

Source: World Bank.

Table 6 shows the share of manufacturing in total exports. This share remains extremely low in most SSA countries, although some of them have made considerable progress in this respect[20]. Most remarkable examples are Côte d'Ivoire and Mali in the CFA zone and Ghana, Madagascar, and Tanzania (during the 1990s) in the non CFA zone, which achieved a steady increase in the export share of manufacturing. Mauritius has been particularly successful in promoting manufactured exports thanks to a policy of Export Processing Zones (EPZs). Starting in the 1970s with an export share of manufacturing lower than in Kenya, and with a share of MVA in GDP lower than in Senegal, manufactured exports in this country reached more than two-thirds of total exports in the first half of the 1990s. Similar progress has been achieved by Morocco and, especially, Tunisia in North Africa; manufactured exports having reached three-quarters of total exports in this latter country. On the contrary, countries like Kenya and Zimbabwe which had a comparatively good performance in the past, have not been able to achieve a sustained rise in the share of manufactured exports.

Tables B1-B3 in the Appendix (part B) show that textiles is probably the most dynamic element in manufacturing export expansion. This is because of the low-skill-intensive character of the textile industry, which makes it a particularly suitable sector of first-stage international specialisation for unskilled-labour-abundant developing countries. It is noteworthy that, in the first half of the 1990s, textile exports in successful countries like Morocco and Tunisia had reached more than 60 per cent of total manufactured exports, while in the case of Mauritius this figure was as high as 84 per cent. Tanzania and Madagascar are countries which show a comparable tendency towards an increasing share of textile exports in total exports, and could be followed shortly by Kenya and Malawi.

Table 7. **External Trade Indicators**

			Export Concentration Index		Terms of Trade 1994
		Country	1984	1992	(1987=100)
CFA		Burkina Faso	0.54	0.62	103
		Cameroon	0.48	n.a.	79
		Congo	0.80	0.64	93
		Côte d'Ivoire	0.32	0.37	81
		Mali	0.58	n.a.	103
		Niger	0.74	n.a.	101
		Senegal	0.31	0.26	107
		Togo	0.46	0.49	90
		CAF	0.45	n.a.	91
Non-CFA	North Africa	Algeria	0.53	0.55	83
		Egypt	0.48	0.36	95
		Morocco	0.28	0.16	107
		Tunisia	0.41	0.21	93
	Sub-Sahara	Ghana	0.54	0.47	64
		Kenya	0.34	0.31	80
		Madagascar	0.47	0.29	82
		Malawi	0.53	0.70	87
		Mauritius	0.66	0.33	121
		Nigeria	0.94	0.93	86
		Tanzania	0.36	0.25	83
		Zambia	0.84	0.79	85
		Zimbabwe	0.30	0.33	84

n.a. not available.
Source: World Bank, World Development Report, 1996.

Export-led growth in the manufacturing sector can be an important factor of sustained growth in so far as it allows export diversification, reducing therefore the exposure to adverse terms of trade shocks. Their low levels of development and the inward orientation of their manufacturing sectors mean that most SSA countries exhibit extremely high concentration of their exports. This can be measured by the Export Concentration Index constructed by UNCTAD and shown in Table 7. It ranges from 0 to 1, and measures (in increasing order) the degree to which a country's exports are concentrated in SITC three-digit level commodities[21].

Most SSA countries exhibit considerably higher export concentration than other developing countries in South Asia, East Asia, or Latin America — whose indexes are around or below 0.20. SSA countries which succeeded in diversifying their exports to some extent are Côte d'Ivoire, Senegal, Kenya, Madagascar, Tanzania, Zimbabwe, and, of course, Mauritius. In Northern Africa, Morocco and Tunisia have been quite successful in this respect.

The last column of Table 7 demonstrates that the low diversification of exports increases the vulnerability of SSA countries to adverse terms of trade shocks. Over the 1987-94 period, most of these countries experienced a decline in their export prices relative to import prices. It is noteworthy that this fall in the terms of trade was comparatively sharper in non-CFA countries. The move towards more flexible exchange-rate systems in these countries has probably dampened the RER overvaluation induced by these adverse terms of trade shocks.

The high export concentration indices shown in Table 7 are mainly due to the extremely high share of primary commodities in SSA exports. In most SSA countries the share of primary commodities in total exports is higher than 80 per cent. In addition, this share has not shown any significant downward trend over the last 20 years. Latin American countries had equally high shares of primary commodities in total exports at the beginning of the 1970s. However, in contrast to SSA countries, this share has been steadily declining in most of these countries, even before the creation of Mercosur which expanded regional trade in manufacturing.

V. EXCHANGE-RATE MANAGEMENT AND TRADE: AN OVERVIEW

Beginning in the late 1970s, numerous authors have studied the theoretical relationship between exchange-rate management and international trade flows [Cushman (1983), Dixit (1989), Gagnon (1993), Hooper and Kohlhagen (1978)]. This relationship concerns both the impact of exchange-rate changes and the impact of exchange-rate variability on trade. While there was a consensus on the impact of exchange-rate changes on trade, the effect of variability was much more controversial. Hence a majority of research was devoted to variability defined as exchange-rate fluctuations over a relevant period of time. Variability is blamed not only for decreasing trade volume but also for affecting the relationship between exchange rate and trade variables. Moreover, variability can be detrimental to the process of current account adjustment.

Variability is defined as fluctuations of exchange rate around its equilibrium level. Two types of fluctuations are considered. One type concerns frequent and non persistent fluctuations. This type of fluctuation is labeled volatility. The second concerns less frequent and more persistent swings: the exchange rate departs from its equilibrium level over several periods. This second type of variability is labeled misalignment.

Beginning with volatility, formal analyses [see Clark (1973), Ethier (1973), Hooper and Kohlhagen (1978)], associate volatility with uncertainty and assume that economic agents are risk averse. Hence they predict a negative impact of volatility on trade volume. The impact of volatility on trade prices may be either positive or negative depending on whether the risk is borne by exporters or importers.

As far as misalignment is concerned, a similar impact, to the one of volatility, is suggested in the literature (De Grauwe, 1987), stemming from the associated overvaluation (under-valuation) of a currency which depresses (fosters) exports [see Grobar (1993)]. Finally misalignment affects the sensitivity of trade variables (volume and prices) to exchange-rate changes. This is based on the costs of reversing changes in foreign market shares due to either the existence of sunk costs or to consumers loyalty [Baldwin and Krugman (1989), Dixit (1989), Froot and Klemperer (1989), Sapir and Sekkat (1995)]. Assuming that exchange rates can not depart permanently from equilibrium levels, it is shown that during a period with substantial misalignment, for instance an overvaluation of the national currency, economic agents expect exchange rate to revert to its equilibrium level. They consider further depreciation of exchange rate as temporary and would not expand sales as much as if actual exchange level was perceived as being at its equilibrium level.

Almost all published studies on the impact of exchange-rate variability on manufactured trade focused on developed countries [Hooper and Kohlhagen (1978), De Grauwe (1987), Kasa (1992) and Sapir and Sekkat (1995)]. Only few papers focused on manufactured trade in developing countries [see Medhora (1990), Coes (1981), Paredes (1989) and Grobar (1993)]. The only paper dealing with African economies is, to our knowledge, Medhora (1990).

In the case of developed countries, empirical research first concentrated on the impact of volatility on prices and on trade volume. They were inconclusive. According to Frenkel and Goldstein (1989) the difficulty in identifying a significant association between volatility and trade might reflect the availability of hedging instruments against exchange-rate risk, or the adaptability of multinationals. During the 1980s, researchers focused more on misalignment. The hypothesis was that misalignment generates uncertainty against which there is little possibility of insurance. Empirical work supports this hypothesis. There has been since a shift in focus from the impact of variability on the level of trade variables, to its impact on the response of trade variables to exchange-rate changes.

Turning to developing countries, the analyses focused on the impact of volatility on the level of trade variables. The evidence is mixed. An analysis of sectoral exports in Brazil, conducted by Coes (1981), showed a negative impact of uncertainty. Parades (1989) reached a similar conclusion concerning the impact of exchange-rate uncertainty on the growth of manufactured export of Chile and Peru. The case of the West African Monetary Union (Benin, Burkina Faso, Côte d'Ivoire, Senegal and Togo) was examined by Medhora (1990). The focus was on imports instead of exports. The empirical analysis failed to reveal any negative effect of exchange-rate volatility on trade. Finally Grobar (1993) examined the effect of exchange-rate volatility on manufactured exports of ten middle-income countries (Argentina, Brazil, Colombia, Greece, Malaysia, Mexico, Philippines, South Africa, Thailand and Yugoslavia). She distinguished four categories of exports and also considered the role of misalignment as measured by the black market premium. The results lent support to the hypothesis that exchange-rate volatility negatively affects exports. Misalignment seemed, however, not to have played a central role in determining exports of the ten countries.

VI. THE IMPACT OF EXCHANGE-RATE MISMANAGEMENT ON AFRICAN MANUFACTURED EXPORTS

This section tests for a possible adverse influence of either an appreciation of the real exchange rate, or an increase in volatility or in misalignment, in the case of African economies. Assuming that the exporter is small with respect to the market for manufactures, we postulate the following relationship between export volume and exchange-rate variables:

$$\log\left(X_i\right) = \mathrm{a}_0 + \mathrm{a}_1 \log(MNF) + \mathrm{a}_2 \log(E) + \mathrm{a}_3 \log(V) + \mathrm{a}_4 \log(Mis) + \mathrm{m} \quad (6)$$

where:

X_i is the ratio of export of sector i over GDP

MNF is the ratio of total manufactured export over GDP[22]

E is the real effective exchange rate

V is the volatility of the real effective exchange rate

Mis is a measure of misalignment

μ is the error term

Equation (6) is the basic specification. It is a traditional specification in the literature [see for instance Grobar (1993)], and may be derived from a formal model of export supply in LDCs. One may also include a measure of capacity constraint in the specification (for instance, deviations of manufactured value added from trend). The estimates using this variable lead to a non-significant coefficient and dropping the variable does not affect the results.

The expected signs of the coefficients in equation (6) are: $\alpha_1, \alpha_2 > 0$ and $\alpha_3, \alpha_4 < 0$. Using the ratio of exports to GDP as a dependent variable avoids the problems due to the difference in countries' sizes. The ratio of total manufactured exports to GDP is intended to take account of non-exchange-rate market determinants of export (infrastructure, commercial policy ...). The parameter α_1 is expected to be positive because an improvement in the overall manufactured export capacity should be reflected in higher exports of individual sectors. The remaining explanatory variables involve exchange-rate market determinants of exports. As a depreciation of the national currency (i.e. increase in *E*) should encourage exports, $\alpha_2 > 0$. Finally given that uncertainty and misalignment of currencies are potentially harmful to export, α_3 and α_4 are expected to be negative.

The basic specification (6) was estimated using a sample of pooled cross-section and time series data. The series of GDP and export are drawn from the United Nations' data base. Export series cover total manufactured exports (5, 6, 7 and 8 excluding 68)[23], textile products (65, 84,85), chemical products (5), and metal products (67, 68, 69). The effective real exchange rate (E) is defined as in equation (1). It is computed on an annual basis and on a monthly basis. The latter is used to compute, for a given year, volatility as the standard deviation of monthly changes[24].

Estimation is conducted with three alternative measures of exchange-rate misalignment. The first measure is the black market premium drawn from the world currency yearbook and from Wood (1988). The second measure of misalignment is related to PPP theory. It is drawn from the Penn World table. It is computed as the ratio between the PPP-GDP and the actual GDP (in US dollars) for a given country. Given the way these GDP series are built, this ratio turns out to be a good proxy of the ratio between the PPP exchange rate and the actual exchange rate. However, a major criticism to the PPP based measures of misalignment is that the equilibrium exchange rate may itself evolve over time due to changes in economic fundamentals. Hence a third measure of misalignment is considered[25]. It is based on our estimation of a formal model of the determinants of the real exchange rate (Section III).

The sample includes annual data for 11 sub-Saharan African countries. Among these countries six are CFA zone countries: Cameroon, Congo, Côte d'Ivoire, Mali, Senegal and Burkina Faso. The remaining five countries have floating exchange rates and are labeled non-CFA countries: Ghana, Kenya, Zimbabwe, Tanzania and Zambia. The period of observation lies between 1970 and 1992 depending on data availability[26].

Equation (6) was first estimated on the assumption that the CFA and the non-CFA slopes are equal. Intercepts are allowed to vary across countries (using the fixed-effects method) but slopes are constrained to be equal. In general, the overall quality of fit is low[27]. The coefficients of the ratio of total manufactured export to GDP are significant for all sectors and irrespective of the measure of misalignment. The coefficients of exchange rate turn out to be significant when the black market premium and the PPP measure are used as indicators of misalignment, for textile and metal products but not for chemical products. They are not significant when using the model-based measure of misalignment. The coefficients of volatility are never significant. As far as the measures of misalignment are concerned, the coefficients of the black market premium are never significant. The coefficients of the PPP measure and of the model-based measure of misalignment are significant and negative only for metal products and textile and metal products respectively.

The poor quality of these results may be due to the fact that equality of slopes between the CFA and the non-CFA zones is imposed from the outset. Such an assumption is statistically rejected by the data. Hence, a second round of the analysis consists in allowing for differences in slopes between the CFA and the non-CFA zones: a separate equation was estimated for

each zone. The results are reported in Table 8. This contains three parts according to the three measures of misalignment. The fixed-effect tests (Hausmann tests) support the fixed-effects over the random effects method of estimation.

Allowing for differences in slopes highly improves the overall quality of fit in the non-CFA zone. However, the quality of fit in the CFA zone remains low and close look at the results reveals that they are disappointing for these countries. In addition to the low quality of fit, the coefficients of the real effective exchange rate are never significant and volatility sometimes has a wrong significant sign. The low variability of the real exchange rate, due to the fixed exchange-rate regime adopted by the CFA countries (see also Balassa, 1990), could be a potential factor in explaining the poor quality of results for the CFA zone. In what follows, the discussion will, therefore, focus on the results for the non-CFA zone. Here the overall quality of fit is good. It is comparable or even higher than that obtained in other studies focusing on African countries (see Balassa, 1990; Cottani et all, 1990; Ghura and Grennes, 1993).

Considering the results with the black market premium measure of misalignment, the coefficients of the level of real exchange rate are always significant. The coefficients exhibit a positive sign and are high in levels. They lie between 1 and 2. Volatility seems to affect trade negatively in two sectors (Textiles and Chemical products). The coefficients of misalignment are significant in the same sectors as volatility. They are, however, significant with the wrong sign (positive) suggesting that exporters have access to the black market, which is questionable.

The results with the PPP measure of misalignment show positive and significant exchange-rate coefficients for textile and metal products. These coefficients are still of high magnitudes (around 1). Volatility has a negative significant coefficient in the textile and the chemical sectors. Finally misalignment has a significant negative impact only on metal products exports. In contrast with the results of the black market premium measure, the coefficients of misalignment do not exhibit a wrong sign. However, they are far from being significant.

Using the model-based measure of misalignment the overall quality of fit remains good. The coefficients of the real effective exchange rate are significant and positive for textile and metal products. They are slightly lower than with the PPP measure. Finally, the coefficients of misalignment are significantly negative for all the sectors while with the PPP measure this occurs only in one case (metal products). The magnitude of these coefficients is very high i.e. between 3 and 5. They are by far greater than the coefficients of the real effective exchange rate. A decrease in exchange-rate misalignment has a much more positive effect on manufactured exports than a depreciation of equilibrium exchange rate. The coefficients of volatility are never significant.

Combining the results of the above tables, several interesting features emerge. First, the behaviour of the real exchange rate seems to be an important determinant of manufactured exports. Second, although volatility has been shown to have a negative impact on exports in some cases, this effect is not robust to alternative specifications of the estimated export supply function. Third, the existence of an important effect of exchange-rate misalignment on manufactured exports, cannot be rejected.

The magnitude of exchange-rate coefficients lies between 0.51 and 1.81. This means that a one per cent change in the real exchange rate is associated with a 0.51-1.81 per cent increase of the share of (a given sector) exports in GDP. Therefore, African manufactured exports seem to be responsive to incentives: depreciation clearly fosters export performance. Nevertheless, the magnitude of the coefficients remains below the findings for other developing countries which are reported in comparable studies. For instance the elasticities reported in Grobar (1993) are in general double those reported here — they lie between 1 and 3.26. Although, African exporters are responsive to incentive mechanisms, they seem to be less responsive than other developing countries exporters.

Except for Grobar (1993), none of the few papers focusing on developing countries manufactured exports studied the impact of volatility and of misalignment simultaneously. The studies were generally limited to the impact of volatility on trade. No consensus emerges about the possible existence of a negative impact of volatility on trade. The only study focusing on African countries [Medhora (1990)] failed to reveal any adverse effect of volatility on trade, though it concentrated on imports rather than exports. As far as misalignment is concerned, Grobar (1993) found that, in her sample, it had no impact on trade. Note that she used the black market premium as a measure of misalignment and encountered similar problems, related to the unexpected positive signs of the coefficients. The use of various measures of misalignment leads us, however, to a different conclusion: the existence of a potential important effect of misalignment on manufactured export in Sub-Saharan Africa cannot be rejected. The coefficient of misalignment is significantly negative in nearly all cases. This implies that the overvaluation of some African exchange rates, which prevailed for a long time, resulted in significant losses of export opportunities.

Table 8.a. **Estimation Results with the Black Market Premium as a Measure of Misalignment**

Sectors / Equations	Textile products	Chemical products	Metal products
Non-CFA zone Equation			
MNF	0.58* (3.42)	0.65* (4.57)	1.00* (7.19)
E	1.81* (3.24)	1.56* (3.29)	1.03* (2.24)
V	-0.58* (-3.00)	-0.39* (-2.39)	-0.03 (-0.19)
Mis	1.28* (2.20)	1.43* (2.91)	0.38 (0.80)
$\overline{R}^2$	0.27	0.32	0.49
Fixed effect	27.99*	22.98*	70.27*
CFA Zone Equation			
MNF	1.11* (4.05)	2.10* (4.85)	0.89* (3.11)
E	0.48 (0.59)	-1.18 (-0.92)	1.05 (1.26)
V	0.32** (1.70)	0.29 (0.97)	0.12 (0.61)
Mis	-8.02** (-1.78)	5.23 (0.73)	-9.53* (-2.03)
$\overline{R}^2$	0.12	0.15	0.06
Fixed effect	32.84*	18.66*	21.69*

$\overline{R}^2$ gives the adjusted $\overline{R}^2$.
Fixed effect gives the F statistic of the test of the non-existence of a fixed effect. Degrees of freedom are (4, 61) for the non-CFA equation and (5, 85) for the CFA equation.
t-statistics are in brackets.
* significant at 5%, ** significant at 10%.
Mis is computed as 100 + the black market premium (in percentage).
Source: Authors' calculations.

Table 8.b. **Estimation Results with a PPP Based Measure of Misalignment**

Sectors / Equations	Textile products	Chemical products	Metal products
Non-CFA zone Equation			
MNF	0.48* (2.66)	0.57* (3.65)	0.92* (6.58)
E	1.05* (2.20)	0.68 (1.63)	0.83* (2.24)
V	-0.48* (-2.39)	-0.31** (-1.76)	0.04 (0.23)
Mis	-2.30 (-1.20)	-1.16 (-0.69)	-2.81** (-1.90)
$\overline{R}^2$	0.23	0.22	0.50
Fixed effect	21.18*	19.02*	49.94*
CFA Zone Equation			
MNF	1.07* (3.83)	2.13* (4.87)	0.90* (3.13)
E	0.41 (0.50)	-1.13 (-0.88)	0.86 (1.02)
V	0.33 (1.66)	0.29 (0.94)	0.06 (0.30)
Mis	-0.75 (-0.37)	0.51 (0.16)	-3.88** (-1.87)
$\overline{R}^2$	0.09	0.15	0.05
Fixed effect	32.87*	18.31*	10.65*

$\overline{R}^2$ gives the adjusted $\overline{R}^2$.

Fixed effect gives the F statistic of the test of the non-existence of a fixed effect. Degrees of freedom are (4, 60) for the non-CFA equation and (5, 85) for the CFA equation.

t-statistics are in brackets.

* significant at 5%, ** significant at 10%.

Mis is computed as $\frac{PPP\ \ GDP}{GDP} x100$.

Source: Authors' calculations.

Table 8.c. **Estimation Results with a Measure of Misalignment based on the Equilibrium Exchange-rate Model**

Sectors / Equations	Textile products	Chemical products	Metal products
Non-CFA zone Equation			
MNF	0.12	0.31	0.26
	(0.44)	(1.57)	(1.49)
E	0.79*	0.05	0.51**
	(2.04)	(0.17)	(1.98)
V	-0.20	0.01	0.09
	(-1.04)	(0.09)	(0.74)
Mis	-3.56*	-5.16*	-2.96*
	(-2.78)	(-5.47)	(-3.47)
$\overline{R}^2$	0.23	0.38	0.32
Fixed effect	35.52*	24.85*	151.35*
CFA Zone Equation			
MNF	0.55*	1.11*	0.34
	(2.47)	(3.27)	(1.39)
E	0.15	0.90	-0.31
	(0.19)	(0.78)	(-0.37)
V	0.30**	0.12	0.08
	(1.75)	(0.46)	(0.45)
Mis	-0.98	4.03*	-3.52*
	(-0.78)	(2.11)	(-2.57)
$\overline{R}^2$	0.01	0.05	0.01
Fixed effect	39.64*	23.84*	27.97*

$\overline{R}^2$ gives the adjusted $\overline{R}^2$.
Fixed effect gives the F statistic of the test of the non-existence of a fixed effect. Degrees of freedom are (4, 71) for the non-CFA equation and (5, 103) for the CFA equation.
t-statistics are in brackets.
* significant at 5%, ** significant at 10%.
In the present case Mis corresponds to RERMIS computed as shown in equation (5a).
Source: Authors' calculations.

We can make a rough assessment of the magnitude of these losses in export shares by using the estimated elasticities of misalignment and of the real exchange rate in the export supply equation. This exercise looks more reliable if carried out for the equation with the model-based estimates of misalignment and for the group of Non-CFA countries for which the estimation turned out to be successful. The estimates reported in Section III show that Non CFA countries experienced an average level of real exchange-rate misalignment of approximately 20 per cent over the 1970-95 period (see Figure 1). According to the estimated elasticities of export shares to misalignment (see Table 8.c), in the absence of misalignment, the ratio of export shares to GDP could have been higher by 70, 100, and 60 per cent for textile, chemical, and metal products respectively.

In Non-CFA countries, the average ratio of export shares to GDP for these three industries was, respectively, 1.4, 0.2, and 0.3 per cent for textile, chemical, and metal products over the same period. Given the above estimated impact of observed RER misalignment, the export shares to GDP of the three industries would have been 2.4 per cent for textile products, 0.4 per cent for chemicals, and 0.5 per cent for metal products in the absence of misalignment. Therefore, the total export share of the three industries could have been of 3.3 per cent of GDP, against the observed 1.9 per cent total share. This involves an estimated total loss of export shares amounting to 1.4 per cent of GDP, due to the adverse impact of RER misalignment alone.

Moreover, one should also take into account the direct impact stemming from a lower level of the RER, if it is assumed that RER misalignment is reversed through RER depreciation. According to our estimated elasticities of export shares to RER movements, a 20 per cent RER depreciation could improve the total export share of the three industries by 0.3 per cent of GDP. This puts our estimate of the direct impact of exchange-rate mismanagement on export shares of the three industries at 1.7 per cent of GDP.

It should be stressed that this figure probably underestimates the overall negative incidence of exchange-rate mismanagement on manufactured exports. A better export performance is likely to improve productivity through learning effects, thanks to an improved allocation of production factors, as well as through economies of scale due to a bigger market size. Therefore, it can induce an export-led growth of the manufacturing sector, showing up as a bigger share of manufactured value-added in GDP. This in turn can further boost export performance, as shown by the (generally) significant coefficients of this variable in our estimated export supply functions.

VII. CONCLUSION

This study presented an overview of the evolution of exchange-rate regimes in Africa and attempted to assess the impact of exchange-rate policy on manufactured exports in Sub-Saharan Africa empirically. Our analysis suggests that exchange-rate management matters for export performance. This is shown both by the significant impact of changes in the real effective exchange rate and by the negative influence exerted independently by exchange-rate misalignment.

Using data from developed countries, several studies have examined the impact of both exchange-rate volatility and misalignment on trade flows. A consensus emerges from this literature: no systematic and significant impact of volatility on trade can be detected, but a potential important effect of misalignment does exist. Our results confirm these findings in SSA countries. The explanation of the contrasting effects of volatility and misalignment relies mainly on the availability, to exporters, of cheap and efficient hedging instruments against the risk generated by volatility. On the contrary it seems that there is little possibility of insurance against the risk generated by misalignment.

Our findings suggest that exchange-rate mismanagement in Sub-Saharan Africa has reduced the incentives for exporters to increase their penetration of foreign markets. On the contrary, African countries that have been successful in expanding manufactured exports significantly have implemented cautious exchange-rate policies, inducing a steadily declining trend in real exchange-rate overvaluation. Mauritius and Tunisia are good cases in point. Moreover, inappropriate exchange-rate policy may lead to a vicious circle. Weak export performance reduces the ability to pay for imported foreign capital goods and hence reduces future capacity of production. This is harmful to both exports and growth. Hence an appropriate exchange-rate policy is a useful tool to promote African exports and hence economic development.

A word of caution is, nevertheless, needed here. Our estimated magnitude of the real exchange-rate impact on exports remains below the findings for other developing countries reported in comparable studies. Although African exporters are responsive to real exchange-rate incentives, they seem to be *less responsive* than other developing-country exporters. Therefore, even though getting relative prices right, through a cautious exchange-rate policy, is a necessary condition to engineer a sustained increase in manufactured exports, it might be not a sufficient one. Implementing appropriate structural policies to strengthen the supply side of the economy so as to achieve a sustained increase in productivity, seems an equally important prerequisite to promote African manufactured exports.

NOTES

1. The data are from World Development Report 1996, World Bank. See Helleiner (1995) for case studies of countries that have recently successfully entered manufacturing for export.

2. See Nishimizu and Robinson (1986) for cross-country evidence at a two-digit industry level of a positive correlation between export expansion and TFP changes.

3. A more global assessment of the responsiveness of trade flows to RER changes in both developed and developing countries is provided by Reinhardt (1995).

4. Some estimates of the negative impact of RER misalignment on African competitiveness, as compared to Asian countries, are provided by Lindauer and Velenchik (1994).

5. In some less common cases (Angola, Nigeria) the government is a net seller of foreign exchange to the private sector. This is because the government controls the main export activities of the economy which usually include the oil and the mining sectors. In these cases RER overvaluation involves subsidising the private sector and worsens the fiscal deficit.

6. An overview of the evolution of exchange rate regimes and their links to monetary arrangements in Africa is provided by Honohan and O'Connel (1997).

7. In some cases wp series were not available. They were replaced by cp series. The effective real exchange rate is calculated on an annual basis and on a monthly basis. The latter is used to compute, for a given year, volatility as the standard deviation of monthly changes.

8. However, it should be observed that Mali was not always member of the CFA zone during this period.

9. This tendency has also been documented econometrically by Savvides (1996).

10. Model-based calculations of RER misalignment for CFA countries have also been provided by Devarajan (1997). See also Elbadawi (1994), as well as Elbadawi and Soto (1997).

11. Egypt, Algeria, Cameroon, Central African Republic, Congo, Ghana, Côte d'Ivoire, Kenya, Madagascar, Malawi, Mali, Mauritius, Morocco, Niger, Nigeria, Zimbabwe, Senegal, Tanzania, Togo, Tunisia, Burkina Faso, Zambia. The minimum and maximum number of observations by country was respectively 13 and 26.

12. To save on space, the country-specific coefficients on the time trend (the bis) are not reported. Three (out of 22) coefficients are negative and significant, thirteen are positive and significant, and the remaining six are not significant.

13. See Latreille and Varoudakis (1996) for evidence on a panel of Senegalese manufacturing industries.

14. Let us denote by F_t and TB_t respectively foreign debt and the trade balance. The balance of payments equilibrium condition determining the accumulation of foreign debt is: $TB_t - r^* F_{t-1} + (F_t - F_{t-1}) = 0$. A sufficient, but not necessary, condition for foreign debt sustainability involves constancy of the foreign debt to GDP ratio(F_t/Y_t). Assuming real GDP grows at a constant rate g, this means: $F_t=(1+g)F_{t-1}$. Combining with the previous equation and scaling by Y, we get, $TB_t / Y_t = (r^* - g) f_t$, where $f_t=F_t/Y_t$. Given that net capital inflow, as defined in the text, is $C_t = F_t - F_{t-1} - r^* F_t$, the sustainability condition can also be written, $C_t / Y_t = (g - r^*) f_t$.

15. See also P. and S. Guillaumont (1994), Ch. 7, for evidence on this issue.

16. These data are from World Development Report, World Bank, 1995 and 1996. A detailed account of manufacturing sector performance in selected SSA countries is provided in Riddell (ed.), 1990.

17. See Ndulu and Semboja (1995) for an analysis of the case of Tanzania.

18. See Berthélemy, Seck, and Vourc'h (1996) for the case of Senegal.

19. For an analysis of the link between supply-side policies and trade liberalisation in promoting manufacturing industries in SSA see Lall and Stewart (1996).

20. The shares of textiles, chemicals, and metal products in total exports are shown in tables B1-B3 in the annex.

21. The inverse of this index can be thought off as representing the equivalent number of commodities, each having equal-sized shares, that the country trades.

22. The same specification was estimated using the value added of total manufactured instead of total manufactured export. The results were disappointing.

23. Figures in brackets refer to SITC classification.

24. Other more sophisticated techniques such as the variance of the residuals of the regression of exchange rate on a time trend or a GARCH model of exchange-rate behavior could be used. From an empirical point of view, however, the various measures seem to be highly correlated and the actual standard deviation measure performs as well as more sophisticated measures in this context [see Kenen and Rodrick (1986) and Grobar (1993)].

25. We also considered a fourth measure of misalignment. It is based on Cottani et all (1990) (see also Ghura and Grennes (1993)]. Misalignment is computed as the difference between log (E) and the average of its three highest values. The results are not reported. They were disappointing.

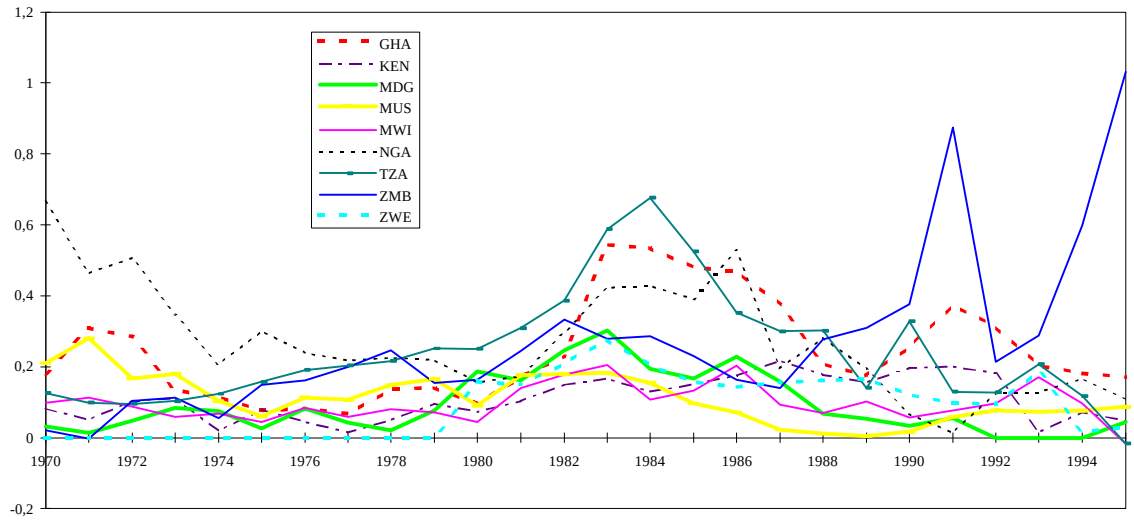
26. In fact both the geographical coverage and the time coverage of the sample were limited by data availability. The resulting number of observations is 80 for the non-CFA zone and 113 for the CFA zone.

27. To save on space, these results are not reported here.

STATISTICAL APPENDIX

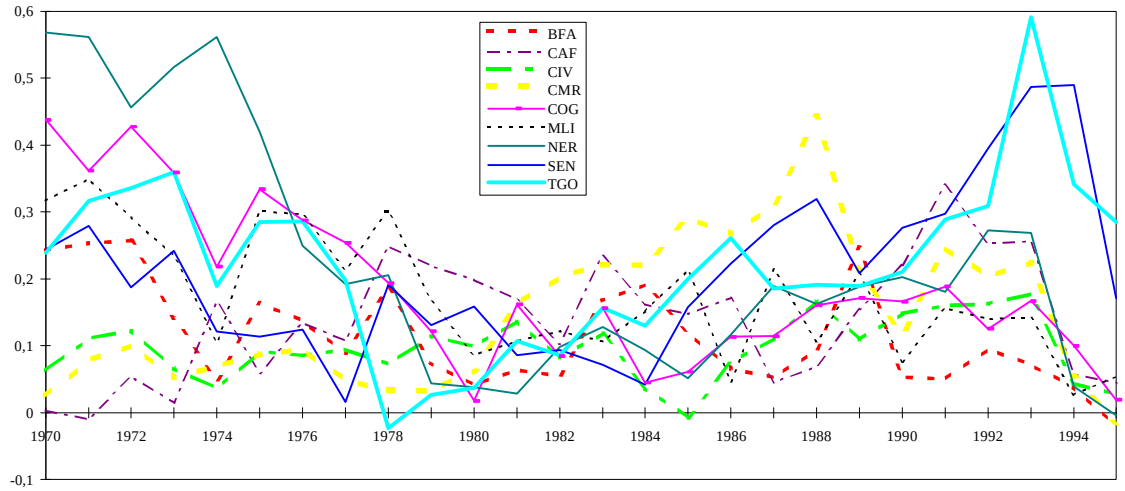
A. EXCHANGE-RATE MISALIGNMENT: COUNTRY ESTIMATES

Figure A.1. **RER Misalignment: Non-CFA SSA Countries**



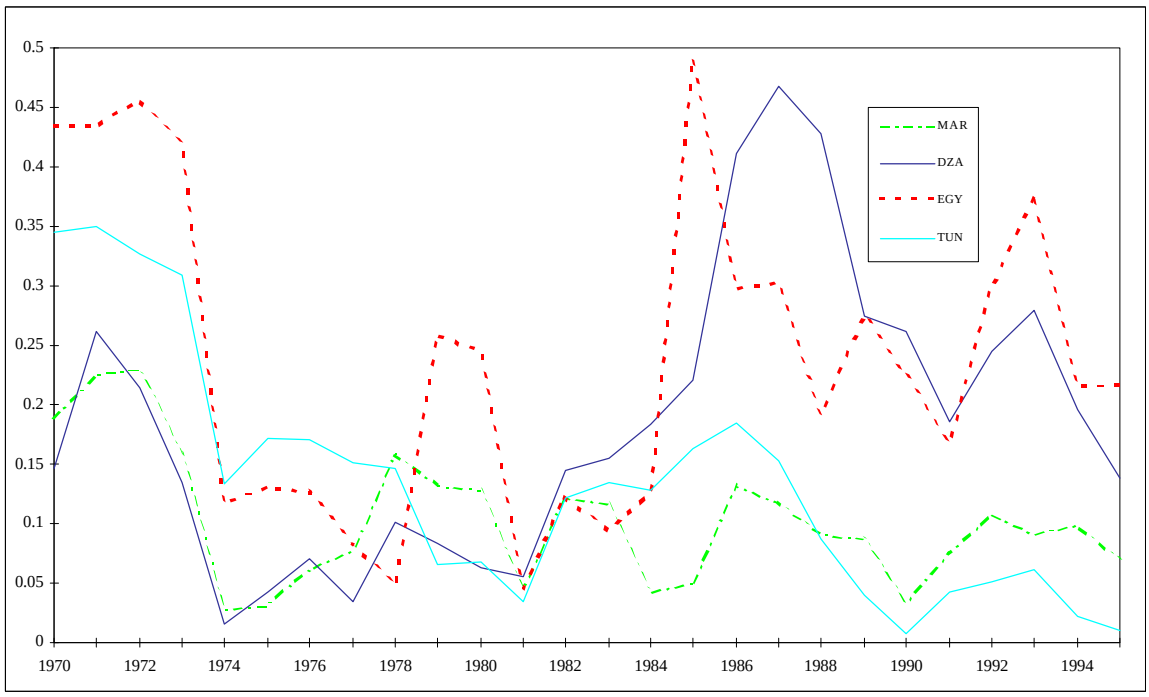
Source: Authors' calculations.

Figure A.2. **RER Misalignment: CFA Countries**



Source: Authors' calculations

Figure A.3. **RER Misalignment: North African Countries**



Source: Authors' calculations

B. AVERAGE SHARE OF EXPORTS BY INDUSTRY IN TOTAL EXPORTS

Table B.1. **Average Share of Textile Exports in Total Exports**

		Country	1970-79	1980-84	1985-89	1990-94
CFA		Burkina Faso	0.84	0.63	1.19	0.50
		CAF	0.52	0.06	0.10	0.09
		Cameroon	0.69	0.85	0.82	0.52
		Congo	0.26	0.14	0.03	0.02
		Côte d'Ivoire	1.28	1.94	1.65	1.98
		Mali	2.55	3.51	1.48	0.64
		Niger	0.39	0.71	0.43	0.45
		Senegal	3.73	3.65	1.50	1.31
		Togo	2.25	0.48	0.18	1.13
Non CFA	North Africa	Algeria	0.34	0.01	0.02	0.08
		Egypt	9.13	4.01	9.55	14.35
		Morocco	7.65	13.76	23.97	34.49
		Tunisia	12.79	23.16	33.17	47.47
	Sub-Sahara	Ghana	0.29	0.09	0.04	0.10
		Kenya	1.03	0.54	0.80	3.13
		Madagascar	2.32	4.28	5.74	13.25
		Malawi	0.93	5.84	3.83	4.77
		Mauritius	8.80	25.87	48.72	56.94
		Nigeria	0.05	0.02	0.05	0.13
		Tanzania	3.44	3.90	4.25	6.94
		Zambia	0.15	0.02	0.42	1.33
		Zimbabwe	3.21	1.12	3.11	7.16

Source: UNCTAD

Table B.2. **Average Share of Chemicals Exports to Total Exports**

		Country	1970-79	1980-84	1985-89	1990-94
CFA		Burkina Faso	0.87	0.11	0.10	0.37
		CAF	0.30	0.24	0.14	0.38
		Cameroon	0.06	0.26	0.08	0.07
		Congo	4.89	0.28	0.14	0.05
		Côte d'Ivoire	0.73	0.85	0.52	0.48
		Mali	0.37	0.34	0.37	0.16
		Niger	12.45	77.53	87.54	81.71
		Senegal	2.45	5.24	9.86	8.42
		Togo	0.70	0.68	0.94	1.19
Non CFA	North Africa	Algeria	0.31	0.36	0.88	1.98
		Egypt	1.39	0.76	1.06	2.56
		Morocco	3.28	10.55	15.64	14.56
		Tunisia	9.69	15.57	15.67	10.80
	Sub-Sahara	Ghana	0.18	0.09	0.12	0.17
		Kenya	4.28	4.63	3.12	4.11
		Madagascar	2.33	1.42	1.47	1.29
		Malawi	0.41	0.38	0.03	0.15
		Mauritius	0.26	0.30	0.55	0.80
		Nigeria	0.09	0.03	0.29	0.58
		Tanzania	0.93	0.61	0.86	1.14
		Zambia	0.58	0.11	0.13	0.26
		Zimbabwe	2.30	0.62	0.78	1.07

Source: UNCTAD.

Table B.3. **Average Share of Metal Exports to Total Exports**

		Country	1970-79	1980-84	1985-89	1990-94
CFA		Burkina Faso	0.83	0.48	0.28	0.16
		CAF	0.08	0.04	0.20	0.63
		Cameroon	0.12	0.06	0.04	0.03
		Congo	0.06	0.05	0.07	0.03
		Côte d'Ivoire	0.17	0.19	0.17	0.27
		Mali	0.18	0.04	0.14	0.09
		Niger	0.07	0.07	0.13	0.11
		Senegal	0.54	0.44	0.19	0.11
		Togo	0.10	0.38	0.05	0.07
Non CFA	North Africa	Algeria	0.63	0.16	0.98	0.47
		Egypt	0.64	0.34	0.88	2.60
		Morocco	0.28	0.22	0.27	0.34
		Tunisia	1.68	0.34	0.95	1.25
	Sub-Sahara	Ghana	0.06	0.04	0.03	0.04
		Kenya	0.85	1.01	0.23	0.70
		Madagascar	0.11	0.03	0.08	0.08
		Malawi	0.43	0.17	0.07	0.08
		Mauritius	0.08	0.17	0.34	0.20
		Nigeria	0.06	0.02	0.02	0.04
		Tanzania	0.14	0.42	0.14	0.30
		Zambia	0.10	0.50	1.26	0.30
		Zimbabwe	17.51	25.44	21.16	16.53

Source: UNCTAD.

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