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Inflation in African Countries: General
Issues and Effect on the Financial Sector 1/

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Abstract

Since the mid-1970s the annual inflation rate in Africa has averaged more than 15 percent, with many countries experiencing rates of 20 percent or more. Inflation rates of this magnitude have significant adverse effects on the financial sectors of African countries, particularly in the context of fixed nominal interest rates. Econometric analysis points strongly to monetary expansion as a major cause of inflation in African countries generally. Exchange rate depreciation is also associated with higher inflation, although in some countries the domestic currency was depreciated to offset the effects of recent inflation, rather than being a cause of inflation.

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	<u>Contents</u>	<u>Page</u>
I.	Introduction	1
II.	Recent Trends in Inflation in African Countries	2
III.	Factors Responsible for Inflation in African Countries	5
IV.	Impact of Inflation on the Financial Sector in African Countries	13
V.	Policy Responses to Inflation and Their Effects on the Financial Sector	16
VI.	Summary and Conclusions	18
	References	20
	Text Tables	
1.	Inflation Rates in Africa and Other Country Groups, (1971-88).	3
2.	Inflation Rates in Selected African Countries, 1975-88.	4
3.	Africa: Selected Economic Indicators for High-Inflation and Other Countries, 1975-88.	8
4.	Africa: Reduced-Form Inflation Regressions, 1977-88.	12
5.	Africa: Selected Monetary Indicators for High-Inflation and Other Countries.	14

11
7
5
1
2

I. Introduction

Since the period of the first oil shock in the mid-1970s, African countries have experienced a considerable amount of inflation. Inflation rates of 20 percent or more a year have been common for many African countries during the past 15 years, and a few countries have even experienced rates in excess of 50 or even 100 percent a year. The persistence of inflation has had important repercussions for African countries, affecting economic performance in a variety of ways. The financial sectors of these countries have felt a significant impact from the ongoing inflation, as have other macroeconomic aggregates--consumption, savings, and investment--and the foreign exchange markets in some countries with particularly high inflation rates. Despite the awareness that Africa has an inflation problem, there is remarkably little analysis of the phenomenon to date. 1/

This paper examines the inflation problem in Africa (excluding South Africa) and Sub-Saharan Africa. 2/ Except for a discussion of cross-country inflation rates, the analysis focuses on inflation in Africa generally, using as a basis comparisons between groups of countries with relatively high and more moderate inflation rates. Differences between individual African countries regarding the sources of inflation are not explored, although the importance of various factors no doubt differs from country to country.

Section II of the paper reviews recent trends in inflation in Africa, examining the data both for individual countries and for groups of countries with relatively high and more modest inflation rates. Section III examines the possible causes of inflation, focusing on the different contributions of monetary expansion, fiscal deficits, exchange rate adjustments, and other factors to inflation in high- and moderate-inflation countries. Section IV then turns to a discussion of the effects of inflation on the financial sectors of African countries. The discussion in this section is necessarily somewhat speculative, since most of the available information is of a qualitative and anecdotal nature. Section V of the paper discusses various policy measures available for reducing inflation in African countries and what their possible effects could be on the financial sectors of these countries. The final section contains some concluding remarks.

1/ Among the few papers are Chhibber et al. (1989), London (1989), and Rwegasira (1979).

2/ Sub-Saharan Africa comprises all African countries except Algeria, Angola, Morocco, Namibia, South Africa, and Tunisia.

II. Recent Trends in Inflation in African Countries

Official price data for most African countries must be evaluated with caution for at least two reasons. ^{1/} First, in many countries price indices record prices only in the capital city or urban areas, and the weights attached to various components have not been revised in many instances for long periods of time, and sometimes even several decades, to reflect changes in consumption patterns. Second, price indices often reflect the official prices of goods subject to price controls, rather than actual prices of goods as sold in popular or rural markets. Both these factors impart a downward bias to measured prices and inflation rates.

Despite these provisos, it is clear by all accounts that African countries have experienced significant inflation since the period of the first oil price shock in the mid-1970s. According to the data in the Fund's World Economic Outlook (IMF (1989)), the rate of consumer price inflation in Sub-Saharan Africa, as measured by a weighted average of individual country data, averaged more than 20 percent a year during the period 1981-88, and significantly exceeded that level during 1981, 1983-84, and 1988 (Table 1). For all of Africa (excluding South Africa), inflation rates in certain years have been almost as high as those for Sub-Saharan Africa, with the period average being about 17 percent. As shown in Table 1, since 1981 Africa's inflation rates have averaged somewhat less than those for all developing countries, mainly because the figures for developing countries as a group reflect the large weight of high-inflation countries in Europe and Latin America. Inflation rates of African countries have been somewhat higher, on average, than those of Middle Eastern countries (16 percent), about twice those for Asia (9 percent), and three to four times the average for industrial countries (5 percent). At the same time, inflation in Africa has averaged less than that of developing European countries (29 percent) and far below the average rates experienced by developing countries in the Western Hemisphere (119 percent).

A closer look at the data in individual African countries indicates that the average inflation rates of 17 to 20 percent largely reflect the experience of a smaller group of countries with very high inflation rates. As indicated in Table 2, inflation rates in a group of 12 countries with annual inflation of 20 percent or more during at least 4 years since 1980 --Ghana, Guinea, Guinea-Bissau, Mozambique, Nigeria, Sierra Leone, Somalia, Sudan, Tanzania, Uganda, and Zambia--have averaged nearly 27 percent a year since 1975. Except for Nigeria, all of these countries have experienced inflation rates in excess of 30 percent during most of the 1980s, with the average for 1981-88 more than 40 percent once Nigeria is excluded. In Sierra Leone and Zaire the average inflation rate during 1981-88 exceeded 50 percent a year. In Uganda, the average was more than

^{1/} These reasons are not necessarily unique to African countries, as similar problems occur in many developing countries.

Table 1. Inflation Rates in Africa and Other Country Groups, (1971-88) 1/

	Average 1971-80 <u>2/</u>	1981	1982	1983	1984	1985	1986	1987	1988	Average 1981-88 <u>2/</u>
Africa <u>3/</u>	15.2	22.4	12.6	19.7	23.8	12.4	13.2	14.7	19.8	17.2
Sub-Saharan Africa <u>4/</u>	17.2	25.7	14.0	24.5	29.4	13.4	14.2	18.2	24.9	20.4
Developing Countries	20.5	25.8	25.2	32.4	38.2	39.7	31.1	40.5	67.1	37.0
By Region:										
Asia	10.5	10.4	6.4	6.7	7.3	7.1	9.1	9.8	14.6	8.9
Europe	13.8	23.6	33.1	22.8	25.4	25.5	24.8	30.3	49.3	29.1
Middle East	13.5	15.1	12.9	12.0	14.4	17.0	18.2	19.3	18.8	15.9
Western Hemisphere	39.8	60.8	66.8	108.6	133.0	144.9	87.8	130.0	277.6	118.6
Industrial Countries	8.7	10.1	7.5	4.9	4.7	4.1	2.3	2.9	3.2	4.9

Source: IMF (1989).

1/ Annual percentage changes in consumer prices.

2/ Compound annual rates of change.

3/ Excludes Angola, Namibia, and South Africa.

4/ Excludes Algeria, Angola, Morocco, Namibia, Tunisia, and South Africa.

Table 2. Inflation Rates in Selected African Countries, 1975-88 ^{1/}

	Average 1975-80	1980	1981	1982	1983	1984	1985	1986	1987	1988	Average 1981-88
High-Inflation Countries	26.6	21.9	33.4	14.5	31.7	39.4	15.8	17.9	26.2	37.0	27.0
Ghana	61.3	50.1	117.4	22.1	123.1	39.7	10.3	24.6	39.8	31.4	44.8
Guinea	11.6	40.0	35.0	29.9	30.3	26.0	19.0	68.4	36.8	27.8	33.5
Guinea-Bissau	16.4	64.8	45.5	16.5	23.3	65.0	45.0	37.0	106.7	66.0	48.4
Mozambique	2.0 ^{2/}	2.0 ^{2/}	2.0 ^{2/}	18.6	28.1	30.3	29.2	38.7	166.0	50.1	39.6
Nigeria	19.8	10.0	20.8	7.7	23.3	39.5	5.5	5.4	10.2	32.9	17.5
Sierra Leone	15.0	12.9	23.4	26.8	68.6	66.6	76.6	80.9	178.7	37.4	64.5
Somalia	21.8	59.0	44.6	22.6	36.4	92.3	37.7	35.7	28.1	82.2	45.7
Sudan	20.1	26.5	24.0	26.6	30.6	33.7	45.6	23.3	19.5	41.2	30.3
Tanzania	16.4	30.2	25.6	29.0	27.0	36.2	33.3	32.4	29.9	25.1	29.8
Uganda	77.3	99.2	108.5	49.4	24.1	40.5	126.8	179.6	256.0	123.0	101.7
Zaire	60.8	46.7	35.4	36.3	77.1	52.2	23.8	45.7	90.4	82.0	53.7
Zambia	14.3	11.7	14.2	12.3	19.7	33.0	34.2	51.6	57.0	50.1	33.0
Above Countries Excluding Nigeria	37.6	41.3	56.0	27.9	50.2	39.1	38.7	44.4	58.4	44.8	44.9
Other Countries											
Africa ^{3/} Sub-Saharan	11.5	10.6	12.3	10.6	8.1	9.4	9.3	9.3	6.1	8.2	9.2
Africa ^{4/}	12.8	11.5	11.5	12.8	10.4	11.1	9.9	8.7	6.4	8.7	9.9

Source: IMF, April 1989 World Economic Outlook.^{1/} Annual rates of change in consumer prices.^{2/} Staff estimate.^{3/} Africa as defined in Table 1, excluding high-inflation countries.^{4/} Sub-Saharan Africa as defined in Table 1, excluding high-inflation countries

100 percent a year, with inflation exceeding 120 percent annually during 1985-88. As shown in Table 2, inflation accelerated noticeably in many of the high-inflation countries during 1986. Inflation rose further in 1987 and then receded somewhat in 1988. These trends are masked to an extent by the heavy weight given to Nigeria in the composite figures shown in Table 2. In Nigeria, inflation remained fairly modest between 1985 and 1987 (averaging 7 percent per year) and then accelerated to more than 30 percent in 1988.

Inflation rates for the remaining African countries were significantly lower during 1975-88, averaging about 12 percent a year during 1975-80 and 9 percent during 1981-88, the latter being about twice the rate for industrial countries during the same period. The comparable figures for the Sub-Saharan component of moderate-inflation African countries were 13 and 10 percent, respectively. Nevertheless, twenty-one of the thirty-five moderate inflation countries in Sub-Saharan Africa experienced at least one year of 20 percent inflation during the 1975-88 period: Burkina-Faso, Burundi, Cape Verde, Chad, Comoros, Cote d'Ivoire, Djibouti, Equatorial Guinea, Ethiopia, Gabon, the Gambia, Kenya, Madagascar, Malawi, Mali, Mauritania, Niger, Sao Tome and Principe, Senegal, Swaziland, and Togo. Of these, eleven countries experienced inflation of 20 percent or more in two or more years, and six (Cape Verde, Equatorial Guinea, the Gambia, Madagascar, Mali, and Niger) had inflation rates of at least 20 percent in three or more years, including at least two consecutive years. Three countries had inflation rates above 20 percent for four years in the period: Cape Verde (1975, 1981-83), Equatorial Guinea (1982-85), and the Gambia (1975, 1985-87). Only one of these countries, the Gambia, had an inflation rate averaging more than 15 percent a year during the period, although the Gambia's inflation rate for the entire 1975-88 period was still smaller than that of any of the countries in the high-inflation group.

III. Factors Responsible for Inflation in African Countries

A variety of factors have been responsible for inflation in African countries. As noted in a recent World Bank study of inflation in Zimbabwe (Chhibber *et al.* 1989), the mechanisms giving rise to inflation in individual countries are complex, frequently involving a combination of monetary and cost-push factors, and are influenced by exchange rate developments and changes in price control regimes. Nevertheless, recent theoretical and empirical work on inflation has identified at least three models, not necessarily independent, for explaining the acceleration of inflation in individual countries. One is a straightforward monetarist model. The second, which can be termed a "fiscal" approach, acknowledges the role of money in inflation, but identifies large fiscal deficits as the underlying cause for monetary expansion. The third approach focuses on the role of exchange rate depreciation, either in conjunction with monetary policy or as an influence on other factors feeding into inflation. In addition to these three complementary approaches, claims have been made for other variables as factors behind the rise in African inflation rates, including

increases in import prices, and increases in domestic incomes arising through higher wages and agricultural producer prices.

First, and perhaps best known, of the various inflation theories is the monetary approach. This reflects Milton Friedman's well-known adage that "inflation is always and everywhere a monetary phenomenon." According to this view, inflation should be positively correlated with rates of monetary expansion, with the most inflation-prone countries experiencing the largest rates of monetary growth. Moreover, as the increase in the money supply can come from various sources, it is the monetary growth that matters, rather than underlying factors that may be responsible for it.

The second approach attempts to look behind simple monetary/inflation correlations to identify the source of monetary expansion in large fiscal deficits. As summarized in a recent paper by Montiel (1988), proponents of this view base their arguments on theoretical models in which fiscal deficits are the major cause of monetary expansion. In these models the ratio of the fiscal deficit to GDP, in the context of rational expectations and a Cagan semi-log money demand function, ultimately determines the economy's inflation rate. Since government deficits have been relatively large in many African countries, this "fiscal" model also has appeal.

The third theory of inflation emphasizes the contribution of the balance of payments, and particularly the exchange rate, in generating price increases. In this approach, exchange rate depreciations are seen as contributing to inflation either through an increase in inflationary expectations or a worsening of the government's budgetary position that is later accommodated by monetary expansion. Alternatively, devaluation may augment inflation by speeding the process of adjusting nominal wages and, thus, domestic prices. ^{1/} Although this latter explanation may be more relevant to countries with formal wage indexing systems, it may also apply to countries with very high inflation rates, in which public sector wage rates are often adjusted following large devaluations.

In addition to these three theories of inflation, two others more reflective of the old "cost push" and "demand pull" models of inflation have been advanced. One emphasizes the role of higher import prices, an important "cost-push" element that can increase domestic prices both directly and through its effect in raising the cost of domestically-produced manufactures. The other stresses the role of higher incomes that lead to a rise in aggregate demand as a source of inflation. This view is reminiscent of more traditional "demand-pull" models.

This paper does not attempt to build a detailed structural model of inflation in African countries, such as that in Chhibber *et al.* (1989), or to undertake a formal test for the relevance of alternative inflation

^{1/} See Montiel (1988), pp. 2-3.

theories, as is done in Montiel (1988). Nevertheless, some initial conjectures can be drawn by comparing data on inflation for high- and moderate-inflation countries with movements in potential explanatory variables, such as the rate of monetary growth, the fiscal deficit to GDP ratio, trends in import prices, and movements in composite nominal effective exchange rates, the latter being a measure of changes in national currencies vis-a-vis a set of country trading partners and trade competitors. These data, drawn from IMF (1989) and the Fund's International Financial Statistics data base (for nominal effective exchange rates), appear in Table 3. In addition, the paper reports on estimates of some reduced form equations for the percentage change in the consumer price index in high- and lower-inflation countries as a further test of the relationship between inflation and these particular variables.

The data in Table 3 provide strong support for the role of monetary expansion in generating inflation. African countries with high rates of inflation have tended on average to have faster rates of monetary growth during the post-1974 period than have African countries with lower inflation rates, even though money growth was not necessarily faster in the high-inflation countries every year. During 1981-88 the average yearly growth rate of broad money in the high-inflation countries approached 26 percent, nearly twice the rate in other African countries. This general pattern can be seen in Chart 1, which provides a scatter diagram of inflation and monetary expansion for the high-inflation and other African countries throughout the 1975-88 period. Indeed, the simple correlation between inflation and monetary expansion in these two groups of countries was 0.63. Of course, the relationship between monetary expansion and inflation may reflect other factors, such as the rate of domestic credit expansion, particularly where net foreign assets have been static or declining.

There does not seem to be the same close relationship between inflation and fiscal deficits per se. For example, central government budget deficits as a percentage of GDP were actually somewhat smaller in the high-inflation countries than was true for other African countries during most of this period. This lack of correlation between inflation rates and fiscal deficits could be because the data available reflect only central government fiscal deficits, rather than deficits for the entire public sector, for which information is not readily available. It could also be because the same budget deficit may have very different inflationary repercussions depending on its financing. For example, a budget deficit financed by external resources would have a less inflationary impact than would one financed by domestic bank borrowing. On this issue Table 3 indicates that the increase in net credit to the government (as a proportion of the beginning-year broad money stock) in the high inflation countries averaged nearly 3 times greater than in the countries with lower inflation rates. This suggests that governments in African countries stimulated inflation by augmenting the growth of total domestic credit. This can also be seen from a scatter diagram relating inflation rates to the growth in net credit to government (Chart 2). Fiscal policy, in other words, appears to have contributed to inflation in these countries, but

Table 3. Africa: Selected Economic Indicators for
High-Inflation and Other Countries, 1975-88

	High-Inflation Countries						Other Countries					
	Inflation Rate <u>1</u> /	Money Growth <u>2</u> /	Fiscal Deficit <u>3</u> /	Net Credit to Govt. <u>4</u> /	Import Prices <u>5</u> /	Exchange Rate <u>6</u> /	Inflation Rate <u>1</u> /	Money Growth <u>2</u> /	Fiscal Deficit <u>3</u> /	Net Credit to Govt. <u>4</u> /	Import Prices <u>5</u> /	Exchange Rate <u>6</u> /
1975	30.6	37.6	9.8	11.5	12.0	..	11.1	18.4	6.8	8.7	14.8	..
1976	26.3	35.2	9.7	20.7	-0.7	..	9.9	23.8	8.5	7.0	-1.4	..
1977	30.0	34.0	8.2	32.3	9.6	-1.2	13.2	20.4	7.8	3.7	8.2	-0.3
1978	26.8	10.7	5.7	18.7	13.8	-9.2	12.3	18.1	7.3	9.8	11.9	-2.0
1979	24.4	15.4	5.0	6.8	15.6	-8.2	11.8	16.0	7.6	5.8	15.8	0.6
1980	21.9	40.2	3.6	5.6	15.7	4.7	10.6	14.0	7.3	6.6	15.5	2.2
1981	33.4	24.3	7.8	31.9	-3.7	1.1	12.3	15.7	5.4	4.4	-4.4	1.9
1982	14.5	16.1	7.7	22.7	-4.6	-1.8	10.6	18.1	8.4	8.2	-6.1	2.7
1983	31.7	19.9	8.2	33.9	-4.6	-5.8	8.1	12.7	10.0	6.9	-3.8	1.8
1984	39.4	21.2	4.8	13.7	-2.8	-6.9	9.4	16.0	6.5	6.5	-3.2	3.3
1985	15.8	27.2	4.0	8.1	-1.6	-13.2	9.3	15.1	6.8	2.5	-1.5	2.3
1986	17.9	20.8	4.9	2.1	13.5	-43.3	9.3	6.6	8.2	6.7	13.0	-7.1
1987	26.2	31.0	9.5	6.0	10.9	-59.9	6.1	9.9	7.4	5.9	10.7	-6.1
1988	37.0	45.3	9.5	18.9	6.2	-18.6	8.2	9.8	7.8	4.1	5.1	-4.6
<u>Averages:</u>												
1975-80	26.6	28.7	7.0	15.9	11.5	-3.5 <u>7</u> /	11.5	18.4	7.6	6.9	10.8	0.1 <u>7</u> /
1981-88	27.0	25.8	7.0	17.2	1.8	-18.5	9.2	13.0	7.5	5.6	1.3	-0.7 <u>7</u>

Source: IMF (1989), and International Financial Statistics, various issues.

1/ Percent change in consumer prices.

2/ Percent change in broad money (M₂).

3/ Central government budget deficit as a percentage of GDP.

4/ Percent change in net credit to government, relative to the broad money shock at the start of the year.

5/ Percent change in import unit values (in U.S. dollars).

6/ Percent change in nominal effective exchange rate; negative figure indicates depreciation.

7/ Average for 1977-80

mostly by contributing to faster monetary growth. The data in Table 3 also provide little support for the role of imported inflation, as measured by import unit values in U.S. dollars, as an underlying source of inflation in African countries. Import unit values rose slightly faster in the high-inflation countries than in the rest, but the difference averaged less than 1 percentage point.

There is a strong, contemporaneous relationship between exchange rate depreciation and the rate of inflation in African countries during the 1981-88 period, although this need not imply that the direction of causality is from depreciation to inflation. As measured by nominal effective exchange rates, the average annual rate of depreciation in the high inflation countries was 18.5 percent, and exceeded 20 percent a year for ten of the twelve countries in the group. By comparison, the average rate of depreciation was only 0.7 percent for the moderate inflation countries, and 0.6 percent for the subset of these countries in Sub-Saharan Africa. In only two of these countries was the average rate of depreciation above 10 percent during the period, and only one (Equatorial Guinea) had an average rate of depreciation as high as that of countries in the high inflation group. Moreover, after excluding two years (1986 and 1987) when depreciation was unusually large in the high-inflation countries, the simple correlation of inflation with depreciations in the nominal effective exchange rate for these two groups of countries is 0.53. Thus, the data are consistent with exchange rate movements being related to inflation in African countries, which is also in agreement with the results in Montiel (1988). This can also be seen from the scatter diagram of inflation and movements in the nominal effective exchange rate for both high-inflation and other countries in Africa, which appears in Chart 3. 1/

Despite these observations, the precise relationship between exchange rate depreciation and inflation is complex. In many of the high inflation countries, depreciation occurred only after several years of rapid monetary expansion, high inflation, and a decision by the government either to adjust the official exchange rate (as in Ghana, Tanzania, and Uganda in 1987 and 1988), or to allow the rate to float, either temporarily (as in Zambia) or permanently (Zaire). In some cases the government did so in response to the growth of widespread parallel exchange markets, which had developed in response to continuing monetary expansion and the subsequent overvaluation of the official (fixed) exchange rate. In these situations exchange rate adjustment may well have been a response to other and more fundamental sources of inflation, rather than an immediate cause. On the other hand, exchange rate adjustments themselves raise the domestic prices of imported goods, which

1/ Data for 1986 and 1987 were excluded so that the unusually large depreciations in the real effective exchange rate in high-inflation countries recorded for those years would not obscure the underlying relationship between exchange rate movements and the inflation rate during most of the 1975-88 period.

in turn affects the overall inflation rate. In some countries where foreign exchange is extremely scarce and most current account transactions occur on the parallel exchange market, there may even be a more direct link between the parallel exchange rate (sometimes reflecting prior monetary expansion) and the overall consumer price index. Indeed, there have been cases, such as Uganda in May-June 1987 and Mozambique in late 1988, where a depreciation of the official exchange rate in conjunction with other adjustment policies contributed to a temporary appreciation of the parallel market rate and a temporary reduction in some consumer prices. Thus, more detailed analysis is needed to specify the precise role of exchange rate depreciation in generating inflation in African countries, in particular the extent to which depreciation, as part of a vicious cycle involving monetary expansion and other factors, has acted as an independent cause of inflation in African countries. 1/

Current empirical research on this issue is inconclusive. Chhibber *et al.* (1989), in their analysis of inflation in Zimbabwe, find that the exchange rate, acting through the price of imported goods, had a positive but statistically insignificant effect on the domestic inflation rate once certain institutional relationships involving food and service prices had been taken into account. Similarly, Harber (1989), in his analysis of inflation in Zambia, found monetary expansion rather than exchange rate depreciation the proximate cause of inflation during the period of its foreign exchange auction, 1985-87. On the other hand, Montiel (1988) has determined that initial exchange rate movements were an important and identifiable cause of hyperinflation in Argentina, Brazil, and Israel. In addition, London (1989) found that the exchange rate was a significant determinant of African inflation during 1980-85 but not during 1974-79.

Although data on wage rates and on farm incomes or producer prices are not readily available for groups of African countries, there is some evidence that wage movements have contributed to inflation in Africa, if not as initial cause then as a factor facilitating inflation in response to other developments such as exchange rate depreciation. Countries that have experienced large, discrete devaluations have often observed major, subsequent increases in wage rates that have subsequently boosted aggregate demand and reinforced inflationary trends already underway. Similar effects may have occurred in countries with severe foreign exchange shortages and limited supplies of domestically manufactured goods following increases in agricultural producer prices. In the case of Uganda, for example, following the May 1987 devaluation wage increases in the private and public enterprise sectors were especially pronounced, raising local food prices and negating the gains in real income from the across-the-board wage increases granted to civil servants. In some countries the resulting increases in consumer prices have led to substantial appreciation in the real effective exchange rate, undermining

1/ There is an extensive theoretical literature on the interaction between devaluation and inflation. See, for example, Rodríguez (1978), Bilson (1979), Bond (1980), and Khan and Lizondo (1987).

competitiveness and creating pressure for further exchange rate depreciations. Indeed, the inability to restrain wage increases following a devaluation has sometimes led to a vicious cycle of devaluation and wage adjustments whose ultimate effect has been a continuing inflationary spiral, much as in countries with formal indexation systems.

As a further test of the effects of different factors on the inflation rate in African countries, several reduced-form equations were estimated relating the weighted average percentage changes in the consumer price indices for high-and lower-inflation African countries to each of the four main variables discussed above, using various lag specifications. The equations took the following forms:

$$(1) \quad \Delta CPI = a_0 + a_1 \Delta M2 + a_2 DEF/GDP + a_3 \Delta IMP.PR + a_4 \Delta NEER$$

$$(2) \quad \Delta CPI = a_0 + a_1 \Delta M2 + a_2 DEF/GDP + a_3 \Delta NEER$$

$$(3) \quad \Delta CPI = a_0 + a_1 \Delta M2 + a_2 DEF/GDP + a_3 (\Delta IMP.PR - \Delta NEER)$$

where ΔCPI is the percentage change in the annual average level of the consumer price index, $\Delta M2$ is the percentage change in the average broad money stock during a year, DEF/GDP is the ratio to GDP of the central government's overall budget deficit (with deficits recorded as positive numbers), $\Delta IMP.PR$ is the percentage change in the average annual unit value for imports (measured in U.S. dollars), and $\Delta NEER$ is the percentage change in the average annual nominal effective exchange rate. In equation (3), the last two variables were combined to impose the condition that the coefficients a_3 and a_4 of equation (1) were equal. This would imply that the main effect of exchange rate movements on domestic prices was through its impact on the domestic price of imported goods and services. To estimate the equations, weighted averages of individual country observations for 12 high-inflation and 35 more moderate-inflation African countries were constructed, with the weights representing the relative size (in U.S. dollars) of each country's GDP, averaged over the preceding three years. Two observations for each variable were calculated and used in the sample set for each year--one for the average of high-inflation countries and one for the average of the more moderate inflation countries. Because data for nominal effective exchange rates were available only for the period 1977-88, and it was desirable to test for the effects of both current period and once-lagged explanatory variables, the equations were estimated with 22 observations, two for each year from 1978 to 1988. As the coefficients on $\Delta IMP.PR$ had uniformly low t-statistics, the final estimations involved only variants of equations (2) and (3).

The principal equations, using contemporaneous values for the rate of broad money growth and the fiscal deficit and either current or lagged values of the percentage change in import unit values and in nominal effective exchange rates, are shown in Table 4. Because of the heavy weight attributed to Nigeria and the substantial fluctuation in its year-to-year inflation rates, equations were estimated with and without

Table 4. Africa: Reduced-Form Inflation Regressions, 1977-88 ^{1/}

	Constant	$\Delta M2$	$\Delta M2_{-1}$	DEF/GDP	DEF/GDP ₋₁	NEER	(IMP.PR-NEER)	(IMP.PR-NEER) ₋₁	R ²	S.E.E.
1.	-2.059 (-.16)	0.605 (1.96)	-- --	-0.935 (-.59)	-- --	-- --	0.248 (1.75)	-- --	.351	11.31
2.	-2.568 (-.16)	-- --	0.830 (2.17)	-- --	-0.598 (-.34)	-- --	-- --	0.167 (1.14)	.292	13.41
3.	-8.354 (-.55)	-- --	0.840 (2.42)	-- --	-1.096 (-.66)	-- --	0.293 (2.19)	-- --	.400	12.35
4.	-0.709 (-.06)	0.553 (1.91)	-- --	-0.845 (-.57)	-- --	-0.370 (-2.44)	-- --	-- --	.429	12.04
5.	-7.665 (-.55)	-- --	0.785 (2.42)	-- --	-1.149 (-.75)	-0.409 (-2.87)	-- --	-- --	.478	11.51

^{1/} Dependent variable is the weighted mean percentage change in the consumer price indices for high-inflation and more moderate-inflation African countries, each aggregated into a single group, yielding two observations per calendar year.

^{2/} Figures in the table are coefficient estimates; numbers in parentheses are estimated t-statistics.

observations for Nigeria. As the results for both sets of equations were quite similar, only equations for data including Nigeria are reported in the table.

The regressions provide considerable support for the importance of monetary growth ($\Delta M2$) as a determinant of inflation in Africa, with the lagged value of $\Delta M2$ having a statistically significant coefficient in the range of about 0.8. These results suggest that a 1 percentage point increase in the rate of broad money growth is associated with about a 0.8 percentage point increase in the inflation rate during the following year. The equations also revealed that the contemporaneous change in the nominal effective exchange rate was also significant in explaining movements in the inflation rate, with the coefficient being about -0.4. ^{1/} This result was similar to the finding in London (1989), where the coefficient on the exchange rate variable was 0.51 for the period 1980-85. Neither the fiscal deficit to GDP ratio nor the percentage change in import prices in U.S. dollars was significantly related to changes in inflation. Moreover, combining the import price change and nominal effective exchange rate into a single variable yielded poorer results than did the use of the nominal effective exchange rate variable by itself. Overall, these results are broadly consistent with the relationships observed from the simple correlations discussed above.

IV. Impact of Inflation on the Financial Sector in African Countries

Research on the effects of inflation on the financial sectors of African countries has been very limited, and only a few general conjectures about these effects can be offered in this paper. Most of these are drawn from experience in Uganda, Zambia, and other countries in eastern Africa and may not necessarily be generalizable to other countries. More systematic research regarding these conjectures is therefore desirable. Nevertheless, these observations may be more broadly applicable insofar as they result from important rigidities in the financial sectors of African countries, in particular the reluctance of many African countries to set or adjust nominal interest rates so that real rates (nominal rates less the currently expected rate of inflation) are positive.

Certainly one effect of inflation on the financial systems of African countries is a tendency for residents to economize on the use of money. This can be seen in Table 5, which reports a number of monetary indicators for both high-inflation and other African countries. As a whole, the velocity of money in the high inflation countries is significantly higher than that in the other African countries, with the average for the former group being one and a half times that of the latter during 1981-88.

^{1/} The coefficient was negative because an appreciation in the nominal effective exchange rate, which is normally associated with less inflation, was recorded as an increase in the index.

Table 5. Africa: Selected Monetary Indicators for High-Inflation and Other Countries 1/

	High-Inflation Countries			Other Countries		
	Velocity <u>2/</u>	Quasi-Money Share <u>3/</u>	Growth in Real Private Credit <u>4/</u>	Velocity <u>2/</u>	Quasi-Money Share <u>3/</u>	Growth in Real Private Credit <u>4/</u>
1975	4.44	0.23	...	3.77
1976	4.46	0.23	97.2	3.47	0.19	...
1977	4.11	0.22	28.9	3.31	0.20	67.6
1978	4.45	0.21	53.6	3.13	0.21	207.9
1979	5.09	0.22	23.8	3.10	0.21	18.7
1980	4.43	0.23	56.4	3.17	0.22	-4.9
1981	4.41	0.22	63.8	3.11	0.23	183.8
1982	4.42	0.25	113.7	2.99	0.23	110.8
1983	4.46	0.24	-59.8	2.99	0.23	54.5
1984	4.23	0.23	107.4	2.84	0.24	-24.7
1985	4.05	0.24	501.1	2.73	0.25	-21.7
1986	3.96	0.22	105.8	2.62	0.25	-13.5
1987	4.51	0.24	12.9	2.59	0.27	37.8
1988	4.02	2.58
Averages: 1975-80	4.50	0.22	52.0 <u>5/</u>	3.33	0.21	72.3 <u>6/</u>
1981-88	4.26	0.23 <u>7/</u>	120.7 <u>7/</u>	2.81	0.24 <u>7/</u>	46.7 <u>7/</u>

Sources: IMF, International Financial Statistics; and IMF (1989).

1/ Data represent averages for country groups weighted by a three-year moving average of country GDP in U.S. dollars.

2/ Ratio of GDP to broad money (M2).

3/ Quasi-money (time and savings deposits) as a percentage of broad money (M2); data exclude Nigeria.

4/ Percent change in end-of-year private sector credit divided by percent change in end-of-year consumer price index.

5/ Average for 1976-80.

6/ Average for 1977-80.

7/ Average for 1981-88.

A second consequence of inflation that arises in the context of negative real interest rates is a persistent excess demand for credit from the private sector in many African countries, particularly for short-term ventures. This process has been aided by the prevalence of overdraft financing in many countries, an inheritance from British banking practice, as the normal format for business credit and by the reluctance of commercial banks to make medium- or long-term commercial loans. Where the expected inflation rate exceeds nominal interest rates, borrowing for certain types of private ventures becomes very attractive, particularly where scarcities of consumer and other goods allow private firms to revise product prices frequently. These same forces encourage consumers to spend, so as to avoid future price increases. Accordingly, private savings are discouraged, and firms may prefer to stockpile consumer goods or other real assets in place of financial assets as a way of maintaining financial reserves. Where inflation is virulent and real interest rates are highly negative, the share of time and savings deposits (i.e., quasi-money) in broad money may also decrease, as private agents economize in general on their use of cash balances. Table 5 provides some support for this during 1984-87, although for the entire 1976-87 period the percentage of quasi-money in broad money was fairly similar in high-inflation and other African countries, once data for Nigeria (a high-savings country) are excluded. ^{1/}

A third consequence of inflation on the financial sector is a greater interest, both among borrowers and lenders, in short-term activities. Given the uncertainties arising from inflation, borrowers are more likely to seek funding for short-term ventures offering relatively secure returns, thereby avoiding riskier propositions that may require more time (and greater short-term financial outlays) to turn profitable. In countries with volatile exchange rates and high inflation, there may be a move into short-term speculative activities, such as the stockpiling of imported goods or of agricultural commodities in anticipation of future price increases. This, for example, was the case in Uganda during 1987 and the first half of 1988, when rapid inflation and the extreme scarcity of consumer goods enabled merchants to earn large profits on sales of imported consumer durables, while coffee brokers accumulated large loan balances during certain times of the year by holding coffee in anticipation of subsequent increases in official producer prices. As regards lenders, commercial banks can earn significant nominal profits on short-term lending operations, even where real interest rates are highly negative, by confining themselves to relatively safe activities, such as normal trade finance and seasonal financing of large agricultural concerns. The reason is that governments in most African countries fix interest rates and provide commercial banks with significant spreads between deposit and lending rates. The availability of large nominal

^{1/} This measure is somewhat flawed as a savings indicator because only savings at commercial banks are included. Data to examine trends in savings across banks and non-bank institutions were not readily available for a large number of African countries.

profits on short-term lending helps to explain the steady growth in the volume of private sector credit in countries with high inflation rates and interest rates that are substantially negative in real terms. Indeed, as Table 5 indicates, during 1981-88 high-inflation African countries on average exhibited somewhat faster rates of growth in credit to the private sector, after allowance for inflation, than did countries with lower inflation rates.

A fourth consequence of inflation on the financial sector has been a reduction in loan losses, particularly as regards commercial lending. Where inflation is marked, borrowers can repay old debts in much cheapened currency, thereby reducing the real cost of debt service. Defaults and loan losses therefore decrease. This, in conjunction with guaranteed spreads between the cost of obtaining and providing funds, provides further impetus for short-term commercial borrowing, thereby raising the growth rate of credit to the private sector. In Uganda, for example, rapid inflation during the mid-1980s largely eliminated loan losses as a serious concern for the commercial banks by early 1988, thereby increasing the willingness of the banks to meet the commercial sector's demand for credit. At the same time, inflation has probably not strengthened the balance sheets of commercial banks, because the real value of their assets as well as their liabilities has eroded.

V. Policy Responses to Inflation and Their Effects on the Financial Sector

During the last decade a number of African countries have attempted, with varying success, to reduce inflation through the implementation of economic adjustment programs. There is evidence that countries making strong efforts at implementing these programs have in fact achieved significant reductions in their inflation rates.

Reducing inflation is an important aspect of economic stabilization that can benefit national economies in a variety of ways. Financial systems in particular stand to gain, especially where (as in Africa) institutional rigidities make it difficult for interest rates to reflect the real cost of capital, thereby subsidizing borrowing and discouraging financial savings. In the transition to a more moderate inflationary environment, however, the financial sector of a country may experience some difficulties, particularly as borrowers adjust to a new economic environment in which real interest rates are less highly negative and fiscal and monetary policy are made more consistent with the country's available financing. Some of these problems are worth mentioning here, although it should be stressed that these are transitional costs rather than reasons for not undertaking economic stabilization.

First, banking sector activity is likely to decrease, particularly where national authorities use outright ceilings on the growth of private-sector, as well as public-sector, credit as the instrument for achieving their monetary and credit objectives. This, in turn, may reduce banking sector profits, at least in nominal terms. On the other hand, the

reduction in total loan volume may be accompanied by an improvement in total banking assets, as the volume of loans profitable only at highly negative real interest rates declines. There may also be an increase in real profits from the decline in inflation.

Second, lower inflation rates may contribute to higher loan losses if the slowdown in inflation is accompanied by recession and greater business difficulties. Accordingly, banks may be less willing to extend credit in some cases and may need to retrench so as to strengthen their capital base, particularly where stronger bank supervision is part of an adjustment program. In some situations the adverse effects on private sector activity may be such as to make a significant percentage of private sector loans non-performing, thereby jeopardizing the soundness of major elements of the commercial banking sector. This, in turn, may necessitate government financial support to individual banks. The requisite government expenditure needed for this support must then be taken into account when developing fiscal policy and setting goals for credit to the public sector.

On the positive side, with less inflation banks may be more willing to lend for longer-term activities, as the uncertainty and financial risks attached to them decrease relative to the returns from shorter-term ventures. It may therefore become easier for borrowers to finance longer-term capital investments offering a greater chance of improving output and productivity at their enterprises. In short, there may be less lending overall, but more funds available for investment, and particularly for projects that stand a chance to increase national output and strengthen the balance of payments over time.

Where higher interest rates accompany the economic adjustment process, a variety of consequences may follow, some of which may appear unfavorable to the financial sector as the economy adapts to a more realistic set of price incentives. However, higher nominal interest rates that raise the real rates on deposits and lending will reduce the incentives for speculative short-term borrowing while increasing (at least relatively) the incentives for financial saving. The quality of loan portfolios should improve as a result, and savings deposits may increase. At the same time, however, the volume of private sector loan applications is likely to decrease, although total bank lending could increase if the higher interest rates generate a rise in loanable funds and enable banks to approve a much larger percentage of the remaining loan applications. Higher interest rates may also impose financial losses on firms, particularly those selling commodities whose prices are fixed by government order. Public enterprises, which are common in many African countries, are particularly likely to bear the brunt of higher interest rates (although they were also benefitting from the previous regime of more negative real interest rates), and the resulting losses (or increases in losses) may translate into higher budgetary subsidies and greater government demands for banking credit.

Few African countries have experimented with eliminating interest rate ceilings and reducing reserve requirements. ^{1/} However, the experience of Argentina and Chile with these types of reforms suggests that they carry risks if not implemented in the context of an effective bank supervision system. Particularly where financial markets are thin and there is a perception that governments will intervene to prevent bank failures, interest rate liberalization can encourage commercial banks to increase the riskiness of their loan portfolios, especially where a sharp rise in interest rates crowds out loan applications for safer but lower-yielding investment projects (Le Fort, 1989). Adequate bank supervision is needed to counteract this tendency. In many African countries, thorough supervision is hard to maintain, but greater effort in this area is essential if the reforms are to have much chance of success.

Regarding financial savings, the rise in real interest rates should generate some increase. In practice, however, the impact may be small or uncertain. Research to date on savings behavior in developing countries has found little evidence to support a strong interest-rate sensitivity of aggregate private savings. ^{2/} This may reflect a variety of factors, including a lack of suitable savings instruments and the availability of more attractive alternatives, such as foreign assets or investments in nonfinancial assets, to agents with resources available for savings. Accordingly, it may be optimistic to hope that increases in interest rates, particularly small increases that leave real rates highly negative, can generate significant increases in private savings. Thus, most of the benefits from higher interest rates are likely to come from their impact on financial savings and bank lending activity, and from improvements in the efficiency of investment.

VI. Summary and Conclusions

During the last fifteen years African countries have experienced substantial inflation. During the 1980s in particular the inflation rate has averaged about 17 percent a year for African countries and 20 percent for the Sub-Saharan countries. Among African countries a small group of about twelve have experienced very high inflation rates, averaging about 27 percent a year, with the average for the others being about 9-10 percent during the 1980s.

A variety of factors have contributed to inflation in African countries, including the effect of the first and second oil shocks and, to a lesser extent, rising prices of imported consumer and intermediate goods from the industrial countries (particularly during the 1970s and in 1986-88). Domestic monetary expansion, however, has played a very important role. There is clear evidence that rates of monetary expansion have been substantially larger on average in high-inflation African countries than in more moderate inflation countries, with monetary growth

^{1/} Ghana is one recent exception.

^{2/} See, for example, McDonald (1983) and Khan and Knight (1985).

averaging about 26 percent a year in the former and 13 percent in the latter during the 1981-88 period. Exchange rate depreciation has also been considerably greater in the high inflation countries, although it is hard to determine the direction of causality between exchange rate movements and the inflation rate. By comparison, fiscal deficits in the two groups of countries have been roughly similar. However, credit to government has increased considerably faster in the high inflation countries.

Inflation has had a number of adverse consequences for the financial sectors of African countries, effects magnified by structural rigidities. Because nominal interest rates have generally been kept low, real interest rates have usually been negative, sometimes highly so in countries with very high rates of inflation. This has encouraged borrowing for short-term trade activities and discouraged savings. Lending for longer-term investments has also been discouraged, and in high-inflation countries there has been evidence of borrowing for short-term speculative activities. At the same time loan losses have declined, which may have encouraged the total volume of bank lending.

Domestic stabilization policies to reduce the rate of inflation are likely to affect the financial sectors of these countries in a variety of ways. Lower inflation may increase the demand for investment and to that extent the demand for credit. It may also make banks more willing to engage in longer-term lending, thereby facilitating investment projects yielding higher benefits in the long run. In the short run, greater fiscal and monetary restraint may also reduce the total volume of bank lending, thereby reducing nominal bank profits, and by slowing private sector activity, contribute to greater loan losses.

Despite the possible adverse consequences in the short run, African countries stand to benefit in a variety of ways from reducing inflation. Lower inflation rates contribute strongly to an improved economic climate that fosters growth through greater stability. A low-inflation environment makes it easier for firms to plan and implement new investment projects by reducing uncertainty and encourages financial savings by providing positive real returns at more moderate nominal interest rates. Lower inflation rates also reduce the costs associated with the need to make frequent price adjustments and to take precautions against future inflation. The quality of the banking sector's loan portfolio should also improve, as less inflation makes more long-term investments viable. Accordingly, policies to lower inflation are essential for African countries to strengthen their financial sectors and achieve a healthier economic environment.

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