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Africa's Rising Inflation

Causes, Consequences, and Cures

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Is there a link between devaluation and high inflation? It depends on accompanying monetary and fiscal policies and the presence of parallel markets. An open capital account would curtail fiscal profligacy and provide price stability without jeopardizing growth.

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This paper — a product of the Office of the Vice President, Development Economics — is part of a larger effort in PRE to study inflation and price decontrol in Africa. Copies are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Bilkiss Dhomon, room S9-041, extension 39413 (26 pages).

Chhibber empirically assesses inflation in Africa using various price indicators and examines the major instruments of anti-inflationary policy in Africa. He sets up a generalized model of inflation and examines four special cases of that model, representing four prototypical African policy regimes:

- (1) Countries with pegged exchange rates, an open capital account, and no price controls (the 13 countries of the CFA franc zone).
- (2) Fixed-but-adjusting exchange rates, with a closed capital account and selective price controls (as in Zimbabwe, Malawi, and Kenya).
- (3) Fixed-but-adjusting exchange rates with widespread parallel markets, a closed capital account, and selective price controls (as in Ghana, Nigeria, Tanzania, and Zambia).
- (4) Dual exchange rates and a closed capital account, but with extensive, effective price controls (as in Algeria and Ethiopia).

Drawing on results from empirical studies, Chhibber focuses especially on the interaction of exchange rate policy and inflation. He concludes, among other things, that:

- At first glance, there seems to be a strong correlation between exchange-rate regimes and inflation. Countries with floating exchange rates (or auction systems) seem to have experienced higher inflation and countries with fixed exchange rates lower inflation. But the story is more complex than that.

- In such countries as Ghana, Sierra Leone, Uganda, and Zambia, high inflation prevailed before exchange reforms, even when the exchange rate was fixed. High inflation rendered the official exchange rate irrelevant, and parallel

markets emerged. Adjusting the official exchange rate may actually have lowered inflation in Ghana by reducing fiscal deficits. High fiscal deficits, financed primarily by creating money, were the underlying cause of inflation.

- The reason for lower, stable inflation in countries with pegged exchange rates is the underlying monetary and financial arrangements, not the fixed exchange rate. The open capital account between countries of the franc zone ensures that the money supply is not a policy variable. Domestic expansion of credit affects the balance of payments but does not lead to inflation and money expansion.

- The key to price stability lies in providing checks on large fiscal deficits and noninflationary mechanisms for financing them. In principle, this can be done through responsible spending and revenue policies. In practice, it requires institutional arrangements that restrain profligate spending. An open capital account is one such mechanism (witness Indonesia). Another is effectively to separate monetary and fiscal policy, either by joining a monetary union (like the CFA franc zone) or by establishing and managing a central bank with the (fiercely protected) independence of the U.S. Federal Reserve System and with a status equal to the judicial system.

- The benefit of joining a monetary system is price stability — but the costs are high. The best option is to control fiscal and monetary policy without the rigidity of a fixed, pegged exchange rate. The path that countries such as Indonesia have followed — through the open capital account — provides price stability without jeopardizing growth.

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This paper is a part of a larger project on inflation and price decontrol in Africa. It draws on individual case studies from this project as well as on a wider literature on this subject. It does not represent the official views of the World Bank or any of its affiliated organizations. I am grateful for extensive discussions and comments on the paper from Nemat Shafik and Bela Balassa.

I am also grateful for discussions on issues presented in this paper with Joaquin Cottani, Shanta Devarajan, Patrick Honohan, Ali Khadr, James Parks, and Michael Walton.

1. Introduction

There is growing concern over the acceleration of inflation in a large number of economies in Sub-Saharan Africa. While few African countries have experienced the triple-digit inflation often observed in Latin America¹, the average inflation rate has increased markedly, sometimes five-fold in many countries. The social and economic consequences of this inflation have been harsh, more so because few African countries have the institutions to manage inflation either through indexation or through safety net programs. Moreover, with persistently high inflation there is the danger that inflation may become self-generating because of changing expectations about future inflation.²

World Bank-IMF programs have been increasingly identified as the cause of accelerating inflation in Africa. A central element of these programs has been the re-alignment of exchange rates, combined with price liberalization and decontrol of interest rates. It is alleged that the introduction of such programs has led to cost-push inflation. Without sufficient supply response (and export response) these price changes have had little positive real effects, while generating higher inflation.³ Concern over the inflationary consequences of reform have led several countries to delay and in a few cases to abort reform programs. The relatively low inflation in the Franc Zone countries in Africa has lent credence to these arguments. It is widely believed that the fixed-exchange rate for the Franc-zone countries has been an important factor in their low inflation rates.⁴

¹ One exception is Uganda where a combination of civil war, drought and mismanagement has led to triple-digit inflation since 1985. Triple digit inflation has also occasionally been observed in Ghana, Sierra Leone and Zaire. The inflation rates used in this study refer to recorded CPI inflation. In some cases unrecorded inflation has been much higher. We will discuss this issue in later sections of the paper.

² The heterodox approach to combating inflation in Latin America argues that the traditional stabilization package is insufficient to fight inflation. This is because the system needs to bring down expectations on future inflation which are high. This requires a heterodox approach combining price controls with stabilization policies. For a survey of these issues see Kiguel and Liviatan (1989), Blejer and Cheasty (1988) and Bruno et al (1989).

³ The most recent criticism has come from the ECA - Economic Commission for Africa.

⁴ See for example Guillaumont and Guillaumont (1989) and Honohan (1990). The CFA zone comprises 13 countries in Sub-Saharan Africa. The common currency is the CFA franc which is valued at one-fiftieth the value of the French Franc. The CFA franc has therefore moved up or down with respect to other currencies in the same proportion as the French franc.

This paper provides an analytical and selective empirical survey of inflation in Sub-Saharan Africa. It begins in Section 2 with an empirical assessment of inflation in Africa using various price indicators. Section 3 looks at the major instruments of anti-inflationary policy in Africa. Instead of listing each instrument the paper attempts to distinguish countries by broad policy regimes into four categories.

A common generalized model of inflation is set-up, and each policy regime is shown to be a special case of that general model. The four prototypes we classify are: a) the CFA franc zone model of pegged exchange rates, open capital account and no price controls; b) fixed-but-adjusting exchange rates, with closed capital account and some selective price controls, examples are Zimbabwe, Malawi, Kenya; c) fixed-but-adjusting exchange rates with widespread parallel markets, closed capital account and selective price controls, examples are Ghana, Nigeria, Tanzania and Zambia; and d) dual exchange rates, closed capital account but with extensive and effective price controls, examples are Algeria,⁵ Ethiopia.

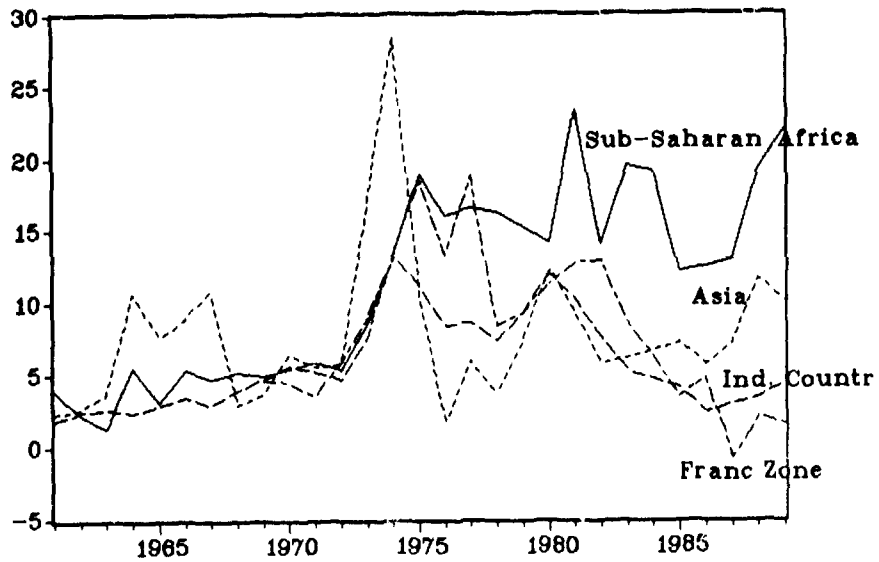
Section 4 uses the results from various empirical studies⁶ to examine the issues of policy coordination and sequencing that arise under each of these policy regimes. The paper particularly focuses on the interaction of exchange rate policy and inflation in view of the recent debate on this subject. The question of unravelling price controls and its implication for exchange rate, monetary and fiscal policy and financial sector reforms is examined. The last section draws the lessons from the survey.

⁵ Algeria has a substantial parallel market, where according to an official survey transactions comprise about 20% of total consumption. There are indications that the parallel and legal markets are fairly segmented with the parallel market supplied through own exchange imports. Demand for goods in the legal market has been controlled and has not spilt over into the parallel market to the same extent as in Ghana, Tanzania and Nigeria. One indicator of this is that during the period 1979-89 the parallel market exchange rate depreciated by 10.8% per annum whereas official inflation was 9.1% per annum.

⁶ This includes the country studies conducted under the World Bank's research project "Inflation, Price Decontrol and Fiscal Adjustment in Africa." Draft case studies are available for Algeria, Cote d'Ivoire, Ghana, Malawi and Zimbabwe.

Figure 1: Inflation in Sub-Saharan Africa: 1960-1989

Inflation in Sub-Saharan Africa 1960-1989



2. Empirical Trends

Inflation in Sub-Saharan Africa coincided with global trends in 1960s. Since 1975, average inflation in SSA has remained above inflation in the industrial countries and in Asia by about 10 percentage points per annum (Table 1 and Figure 1). While inflation in the industrial countries has averaged 7 percent per annum during 1975-1988, in SSA the average has been about 16.4 percent per annum. This average masks considerable disparity. In particular inflation has been much lower in countries belonging to the CFA zone (Table 1 and Figure 2).

Inflation rates in Sub-Saharan Africa as a whole and in the sub-set of CFA franc zone countries were about the same until 1977 (Figure 2). Since then inflation has been much lower in the CFA franc zone countries where it has followed closely inflation in the industrial countries, and more particularly, inflation in France. The average for Sub-Saharan Africa has deviated from industrial country inflation substantially since 1977. The average includes countries with extensive price controls and the CFA franc-zone countries. In some individual cases recorded inflation has been much higher⁷. Recorded triple digit inflation has been observed in at least four countries - Ghana, Sierra Leone, Uganda and Zaire.

The recorded inflation often greatly underestimates true inflation in the system. This is especially true of countries with extensive price controls. In some cases this inflation spills over into parallel markets where it is observed but unrecorded, such as in Ghana, Nigeria and Zambia and more recently in Angola. In other cases the controls are effective in keeping inflation in check but lead to unmet demand which shows up in the form of unusually large real money balances.

Data on unrecorded inflation in parallel markets are not widely available, and certainly not available systematically over time to get a meaningful picture. Data are available on a systematic basis for the exchange rate premium. These are not a fully accurate indicator of unrecorded inflation, because the exchange premium reflects a greater risk on illegal exchange transactions. But it nevertheless is a useful indicator of the existence of unrecorded inflation in the economy.

⁷ Countries with inflation over 20 percent in the 1980s are for example: Ghana, Sudan, Sierra Leone, Somalia, Tanzania, Uganda, Zaire, and Zambia.

Table 1: Inflation in Sub-Saharan Africa: 1975-89
(Average Annual)

	<u>1980-89</u>	<u>1975-89</u>	<u>Highest Recorded</u>
Industrial Countries	5.0	6.4	
Asia	7.9	7.3	
Sub-Saharan Africa	17.2	16.7	
<u>More than 20 percent</u>			
Ghana	43.7	52.2	122.9
Sierra Leone	63.7	43.9	178.7
Somalia*	41.1	32.9	91.2
Sudan*	33.1	25.1	64.7
Tanzania*	30.5	24.1	35.3
Uganda	104.6	--	238.1
Zaire	58.8	62.1	101.0
Zambia*	30.8	24.5	55.6
<u>Between 10-20 percent</u>			
Botswana	10.5	11.0	16.4
Burundi	7.6	10.1	36.6
Gambia	17.9	15.1	56.7
Kenya	10.4	11.3	20.4
Lesotho	13.6	13.9	18.0
Madagascar*	17.2	14.3	31.8
Malawi	16.6	--	33.9
Mauritius	7.6	10.8	42.0
Nigeria	20.5	18.9	40.9
Swaziland*	13.9	13.7	20.8
Zimbabwe	13.5	12.3	23.1
<u>Under 10 percent</u>			
Burkina Faso	4.1	6.4	30.0
Cameroon*	9.4	9.8	17.2
C. Afr. Rep. **	3.9	--	14.6
Congo*	8.0	8.5	17.4
Cote d'Ivoire*	5.3	9.5	27.4
Djibouti	4.2	--	18.1
Ethiopia	4.3	8.3	28.5
Gabon*	7.7	9.8	28.4
Liberia*	4.3	6.1	19.5
Niger	2.4	6.7	23.5
Rwanda	4.4	6.8	31.1
Senegal	6.5	6.6	31.7
Togo	4.0	6.3	22.5

* For these countries averages are for 1980-88 and 1975-88.

** For these countries averages are for 1981-89.

**Table 2. Classification of Macro-Policy Regimes
in Sub-Saharan Africa**

TYPE I - Fixed Exchange Rates; Open Capital Account; None or very few price controls

Benin	Congo	Mali
Burkina Faso	Cote d'Ivoire	Niger
Cameroon	Equatorial Guinea	Senegal
Central African Republic	Gabon	Swaziland
Chad	Lesotho	Togo
Comoros		

TYPE II - Fixed-but-Adjusting Exchange Rates, Closed Capital Accounts, Selective Price Controls

Burundi	Rwanda
Cape Verdi	Seychelles
Kenya	Zimbabwe
Mauritius	

TYPE III - Dual/Multiple Exchange Rates; Closed Capital Accounts; Selective Price Controls

Gambia	Malawi	Sudan
Ghana	Nigeria	Tanzania
Guinea	Sao Tome & Principe	Zaire
Guinea-Bissau	Somalia	Uganda
Madagascar		Zambia

TYPE IV - Dual/Multiple Exchange Rates; Closed Capital Accounts; Widespread Price Controls

Algeria ¹	Ethiopia
Angola ²	Mozambique ²

¹ Although Algeria is not in Sub-Saharan Africa it is included here for discussion.

² It is important to point out that countries such as Angola and Mozambique have extensive price controls but are unable to enforce them.

3. The General Framework

We begin with a general framework for analyzing inflation. The framework incorporates cost-push and monetarist features, and it builds in the implications of price controls - both selective and general. We then examine the implications of the four prototype policy regimes we set out in the introduction and show that these are special cases of the general framework.⁸

Overall inflation is a weighted average of inflation in traded goods prices (p_t), non-traded goods prices (p_n), and controlled-price goods (p_c).

$$\hat{p} = a_1 \hat{p}_t + a_2 \hat{p}_n + (1-a_1-a_2) \hat{p}_c \quad (1)$$

where a_1 and a_2 are $0 < < 1$

When the economy is subject to widespread price controls a_1 and a_2 are close to zero and domestic inflation reflects governments decision to change controlled prices. The wedge between p_c the controlled prices and free prices reflects price distortions in the system.

For traded goods, the domestic inflation is equal to the change in the foreign price plus the change in the nominal exchange rate.⁹

$$\hat{p}_t = \hat{p}_f + \hat{e} \quad (2)$$

⁸ We have classified African countries into these four prototypes in Table 2.

⁹ This should strictly also include changes in the trade regime. For the sake of simplification we ignore those generally discrete changes.

For non-traded goods we use a standard mark-up model.¹⁰ The mark-up is applied to unit labor costs (wc) and the cost of imported inputs (mc).

$$pn = (1 + \mu) * (mc, wc) \quad (3)$$

Instead of using a fixed mark-up (μ) as is commonly assumed we make the change in the mark-up a function of excess demand in the system. The excess demand is not directly measurable. In economies in which financial instruments are not well developed and substitution between money and other financial assets is small, a good proxy for excess demand is excess real money balances defined as the excess real money supply over real money demand (EMB). This appears to perform well empirically (as we report later), and is analytically convenient.

Using a quadratic cost-function we get the following simplified mark-up equation for inflation in non-traded goods.

$$\dot{p}_n = b_1 \text{EMB} + b_2 \dot{m}c + b_3 \dot{w}c \quad (4)$$

$$\text{where } b_2 + b_3 < 1, b_1 > 0$$

Changes in import costs are the sum of changes in foreign prices and the exchange rate.

$$\dot{m}c = \dot{p}f + \dot{e} \quad (5)$$

¹⁰ Bruno (1979) and Gordon (1975). Non-traded goods refer both to goods that it is not feasible to trade, such as land, and goods that are de-facto non-tradeables such as those subject to non-tariff barriers.

Combining (1)-(5) we get the overall inflation equation

$$\dot{p} = d1 (\dot{p}f + \dot{e}) + d2 \dot{w}c + d3 EMB + d4 \dot{p}c \quad (6)$$

This general model adequately identifies the basic sources of inflation in the African context. These can be categorized as: imported inflation ($\dot{p}f$), inflation due to the cost-push effect of devaluation (\dot{e}), wage-push inflation ($\dot{w}c$), demand-pull inflation (EMB), and inflation arising from the control and subsequent decontrol of prices.

Turning now to the four prototype policy regimes that were identified earlier to see how this general framework is modified under each of these.

Type I: Pegged Exchange Rate: Open Capital Account

This is the CFA franc zone model. The exchange rate is fixed at one-fiftieth the value of the French franc. The exchange rate is therefore fixed only in relation to the french franc but obviously varies with respect to other currencies. There are no significant price controls. Each individual country has no effective control on monetary policy. Economic policy in the CFA zone is managed in two sub-zones, each with a central bank - the BCEAO and the BEAC. The money supply is not an effective policy variable because of the open capital account.¹¹

In this policy framework the underlying or base inflation is equal to the French inflation rate. Temporary deviations around this base inflation rate can come from several factors such as droughts, wage-push, or because of differences in pass-through of imported inflation to non-traded goods prices. But over the long run, inflation converges to the French inflation rate.

¹¹ For a more detailed description of the monetary arguments in the CFA Zone, see Bhatia (1985) and Honohan (1990 b).

This is confirmed in a recent study of inflation in CFA franc zone countries by Honohan (1990a). Honohan shows that in the long-run there is a tendency for inflation in CFA zone countries to converge to the French inflation rate. Honohan also looks at the effect of domestic credit policy on money supply in four CFA franc zone countries. He confirms that in three of the four countries domestic credit policy has no lasting effect on money supply. This is to be expected given the open capital account in these countries and the statutory freedom of capital movements between France and the CFA franc zone members.

Membership in the CFA franc zone therefore ensures low inflation as there is very little imported cost-push inflation and checks on monetary policy are provided by membership in the monetary union. At the same time the costs in terms of growth have been very high. Devarajan and de Melo (1990) document the dismal performance of CFA Zone countries in the 1980s.

Type II: Fixed-but-Adjusting Exchange Rates, Closed Capital Account, Selective Price Controls

This policy regime is typically found in economies such as Kenya and Zimbabwe¹². The exchange rate is fixed but subject to discrete devaluations. The exchange rate is therefore temporarily misaligned when exchange rate adjustments are delayed. These show up in balance of payments problems which are resolved through import controls and foreign exchange rationing. However, the misalignment is never large enough for the system to spill-over into large parallel markets. The capital account is closed; as a result government expenditure and credit policies affect the money supply. There are selective price controls, applied to particular commodities to protect the poor and the urban working class. But the controls are not widespread.

In this system the diagnosis of inflation is complex. It can come from any of the four sources in our general model. There is the cost-push inflation from discrete devaluations. Demand-pull inflation is prevalent when there is excess demand in the system created by excessive credit expansion in the economy, typically to finance unsustainable budget deficits. Note that while we classify the devaluation generated inflation as cost-push, the reasons for it are often excess demand in the system which spills over into balance of payments problems requiring

¹² For a good description and analysis of Kenya's Monetary and Exchange Rate Policy, see Killick and Mwega (1989). For Zimbabwe, see Chhibber et. al (1988).

corrective devaluation. This inflation is temporarily suppressed by import controls, but is then released by the devaluation.

Selective price controls also keep inflation in check temporarily. When price controls are applied directly to private traders they are generally not enforceable. If they are enforced they typically reduce private profit margins and discourage future investment. Price controls are better enforced when applied to products produced or distributed by a state enterprise, e.g. utilities, transport agencies and public food distribution agencies. The cost of these controls are higher deficits of these state agencies which must then be financed by transfers from the state budget. The financing of these higher budgets creates inflationary pressures. When controlled prices deviate widely from market prices their re-adjustment creates inflation.

A recent detailed analysis of inflation in Zimbabwe by Chhibber et al (1989) brings out some of these elements. The Zimbabwe study also reveals the presence of wage-push inflation brought about by a surge in nominal wages legislated by the government after independence in 1981 (see Table 3). As these wage increases were not based on underlying growth in labor productivity they could not be sustained. The resulting inflation wiped out the nominal wage increases, and restored real wages to their trend levels. This type of wage-push inflation is rare in Africa. Organized labor unions are not very strong, except in a few cases. The typical pattern has been one of continuous decline in real wages, coinciding with the decline in per capita GDP. Nevertheless, it shows that nominal wage increases not based on underlying labor productivity improvements will be wiped out quickly through higher inflation.

The inflation equations from the Zimbabwe study are shown in Table 3. These confirm that the diagnosis of inflation in Type II economies is complex. Separate equations are also presented for the high income and low income consumers. These show that the causes of inflationary pressures in the two cases vary. As one would expect, in the case of high income consumers the effect of selective price controls is non-existent, whereas in the case of low income consumers changes in selective price controls matter a great deal.

The pass-through effect of cost-push inflation from a devaluation is small (coefficient of 0.14), considering that the import/GDP ratio is over 25 percent of GDP. This low pass-through may be unique to Zimbabwe because of its relatively well developed industrial sector and a capital goods sector which allows for greater substitution

Table 3a: Zimbabwe Inflation Equations; TSLS

Equation	Constant	$\Delta \hat{p}_f$	\hat{w}_p	$\log(W/P_{-1})$	$\log y$	i	C_f	C_s	\bar{R}^2	D.W.
III.1.1. Over-all Inflation (\hat{p})	0.6312 (1.55)	0.1402 (2.42)	0.3463 (2.66)	0.0818 (1.94)	-0.1462 (2.21)	0.83 (3.42)			0.79	1.99
III.1.2. \hat{p}	0.4034 (1.34)	0.0995 (2.28)	0.2750 (2.74)	0.1161 (3.62)	-0.1430 (2.98)	0.69 (3.12)	-0.5073 (3.40)		0.89	1.89
III.1.3. \hat{p}_s	0.7159 (2.23)	0.0828 (1.66)	0.3119 (2.92)	0.1058 (3.10)	-0.1784 (3.32)	0.98 (4.92)		-0.2651 (2.83)	0.87	2.44
III.1.4. \hat{p}	0.6150 (1.83)	0.0781 (1.83)	0.2738 (3.01)	0.1213 (4.15)	-0.1619 (3.62)	0.73 (3.86)	-0.3713 (2.38)	-0.1584 (1.76)	0.91	2.46

All Equations were estimated with two stage least square, using ISP. The instruments used were change in import prices, lagged nominal interest rates, lagged real money balances, lagged money growth, lagged inflation, lagged log GDP, fiscal deficit as a share of GDP, C_f , C_s and the lagged difference between real wages and productivity growth.

- $\Delta \hat{p}_f$ = Change in import prices in Zimbabwe \$
- W/P_{-1} = W2 deflated by lagged CPI
- y = real GDP
- i = 6-month deposit interest rate
- C_f = difference between food inflation for low income versus high income
- C_s = difference between service inflation for low income versus high inflation
- \hat{w}_p = change in unit labor cost

Table 3b: Zimbabwe Inflation: Low and High Incomes
(1969-86)

Equation	Constant	$\hat{\Delta} + \hat{p}_f$	\hat{w}_p	$\log(W/P_{-1})$	$\log y$	i	C_f	C_s	\bar{R}^2	D.W.
III.2.1. Low income \hat{p}_L	0.4118 (1.09)	0.0929 (1.66)	0.1473 (1.21)	0.1469 (3.75)	-0.1898 (2.82)	0.83 (3.28)	-0.8505 (3.11)	-0.3443 (2.85)	0.89	2.83
III.2.2. \hat{p}_L	0.2344 (0.66)	0.0786 (1.40)		0.1885 (4.48)	-0.1822 (2.86)	0.85 (3.28)	-0.8989 (3.33)	-0.3458 (2.80)	0.88	2.88
III.2.3. High Income \hat{p}_H	0.8135 (2.15)	0.0593 (1.40)	0.3912 (4.25)	0.0984 (3.25)	-0.1541 (3.39)	0.64 (3.33)	-0.0982 (0.61)	-0.0214 (0.23)	0.89	2.19
III.2.4. \hat{p}_H	0.6835 (2.63)	0.0824 (1.74)	0.4019 (4.79)	0.0918 (3.15)	-0.1671 (3.82)	0.70 (4.66)			0.90	2.23

All Equations were estimates with two stage least square, using TSP. The instruments used were change in import prices, nominal interest rates, lagged real money balances, lagged money growth, lagged inflation, lagged log GDP, fiscal deficit as a share of GDP, C_f , C_s and the difference between wages and productivity growth.

- $\hat{\Delta} + \hat{p}_f$ = Change in import prices in Zimbabwe \$
- W/P_{-1} = W2 deflated by lagged CPI
- y = real GDP
- i = 6-month deposit interest rate
- C_f = difference between food inflation for low income versus high income
- C_s = difference between service inflation for low income versus high inflation
- \hat{w}_p = change in unit labor cost

possibilities when import prices rise. The effect is reduced further when price control variables are introduced. This indicates that the government cushions the effects on the poor of imported inflation for consumer goods also.

The study of Killick and Mwegu (1989) also shows similar results with significant effects on Kenyan inflation from monetary growth and import price change and negative effects due to output growth. The pass-through effect of import prices is about 0.20, again somewhat lower than the share of imports in GDP which is around 25 percent of GDP. Because inflation has been typically low, lagged inflationary expectations are not important. In both the Kenya and Zimbabwe studies, the lagged inflation term was insignificant.

Type III: Dual/Multiple Exchange Rates, Closed Capital

Account, Selective Price Controls

Ghana, Nigeria, Tanzania and Zambia are typical examples of this policy regime. The exchange rate is fixed but is adjusted through discrete devaluations. However, in the past severe misalignment of the exchange rate has led to the emergence of a large parallel market for foreign exchange. The capital account is closed, but there is illegal movement of assets through the parallel market. There are selective price controls, but these are not enforceable because of parallel markets in goods and services.

Excess demand spills over into higher inflation as well as into the parallel market. It therefore affects the exchange rate premium. The official exchange rate affects the parallel market exchange rate in two ways. On the supply side, an overvalued exchange rate induces exporters to sell in the parallel market and increases the supply of foreign exchange in that market. On the demand side a more overvalued official exchange rate increases the demand for imports. As this demand cannot be met in the official market it spills over into the parallel market where it leads to a higher parallel exchange rate and widening exchange premia.

Interest rate policy also matters as it affects the portfolio choice between holding domestic currency and foreign assets. The only channel to acquire foreign assets is through the parallel market for foreign exchange. Widening interest rate differentials increase the preference for foreign assets. This leads to a higher demand for foreign exchange in the parallel market and widening exchange premia.

This model of the exchange premium was applied to Ghana by Chhibber and Shafik (1990).¹³ The results presented in Table 4 confirm the validity of the model. Both the official real exchange rate and the interest rate differential play a significant role in explaining exchange rate premia.

As the size of the parallel markets grows the cost of foreign exchange increasingly reflects the parallel exchange rate. In terms of our general model the exchange rate (e) becomes a weighted average of the official exchange rate (e_o) and the parallel exchange rate (e_p). The inflation equation becomes:

$$\hat{p} = (w\hat{c}, EMB, e\hat{w}, \hat{p}_f, \hat{p}_c) \quad (7)$$

$$e\hat{w} = s\hat{e}_o + (1-s)\hat{e}_p.$$

where $0 < s < 1$, is the share of foreign exchange transactions in the official account.

In the extreme, the official exchange rate has little relevance in the market. It simply becomes an accounting price in government transactions with its own agencies, in debt service calculations and in customs duty calculations. Domestic prices increasingly reflect the shadow cost of foreign exchange; which is the parallel market exchange rate; $s=0$. Grid tests conducted with Ghanaian data and reported in Chhibber and Shafik (1990) confirm that this was the case in Ghana. The final equations from that study are also reported in Table 4.

The results show that the cost-push effects of exchange rates are higher in the case of Ghana than was the case in Zimbabwe. The first round effect is 0.16, and the long run effect is larger 0.40, because of lagged inflationary expectations.¹⁴ This is approximately twice the share of imports/GDP in the economy. This high pass-through is more typical of African economies where possibilities for substitution between imported inputs and domestic goods is limited. Demand pull variables are also significant in the Ghanaian case. There is no wage push

¹³ It follows the work of Dornbusch et al (1983) for Brazil and Rocha (1989) for Algeria. See also Azam and Besley (1989) for a model with a somewhat different focus.

¹⁴ The coefficient on lagged inflation is 0.5872, so the long-run effect of exchange rate changes on inflation is $0.1649/(1-0.5872)=0.3995$. A study of Tanzania by Horton and McLaren (1989) finds very similar results. Using a macroeconomic model of the economy, it shows that a 50 percent devaluation would lead to a 26 percent increase in nominal prices after two years, thereby eroding about half of the real impact of the devaluation.

Table 4: GHANA EXCHANGE RATE PREMIUM EQUATIONS, 1965-88

Equation	Constant	r	Ry	M2P	DUM 78	PVAR	CHI ²	DW
1	-0.5157 (0.74)	-0.0004 (0.17)	0.9992 (2.56)	0.0040 (0.63)			2.87	2.38
2	-0.0303 (0.20)	-0.0012 (0.85)	1.1486 (4.00)		-1.8476 (4.01)		8.54	2.33
3	-0.4874 (2.81)	-0.0038 (2.87)	1.3173 (5.67)		-2.4904 (6.21)	1.8525 (3.56)	13.96	1.73

All equations were estimated by two stage least squares using PCGIVE. The instruments used were lagged values of the exchange rate differential, the real exchange rate, relative yields, price variability, inflation, and foreign exchange as a proportion of imports.

r : Real Exchange Rate Index (\$/Cedis)

Ry : Relative Yield between Cedis and UKStg.

DUM78 : Dummy Variable for 1978

PVAR : Index of Monthly Variation in Prices

M2P : M2/CPI

GHANA INFLATION EQUATIONS, 1965-88

Equation	Constant	$\hat{e}_o + P_f$	$\hat{e}_p + P_f$	Log (M/P-1)	Log y	l	\hat{P}_{-1}	CHI ²	D.W.
1	14.3193 (2.07)	0.2909 (2.03)		0.4036 (3.80)	-1.5513 (2.30)	0.0390 (2.97)	0.3209 (2.17)	22.62	1.80
2	8.8233 (1.97)		0.1649 (4.52)	0.3566 (6.90)	-1.0049 (2.32)	0.0258 (3.25)	0.5872 (5.22)	69.60	1.39
3	9.1805 (1.80)	0.0691 (0.39)	0.1474 (1.60)	0.3832 (5.31)	-1.0533 (2.12)	0.0281 (2.86)	0.5596 (3.32)	42.74	1.35

All equations were estimated by two stage least squares using PCGIVE. The instruments used were lagged values of inflation, output, money supply, interest rates, import prices at the official parallel market exchange rates, and the parallel market premium.

\hat{e}_o : Official Exchange Rate (Cedis/US\$)

\hat{e}_p : Parallel Market Exchange Rate (Cedis/US\$)

\hat{P}_f : Foreign Price Index in US\$

M : Money Supply (M2)

y : Real GDP

l : Six-month Deposit Rate

\hat{P}_{-1} : Lagged Inflation

effect and little impact from controlled price changes as one would expect in an economy with widespread parallel markets.

Type IV: Dual/Multiple Exchange Rate: Closed Capital Account, Widespread Price Controls

The last prototype we examine is the economy subject to widespread controls. The exchange rate is typically fixed. The capital account is closed. There are demand pressures in the system arising from high fiscal deficits. But these do not translate into inflation because of price controls. There are widespread shortages in the system so that the "true" inflation is much higher than observed inflation. There may be a parallel market but this market remains small because the system is able to enforce price controls. There is very little private ownership and most assets, including fixed assets are owned by the government or state agencies. The private sector is allowed to hold domestic foreign assets.

The system leads typically to institutionalized accumulation of financial assets. Real money holdings rise since incomes cannot be translated into consumption leading to forced savings. This pattern has been observed in a large number of socialist countries.

Very few African economies fall in this category as enforcing this system requires an effective and institutionalized government machinery. Two African economies come close to this type of economy - Algeria and possibly Ethiopia.¹⁵ One indication that price controls are effective in Algeria is that the general model spelled out in Equation 6 was estimated in a recent study by Khadr and Parks (1990) for Algeria and gave very poor results. There was no significant effect of changes in imported inflation (and exchange rates) and excess demand on domestic inflation. This indicates that domestic inflation is primarily a function of changes in price controls. In our general model overall inflation is simply equal to the average change in controlled prices:

$$\hat{p} = \hat{p}_c \quad (8)$$

¹⁵ For an earlier discussion and analysis on Algeria see Conway and Gelb (1988). For a more recent analysis see Khadr and Parks (1990).

In this type of economy, inflation is low but cannot be contained indefinitely once the contradictions in the system accumulate and become unsustainable. There is a large accumulation of monetary assets or monetary overhang conceptually measured by

$$(M/p) - (M/p_u) \quad (9)$$

where p_u is the true price level and p is the observed price level.

The monetary overhang is a major problem when a reform of the system is contemplated. This is because the decumulation of these monetary assets creates a sudden surge in inflation and threatens the reform. The challenge is to manage this reform such that the decumulation is staggered over a period of time. One way to manage the decumulation of monetary assets is to provide consumers real assets such as land or houses which private individuals could not own. This can help in soaking up a part of the monetary overhang.

How large is the monetary overhang is not easily determined since p_u , the true price level is unknown. One way to determine the true price level is to write a well-known behavioral function in terms of the true price level and transform these into equations which could be estimated for the observed price level. For example, a money demand function using the true price level would be written as:

$$\log (M_d/p_u) = a_0 + a_1 i + a_2 \hat{p}^e + a_3 \log (y).$$

$$a_1 > 0, a_2 < 0, a_3 > 0$$

a_1 is > 0 for quasi money, but < 0 for M1.

In addition, we can posit a relationship between true and observed prices, which leads to a transformed equation which can be estimated.¹⁶

¹⁶ Transformed money demand functions have been estimated for China by Feltenstein and Ha (1989) and Feltenstein and Farhadian (1987). Error corrected transformed money demand functions have also been estimated for Algeria by Khadr and Parks (1990). The need to use an error corrected model indicates that there is considerable short-run disequilibrium in the money market i.e. money markets do not clear.

The question of how to manage the unravelling of controls is currently a major issue in Algeria. Since the "true" price level is unobservable, the question then arises as to how to measure the extent of the monetary overhang. One way to do this is to measure the change in the ratio of real money supply to real GDP.¹⁷ In addition one could measure the change in the real money supply to individual components of real GDP such as consumption. However, the existence of a parallel market implies that the measure of monetary supply to official GDP may be misleading. Khadr and Parks (1990) correct this by adding estimates of the parallel market output to official GDP and conclude that the emergence of parallel markets help reduce demand pressure, but excess demand still exists in the system. This unmet demand is held in the form of narrow money.

The exchange rate premium between the parallel market and the official market can be analyzed with a model similar to the one used in Type III. Rocha (1989) has successfully estimated such a model for Algeria. It shows that the relevant explanatory variables are the interest differentials between Algeria and France, the real exchange rate and real money balances. Excess demand in consumer goods, and to some extent even in investment goods spills over into the parallel market bidding up the parallel market exchange rate.

4. Implications for Anti-Inflationary Policy

It is clear from our survey that inflation was low only in Type I or Type IV countries although for very different reasons. These are two extreme cases. In the first case we have an open capital account, a fixed exchange rate and no independent monetary policy. This is the policy regime in the CFA franc zone. In the second case we have complete price controls. But it is clear that this is usually unsustainable and the unravelling of price controls generally involves wrenching economic and often political change because of a release of repressed inflation, moreover, "true" or virtual inflation is much higher than recorded inflation reflecting unmet demand. What do the

¹⁷ Using these ratios Khadr and Parks (1990) show that the M2/GDP ratio is much higher than in Tunisia, Morocco, Turkey, and Pakistan. It is also higher than the M2/GDP ratios in Sub-Saharan Africa.

studies in Section 3 tell us about how various policies affect inflation? We look at three policy areas in Section 4 and draw the overall conclusions in the last section.

4.1 Exchange Rate Policy

The low inflation rate in the CFA zone has often led to the conclusion that exchange rate devaluation is inflationary. In a recent paper Guillaumont and Guillaumont (1989) argue that there are two approaches to affecting a change in the real exchange rate; through a nominal devaluation or through a real deflation in the economy. They argue that the latter approach is preferable because it avoids the costs of high inflation. A somewhat different but related critique has come from the Economic Commission for Africa ECA (1989) which argues that a nominal devaluation is very quickly wiped out by inflation with no effect on the real exchange rate. This arises from the low supply response and the high share of monetary financing of the budget in many African countries. What does the evidence from the empirical studies tell us?

First, there is no doubt that there is a direct cost-push effect from exchange rates to domestic prices. This is confirmed by the studies on Ghana and Zimbabwe as part of this study; as well as by a host of studies in Africa and other parts of the world.¹⁸ In general the pass-through effect of exchange rate changes on inflation is likely to be larger than the share of imports in GDP. This is due to the importance of key imports in the production process and the inability of domestic industry to substitute for these imports. The Ghana study confirms this result with a pass-through effect of 0.40 in an economy where the share of imports in GDP is about 0.20 on average during the estimation period.

The first round pass-through effect of exchange rate changes on domestic prices is lower when there is a substantial domestic capacity to produce goods which can substitute for imports. It is also lower when the government does not allow the full pass-through with price controls and subsidies. This is the case in Zimbabwe

¹⁸ See Chhibber and Shafik (1990) and Chhibber et al (1989) as well as Tegene (1989), Horton and McLaren (1989) and Killick and Mwegu (1990) for Africa. For empirical studies not specific to Africa, see Bhalla (1981), Darrat (1986), Giytsos (1977) and Saini (1982).

where both factors lead to a very small first round effect of exchange rate changes on domestic inflation. In the extreme case where there are complete price controls as in Algeria there is no effect of exchange rate changes on domestic prices.

The concerns reflected in the ECA report on the effects of devaluation on inflation are examined with a simulation exercise on the Zimbabwe model reported in Table 5. The effects of exchange rate changes on domestic inflation are examined under alternate assumptions about export response and the share of monetary financing of the budget. The simulations show that in Zimbabwe under normal circumstances about a third of the devaluation would get wiped out by inflation (Case 1). Note that the full effect of a devaluation on inflation is larger than the first-round effect because the budget deficit increases with a devaluation. The higher budget deficit leads through monetary financing to higher inflation. How much inflation depends on the share of the budget deficit financed by money creation. In the case of Zimbabwe the net effect of a 10% increase in the rate of devaluation is an increase in inflation by 3.33 %.

Table 5:

Devaluation, Inflation and Real Exchange Rate (RER)
Under Alternative Assumptions

<u>Simulation</u>	<u>Cumulative Devaluation of 27.5%</u> <u>at the rate of 5% per annum</u>	
	<u>Inflation</u>	<u>RER Depreciation</u>
SI: Real Exports to RER s-run Elasticity 0.3 l-run Elasticity 1.0	9%	18.5%
SII: Real Exports to RER s-run Elasticity 0.1 l-run Elasticity 1.0	10%	17.5%
SIII: Real Exports to RER s-run Elasticity 0.1 l-run Elasticity 1.0 50% of budget deficit financed by borrowing from Central Bank (instead of about 25% in (i) and (ii))	16%	11.5%
SIV: Real Exports to RER s-run Elasticity 0.1 l-run Elasticity 1.0 50% of budget deficit financed by borrowing from Central Bank (instead of about 25% in (i) and (ii)) Slower revenue adjustment to inflation	27.5%	0%

In the extreme when the supply response of exports is low in the short-run (elasticity 0.1), and 50% of the budget is financed by monetary creation (Case IV) the devaluation gets wiped out completely. There is no effect on the real exchange rate. A 10 % increase in the rate of devaluation would lead to a 10% increase in the inflation rate. The high share of monetary financing of the budget deficit is quite common in Africa. The domestic bond markets are not adequately developed for the government to borrow in the domestic market. Therefore, the ECA critique needs to be taken seriously. The Ghana case shows that this concern applies only to countries where the devaluation leads to a larger fiscal deficit. Horton and McLaren (1989) show that this is a serious issue in Tanzania.¹⁹

In Ghana the devaluation led to an improvement in the fiscal deficit, and as a result a declining rate of inflation. Both the theory as well as simulations with the Ghana model reported in Chhibber and Shafik (1990) show that a slower official devaluation would have meant a higher rate of inflation as well as a more depreciated parallel exchange rate. The fiscal deficit improved, as mentioned earlier, because devaluation resulted in higher domestic currency equivalent in foreign aid and a reduction in exchange subsidies to importers. The key role of foreign aid in the funding of Ghana's exchange reforms came through its impact in improving the fiscal position of the government.

The Ghana case also shows that once the misalignment of the exchange rate had gone very far and there was a very wide differential between the official and parallel exchange rate there was very little choice but to devalue. Consumer and producer prices already reflected the parallel market exchange rate. The official devaluation was just the formalization of the status quo. This was confirmed by careful econometric tests in the Ghana study. The devaluation of the official exchange rate therefore had no direct cost-push effect. This is true also of a large number of countries in the Type III category in Africa where the extent of misalignment is so large that reforms without devaluation are unlikely to be successful. Large parallel markets are prevalent. In these cases managed official devaluation leads to lower inflation if, and only if, the budget improves with the official devaluation.

¹⁹ The Horton and McLaren (1989) study does not adequately address the issue of the parallel exchange rate. For a theoretical discussion and empirical determination of the parallel exchange rate in Tanzania, see Kaufmann and O'Connell (1990).

One important conclusion that can be drawn from these studies is that there is no unique relationship between devaluation and inflation. In the first round there is always a positive cost-push effect of a devaluation on inflation. This is confirmed by almost all studies of inflation in Africa. The exceptions are countries with complete price controls, but here we see a build-up of repressed inflation. But the subsequent and overall effect of devaluation on inflation depends on the impact of the devaluation on the budget, the adequacy of external funding of the program and the export response. Carefully managed exchange reforms therefore remain the only vehicle to correct exchange rate misalignment. The ECA concern that the impact of nominal devaluation or real devaluation can be small is a realistic possibility; only if supporting fiscal policies are not in place.

4.2 Monetary and Fiscal Policy

There is no denying the link between money supply and inflation. In the Ghana and Zimbabwe studies the results from our general model showed that excess real money balances had a significant and positive effect on inflation. This link is confirmed by a number of other studies on inflation in Africa.²⁰

In these cases the reduction in the fiscal deficit in order to reduce inflation is obviously necessary. In other cases the solutions are not so obvious and require more fundamental institutional reform. In Ghana, for example, the growth in money supply in recent years is due to increasing net foreign assets. This indicates that monetary policy is ineffective in sterilizing the inflow of foreign assets (foreign exchange). One reason is the negative deposit rates, but anecdotal evidence indicates that commercial banks are unwilling to accept deposits even at these negative real interest rates because the recovery of the high costs of financial intermediation can only be achieved at real lending rates at which the demand for funds is low. The banking system is not willing therefore to accept time deposits and the currency/deposit ratio has risen. This money chases scarce goods leading to higher inflation. This indicates fundamental problems in the financial system leading to high costs of financial intermediation. This problem cannot be resolved without fundamental financial sector reform.

²⁰ See again for example, Greene (1989), Tegene (1989), London (1989).

The reduction in the fiscal deficit must also be looked into carefully. How and where the cuts are made matters a great deal in reducing inflation? This is because if cuts in government expenditure reduce growth, then it is not obvious that inflation will be reduced. In the Ghana study, a cut in public investment leads to lower monetary growth but has no significant effect on inflation. This is because lower public investment leads to lower real growth. The same trade-offs emerge in the study on Zimbabwe.

The strong link between monetary growth and inflation raises the issue of what causes low inflation in the CFA Franc zone countries. The answer is clearly the CFA franc zone's common monetary policy and the open capital account. Honohan's study of inflation in the CFA franc zone showed that in three of the four countries there is no link between domestic credit growth and monetary growth. Excessive domestic credit growth spills over into balance of payments problems rather than into high inflation. Inflation is low because monetary growth is low. This raises the issue of whether the institutional arrangements of the CFA franc zone can be emulated in other parts; and what are the benefits and costs of doing so?

The benefit of membership in the monetary union is obviously lower inflation. However, this has very little to do with the fixed nominal exchange rate. It arises primarily from the common monetary policy and the open capital account. Along with the benefits come some costs. In this context Devarajan and de Melo (1987, 1990) have argued that the cost of a fixed exchange rate has been high variability in the real exchange rate in these countries and lower growth rate.

4.3 Removing Price Controls

In examining the question of price decontrol on inflation, one has to look at three cases: a) economies with extensive price controls, b) economies with selective-but-enforced price controls and c) economies with parallel markets.

In Case a) the issue is one of measuring the extent of monetary over-hang and determining how much can be absorbed by special schemes. These could involve the sale of public assets such as housing. Alternatively, the government could sell bonds which provide a positive real return to soak up money which would otherwise chase

scarce commodities. The remaining money supply will probably lead to higher demand for goods and services driving up inflation. The pace of the reform will obviously determine how quickly the monetary overhang gets dissipated.

A faster reform entails quicker removal of price controls and consequently higher inflation. The degree of supply response will also determine the extent of inflation. In Ghana, for example, higher growth has led to an increase in the real money balances lowering the inflationary impact from the same level of monetization.

In Case b) the enforcement of selective controls implied that demand for commodities subject to price controls could not be met. Typically, price controls are effective when they are applied through public enterprise pricing. But when applied directly to the private sector they can be easily circumvented. In Zimbabwe low income consumers are protected by subsidized transport, electricity and publicly provided housing. Part of this demand spilled over into uncontrolled commodities whose prices rose, the unspent balance accumulated as in Case a) into monetary assets. In this situation, the price-decontrol typically leads to a return of high inflation in the sectors subject to price controls; which can then conceivably spill over into cost-push inflation in other sectors.

In Case c) with parallel markets, there is strictly speaking no excess demand. The demand for controlled commodities has shifted into parallel markets leading to higher prices there. Inflation is unrecorded and price decontrol typically has insignificant inflationary effects.

5. Conclusion

High and rising inflation has emerged along with other problems as important issues confronting Sub-Saharan Africa. While inflation in Sub-Saharan Africa is low in comparison with Latin America, it is a serious problem. Inflation rates have increased sharply and most African economies do not have the institutions to manage high inflation.

At first glance, the evidence appears to suggest a strong correlation between the exchange rate regimes and inflation. Countries with floating exchange rates (or auction systems) appear to have experienced higher inflation. On the other hand, countries with fixed exchange rates have typically faced lower inflation.

A careful analysis, however, indicates that the story is more complex. In countries such as Ghana, Uganda, Sierra Leone and Zambia, the high inflation was prevalent prior to the exchange reforms and was prevalent through periods when the exchange rate was fixed. The high inflation rendered the official exchange rate more or less irrelevant and parallel markets emerged. The level of the official exchange rate was important for accounting purposes but was irrelevant in affecting behavior which was driven by the true price of foreign exchange -- the parallel exchange rate. Detailed analysis of the Ghanaian exchange reforms shows that adjusting the official exchange rate may have actually lowered inflation by reducing fiscal deficits. The underlying cause of inflation was the high fiscal deficits, which were financed primarily through monetary creation.

The lower and stable inflation in countries with pegged exchange rates such as those of the Franc Zone also has its genesis in the underlying monetary and financial arrangements, rather than in the fixed exchange rate. The openness of the capital account between countries of the zone ensures that the money supply is not a policy variable. Domestic credit expansion does not lead to monetary expansion and inflation, but instead affects the balance of payments.

The key then to price stability lies in providing checks on large fiscal deficits and non-inflationary mechanisms for financing them. In principle, this can be done through responsible expenditure and revenue policies. In practice, experience shows that it requires institutional arrangements which restrain profligate

expenditure. An open capital account provides one mechanism for such a restraint, as shown by the experience of Indonesia. Indonesia therefore is forced to follow a balanced budget policy to avoid potential balance of payments problems. The other is to separate effectively monetary and fiscal policy, either by joining a monetary union a la the CFA Zone, or by establishing and managing an independent Central Bank. This independence also needs an institutional structure akin to the Federal Reserve System in the United States. The Central Bank needs to be allocated the status of the judicial systems and its independence fiercely protected.

The costs of joining a monetary union appear to be high. These arise largely from the fact the nominal exchange rate gets pegged, restricting adjustment in the real rate. During adjustment, the burden is borne entirely by expenditure cuts rather than by expenditure switching. On the other hand, benefits are price-stability. The best option is to have the control on the fiscal/monetary policy without the rigidity of a fixed pegged exchange rate. This is the option countries such as Indonesia have followed through the open capital account. It appears to provide the path to price stability without jeopardizing growth.

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