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EXCHANGE RATE POLICY AND INFLATION: THE CASE OF UGANDA

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Exchange rate policy and inflation: The case of Uganda

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by

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Abstract

This paper examines the determinants of inflation in Uganda. High inflation, an economic virus of the Ugandan economy for most of the 1980s, has been recorded at annual rates of less than 10% since 1993/94. A competitive exchange rate has also been sustained since 1990.

The paper analyses the relative importance of monetary, cost/push and supply-related causes of inflation. A striking observation of the study is that inflation in Uganda is persistently a monetary phenomenon — the monetary financing of the fiscal deficit is the main cause of sustained inflation in the economy. In addition to the links between fiscal deficits and monetization, the study investigated the causal relationship between the exchange rate and fiscal balance. The major conclusions are that monetary expansion as dominated by the financing of the fiscal deficit is instrumental in determining the pace of inflation.

The exchange rate continues to be a key policy tool. During the 1980s parallel exchange rate induced inflation was significant. Since liberalization of the foreign exchange market in 1990, there still remains a heavy focus on the exchange rate policy as key to maintenance of macroeconomic stability. It is suggested that the exchange rate policy tool should be used together with appropriate monetary and fiscal instruments so as to enable domestic and external stability of the Ugandan economy.

I. Introduction

The decade of the 1980s in Uganda witnessed a rapid increase in the rate of inflation, with an annual average of more than 100% during 1981 – 1989. The highest recorded annual figure was more than 200% in 1986/87. The 1990s have seen the relative stabilization of the economy. Inflation was recorded at an annual rate of less than 10% in 1993/94. A competitive exchange rate has also been sustained since 1990.

The improved performance of the Ugandan economy has been largely a result of political stability and commitment to the national economic recovery programme. The economic recovery programme adopted in 1987 heavily hinges on price, trade and exchange rate liberalization, restoration of fiscal discipline, and adherence to a decidedly anti-inflationary monetary stance.

The high and persistent inflation has been a source of much concern, and the fact that it was largely attributed to major devaluations of the official exchange rate led to widespread debate about its causes in the 1980s.

Prior to 1981, Uganda's economy went through a period of decay. Real GDP declined to negative levels, including the key export commodity coffee, with officially reported production falling drastically. The budget deficit was increasing at an annual rate of 23% and was financed by simply printing money. Triple-digit inflation resulted and the differential between the official exchange rate and the black market rate was 1:30!

There was an acute shortage of foreign exchange during this period. And as it became increasingly difficult to obtain foreign exchange, with foreign exchange dealings withdrawn from commercial banks to the central bank, a new parallel market developed, popularly known as *kibanda*. The official exchange rate was fixed at 7.80 Uganda shillings per US dollar, but the excess demand for foreign exchange pushed to the parallel market rate to 300 Uganda shillings per US dollar. Uganda, therefore, witnessed the emergence and subsequent expansion of an active parallel economy — primarily concentrated in the foreign exchange sector of the economy, mis-invoicing and smuggling of exports and imports.

On the eve of 1981, therefore, Uganda had a fixed exchange rate regime, high inflation, an active parallel market, and gross monetary and financial indiscipline.

In June 1981 Uganda adopted its first structural adjustment programme with the was support of the IMF and World Bank. This policy package included price liberalization, devaluation, trade policy reforms, and public enterprise and fiscal reform, including reduced subsidies and rationalization of public spending. The major component of this programme at the time was exchange rate adjustment. Because inconsistent macroeconomic policies over the previous decade had led to real exchange rate

misalignment and deterioration of the country's external position, these stabilization efforts were successful initially. However, success proved transitory as inadequate policies and socio-political insecurity reversed the initial gains.

In 1987 an economic recovery programme (ERP) was launched, supported by the IMF, the World Bank, the African Development Bank and member countries of the Paris Club. The broad objectives of Uganda's reform efforts were the following:

- Macroeconomic stabilization, mainly through restoration of fiscal and monetary discipline.
- Rehabilitation of war-damaged physical infrastructure.
- Control of inflation.
- Exchange rate realignment.
- Trade liberalisation.
- Privatisation and rationalisation of public enterprises.
- Downsizing of the civil service and the army.
- Liberalization of interest rates.
- Financial sector reforms aimed at greater mobilization of savings and higher investment ratio, with a view to raising the rate of economic growth.

Several economists argue that the emergence of such substantial inflationary pressure in Africa is due to monetary growth arising from domestic bank financing of large budget deficits; others point to exchange rate depreciations as the main cause. Such controversy about the causes of inflation in African countries has led to different prescriptions for the appropriate policy response.

Canetti and Greene (1991) make the following observation on policy issues. Those focusing on the monetary factors emphasize reduction in government budget deficits and restraint of credit to the public sector, while stressing the need for exchange rate depreciation to offset any over-valuation resulting from past inflation and deterioration in terms of trade. Many IMF and World Bank supported adjustment programmes have reflected this perspective. In comparison, those focusing on the role of exchange rate depreciation argue against exchange rate adjustments, preferring a combination of income policies and demand reduction measures. A set of African alternatives to structural adjustment programmes developed by the United Nations Economic Commission in Africa (1989) has advocated this approach.

Taking such controversy into consideration, we examine the relationship of the exchange rate policy and inflation in Uganda in the context of a wider analysis of the determinants of inflation in the economy. The broad objective of the study is to investigate the causes of inflation in Uganda. The major focus is on the exploration of the links between fiscal deficits and monetization, exchange rate movements and inflation, and the indirect link between the exchange rate and inflation via its impact on the fiscal deficit. Section II provides a literature review of monetary and structuralist analyses of causes of inflation. Section III discuss as sources of inflation in Uganda over the period 1981 to the mid 1990s. An error-correction model is specified in Section IV. Policy implications are summarized in the concluding section.

II. Literature review

Monetarist — Structuralist debate

The approach adopted in this study attempts to synthesize the monetarist and structuralist theories of inflation. As a starting point, therefore, we review the monetarist — structuralist debate.

Monetarists regard inflation as a purely monetary phenomenon, originating in and sustained by expansionary monetary and fiscal policies (government deficit financing, expansionist credit policies and expansionary exchange rate operations of central banks). The control of inflation, therefore, requires as a necessary and sufficient condition the control of the money supply.

In contrast, the structuralist argues that there existed rigidities (e.g., inelastic food supply, foreign exchange constraints, budget constraints) within developing economies that created structural vulnerability to inflation. Inflation is therefore due to structural factors such as food prices and wage or exchange rate changes, and sustained by propagating mechanisms, including increases in money supply.

The assumption that exchange rate movements have a predominant effect on inflation is not exclusively a structuralist view. However, structuralist economists tend to emphasize the role played by the cost of imported inputs in the transmission mechanism of exchange rate changes to inflation, through mark-up pricing.

The monetarists argue that these structural factors can only cause a shift in the price level but cannot explain how it translates into sustained inflation. For this to happen, they say, one needs monetary accommodation, without which the inflationary process stalls.

To the structuralist, however, the increase in the supply of money is a permissive factor that allows the inflationary spiral to manifest itself and become cumulative — it is a symptom of the structural rigidities that give rise to inflationary pressures rather than the cause of inflation itself. An increase in the money supply is thus a necessary condition for the rise in the overall level of prices but it is not a sufficient condition (Kirkpatrick and Nixson, 1976).

Chhibber and Shafik (1990) point out that although money can be viewed as the proximate cause of inflation, cost/push factors can directly or indirectly trigger change in the rate of monetisation and in the velocity of the circulation of money. Furthermore, in order to understand the inflationary process, it is necessary to disentangle the underlying

factors that ultimately result in higher growth of domestic liquidity.

Until recently, studies concerned with the monetary aspects of the inflationary process in developing countries generally treated the money supply as strictly exogenous (or policy determined). In this paradigm inflation is essentially caused by the expansion in the money supply and there is no evidence to the contrary. Lately, however, some studies have recognized that the expansion in the money supply may not be independent of inflation. Inflation may result in the widening of fiscal deficits financed through the banking system (particularly by the central bank), leading to high prices. This self-perpetuating process was first formalized by Olivera (1967) and was later empirically tested by Dutton (1971) and Aghevli and Khan (1978) to explain the episodes of high inflation experienced by Argentina and Indonesia, respectively.

The Chhibber and Shafik (1990) study on Ghana, which was part of a wider research into the inflationary effects of policy adjustments in Africa, is probably the most relevant for our review. They develop a model using Ghanian data that integrates monetary/fiscal, cost/push and real factors into the analysis of the transmission mechanisms for inflation in Ghana.

Some of the more important results of their study are that monetary growth was instrumental in determining the pace of inflation; that parallel exchange rate induced inflation was significant; and that fiscal policy had a limited role in current inflationary issues in Ghana.

The conclusions drawn from this study are consistent with most empirical and theoretical research on causes of inflation in African countries. However, we argue that fiscal policy plays a crucial role in determining inflation and the exchange rate policies pursued.

III. Determinants of inflation

This section attempts to determine the relative importance of the various causes of inflation in the Ugandan economy and the channels through which monetary and exchange rate policy shocks are transmitted to inflation. The main underlying supply related causes of inflation, that is, food and transport costs, are also analytically reviewed.

There are some key structural features of Uganda's economy to be noted. Uganda's economy is basically coffee propelled. Coffee accounts for more than 90% of export earnings and about 56% of tax revenue. Thus the one critical external factor that continues to affect Uganda's economy is the international price of coffee. Coffee exports' finance requirements, however, have often been a key factor behind domestic credit expansion. The price of coffee is the key determinant of external terms of trade, and declining international coffee prices have created adverse fiscal and balance of payments problems. For example, the average price had declined by about 60% in 1992 to less than $0.82 per kilogram as compared to $2.05 per kilogram in 1987. This led to a drastic decline in export earnings in 1992, to $95 million from $394 million (1986/87).

Inflation in Uganda has been regarded basically as a monetary phenomenon. Since the 1980s inflation has largely been attributed to two main factors: ad hoc government expenditure, hence widening the budget deficit, and sharp increases in domestic budgetary financing. For example, in 1986/87 bank credit to government accounted for 70% of the total increase in the broad money stock of almost 100%money stock of almost 100%.

A previously major feature of the Ugandan economy (in the 1980s) was the importance of the parallel economy — specifically, the market for foreign exchange. The parallel market rate was an important economy-wide price signal. It has been argued that expectations of future devaluation are likely to affect inflation through the parallel market rate, but no significant direct relation between inflation and the official exchange rate devaluation can be established (Morris, 1989). The prominence of the black market also derives from the shortage of official foreign exchange. Foreign exchange is rationed at the official exchange rate, and only negligible amounts are available for allocation to the private sector. Thus, the parallel market is an important vehicle of foreign transactions.

Pinto (1985) asserts that the existence of illegal parallel markets for foreign exchange raises several pertinent questions, e.g., reasons for the existence of the black market, its "thinness" and efficiency, the relevant nominal exchange rate for transactions and defining the real exchange rate, the rate movements, the implications of the parallel market for nominal exchange rates, and the preconditions/path for achieving a stable and unified exchange rate regime.

Both theory and evidence (Canetti and Greene, 1991) suggest that monetary growth

and exchange rate depreciation are major determinants of the inflationary process in Uganda. The implications of the monetized fiscal deficit, as well as the parallel market, are therefore central to our discussion.

Fiscal deficit

In the early 1980, the government relied heavily on domestic credit expansion to finance its fiscal deficit and crop finance. In 1983/84 domestic financing stood at 86.4% and remained more than 70% of total financing of the deficit prior to 1987. This can be largely explained by the dominance of the coffee economy in both the fiscal deficit and crop finance requirements. For a given level of external assistance and domestic expenditure, improved export performance of coffee will reduce the fiscal deficit and hence domestic credit requirements for financing the deficit. However, increased coffee production will lead to accelerated domestic credit expansion in order to meet larger crop finance requirements. Therefore, the fiscal deficit and crop finance are both inflationary, and the interaction between them complicates attempts to control monetary emission.

The fiscal deficit is also partly financed by tax revenues on export crops, especially coffee. Government buys declared coffee export proceeds at the official exchange rate and spends the earned foreign exchange on financing government imports and debt service. This implicit tax on coffee reduces the government's need to print money to cover the gap between expenditures and revenues. In effect, the premium of the free market rate over the official rate provides an alternative to using the inflation tax (i.e., domestic credit creation) to finance the fiscal deficit.

Export tax on coffee is the most important source of government revenue, it contributed an average of more than 44% to total recurrent revenue until 1987/88 (see Table 1), but declined to less than 15% in 1988/89 due to the drastic fall in international coffee prices. Despite the decline, contribution from coffee export tax accounts for virtually all export revenue, most of which is used to finance government imports, service external debt and pay for imports of petroleum products.

In 1992 coffee export taxes were abolished due to the drastic decline of international prices by about 60%. However, this trend reversed and by mid 1994 Uganda experienced a coffee boom in the wake of the frost in Brazil. But this coffee boom (increased foreign exchange inflows), combined with increased capital inflows (private transfers), has created a new problem — the appreciation of the real effective exchange rate. Sharer et al. (1995) explain the channels through which this appreciation of the real effective exchange rate is transmitted into inflation. The larger transfers will lead to an increase in domestic absorption, and such additional spending is usually accompanied by an increased demand for non-tradeable goods. Any increase in the demand for non-tradeable goods is likely to cause a rise in their relative prices and hence an appreciation of the real effective exchange rate. In addition to the pressures on the domestic price level, the increased inflows will tend to cause nominal exchange rates to appreciate. Policy makers generally face the dilemma of whether to allow a more rapid appreciation of the nominal rate or an increase

Table 1: Recurrent revenue performance 1982/83 — 1993/94 (By percentage of total)

Source of Revenue	1982/83	1983/84	1984/85	1985/86	1986/87	1987/89	1988/89	1989/901	1990/91	1991/923	19923/93	1993/94
Income tax	4.8	6.9	6.0	5.5	11.4	6.8	9.6	10.1	10.1	12.9	13.8	14.5
PAYE	0.5	0.4	0.5	0.5	0.7	0.4	1.1	0.8	0.7	1.7	3.5	3.7
Other	4.2	6.6	5.5	5.0	10.7	6.4	8.6	9.3	9.4	11.1	10.3	10.8
Export taxes	30.7	45.6	58.1	67.3	39.9	23.7	10.9	13.8	9.3	1.1	0.0	0.0
Coffee	30.7	45.6	58.1	66.5	39.9	23.6	10.8	13.8	9.3	1.1	0.0	0.0
Other	0.0	0.0	0.0	0.8	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Custom duty	12.2	10.3	8.8	6.2	11.9	8.4	15.7	26.4	36.2	41.7	43.0	38.6
Excise duty	5.4	3.9	3.4	3.4	6.8	7.7	9.9	7.5	9.1	8.2	6.4	10.7
Sales tax	20.2	19.6	19.7	14.9	25.3	9.9	35.3	32.5	26.7	23.6	25.2	25.3
Commercial transaction levy	0.9	1.2	1.1	0.8	1.4	1.7	1.9	2.3	2.2	2.9	3.3	3.9
Freight charges	2.5	1.5	1.5	1.8	1.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0
Other tax revenue	1.2	0.2	0.2	0.1	2.4	4.1	2.8	4.8	3.8	3.6	5.9	5.2
Non-tax revenue	0.0	2.0	1.2	0.0	0.0	17.8	14.1	2.7	2.5	1.9	2.3	1.6
Total recurrent revenue		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Ministry of Finance.

in the domestic price level.

During the five-year period 1989/90 – 1993/94, the overall deficit including grants averaged 5.1 % of GDP, with a peak of 7.3% in 1991/92, and showed a declining trend thereafter (Table 2). Excluding foreign grants, the overall deficit was much higher, averaging 10.5% of GDP. There is a very striking grant element of budgetary financing that averaged about 8% of GDP in this period. It is important to point out that once shortfalls in external financing are experienced, then inflationary surges begin to ripple due to increased domestic credit and net bank credit to the government.

With regard to public expenditure, the ratio of expenditure to GDP declined from 17% in 1982/83 to 9% in 1988/89. The expenditure ratios are relatively low although there is a need for further spending in rehabilitation and expansion of physical infrastructures. At the same time fiscal balance is a major policy objective. More emphasis should therefore be placed on the revenue side; government should strengthen its capacity to finance the budget deficit from non-inflationary sources. Direct external budgetary support has so far enabled a decline in the fiscal deficit.

Table 2: Fiscal deficit and inflation

	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94 (estimate)
Overall Deficit				(Ush million)			
Excluding grants	21,752	(43,742)	80,402	(132,360)	(395,500)	(436,91)4	(452,890)
Including grants	(15,252)	(29,582)	(60,106)	(62,175)	(200,856)	(123,160)	(165,348)
Financing	16,500	32,804	69,548	74,561	198,366	176,990	216,265
External (net)	7,800	13,400	(22,248)	9,409	56,028	(23,826)	26,962)
Financing				(In percent of total)			
External	52.7	59.1	131.9	87.4	71.7	113.5	112.5
Domestic	47.3	40.8	31.9	12.6	28.2	13.5	12.5
				(In percent of GDP)			
External	2.2	2.2	6.6	3.6	5.2	5.2	5.3
Domestic	2.0	1.5	1.6	0.5	2.1	0.6	0.6
Inflation rate (Annual)	199.1	76.8	26.9	32	62.9	0.6	16.1

Source: Bank of Uganda, Ministry of Finance.

Crop finance

Towards the late 1980s, the issue of crop finance mismanagement led to increasing concern over its immediate impact on fiscal and monetary policy.

Increased crop finance requirements have become a major determinant of domestic credit creation thereby resulting in higher domestic inflation. The adjustment and stabilization programme initiated in 1987/88 resulted in acute shortage of crop finance, largely attributed to the tight fiscal and monetary measures adopted. Another reason was slow growth in commercial bank deposits meaning that the commercial banks could not take care of the desired new lending, even for coffee crop finance alone. This necessitated direct active involvement of the central bank to fill the financing gap. Accordingly, in 1989, crop finance by the banking system was given a boost by the central bank's dramatic increase in money supply by the sum of Ush 10 billion. Most of this was to meet the coffee financing requirements for farmers, processors and the Coffee Marketing Board.

Between June 1986 and June 1989, the share of coffee in credit extended by the banking system averaged more than 76%. In 1989 alone, it accounted for 95% (see Table 3). The expansion of domestic credit to meet crop financing needs was bound to be inflationary. Inflation, which had been steadily reduced from 243% in June 1988 to 104% by January 1989, increased rapidly to 150% by March 1989.

Table 3: Crop finance and money supply (Ush billion)

	1986 (June)	1987 (June)	1988 (June)	1989 (June)
Money supply (M2)	4.51	8.82	26.17	60.15
Crop finance by the banking system	1.11	1.52	4.4	16.13
Of which (%) allocated to coffee	50	99	63	95
% crop finance to money supply	25.1	16.6	15.5	28.3
% crop finance to deposits with banks	45.5	30.5	34.1	54.3
% crop finance to total credit allocation by commercial banks	62.00	42.9	37.8	56.2

The black market and domestic inflation

Economic theory suggests that with a fixed over-valued rate of exchange and a thriving parallel market for foreign exchange, where the rate is determined by market forces, the relevant rate of exchange for portfolio shifts and traded goods is the black market rate, since it is the marginal cost of foreign exchange.

Pinto (1989) argues that there should be extreme caution in interpreting the black market rate as the correct rate of exchange. This is partly because of the well-known distortions inherent in the black market premium. More importantly, for policy prescription, it is essential to examine the determinants of the black market premium, as will be discussed briefly. However, first we point out that in Uganda the importance of the black market derives from the role played by the premium as a relative price signal and the failure to adjust policy for the existence of parallel markets. More precisely, the work of Pinto (1989) argued for the primacy of fiscal policy and the need to design the pace of exchange rate policy to be considered with fiscal reform.

It is necessary, however to understand determinants of the black market premium — both portfolio and longer-run official trade oriented influences. In Uganda, the major determinants of the parallel market rate are the relative shortage of cheaper official foreign exchange, so that demand for foreign exchange cannot be met in the official market, and the excess liquidity due to increasing money supply. The presence of a large parallel economy in Uganda, therefore, can be attributed mainly to unsustainable expansive macroeconomic policy. The parallel market rate through monetary expansion is also influenced both by fiscal deficit and by expectations of future devaluation. When the expectation of domestic exchange rate devaluation increases, there is a reduction in holdings of assets denominated in domestic currency and shift into assets denominated in foreign currency, in this case particularly foreign currency. The shift from shilling assets to foreign currency assets will cause the parallel exchange rate to depreciate, increasing the shilling price of traded goods, and hence put upward pressure on the general price level.

Thus, in the medium to long run, foreign exchange transactions in the parallel market are basically driven by excess aggregate demand for imported goods. As a result of the shortage of foreign exchange from the official channels, a large proportion of traded goods in the country are imported with foreign exchange obtained through the black market. In the short run, the parallel rate is basically asset market determined. With continued low domestic interest rates, uncertainty about future exchange rates, inflation and government policies, the process of currency substitution in the parallel market is accelerated. The higher the rate of inflation, the higher the opportunity cost of holding local currency and therefore the higher is the real demand for foreign exchange. The expected rate of depreciation of the parallel exchange rate reflects the opportunity cost of holding domestic currency vis-a-vis holding foreign exchange, while the premium indirectly affects inflation through portfolio adjustments.

In 1987 the Uganda shilling was demonetizated during the currency reform and a currency conversion tax at a rate of 30% was imposed to further reduce excessive liquidity

in the economy. There was an immediate drop in average inflation from 360.7% in May to about 200% cent in June. However, with the possible fears of complex and drastic currency reform, the premium shot up, representing essentially a portfolio shift to foreign currency, and possible capital flight, and suppressed inflation.

The intended aim of the conversion tax, apart from reducing excessive liquidity, was to lend money raised through this tax to the government. This was to finance the budget deficit over a short period, rather than financing it through printing more money. Nonetheless, inflation shot up again within three months mainly due to renewed monetary financing of increased government expenditure, domestic credit expansion by commercial banks to meet coffee financing requirements and financing of the newly launched rural farmers scheme.

The three indicators of monetary stock – narrowly defined stock. of money M1, broad money stock M2 and domestic credit DC — registered an average quarterly rate of growth of 19.3%, 18.8% and 18.6%, respectively (Table 4). The black market rate also registered an average quarterly rate of depreciation of 21.8% during the period 1983 - 1990. Despite numerous devaluations during this period, the black market premium remained high at an average quarterly rate of more than 300%.

It has already been argued that in Uganda's case official exchange rate devaluation is not a major source of domestic inflation. In fact, it is further argued (e.g., Morris, 1989) that official devaluation has a positive effect on the government budget, in the sense that it creates revenue improvements. The revenue improvements come from two channels: higher grant aid disbursed at a more depreciated exchange rate, and a reduction in subsidies to importers due to exchange rate over-valuation.

In the case of the budget, a devaluation has tended to increase the level of resources in the budget, because the budget has tended to have a surplus on foreign exchange transactions priced at the official exchange rate. An increase in the level of budget resource will, other things being equal, lead to a decrease in government's borrowing from the banking system and by reducing the rate of monetary expansion will reduce upward pressure on the price level.

Food and transport costs

Figure 1 shows the trend in food and general price indexes. The increasing price trend between 1983 and 1986 was a result of insufficient food supply due to poor transportation and distribution networks. Problems affecting transportation, such as increases in the costs of fuel and spare parts and lack of good feeder roads from rural to urban areas, all easily get translated into inflationary pressures. As shown in Figure 1, food prices closely lagged behind general prices until 1986, when the swings in the latter were then dictated by those of the former.

Table 4: Money, exchange rates (quarterly average) and domestic inflation

							Growth rates (%)					Inflation (%)
	M1	M2	DC	OER	BER	BER/ OER	M1	M2	DC	OER	BER	
1983 Q1	334.3	427.5	597.3	1.16								22.4
Q2	364.1	472.1	720.3	1.38			8.9	10.4	20.6	19.0		26.5
Q3	374.0	483.6	676.6	1.76	4.25	2.41	2.7	2.4	6.1	2.75		25.2
Q4	435.4	544.2	756.4	2.33	4.12	1.77	1.64	12.5	11.8	32.4	-3.1	21.2
1984 Q1	435.4	544.2	756.4	2.74	4.42	1.61	0.0	0.0	0.0	17.6	7.3	18.3
Q2	617.7	759.0	649.1	3.07	4.80	1.56	41.9	39.5	12.3	12.0	8.6	16.2
Q3	938.8	759.0	849.1	4.00	6.45	1.56	52.0	0.0	0.0	30.3	34.4	61.9
Q4	938.8	1115.1	1202.4	5.51	9.48	1.72	0.0	46.9	41.6	37.7	47.0	101.9
1985 Q1	1404.4	1608.9	1828.8	5.78	12.25	2.12	49.6	44.3	52.1	4.9	29.2	139.4
Q2	1572.2	1817.2	1949.2	6.00	14.97	2.50	11.9	12.9	6.6	3.8	22.2	155.5
Q3	1838.1	2151.9	2184.9	6.00	17.95	2.99	16.9	18.4	12.1	0.0	19.9	106.6
Q4	2256.2	2619.5	2572.4	12.75	31.15	2.44	22.7	21.7	17.7	112.5	73.5	90.9
1986 Q1	3279.1	3775.2	3365.6	14.8	34.90	2.36	45.3	44.1	30.8	16.1	12.0	123.1
Q2	3923.4	4514.9	3165.6	14.0	54.33	3.8	19.6	19.6	5.9	5.4	55.7	153.1
Q3	4988.8	5727.7	3590.0	14.0	78.67	5.63	27.2	26.9	13.4	0.0	45.0	172.00
Q4	6131.7	7184.4	5170.3	14.0	100.43	7.17	22.9	25.4	44.0	0.0	27.5	356.4
1987 Q1	7190.9	8476.6	6213.1	14.00	132.05	9.43	17.3	18.0	20.2	0.0	31.5	255.4
Q2	7804.5	8824.5	9824.3	60.00	106.00	1.77	8.5	4.1	58.1	328.6	19.7	233.2
Q3	11083.5	12338.8	10544.5	60.00	189.00	3.15	42.0	39.8	7.3	0.0	78.3	278.2
Q4	16522.1	18535.7	15349.3	60.00	258.00	4.30	49.1	50.2	55.6	0.0	26.5	163.0

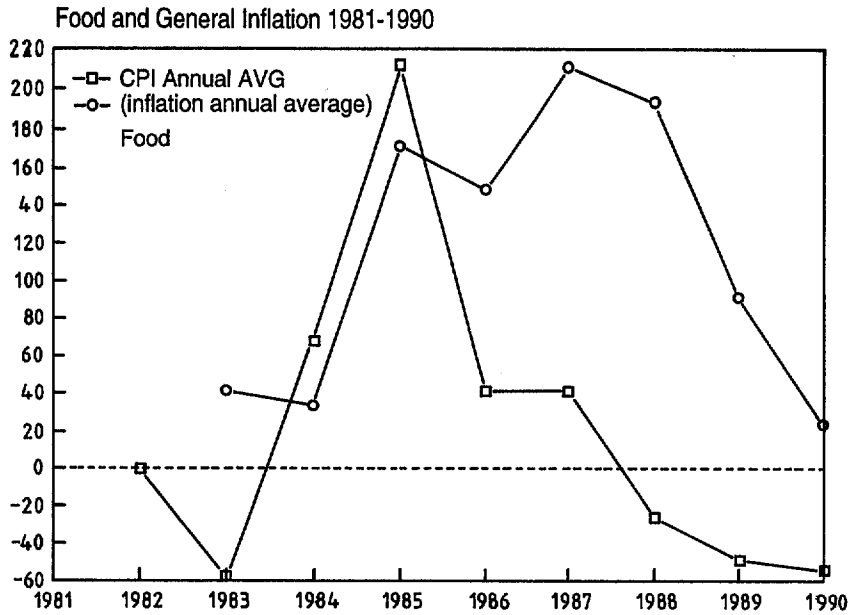
Table 4:cntinued

	M1	M2	DC	OER	BER	BER/ OER	Growth rates (%) M1	M2	DC	OER	BER	Inflation (%)
1988 Q1	21360.7	23494.6	18756.6	60.00	390.00	6.50	29.3	26.8	22.2	0.0	51.2	172.5
Q2	24106.7	26717.6	18948.2	60.00	451.00	7.52	12.9	13.7	1.0	0.0	15.6	234.1
Q3	30498.8	33273.6	21660.2	150.00	445.00	2.97	26.5	24.5	14.3	150.0	1.3	191.1
Q4	35967.3	39188.9	28556.9	165.00	447.00	2.71	17.9	17.8	31.8	10.0	0.4	118.9
1989 Q1	46424.9	50681.3	43250.9	200.00	460.00	2.30	29.1	29.3	51.5	21.2	2.9	149.4
Q2	54254.9	60165.7	52783.4	200.00	612.00	3.06	16.9	18.7	22.0	0.0	33.0	86.3
Q3	58889.6	66220.9	54831.9	200.00	610.00	3.05	8.5	10.1	3.9	0.0	0.3	75.5
Q4	69584.7	79103.6	63899.5	370.00	751.00	2.03	18.2	19.5	16.5	85.0	23.1	81.1
1990 Q1	75172.1	87738.6	70971.7	379.00	642.00	1.69	8.00	10.9	11.1	2.4	14.5	41.8
Q2	81402.2	94433.0	79658.0	440.00	657.00	1.49	8.3	7.6	12.2	16.1	2.3	29.1
Q3	85597.1	103441.3	86132.4	480.00	731.00	1.52	5.2	9.5	8.1	9.1	11.3	36.7
Q4	92691	117203.3	86132.4	540.00	769.00	1.42	8.3	13.3	0.0	12.5	5.2	57.6
Average						3.16	20.78	20.61	18.61	30.43	21.89	118.86

Deposit

M1 - Currency in circulation, demand
M2 - Broad money
DC - Domestic credit
OER - Official exchange rate
BER - Black market exchange rate
BER/OER - Black market premium

Figure 1: Food and general inflation



The continuous decline in food prices and the growth of the food crop sub-sector within agriculture since 1987 has been mainly due to free market policies adopted under the economic recovery programme.

Exchange rate and trade liberalization policies under the economic recovery programme have made farm inputs more available. Export diversification efforts have also enhanced the production of food crops, e.g., maize and beans, for trade and particularly barter trade.

Supply oriented factors in the 1980s were especially important in the case of transport. While demand for transport is understandably inelastic, the supply of transport services has been largely constrained by poor road conditions and inadequate transport vehicles. Increases in petroleum products affect the price level due to increased costs. Diesel and petrol enter into costs both for individual transportation and for consumer goods, especially bulky items like staple foods.

There is a high correlation between petroleum prices and the official exchange rate. Devaluation in the short run is bound to lead to transport price inflation, as a result of both the real effect on fuel prices and the increase in transport charges due to speculation. With subsequent devaluations and road infrastructure improvement, the number of transport vehicles began to rise substantially and the market has become competitive. However, the response of petroleum prices to these devaluations has been slow.

The government has a direct impact on the price level through two particular avenues: by setting the level of taxation on petroleum products and by taxing goods and services in the economy. The price of petroleum is basically determined by four factors: the landed

cost of petroleum in Uganda, the prevailing exchange rate, the operating costs of the local oil companies and the tax levied by government. Recent petroleum price adjustments have been a reflection of upward revisions of these factors, especially the duty on petroleum products.

Morris (1989) argues that any effect the official exchange rate devaluation appears to have on prices is due to the correlation of government determined petroleum product prices with the official exchange rate. From an estimation of a simple empirical model of inflation in Uganda, it is shown that a 1.0% change in the price of petrol will lead to only a 0.13% per cent increase in the price level. And overall a 1.0% official devaluation will lead only to 0.03 % increase in the price level. (Morris, 1989). The conclusion that the official exchange rate is not inflationary is plausible.

IV. Examination of the indirect link between the exchange and inflation via the impact on the fiscal deficit

As mentioned earlier, during the mid 1980s in Uganda there was a controversy between policy makers and academics over the inflationary impact of a devaluation of the previously administered official exchange rate.

The indirect impact on the general price level of a devaluation, through its impact on the parallel exchange rate and the budget, has been to reduce inflation pressure rather than increase it.

In the case of the parallel exchange rate, a devaluation of the official exchange rate, by reducing excess demand for foreign exchange in the economy, has tended to cause the parallel exchange rate to appreciate and consequently to reduce any upward pressure on the general price level.

Official devaluation has had positive impact on the government budget. It has tended to increase the level of resources in the budget. This is mainly because the budget has tended to have a surplus of foreign exchange transactions priced at the official exchange rate, i.e., the government sold more foreign exchange at the official exchange rate than it bought. An increase in the level of budget resources will lead to a decrease in government's borrowing from the banking system, and by reducing the rate of monetary expansion, reduce upward pressure on the price level. The presence of a budget surplus of foreign transactions priced at the lower exchange rate is more clearly obvious in the current context, where government's own requirements are priced at the forex bureau rate while import support is sold to the private sector at the lower auction rate.

Estimates suggest that government has since 1988 been a net seller of foreign exchange through auction sales, and the special import programmes (which aimed to improve allocation of foreign exchange to importers), and the open general license (OGL) system (established for the purpose of availing foreign exchange on a priority basis to specific industrial sub-sectors). The OGL and SIP were short-lived programmes between 1989 and 1990 (see Table 5), after which the government continued selling foreign exchange through the auction system, as shown in Table 6. As a result, all foreign exchange transactions in the economy began to take place at market-determined rates.

Devaluation has also tended to increase the shilling value of revenue generated through trade taxes (import duties), thereby improving the fiscal account. Throughout the period 1982 to 1991, trade taxes contributed more than 50% of tax revenue. Import duties contributed a much larger share than domestic taxes (Table 1).

On the expenditure side, import support loans during the period 1986 to 1990 formed a large proportion of budgetary support. Thus with the depreciation in the exchange rate, there is a rise in revenue in domestic currency terms (i.e., an increase in counterpart

financing by local funds), thereby increasing budgetary support.

During the period 1990 to 1994, fiscal discipline continued to play a key role in the government's strategy for achieving stability. Thus, the overall budget deficit including grants was maintained at about 5% of GDP and a major domestic revenue mobilization effort was envisaged. Moreover, structural measures included reducing dependence on external budgetary support, widening the tax base, implementing a comprehensive programme to strengthen tax administration and continuing the implementation of budgetary reform.

Table 5: SIP and OGL approvals by month 12/ — 2/90 (In US$ Million)

Month	SIP Ordinary Applications	OGL	Monthly totals
1988			
Dec	13.515	–	13.515
1989			
Jan	11.567	–	11.567
Feb	6.136	–	6.136
Mar	6.658	2.418	9.076
Apr	0.13	2.946	11.959
May	4.561	3.959	8.520
Jun	7.808	2.524	10.332
Jul	2.194	0.686	2.880
Aug	3.083	0.516	3.599
Sep	1.263	1.058	2.321
Oct	0.929	0.199	1.128
Nov	2.599	2.424	5.023
Dec	1.964	0.353	2.317
1990			
Jan	6.723	2.228	8.951
Feb	2.753		2.753
Grand Total	80.766	19.311	100.077

Source: Bank of Uganda
Note: A Total of US$ 100.08 million was allocated under the above systems of foreign exchange allocation in the 15-month period beginning December 1988. This is a clear reflection of the failure of the earlier system to match available resources to the demand for imports. The system managed to attract demand from the parallel market, resulting in a fall in the premium on the official exchange rate in the parallel market.

Table 6: Forex auction details

Date	Auction number	Amount pledged (US$ M)	Total bids (US$ M)	Amount sold (US$ M)	Max. rate (Shs/US$)	Min. rate (Shs/US$)	Clearing rate (Shs/US$)	Average weekly sales (US$)
31/1/92	1	5.00	2.480	2.286	1100	970	970	
7/2/92	2	2.50	2.470	1.414	1100	900	980	
14/2/92	3	2.50	2.470	1.414	1100	900	980	
21/2/92	4	3.50	3.560	3.334	1050	980	980	
28/2/92	5	4.00	1.940	1.933	1050	985	1000	
6/3/92	6	3.50	3.240	3.240	1050	1000	1000	
13/3/92	7	2.50	1.503	1.253	1050	1000	1000	
20/3/92	8	4.00	3.712	3.385	1050	1000	1000	
27/3/92	9	4.00	2.233	2.230	1175	1000	1000	
Total Q1		31.5	24.213	221.575	1075	978.333	993.777	2.40
6/4/92	10	3.50	2.180	1.971	1050	1000	1000	
10/4/92	11	3.00	2.116	2.121	1020	1000	1000	
21/4/92	12	3.50	1.695	1.654	1010	1000	1000	
24/4/92	13	1.00	1.239	0.901	1030	1000	1000	
4/5/92	14	1.20	1.663	1.020	1050	1001	1002	
8/5/92	15	0.60	1.966	0.329	1060	1002	1006	
15/5/92	16	3.48	3.909	3.481	1915	1007	1010	
22/5/92	17	2.28	2.523	2.523	1030	1012	1012	
29/5/92	18	1.18	1.272	1.185	1020	1010	1014	
5/6/92	19	3.50	1.070	1.050	1030	1005	1015	
12/6/92	20	2.00	1.660	1.575	1025	1016	1016	
19/6/92	21	2.00	2.200	1.999	1022	1017	1018	
26/6/92	22	2.00	1.719	1.719	1025	1025	1020	
Total QII		29.24	25.212	21.267	1029.769	1006.923	1008.769	2.37
3/7/92	23	2.50	2.485	2.485	1020	1020	1020	
10/7/92	24	3.00	1.802	1.802	1027	1021	1028	
17/7/92	25	1.50	1.844	1.460	1026	1021	1022	
24/7/92	26	2.50	0.988	0.988	1026	1022	1022	
31/7/92	27	1.50	0.455	0.435	1025	1023	1023	
Jul Total	11.0	7.6	1026.0	1021.4	1021.6			
7/8/92	28	3.08	3.066	3.066	1200	1023	1024	1.44
14/8/92	29	1.50	0.343	0.552	1026	1024	1024	
21/8/92	30	1.50	1.358	1.290	1028	1024	1025	
28/8/92	31	1.00	2.723	0.877	1070	1025	1027	
Avg Total		7.80	7.699	5.576	1030	1024	1025	1.39
4/9/92	32	8.50	3.168	2.746	1031	1027	1028	
11/9/92	33	1.50	0.563	0.562	1035	1029	1029	
18/9/92	34	1.50	1.371	1.371	1033	1029	1029	
29/9/92	35	1.50	1.821	1.499	1032.50	1030	1030	
Sep Total		8.00	6.92	6.18	1033	1029.00	1029.00	1.55
2/10/922	36	2.50	1.426	1.393		1030	1030	

Source: Bank of Uganda.

An error-correction model

This section reports econometric work was undertaken to disentangle the role played by the monetary base and the real exchange rate in explaining the inflationary process in Uganda . The Engle-Granger two-step procedure was used.

Time-series characteristics of the data and test for cointegration

Since our data proved to be non-stationary, [2] we proceed to test for the existence of a cointegration relationship for the set of variables. A static OLS regression is run on the levels or log of each variable in order to search for a linear combination of individually non-stationary time series that is itself stationary. The domestic consumer prices were chosen as the dependent variable so as to, establish the long-run relationship between this variable, the money supply and the real exchange rate (Equation 1). The equation to test for the existence of cointegration between the first order integrated series in log representation is as follows:

$$P_t = a_0 + b_1M_t + b_2E_t + u_t \qquad (1)$$

Where:

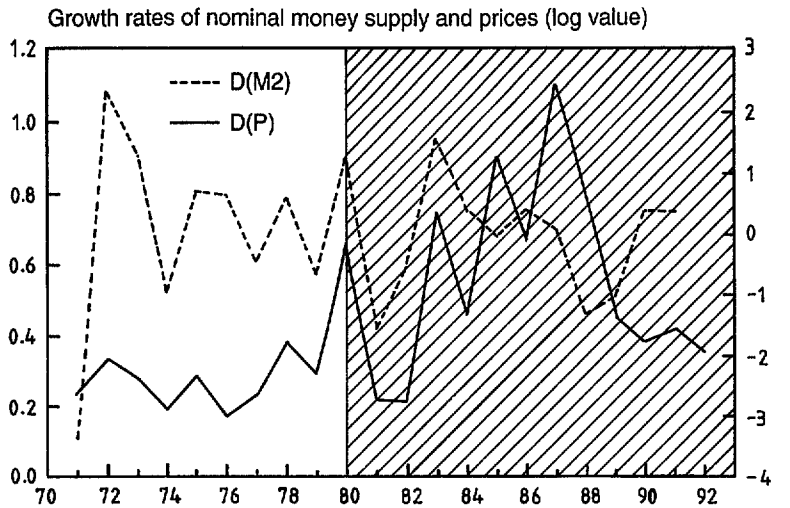
P_t = logarithm of the consumer price index of Uganda
M_t = logarithm of nominal money supply or M2
E_t = logarithm of the real exchange rate

Table 7: Cointegration test statistics

Dependent variable :	Consumer price index
Regressor	Parameter estimate
Time period	1961-88
c	5.803
m2	0.225
e	0.585
R-squared	0.317
Adjustment R-squared	0.245
S.E. of regression	1.007
Sum squared resid	19.259
CRDW	1.799
DF	4.177

ADF critical value = -1.9583

Figure 2: Growth rates of nominl money supply and prices (log values)



The results for Equation 1 are presented in Table 7. The t-statistics are not reported as these are badly biased. The DF test presents strong evidence that the residuals follow a stationary process, since the value of -4.177 was higher than the critical value of -1.9583 (5% level). The CRDW statistic also confirms that the variables are cointegrated as the d value of 1.799% per cent is above the 1.0% cent critical value (0.511). Thus there seems to be a long-term equilibrium relationship among the variables and the coefficients have the expected sign according to our hypothesis on the strong links between the money supply and the inflationary pressures in Uganda (see Figure 2). However, between 1989 and 1992, as shown in Figure 2, prices continue to rise as money growth declines; this may be explained by structural factors. The money supply has a positive coefficient indicating that the consumer price index was positively associated with the movements in the monetary expansion in the long term. Likewise, the coefficient of the real exchange rate is negative, meaning that a real devaluation does not seem to help explain the inflationary process in the long term in Uganda.

Developing an error-correction model

Since the vector of variables chosen appears to be cointegrated, the second step of the Engle-Granger method (1987) led us to estimate an error-correction model or dynamic model. As discussed, this represents an equation that specifies the relationship of long-run behaviour of consumer prices in Uganda to its short-term value. Thus the residuals from Equation 1 presented in Table 7 are used as an error-correcting variable in the following dynamic equation:

$$DP_t = a_0 + b_1 Dm_t + b_2 m_{t-1} + b_3 De_t + b_3 DP_{t-1} + Du + r_{t-1} + e_t \quad (2)$$

where D denotes first difference; r_{t-1} is the one-period lagged value of the residual from regression 1; and et is the error term. Regression 2 links the changes in the domestic consumer price index (*pt*) to the changes in the nominal money supply (*m*), in the real exchange rate (*e*), in the 1 lagged value of prices (p_{t-1}), and in the equilibrating error in the preceding period. A dummy variable (Du) is used to account for the effect of increasing coffee prices during 1975-1980. In this equation Dm and De account for the short-run disturbances in the prices index (P_t) and the error-correction term (r_{t-1}) captures the adjustment toward the long-run equilibrium. An attempt was made to follow the general-to-simple modelling methodology (Hendry, 1986; and Jenkinson, 1986). However, given the limitation imposed by the reduced number of observations the simplest representation was chosen. The results for estimation of the error-correction model in logs are reported in Table 8. Although the Durbin-Watson was rather low, there are no symptoms of residual autocorrelation from the LM tests for five-order autocorrelation, so the equation was estimated by OLS.

Table 8: ECM model results

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	0.219	0.629	0.348	0.733
Δm	2.078	0.764	2.720	0.081
Δ(-1)	2.078	0.816	1.480	0.163
Δe	0.219	0.273	0.801	0.437
ΔP(-1)	0.308	0.188	1.634	0.126
Dummy	0.037	0.499	0.074	0.942
r1(-1)	1.007	0.271	3.714	0.003
R-squared	0.702	Mean dependent var	0.191	
Adjusted R-squared	0.565	S.D. dependent var		1.015
S.E. of regression	0.670	Akaike info criterion	0.533	
Sum squared resid	5.831	Schwartz criterion	0.184	
Log likelihood	16.053	F-statistic		5.108
Durbin-Watson stat	1.707	Prob(F statistic)		0.007
LM(autocorrelation)F (7,16)	0.541	Normality	0.909	
LM(5)	5.056	ARCH F(7,16)		1.136
Reset test F(1,23)	0.300	ARCH		5.803

Notes: Dependent variable is D (P_T); Sample: 1980-96; Included observations: 27 after adjusting endpoints

The model performs quite well. It passes all the tests for misspecification, serial correlation, heteroscedasticity and normality. According to the results, short changes in the value of the nominal money supply (m) have significant and positive effects on the consumer price index (p). Although the one period lagged value of M2 has a negative sign this is not statistically significant. By contrast, the real exchange rate has a negative sign, indicating that a real appreciation of the domestic currency is not inflationary in the short-term. The coefficient of this variable is not statistically significant.

The important fact from the hypothesis put forward in this paper is that the only variable statistically significant, apart from the error-correction term, is the actual value of M2. Thus it seems that monetary expansion is the main source of variations in prices in the short-term. In our view, the negative sign of the real exchange rate variable (e) may be due to the fact that a significant volume of imports was financed through import support grants. This may have offset the inflationary impact of real devaluation.

V. Conclusion

The purpose of this paper has been to analyses the determinants of inflation in the Ugandan economy. Both the monetary and cost/push causes of inflation were examined in depth using descriptive empirical evidence. The evidence suggests that over the medium term, high inflation is mainly due to the increase in money supply, over and above the excess demand for money, resulting in excess demand for goods and services, thus causing a further increase in the general price level. The model results point to the assertion that broad money and prices are closely linked. This revelation strongly draws the focus away from the belief that inflation in Uganda is mainly due to the devaluation of the official exchange rate. Devaluation has been found to have an indirect impact on the general price level through its effect on the parallel exchange rate and the budget, but this transmission mechanism has been deflationary rather than inflationary. Supply side shocks appear to have a more significant impact in the short run, as depicted by the sharp but not so frequent increase in the food price index.

Strong emphasis remains on non-inflationary financing of the government budget and on reduction of fiscal imbalances. However, more recently the downward trend in inflation can be attributed to factors such as improvement in the efficiency of domestic tax revenue collection, the fairly well monitored auction system alongside freely market operating forex bureaus and — most of all — the significant budgetary support provided by donor resources for almost a decade under the structural adjustment programme adopted in 1987. We then pose the fundamental question — Are these policies that are heavily hinged on donor aid sustainable in the long run?

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