FISCAL DEFICITS, INFLATIONARY EXPECTATIONS AND PARALLEL EXCHANGE MARKETS IN GHANA: MONETARISM IN THE TROPICS?

Brian Pinto

CPD Discussion Paper No. 1985-56
October 1985
Abstract

FISCAL DEFICITS, INFLATIONARY EXPECTATIONS AND PARALLEL EXCHANGE MARKETS IN GHANA: MONETARISM IN THE TROPICS?

Brian Pinto


The emergence in Ghana of black market foreign exchange premia in excess of several hundred percent is ascribed to a basic inconsistency between past fiscal and exchange rate policy, which led to goods and stable foreign currency becoming stores of value. A model with officially rationed exchange markets, deficits financed by domestic credit creation, smuggling and currency substitution is developed. It suggests that the black market premium is determined by fiscal deficits, official rate of devaluation (crawl), portfolio balance and the propensity to spend on imports. It is demonstrated that the black market rate is the relevant, though not necessarily equilibrium, one, with the official rate serving as a benchmark for a tax-subsidy scheme. Evidence is provided that the government relied excessively on the inflation tax, leading to triple-digit inflation rates that were greater than the inflation tax maximizing rate. This has important implications for exchange rate adjustments and rules, e.g., once-and-for-all devaluations, crawling pegs and auctions. A devaluation which kept the official rate below the black market rate would be non-inflationary. A crawling peg, if introduced in a high-inflation situation, could increase the black market premium and accelerate inflation. It is best introduced when inflation is low and stable. The same applies to auctions. Finally, the sustainability of recent cuts in fiscal deficits, the adequacy of domestic credit to the private sector and confidence in the domestic banking system are flagged as crucial issues in the next few years.
Acknowledgements

I acknowledge helpful discussions with Homi Kharas, Saul Lizondo, Ken Miranda, Pravin Trivedi and Sweder van Wijnbergen. Marinela E. Dado and Francis Ng provided excellent research assistance. I retain sole responsibility for errors and omissions. The opinions herein are those of the author and do not necessarily represent those of the World Bank or affiliated institutions.
Table of Contents

Page No.

I. Introduction .................................................. 1

II. Empirical Evidence on Exchange Rates and Inflation, 1974-84 ....... 4
    A. Interactions Between Official and Black Market
        Exchange Rates ............................................. 4
    B. Black Market Depreciation and Domestic Inflation ............. 10

III. Conceptual Framework ........................................ 16
    A. Background ................................................. 16
    B. The Model .................................................. 18

IV. Exchange Rate Rules and Transition Issues ...................... 23
    A. Implications of the Analytical Model .......................... 23
    B. Estimation of Inflation Tax Maximizing
        Rate of Inflation (\pi^*) .................................. 24
    C. Exchange Rate Rules ........................................ 28
    D. Fiscal Policy and Other Transition Issues ..................... 31

V. Concluding Remarks ............................................ 33

Footnotes ......................................................... 35

References ......................................................... 38
I. INTRODUCTION

This paper discusses exchange rate rules and transition issues for Ghana. Ghana's economic fortunes deteriorated considerably during the last fifteen years or so. Real per capita income declined by 30 percent between 1970 and 1982, with officially reported production, including the key export commodities cocoa and gold, falling drastically. In the last decade Ghana has suffered triple-digit inflation (1977, 1981, 1983) and had inflation rates generally greater than 50 percent. This is cause for concern when viewed jointly with a black market foreign exchange premium frequently in excess of a thousand percent! Traditional models, which rely on the evasion of trade-related taxes as a motive for smuggling, and hence of the emergence of black markets for foreign exchange, would be hard put to explain premia of such magnitude. This paper provides an explanation for the emergence of black markets for foreign exchange in Ghana based on the notion that (relatively) stable foreign currency became a store of value in an environment marked by high and volatile inflation and growing diffidence in the domestic currency. While doing so, it tells an open economy story of inflation—and potential hyperinflation—in contrast to the more common closed economy models inspired by the work of Cagan (1956). By embedding the story in a dual exchange market framework, it simultaneously provides a rationale for the high black market exchange premia observed in Ghana over the last ten years or so. A model with officially rationed exchange markets, fiscal deficits financed by domestic credit creation, currency substitution and smuggling, which serves as the current account for illegal foreign asset accumulation, is justified on the
basis of empirical observation and then formally developed. Given serious
data limitations, the strategy of the paper is to hop back and forth between
economic reasoning and suggestive empirical illustration.

The following quotations from the *World Currency Yearbook, 1984*, give
some idea of the impact of currency black markets on the Ghanaian economy: 1/

> The horrendous budget deficits were financed ... (by) simply printing money.

> ... the pittance paid to cocoa farmers prompted the smuggling of as much as 40 percent of the
crop into neighbouring Togo and Ivory Coast (for) convertible currencies, the Cedi (Ghana's
currency) by now (1977) being worthless.

> By 1979, the Ghanaian economy was totally shattered, a society based on barter, graft,
smuggling and the endless turnover of consumer goods, which functioned as a store of value.

> As international prices for her commodities slid on, Ghana's economic collapse accelerated, and
almost all currency transactions (1982) shifted to the black market.

May (1985) estimates that the parallel market economy rose steadily
to account for 32.4 percent of official GDP in 1982. 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 effi-
ciency, the relevant nominal exchange rate for transactions and defining the
real exchange rate, the relationship between domestic inflation and parallel
exchange rate movements, the implications of the parallel market for nominal
exchange rate rules and managing the transition, the preconditions/path for
achieving a stable and unified exchange rate regime, etc. It is anticipated
that these issues will become increasingly important for Ghana during its
transition and movement toward structural adjustment, to echo themes of recent Ghana CEMs.

It will be argued that the real exchange rate, though a crucial relative price for resource allocation, has not been an issue over the last decade or so. This is partly because of the difficulty in choosing between the official and parallel nominal exchange rates in computing it; but more importantly, because with high and variable inflation, the information content of relative prices was low, confirming an empirical regularity observed elsewhere, e.g., Marquez and Vining (1984). The fundamental issue appears to have been an inconsistency between past fiscal and exchange rate policy, which it will be argued, was the prime reason for the emergence of a thriving black market for foreign exchange, rendered the official exchange rate irrelevant, and led to inflationary expectations being mirrored in the black market depreciation of the currency.

The paper is organized as follows: section II concerns itself with interactions between official and black market exchange rates on the one hand, and inflation and black market depreciation on the other, presenting data for 1974-84. Section III sets out a conceptual framework which attempts to capture the salient features of the Ghanaian economic context. This section is technical, and can be skipped without any loss in continuity. Nevertheless, it is necessary because the existing literature on dual exchange markets cannot directly be applied to the complex Ghanaian situation, especially in view of the questions raised above. Section IV summarizes the policy prescriptions inherent in the conceptual framework of the previous section, and presents estimates of the inflation tax maximizing rate of inflation, which is a key parameter according to the model of section III. This section also discusses major transition issues for Ghana. Section V concludes.

[pinto-ld]
One clarifying point must be made here. The cocoa sector is extremely important in Ghana, being a significant contributor to GDP, a major source of employment and consistently accounting for about 60 percent of Ghanaian exports. Its price is a key determinant of the external terms of trade, and it has been an important source of government revenue. In this analysis, however, its role is secondary, deriving largely from the ease with which it can be smuggled to neighboring countries for hard foreign currency, and leading thereby to increased reliance on the "inflation tax" for financing the fiscal deficit. Thus, a high black market premium increases the incentive for smuggling, implying less revenues for the government and more domestic credit—an expansion in domestic money—for financing the fiscal deficit. This is not to gainsay the importance of improved producer incentives for cocoa; but merely to emphasize that fluctuations in the international price of cocoa have not been the main issue as one might expect when a single primary commodity dominates export trade as cocoa has in Ghana. 2/

II. EMPIRICAL EVIDENCE ON EXCHANGE RATES AND INFLATION, 1974-84

A. Interactions Between Official and Black Market Exchange Rates

Officially, the cedi (₵) (as of October 1985) is on a managed float with an effective rate vis-a-vis the U.S. dollar ($); but in effect, Ghana has a dual exchange market, with the black market rate "freely" determined in an illegal parallel market. The official exchange rate was infrequently adjusted until October 1983. It was 1.15 ₵/$ until June 1978, when it was adjusted to 2.75₵/$. There has been a history of the imposition and subsequent abolition of various export premia and import surcharges; but these were of small
magnitude, especially compared to the black market premium, until May 1983 when massive export premia and import surcharges resulted in a de facto devaluation of about 800 percent. This was followed by an actual devaluation from 2.75¢/$ to 30¢/$ in October 1983. At the same time, the complex system of premia and surcharges was scrapped. The official rate today is 57¢/$, with a black market premium of 2.63, i.e., a black market rate of about 150¢/$.

There are no minimum reserve requirements of gold and foreign currency for the national currency. Although it is generally forbidden for private citizens to own foreign currencies or securities or maintain bank balances abroad, there is in fact a thriving black market for foreign exchange. 3/

Figure 1 graphs domestic inflation rates, the official cedi-dollar rate and the black market premium (defined as the ratio of the black market to the official exchange rate—actually, the premium plus 1.0) between 1974 and (June) 1985. In Figure 1, the left-hand vertical scale plots the inflation and official exchange rates, and is vastly different from the right-hand vertical scale, which plots the premium. 4/ The most interesting observation from Figure 1 is that the black market premium tracks the domestic inflation rate rather well. In 1982, however, they move in opposite directions. A plausible reason is that with the change in regime and strict enforcement of price controls, inflation dropped from 116 percent in 1981 to 22 percent; but, with the demonetization of the 50 cedi note and possible fears of the complex and drastic kind of currency reform of 1979, (for details, see World Currency Yearbook, 1984, pp. 288-295) the premium shot up, representing essentially a portfolio shift to foreign currency, possible capital flight, and suppressed inflation.

[imoto-ld]
OFFICIAL EXCH. RATE, BLACK MKT PREMIUM, AND INFLATION RATE

Source: IMF and World Currency Yearbook
Understanding the causes of domestic inflation is crucial in interpreting Figure 1. This is equivalent to asking why the purchasing power of the cedi declined so drastically in the last decade or so. Table 1 presents data on past fiscal deficits, inflation and the proportion of the deficit financed by external sources. The table suggests that the Ghanaian government relied heavily on the "inflation tax," i.e., expansion in domestic money, to finance its fiscal deficits, since external aid was limited and large increases in net domestic credit were required. There appears to have been a basic inconsistency between past fiscal and exchange rate policies. Thus, despite high rates of domestic inflation, the exchange rate was not adjusted until 1983. Its overvaluation has been evident in the black market premium and in the rationing of officially available foreign exchange through a stringent import licensing system. Table 2 provides more evidence on inflation in Ghana, showing that it has been highly volatile between 1974 and 1984. This is evident from the coefficient of variation for monthly inflation in the last column. A credible hypothesis is that the decline in the purchasing power of the cedi through high and sustained inflation made goods an attractive store of value. With the relatively stable and convertible CFA franc accessible by smuggling, it is plausible that foreign currency also became an attractive store of value. In fact, it is easy to argue that stable foreign currency is preferable as a store of value to goods owing to lower risk of detection and costs of storage. Thus, although there have been periodic episodes of forced dishoarding of goods and strict but erratic enforcement of price controls in the past, attempts to mop up foreign currency have taken milder means such as the opening of foreign currency shops, granting special licenses for imports and using a "no questions asked" approach for opening foreign currency accounts. A plausible set of
### Table 1: FISCAL DEFICITS AND INFLATION

<table>
<thead>
<tr>
<th>Year</th>
<th>Deficit/GDP (%)</th>
<th>Proportion of Deficit Externally Financed (%)</th>
<th>Rate of Inflation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975/76</td>
<td>14.20</td>
<td>0.00</td>
<td>42.70</td>
</tr>
<tr>
<td>1976/77</td>
<td>11.50</td>
<td>0.00</td>
<td>81.93</td>
</tr>
<tr>
<td>1977/78</td>
<td>12.10</td>
<td>3.31</td>
<td>104.04</td>
</tr>
<tr>
<td>1978/79</td>
<td>7.40</td>
<td>0.00</td>
<td>79.80</td>
</tr>
<tr>
<td>1979/80</td>
<td>5.09</td>
<td>16.59</td>
<td>23.62</td>
</tr>
<tr>
<td>1980/81</td>
<td>8.03</td>
<td>7.80</td>
<td>102.40</td>
</tr>
<tr>
<td>1981/82</td>
<td>5.99</td>
<td>8.02</td>
<td>64.17</td>
</tr>
<tr>
<td>1982</td>
<td>4.54</td>
<td>5.42</td>
<td>22.30</td>
</tr>
<tr>
<td>1983</td>
<td>6.46</td>
<td>5.56</td>
<td>122.83</td>
</tr>
<tr>
<td>1984</td>
<td>1.75</td>
<td>37.57</td>
<td>39.60</td>
</tr>
</tbody>
</table>

**Notes:**

1. Deficit is "Overall Deficit" as reported in Ghana--Recent Economic Developments, IMF, various issues. Deficit for 1983 includes a one-time transfer to the Cocoa Board. Figures for 1983 and 1984 are provisional.

2. Fiscal years 1975/76 to 1981/82 are on a July-June basis and GDP is computed by averaging adjacent years' GDP.

3. Inflation rates for 1975/76 to 1981/82 are calculated as the percentage change in CPI averaged over the fiscal years, i.e., July-June.

Table 2: VARIABILITY IN INFLATION

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Monthly Inflation Rate (%)</th>
<th>Min. (%)</th>
<th>Max. (%)</th>
<th>Standard Deviation</th>
<th>Coefficient of Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>1.26</td>
<td>-2.05</td>
<td>3.60</td>
<td>1.73</td>
<td>1.37</td>
</tr>
<tr>
<td>1975</td>
<td>2.88</td>
<td>1.24</td>
<td>6.83</td>
<td>1.65</td>
<td>0.57</td>
</tr>
<tr>
<td>1976</td>
<td>4.15</td>
<td>0.58</td>
<td>10.10</td>
<td>2.62</td>
<td>0.63</td>
</tr>
<tr>
<td>1977</td>
<td>6.76</td>
<td>-8.73</td>
<td>22.79</td>
<td>8.99</td>
<td>1.33</td>
</tr>
<tr>
<td>1978</td>
<td>6.36</td>
<td>1.43</td>
<td>11.41</td>
<td>3.17</td>
<td>0.50</td>
</tr>
<tr>
<td>1979</td>
<td>1.66</td>
<td>-15.17</td>
<td>8.93</td>
<td>7.24</td>
<td>4.36</td>
</tr>
<tr>
<td>1980</td>
<td>5.43</td>
<td>1.10</td>
<td>11.18</td>
<td>3.04</td>
<td>0.56</td>
</tr>
<tr>
<td>1981</td>
<td>6.00</td>
<td>2.32</td>
<td>13.17</td>
<td>3.30</td>
<td>0.55</td>
</tr>
<tr>
<td>1982</td>
<td>1.40</td>
<td>-9.38</td>
<td>7.94</td>
<td>4.64</td>
<td>3.31</td>
</tr>
<tr>
<td>1983</td>
<td>7.97</td>
<td>-7.77</td>
<td>23.45</td>
<td>8.48</td>
<td>1.06</td>
</tr>
<tr>
<td>1984</td>
<td>0.57</td>
<td>-6.57</td>
<td>6.12</td>
<td>3.78</td>
<td>6.59</td>
</tr>
</tbody>
</table>

Source: IFS, IMF.
hypotheses, therefore, is that with the declining attractiveness of the cedi as a store of value, inflationary expectations were mirrored in the black market depreciation of the cedi; and further, that with goods and foreign currency serving as alternative stores of value, factors distorting the black market rate such as capital flight, lack of business confidence, risk premia since foreign exchange transactions by private individuals are illegal, etc., were ultimately reflected in domestic inflation. In other words, black market depreciation represented the differential rate of return between holding cedis on the one hand, and goods or foreign currency on the other, with some form of uncovered arbitrage between rates of return on the latter two. With the official exchange rate fixed for most of this period, a black market depreciation implied a higher black market premium, and consequently, increased incentives for smuggling, which served essentially as the "current account" for illegal asset accumulation. With the subsequent erosion in the tax base, the reliance of the government on the inflation tax to finance its fiscal deficit was only increased. Some evidence is now presented to show that the data are consistent with the set of hypotheses mentioned above.

B. Black Market Depreciation and Domestic Inflation

In Figure 2, the quarterly depreciation in the black market rate and domestic inflation are plotted from 1976 to (June) 1985. As is to be expected, the depreciation in the black market is more volatile; but with some lead/lag, it mirrors the quarterly inflation rate, with the exception of the last quarter of 1982, for which a possible explanation has been provided above.

Economic theory would suggest that with a fixed overvalued rate of exchange and an illegal parallel market where the rate is determined by market forces, the relevant rate of exchange for portfolio shifts and traded goods is
QUARTERLY BLACK MARKET RATE DEPRECIATION AND INFLATION

Sources: IMF and World Currency Yearbook
the black market rate, since it is the marginal cost of foreign exchange. Further, since goods and stable foreign currency are alternative stores of value in times of inflation, some arbitrage would take place between the two. In small, open economies with freely floating rates, the domestic rate of inflation is the world rate of inflation plus the rate of depreciation of the domestic currency. In view of this, and the above economic reasoning, a comparison was made between the Ghanaian rate of inflation and the depreciation in the black market plus the "world" rate of inflation, which is presented in Table 3. To rigorously test the hypothesis that the Ghanaian rate of inflation on average equals the world inflation rate plus black market depreciation, two factors would have to be taken into account: first, the simultaneity between the inflation rate and black market depreciation; and second, the complex and variable structure of lags bound to exist in the relationship between the two variables. A suggestive test, which abstracts from both factors, looks at the cumulative sums in the rates of change of the variables. It can be calculated from Table 3 that the cumulative depreciation in the black market rate, i.e., the sum of the annual rates of depreciation, was 598 percent over 1975-84, while cumulative domestic inflation was 681 percent. If one proxies the world rate of inflation by the average rate of inflation in industrial countries, the cumulative sums are much closer. Although in individual years (with the exception of 1975, 1976, and 1984) the discrepancy between the numbers in the two relevant columns of Table 3 has been large, over the ten-year period, domestic inflation has roughly equaled the depreciation in the black market plus world inflation. This is demonstrated vividly in Figure 3, which depicts the two rates cumulatively. In addition, the (semilogarithmic) growth rates of the domestic CPI, "world" [pinto-ld]
### Table 3: Ghanaian and World Inflation, and Real Exchange Rates

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation of Cedi</th>
<th>World Inflation</th>
<th>World Inflation plus Official Blk. Mkt. Rate Dep.</th>
<th>Domestic Inflation</th>
<th>Real Exchange Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Official Rate</td>
<td>Black Mkt. Rate</td>
<td>Rate</td>
<td>Rate</td>
<td>Rate</td>
</tr>
<tr>
<td>1975</td>
<td>0.00</td>
<td>15.03</td>
<td>11.1</td>
<td>26.13</td>
<td>29.82</td>
</tr>
<tr>
<td>1976</td>
<td>0.00</td>
<td>46.23</td>
<td>8.3</td>
<td>54.53</td>
<td>56.08</td>
</tr>
<tr>
<td>1977</td>
<td>0.00</td>
<td>216.15</td>
<td>8.4</td>
<td>224.55</td>
<td>116.45</td>
</tr>
<tr>
<td>1978</td>
<td>53.35</td>
<td>-2.71</td>
<td>7.2</td>
<td>4.49</td>
<td>73.10</td>
</tr>
<tr>
<td>1979</td>
<td>55.93</td>
<td>73.85</td>
<td>9.1</td>
<td>82.95</td>
<td>54.42</td>
</tr>
<tr>
<td>1980</td>
<td>0.00</td>
<td>7.33</td>
<td>11.9</td>
<td>19.23</td>
<td>50.09</td>
</tr>
<tr>
<td>1981</td>
<td>0.00</td>
<td>57.18</td>
<td>9.9</td>
<td>67.08</td>
<td>116.49</td>
</tr>
<tr>
<td>1982</td>
<td>0.00</td>
<td>134.92</td>
<td>7.5</td>
<td>142.42</td>
<td>22.30</td>
</tr>
<tr>
<td>1983</td>
<td>580.00</td>
<td>24.18</td>
<td>5.0</td>
<td>29.18</td>
<td>122.87</td>
</tr>
<tr>
<td>1984</td>
<td>92.40</td>
<td>26.01</td>
<td>4.8</td>
<td>30.81</td>
<td>39.70</td>
</tr>
</tbody>
</table>

**Notes:**

1. "World inflation" is proxied by the average rate of inflation in industrial countries.

2. Depreciation of cedi is based on the cedi-dollar rate. The official rate for 1983 reflects export premia/import surcharges.

**Sources:** IFS, IMP; and World Currency Yearbook.
CUMULATIVE BLK MKT RATE DEPRECIATION AND GHANAIAN INFLATION

Figure 3

Source:IFS and World Currency Yearbook
CPI and black market rates were calculated over 1974–84 to approximate the average annual rates of domestic inflation, world inflation and black market depreciation, respectively. These rates were 51.8 percent (domestic inflation), 8.2 percent (world inflation) and 42.4 percent (black market depreciation). Consequently, the average annual rate of domestic inflation at 51.8 percent was approximately the sum of the average annual rates of change of the other two variables at 50.6 percent over the ten-year period. This suggests further that the real exchange rate showed no perceptible trend over the last decade. An index of the real exchange rate, defined as the "world" CPI times the black market rate divided by the Ghanaian CPI, is shown in the last column of Table 3, and confirms this suspicion. The real exchange rate is "noisy," alternately appreciating (falling) and depreciating (rising). This is consistent with the high and variable inflation depicted in Table 2, which would suggest that relative prices conveyed little information of use to investors and producers.

The above is not surprising. It essentially supports the notion that the black market rate is the relevant rate of exchange. Although transactions do take place at the official exchange rate, owing to re-selling, the official rate is little more than a benchmark for a tax-subsidy scheme, representing a transfer from exporters to importers and serving as an incentive both for rent-seeking and smuggling. One should, however, be extremely cautious 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; but more importantly, because for policy prescription, it is essential to examine the determinants of the black market premium. The crucial variable here is the decline in the purchasing power of the cedi.
combined with inconsistent fiscal and exchange rate policies in a sense made precise in the model of the next section. In sum, therefore, while the above analysis points convincingly to overvaluation, it does not indicate, or provide a basis, for determining the extent of overvaluation. The black market premium is an endogenous variable responding to inflationary expectations, official policy, uncertainty and instability in the economic and business environment. With the inception of the Economic Recovery Program in April 1983, budget deficits have been slashed, inflation lowered and several official exchange rate adjustments made. This is reflected in a dramatic decline in the black market premium as is evident from Figure 1.

III. CONCEPTUAL FRAMEWORK

A. Background

The literature on dual exchange markets has traditionally assumed that current, or commercial, transactions are conducted through official channels at a fixed exchange rate, while capital transactions take place through a paralleled market where the exchange rate floats freely. Lizondo (1984) extends this literature by assuming that in addition to capital transactions, a certain fraction of current transactions also go through the parallel "free" market. Thus, while the official market may handle government transactions, priority imports and traditional exports, all other current transactions as well as private capital transactions are channeled through the free market. Lizondo's model, while elegant, has one crucial drawback: the fraction of commercial transactions going through the free market is exogenously given, being administratively determined by the Central Bank. As a result, the earlier work on dual exchange markets (an exhaustive list of...
references is cited by Lizondo) as well as the extension contained in Lizondo (1984) are not directly applicable to the situation one frequently encounters in LDCs: flourishing black markets for foreign exchange funded by smuggling, and officially rationed exchange markets. The ability of the authorities to segment the free and official markets that is implicit in this literature is belied in practice. Nowak (1984) attempts to remedy this by emphasizing the incentives for smuggling and the existence of quantitative restrictions on payments through official channels.

With the exception of Nowak (1984), existing dual exchange market models do not assume official rationing, so that the official market clears through some combination of changes in reserves and exchange rates. Many LDCs have highly depleted reserve levels, however, and devaluations may not be acceptable as solutions. The response to sustained balance of payments deficits is often to introducte administrative allocation of exchange and impose severe restrictions on the issuance of import licenses. Since it is typically illegal for private citizens in such countries to hold foreign exchange, a black market arises which is funded by the proceeds from smuggling. The incentive for smuggling arises from a black market premium for foreign exchange, which partly reflects official overvaluation. 6/

The model presented below is based on Lizondo (1984), but differs in two important respects: that of official exchange rationing, and smuggling. Consequently the fraction of officially channeled exports is endogenously determined. The model thus combines Lizondo's basic framework with elements of Nowak's (1984) analysis. It differs from Nowak in terms of simplicity and focus: non-traded goods are abstracted from, thereby avoiding the need for modelling resource and spending allocations between traded and non-traded
goods. This implies that the real exchange rate is not considered, a justification for which has been provided in Section II. Essentially, the incentive effects of relative prices are abstracted from, not because they are irrelevant, but because they are not the main issue in view of the high and volatile inflation in Ghana. Nowak (1984) focuses exclusively on devaluations. The model of the next section, on the other hand, is amenable to the modelling of inflationary expectations, and can be used to bring out rather graphically the implications of inconsistency between fiscal and exchange rate policy. Finally, it permits an important distinction between once-and-for-all devaluations and increases in the rate of devaluation (crawl), shown to be crucial in an inflationary context. The discussion abstracts from the issues of rent-seeking and the allocative inefficiencies introduced by the existence of stringent import licensing. 7/

B. The Model

With the exception of 1983 and 1984, which mark the inception of the Economic Recovery Program in Ghana, fiscal deficits have been financed largely by recourse to domestic debt, as is obvious from Table 1. The response to declining foreign reserves has not generally included devaluations, once again with the exception of post-1983. Faced with depleted reserves, foreign exchange has been administratively allocated via a system that issues import licenses to the tune of projected export earnings, thereby keeping reserves intact.

The model accordingly has the following features: (1) a fiscal deficit financed by domestic credit creation, (2) officially rationed exchange markets, in such a way that the foreign currency value of reserves is held constant, (3) a fixed exchange rate with some rate of crawl (depreciation),
(4) the smuggling of exports and imports, the fraction of smuggled exports being determined by the black market exchange premium, and the volume of smuggled imports by the difference between desired imports and officially made available exchange for imports. Essentially, the model gives a conceptual framework for examining the consistency between fiscal and exchange rate policies. The black market premium, defined as the ratio of the black market to the official exchange rate, is endogenously determined, responding to fiscal deficits, inflationary expectations and desired portfolio holdings of domestic and foreign currency.

Consider a small, open economy producing a single traded good entirely for the export market. Domestic expenditure by the residents and the government is only on imports. Foreign prices are normalized to unity so that domestic (purchase) prices are equal to the exchange rate. Capital transactions and the holding of foreign currency by private residents are illegal. Accordingly, all exports are expected to go through official channels, with foreign exchange being surrendered to the Central Bank in exchange for domestic currency. In practice, however, there is a black market for foreign exchange. A fraction of exports, \( u \), goes through the black market, providing a source for the accumulation of foreign assets. The fraction \( u \) is a function of the premium in the black market, denoted \( \phi \), and defined as the ratio of the black market exchange rate, \( b \), to the official rate \( E \), i.e., \( \phi = b/E \).

In keeping with the standard assumptions on smuggling, we assume \( u(\phi) \) exhibits \( u(\phi) = 0, \phi \in [0,1] \), and for \( \phi > 1 \), \( u'' > 0 \), \( u'' < 0 \) and \( \lim_{\phi \to +\infty} u(\phi) = 1 \). These features capture the notion of increasing marginal costs associated with smuggling, and ensure, except for extreme cases, that some positive fraction of commercial transactions always goes through official channels. The
exchange rate regime is marked by a fixed rate with $E$ depreciating at a rate of crawl, $\pi$.

Domestic residents hold two non-interest bearing assets: domestic money, $M$, and foreign money, $F$, the latter illegally. Continuous asset-market clearing and perfect foresight give us the portfolio balance condition:

$$M = \frac{\lambda(b/b)}{1-\lambda(b/b)} \cdot bF, \quad \lambda < 0,$$

where $\lambda$ is the fraction of total wealth, $(M+bF)$, held as domestic money, and $b/b$ is the rate of depreciation of the domestic currency in the black market. Government spending, $g$, and taxes, $t$, are fixed in terms of imported goods. The deficit, $(g-t)$, is financed by domestic credit, $D$. Official international reserves, $R$, are effectively exogenous as a result of official exchange rationing. We assume that this is done in such a way that $R^*=0$. Further, changes in the value of reserves following official exchange rate adjustments are not monetized, in keeping with Ghanaian practice. Consequently, we have

$$\dot{M} = (E\dot{R}) + \dot{D} = 0 + E(g-t).$$

Since $\dot{R} = 0$, the amount of official exchange available for private imports is given by:

$$I^* = (1-u) y - g,$$

[pinto-ld]
where \( y \) is total output, \( g \) is the amount of foreign exchange set aside for government spending, and the argument of \( u(.) \) has been omitted. 9/ Private nominal spending is a fixed proportion, \( a \), of nominal financial wealth. Accordingly, the current account for the black market is given by

\[
(4') \quad \bar{F} = uy - \left\{ \frac{a (M + bF)}{b} - I^o \right\},
\]

where the expression in brackets is the amount of imports going through the black market. Combining equations (3) and (4') gives:

\[
(4) \quad \bar{F} = y - \frac{a (M + bF)}{b} - g,
\]

which is just the current account for the economy as a whole. Defining \( m \equiv M/E \) and since \( \phi \equiv b/E \), (1), (2) and (3) can be rewritten:

\[
(5) \quad m = \frac{\lambda (\dot{\phi}/\phi + \pi)}{1 - \lambda (\dot{\phi}/\phi + \pi)} \cdot \phi F
\]

\[
(6) \quad \dot{m} = (g - t) - m \pi
\]

\[
(7) \quad \bar{F} = y - a \left( \frac{m}{\phi} + F \right) - g.
\]

The steady-state solution based on (5)-(7) with \( \pi = \pi^* \), a pre-announced rate of crawl, is given by: 10/

\[
(8) \quad m^* = (g - t)/ \bar{\pi}
\]

\[
(9) \quad F^* = (1 - \lambda (\bar{\pi})) \cdot \frac{y - g}{a}
\]
The first observation from (8) - (10) is that in the steady state, b and E depreciate at the rate \( \bar{\pi} \), which is also the steady state rate of inflation. It is also immediate from (8) that in the steady state, the deficit \((g - t)\) is financed by the inflation tax, \( m^* \). The premium, \( \phi^* \), depends upon the propensity to spend on imports, portfolio balance, official devaluation rate, and an expression \(((g - t)/(y - g))\) which looks very much like the deficit/GDP ratio. 11/

Consider now the comparative static expressions:

\[
(11a) \quad \frac{d\phi^*}{dg} = \frac{a}{\lambda(\bar{\pi})} \cdot \frac{y - t}{(y - g)^2} > 0
\]

\[
(11b) \quad \frac{d\phi^*}{d\bar{\pi}} = \frac{a \cdot (g - t)}{y - g} \cdot \frac{(\eta - 1)}{\lambda(\bar{\pi})^2} \quad > 0 \text{ if } \eta > 1
\]

According to (11a), a reduction in government spending lowers the black market premium. This occurs essentially to restore portfolio balance, and is intuitively clear. On the other hand, an increase in the rate of crawl has an ambiguous effect on the premium: in (11b), \( \eta = \lambda'(\bar{\pi}) / \lambda(\bar{\pi}) \) is the elasticity of demand for money, \( M \), with respect to the expected rate of inflation (crawl). If this exceeds 1.0, an increase in \( \bar{\pi} \) actually raises the premium, and vice-versa. 12/ This is an interesting result, since \( \eta > 1 \) implies that the inflation rate exceeds its revenue (inflation tax) maximizing level. Finally, note that a once-and-for-all devaluation of \( E \), while having temporary effects, does not influence the steady state levels of \((m, F, \phi)\).

An inconsistency between fiscal and exchange rate policy can now be defined with respect to the model. It is a situation characterized by \((g - t)\)
> 0 and $\pi = 0$, i.e., the government runs a deficit, but refuses to devalue.

Since domestic money is increasing (equation (2)), it follows that the only way the inflation tax can be generated is for inflation to take place via depreciation in the black market, which is also required for portfolio balance (equation (1)). Since the official exchange rate is fixed, the premium grows, and expected inflation, $\pi^e$, must therefore satisfy $\pi^e = (b/b) = (\phi/\phi)$. Consequently, there is no steady state solution for the black market premium, $\phi$.

Consider now the more realistic case where taxes, $t$, instead of being exogenous are a function of the fraction of transactions going through official channels. It follows that as the premium rises, fewer transactions go through official channels, i.e., $t = t(\phi)$, $t' < 0$. To maintain a given level of government spending, therefore, the rate of increase of money supply will have to go up since $t$ is going down in equation (2). Clearly, such a situation is not indefinitely sustainable. Ultimately, government spending will have to be reduced, the official exchange rate devalued, or both. In other words, fiscal policy is inconsistent with the exchange rate rule $\pi = 0$.

IV. EXCHANGE RATE RULES AND TRANSITION ISSUES

A. Implications of the Analytical Model

The features of the model are described in the first few paragraphs of Section III. It implies the following:

a) a reduction in the fiscal deficit (which is perceived as permanent) will lower the inflation tax, hence inflationary expectations, and result in a lower black market premium;

b) a once-and-for-all devaluation, while perhaps having temporary salutary effects, will not affect the premium in the long run unless
deficits are simultaneously (or first) reduced;
c) an increase in the rate of depreciation (crawl) in a situation where inflationary expectations are high, i.e., where the inflation elasticity of demand for domestic money balance exceeds unity, will actually increase the black market premium instead of creating a unifying trend.

Though not immediate from the model, the following additional conclusions can be drawn:

d) an exogenous increase in capital inflows through, say, concessional aid, will for a given rate of crawl lower the reliance on the inflation tax and result in a reduced black market premium. (This can be effectively captured in the model of Section III by setting \( R < 0 \).)
e) if all goods (imports) are resold, the ultimate price will reflect the black-market exchange rate. Consequently, a once-and-for-all devaluation, when either preceded or accompanied by a credible reduction in the fiscal deficit, will not only be non-inflationary, but will cause a permanent lowering of the black market premium;
f) given strictly enforced minimum wage laws and the impossibility of laying off workers in slack periods, a devaluation will not affect the real wage.

B. **Estimation of Inflation Tax Maximizing Rate of Inflation (\( \pi^* \))**

The inflation rate which maximizes the revenue from the inflation tax was identified by the model of Section III, B as a crucial parameter, with important implications for exchange rate rules. An attempt was made to estimate this for Ghana. 13/
In steady-state equilibrium with constant real income and population, the inflation tax is the inflation rate times the real stock of non-interest-bearing money, since this represents the reduction in the purchasing power of privately held cash balances and accrues to the issuer of money. Strictly speaking, however, the inflation tax is the real stock of money times the growth rate of nominal money (see Friedman (1971)). In this case, the revenue from the inflation tax, \( V \), is given by:

\[
(12') \quad V = \frac{M}{P} \cdot g_M,
\]

where \( M \) is the nominal stock of money, \( P \) the price level and \( g_M \), the growth rate of nominal money. Assume that the demand for real balances per capita is given by \( m^D = m(\pi) \cdot y, \ m' < 0 \), where \( y \) is per capita real income and \( \pi \) is the rate of inflation. Then, with instantaneous clearing in the money market, \( g_M = (\pi + \hat{y} + \hat{N}) \), where \( N \) is population and "\( \hat{\} \)" denotes proportionate change, since \( M^D = N \cdot P \{m(\pi) \cdot y\} \). This expression for \( g_M \) holds for alternative steady state rates of inflation. Substituting for \( g_M \) in (12') gives:

\[
(12) \quad V = \frac{M}{P} (\pi + \hat{y} + \hat{N}).
\]

There are several problems in attempting to estimate \( \pi^* \), the rate of inflation which maximizes \( V \), for Ghana. First, there is the question of what nominal money stock to use. Real interest rates have been negative and large through most of the last decade. Further, the government has borrowed not just from the Bank of Ghana, but also the commercial banks. It was decided to handle this by using three alternative definitions of \( M \) in computing \( V \): \( M \) (currency with non-bank public plus reserves of commercial banks with Bank of [pinto-ld])
Ghana); M1 (currency with non-bank public plus private demand deposits); and M2 (M1 plus private time deposits). Second, there is the issue of how to treat the rather drastic currency reforms of 1979 and 1982, which amounted to forced saving. This was ignored, an extenuating circumstance being that currency reform would lead to a higher depreciation in the black market and ultimately, to higher domestic inflation. Third, real per capita income has been falling during the period, at an annual rate of about 2.9 percent (30 percent over 1970-82). This, however, is almost neutralized by an annual population growth rate of 2.6 percent. In view of the high rates of domestic inflation, it was decided to approximate V by the expression \( V = (M/P) \cdot \pi \), i.e., to treat \( (\hat{y} + \hat{N}) = 0 \) in (12). Fourth, strictly speaking, the inflation tax over a period of time is an integral. It was decided to approximate this integral over each year by defining the average holdings of \((M/P)\) by its value as of June 30, i.e., either MO, M1 or M2 as of June 30 divided by the CPI for June. The rate of inflation, \( \pi \), would be given by the percentage change in the CPI over the year, i.e., the percentage change from December to December. Table 4 presents V when computed using MO and \( \pi \) as the December-to-December change in the CPI. Inflation, when computed on a December-December basis, was triple-digit in 1977, 1978, 1981 and 1983. An interesting observation is that the inflation tax for inflation rates towards the end of the period 1968-84 was much lower than for comparable (and even considerably lower) rates of inflation towards the middle of the period, indicating diminishing returns to using the inflation tax excessively as a source of revenue.
Table 4: INFLATION TAX (V) AND THE RATE OF INFLATION (π): 1968-84

<table>
<thead>
<tr>
<th>Year</th>
<th>V (Millions of 1980 cedis)</th>
<th>π</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>590.19</td>
<td>12.40</td>
</tr>
<tr>
<td>1969</td>
<td>161.09</td>
<td>3.28</td>
</tr>
<tr>
<td>1970</td>
<td>41.98</td>
<td>0.71</td>
</tr>
<tr>
<td>1971</td>
<td>606.73</td>
<td>10.88</td>
</tr>
<tr>
<td>1972</td>
<td>792.76</td>
<td>12.66</td>
</tr>
<tr>
<td>1973</td>
<td>1,956.87</td>
<td>25.35</td>
</tr>
<tr>
<td>1974</td>
<td>1,354.07</td>
<td>16.09</td>
</tr>
<tr>
<td>1975</td>
<td>3,675.93</td>
<td>40.38</td>
</tr>
<tr>
<td>1976</td>
<td>5,643.27</td>
<td>62.43</td>
</tr>
<tr>
<td>1977</td>
<td>6,070.17</td>
<td>110.84</td>
</tr>
<tr>
<td>1978</td>
<td>6,924.74</td>
<td>108.48</td>
</tr>
<tr>
<td>1979</td>
<td>873.47</td>
<td>18.29</td>
</tr>
<tr>
<td>1980</td>
<td>3,918.37</td>
<td>87.84</td>
</tr>
<tr>
<td>1981</td>
<td>3,177.00</td>
<td>100.22</td>
</tr>
<tr>
<td>1982</td>
<td>562.62</td>
<td>16.79</td>
</tr>
<tr>
<td>1983</td>
<td>2,902.85</td>
<td>142.42</td>
</tr>
<tr>
<td>1984</td>
<td>105.48</td>
<td>6.28</td>
</tr>
</tbody>
</table>

Source: IFS, IMF. The inflation rate is on a December-December basis. See text.
To estimate $\pi^*$, it was decided to fit a curve of the type.

\[
V = a\pi + b\pi^2,
\]

where the a priori signs of the coefficients are indicated below them.

$\pi^*$ would then be given by solving the first order condition $dV/d\pi = 0$,

yielding $\pi^* = -\bar{a}/2\bar{b}$, where $\bar{a}$ and $\bar{b}$ are the estimated values of $a$ and $b$. 14/

The estimation results are summarized in Table 5. The estimates of $\pi^*$ are fairly close to each other, at about 95% annually. Inflation rates in Ghana have been in excess of this in four years over the sample period as is evident from Table 4.

C. Exchange Rate Rules

Suppose in 1983, with the inception of the Economic Recovery Program (ERP), it was decided that in addition to a large devaluation, Ghana should move to a crawling peg designed to keep the official real exchange rate constant and lower the black market premium. This would have implied a rate of crawl equalling or exceeding the domestic rate of inflation. In 1983, the inflation rate was in excess of a 100 percent, i.e., given the estimate of $\pi^*$ at about 95 percent, the elasticity of cedi money balances with respect to inflation probably exceeded unity. Equation (11b) would then imply that rather than creating a unifying trend, this rule would have increased the black market premium and led ultimately to higher inflation, matching the increased rate of crawl. Persistent application of the rule, therefore, might very well have resulted in a growing premium and a self-feeding inflationary process, culminating possibly in hyperinflation and sabotaging the Economic Recovery Program.

[pinto-ld]
Table 5: ESTIMATION RESULTS FOR $\pi^*$

<table>
<thead>
<tr>
<th>Definition of Money Stock</th>
<th>$a$</th>
<th>$b$</th>
<th>$\pi^*$</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>M0</td>
<td>102.33</td>
<td>-0.5296</td>
<td>96.61%</td>
<td>0.7972</td>
</tr>
<tr>
<td></td>
<td>(6.93)</td>
<td>(-4.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M1</td>
<td>119.90</td>
<td>-0.6350</td>
<td>94.41%</td>
<td>0.7845</td>
</tr>
<tr>
<td></td>
<td>(6.96)</td>
<td>(-4.14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>167.02</td>
<td>-0.9221</td>
<td>90.56%</td>
<td>0.7794</td>
</tr>
<tr>
<td></td>
<td>(7.30)</td>
<td>(-4.53)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Numbers in parentheses are t-statistics.

Source: IFS, IMF.

The black market premium in the model of Section III Part B depended in equilibrium on the fiscal deficit, the announced rate of crawl (inflation) and portfolio balance. Further, its value could only be temporarily affected by a once-and-for-all devaluation. Given the initial conditions at the time of starting the ERP, therefore, the reasoning throughout this paper would suggest that the logical sequence in a stabilization and adjustment program would be:

1. reduce deficits as a percentage of GDP
2. large once-and-for-all devaluation
3. once inflation is low and stable, introduce a crawling peg.

Steps 1 and 2 can be done simultaneously. This is in keeping with what actually took place in Ghana. Since April 1983, two major changes have
occurred in the policy environment: deficits have been slashed and a massive exchange rate adjustment has been made. Our reasoning suggests that the policymakers have embarked on the "right" path, in terms of the sequence of measures taken. Inflation has subsided. Discussion with several businessmen and bankers suggest that the crucial factors influencing a downward trend in the premium are increased output and higher purchasing power of the cedi, which is tantamount to lower expected inflation. A crawling peg is best instituted when inflation has subsided, and is stable. There is still the question of how the rate of crawl should be determined. A rate of crawl that equals the difference between foreign and domestic inflation would essentially mirror the black market depreciation of the cedi, at least on an average over longish periods of time. The model and empirical evidence would suggest that this is the logical choice, rather than a rule based on the black market premium, which relates to the levels of the black market and official rates, rather than rates of depreciation. A rule based on the difference between the levels of the two rates could backfire and lead to higher inflation.

Finally, although a detailed treatment is beyond the scope of this paper, some comments are in order regarding the welfare costs of inflation (for a seminal treatment, see Bailey (1956)). While governments may find it an easy option to resort to inflationary finance rather than cut the fiscal deficit, reaching a situation where the inflation tax is maximized has severe, adverse welfare consequences. It leads to confusing signals in relative prices (as Table 3 showed) and to a situation where trading becomes much more attractive than production. Excessive reliance on the inflation tax is self-defeating, as more and more transactions move to parallel channels.
D. Fiscal Policy and Other Transition Issues

Given the sharp policy changes since April 1983, a number of issues arise which have either not been adequately studied, or for which reliable data have not yet been collected. In addition to the exchange rate adjustment, preliminary analysis indicates that the following factors are extremely important:

1. **Sustainability of deficit reduction**

Deficits have been slashed as a result of the ERP. Inflation has slowed down because of this, as well as good rains and capital inflows from abroad related to the ERP. Consequently, deficits have been reduced through a combination of lower spending, higher revenues and capital inflows. Since past fiscal deficits have been the major source of Ghana's present problems, the issue of the sustainability of the current reductions is of paramount importance.

2. **Domestic credit to private sector**

Bankers assert that the cedis in the banking system are just a fraction of the total amount of cedis with the public. In view of the large devaluation that has already taken place, it is not clear whether domestic credit is adequate. There are two possibilities. The first is that the bankers are right in asserting that there is a great deal of currency (cedi) hoarding. In this case, the problem is one of intermediation, caused by lack of confidence in the banking system owing to the earlier seizure and freezing of cedi accounts and the attendant publicity. A related point pertains to interest rate policy. If, in fact, there is a serious confidence problem, then raising interest rates is going to raise the cost of borrowing without necessarily attracting new cedi deposits into the
banking system. The second possibility is that there is a liquidity problem. This is not merely because of the devaluation, but also because some of the aid import credit programs insist on a 100 percent cedi counterpart deposit with the banking system upfront. It is difficult to overemphasize the immediacy of this issue, if foreign credits extended are to be used as envisaged and the export drive is to be strengthened. The crucial point, as has been repeatedly stressed, is the fiscal deficit and its sustained monetary impact. It has never been seriously argued in the Ghanaian economic context that relatively the neglected private sector has had excessive access to domestic credit.

3. Confidence in the banking system

The importance of this is primarily with respect to Foreign Currency Accounts. Despite the July directive of the Bank of Ghana (BOG) to start such accounts, and the associated incentives (tax-free interest, secrecy, "no-questions-asked" approach) the response has been poor. The Bankers do not consider the interest differential between say, Lome and Abidjan on the one hand and Accra on the other as a factor influencing the location of foreign currency deposits, but rather the fear of a repetition of earlier events when cedi deposits were frozen and seized. Two impediments were mentioned: first, in a strict, legal sense, the BOG directive is counter to the Exchange Control Act of 1961, and hence, the holding of foreign currency deposits is against the law; second, convertibility and transferability of such accounts, if assured, would greatly enhance their attractiveness.
4. Exchange rate adjustment

There is scope for another exchange rate adjustment. Its magnitude will have to be carefully determined. Caution should be exercised in using the black market premium to estimate the required magnitude of devaluation. If a devaluation is inevitable, this is the best time to have one. Inflation is down, aid imports are up, several adjustment programs are underway, or being designed with crucial assumptions on the exchange rate. Not only are the current circumstances good for accommodating a devaluation, it would also eliminate a great deal of uncertainty.

V. CONCLUDING REMARKS

The basic issue in Ghana seems to have been an inconsistency between past fiscal and exchange rate policies. Excessive reliance on the inflation tax, combined with a fixed exchange rate policy, led to high rates of inflation and quite plausibly to a situation where both goods and stable foreign currency accessible by smuggling, became stores of value. As a result, inflationary expectations were mirrored in the black market depreciation of the cedi. It was shown, for example, that over a ten-year period, annual domestic inflation was on an average roughly equal to world inflation plus black market depreciation. Although it was argued that the black market rate is the relevant one, attention was also drawn to its being highly distorted.

Inflation rates in Ghana at the time of the ERP's inception appeared to have been in excess of the inflation tax maximizing rate. This had serious implications for exchange rate rules, and suggested that a logical sequence in
a stabilization and adjustment program would be a cut in fiscal deficits, devaluation and, only when inflation had subsided and was stable, the introduction of a crawling peg based on domestic-foreign inflation differentials. Finally, it was pointed out that the sustainability of recent cuts in the fiscal deficit, net domestic credit to the private sector and confidence in the banking system were key issues that needed detailed study.

A comment on exchange auctions: it has become fashionable in recent times to recommend them as a transitional mechanism in exchange rate adjustment. As of now, however, no satisfactory conceptual treatment of foreign exchange auction exists. If one views an auction as a rapid increase in the official rate of crawl, then it is clearly not to be recommended in a volatile, inflationary environment.

Money management techniques once learned, are not forgotten. The potential for cross-border trade and thereby the generation of hard foreign currency coupled with the inflation-black market depreciation and black market premium-smuggling links places constraints on the extent and duration of inconsistency between fiscal and exchange rate policy almost as surely as legal asset market integration with the external world would. The recognition of this by policymakers is implicit in the wide range of proposals under study for increasing confidence in the business environment and prompting economic activity, such as a modified investment code aimed both at domestic and foreign investors, the freeing up of import licensing procedures, etc. We end therefore on a sanguine note. The essential point that has been made is that Ghanaian economic agents are rational, behaving in a manner that economic theory would predict. If they respond to disincentives, there is every reason to believe, by symmetry, that they will respond positively to incentives.
Footnotes

1. The material in parentheses has been added by me.

2. For a study looking at cocoa in Ghana, see May (1985).

3. With the exception of the recent Bank of Ghana directive (July 1985) on foreign currency accounts, although many businessmen and bankers claim that in a strict legal sense, it contravenes the Exchange Control Act, 1961.

4. The premium for 1983 and 1984 is an underestimate compared to the black market rates reported in the Daily Graphic, Accra, dated December 18, 1984. Thus, the unofficial rates reported for 1983 and 1984 in the Daily Graphic were $150/€/$ and $170/€/$, respectively, while those in the World Currency Yearbook, on which the graph is based, were $76.58/€/$ and $96.50/€/$, respectively. It is not clear whether the Daily Graphic rate is an annual average or a point estimate. The World Currency Yearbook rates are annual averages.

5. We abstract from nominal interest rates in defining the differential rate of return because they were small in relation to expected inflation. More importantly, there is a strong feeling in contemporary Ghana that interests rates have been largely irrelevant in either influencing the form of store of value held (bank deposits vs. currency) or the location of deposits (Lome and Abidjan vs. Accra, with the new directive on foreign currency accounts). It is believed that interest rates pale in comparison with the lack of confidence in the domestic banking system caused by the seizure and freezing of bank assets in the past and the attendant publicity.
6. Dornbusch et al. (1983) model the black market for dollars in Brazil. Although partial equilibrium, the model does capture some of the important conclusions in Lizondo (1984). One of the difficulties in the Dornbusch et al. model in the Ghanaian context is that the current account for the black market has as an argument, the official real exchange rate, the justification being that the black market is small enough not to have general equilibrium consequences. Dornbusch (1985) presents a general equilibrium version, but is similar to Lizondo (1984) in assuming that the official and parallel markets can be administratively segmented, and in abstracting from official exchange rationing.

7. For an analysis of these aspects with regard to Ghana, see Ansu (1984) and May (1985).

8. The reader is reminded that all exchange rates are expressed as the number of units of domestic currency per unit of foreign currency.

9. We assume \((1-u)y \geq g\), effectively setting an upper bound on \(\phi\). Further, we assume \(y > g > t\).

10. As is conventional with perfect foresight models, the steady state solution will exhibit saddle-point stability. Notice that by equation (6), any \(\pi > 0\), given \((g-t) > 0\), will be consistent with equilibrium, i.e., (6) will always have a steady state solution for \(m\).

11. Interestingly enough, Lizondo's (1984) equilibrium expression for the black market premium does not include either the fiscal deficit or government spending.

12. This is essentially Lizondo's (1984) result. Note that since \(M\) has unit elasticity with respect to \(W\), it follows that \(\eta\) is also the elasticity of \(m\) with respect to \(\pi\).

[pinto-ld]
13. Some parts of this section are technical, but may be skipped.

14. Notice that this value of $\pi^*$ has the property that the inflation elasticity of demand for real money balances is unity. See also footnote 12.
References


[pinto-id]