Black Market Premia, Exchange Rate Unification, and Inflation in Sub-Saharan Africa

Brian Pinto

World Bank and International Monetary Fund (IMF) programs favor unification of official and black market exchange rates on the argument that multiple exchange rates misallocate resources. This article shows that such policy advice sometimes overlooks an important consideration when multiple rates are a means of taxation, the widened deficit from unification increases inflation. This article uses the experience of Ghana, Nigeria, and Sierra Leone to illustrate the tradeoff between the benefits of unification for resource allocation and its costs for inflation.

In some Sub-Saharan African countries, exchange rate overvaluation has created import license rents, a heavy tax on exports, and a bustling parallel market in foreign exchange, with black market exchange rates in some cases at levels several hundred percent over the official rates. Recent exchange rate reforms in Africa have thus emphasized the unification of official and black market exchange rates, often with the explicit goal of reducing black markets and minimizing black market premia on foreign exchange (Quirk and others 1987). World Bank and IMF programs have supported this move to unified exchange rates on the argument that multiple exchange rates misallocate resources. This article shows that this policy advice sometimes overlooks an important consideration when multiple rates are a means of taxation (as is well known from the literature on multiple rates, such as Dornbusch 1985, 1986), the increase in the deficit resulting from unification increases inflation. In Sierra Leone and Zambia, inflation surged with attempts to unify official and black market exchange rates. The welfare and political costs of inflation are high, undermining the credibility of reform and leading to policy reversals. There is thus a tradeoff between the benefits of unification for resource allocation and its costs.

The author is a senior financial officer with the Financial Operations Department of the World Bank. This article summarizes selected results of a two-year research project on exchange rate regimes in Africa conducted in the former Country Policy Department of the World Bank and is based on Pinto (1987a, 1987b). The following economists contributed to the ideas presented here: Christophe Chamley, Armeane Choksi, Vinod Dubey, Homi Kharas, Saul Lizondo, Marcelo Selowsky, and Sweder van Winbergen. T N Srinivasan and an anonymous referee helped substantially to clarify and improve the exposition.

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for inflation. A framework to evaluate this tradeoff is described here and used to interpret the unification experience in Ghana, Nigeria, and Sierra Leone.

A dual regime of official and black market exchange rates is conceptually similar to multiple exchange rates, but a few important differences need to be highlighted. First, the fiscal effect from a dual regime arises because the government’s foreign exchange transactions are made at an official price of foreign exchange that is lower than the market-clearing rate, not because foreign exchange is bought and sold at multiple official rates (as in Dornbusch 1985). The fiscal effect of unification depends on whether the government sells dollars to the private sector (as in Nigeria) or buys them (as in Ghana and Sierra Leone). For the net seller, unification would eliminate the subsidy on foreign exchange to the private sector, improving the deficit. For the net buyer, substantial revenues from the cheap purchase of export earnings could be lost, worsening the deficit. This article concentrates on the net buyer case, which is more common, with departures noted for Nigeria.

Second, the tax revenues from purchase of undervalued export earnings are not obvious in the fiscal accounts. Instead, these revenues are implicit—they reduce the government’s need to print money to cover the gap between spending and revenues. In effect, the premium of the free market rate over the official rate provides an alternative to using inflation (the tax on domestic money) to finance the fiscal deficit.

Third, unlike other tax rates—such as an import tariff of 30 percent—the premium is not arbitrarily fixed but is endogenously determined by the general equilibrium of asset and goods prices in the economy. Identifying the determinants of the premium is therefore important in examining the effects of unification.

I. The Black Market Premium, Inflation, and Real Exchange Rates

This section develops, in nontechnical terms, a framework for viewing the unification experiences in section II (a rigorous analytical treatment can be found in Pinto 1987a). The basic idea is simple: the fiscal deficit is financed partly by printing money and partly by the revenues from the government’s purchase of foreign exchange with the overvalued domestic currency, which serves as a tax on exporters. Gross revenue from the premium is an increasing function of the size of the wedge between the official and black market exchange rates. Unifying the official and black market rates obliterates this wedge so that the related revenues vanish. So, unless real government spending is simultaneously lowered or other compensating tax revenue raised, the fiscal deficit will widen. Given the time needed for fiscal reform and the limited menu of tax instruments available, the most likely outcome is that this additional deficit will be monetized, raising inflation. In short, unification takes away a
tax instrument, which in the absence of accompanying fiscal reform must be compensated for by the "inflation tax."

The analytical framework unfolds in five stages. The first discusses the nature of the exchange rate regime. The second develops the demand for domestic money in a currency-substitution context (Calvo and Rodriguez 1977). Third, the exchange rate regime and demand for money function are integrated with monetary financing of the fiscal deficit to present the tradeoff between the black market premium and inflation, the focus of this article. The fourth stage briefly discusses the real exchange rate, and the fifth summarizes the determinants of the premium.

**Exchange Rate Regime**

The official foreign exchange market is rationed through import licenses and capital controls. The government issues import licenses to equate official private sector import expenditures with expected legal export earnings (some exports and imports are smuggled) after subtracting its requirements for official imports and foreign debt service. As a result, official foreign exchange reserves remain constant—that is, there is no net official accumulation of or reduction in reserves. All official foreign exchange transactions, including the issuance of import licenses, are at the official exchange rate, $e$, which depreciates at a rate chosen by the government, $\dot{e}/e$. I write $e$ in units of domestic currency per unit of foreign currency, and throughout the model I use "pesos" and "dollars" to represent the former and the latter.

Because foreign exchange is rationed, its marginal cost is determined in a black market where the currency floats freely. The black market rate, $b$ (also in pesos per dollar), is higher than the official rate. Domestic prices adjust fully to the black market rate: all imports, even those obtained through import licenses at the rate $e$, are sold at the rate $b$, with the premium accruing to the importer. Consequently, there are close links between currency depreciation in the black market and domestic inflation, with $b$ adjusting to equilibrate demand and supply in the foreign exchange market as a whole.

Exporters either smuggle their exports out, earning $b$, or surrender them to the authorities at the official rate $e$. I consider here the private costs of smuggling, the bribes paid to various officials, but ignore the social costs of smuggling, for three reasons. First, social costs have already been widely researched. Second, the focus here is on the tax and inflation tradeoff associated with the black market premium. Third, smugglers use more or less the same means of export as the authorities (aside from bribes) and thus their costs are expected to be similar to official costs.

The marginal cost of smuggling increases with the volume of exports smuggled. At the margin, exports equate the returns from the official and black markets. I assume that export levels are at that upper bound and, consequently, the marginal return for exporters is determined by the official exchange rate, $e$. 
In contrast, the rationed level of imports is much lower than demand at the official price, and thus $e$ is completely inframarginal for importers. This difference in import and export markets gives rise to import license rents and to the black market premium serving as a tax on exports.

The marginal return to exporters in a dual regime of official and black market exchange rates could be a source of confusion. Some argue that the marginal return is a weighted average of $b$ and $e$, with the weights dependent on the share of exports through each market. Such an argument is valid if (and only if) the share of exports through each market is predetermined and known beforehand by the exporters. Suppose the government sets up a scheme whereby 40 percent of the export dollars must be surrendered at the rate $e$, while 60 percent can be sold freely. The marginal return on exports would be $(0.6b + 0.4e)$. Such a scheme is inherently contrary to the notion of an export smuggling function. In its absence, and given smuggling with the costs described above, the marginal return to exporters is $e$.

**Demand for Money**

Domestic residents hold two noninterest bearing assets in their portfolios: pesos ($M$) and dollars ($F$). Private sector financial wealth is $W = (M + bF)$, with dollars converted to pesos at the relevant rate, $b$. Considerations of portfolio balance determine the desired shares of $M$ and $F$ in $W$. Let $\lambda$ be the desired fraction of pesos—that is, $M = \lambda W$. The variable $\lambda$ depends on the differential rate of return between pesos and dollars. In the absence of interest rates, this is just the expected black market rate of depreciation. Assuming perfect foresight, so that the expected rate of depreciation in the black market equals the actual rate, $b/b$, and assuming instantaneous clearing in the asset market, the equation for $M$ can be written:

\begin{equation}
M = \lambda (b/b)[M + bF], \lambda' < 0.
\end{equation}

In short, the desired share of pesos goes down as the rate of currency depreciation and domestic inflation go up.

**Financing of the Fiscal Deficit**

For simplicity, it is assumed that the government spends only on imported goods and interest payments on foreign debt, which remains constant. The government buys dollars from exporters at the rate $e$, with the export proceeds coming from officially declared exports and the balance of exports being smuggled. After setting aside the dollars required for its needs, the government returns the remainder of the declared export earnings to the private sector through import licenses, also at the rate $e$. The dollars the government retains are paid for partly by tax receipts (fixed in dollar terms) and partly by issuing debt with zero or negative real interest rates—Treasury bills or currency. Inflation thus provides a revenue gain to the government at the expense of holders.
of its outstanding liabilities. The policy question addressed here is the tradeoff between financing the deficit through inflation (printing pesos in this model) relative to purchasing export proceeds at the lower rate, \( e \). The exchange rate regime thus amounts to a redistribution within the private sector through import licenses coupled with an implicit tax transfer to the government.

Letting \( g \) denote government spending and \( t \) taxes (in dollars), the peso deficit \( e(g - t) \) is financed by printing pesos. Since official reserves are fixed in dollars (see section on Exchange Rate Regime), it follows that the change in the stock of pesos in private portfolios is:

\[
\Delta M = e(g - t).
\]

\( M \) thus depends both on the budget and on official exchange rate policy. Budget equation (2) can be rewritten as: \( \Delta M / e = (g - t) \). Multiplying and dividing by \( M / b \) and rearranging gives:

\[
(\Delta M / M)(M / b)(b/e) = (g - t).
\]

Equation 3 simply says that the proceeds from seigniorage (the inflation tax) must equal the deficit, \( (g - t) \). Note that equation 3 is always true, both in and out of steady state. The expression \( M / M \) on the left—the growth rate of nominal money—can be interpreted as the rate of the inflation tax, and \( (M / b) \), the real money stock, as the base of the tax. Recall from the portfolio balance equation (1) that \( M / b \) in equilibrium is the demand for money given by the functional form in equation 1: the demand for pesos depends on financial wealth, the expected depreciation in the black market, and the function \( \lambda(\cdot) \). The third expression on the left of 3 is \( b/e \), the black market premium (strictly, the premium plus one). Letting \( \phi = b/e \) denote the black market premium (with \( \phi \geq 1 \)) equation 3 can be rearranged to give:

\[
g / \phi = t / \phi + (\Delta M / M)(M / b).
\]

Suppose that \( g = $100, b = 4 \) pesos/dollar, and \( e = 3 \) pesos/dollar. Then \( g / \phi = $75 \). But the government actually spends $100. The $25 balance is the implicit tax on exporters, given by \( g - g / \phi = g[(b - e)/b] \). The tax arises precisely because the government can purchase dollars at 3 pesos/dollar rather than at the marginal cost of 4 pesos/dollar. As a result it prints less money, relying less on inflation than it would have to if \( b = e \). Incorporating this hidden tax on exporters, budget equation 4 can be unraveled to give the complete fiscal accounts:

\[
g = t / \phi + (\Delta M / M)(M / b) + g(1 - 1/\phi),
\]

where the tax on exporters through the premium is shown explicitly as the last term on the right-hand side. If \( \phi > 2 \)—that is, if the black market premium exceeds 100 percent, as is common in Africa in recent times—the implicit tax
on exporters finances more than 50 percent of government spending on imports and foreign interest payments!

Tradeoff between Inflation and the Premium

Embedded in equation 5 is the tradeoff between inflation and the premium. Recall that the government chooses the official rate of depreciation, \( \bar{e}/e \). Assume this to be given and the system to be in steady state. By definition, \( \bar{M}/M = \bar{b}/b = \bar{e}/e \). That is, inflation equals the growth rate of money and the rate of depreciation in the black market so that the real domestic money stock and premium are constant at their steady-state values.¹ Letting \( \pi = \bar{e}/e \) denote the steady-state rate of inflation, equation 5 can be rewritten:

\[
(6) \quad g = t/\phi + (M/b) \pi + g(1 - 1/\phi).
\]

Suppose that the rate of depreciation in the official market is accelerated—that is, the government raises \( \pi \). One might argue that depreciating the peso faster in the official market would tend to make \( e \) “catch up” with \( b \), lowering the premium. Alternatively, equation 1 would imply that since the steady-state differential return on dollars is going up (\( b/b = \pi \) in steady state), dollars would become more attractive, raising the premium. The outcome is ambiguous, however.

Returning to equation 6, suppose that \( \pi \) is raised permanently. The proceeds from the inflation tax \( (M/b)\pi \) will rise if the inflation elasticity of peso demand is less than one because money demand (equation 1) falls off less than the rise in inflation. In this case, \( \phi \) will fall for given \( g \) and \( t \), restoring equation 6 in the new steady state. Under these circumstances, accelerating the rate of crawl will raise inflation but lower the premium, creating a tradeoff between the two. If, however, the elasticity of inflation exceeds one such that there is a marked propensity to shift into dollars to avoid further losses from inflation, proceeds from the inflation tax will fall, and \( \phi \) must rise to compensate. In this case, both inflation and the premium will rise. A tradeoff between inflation and the premium is no longer possible. This will typically be the case if inflation is already high and exceeds its seigniorage-maximizing level.

Overnight Floats and Inflation

Suppose now that there is an unexpected overnight float of the currency: the government abandons rationing and lets the market determine the rate of exchange. All official transactions are now at the market exchange rate, so the

¹ I have abstracted from much of the technical detail here. From equation 1, it is clear that the level of dollars, \( F \), should also be at its steady-state level, the three state variables being, \( \phi, M/b \) and \( F \). The dynamic equations are 1, 2, and the current account. The equations and their solution are fully developed in Pinto (1987a). Some of the basic model features come from Lizondo (1987a,b) and Pinto (1986).
premium vanishes. In other words, \( b = e, \phi = 1 \), and the implicit tax on exporters \( g(1 - 1/\phi) \) vanishes. The government's net revenue loss is \((g - t)(1 - 1/\phi) > 0\) where the calculation is at the steady-state value of the premium before the float. The size of the loss depends on this value as well as the deficit. Clearly, if the government cannot maintain the real value of revenues (it has been assumed that \( t \) is fixed in dollars), the effect will be even greater. Letting \( \pi^* \) denote the new steady-state level of inflation following the float, equation 6 can be rewritten:

\[
(7) \quad g = t + (M/u)^* \pi^*,
\]

where \( u \) is the unified rate and \((M/u)^*\) the new steady-state real money stock. By comparing equations 6 and 7, it can be readily seen that \((M/u)^* \pi^* > (M/b) \pi\) since \( \phi \) in 6 is greater than unity by assumption. In other words, the inflation tax has risen to compensate for the loss of revenues from the premium.

What will guarantee that \( \pi^* > \pi \), that the rate of inflation goes up? It would depend on the inflation elasticity of domestic money demand measured at the prefloat inflation rate, \( \pi \). Since the product of the real money stock and rate of inflation must go up in the new steady state, it follows that inflation will rise if the inflation elasticity of money is less than one but will fall if this elasticity exceeds one. If the elasticity is less than one, inflation is guaranteed to rise. The jump in inflation will be higher the larger the premium preceding the float and the greater the dollar component of the government deficit.

**Exports and Home Goods: the Real Exchange Rate**

The real exchange rate, the ratio of the prices of exports, and home goods, varies inversely with the black market premium. This relation follows from the facts, first, that the premium is an implicit tax on exports as discussed earlier and, second, that home goods include intermediate imports priced at their marginal cost, the black market rate. Consequently, the higher the premium, the lower the "post-tax" export earnings and the higher the price of imported inputs in (and thus prices of) home goods. So, to stimulate exports, the premium must be lowered.

Note that the capacity to import is eventually a function of the volume of exports. Taxing exports through the premium and thereby creating disincentive to produce exports ultimately lowers the ability to import intermediate goods, leading to "import compression" and its deleterious effects on capacity utilization and unemployment noted in many African countries.

**Determinants of the Premium**

The foregoing discussion shows that the premium depends on the following parameters: demand for domestic money as captured by equation 1—\( \lambda(*) \), \( b/b \) and \( W \); the financing of the deficit and rate of inflation—\( g, t, \phi/e \); and the...
terms of trade, or ratio of price of exports to imports, $p_x$. This steady-state dependence can be summarized:

$$(8) \quad \phi^* = [g, t, p_x, \dot{e}/e, \lambda(\cdot)],$$

where $\phi^*$ denotes the premium in steady state, the function $\lambda(\cdot)$ summarizes money and demand preferences, and the signs below each determinant show the direction of the relationship (for a technical discussion see Pinto 1987a). A rise in the fiscal deficit will tend to raise the premium as dollars become relatively more attractive. A terms of trade improvement (a rise in $p_x$) will have the opposite effect as the supply of dollars eases. And as discussed above, an acceleration in the rate of depreciation, $\dot{e}/e$, has ambiguous effects.

The determinants of the premium in equation 8 do not include the level of the official exchange rate, $e$. This exclusion implies that a series of discrete, single devaluations—undertaken, say, every few months—will reduce the premium only temporarily but not affect its steady-state value (see, for example, Dornbusch and others 1983, Lizondo 1987a, Pinto 1986). Devaluations will permanently reduce the premium only in the (uninteresting) case where government runs a balanced budget: that is, where $g = t$. However, devaluations are valuable when they accompany reductions in the real deficit or signal the intent to introduce more basic reform in fiscal, monetary, and exchange rate policy.

II. COUNTRY EXPERIENCES WITH UNIFICATION

Ghana

Ghana's experience typifies an extreme, eventually unsustainable case of the foregoing model. The official exchange rate was kept fixed for long periods ($\dot{e} = 0$). Adding considerable and consistent reliance on the inflation tax created a situation where the black market premium grew monotonically, reflecting the depreciation of the black market rate as the domestic money stock grew and strict foreign exchange rationing was implemented.

Between 1976 and 1983, average inflation exceeded 50 percent a year, hitting triple digits in 1977, 1981, and 1983. These high rates of inflation were traceable to large fiscal deficits, which were financed mainly by printing money. There was little or no recourse to external financing or aid. The value of import licenses approximated expected legal export earnings. This quantity rationing, combined with capital controls, meant that official reserve depletion to support the fixed exchange rate was not required.

The official exchange rate was kept unchanged from June 1978 until October 1983, when it was devalued from 2.75 cedis per dollar to 30 cedis per dollar, a change of 990 percent. Before this, there were several quasi-devaluations

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2. The terms of trade enter the steady-state determination of $F$ via the current account.
effected through the imposition and subsequent abolition of import surcharges and export premiums. But they were small compared with the black market premium, which between 1976 and 1983 was generally more than 500 percent and exceeded 2000 percent in 1982, by far the highest in recent recorded economic history.

Table 1 presents data pertinent to the Ghanaian macroeconomy between 1970 and 1983.1. The last period, 1979.1 to 1983.1, refers to the four years of political uncertainty and economic collapse immediately before the introduction of the Economic Recovery Program in April 1983. Sustained inflation, political uncertainty, and unclear economic objectives undermined confidence in the cedi and drastically reduced revenue generation from inflation, as can be seen from table 1. Real base money fell sharply and seigniorage declined from a quarterly average of 848 million 1980 cedis over 1975.1–1978.4 to 269 million 1980 cedis over 1979.1–1983.1.

The demand for cedis was extremely sensitive to inflation. In all likelihood, ready access to dollars through widespread smuggling of cocoa increased the inflation elasticity of the demand for cedis and shrunk the real monetary base as wealthholders diversified into dollars to escape the inflation tax. The changes in political regime in 1979 and 1982 may also have biased portfolio preferences sharply toward dollars. The increasing difficulty of generating revenue from

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<tr>
<td>Average inflation (percent per quarter)</td>
<td>3.15</td>
<td>15.60</td>
<td>12.94</td>
</tr>
<tr>
<td>Real base money (end-of-quarter averages, billion 1980 cedis)</td>
<td>7.11</td>
<td>7.80</td>
<td>4.05</td>
</tr>
<tr>
<td>Seigniorage (quarterly averages, million 1980 cedis)</td>
<td>424</td>
<td>848</td>
<td>269</td>
</tr>
<tr>
<td>Average black market premium (percent)</td>
<td>1.44</td>
<td>4.64</td>
<td>11.02</td>
</tr>
<tr>
<td>Marginal tax on exports (percent)</td>
<td>31</td>
<td>78</td>
<td>91</td>
</tr>
<tr>
<td>Real GDP (annual averages, billion 1980 cedis)</td>
<td>42.54</td>
<td>41.57</td>
<td>41.24</td>
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</table>

*Note: 1979.1 to 1983.1 refers to the period of political uncertainty and economic collapse immediately preceding the Economic Recovery Program of April 1983. Inflation is based on percentage changes in the consumer price index (CPI). Real base money = reserve money (line 14, International Monetary Fund, various years), divided by CPI. Seigniorage is change in reserve money divided by CPI. Black market premium = black market rate/official rate. Marginal tax on exports = (black market rate – official rate)/black market rate. Sources: Inflation, base money, official exchange rate: International Monetary Fund, various years. Black market rates: International Currency Analysis, Incorporated, various years.*
inflation is perhaps what lay behind the monetary reforms of 1979 and 1982. In 1979 there was an exchange of old bank notes for new at a rate of less than 1 to 1, substantially reducing the money stock. In 1982 the 50 cedi note, the largest note in circulation, was demonetized. The fact that the black market premium was allowed to rise to the extent it did (see table 1) is prima facie evidence of the inability to generate revenue from inflation. In April 1983, the official exchange rate was 2.75 cedis to the dollar, compared with a black market rate of about 60 cedis.

Given the high levels of taxation implicit in the black market premium (table 1), production of the key exports cocoa and gold fell sharply. The resulting scarcity of foreign exchange led to a shortfall in imported intermediate goods, so that real gross domestic product (GDP) (table 1) stagnated and real per capita income declined 30 percent between 1970 and 1982.

The Economic Recovery Program of April 1983 resulted from the government’s flagging ability to generate revenue from inflation and the unsustainable increase in the premium—unsustainable because of the export tax it represented and the incentives it created for smuggling and the nonsurrender of dollar export earnings.

What exchange rate options were realistically open to Ghana in 1983? Johnson and others (1985) provide some guidance. For exchange rate policy, the most popular approach at the time was to attempt to attain some targeted real exchange rate (the official exchange rate multiplied by the ratio of foreign to domestic prices). The starting point was to compute a time series of the real exchange rate, next to identify a “normal” year, and then to suggest that the nominal exchange rate be moved to attain the real exchange rate of that year. Typically, a devaluation was required to compensate for past domestic inflation far in excess of past foreign inflation. The second option was to accelerate the rate of depreciation of the official exchange rate above prevailing inflation to achieve real depreciation (see Johnson and others 1985). The third was to float the cedi.

If exchange rate reform is to stimulate exports, it must lower the black market premium. Given the considerable black market premium in Ghana in 1983, inflation of about 120 percent a year, and extreme sensitivity of cedi money demand to inflation, neither devaluations nor accelerated crawls would have helped. A float would have been disastrously inflationary. Underscoring this conclusion is the observation made above that when the black market premium is high, the link between fiscal and exchange rate reform is direct.

3. Edwards (1985) emphasizes, however, that the equilibrium exchange rate changes over time and is endogenous, depending on fiscal, monetary, external debt, and trade policy. Deciding this level on the basis of historical time series is more art than science.

4. Strictly speaking, the inflation elasticity of the portfolio share of cedi demand [the parameter \( \lambda \)] in equation 1) has to be estimated. As discussed in section 1, if this exceeds unity, an accelerated crawl at a rate exceeding prevailing inflation would actually raise the premium, worsening the situation. Unfortunately, data on dollar holdings in private portfolios are unavailable, preventing this estimation.
The allocative goal of stimulating exports by reducing the premium conflicts with the fiscal goal of financing government spending when facing a limited menu of available tax instruments. With an unsustainable premium and a rapidly declining ability to raise revenue from inflation, there was little choice but to reduce the fiscal deficit.

Ghana’s strategy since April 1983 has been to reduce the fiscal deficit gradually and to make widely spaced (but large) devaluations of the cedi. In October 1983 the official dollar exchange rate was moved from 2.75 cedis to 30 cedis, with the black market rate at about 90 cedis. In October 1985 the special import license scheme was reintroduced, permitting those who wished to bring in imports through the black market to do so freely if the requisite taxes were paid. This conferred formal recognition on the black market. By January 1986 the dollar exchange rate had been devalued to 90 cedis, and unification had become a serious quest: the fiscal deficit had been reduced from 2.7 percent of GDP in 1983 to 0.7 percent in 1986 (for further details, see Pinto 1988 and World Bank 1988, box 3.5).

In September 1986 the official foreign exchange market was split into two tiers: a fixed-rate tier, with an official rate, and an auction of foreign exchange for imports of raw materials and inputs only. The implied segmentation of transactions represented the continued taxation of cocoa and subsidization of petroleum. The fixed-rate and auction markets were finally unified at the auction rate in March 1987. Imports of consumer goods were subsequently integrated into the auction, unifying the auction and special import license markets.

**Nigeria**

By 1981 oil had become the main determinant of Nigerian real income, terms of trade, creditworthiness, and government revenues: it accounted for 22 percent of GDP, 81 percent of revenues, and 96 percent of exports. Between late 1981 and 1986, events in the foreign exchange market thus were dominated by the collapse of international oil prices. The key change in the determinants of the black market premium was the fall in dollar oil prices. This directly reduced government revenues, since oil dollars accrue to the government in the first instance. In addition, because the Nigerian government is a net seller of dollars, any rise in the black market premium meant a bigger real transfer from the government to the private sector through the import licensing system. The government added to its fiscal burdens as the premium rose, so that the reliance on inflation increased: there was no scope for a tradeoff. The real fiscal deficit

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therefore depended on the black market premium. At the same time, the taxation and disincentive effects of the premium applied to non-oil exports and the traded goods sector, notably agriculture.

Table 2 summarizes the macroeconomic situation as oil earnings fell and the government subsequently responded. At first (1981.4–1984.3), government spending remained roughly the same and the rationing of foreign exchange was intensified, so that inflation rose and the black market premium increased. In 1984.4 and 1985, administrative control over foreign exchange allocation tightened further, but with two major changes: the government implemented a plan of fiscal austerity that greatly reduced spending and inflation, and it accelerated the depreciation of the naira/dollar rate. Both measures slowed the growth of the premium. Fiscal austerity did so by slowing the growth of base money. And the acceleration in the official rate of depreciation increased the naira price of dollar-denominated import licenses and, in all likelihood, the proceeds from the inflation tax, owing to the low rate of inflation.

As oil prices continued to fall, however, the black market premium continued to rise, increasing the fiscal burden of import license rents. Given a conservative estimate of an average import program of $3 billion and a black market

Table 2. Oil Prices and Fiscal, Monetary and Exchange Rate Indicators, Nigeria, 1980–85 (quarterly averages)

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<tr>
<td>Real price of oil</td>
<td>116.04</td>
<td>94.57</td>
<td>80.07</td>
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<tr>
<td>Change in net claims</td>
<td></td>
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<td>on government / beginnig</td>
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<tr>
<td>monetary base (percent)</td>
<td>2.48</td>
<td>11.59</td>
<td>1.18</td>
</tr>
<tr>
<td>Growth rate of monetary</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>base (percent)</td>
<td>4.55</td>
<td>5.83</td>
<td>3.00</td>
</tr>
</tbody>
</table>
| Inflation*

(percent) | 4.49 | 5.78 | -0.84 |
| Depreciation             |      |      |      |
| Official                 | 2.36 | 1.16 | 4.06 |
| Black market             | -0.36 | 12.00 | 2.18 |
| Black market premium     | 1.61 | 2.66 | 4.24 |

Note: 1984.4 to 1985.4 refers to the period of fiscal austerity. Real oil price = Nigerian bonny light petroleum price deflated by U.S. wholesale price index (1980.1 = 100). Net claims on government = as in line 32an, International Monetary Fund, various years. Monetary base = reserve money + net claims on government by commercial banks (as in lines 14+22a–26d, International Monetary Fund, various years). CPI and official exchange rate = period averages. Black market premium = black market rate/official rate.

a. Percentage change in the consumer price index.

premium anywhere between 2 and 3 naira (N) to the dollar, rents were between N6 and N9 billion, a significant fraction of Nigeria’s GDP of about N70 billion a year at the time.

By the time Nigeria floated the naira in September 1986, it had established a solid record of credible fiscal reform. The float became inevitable as oil prices fell sharply in 1986 and debt rescheduling and external financing became urgent issues. The float was the centerpiece of a medium-term restructuring program predicated on market incentives, price signals, and the abolition of the import license system.

From the analytical perspective of section I, three issues are of interest. First, given the level of real government spending, one would expect unification to reduce inflation as the fiscal burden of rents implicit in the black market premium was eliminated. In large measure, this was the case. Although the ceteris paribus assumption may not have held exactly—oil prices continued to move, and real government spending may have changed—inflation in the twelve months following the float was lower than in the twelve months preceding it.

Second, there was some debate about what naira-dollar rate should emerge from the float. Since the official dollar exchange rate was N1.5 at the time of the float and since official oil dollars accounted for more than 90 percent of exports, it was argued, an “equilibrium” rate close to N1.5 should emerge. This argument ignored the facts that domestic prices had substantially adjusted to the black market rate and that there was a virtual secondary market in import licenses issued at the official exchange rate: imports were priced at their opportunity cost, the black market rate.

The issue is resolved by the portfolio balance equation (1). Since the stock of naira (M) and the stock of dollars (F) are predetermined, what happens to the unified floating rate depends on whether people expect postunification inflation to rise or fall. If they expect it to stay the same, naira assets retain their relative attractiveness, so that with the stock of M and F given, one would expect an equilibrium rate close to the prevailing black market rate. The foregoing arguments on the favorable inflationary effects of unification suggest that a rate more appreciated than the black market rate should have emerged, ceteris paribus. In fact, a rate close to the black market rate of N5 emerged. The basic point is that the crucial factor is not the ratio of exports or imports at the official exchange rate, but the expected fiscal and inflationary effects of unification.

Third, it was feared that inflation would go up if the official rate registered a substantial one-shot depreciation on floating. The response to this concern is similar: first, inflation mirrors the movement of the black market rate, and second, the inflationary effects of floating depend on the fiscal effects of unification, not on the depreciation of the official rate by itself.6

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6. Ironically, in interviews it became apparent that the private sector had a keen appreciation of this. They did not expect any inflationary effects from floating the naira, but they bemoaned the imminent reduction in their profit margins from 400 percent (representing the premium) to more “modest” levels of 20 percent.
Sierra Leone's experience shows graphically the tradeoff between the premium and inflation. When the government is a net buyer of foreign exchange from the private sector and the premium is high, inflation will rise substantially if the currency is floated to achieve unification. When Sierra Leone floated its leone in June 1986, the value of $\phi$, the premium, was between 3 and 4, implying (from equation 5) a tax on exports of between 67 and 75 percent. Inflation rose from an annual average of 70 percent for the three years before the float to an annual rate of more than 200 percent after the float.

The basic insight from Sierra Leone's experience is the inseparability of fiscal and exchange rate reform for countries with a high black market premium. Fiscal discipline was weak when the leone was floated in June 1986. The fiscal deficit, after falling to a low of 7 percent of GDP in 1983–84, peaked at 14 percent in 1985–86.

Three main factors accounted for this deterioration. First, there was a systematic decline in the tax-GDP ratio from 16.5 percent in 1978–79 to 5.6 percent in 1985–86. Second, the rice and petroleum subsidies, which persisted after the float, were a major fiscal burden. The petroleum subsidy alone accounted for roughly half the difference between the actual deficit of 14.5 percent of GDP in 1985–86 and its budgeted level of 3 percent. These subsidies were partly financed by the premium (the implicit tax on exports). Third, there were no suitable tax and royalty contracts with the mining companies—a strange omission for a country with as rich and diversified a mineral base as Sierra Leone's—and there was no revenue contribution from the fishing industry.

Table 3 summarizes budgetary and exchange rate movements for six months following the float (comparative prefloat data are not available). The deficit is expressed in dollars at the black market rate because the official rate, while varying, was set at a discount relative to the black market rate. As a result, there was not even one transaction in the official interbank market between June 1986 and March 1987. Instead, the black market rate became the de facto unified rate for all foreign exchange transactions. The data in table 3 show an erratic but upward trend in the deficit after July 1986. The average monthly deficit between August 1986 and January 1987 was about $4.5 million. The real monetary base was about $50 million, implying an inflation rate of 9 percent per month to generate the necessary seigniorage for the deficit. For the six months ending December 1986, this implied 70 percent inflation, close to actual inflation and close to the depreciation of the leone (calculated as the percentage change in the black market rate), which was 80 percent.

The real monetary base fell over the period shown in table 3. This was partly due to the shift from leone assets into dollars or accounts abroad to avoid the inflation tax. The ratio of quasimoney (time and savings deposits) to M1
<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Monthly Deficit ($ millions)</th>
<th>Monetary Base (Le millions)</th>
<th>Real Monetary Base ($ millions)</th>
<th>Black Market Exchange Rate (Le/$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>June</td>
<td>n.a.</td>
<td>1423.28</td>
<td>61.88</td>
<td>23.00</td>
</tr>
<tr>
<td></td>
<td>July</td>
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<td>August</td>
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<td></td>
<td>September</td>
<td>3.52</td>
<td>1894.99</td>
<td>57.42</td>
<td>33.00</td>
</tr>
<tr>
<td></td>
<td>October</td>
<td>5.39</td>
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<td></td>
<td>November</td>
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<tr>
<td></td>
<td>December</td>
<td>3.91a</td>
<td>2122.05</td>
<td>51.13</td>
<td>41.50</td>
</tr>
<tr>
<td>1987</td>
<td>January</td>
<td>4.81</td>
<td>2064.70</td>
<td>43.93</td>
<td>47.00</td>
</tr>
</tbody>
</table>

Note: Conversion to U.S. dollars is at black market rate. Monetary base is defined as currency outside banks + commercial banks' deposits with Bank of Sierra Leone (BSL) + cash-in-hand of commercial banks + net claims on government by commercial banks.

a. Excludes a cash grant from the Saudi Arabian Monetary Authority of $5 million.

Sources: BSL except black market rates, which are staff estimates.

(currency outside banks plus demand deposits) fell from 35 percent in 1985 to 31 percent in June 1986 and to 23 percent in December, further reflecting the shift to dollars.

There is little doubt that Sierra Leone’s float was poorly timed owing to the high black market premium and the low credibility of fiscal policy. But another lesson is that fiscal reform becomes much more difficult as inflation rises, because sensitive subsidies may have to be retained. For example, before the float, the rice subsidy could have been eliminated by privatizing the procurement and distribution of rice. But private traders who were willing to take over this function before the float refused to touch it after the float for fear of being blamed for price hikes. For countries such as Sierra Leone, fiscal reform may have to be credibly established before a float is contemplated.

IV. Concluding Remarks

One of the obstacles impeding successful unification of official and parallel market exchange rates may be the increase in the level and rate of inflation which follows. It needs to be stressed that the inflationary effects have nothing to do with any slackening of fiscal discipline—inflation can rise permanently and substantially even if real government spending remains constant. Inflation rises because the devaluation involved in unification eliminates revenues from purchasing export earnings at the overvalued official exchange rate. This then requires increased monetization to finance a set level of government expenditure. The analysis here has explored the interactions between these two taxes—
the taxation of export earnings, and the inflation tax on domestic financial assets.

The first step in exchange rate reform for countries with very overvalued official rates may, paradoxically, have to be a fiscal one: recasting the budget to explicitly set the level of implicit tax revenues that accrue from purchasing export earnings with overvalued domestic currency. The reason is the inseparability of and conflict between fiscal and exchange rate reform for such countries. The tax-subsidy redistribution in the private sector—as a result of foreign exchange rationing through import licenses—is also important. This redistribution involves identifying the potential gainers (say, agriculture) and losers (commerce, protected manufacturing using imported inputs) in the event of devaluation and eventual unification of the official and parallel market rates. Such identification will make plain the political pressure points likely to emerge on unification.

Four distinct political issues arise:

- Can government spending be justifiably reduced?
- Is there an equitable distribution of the tax burden?
- Are existing tax instruments, other than the hidden export and inflation taxes, being used to the hilt, or are these hidden taxes being used as the easy alternative to transparent taxation?
- If the export tax is being used in lieu of a land or profits tax, which are more difficult to collect, is the optimal export tax zero, as implied by unification?

The main conclusion is that if the credibility of fiscal reform is low and the initial level of the premium high, with significant revenue and redistributive implications, the pace of reform should be set by the feasible speed of fiscal reform. Accelerating rates of depreciation above prevailing inflation in the absence of credible fiscal reform could raise the black market premium as a result of preemptive portfolio shifts into dollars, jeopardizing the survival of both fiscal and exchange rate reform. Moreover, such policy will not achieve real depreciation unless the premium falls. Likewise, sudden floating is likely to meet with considerable political and social opposition as inflation rises, creating the possibility of policy reversals as evidenced by recent events in Zambia, Somalia, and Sierra Leone. The best route might thus be to relax rationing gradually, accompanying the relaxation with discrete devaluations and linking the pace of exchange rate reform to the speed of fiscal reform. Most important, fiscal reform needs to be designed and implemented in a credible and sustainable manner, with a clear assessment of the taxes and subsidies implicit in the dual exchange rate regime.

Four additional guidelines might help. First, commercial transactions can be transferred to the black market. Such legitimization of the black market could be an important step in eventual unification and the removal of rationing. If the ultimate goal is to have a floating interbank market, commercial banks...
could be permitted to buy foreign exchange from the black market and resell it to importers at a market rate.

Second, in many instances, foreign-currency-denominated accounts are created in the domestic banking system to encourage private citizens to return money invested abroad. The nature of these accounts is important. For example, are these going to be checking or savings accounts? Are withdrawals going to be made in local or foreign currency? Could such accounts compete with local currency checking accounts for holding transactions balances? Foreign-currency-denominated accounts do not augment official reserves. They merely make it easier and cheaper to hold foreign financial, rather than domestic financial, assets. By increasing substitutability between domestic and foreign assets, such accounts lower the base for the inflation tax, calling for a higher rate of inflation for a given real fiscal deficit. Introducing such accounts therefore needs to be carefully considered.

Third, should dual official rates—distinct from the black market rate—be adopted in the transition? In particular, a two-tier system with a fixed (and more appreciated) first-tier rate, and a floating market-determined second-tier rate? If adopted, the dual system should be designed so incentives for new economic ventures and investments are governed solely by the floating rate. This can be done by letting the floating rate apply to all commercial transactions, including those of state-owned enterprises, and by restricting the fixed rate to purely government transactions and to foreign interest payments on existing (but not new) debt.

Fourth, the transition provides an opportunity to design and implement mechanisms that will speed information flows in the domestic banking system and the various ministries. The mechanisms will ensure that information on key macroeconomic variables—such as government spending, domestic credit to the government and private sector, money growth rates, and price data—are available punctually. Such data are basic inputs that must be available in timely fashion to market participants, as must such other data as terms-of-trade movements.

To conclude from this study that a developing country should never float its currency would be incorrect. This decision should depend on the credibility of accompanying fiscal reform and the initial size of the premium. Even a country that follows the Ghanaian route will at some stage need to float its currency to achieve unification. At a minimum, the rationing of commercial transactions has eventually to be eliminated. It is difficult to think of doing this on a sustained basis with fixed exchange rates. Once unification with or without capital controls is attained, however, there remains the decision of whether to continue with a float as a permanent mechanism. The experience of developing countries over the next few years should give some insights on this issue. But the issue of a permanent float should not be separated from the inflation tax and the credible sustainability of fiscal reform.
References


