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FISCAL AND QUASI-FISCAL EFFECTS OF THE PARALLEL EXCHANGE PREMIUM IN NIGERIA[+]

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ABSTRACT

Starting from the immediate post-independence era, Nigeria pursued an overvalued foreign exchange rate policy. As the central bank is a net seller of foreign exchange to the private sector, the policy was aimed at subsidizing and protecting the populace and local firms. This paper investigates the impact of the exchange rate policy on real customs revenue in Nigeria using error correction methodology. In addition, the paper estimates the implicit central bank losses associated with the valuation of the net foreign exchange sold to the private sector at the overvalued official exchange rate. The paper also discusses the politics of the exchange rate policy in Nigeria. Findings indicate that Nigeria's exchange rate policy had serious fiscal and commercial policy implications by squeezing the tax base in foreign trade transactions and expanding opportunities for large scale rent seeking activities. Furthermore, the premium negatively affects customs and excise duties collected. In the long run, a 10% reduction in parallel premium engenders 6% increase in real customs revenue. In addition, estimates show that exchange rate overvaluation subsidy has been quite substantial overtime, rising from 7.4% of GDP in 1979 to 25.5% of GDP in 1986. The results underscore the need to sustain the present regime of low parallel market exchange premium in Nigeria through compatible economic policies. An enduring lesson is the need to entrust economic management to technocrats who are free of political influences, and the necessity of agencies of restraint such as an independent central bank.

Key words: fiscal, quasi-fiscal effects, parallel premium

1.0 Introduction

In recent decades, African governments adopted exchange rate and trade policies that were atypically anti-export and pro-imports. Like other African countries, Nigeria also directly managed foreign exchange transactions over long periods of time. In the aftermath of the oil boom, huge salary increases, and tariff and excise policies aimed at subsidizing people's purchasing power, engender excess demand for tradable goods. This led to a real appreciation of the exchange rate. Between 1972 and 1981, imports in constant dollars increased by about 33% annually. During the same period, the ratio of imports to GDP increased from 18% to 27%. Though domestic inflation exceeded world inflation by 5.4% per year, the naira appreciated in nominal terms at an annual rate of mere 2.2%.[1] This made imports to be 44% cheaper than home goods in 1981 relative to 1971. At the onset of the oil crisis in the late 1970s, an option open to the government was to offset the pressure on the balance of payments through devaluation or quantitative controls. The government chose the latter. This was first implemented in 1978 through reduction in official foreign exchange supply, increase in tariff rates, and import licensing and prohibitions. Subsequent policy responses in 1982 and 1984 were all geared towards reducing the quantity of imports rather than raising the price (the exchange rate).

These policies provided the impetus for the growth of the parallel foreign exchange market in Nigeria. In the period after independence, the parallel market was not an important feature, partly because the extent of rationing was limited, and excess demand was very low. The parallel market has reached a remarkable size in Nigeria. Overtime, the parallel market has become a major source of foreign exchange to a wide variety of economic agents, and the exchange rate in the market is usually more depreciated than the official exchange rate. The expansion of the parallel market for foreign exchange leads to loss of government control over the economy as more and more of the official transactions are diverted to the parallel market.

The importance of parallel markets and their effects on macroeconomic performance generally depends on the size of the parallel premium (Kiquel and O'Connel, 1995:21). The premium is defined as the percentage gap between the parallel and official exchange rates.[2] Parallel market premium seems to have played important roles in explaining macroeconomic performance in Nigeria overtime. Among others, the fiscal impact of the parallel market premium seems to have been very profound. Indeed, it was the foreign exchange market reforms of the 1980s that actually brought the link between parallel premium and government fiscal deficit to the fore in Nigeria.

[1] Table 1 in the Appendix B present movements in the naira exchange rates between 1971 and 2003 respectively.
[2] That is, $[PER_t/OER_t - 1] \times 100$. PER and OER refer to parallel and official exchange rates respectively.

Fiscal effect of the premium arises because the Nigerian government is a net seller of foreign exchange to the private sector. In the event that the parallel market exchange rate is a better approximation of the market equilibrium exchange rate, transactions at the official rate represent a subsidy by the central bank. The subsidy is approximately equal to the premium multiplied by the total amount of foreign exchange sold. With a pre-unification premium of over 300% in 1985, 1994, and 1998, the difference was significant. This suggests that government fiscal burden has been greater than it should otherwise have been, thus amplifying the need for monetary financing. At unification, the significant reduction in parallel premium implies a transfer of the rents that used to accrue to the private sector to the government. The view that the premium has important implications for government finances in Nigeria is underscored by the fact that transfers from the Autonomous Foreign Exchange Market (AFEM) Surplus Account were used to wholly finance federal government deficits in 1998, and 69.1% of the deficit in 2002 (CBN 2002).

In view of the observed interconnections between exchange rate policy and fiscal outcomes in Nigeria, it is necessary to quantify the fiscal and quasi-fiscal effects of the parallel market exchange premium in the country. The simultaneous occurrence of large premium and fiscal crisis of state in Nigeria since the late 1970s, suggests that there exist an exchange rate dimension to the budgetary problem in the country. Thus, the overriding objective of this study is to investigate the fiscal and quasi-fiscal impacts of the parallel market exchange premium in Nigeria. This was achieved through the following tasks:

(a) Provide analytical overview of the factors leading to the emergence and growth of the parallel market and the premium in Nigeria;
(b) Estimate the effect of the premium on real customs and excise duties revenue in Nigeria; and,
(c) Determine the quasi-fiscal effects of the parallel market exchange premium in Nigeria.

The fiscal effect of the parallel market exchange premium has received some attention in the literature. However, existing studies on the parallel foreign exchange market in Nigeria have not investigated the impacts of the parallel premium on government finances.[3] There is therefore need for a study to do this using Nigerian data. This can be used to assess the extent to which Nigeria's experience compares with sub-Saharan African countries like Ghana, Kenya, Sierra-Leone, Sudan, Tanzania and Uganda, for which such studies have been conducted. Thus, this study attempts to fill an important gap by examining the parallel premium and its implications for government finances in Nigeria. However, it needs be emphasized that the paper does not attempt a complete treatment of the fiscal effects of the parallel market exchange premium in Nigeria. Such would entail

[3] Studies on the parallel foreign exchange market in Nigeria include Olopoenia (1986), Ayogu (1993), Ogiogio (1993), and Garba (1994).

consideration of both the revenue and expenditure effects. However, this study focuses on the revenue side only. Nevertheless, the historical and empirical contributions of the study are informative in view of the observed pressures on government finances, and the importance of the parallel market for foreign exchange in Nigeria. According to Pinto and Van Winjubergen (1987), the parallel market provides useful insight into understanding Africa's economic problems.

Furthermore, foreign exchange management continues to be a major concern in the economic reform process in Nigeria. The importance attached to the parallel market for foreign exchange by policy makers thus justifies the need for a study of its implication for macroeconomic management in Nigeria. Findings of the study provide the essential background for consideration of such current policy issues as the unification of the foreign exchange markets, and its sustainability. Finally, even though the premium is presently not as high as it was during its previous peak periods, recent data suggest that the premium may be on its way up again. The parallel premium which narrowed drastically to single-digit percentage points between 1999 and 2000, increased to 19.6% in 2001. Between 2000 and 2001 the parallel premium widened by 111.7%. It is clear that without the continuous support of compatible monetary and fiscal policies, the parallel premium may rise again. Monetary financing of fiscal deficit has been a recurring feature on Nigeria's fiscal scene.

The rest of the paper is organized into six parts. Section II which follows, outlines the structure of the Nigerian economy, the mitigating factors in the emergence and growth of the parallel foreign exchange market in Nigeria, and the behaviour of parallel premium and fiscal outcomes between 1970 and 2003. A brief review of the literature is presented in section III, while section IV contains the analytical framework. Explained in the fifth section are the estimation procedure and data issues. The results are discussed in section VI while the final section summarizes and concludes the study.

2.0 Structure of the Nigerian Economy

Prior to the discovery and exploitation of crude oil in 1958, the Nigerian economy was largely driven by activities in the agricultural sector. For many years, Nigeria was a leading producer of tropical agricultural products like cocoa, groundnut, rubber, and palm produce. Agriculture was so important then that it accounted for 64.1% of real Gross Domestic Product (GDP) in 1960. Thus, the sector was the major source of foreign exchange earnings. Cash crops like groundnut, cocoa, rubber and palm oil were widely produced for export. However, the share of agriculture in GDP declined to 47.6% in 1970. This further declined to 32.7% in 1980-89 and 27.0% in 2003. Concomitantly, the share of crude oil in GDP leapt from an average of just 1.6% in 1960-69 to 20.3% in 1970-79, and had generally been above 40% since the 1990s. The decline in the contribution of the agricultural sector is traceable to a number of factors. One of them is the priority accorded industrial development

by the post-independence governments of Nigeria. The new political class that took control of the government after independence understood development to entail industrialization due to its linkages with the rest of the economy. Thus, they favoured a strongly interventionist state and pursued industrialization programmes aimed at increasing the share of Nigerians in the modern sector. Consequently, policy makers unwittingly neglected the agricultural sector in the 1960s and 1970s. This led to the dramatic shrinkage of Nigeria's once robust agricultural production. Another reason is the disruption of farming activities in the late 1960s occasioned by the ravage of the Nigerian civil war, 1967-70. Perhaps the major reason is the improved conditions in the world oil market in the early 1970s. The combined effect of the factors is a trade-off between the relative contributions of each of the sectors in favour of the oil sector.

The critical importance of the oil sector rests on the fact that it remains the major source of government revenue and foreign exchange earnings in Nigeria. From a mere 0.1% of government revenue in 1958, it rose to 26.3% in 1970. Ever since, its share in total government revenue has remained consistently high. On average, it contributed 69.7% between 1971 and 1980. At its peak, it contributed 86.2% to government coffers in 1992 (see figure 1 in Appendix B). Similarly, oil constitutes a major component of Nigeria's exports and foreign exchange earnings. Indeed, earnings from oil export have been rather stupendous. Xavier and Subramanian (2000) notes that over the 35-year period beginning from 1965, Nigeria's cumulative revenues from oil (after deducting the payments to oil companies) amount to $350 billion at 1965 prices. Just as it is with government revenue, the dependence on oil for foreign exchange is near total. Oil export, which started in 1958, increased remarkably from mere 2.7% of total exports in 1960 to 57.6% in 1970. It further climbed to 83.1% in 1973, and has generally remained above 90% since that year to date.

In the early stages of crude oil discovery in Nigeria, the interest and involvement of the government was limited to the collection of royalty from the oil companies. With the cessation of civil hostilities in the country in 1970, the need to earn more petrodollars for post-war reconstruction became very imperative. More importantly, OPEC's resolution XVI, article 90 of June 1968 required member countries to acquire a minimum of 51% participation in their country's oil business by 1982. The establishment of the Nigerian National Oil Company (NNOC) in 1971 was, in part, to meet this requirement. To maximize the benefits of oil resources to the nation and the populace, the NNOC was merged with the Ministry of Petroleum Resources in 1975 to form the Nigeria National Petroleum Corporation (NNPC). The NNPC is wholly government-owned. Through the NNPC, the Nigerian government participates in joint ventures with several oil companies. The government, through the NNPC, holds a minimum of 60% participation in the joint venture arrangements. The

only exception is the NNPC/Shell/Agip/Elf joint venture arrangement in which the government holds 55% interest.

As a result of this, about 60% of foreign exchange earnings from the oil sector go into the national treasury in Nigeria. Therefore, as the major foreign exchange earner, the government has been a net seller of foreign exchange to the private sector. Pursuant to government's disposition towards a strong interventionist state, it fostered the development of the indigenous business class through trade and tariff incentives, capital goods subsidies and licences. This was the foundation for the rent-seeking economy manifested by a neo-patrimonial state, and an overvalued exchange rate. A major plank of the policy is the sale of foreign exchange cheaply to users of foreign exchange in Nigeria. Overvalued exchange rates were maintained by the authorities to keep the cost of imports of capital goods and raw materials relatively low in favour of infant industries. However, the policy also made Nigeria's exports relatively expensive and uncompetitive. Thus, it encouraged large-scale importation of various items of merchandise while discouraging exports. The authorities had to prop up the overvalued currency with a pervasive system of exchange control.

2.1 Emergence and Growth of the Parallel Market for Foreign Exchange in Nigeria

The parallel market for foreign exchange emerged in Nigeria during the World War II. Then, the returning veterans that brought home foreign currencies exchanged them in the market. For a very long time afterwards, activities in the parallel market for foreign exchange were on a very moderate scale. The market received a boost shortly after independence between 1963 and 1966 as politicians exchanged their estacodes then in the market. At this time the there was a one-to-one relationship between the Nigerian pound and the British pound sterling in the official market. Administrative measures were used to sustain the parity with the anchor currency. This fixed parity lasted until the British pound was devalued in 1967. Rather than devalue the Nigerian pound, the monetary authorities decided to peg the Nigerian currency to the US dollar at par. This was done to make imports cheaper for the import substituting industries that still relied heavily on foreign inputs.

The parallel market further expanded following the outbreak of civil war in Nigeria in 1967. At that time, uncertainties regarding the outcome of the war led to capital flight. This necessitated the imposition of severe import restrictions and strict administrative controls on foreign remittances. In addition, the boom witnessed in the parallel market at that time reflected over-invoicing of imports which was very rampant then. Furthermore, government officials in the military regime then were reported to be transferring funds abroad through the parallel market. By this time, Lagos had become a major centre for parallel foreign exchange operations. However, the change of the Nigerian currency early in the civil war in January 1968 made things pretty difficult for the parallel

market operators; participants had to go as far as Abidjan for transactions. Nonetheless, the market reappeared, though on a very limited scale by May 1968. As the civil war ended in 1970 and the air of uncertainty and insecurity over, activities and the exchange rate of the Nigerian pound in the parallel market plummeted. Consequently, the anchor currency was traded at a discount in the parallel market for foreign exchange. It is clear that up to this time parallel premium was not an important feature of the Nigerian economy, partly because the extent of rationing was limited, and excess demand was very low.

The collapse of the Bretton Woods System and the subsequent 10% devaluation of the US dollar in 1971 slightly increased the rate of activities in the parallel market. This was because the Nigerian authorities refrained from devaluing the Nigerian pound then. The fear was that devaluation would engender high cost of imports of capital goods and raw materials needed to implement the national development plan. Thus, parity with the US dollar was discontinued and the Nigerian pound was once again fixed at par with the British pound. In 1972, when the British pound sterling was floated, the parity relationship between the pound sterling and the Nigerian pound was abandoned. In January 1973, the Nigerian pound was replaced with naira, a decimal-based currency, and pegged to the US dollar. In spite of the terrific inflow of foreign exchange from crude oil sales at that time, capital flight intensified. This may have been a direct result of the indigenization programme introduced by the Nigerian government in 1972 to check the increasing dominance of major sectors of the economy by foreign firms. The resulting excess demand for foreign currency and pervasive rationing (together with other factors) made the naira very weak in the market. From that time onwards, the US dollar was sold at a premium in the parallel market.

However, this policy did not last long. Soon after, the US dollar was devalued. In sympathy, the naira was devalued too even though macroeconomic fundamentals dictated otherwise. This led to higher premium in the parallel market for foreign exchange. The shortcoming of Nigeria's post-independence exchange rate policy of pegging the national currency to a single currency became apparent at this time. It was expected that the devaluation exercise would ensure stability of the local currency value of exports and protect local industries from excessive competition. The measure rather worsened Nigeria's inflationary situation. Thus, the need to manage the naira exchange rate became very clear.

Accordingly, the country decided to implement an adjustable exchange rate system in 1974. This entailed pegging the naira to the US dollar or the British pound sterling, whichever of them was stronger in the foreign exchange market. In effect, the Nigerian monetary authorities implemented an independent exchange rate management policy between April 1974 and late 1976. The basic policy

objective then was to influence real economic variables in the economy and lower the inflation rate. The decision to manage the naira led to its gradual appreciation. The policy of allowing the naira to appreciate as an overvalued currency was deemed necessary for the import substitution industrialization programme that was being implemented then. This was possible because of the large inflows of foreign exchange from crude oil sales during the oil boom era. The naira became so strong that it was openly traded in the London foreign exchange market. This marked the beginning of a very active parallel market for foreign exchange in Nigeria. The independent exchange rate policy continued until 1976 when Nigeria's economic fortunes began to decline.

Between 1976 and 1985, the policy of pegging the naira to an import-weighted basket of currencies was experimented. A basket of seven currencies of Nigeria's major trading partners was adopted. The currencies were the US dollar, the British pound sterling, the German mark, the French franc, the Dutch guilder, the Swiss franc, and the Japanese yen. This policy was abandoned in 1985; the naira has since then been quoted against the US dollar. Following the economic crisis that started in January 1981, which worsened afterwards, the naira became grossly overvalued against the US dollar. This was in spite of the fact that the currency was deliberately depreciated during the period. As the economic crisis deepened, the government introduced a market-determined exchange rate policy as part of its structural adjustment policies (SAP) in September 1986. This stance of policy has continued since then to date in various forms.

In sum, the deliberate overvaluation of the exchange rate during the 'oil boom' years, and the resultant lower import prices altered the structure of incentives in favour of imports and import-competing sectors and against agriculture and export production. Further, the policy greatly eroded the competitiveness of the economy. This stifled the growth of the private sector and non-oil export earnings, and entrenched the reliance on the public sector oil export earnings as the main source of foreign currency in the economy. Also, the policy resulted in massive capital outflows and severe reserve shortages. In the early days of the boom, foreign exchange was not a constraint; consequently, imports increased markedly. The quantitative policies implemented at the onset of the oil crisis in the late 1970s (and repeated in 1982 and 1984) provided the impetus for the growth of the parallel market. The market emerged to satisfy the demand that could not be met at the official market. As a result of the rationing of foreign exchange, the parallel market became a major source of foreign exchange to a wide variety of economic agents. Absence of documentation requirements and the ease of import duty evasion join to make the market to thrive.

Figure 2 in Appendix B shows the series of the official and the parallel market exchange rates over 1970-2003, in logarithm. Examination of these series indicates that the parallel market

exchange rate has a more homogenous behavior during this period than the official rate. The growth in the latter was quite small relative to the parallel rate before 1986. Between 1986 and 1993 however, the two rates exhibited closer profiles. This reflects efforts of the Central Bank of Nigeria (CBN) geared towards exchange rate convergence across the segments of the foreign exchange market. In spite of the foreign exchange reform of 1986, multiple exchange regimes prevailed in the Nigerian economy. Furthermore, the foreign exchange market was characterized by the continuous decline in the value of the naira and lack of tendency towards exchange rate convergence.

To achieve stability and convergence of the multiple exchange rates, the CBN 'deregulated' the foreign exchange market on 5 March 1992. Equating the realistic exchange rate to the parallel market rate, the CBN merged the official rate with the former. Temporary convergence was achieved through the equalization policy on 5 March 1992. However, the forced convergence was not sustained. The CBN was to induce stability of the exchange rate by increasing the supply of foreign exchange. The federal government was to support this by inducing a fall in foreign exchange demand through fiscal and monetary restraints. Contrary to expectations, CBN's supply of foreign exchange through the end of 1992 was erratic; foreign exchange sales were suspended three times. Also, federal deficit in 1992 was 1097% greater than it was at the inception of adjustment policies in 1986. Not only did the foreign exchange market rate divergences continue afterwards, the naira continued to depreciate against the dollar in the markets (see Table 1 in the Appendix B). The official rate seems to follow the parallel one most of the time, though with a lag.

2.2 Parallel Premium and Fiscal Performance in Nigeria

The issue is that parallel marketing still thrives in Nigeria despite attempts to unify the official and parallel foreign exchange markets. As a result, parallel market premium is still present with very distortionary consequences. Figure 3 in Appendix B shows the time profile of the premium on the US dollar in the parallel market. For two periods, 1984-85 and 1994-98, the premium was approximately 300%. There was a drastic cut in the exchange rate premium in 1986 following the adoption of the Structural Adjustment Programme (SAP) in September. The premium continually declined to 137% in 1986, 38% in 1987, and 33% in 1988. Movements in the parallel premium can thus be segmented into five phases within 1970 and 2003. The first is 1970-72, a discount era when parallel premium was absent in the economy. After this, the country moved into a moderate premium era.[4] This lasted only for the four years between 1973 and 1976. The tightening of controls

[4] Ghei *et al* (1999: 19) define 'low', 'moderate', and 'high' premium as that below 10%, between 10% and 50%, and above 50%, respectively.

on foreign transactions in response to balance of payments problems in the late 70s led to the emergence of high premium in 1977. This situation remained so for close to a decade.

The exchange rate policy reforms implemented as part of the adjustment measures in Nigeria succeeded in drastically reducing the premium from an average of 183.8% in 1981-1985, to 46.4% in the adjustment years, 1986-1992. Thus, the introduction of adjustment measures in July 1986 moved the economy back to another period of moderate premium between 1987 and 1992. Subsequently however, the premium levitated dramatically and remained very high for the six-year period (1993-1998). This is traceable to the numerous policy reversals, the erratic manner the reforms were implemented in Nigeria, and lax domestic policies after adjustment. It reached a peak of 354% in 1994, and an average of 261.7% within the period. Thus, the experience of the premium remaining high for periods of five years or more placed Nigeria among the high-premium countries. However, it is instructive to note that since 1999, the economy has returned to the low premium experience of the early 1970s. This reflects the strong implementation of the exchange rate reforms by the Obasanjo civilian administration in the country. Parallel premium witnessed dramatic jumps in-between the periods. For instance, average parallel market exchange premium range from 79.5% in 1978 to 324% in 1985. This was from a low level of less than 5% and 48.3% in 1970-1974 and 1975-77 respectively.

A discernible relationship seems to exist between parallel premium and customs and excise revenue performance in Nigeria. There exists a high and significant inverse relationship between the two variables.[5] Evidently, revenue from customs and excise duties was relatively high before 1983 when the premium was less than 75% (see Table 2, Appendix B). This however witnessed a sharp decline as the premium rose to over 300% in 1984-85. On the eve of the SAP in 1985, revenue from this source rose consistently from 3.0% of GDP to 3.9% in 1988, and 3.5% of GDP in 1991. Between 1986 and 1987, revenue from customs and excise duties grew by 105%. Also, the proportion of customs and excise taxes in total government revenue increased from 14.5% in 1985 to 20.6% in 1988. Afterwards, revenue from customs and excise duties declined to as low as 2.0% of GDP in 1998 following the rise in parallel premium in 1994. It remained at an average of 2% of GDP during the high premium period, 1994-98. Reflecting the influence of other factors, real customs and excise revenue has only marginally increased with the fall in parallel premium in recent times. However, it still exhibits a clear upward trend.

[5] The coefficient is -0.525.

Customs and excise duties are important revenue sources in Nigeria. Their importance rests on government's current efforts aimed at diversifying its revenue base. While the proportion of customs revenue to total government revenue has been declining progressively overtime, its proportion in non-oil revenue has been oscillating. At present, oil revenue account for more than 90% of government revenue in Nigeria. Through policy choices, Nigeria gradually neglected the non-oil sector. Hence, revenue from custom and excise duties fell continuously from an average of 4.6% in the 1970s, to 3.4% in the 1980s and 2.5% between 1990 and 2002. Nigeria earned N207.54 billion from import duty and other levies in the first eight months of 2004. This was an increase of 14.5% over the N181.2 billion that was recorded in the corresponding period in 2003.

Therefore, statistical data gives the impression that significant unofficial trade took place in Nigeria with associated implications for government finances. Parallel premium may have affected the fortunes of revenue from trade taxes by varying the share of trade that took place through the official channel. This is because the premium encourage over-invoicing of imports and under-invoicing of exports. In addition, by selling its foreign currencies below the market price, the Nigerian government has overtime been giving up quite a lot of potential resources. Consequently, these potential revenues never appeared in the government budget. This may have contributed to Nigeria's poor fiscal record. It is not surprising therefore that budget deficits was an abiding feature of government fiscal operations in Nigeria. The overall Federal deficits ranged between N0.43 billion in 1975 and N301.4 billion in 2002. Surpluses were only recorded in 7 of the 34 fiscal years between 1970 and 2003, mostly before 1980.

It is clear from the foregoing that overall budget deficit was not initially a policy problem. But from 8.7% of GDP in 1970, it reached 11.8% in 1982, and peaked at 15.4% in 1993. The surpluses in 1995 and 1996 were 0.5% and 1.6% of GDP respectively. This trend soon reversed into a deficit of 4.7 per cent of GDP in 1998, 8.4% in 1999 and 2.9% in 2000. Deficits correlated with parallel premium with a coefficient of 0.115. The most recent data on Nigeria indicates that budget deficit is still a pressing problem facing the Nigerian economy. Hence, the prolonged period of naira overvaluation may have contributed to the recurring fiscal deficits in Nigeria. A close inspection of available data reveals some degree of association between naira overvaluation and poor fiscal outcomes in Nigeria. The simultaneous occurrence of these, especially since the early 1980s suggests the need to investigate the fiscal impacts of parallel market exchange premium so as to inform current exchange rate policy reform programme being pursued in Nigeria.

3.0 Literature Review

A rich literature exists on parallel foreign exchange systems. However, evidence on the effects of such systems on economic performance is very scanty. Similarly, only few studies have considered the ways through which parallel market exchange premium affect economic performance. Landmarks in the literature in this area include Pinto (1990, 1991), Kaufmann and O'Connell (1991, 1999), and Chibber and Shafik (1991). Others are Elbadawi (1994), Morris (1995), Agenor and Ucer (1995), Azam (1999), Degefa (2001) Rutasitara (2004).

Pinto (1991) analyzed the fiscal and inflationary effects of exchange market unification with emphasis on the role of implicit taxation of exports. In Pinto's framework, exports are shared between official and unofficial markets. Thus, the parallel premium acts as an implicit tax on export earnings repatriated through official channels. By unifying the foreign exchange markets, the government loses the tax revenue implicit in the premium. The paper concludes that loss of the implicit tax on exports induced by exchange market unification may lead to a permanently higher inflation in the presence of fiscal rigidities. The rise in inflation upon unification depends on the size of the implicit tax on exports prior to reform. Policy makers are expected to compensate for the reduction in revenue by financing the resulting fiscal deficit.

Agenor and Ucer (1995) extend Pinto's (1991) analysis by identifying a variety of implicit taxes and subsidies that must be taken into account in assessing the fiscal effects of exchange market reforms. The authors emphasized two issues. The first issue is whether the public sector is a net buyer or net seller of foreign exchange. The second is the extent to which the use of the official exchange rate for the valuation of imports for duty purposes provides an implicit subsidy to importers. The authors derived a formula that explicitly captures these scenarios. The formula was applied to six countries – Guyana, India, Jamaica, Kenya, Sierra Leone, and Sri Lanka. The results suggest that exchange market reform led to lower reliance on inflationary finance in some cases by reducing the quasi-fiscal deficit of the monetary and the fiscal authorities. Chibber and Shafik (1991) submitted that official devaluation in Ghana had a positive budgetary effect which was anti-inflationary. The authors maintained that pre-devaluation prices already reflected the more depreciated shadow exchange rate. Simulation results indicate that slower devaluation in Ghana would have led to higher parallel rate depreciation and higher inflation. Using a five-equation model, the authors found that parallel premium adversely affected Ghana's growth performance. Elbadawi (1994) shows that higher premium have deleterious effects on official exports and tax revenue from foreign trade.

Morris (1995) also investigated the macroeconomic implications of unification. The study builds on the work of Pinto (1990) by showing how Pinto's results are reversed. The author emphasized that different fiscal structure leads to radically different policy implications. The paper therefore argue that official exchange rate devaluation makes sense as it reduces money creation, and hence, inflation in Uganda in the 1980s. Kaufmann and O'Connell (1999) also investigated the fiscal impact of the parallel premium.[6] The authors submitted that a more aggressive depreciation of the official exchange rate would have delivered a substantial fiscal bonus, reducing money growth and moderating inflationary pressures. It is interesting to note that Ghana, Tanzania, and Uganda had adequate foreign financing. In the case of Uganda, external inflows of foreign capital outweighed debt obligations. This does not seem typical of many African countries though.

Perhaps, the most comprehensive effort aimed at understanding the parallel exchange systems in developing countries is the World Bank study of eight countries – Argentina, Ghana, Mexico, Sudan, Tanzania, Turkey, Venezuela and Zambia.[7] A synthesis of the studies by Kiguel and O'Connel (1995) reported that the studies found that high premium was tolerated for a long time in most of the case studies, with damaging effects on allocative efficiency and growth. In general, the authors considered the microeconomic cost arising from resource misallocation to outweigh the macroeconomic gains of protecting reserves and avoiding inflation. In most cases also, the studies found evidence that exchange controls generated large parallel premiums and significant fiscal losses. The large premiums had detrimental effects on exports and growth with little insulation from external shocks.

Azam (1999) shows how the premium on foreign currencies at the parallel market and fiscal deficit combine to determine the dynamics of inflation. The paper presents an analytical model on the appropriate pricing strategy that should be adopted when the government is the main provider of foreign exchange to the economy. The theoretical discussion in the paper focused on two interesting case studies namely, Nigeria and Guinea. Using the case of Nigeria, the policy of indexing the official exchange rate on the parallel one is destabilizing. The case of Guinea is presented as an example of where the nominal anchor policy has succeeded. Under the assumption of rational expectations equilibrium, the model supports the view that government should select a low and constant rate of crawl (as in Guinea), rather than attempt to catch up on the changes in the parallel market rate (as done in Nigeria).

[6] Their conclusions are similar to that of Morris (1995) and Agenor and Ucer (1995).
[7] The studies include: Ansu (1999), Aron and Elbadawi (1999), Ghei and Kiquel (1999), Hausmann (1999), Kamin (1999), Kaminski (1999), Kaufmann and O'Connel (1999), and Ozler (1999).

Azam (1999) also did a quantitative analysis of the dynamics of the exchange rates and inflation in Nigeria. The outcome of this exercise is that the parallel market exchange rate is strongly linked with inflation, unlike the official exchange rate. This confirms an earlier result obtained by Egwaikhide *et* al (1994) for Nigeria. Rutasitara (2004) also find this to be the case in Tanzania using quarterly data. Like Elbadawi (1994), Degefa (2001) examine the impact of the parallel premium on merchandise exports in Ethiopia. Using both annual and monthly data its findings reveal that the parallel premium significantly constrains merchandise exports in both the long run and the short run.

4.0 Analytical Framework[8]

Theory suggests that the parallel exchange premium affects economic performance through many channels. The first channel is through illegal trade. High premium discriminates against exports. As a significant portion of the costs of production is paid in domestic currency, the significant parallel exchange rate premium reduces exporters' incentives and their ability to compete in foreign markets. Consequently, sustained increases in the premium encourage the diversion of exports from official to unofficial channels. Accordingly, it dampens official exports growth thereby choking foreign exchange receipts and damaging a country's ability to purchase the imports needed for domestic economic activity. Higher parallel premium is thus usually associated with lower export-GDP ratio in the official market. The reverse is the case for imports. Cheaper foreign exchange from official channels means that import-competing firms are faced with increased pressure from foreign companies. This results in increased calls for protection against imports. Lower premium is therefore usually associated with higher real imports. Overall, continuous increases in parallel premium tend to worsen the official trade balance. This could force officials to impose tighter restrictions. Devaluation serves the dual purpose of uniformly protecting import-competing industries and increasing the incentives to exporters.

Government's attempts to defend the official exchange rate through very tight monetary policy can plunge the country into severe recession due to the adverse impact of such measures on investment and output. As confidence in the sustainability of the official exchange rate ebb, capital flight results among residents anticipating devaluation. People may engage in capital flight by buying imported consumer durables. Again, less foreign exchange is available for needed imports. This may make the available foreign exchange to be rationed and allocated inefficiently by the government. Government budget balance may also be affected when exchange controls extend to the current account and illegal trade is substantial. This may alter the growth of government liabilities

[8] Aspects of the issues here are discussed in Kiguel and O'Connel (1995), Morris (1995), Agenor and Ucer (1995), and Shatz and Tarr (2000).

overtime. Revenue from trade taxes generally decrease as parallel premium increases. This is because officially remitted export revenues fall and the authorities implement import compression measures to protect external reserves. From the foregoing therefore, it is clear that parallel premium affects government revenue from trade taxes. Elbadawi (1994) investigated this for Sudan. The result indicates that higher premium have deleterious effects on official exports and tax revenue from foreign trade.

The theoretical literature on parallel foreign markets has traced the effect of exchange rate premium on government finances. This view considers the fact that governments are usually substantial net buyers or sellers of foreign exchange in comparison with the private sector. In dual foreign exchange market systems, the transactions mostly take place at the official exchange rate. The spread between the parallel and official exchange rates acts as a shadow tax or subsidy scheme with important implications for government finances. Standard calculations of fiscal deficits do not capture the 'shadow' fiscal effects of the premium. Thus, Pinto (1990, 1991) warns that unification will tend to raise inflation if the government is a net buyer of foreign exchange from the private sector unless deficits are reduced to offset the effects.

The impact of the premium on government finances can be explained using the basic government budget constraint. This shows the sources of financing total explicit and implicit government expenditure as follows:

Explicit expenditure + Implicit exchange rate overvaluation expenditure	=	Explicit revenue + Implicit exchange rate overvaluation revenues + Money financing + Domestic debt financing + Foreign debt financing	***(1)***

The relationship in equation (1) shows that the government can finance its total spending through revenue from explicit (traditional) sources, domestic and external debt borrowing, money creation, and exchange rate overvaluation. Thus, the parallel premium acts as an implicit tax on exports repatriated through official channels where government is a net buyer of foreign exchange from the private sector. This provide funds to finance public sector activities thereby reducing the pressure for monetary and debt financing. In Pinto's analysis, government loses the tax revenue implicit in the premium when the parallel and official foreign exchange markets are unified. Accordingly, this would create a deficit in government budget which will have to be financed.

Equation (1) also shows that a differential between the official and parallel exchange rates translates into implicit government expenditure where the public sector is a net seller of foreign

exchange to the private sector. This is because the premium in this case is an implicit subsidy from the government to the private sector. Sales of foreign currencies at a discount to the private sector amount to loss of potential revenue to the government. Unifying the official and parallel exchange rates therefore would boost government finances. In sum, if the central bank buys foreign exchange at a given official rate and sells to importers at a more depreciated rate, it makes a profit. Conversely, it will provide a net implicit subsidy when it buys foreign currency from exporters at an exchange rate that is more depreciated than the rate at which it sells to domestic agents. Both types of operations affect the profit of the monetary authorities and consolidated public sector deficit.

Agenor and Ucer (1999) provide a framework that extends Pinto's (1991) analysis, which emphasizes the role of implicit taxation on exports. The authors identify the implicit taxes and subsidies useful in assessing the fiscal effects of the parallel premium. Let the β denote the parallel exchange rate, α the official exchange rate, and χ and λ the sales and purchases of foreign currency by the central bank respectively.

$$\alpha(\chi - \lambda) \equiv \beta(\chi - \lambda) - (\beta - \alpha)(\chi - \lambda) \qquad (2)$$

The first term on the right-hand side of the identity measures the net sales of foreign exchange, while the second term measures the implicit profit or loss associated with an overvalued official rate. The central bank provides an implicit subsidy where it is a net seller of foreign exchange. Conversely, it will collect implicit tax from private agents if it is a net buyer of foreign currency. When official rather than the parallel market exchange rate is used for customs valuation, implicit subsidy is provided to importers. The net effect of the parallel premium on the quansi-fiscal deficit of the central bank is thus its net position regarding its foreign currency operations taking into account the overvaluation of the official exchange rate. It is expressed as follows:

$$\textit{Net effect} = (\beta - \alpha)[(\phi EXP + \lambda_0) - \chi] \qquad (3)$$

where ϕ is the surrender requirement imposed on exporters, EXP the domestic currency value of official exports, and λ_0, other sources of central bank foreign exchange receipts. Such sources include disbursement of foreign aid and those related to private unrequited transfers. The others are as defined earlier. This expression measures the difference between the implicit revenue resulting from purchases of foreign exchange at the official exchange rate and the implicit subsidy provided to buyers of foreign exchange. It is clear that the quasi-fiscal balance of the central bank will improve when the premium is eliminated if it is a net buyer of foreign exchange. Next is the effects of foreign exchange premium on the consolidated public sector, which covers the central bank, the government and public enterprises. This takes account of the foreign exchange operations of the rest of the public sector; and the implicit subsidy provided to importers due to taxation of foreign goods

at the official exchange rate. The public sector gets foreign exchange from disbursement of foreign loans, grants, or export proceeds of its enterprises. The sector requires foreign exchange for imports, servicing of its external debt, and other foreign exchange transactions. As these transactions pass through the central bank, getting the net effect of the parallel market premium on the broadly-defined quasi-fiscal balance of the consolidated public sector requires netting out the flow of foreign exchange from the rest of the public sector to the central bank (λ_g), and that of the central bank to the rest of the public sector (χ_g). From equation (3):

$$\textit{Net effect} = (\beta - \alpha)\,[(\phi EXP + \lambda_0 - \lambda_g) - (\chi - \chi_g)] \qquad (4)$$

The net foreign exchange position of the rest of the public sector is ($\chi_g - \lambda_g$). Thus, the outcomes of equations (3) and (4) will be about the same if the foreign exchange operations of the rest of the public sector are roughly balanced. Considering the implicit subsidies to importers, let ***M*** be the domestic currency value of total imports, and ***t*** the average rate of taxation on imports. If tariff duties are assessed on imports valued at the official exchange rate, the modified formula becomes:

$$\textit{Net effect} = (\beta - \alpha)\,[(\phi EXP + \lambda_0 - \lambda_g) - \chi_p - tM] \qquad (5)$$

where $\chi_p \equiv \chi - \chi_g$ represents sales of foreign exchange by the central bank to the private sector. Thus, a positive premium implies an implicit subsidy to the private sector which worsens the consolidated public sector deficit.

Exchange rate overvaluation subsidy has not been frequently estimated empirically in the literature. This in part, may be because of lack of data on the net purchases or sales of foreign currency to the private sector. Davis (2002) estimated exchange rate overvaluation subsidy for Sierra Leone over the period 1982-94. The author estimated the net foreign currency to the private sector (χ_p) using data from IMF's *Balance of Payments Statistics*. This was done by determining the difference between the sum of all government credit items on the balance of payments, and the sum of all government debit items noting that an increase in reserves is recorded as a negative item and a decrease in reserves is entered as positive. A positive χ_p implies that the public sector is a net seller of foreign currency to private sector and a negative means the government is a net buyer. The exchange rate overvaluation subsidy is given by the product of the parallel market differential and the net foreign currency sold to the private sector. This is the approach adopted in this study.

In addition, some experiments were conducted to determine the customs revenue effect of valuing duties payable at higher official exchange rates.

5.0 Methodological and Data Issues

Time series econometric techniques are used to examine the impact of the premium and other variables on revenue from customs duties. This section outlines the econometric approach and

provides information on the data employed. Real customs and excise duties is specified as being dependent on parallel premium, real exchange rate, real GDP and average tariff rate. It is expected to be positively influenced by the tax base as reflected by a general indicator of economic activity (GDP). The premium which leads to trade diversion from official channels is expected to have a negative effect. Similarly, the average tariff rate is expected to have a negative impact on revenue from customs and excise duties as it is capable of reducing imports. Finally, the effect of the real exchange rate could not be signed *a priori.* This is because a real exchange rate appreciation encourages imports while it discourages exports at the same time. The net effect is thus theoretically ambiguous. In effect, the determination of the customs revenue equation recognizes the main elements of the tax base in line with the tax handle literature. The estimated empirical model is:

$$RCED = f(PMP, RGDP, RER, TARIFF) \qquad (6)$$

where RCED is the real revenue from custom duties, PMP is the parallel market premium,[9] RGDP is real GDP, RER is the real exchange rate index, and TARIFF is the average tariff rate. This kind of model is similar to that of Elbadawi (1994) for Sudan.

5.1 Data issues

The sample period covers 33 years, from 1970 to 2002. The data for the period on customs and excise duties, GDP and imports were collected from the CBN. Customs and excise duties and GDP was deflated using the consumer price index (CPI) with 1995 as the base year. The data on the official exchange rate are the year averages from the African Development Bank database. The series were found to be consistent with those of the CBN. The data on the parallel exchange rate for the period 1970-79 was collected from the International Currency Analysis, Inc.'s World Currency Yearbook. Series for the period 1980-2002 were obtained from the World Bank's *African Development Indicators*. The series were also found to be consistent with those published in the various issues of the CBN's *Annual Reports and Statement of Accounts*. The exchange rate variables are expressed in units of naira to 1US$. Thus, an increase in the variables translates into depreciation relative to the US dollar. The average tariff rate is defined as the ratio of customs and excise duties to total official imports expressed in percentage terms.[10] The real exchange rate is computed as E/P^*P^w, that is, the product of the world price level (US wholesale price index, WPI) and the ratio of the naira official exchange rate (E) to Nigeria's domestic price level (CPI). The price indexes are from IMF's *International Financial Statistics.* These data sources are among the most widely used for economic studies. Thus, the series are assumed to be of good quality.

[9] The parallel premium used in the regression is defined as ln PMP = ln (PER/OER) rather than 100*(PER-OER)/OER as defined earlier in the text.

[10] Kidane (1997), Degefa (2001), and Nkurunziza (2002) used this method.

5.2 Statistical Properties of the Variables

Before undertaking the empirical test of equation (6), various descriptive statistics of the data series being employed were examined. This provides an insight into their characteristics. Table 3 in Appendix B contain these descriptive statistics. The statistics presented in the Table indicates presence of deviation from symmetry (Skewness) and that outliers or extreme values are more common than in a normal distribution. Accordingly, the normality χ^2 strongly rejects the null in the case of parallel premium, real exchange rate, and tariff rate. The various Jarque-Bera statistic confirm that the series are not normally distributed at the 5% significance level. Only real customs duty revenue and real GDP has evidence of normal distribution. The Kurtosis statistic reveals that the distribution of tariff rate is peaked (luptokurtic) relative to normal. Conversely, the distribution of parallel market premium, real customs duty revenue, real GDP, and real exchange rate are flat (platykurtic) relative to normal. Autocorrelations (AC) and the Partial Autocorrelations (PAC) functions characterize the pattern of temporal dependence in the series. In general, the series seems to obey a low-order autoregressive (AR) process. This result indicates that the variables are nonstationary series.

Another descriptive statistic that was computed is the correlation between the series. This was calculated to gain insight into the nature of the relationship between variables in the model. This is presented in Table 4, Appendix B. The table reveals that the different regressors do not appear to be strongly correlated with each other except revenue from customs duties the real exchange rate whose correlation coefficient is -0.705.

5.3 Unit Root Tests

Having established the statistical properties of the data series, the next step is to determine whether the data series possess unit roots. It is important to check the time series properties of variables used in econometric modelling. It is by ascertaining the data generating process of the variables that the best way of modelling their relationships can be identified. If the variables are stationary in levels, it is best to use OLS linear model to determine their relationship. However, if the variables are integrated, a stationary model can not be estimated. Rather, the relationship between the variables is better modelled via cointegration and error correction technique. This entails determining whether the variables are cointegrated, thus having an error correction representation.

Stationarity of the time series economic variables in the model was established using the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests. An important issue is whether the test should be conducted with trend and drift terms, with just a drift term, or with no trend and no

drift. The matter is crucial as erroneous inclusion of a term in the equation, or its wrongful omission may bias the test result. Thus, the ADF test is performed in the first instance with a drift term. If the null hypothesis of the presence of unit roots is rejected, it is concluded that the variable is stationary. Where ADF fails to reject the null, the PP test is conducted for confirmation. As a non-parametric test, the PP test is known to produce superior results than the parametric ADF test as it has more power.[11] The PP test is also known to be better in the presence of regime shifts and small samples. These problems are frequently encountered with African macroeconomic data. The results of the ADF and PP tests are reported in Table 5, Appendix B. All the variables are found to be non-stationary in levels at the 5% level of significance. The variables become stationary series after differencing them once.

6.0 Empirical Issues and Estimation Results

Following the findings in the last section that the time series data employed are all I(1) series and as such, non-stationary stochastic processes, test of possible cointegration among them was conducted. This is necessary because linear combinations of the unstationary series that are stationary might exist. If this is the case, then such series share some stochastic trends and are therefore cointegrated. In essence, there is an adjustment process which prevents errors in the long run relationship from increasing. Cointegration is a necessary condition for an error correction model to hold. The Engle-Granger two-step procedure was adopted to test for cointegration.

First, the long run relation of real revenue from customs and excise duties was estimated by OLS. To single out the relative responsiveness of real revenue from customs and excise duties to the parallel premium and other variables, the estimations were undertaken in log-linear form. Thus, the coefficient estimates are interpretable as elasticities. Taking the logs of the data series was done to stabilize the variance overtime. Table 6 in Appendix B presents the result of the long run (static) regression. As parallel premium drives the tariff variable as measured in this study, another model is estimated without it. However, the conclusions remain the same. The coefficients of the explanatory variables in the two models have the expected signs. In the model, parallel market exchange premium, real exchange rate, and real output are found to be statistically significant at 5% level or better.

In the long run static estimations of model 2, the elasticity of real customs and excise duties collected with respect to parallel premium, real exchange rate, and real GDP is -0.77, -0.45, and 0.41, respectively. In effect, the static equation shows a strong and significant negative relationship between real customs and excise duties revenue and the parallel premium. In the long run, a 10%

[11] These two tests are the most commonly used in the literature.

reduction in parallel premium leads to 6% increase in real customs revenue. This underscores the damaging effect of exchange premium on government finances in Nigeria overtime. The official real exchange rate variable is statistically significant; it affected real customs and excise duties collected negatively. This shows that real appreciation would have resulted in larger tax base and revenue through higher imports. The combined influence of parallel market exchange premium and real exchange rate with the elasticities of -0.76 and -0.45 underscores the damaging effect of overvaluation of the real official exchange rate in the presence of high parallel premium for the large part of the study period. The real output variable captures the changes in real customs and excise revenue collection as a result of changes in real national output. The positive and significant coefficient of real output indicates that in the long run, 10 additional units of output increases real customs revenue by 6 points as Nigeria depends on foreign inputs for production. In this estimation, the goodness of fit and diagnostic tests indicate that the model fits the data very well.

Next, is the test of whether the postulated equality in the long run relationship between real revenue from customs duties and its determinants gives a stationary error. This is a test against the null hypothesis that the residual of the long run (static) models are non-stationary. Evidence obtained indicates that the residual of the static models are indeed stationary at the 5% level of significance. Their ADF statistic (-3.377 and -3.131), respectively, are greater than the 5% critical t-value of -2.96 at two lags. This suggests that the series in the models are cointegrated. A confirmation test was performed using the Johansen multivariate cointegration technique. Test results confirm that the integrated series are indeed cointegrated.

When tariff is included, the likelihood ratio (97.77) is greater than the 5% critical value (87.32). The series are still cointegrated when average tariff rate is excluded from the series; the likelihood ratio (60.02) is also greater than the 5% critical value of 47.21. In both cases, the likelihood ratio indicates only 1 cointegrating vector. With the evidence of steady state long run equilibrium, it is useful to state that the coefficients of the static model are well-determined. The residual of the long run equation lagged one period was employed in the short run model of real revenue from customs and excise duties. The general-to-specific approach was employed in the search for the determinants of the real revenue from customs and excise duties. The regression analysis was done using Pc Give version 10.0 statistical and econometric software. The data used in estimation are provided in Table 7 in Appendix B.

The estimates of the parsimonious single-equation error correction model are contained in Table 8, Appendix B. The results are quite insightful and their discussion follows. The regression coefficients, with the exception of the constant, are significant with the anticipated signs. Also, the

result clearly indicates a well-defined error correction term, ECM_{t-1}. Though it oscillates, yet it is not explosive. The error correction estimate indicates quick convergence to equilibrium in each period, with intermediate adjustments captured by the differenced terms. The strong significance of the error term confirms that the residual of the static model is level stationary and that the series are cointegrated.

The ECM model shows the short-run effects of changes in parallel premium on real customs revenue and compares well with the long run estimates. In Model 2, parallel premium has a statistically significant negative effect on real customs and excise duties revenue in Nigeria, though with important positive spread effect. On aggregate, a 10% increase in parallel premium engenders 1.9% decline in real customs duties collected in Nigeria. The immediate impact is however close to 5%. This suggests that increases in parallel premium may have been reducing the share of trade through official channels, thereby reducing the tax base in foreign trade and foreign trade tax revenue. This is true as exchange controls extended to current account transactions in Nigeria in the past, leading to increase in unofficial trade. This result is in conformity with theory and the empirical findings of similar studies. A study in this genre is Elbadawi (1994). Estimates reveal that parallel premium affects customs and excise duties collection more seriously in the long run. The sustained impact of parallel premium mirrors the long standing reluctance of Nigerian authorities in allowing the official exchange rate to reflect its true value.

In addition, the results of the short-run dynamic equations indicate that official real exchange rate has an appreciable depressive effect on real customs duties collected over the study period. This implies that real depreciation significantly reduce imports leading also to smaller tax base and tax revenue. Similar result was obtained by Elbadawi (1994) for Sudan. Furthermore, estimates in model 1 show that the elasticity of real customs and excise duties collected to tariff rate is 0.3. This implies that doubling the tariff rate on average may increase real customs and excise duties collected by 30.4%. The result also shows that revenue from import duties has weak persistence effect, with an elasticity of 0.3% in both models. This suggests that past values of revenue from imports duties explain a part of it current value. Nonetheless, this link is only significant at the 10% level. This seems to suggest the presence of some kind of continuous drive and motivation on the part of the custom authorities. Impressive operational performance seems to be immediately followed by brilliant performance and vice versa. Thus, there is need to introduce and sustain measures that could boost the morale and motivation of the Customs authorities for continuous improved performance.

Finally, evidence emerges that there is also a positive short run relationship between real revenue from customs and excise duties and the level of real output in the Nigerian economy, with

contemporaneous parameter of 0.69 and 0.47 in models 1 and 2, respectively. This result is also in conformity with theory; hence, it is not surprising. Like many other developing countries, Nigeria depends on foreign productive inputs for production. Thus, higher output implies greater demand for imports and revenue from customs and excise duties.

Despite the impressive nature of the coefficients, only a correctly-specified model with normally-distributed white noise residual is useful for inference. Thus, some basic and informative tests were considered to establish that the model fits the data very well. In general, the tests reveal that the specification of the models are acceptable and that the residuals can be assumed to be white noise with normal distribution (see Table 8, Appendix B). On inspection, there is no significant outlier in the residual. The adjusted r-squared show that the models explain 80% of changes in real customs and excise revenue. Furthermore, the RESET test results indicate that the equations are not misspecified and that the assumption of linearity is correct. Besides, the ARCH test suggests absence of autocorrelation in the residuals and as such there is no missing explanatory variable. Lastly, the Chi$^{\wedge 2}$ statistic of the test for normality confirms that the residuals are normally distributed. A glance at the graphical diagnostics of model 2 for instance (corresponding to Figure 4 in Appendix B) confirms to its goodness-of-fit.

6.1 Exchange Rate Overvaluation Subsidy

The fiscal effect of the parallel premium is not only limited to its impact on revenue from customs and excise duties. Overtime the premium has meant loss of substantial potential revenue to the public sector. Table 9 in Appendix B contains the sources and uses of foreign currency by the Nigerian government between 1978 and 1988. This information was used to determine the exchange rate overvaluation subsidy in Nigeria during the period (see Table 10 in the Appendix B). The parallel real exchange rate was assumed to be the equilibrium rate, so that unification would take place at the parallel exchange rate. Perhaps, this is an imperfect proxy; the real exchange rate consistent with external balance in a unified regime may differ from the market-clearing rate under the parallel regime (Kiguel and O'Connell, 1995). The mainstream literature suggests that price convergence, rather than unification, is achieved when transport costs are non-zero. Thus, the size of the shadow losses associated with the pricing of foreign exchange transactions at the overvalued exchange rate can be biased upwards if the parallel exchange rate overestimates the true shadow value of foreign exchange. Nonetheless, previous unification attempts in 1987, 1992, and 1999 suggests that the market-clearing unified rate is typically much closer to the parallel rate than the official rate, especially as the system has been in place for sometime in Nigeria. In fact, equating the realistic exchange rate to the parallel market rate, the CBN merged the official rate with the former

on 5 March 1992. Preliminary estimates show that exchange rate overvaluation subsidy was quite substantial between 1978 and 1988, rising from N3.2 billion in 1979 to N18.4 billion before SAP in 1985. Sequel to the adjustment measures, the level of subsidy reduced to N4.0 billion in 1988. Estimates reported are the upper bound on the actual subsidy. The effect remains significant even after correcting for a possible bias. A shadow exchange rate equal to 70 per cent of the parallel exchange rate reduces the estimated average central bank loss in Nigeria from 11.2% of GDP to 5.4% of GDP between 1978 and 1988. The central bank benefited from the dual exchange rate system in 1987 and 1988. The estimated profits were 0.1% of GDP and 0.6% of GDP respectively. Thus, it may be inferred that the implicit exchange rate subsidy has indeed been very large.

As a proportion of GDP, it rose from 7.4% in 1979 to 25.5% in 1985. With correction for bias, maximum value reduced to 22.4% of GDP in 1985. Its proportion in GDP however became low during adjustment, averaging 5.4% in 1986-88. Thus, the nature and the dimension of distortions of government's implicit subsidy to the private sector through sales of foreign currency at low official exchange rates become apparent. The overvaluation of the naira induced the parallel market for foreign exchange. Also, it encouraged smuggling across the border to neighbouring countries. More importantly, it not only reduced the capacity to pay for imports and service foreign debts, it is likely to have exacerbated the country's fiscal and balance of payments problems. Undoubtedly, a more prudent policy could have enhanced social welfare through reduction in taxation, foreign borrowing, and external indebtedness.

The pricing of foreign exchange transactions at overvalued exchange rates also generated quasi-fiscal losses in three of the four countries covered by Kiguel, Lizondo and O'Connell. The central bank ran shadow losses of about 9.8% of GDP in Tanzania, 25.4% of GDP in Venezuela, and 16.2% of GDP in Zambia. Davis (2002) estimated the highest central bank subsidy in Sierra Leone to be 19.9% of GDP in 1982.

6.2. Implicit and Explicit Government Finances

Estimates of implicit government finances are presented in Table 11, Appendix B. The table provides some insights into some quasi-fiscal implications of the parallel market exchange premium in Nigeria. It shows that 100% reduction of the arbitrage premium through devaluation when the world oil market weakened in 1979 might have increased real customs revenue collection by about N213.5 billion between 1979 and 1982. Furthermore, if the devaluation policy had accompanied the demand management measures implemented in Nigeria between 1983 and 1985, additional real customs revenue totalling N351.8 billion would have been collected. Shortly before adjustment, customs valuation effect rose to 9.8% of GDP in 1985 from 2.0% of GDP in 1979. This suggests that

delay in the adoption of exchange rate reforms in the early 1980s resulted in significant customs revenue loss. The loss is about 2.4% and 7.8% of GDP in 1979-82 and 1983-85, respectively.

Customs revenue effect of official exchange rate overvaluation significantly reduced during adjustment period, 1986-1992. The highest during this period was N46.0 billion in 1986. Concomitantly, CBN data show that real customs and excise duty collected during this period rose dramatically from N33.4 billion 1986 to N61.6 billion in 1987, and N70.6 billion in 1991. This confirms the genuineness of the estimates. Recall that sequel to adjustment in late 1986, parallel market exchange premium fell drastically from 324.0% in 1985 to 137.7% in 1986, and further to 38.2% in 1987. The exchange rate policy reversal during the Abacha regime in 1994-98 is likely to have reduced customs revenue collection by a yearly average of about 6.2% of GDP. In real terms, this amounts to a total of N579.1 billion, and an annual average of N115.8 billion. These estimates are largely in line with the conclusion drawn from the regression approach that in the long run unification would lead to about 76.9% increase in revenue from real customs revenue.

Thus, the significant reliance on inflation tax before the up to the mid-1980s is not surprising. In 1971, inflation tax was as high as 18.1% of total revenue and 3.2% of GDP. This might have been as a result of the 1967-70 civil war which eroded government's revenue from traditional sources. Starting from when the war ended in 1970, the government required funds for post-war reconstruction and rehabilitation. Inflation tax became an alternative source of revenue as Table 7 illustrates. Inflation tax only decreased for a year before climbing back to a peak of 20.7% of total revenue in 1975; a point higher than its immediate post-war level. Inflation tax generally declined afterwards until the onset of the economic crisis of the early 1980s when it rose to 13.3% of total revenue. On average, inflation tax was 10.5% of total government revenue between 1971 and 1976. Over the same period, the level of seigniorage as a percentage of GDP was 4.6%. Inflation tax as proportion of government revenue declined from a mean value of 7.3% in 1977-84 to 1.0% in 1985-2003. Similarly, seigniorage/GDP ratio declined from an average of 1.3% in 1977-84 to 0.3% in 1985-2003.

It is also observable in Table 11, Appendix B that inflation gets considerably large in periods of large 'fiscal impact' (the sum of exchange rate overvaluation effect and customs revenue effect). Overall, strong inflationary pressures dominated the Nigerian economic scene since the 1970s. As Table 7 demonstrates, the rate of inflation was conspicuously high immediately after the civil war in 1971 with 15.7%. The inflation rate, which was only 3.2% in 1972, however, rose to 34.4% in 1975. It generally declined afterwards to 9.9% in 1980.

In the high premium era (1982-85), inflation increased rapidly from 7.6% in 1982 to 23.2 and 39.6% in 1983 and 1984, respectively. It declined to 5.5% in 1985 as a result of the anti-inflation measures adopted in the earlier years, and further to 5.4% at the onset of SAP in 1986. In actual fact inflationary pressures moderated significantly during low premium period of SAP. The average rate of inflation in the SAP years between 1986 and 1992 was 26.7%. However, two years into the programme, SAP was widely criticized as imposing severe hardship on the people. The government responded by implementing reflationary policy measures in 1988. Reflecting the measures, inflation rate climbed to 56.1% in 1988 and 50.5% in 1989 before declining sharply to 7.5% in 1990. Policy inconsistencies and reversals which characterized the period 1991-1994 explain the movement of inflation from 13% in 1991 to 72.8% in 1995. The decline afterwards generally reflects the disciplined fiscal policy.

6.3 The politics of exchange rate behaviour

The political economy explanations of Nigeria's exchange rate behaviour overtime are briefly presented here. Starting from the immediate post-independence era, Nigeria started as a strongly interventionist state set to pursue policies aimed at subsidization and protection of the populace and the indigenous companies. One of the ways through which this was pursued was an overvalued fixed exchange rate policy. This policy stance was maintained during the oil boom era. A relevant question is why the government maintained the policy. A key explanation is the strong political will to distribute the oil windfall by making imports cheaper thereby subsidizing the purchasing power of citizens. Another mitigating factor is the considerable influence of professional associations. In view of the priority accorded industrial development by the government, it was quite easy for interest groups like the Manufacturers Association of Nigeria and the Nigeria Chamber of Commerce, Industry, Mines and Agriculture to prevail on government to adopt the exchange rate policy that favoured their members in spite of the rationality of devaluation. The argument of the bodies rested on their heavy dependence on imported inputs for production. However, once implemented, the implicit and explicit subsidies became politically difficult to remove.

Sequel to the weakening of the oil market in 1979, it became clear that the country's exchange rate policy posture is unsustainable. However, suggestions for the naira to be depreciated (even from multilateral institutions) were rejected by the Nigerian government. Considering the nominal exchange rate as an indicator of good economic housekeeping, it seems the Nigerian authorities maintained the overvalued exchange rate then as a symbol of strength. Expecting that the glut in the world oil market will be temporary, the government did not want to send a signal of weakness to the international community.

As the nation's economic crisis deepened in the early 1980s the Nigerian government had difficulty selling the idea of devaluing the naira to the populace. Just as in many other developing countries, exchange rate policies have overtime been very sensitive and controversial in Nigeria. This is because the structural transformation required in the economy implies the devaluation of the nominal exchange rate. As the economy is also dependent on foreign sources for consumer goods, devaluation was perceived to be inflationary and contractionary. Consequently, labour unions and other organized interest groups mounted political pressure on the government to reject the devaluation of the naira. Therefore, to avert industrial disharmony and civil unrest the devaluation policy was delayed and scarce foreign currency was rationed for imports at overvalued official exchange rates.

In the 1970s and 1980s labour unions such as the Nigeria Labour Congress (NLC) and other organized interest groups like the National Association of Nigerian Students were very strong and influential. The threat of labour/civil unrest by these groups significantly contributed to the delay in the implementation of the devaluation policy in Nigeria. It is not surprising that exchange rate reforms were met with stiff political resistance, and upon its implementation, strong political resentment. In less than 5 years of its implementation, adjustment fatigue had emerged. Thus, starting from the twilight years of the Babangida administration, there were several policy reversals to please lobby groups. This continued in the Abacha era, 1994-1998. In 1994, the government re-introduced the fixed exchange rate system and pegged the naira exchange rate at N22.00 to US$1.00 in the official market to satisfy strong political interests.

However, the above does not explain why the elite benefited more. A political analysis of the situation shows that the military regimes during this period used the exchange rate policy for control and retention of political power, institutionalizing patron-client relationship based on support to the regimes in exchange for access to rents from the distortions. Those that could get the foreign exchange at the official price of N22.00 per US$ during the Abacha regime make a profit of about 264% by selling them at the parallel market at over N80.00 per US$. Nevertheless, the exchange rate policy implemented by the Abubakar regime in 1998-99 depoliticized the foreign currency market and significantly reduced the rents enjoyed by the elite. This was sustained by the Obasanjo civilian administration. Another significant development during this regime is the shift of economic management towards technocrats who are free from political influence.

7.0 Conclusion and Policy Recommendations

Nigeria has experienced high parallel market exchange premium for about half of the period between 1970 and 2003. Also, the country has been selling its foreign currencies at a discount to the

private sector, leading to significant revenue loss overtime. This study empirically examines the fiscal impacts of the parallel premium in Nigeria. It traces the emergence and development of the parallel market for foreign exchange in the country. In doing this, it investigates the evidence on the link between the parallel premium and revenue from customs and excise duties. Further, the exchange rate overvaluation subsidy to the private sector was determined. The results show that the fiscal impacts of the premium have been very profound. The premium negatively affects revenue from customs and excise duties in Nigeria. In the long run, a 10% reduction in parallel premium leads to 6% increase in real customs revenue. In effect, a rising premium and expanding parallel market could have serious fiscal and commercial policy implications by squeezing the tax base in foreign trade transactions and by expanding opportunities for large scale rent seeking activities. In addition, findings reveal that the general government lost about N54.2 billion (an average of N10.8 billion), between 1982 and 1986 due to the valuation of the net foreign exchange sold to the private sector at the official rate. This translates to an average of 16.7% of GDP within the period.

On the basis of the empirical results, an important policy conclusion emerges; which is that the unification of the parallel and official markets is not only desirable but also urgent. Hence, current efforts aimed at minimizing the premium should be sustained and pursued to logical conclusion. This will prevent a re-occurrence of past significant revenue losses, and the resultant huge fiscal deficits. An enduring lesson from the study is the need to entrust economic management in Nigeria to technocrats who are free of political influences, and the necessity of agencies of restraint such as an independent central bank to keep the fiscal behaviour of government in check.

An important extension to the study is the use of statutory tariff rate in modelling the real revenue from customs and excise duties. This entails calculation of the average legal tariff rate. With this, it would be possible to include the tariff rate and the parallel premium in the same equation. Furthermore, this study leaves out a variety of other potentially important effects on *d*, the real consolidated budget deficit of the public sector including especially any impact on the government's official price of oil and gasoline in the domestic market. Future studies can try to incorporate effects like this to get a more complete picture. One of the main uses of oil revenue in Nigeria is to support transfers to state and local governments, through the Federation Account. Another issue for future studies is the extent the overvalued official exchange rate strengthened the federal government relative to the state governments through the reduction of the real value of Federation Account transfers. Given the dollar amount of oil revenues, the naira value of these transfers is determined at the official exchange rate.

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APPENDIX A

Inflationary Implications of a Large Quasi-Fiscal Deficit

Let P be the domestic price index and d the real consolidated budget deficit of the public sector. Then if there is no change in the public sector's internal or external debt (so that domestic credit from the central bank is the only form of financing), the public sector's budget constraint reads:

(1) $$P \cdot d = \Delta DC = -E_O \cdot \Delta R + \Delta H,$$

where DC is central bank domestic credit to the public sector, R is international reserves, H is the monetary base, and E_O is the official exchange rate. Let's assume that all foreign exchange sales and purchases of the central bank take place at the same exchange rate, so that there are no explicit profits or losses arising from these.[12] The change in central bank international reserves is the (negative of the) sum of net foreign exchange sales to the government, S_G, and net foreign exchange sales to the private sector, S_P:

(2) $$\Delta R = -(S_G + S_P).$$

The change in the monetary base can therefore be expressed as the sum of net foreign exchange sales to the private sector and the fiscal deficit net of foreign exchange sales to the public sector:

(2) $$\Delta H = -E_O \cdot S_P + [P \cdot d - E_O \cdot S_G].$$

Defining the real monetary base as $h \equiv H / P,$ then real seigniorage can be re-expressed as approximately equal to the sum of the change in real money balances and the inflation tax (the approximation is exact in continuous time). Using $\pi \equiv \Delta P / P$ to denote the inflation rate,

(4) $$\frac{\Delta H}{P} = \frac{\Delta H}{H} \cdot h \cong (\frac{\Delta h}{h} + \frac{\Delta P}{P}) \cdot h = \Delta h + \pi \cdot h.$$

Combining (3) and (4), we get

(5) $$\Delta h + \pi \cdot h = -\frac{E_O}{P} \cdot S_P + [d - \frac{E_O}{P} \cdot S_G].$$

[12] If the central bank was operating a multiple exchange rate regime, its "quasi-fiscal" profits or losses from foreign exchange intervention would have to be added to the public sector deficit on the left-hand side of (1).

Equation (5) links the pricing of public sector foreign exchange transactions to inflation. If exchange rate unification alters the right-hand side of (5), then the rate of money creation must change (the left-hand side), and this may feed through to the inflation rate. In fact, if we are comparing steady states before and after unification, then $\Delta h = 0$. In other words, any change in the steady-state real fiscal deficit must be absorbed by the inflation tax. As long as the economy is operating on the "good" side of the inflation-tax Laffer curve, where the elasticity of money demand with respect to expected inflation is below 1, a reduction in the right-hand side of (5) would mean a reduction in the steady-state inflation rate.

Pinto and others made a variety of assumptions about the right-hand side of (5), in order to tie down the precise effect on inflation across steady states. For example, Pinto assumed complete pass-through from the parallel exchange rate to the domestic price level, so that essentially $P = U$, where U is the parallel exchange rate. He also assumed that the term in square brackets in (5) was invariant to the parallel exchange rate across steady states and that net foreign exchange sales to the private sector were also invariant. Using Δ_s to denote a change across steady states, then equation (5) says

$$\Delta_s[\Delta h + \pi \cdot h] = \Delta_s\left(-\frac{E_O}{P} \cdot S_P\right) + \Delta_s[d - \frac{E_O}{P} \cdot S_G].$$

Pinto assumed $\Delta_s(\Delta h) = 0$ and $\Delta_s[d - \frac{E_O}{P} \cdot S_G] = 0,$ which means that the change in the steady-state inflation tax due to unification is

$$(6) \qquad \Delta_s(\pi \cdot h) = \Delta_s\left(-\frac{E_O}{P} \cdot S_P\right) = -\left(1 - \frac{E_O}{U}\right) \cdot S_P = -\left(\frac{z}{1+z}\right) \cdot S_P,$$

where $z \equiv \frac{U - E_O}{E_O}$ is the black market premium. Thus the steady-state inflation tax (and therefore the steady-state inflation rate) must fall with unification if the central bank is a net seller of foreign exchange to the private sector at the official exchange rate. The calculation of the "fiscal" impact is very close to the right-hand side of (6). Note that 1+z is approximately 1.

Equations (5) and (6) do not measure the effect of unification on the fiscal deficit, which in real terms is given by Δd. Nor can we unambiguously measure the quasi-fiscal deficit of the central bank, because there is only one official exchange rate, so that quasi-fiscal gains or losses can only be defined implicitly, with reference to what the central bank's accounts would look like at a

hypothetical unified exchange rate. So there is a sense in which all these calculations can be said to refer to the "fiscal" effect of the premium, but what is really going on is that in a fiscal theory of inflation, exchange-rate unification can have very similar effects on money growth and inflation as changes in conventional taxes can. The only truly "fiscal" effect of the premium measured in this paper is the effect on real customs revenue. This is part of Δd in the expression above in equation (6). Pinto assumed that $\Delta d = \Delta\left(\frac{E_O}{P} \cdot S_G\right)$; in other words, he assumed that any valuation change in the price paid for foreign exchange by the rest of the public sector would be passed on into a higher deficit to be financed by domestic credit, but that there would be no other sources of change in the government's domestic credit requirement.

APPENDIX B

Table 1. Average Naira Exchange Rate, 1971-2003

Year	Parallel Market		Official Market	
	Rate (N:US$) (1)	*Depreciation/ Appreciation (%)* (2)*	*Rate (N:US$) (3)*	*Depreciation/ Appreciation (%)* (4)*
1971	0.58	0.00	0.71	-0.20
1972	0.58	0.00	0.66	-7.71
1973	0.83	43.10	0.66	0.00
1974	0.88	6.02	0.63	-4.20
1975	0.89	1.14	0.62	-2.35
1976	0.89	0.00	0.63	1.80
1977	1.02	14.61	0.64	2.89
1978	1.14	11.76	0.64	-1.46
1979	1.06	-7.02	0.60	-4.92
1980	0.90	-15.09	0.55	-9.47
1981	0.93	3.33	0.62	12.97
1982	1.14	22.58	0.67	9.03
1983	1.82	59.65	0.72	7.57
1984	3.25	78.57	0.77	5.81
1985	3.79	16.62	0.89	16.60
1986	4.17	10.03	1.75	96.30
1987	5.55	33.09	4.02	128.9
1988	6.05	9.01	4.54	12.97
1989	10.55	74.38	7.36	62.33
1990	9.61	-8.91	8.04	9.15
1991	13.40	39.44	9.91	23.28
1992	20.30	51.49	17.30	74.56
1993	36.20	78.33	22.07	27.56
1994	99.95	176.10	22.00	-0.31
1995	83.70	-16.26	21.90	-0.46
1996	83.10	-0.72	21.88	-0.05
1997	85.00	2.29	21.89	0.01
1998	87.90	3.41	21.89	0.00
1999	99.30	12.97	92.34	321.9
2000	111.10	11.88	101.70	10.14
2001	133.00	19.71	111.23	9.37
2002	136.90	2.93	120.58	8.40
2003	141.40	3.29	129.30	7.23

* *+ denotes depreciation while - means appreciation*

Source: *ADB Database, World Currency Year Book, World Bank.*

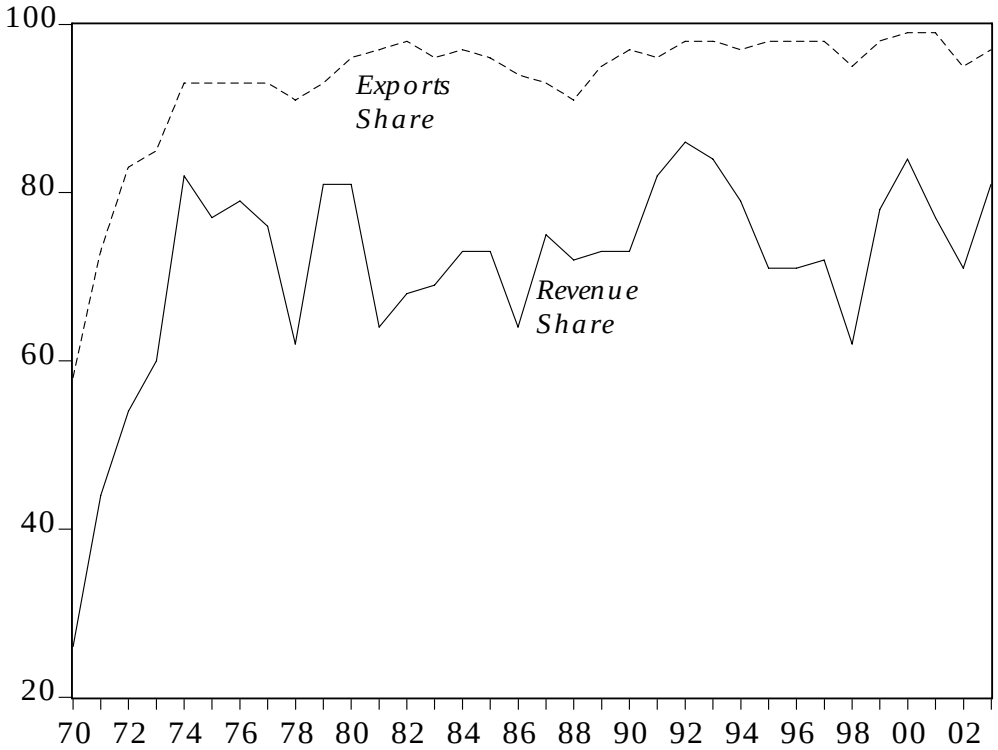


Fig. 1. ***Share of Oil in Real Government Revenue and Export Earnings (%): Nigeria, 1970-2003***

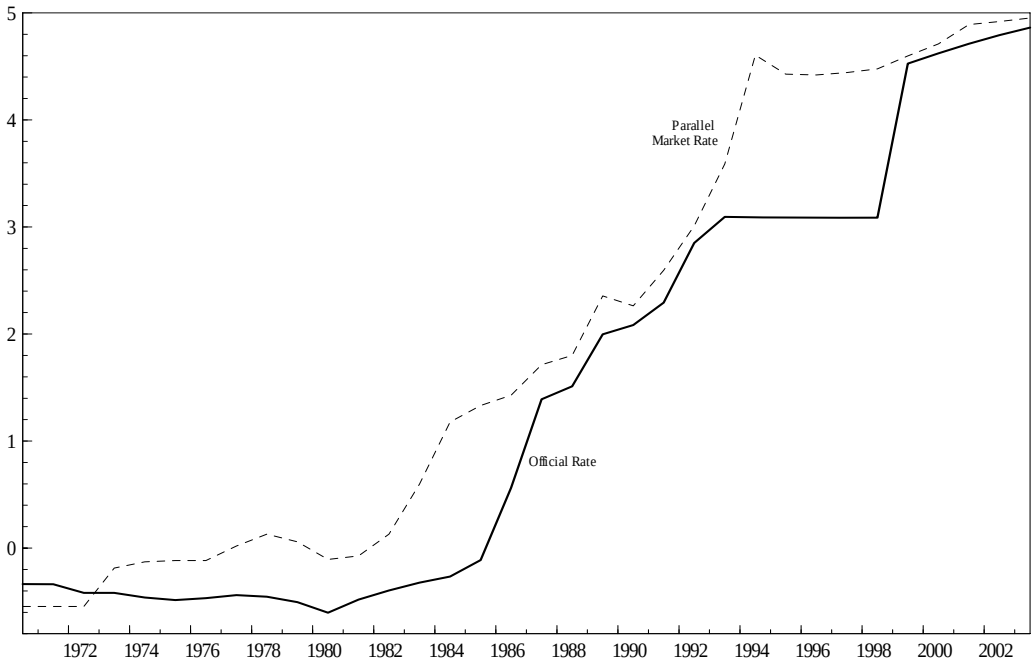


Figure 2. ***Official and Parallel Exchange Rates: Nigeria 1970-2003 (Logarithmic Scale).***

Figure 3. ***Parallel Market Premium (%)*****: Nigeria 1970-2003.**

Table 2. Size of Customs and Excise Duty in Government Revenue and Domestic Output (%)

YEAR	1970	1975	1980	1985	1988	1991	1994	1996	1998	1999	2000	2001	2002	2003
DTGR	58.4	13.8	11.9	14.5	20.6	11.3	9.1	10.6	12.4	9.3	5.3	7.6	10.5	7.6
DTNR	79.2	61.2	63.0	52.9	73.0	62.5	43.9	36.4	41.4	39.1	32.3	32.6	36.2	39.0
DGDP	7.1	3.5	3.6	3.0	3.9	3.5	2.0	2.3	2.0	2.7	2.2	3.3	3.3	2.7

Source: Central Bank of Nigeria, *Annual Report and Statement of Account*, various issues
Note: DTGR, DTNR, and DGDP denotes the ratio of customs duty in total revenue, non-oil revenue, and GDP respectively

Table 3: Descriptive Statistics of the Data Series

	PMP	RCED	RER	RGDP	TARIFF
Mean	51.88788	63930.32	161.2303	1928701.	404.5000
Median	37.80000	63873.90	159.6000	1958682.	373.5000
Maximum	118.9000	102921.2	316.4000	2541431.	988.6000
Minimum	21.20000	31613.30	63.90000	1040740.	100.0000
Std. Dev.	30.50866	19832.62	76.42700	414615.5	237.7922
Skewness	1.144286	-0.031644	0.350385	-0.398843	1.172836
Kurtosis	2.732382	1.911071	1.742964	2.307447	3.642999
Asymptotic test: Chi^2(2)	7.2994 [0.0260]*	1.6359 [0.4413]	2.8475 [0.2408]	1.5344 [0.4643]	7.5432 [0.0230]*
Normality test: Chi^2(2)	34.997 [0.000]**	1.9255 [0.3818]	7.2118 [0.0272]*	2.1734 [0.3373]	12.934 [0.0016]**
Jarque-Bera	7.300122	1.635938	2.847927	1.534409	8.380467
Probability	0.025990	0.441327	0.240758	0.464309	0.015143
Autocorrelation Coefficient (AC)					
Lag 1	0.6727	0.6506	0.7380	0.6355	0.8103
Lag 2	0.2951	0.4279	0.4203	0.3214	0.6485
Lag3	0.0195	0.2886	0.1149	0.0615	0.4212
Lag 4	-0.1843	0.2124	-0.1310	-0.1329	0.2154
Partial Autocorrelation Coefficient (PAC)					
Lag 1	0.6727	0.6506	0.7380	0.6355	0.8103
Lag 2	-0.2874	0.0081	-0.2731	-0.1382	-0.0232
Lag 3	-0.0851	0.0124	-0.1859	-0.1422	-0.2844
Lag 4	-0.1612	0.0313	-0.1343	-0.1299	-0.2154

Table 4: Correlation between the series

	PMP	RCED	RER	TARIFF	RGDP
PMP	1.0000				
RCED	-0.70520	1.0000			
	*[0.000]***				
RER	-0.70571	0.17644	1.0000		
	*[0.000]***	*[0.326]*			
TARIFF	-0.43595	0.42840	0.021029	1.0000	
	*[0.011]**	*[0.013]**	*[0.908]*		
RGDP	-0.000467	0.25215	0.054683	-0.57147	1.0000
	[0.998]	*[0.157]*	*[0.762]*	*[0.001]***	

Note: **, * indicates significance at 1 and 5 per cent level respectively.

Table 5: Unit Root Test Results

	ADF		**PP**		
Variable	*Level*	*1st Difference*	*Level*	*1st Difference*	*Order of integration*
Premium	-2.912*	-3.395**	-2.531	-4.915***	I(1)
Real Customs Revenue	-2.187	-4.521***	-2.427	-6.921***	I(1)
Real Exchange Rate	-2.316	-3.628**	-2.186	-4.819***	I(1)
Real GDP	-2.888*	-4.269***	-2.802*	-5.973***	I(1)
Tariff Rate	-2.495	-3.235**	-2.530	-5.935***	I(1)

Note: ***, **, * indicates significance at 1, 5, and 10% probability level, respectively.

Table 6: OLS Estimation Results of the Long-run Cointegrated Equilibrium Models

Dependent variable: LRCED (Sample 1970-2002)

	Model 1		**Model 2**	
Regressor	*Coefficient*	*t-value*	*Coefficient*	*t-value*
Constant	5.3653	1.73*	**10.2349**	**5.53*** **
LPMP	-0.6308	-6.02***	**-0.7688**	**-9.70*** **
LRER	-0.3588	-3.92***	**-0.4499**	**-5.51*** **
LRGDP	0.6169	3.87***	**0.4113**	**3.34*** **
LTARIFF	0.1569	1.91*		
Adj R^2	**0.81**		**0.79**	
F-statistic	**29.89*** **		**35.4** **	
RSS	**0.69**		**0.77**	
Sigma	**0.16**		**0.16**	
DW	**2.19**		**2.34**	
Log-likelihood	**17.1**		**15.1**	
Hetero test	**1.03 [0.451]**		**0.51 [0.788]**	
Normality test	**1.24 [0.537]**		**0.31 [0.855]**	
RESET test	**1.30 [0.264]**		**2.06 [0.162]**	
ARCH 1-1 test	**0.39 [0.533]**		**0.30 [0.591]**	
Hetero-X test	**0.74 [0.709]**		**0.41 [0.912]**	

Note: ***, **, * indicates significance at 1, 5, and 10% probability level, respectively.

Table 7: DATA USED FOR ESTIMATION

YEAR	PER	OER	PREM	CED	WPI	CPI	RER	TARIFF	GDP	IMPORTS
1970	0.58	0.71	0.81	370.0	29.6	0.5	192.8	48.9	5203.7	756.4
1971	0.58	0.71	0.81	491.0	30.5	0.6	171.4	45.5	6570.7	1078.9
1972	0.58	0.66	0.88	481.1	31.9	0.6	159.6	48.6	7208.3	990.1
1973	0.83	0.66	1.26	516.2	36.1	0.6	169.3	42.1	10990.7	1224.8
1974	0.88	0.63	1.40	498.3	42.9	0.7	171.3	28.7	18298.3	1737.3
1975	0.89	0.62	1.45	760.7	46.8	1.0	137.1	20.4	21558.8	3721.5
1976	0.89	0.63	1.42	882.7	49.0	1.2	117.8	17.1	27297.5	5148.5
1977	1.02	0.64	1.58	1145.6	52.0	1.4	112.6	16.1	32747.3	7093.7
1978	1.14	0.64	1.79	1698.2	56.1	1.7	98.5	20.7	36083.6	8211.7
1979	1.06	0.60	1.75	1143.9	63.1	1.9	94.0	15.3	43150.8	7472.5
1980	0.90	0.55	1.65	1813.5	72.0	2.0	88.5	19.9	50848.6	9095.6
1981	0.93	0.62	1.51	2325.8	78.6	2.5	90.1	18.1	50749.1	12839.6
1982	1.14	0.67	1.69	2336.0	80.1	2.6	93.3	21.7	51709.2	10770.5
1983	1.82	0.72	2.51	1984.1	81.1	3.3	82.3	22.3	57142.1	8903.7
1984	3.25	0.77	4.24	1616.0	83.1	4.6	63.9	22.5	63608.1	7178.3
1985	3.79	0.89	4.24	2183.5	82.7	4.9	69.0	30.9	72355.4	7062.6
1986	4.17	1.75	2.38	1728.2	80.3	5.2	124.4	28.9	73061.9	5983.6
1987	5.55	4.02	1.38	3540.8	82.4	5.8	262.8	19.8	108885.1	17861.7
1988	6.05	4.54	1.33	5672.0	85.7	8.9	200.0	26.4	145243.3	21445.7
1989	10.55	7.36	1.43	5815.5	90.0	13.4	226.3	18.8	224796.9	30860.2
1990	9.61	8.04	1.20	8640.9	93.2	14.4	238.3	18.9	260636.7	45717.9
1991	13.40	9.91	1.35	11456.9	93.4	16.2	260.5	13.2	324010.0	87020.2
1992	20.30	17.30	1.17	16054.8	93.9	23.5	316.4	11.0	549808.8	145911.4
1993	36.20	22.07	1.64	15486.4	95.3	36.9	260.6	9.3	697095.2	166100.4
1994	99.95	22.00	4.54	18294.6	96.6	57.9	167.6	11.2	914940.0	162788.8
1995	83.70	21.90	3.82	37364.0	100.0	100.0	100.0	4.9	1977740.0	755127.7
1996	83.10	21.88	3.80	55000.0	102.4	129.3	79.1	9.8	2356600.0	562626.6
1997	85.00	21.89	3.88	63000.0	102.3	139.9	73.1	7.4	3127940.0	845716.6
1998	87.90	21.89	4.02	57683.0	99.7	154.3	64.6	6.9	2881310.0	837418.7
1999	99.30	92.34	1.08	87906.9	100.6	161.7	262.3	10.2	3203314.5	862515.7
2000	111.10	101.70	1.09	101523.6	106.4	185.2	266.8	10.5	4547065.1	962963.9
2001	133.00	111.23	1.20	170557.1	107.6	209.2	261.2	12.6	5187940.0	1357695.0
2002	136.90	120.58	1.14	181408.2	105.1	236.1	245.1	11.5	5465330.0	1580527.3

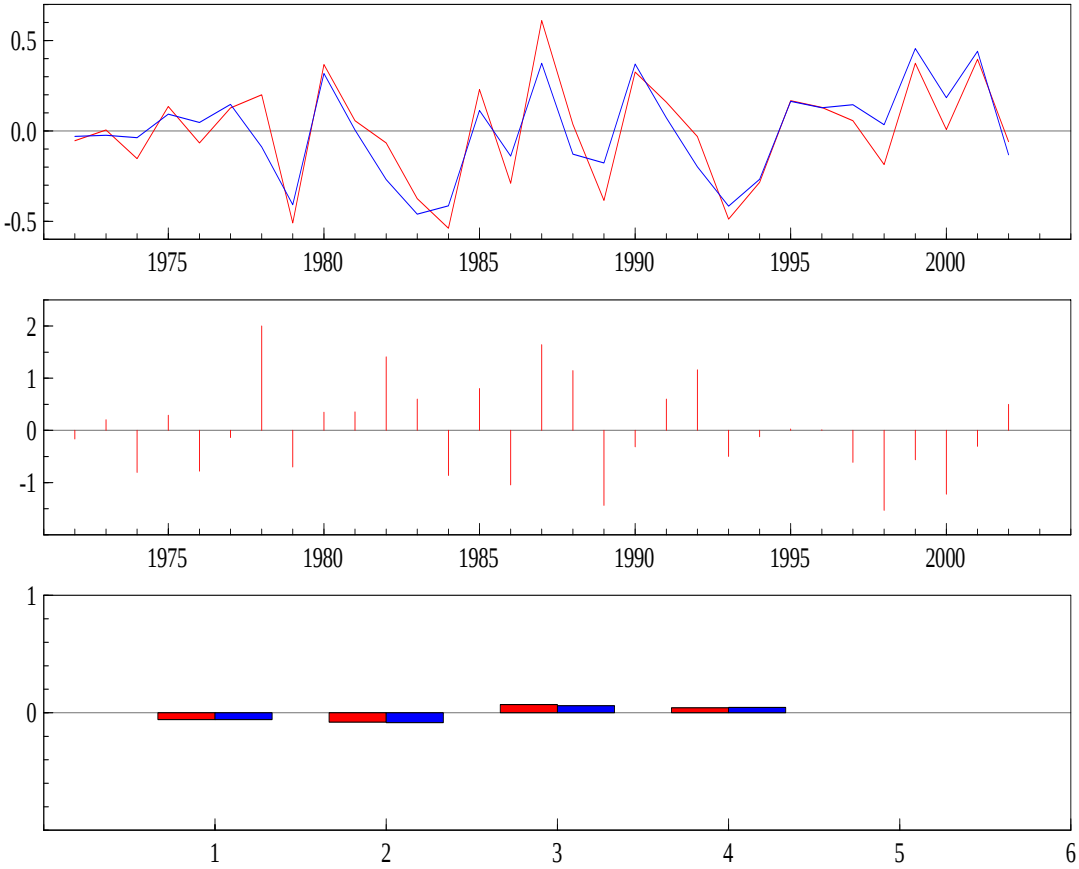
Table 8: Error Correction Estimates of Alternative Models

Dependent variable: DLRCED (Sample 1973 to 2002)

	General Model 1		Reduced Model 1		General Model 2		Reduced Model 2	
Regressor	*Coefficient*	*t-value*	*Coefficient*	*t-value*	*Coefficient*	*t-value*	*Coefficient*	*t-value*
Constant	-0.0112	-0.41	- 0.0073	-0.265	-0.0144	-0.51	-0.0132	-0.497
DLPMP	-0.4300	-3.30***	-0.4672	-3.61***	-0.4808	-3.67***	-0.4860	-3.87***
DLRER	-0.3366	-2.32**	-0.3494	-2.48**	-0.3301	-2.26**	-0.3365	-2.47**
DLRGDP	0.7239	3.80***	0.6963	3.54***	0.4465	2.53**	0.4735	2.83***
DLTARIFF	0.2558	2.14**	0.3044	2.75**				
DLPMP(-1)	0.3614	2.00*	0.2564	2.08**	0.4087	2.08**	0.2948	2.34**
DLRCED(-1)	0.5149	2.48**	0.2989	1.75*	0.3802	1.94*	0.3227	1.91*
DLRER(-1)	0.0805	0.58			0.1095	0.77		
DLRGDP(-1)	-0.4126	-1.70			-0.0434	-0.22		
DLTARIFF(-1)	-0.1869	-1.46						
ECM(-1)	-1.780	-5.79***	-1.5577	-5.54***	-1.7779	-5.75***	-1.6909	-6.19***
Adj R^2	**0.832**		**0.804**		**0.800**		**0.795**	
F-statistic	**9.91*** **		**12.93*** **		**11.02*** **		**15.5** **	
RSS	**0.41**		**0.48**		**0.49**		**0.50**	
Sigma	**0.14**		**0.15**		**0.15**		**0.14**	
Log-likelihood	**23.1**		**19.6**		**20.4**		**20.0**	
Hetero test	**18.1[0.581]**		**0.63[0.789]**		**0.19[0.807]**		**0.33[0.964]**	
Normality test	**0.87[0.648]**		**0.29[0.866]**		**0.60[0.741]**		**0.98[0.613]**	
RESET test	**0.14[0.713]**		**0.03[0.857]**		**0.37[0.550]**		**0.11[0.743]**	
ARCH 1-1 test	**0.93[0.349]**		**0.14[0.710]**		**0.59[0.453]**		**0.10[0.761]**	
AR 1-2 test	**0.54[0.589]**		**0.76[0.479]**		**0.21[0.807]**		**0.32[0.727]**	

Note: ***, **, * indicates significance at 1, 5, and 10% probability level, respectively.

Figure 4. Goodness of Fit Measures for Model 2



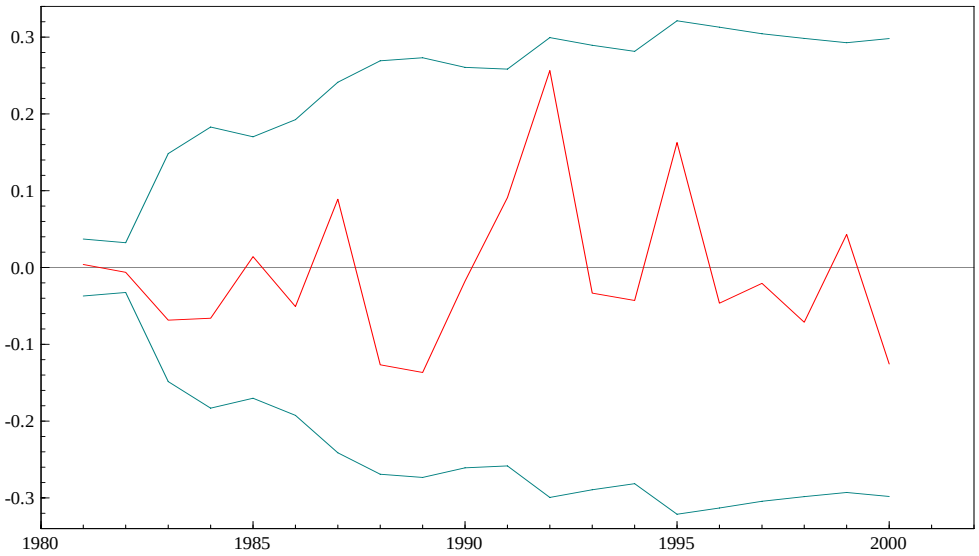


Table: 9. Sources and Uses of Foreign Currency by Government, Nigeria (Nm)

YEAR	INVESTMENT INCOME (DEBIT)	OFFICIAL GDS., SERVS & INCOME (DEBIT)	TRANSFERS (CREDIT)	TRANSFERS (DEBIT)	OIL EXPORTS RECEIPTS (60% of Total)	LONG TERM CAPITAL TO RESDIDENT OFFICIAL SECTOR	SHORT TERM CAPITAL OF RESIDENT OFFICIAL SECTOR	RESERVES	NET FOREIGN CURRENCY TO THE RPIVATE SECTOR (in SDR)	SDR/US $ EXCHANGE RATE	NET FOREIGN CURRENCY SOLD TO THE PRIVATE SECTOR (NFC^{PS}) US $
1978	-35	X	6	-22	4496.4	1129	5	1702	7281.4	1.25	9101.8
1979	-158	X	12	-42	7291.8	748	8	-2473	5386.8	1.29	6949.0
1980	-231	X	15	-145	11494.2	470	-3	-3362	8238.2	1.30	10709.7
1981	-364	-280	17	-116	8573.4	651	-1	4075	12555.4	1.18	14815.4
1982	-615	-219	15	-51	6456.6	972	2575	1872	11008.6	1.10	12106.2
1983	-564	-164	9	-27	5578.8	1386	1140	408	7766.8	1.07	8310.5
1984	-910	-274	9	-34	6770.4	-945	414	-467	4563.4	1.03	4700.3
1985	-1078	-47	20	-22	7438.2	-1435	1811	-458	6229.2	1.02	6353.8
1986	-619	-38	9	-13	3159.6	-1031	1337	456	3260.6	1.17	3814.9
1987	-1671	X	1	-5	3255.0	-2703	1635	-40	472.0	1.29	608.9
1988	-1549	x	18	-2	2906.4	-2562	2824	343	1978.4	1.34	2651.1

Source: IMF's Balance of Payments Statistics, various issues.

Table: 10. Nigeria: Estimate of Exchange Rate Overvaluation Subsidy, 1978-88

YEAR	NET FOREIGN CURRENCY TO THE PRIVATE SECTOR (US $ Million)	AVERAGE OFFICIAL EXCHANGE RATE (₦/US$)	PARALLEL MKT. EXCHANGE RATE (₦/US$)	**PARALLEL MARKET DIFFERENTIAL**	EXCHANGE RATE OVERVALUATION SUBSIDY (EROS, ₦ million)	**NOMINAL GDP (₦ million)**	**E ROS (GDP %)**
	1	***2***	***3***	***4 (3-2)***	***5 (1x4)***	***6***	***7 (5x100)/6***
1978	9101.8	0.64	1.14	0.50	4550.9	36083.6	12.6
1979	6949.0	0.60	1.06	0.46	3196.5	43150.8	7.4
1980	10709.9	0.55	0.90	0.35	3748.4	50848.6	7.4
1981	14815.4	0.62	0.93	0.31	4592.8	50749.1	9.1
1982	12106.2	0.67	1.14	0.47	5689.9	51709.2	11.0
1983	8310.5	0.72	1.82	1.10	9141.6	57142.1	16.0
1984	4700.3	0.77	3.25	2.48	11656.7	63608.1	18.3
1985	9353.8	0.89	3.75	2.90	18426.0	72355.4	25.5
1986	3814.9	1.75	4.17	2.42	9232.1	73061.9	12.6
1987	608.9	4.02	5.55	1.53	931.6	108885.1	0.9
1988	2651.1	4.54	6.05	1.51	4003.2	145243.3	2.8

Table 11. Nigeria: Implicit Government Finances, 1971-2003

Year	Inflation Rate (%)[1]	Inflation Tax (% GDP)[2]	Inflation Tax (% Revenue)[2]	Seigniorage (% GDP)[2]	EROS (% GDP)[3]	Customs Valuation Effect (N Billion)[2]	Customs Valuation Effect (GDP%)[2]
1971	15.7	3.2	18.1	1.5		-15.8	-1.4
1972	3.2	0.5	2.8	1.2		-9.5	-0.8
1973	5.4	0.6	4.1	2.6		21.1	1.2
1974	13.2	1.1	4.4	11.0		27.4	1.1
1975	34.4	5.3	20.7	7.5		35.3	1.6
1976	23.7	3.3	13.3	3.8		31.2	1.4
1977	15.6	1.9	7.6	2.7		49.0	2.0
1978	16.6	1.9	9.4	-0.1	12.6	81.8	3.7
1979	11.6	0.9	3.7	1.3	7.4	46.7	2.0
1980	9.9	0.7	2.3	4.5	7.4	57.7	2.3
1981	21.0	2.3	8.8	0.1	9.1	47.8	2.3
1982	7.6	0.7	3.0	0.7	11.0	61.3	3.1
1983	23.2	1.8	9.9	0.6	16.0	92.0	5.3
1984	39.6	2.3	13.3	0.8	18.3	115.1	8.2
1985	5.5	0.2	1.0	0.3	25.5	144.7	9.8
1986	5.4	0.2	1.2	0.2	12.6	46.0	3.3
1987	10.2	0.3	1.1	0.5	0.9	23.5	1.2
1988	56.1	1.2	6.2	1.0	2.8	21.3	1.3
1989	50.5	0.6	2.6	0.5		18.8	1.1
1990	7.5	0.1	0.2	0.3		11.8	0.6
1991	12.9	0.1	0.4	0.4		24.9	1.2
1992	44.6	0.3	0.9	0.7		11.9	0.5
1993	57.2	0.5	1.7	0.4		26.9	1.4
1994	57.0	0.3	1.6	0.2		112.0	7.1
1995	72.9	0.2	0.7	0.1		105.5	5.3
1996	30.4	0.04	0.19	0.02		119.0	6.5
1997	8.2	0.01	0.04	0.00		129.9	5.8
1998	10.3	0.01	0.06	0.01		112.7	6.0
1999	6.7	0.01	0.02	0.02		4.1	0.2
2000	6.9	0.00	0.01	0.03		5.1	0.2
2001	18.9	0.02	0.04	0.03		16.0	0.6
2002	12.9	0.01	0.04	0.01		10.4	0.4
2003	14.0	0.01	0.03	0.03		6.2	0.2

1. Source: Central Bank of Nigeria, *Statistical Bulletin,* December 2003, vol. 14.
2. Calculated using data from Central Bank of Nigeria, *Statistical Bulletin,* December 2003, vol. 14.
3. Calculated using data from IMF's Balance of Payments Statistics, various issues.