Petroleum and its Consequences for Prices, Employment and Wages in Nigeria[1]

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ABSTRACT

The availability of oil resources in Nigeria has had a profound impact on the economy, particularly the economy's sectoral structure. Although the oil sector itself never did put pressure on the other sectors directly, since its labour requirements were negligible, the policy response by the authorities towards the oil revenue inflicted adverse effects on the agricultural sector. Exchange rates appreciated both in nominal and real terms, the latter considered to be a spending effect of the oil boom. Consequently, labour costs increased in terms of the exogenously determined agricultural product prices. The oil resource, undoubtedly, contributed to Nigerian agricultural deterioration.

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The Nigerian government had, before the 1970s, relied heavily on agricultural exports for its foreign exchange. Such agricultural products included cocoa, palm produce (palm oil and palm kernel), groundnuts, rubber and cotton, all of which accounted for over 50% of the government total export earnings. These primary exports were produced by peasant farmers who then sold the crops to the government, through the commodity marketing boards (CMB), at prices below the world market prices. The CMB set the domestic prices of the products in such a way that farmers received prices that were below the world market prices. The difference between the world market prices and those paid to farmers were considered as taxes, comprising commodity taxes, export duties and produce purchase taxes, all of which became government revenue.

During the 1970s, following the oil boom in the country, the commodity taxes on the agricultural exports were greatly reduced. In many cases, they were substituted by subsidy payments to farmers. During the same period, export duties and produce purchase taxes on these exports disappeared. The oil price boom and the taxes on oil eliminated the need to finance government development projects through the taxation of agriculture. The reduction of taxes might be expected to have increased profitability in agriculture and incomes of farmers. But that was not the case. The powerful indirect transmission mechanism from the oil boom served to offset an improvement for agriculture. This paper focuses on the effects increased revenue from oil exports had on relative prices, sectoral structure of production, and wages.

The period under study here does not exceed the second half of the 1980s for two reasons: firstly, the effect of the oil boom was mostly felt in the 1970s and the early 1980s; secondly, strange as it may seem, data availability in Nigeria has deteriorated drastically in recent years.

1 OIL BOOM AND AGRICULTURE: THEORY

The theoretical part of this paper relies on the "Dutch Disease" literature that was developed in the 1970s and modified in the 1980s, for the study of the effects of resource booms[2]. Let us briefly summarize the results from this literature for an economy with three sectors: the booming (oil) sector, the lagging (agricultural/ manufacturing) sector, and the non-tradeable (services) sector. The booming and the lagging sectors produce tradeable goods facing given world market prices, whereas the prices of the non-tradeable goods are determined domestically. The analysis relies on Jones (1971) and Snape (1977), assuming only one domestically mobile production factor, traditionally considered to be labour (Corden and Neary, 1982), moving between all three sectors so as to equalize its wage in all three employments (Corden, 1984). Other factors are assumed to be sector-specific. The initial effect of a boom in the oil sector, due to an exogenous oil price increase in the world market, is to raise aggregate incomes of the factors initially employed there. If some part of the extra income is spent, either directly by factor owners or indirectly by the government through being collected in taxes, and provided the income elasticity of demand for non-tradeable goods is positive, the price of non-tradeable goods relative to the price of tradeable goods must rise. This is real exchange rate appreciation. It is the **spending effect** of the boom. Resources will be drawn out of the tradeable goods sector into the non-tradeable goods sector. In addition, there will be a rise in the marginal value product of labour in the booming oil sector so that, at constant wages in terms of tradeable goods, the demand for labour in the booming sector rises, inducing labour movement out of the lagging and service sectors. This is a **resource movement effect**[3]. Apparently, both the spending effect and the resource movement effect tend to draw labour from the lagging sector.

Any further development with regard to factor-based income distribution will depend on how the authorities dispose of the oil boom revenues (Neary and van Wijnbergen, 1984; Corden, 1984; Edwards, 1986), and on how the country's labour market functions (Kaldor, 1976; Corden, 1984; Forsyth, 1986). An oil price boom could lead to accumulation of foreign reserves, causing a high rate of domestic money growth and excess money supply in the resource exporting country. The resulting spending effect will increase the nominal price of non-tradeable goods and further cause the real exchange rate to appreciate (Edwards, 1986). There will be a further shift of labour from tradeable goods sector to non-tradeable goods sector and wages in both sectors will increase. The wage increase in the non-tradeable goods sector is based on the assumption that factor rewards are related to output prices (Warr, 1986), whereas the wage increase in the tradeable goods sector is induced by that in the non-tradeable goods sector. Wages relative to prices will rise in the tradeable goods sector and fall in the non-tradeable goods sector (Corden, 1984; Warr,1986). The higher wages will raise the cost of the tradeable goods (lagging) sector and hence affect profits in that sector adversely, decreasing employment and output (Corden, 1985b:283; Forsyth, 1986).

The adverse cost effects could be avoided through exchange rate protection that avoids appreciation, and keeps the current account balance unchanged, the exogenous capital inflow being matched by an increase in official reserves,[4] or by (private) capital outflow induced by monetary policy (fall in the interest rate) (Corden, 1985b:275). There would then be no rise in nominal wages. Alternatively, the higher income of the booming oil sector may be siphoned off by taxes,[5] while government expenditure is held constant. Finally, the authorities could devalue the domestic currency, combined with expenditure reduction (reducing the public sector borrowing requirements). The result would be to generate a current account surplus (Corden, 1981b, 1987:17-19).

2 OIL BOOM AND AGRICULTURE: EVIDENCE

In this section, we relate the general prediction of the "Dutch Disease" to the Nigerian experience. Of particular concern in our exercise are the developments of: relative prices (real exchange rates), sectoral structure of production (output and employment), and the real wage.

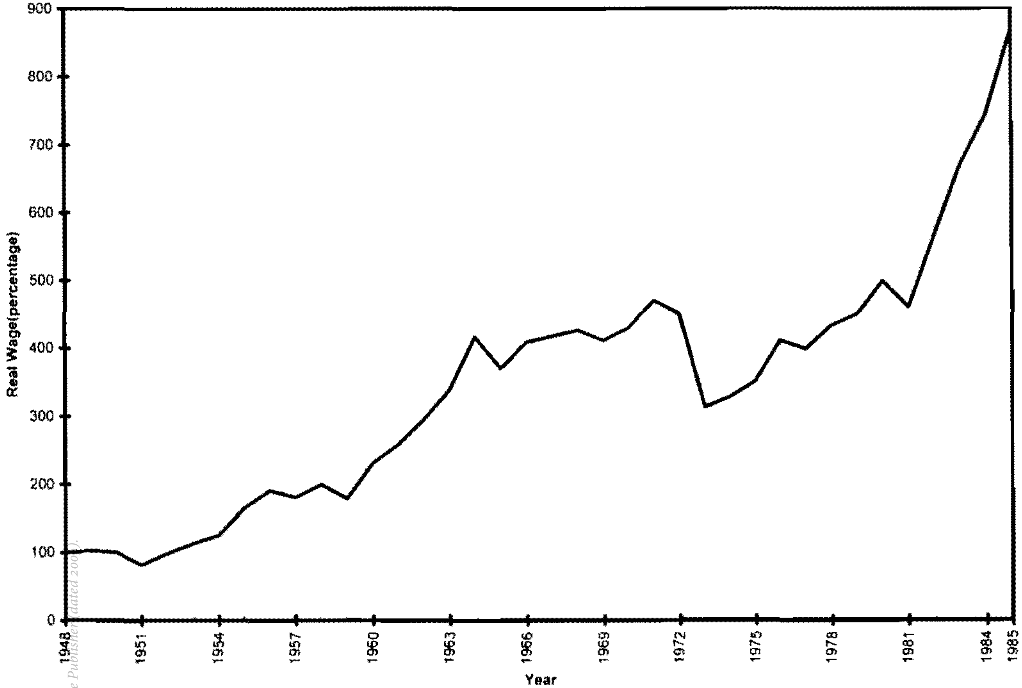
2.1 The Effect on Relative Prices

The Dutch Disease predicts a decrease in the ratio of tradeable goods to non-tradeable goods prices. In Nigeria, the tradeable goods are agricultural (primary) crops and manufactures, whereas the non-tradeable goods are services. Manufactures comprise of imports and locally produced goods. Some of the imports are rationed via import restrictions so that their domestic prices are not determined by world market prices, but rather by domestic demand and supply conditions. The locally produced goods are often close but not perfect substitutes for imports. Often they contain both a tradeable and non-tradeable goods element. These factors constitute a serious problem in getting a clear picture of relative price developments in Nigeria. Therefore we shall rely on primary crops prices and urban formal wages as proxies for tradeable goods and non-tradeable goods prices, respectively. Figure 1 shows the ratio of formal wage to aggregate price of primary crops.

The figure shows that relative prices have remained in favour of non-tradeable goods and against agriculture, even with the commodity tax reductions and subsidy payments to farmers in the 1970s. The main factors responsible for that development were the macroeconomic and exchange rate policies pursued by the authorities, that remained biased against agriculture. Based on the 1970 level, Oyejide (1986) noted a real exchange rate appreciation of 62 percent between 1973 and 1980,[6] while the World Bank noted a real appreciation of 30 percent between 1974 and 1978, based on the 1970/72 level.[7] (We return to discussing the diagram further at a later stage.)

Devaluation of the nominal exchange rate should have been one of the best policy options for the Nigerian authorities during the period.[8] To the extent that devaluation has the effect of improving the domestic prices of tradeable goods relative to non-tradeable goods prices, this device can achieve, albeit temporarily, protection of the agricultural exports. But the Nigerian authorities resisted any devaluation of the nominal exchange rate.[9] They rather adopted a strategy of gradual nominal appreciation of the local currency, the naira, against the US dollar and British sterling. The primary argument by the authorities was to produce naira exchange rates that would adequately reflect the country's balance of payments position.[10] Between 1973 and 1980, when the oil-related capital inflows were particularly significant, the nominal exchange rate appreciated by about 17 percent (Oyejide, 1986:27). The nominal exchange rate policy adopted by the authorities strengthened the tendency of capital inflows to cause the real exchange rate to appreciate.

Figure 1: Index of real wage* in Nigeria (1948=100) (per cent)



*The real wage is the nominal wage deflated by the index of aggregate producer prices of the main primary crops.

Sources: Annual reports of the commodity marketing boards (various issues); United Nations Statistics Year Book (various issues); Helleiner (1966: 444-7); FOS, Economics and Social Statistics Bulletin (various issues).

It was in an attempt to compensate the agricultural sector, which seemed to be carrying not only the burden already created by CMB taxes but also a great deal of the burden of the appreciated exchange rate, that the authorities cut down the taxes on export crops and intensified the payment of subsidies to primary crops producers. The tax remissions and subsidy payments could, in fact, be interpreted as political decisions to mitigate the negative effects on farmers' incomes by both the commodity taxes and the appreciating naira.

2.2 The Effect on Sectoral Structure of Production (output and employment)

The Dutch Disease stresses the changes in sectoral shares in the domestic economic activity caused by a resource boom. The problem is that such changes in Nigeria that are directly related to the oil boom are not altogether clear-cut. This is partly because the oil boom descended on an economy already undergoing gradual sectoral changes, and partly because the oil sector itself is highly capital intensive,[11] as well as an export enclave,[12] with spending effects but only modest resource movement effects. Table 1 shows changes in the sectoral contribution to total non-oil GDP (total GDP minus the oil sector's contribution) and total non-oil employment, for selected years during the period 1960-80.

Section (a) of the table shows that agriculture's shares in total non-oil GDP followed a steady decrease throughout the sample period. The decrease was, however, more pronounced during the 1970s (24.7 percent and 25.8 percent for the periods 1970-1975 and 1975-1980, respectively) compared with the decrease during the 1960s (12.6 percent and 6.1 percent for the periods 1960-1965 and 1965-1970, respectively). Agriculture also experienced the same pattern of development in its share of total non-oil employment. (See Section (b) of the table). It appears that agriculture lost more of its labour share during the 1970s compared with its falling share in the 1960s. Generally, the development in the agricultural sector is consistent with the Dutch Disease approach. It is important though to note that the changes in agricultural structures might have taken place even without the oil boom, though one may conclude that the boom obviously reinforced the changes (declines) in that sector.

Table 1: Changes in Sectorial Contribution to Non-Oil GDP and employment, 1960-1980 (per cent)

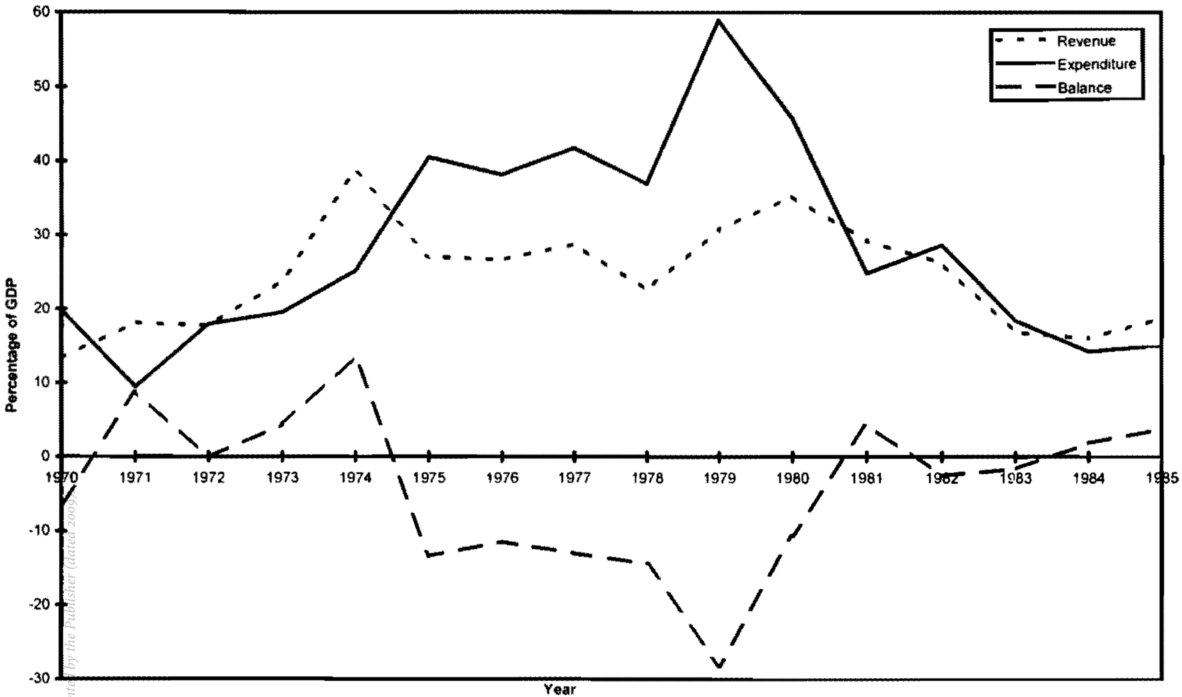
Sector	1960	1965	1970	1975	1980
(a) Shares in non-oil GDP at current factor cost					
Agriculture	65.1	57.0	53.5	40.3	29.9
Manufacturing	4.9	7.3	8.1	11.7	7.4
Serivces	30.0	35.7	48.4	48.0	62.7
(b) Shares in non-oil employment					
Agriculture	80.1	78.1	75.2	64.2	60.2
Manufacturing	11.9	13.1	15.0	16.9	17.1
Services	8.0	8.8	9.8	18.9	22.7

Sources: Federal Office of Statistics (FOS), National Accounts of Nigeria; FOS, Economics and Social Statistics Bulletin, January 1985; Oyejide (1986: 37)

The pattern of development of the services sector's share in both non-oil GDP and employment, also shown in the table, are also consistent with the predictions of the Dutch Disease. Its shares in both GDP and employment increased steadily during the entire sample period, with the increases in the 1970s surpassing those during the 1960s. Compare the growth rates of the sector's employment shares, 92.2 percent and 20.1 percent for the periods 1970-1975 and 1975-1980, respectively, with the growth rates of 10 percent and 11.4 percent for the periods 1960-1965 and 1965-1970, respectively. According to the analysis of the Dutch Disease, an increase in spending on non-tradeables (services in Nigeria) and a consequent real exchange rate appreciation results in an increase in the non-tradeables sector's output and employment.

Nigerian government expenditure in the 1970s was spectacular by any standards. See Figure 2 for a summary of government budget balance.

Figure 2: Summary of government budget balance measured in terms of GDP, 1970-1985 (per cent)



Sources: IMF International Financial Statistics (various issues); CBN, Annual Report and Statement of Accounts (various issues).

The government expenditure in terms of GDP increased successively from 19.8 percent in 1970 to 40 percent and 58.9 percent in 1975 and 1979 respectively. The increases in expenditure moved more or less in line with the services sector's expansion. This sector included government administration, defence and internal security, transport, construction and education. A great deal of expenditure also went for the creation of states.[13] The financial appropriation to the state governments and their numerous ministries grew successively from 3.7 percent of GDP in 1971 to 4.8 percent and 13.3 percent of GDP in 1972 and 1979, respectively.[14]

The manufacturing sector's shares in total non-oil GDP and employment are also shown in Table 1. The share of the manufacturing employment was on the increase throughout the sample period, while its share in GDP showed a similar development but for 1980. On the whole, developments in the manufacturing sector are not consistent with the prediction of the Dutch Disease. This inconsistency, particularly in the increasing share of manufacturing employment, is obviously a reflection of the government import-substitution policies which have traditionally protected local manufacturing industries by imposing relatively high import duties on finished products, and very low or no import duties on industrial raw materials and intermediate capital inputs.

2.3 The Effect on Wages

Recall Figure 1 for the development of the Nigerian real wage (nominal wage deflated by the index of aggregate producer price of the main primary crops) during the period 1948-1985. Certain points are especially remarkable. First, there is a general trend of a rising real wage during the period. Secondly, the trend had few disruptions which occurred during certain historical periods in the country. For example, until the country's political independence in 1960, the rise in the real wage was gradual, reflecting a certain degree of closeness in the growth of nominal wages and producer prices, even though the former grew faster. In nearly half a decade after independence, just before the political crises in the country during the middle of the 1960s, the growth gap between the two variables widened. This wider gap reflected partly the increased commodity taxes on agricultural exports during the period to support several financial commitments of the local political parties,[15] and partly the upward adjustment of wages by the ruling parties to court the support of workers (Waterman, 1976). At the very peak of the political crises, 1966-69, the real wage hardly grew at all. At the end of the crises (civil war) in 1970, it was revived again showing remarkable growth until 1971. This growth period reflected the government general review of wages and salaries known as the Adebo Award (IMF, 1975:317-318). The main purpose of the wages and salaries review was, undoubtedly, to compensate workers for the post-war inflation. The adjustment provided for wage increases between 12 percent and 30 percent (IMF, 1975:318). During this period, primary crops producers continued to bear the heavy burden of commodity export taxes.

The oil boom of 1973 and practically during much of the 1970s, generating massive inflows of capital into the country. As the oil money flooded in, the authorities embarked on several projects that entailed massive expenditures. Since a great part of this spending was on services, adjustments to the newly demand/supply conditions became inflationary. The inflation rate was estimated at about 16.2 percent annually between 1973 and 1980 (CBN, Annual reports, various issues). With the accumulation of international reserves,[16] the nominal exchange rate appreciated, and this tendency strengthened real exchange rate appreciation too.

It was to compensate workers for the domestic inflation that the authorities resorted to upward adjustments of wages. The most significant during the oil boom-dominated period was the Udoji Award in 1975/76 (IMF, 1975:319). This award granted workers wage increases between 30 percent and 131 percent (IMF, 1975:319). To compensate primary crops producers for the effects of the appreciated exchange rate, as well as for the commodity export taxes, the authorities reformed the agricultural policies in 1973, introducing tax remissions, and awarding frequent subsidies to farmers. (Recall Figure 1 and note the sharp fall in real wage in 1973.) The improvement in primary crops producer prices as a result of the reform policies could however not match the increases in wages. Between 1973 and 1980, wages increased over 230 percent, whereas aggregate producer prices increased about 110 percent.

The real wage increase continued into the 1980s. This was partly accounted for by the increasing inflation, aggravated by successive naira devaluations and the simultaneous attempt by the authorities to compensate workers,[17] and also by political forces seeking for the support of workers.[18] The cost situation was simply not favourable for the agricultural sector, particularly since the rural/agricultural labour aspired to higher wages in line with those paid in the urban/non-agricultural sector.

3 CONCLUDING REMARKS

The availability of the oil resource has undoubtedly had a profound impact on the Nigerian economy as a whole, particularly the economy's sectoral structure. Although the oil sector itself never did put pressure on the other sectors directly, since its labour requirements were negligible, the policy response by the authorities towards the oil revenue generated adverse effects on the agricultural sector. Exchange rates appreciated both in nominal and real terms, the latter considered as a spending effect of the oil boom. Consequently, labour costs increased in terms of the exogenously determined agricultural product prices.

Generally, the deterioration of agriculture was very much the result of a long-drawn process that originated before the oil boom. However, the boom aggravated the problem and in that way reinforced the deterioration.

ENDNOTES

1 Paper presented at the EBM Research Conference, Port Elizabeth, 1996.

2 It took its name from the effects of a boom in natural gas on the economy of the Netherlands. Contributions to the literature include Gregory (1976), Corden and Neary (1982), Edwards (1986), Neary and van Wijnbergen (1986), and Oyejide (1986).

3 Some economists have analysed a special case in which the booming (oil) sector is considered as an "enclave" and participates very marginally, if at all, in domestic factor markets. In that case, there will be no resource movement effect, but only a spending effect, with the key mechanism of resource allocation being real exchange rate appreciation. See Neary and van Wijnbergen (1986).

4 For a discussion on the cost of accumulating excess foreign financial assets, see Corden (1981b).

5 It is likely that private expenditure reduction induced by lower disposable income would involve a substantial reduction in spending on non-tradeable goods (Corden, 1981b).

6 Oyejide (1986:27).

7 IBRD (1986:72).

8 There are sound practical arguments for the possible superiority of that form of exchange rate protection over alternative forms such as tariff, quotas, and subsidies. See Warr (1986:298-300), Corden (1987:18-19).

9 In a comparison of Nigeria with Indonesia (another oil producing and exporting country that also experienced a boom), the World Bank noted that although both countries experienced almost identical real exchange rate appreciation during the period 1970-72 and 1974-78, Indonesia was able to correct the development of its exchange rates by tightening the country's monetary and fiscal policies, and between November 1978 and March 1983 devalued its currency, the rupiah, by over 50 percent against the US dollar. Nigeria, on the other hand, apart from resisting any devaluation of its currency, the naira, borrowed heavily on the basis of future oil earnings . See IBRD (1986:72). The first remarkable devaluation of the naira (by about 16 percent against the US dollar) occurred in 1981, to be followed successively by several devaluations of various magnitudes in the following years. See Central Bank of Nigeria (CBN), Annual Reports (various issues).

10 See Oyejide (1986:27).

11 All through the period 1970-1982, the share of the mining (oil) sector in total employment was only between 0.2 percent and 0.4 percent (Oyejide, 1986:37).

12 The national account of Nigeria, 1973-1975 (1981:139).

13 The regions/states increased successively from 3 and 4 regions in 1954/55-62 and 1963-66, respectively, to 12, 19, and 21 states in 1967-75, 1976-86, and 1987-, respectively. For the politics surrounding the creation of states Nigeria, see Nigerian Hand Book (1985:50-53).

14 Calculations are based on the data from IMF international financial statistics (various issues); FOS, economics and social statistics bulletin (various issues); Central Bank of Nigeria (CBN), Annual reports (various issues).

15 On the issues of the political effects on export crops in Nigeria, see Nixon (1970).

16 The peaks were attained in 1979 and 1980 when they represented about 25.5 percent and 31.2 percent of GDP, respectively. See CBN, Annual reports (various issues).

17 In the period 1981-85, the Nigerian currency, the Naira, was devalued at an average annual rate of about 11.26 percent against the US dollar. See CBN, Annual reports(various issues).

18 Political influence on wage setting in Nigeria has been discussed by Warren (1966). For comments, see Berg (1969), and for counter argument, see Weeks (1971).

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