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## Growth and Flexibility of Federal Government Tax Revenue 1960 - 79

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# GROWTH AND FLEXIBILITY OF FEDERAL GOVERNMENT TAX REVENUE — 1960-1979

In the 1970 decade, revenue accruing to the Federal Government was derived largely from receipts from the oil industry. In the 1980's the trend has continued. Sources of revenue other than oil seem to have seriously lagged behind in generating revenue. As a proportion of GDP, total tax revenue of the Federal Government accounted for an average of only about 6 per cent in 1960-79 period.

But rapidly growing tax revenues are needed, not only to match highly elastic public current expenditures, but also to generate savings to finance government capital expenditure programmes<sup>1</sup>. Consequently, a continuous appraisal has to be made of the growth potential of different tax revenue sources. While there is a need for a very significant enhancement of the ratio of tax to national income, it may not be politically or even economically feasible to raise taxation to a relatively high level in circumstances of generally low incomes. Frequent legislative measures to enhance tax rates and expand the tax base may prove counter-productive as they may invite strong resistance from tax payers. Fortunately, as the economy grows, less and less reliance will have to be placed on legislative measures and more and more on the built-in flexibility of the tax structure. In fact, for the share of taxation in National Income to rise to a significant level, the tax system must be sufficiently income elastic. An investigation of the income elasticity of our tax system is therefore pertinent at this stage of our economic development.

Several studies have focused on the tax-to-base elasticity of some specific taxes in Nigeria over different time periods but a study of the whole spectrum of taxes and their income elasticities does not appear to have been attempted. For instance, Idachaba, while discussing the subject of public revenue instability calculated the tax-to-base elasticities of import and export duties with respect to total imports and exports (1959/60-1969/70), respectively. Moreover, in his study of import taxation, Diejomaoh presented estimates of income-elasticities of import volume represented by the volume index of imports, over the period 1954-1964<sup>2</sup>. This paper seeks, therefore, to up-date earlier efforts by providing the missing link in the chain of discussions on the subject to tax revenue growth. While analysing the growth of Federal Government tax revenue in the twenty-year post-independence period, the paper may hopefully give some insights into the main characteristics of the tax system, including its responsiveness to changes in income.

The paper is divided into two parts. Part I discusses the growth of tax revenue including an analysis of shifts, if any, in revenue productivity of taxes or tax types. Part II outlines our flexibility co-efficients based largely on single equation, simple regression model.

## Limitations to the Data:

It has not been possible to obtain adequate information or data necessary to account for increases in revenue arising from the large number of tax changes which took place during the review period, so as to deduct the increases from the tax revenue series. For example, in the first quinquennium of the review period alone, there were no less than fifteen changes in tariff rates<sup>3</sup>. Consequently our index

of income flexibility of tax revenue includes revenue arising from fiscal policy changes in tax rates and the base, and hence it is more akin to the "buoyancy" concept used by Sahota<sup>4</sup> and Ghai<sup>5</sup>.

## PART I

### Growth of tax revenue:

Total tax revenue of the Federal Government, including appropriations to Regions/States, increased by about 42-fold in the twenty-year study period, from ₦165.6 million or 7.4 per cent of GDP in 1960 to ₦6,898.2 million or 16.9 per cent of GDP in 1979. The bulk of the revenue averaging 87.3 per cent of total tax revenue or 6.4 per cent of GDP in the 1960 decade was derived from taxes on commodities or indirect taxes. The dominant position of indirect taxes in total tax yield was, however, reversed in favour of direct taxes in the 1970 decade when the latter accounted for an average of 67.6 per cent or 11.1 per cent of GDP. The major factor responsible for this development was the substantial expansion in the yield of revenue from the petroleum profits tax (See Tables 1, 2, 3).

### Direct taxes:

In the first decade of the review period, except 1969, revenues from direct taxation came largely from two sources: taxes on personal incomes and taxes on company incomes. In 1969 the petroleum profits tax (PPT) started yielding substantial revenue. In the 1970 decade the PPT yielded so much revenue that it became the largest single source of revenue for the Federal Government, thus displacing the company income tax and the personal income tax whose yields had progressively dwindled into insignificance.

At ₦14.8 million or 0.7 per cent of GDP in 1960, the yield from total direct taxes rose through ₦43.8 million in 1969 to ₦5,754.2 million or 14.1 per cent of GDP in 1979, reflecting a compound growth rate of 38 per cent over the two decades. In the 1960 decade the company income tax constituted the largest single source of direct tax revenue, accounting for an average of 58.7 per cent.

In the 1970 decade, however, the relative contribution of company income tax to direct tax revenue declined to an average of 11.8 per cent. Revenue from **personal income tax**,

<sup>1</sup>A. Martin & W. A. Lewis: "Patterns of Public Revenue and Expenditure" *The Manchester School of Economic and Social Studies*, Vol. XXIV, 1956 S. E. Omoruyi, "Patterns of Current Expenditure in Nigeria, 1950/51-1974/75", Central Bank of Nigeria, *Economic and Financial Review*, Vol. 17 No. 2, December, 1979.

<sup>2</sup>F. S. Idachaba, "Economic Structure and Public Revenue instability: The Nigerian and Ghanaian experiences", in *Money, Finance and Nigerian Economic Development* edited by O. Teriba & V. P. Diejomaoh, Ibadan University Press 1976 V. P. Diejomaoh, "Mobilising Resources for Development: Problems and Prospects of Import Taxation in Nigeria", *Ibid.*, Page 213-239.

<sup>3</sup>A. Adedeji, *Nigerian Federal Finance*, Hutchinson Educational, 1969 p.172

<sup>4</sup>G. S. Sahota, *Indian Tax Structure and Economic Development*, London, Asia Publishing House, 1961.

<sup>5</sup>D. P. Ghai, *Taxation for Economic Development: A case study of Uganda* (Nairobi, East African Publishing House, 1966).

which for most of the 1960 decade was the next most important revenue source to the company income tax, fell from ₦5.9 million or 39.9 per cent of total direct tax revenue through ₦0.8 million or 1.8 per cent in 1969 to a negligible ₦3.2 million or 0.06 per cent. The main reason for this stems from the constitutional arrangement which limited the Federal Government's authority to collect personal income tax to the Federal Territory, in the period before fiscal year 1967/68. From May 1967, following the creation of new states, the Federal Government was stripped of its jurisdiction relating to individual income taxes except those on the Armed Forces personnel and other specified persons<sup>1</sup>.

The 1970 decade witnessed the emergence of **petroleum profits tax (PPT)** as the most productive and dominant revenue source. At ₦9.8 million or 0.3 per cent of GDP in 1969, receipts from the PPT rose dramatically through ₦97.6 million in 1979 to ₦5,164.0 million or 12.7 per cent of GDP in 1979, averaging about 88 per cent of direct tax revenue in the decade.

### Indirect Taxes:

Revenue from indirect taxes made up of import, export and excise duties rose about eight-fold between 1960 and 1979. At ₦150.8 million the yield from indirect taxes in 1960 rose through ₦261.2 million in 1969 to ₦1,144.0 million in 1979, reflecting a compound growth rate of 12.2 per cent over the twenty-year period. As a proportion of GDP, however, total indirect taxes tended to decline, particularly in the 1970 decade following the remarkable expansion of the former due largely to the contribution of the petroleum industry. From 6.7 per cent in 1960 the share of indirect taxes in GDP rose to 6.9 per cent in 1969, but declined in virtually all subsequent years thereafter to 2.8 per cent in 1979. Import duties constituted the major source of indirect taxes, accounting for an average of 68.8 per cent of indirect tax revenue, in the review period. The corresponding figures for excise and export duties were 22.0 and 9.2 per cent, respectively.

### Import duties

At ₦871.0 million in 1979 revenue from import duties was about eight times the level in 1960. However, the revenue out-turn of import duties fluctuated rather erratically in both the 1960 and 1970 decades of the review period, reflecting a number of major events in the nation's political economy. Import duties rose slowly from ₦109.6 million in 1960 to ₦151.2 million in 1964. In this quinquennium the slow growth in revenue from import duties was attributable to the slight decline in total imports following the post-independence import substitution industrialisation programme and the need to curtail import demand through higher import taxes designed to arrest the deteriorating balance of payments position.

The last five years of the 1960 decade witnessed an absolute decline in the trend of yield from import duties. For example, import duties declined from ₦169.2 million in 1965 to ₦109.6 million in 1967 — a level equal to that of 1960. This trough followed the fall in imports arising partly from the delayed effects of the tight monetary and fiscal policies

inaugurated late in 1964 and 1965 and partly from the increased uncertainty engendered by the coup and counter coup of 1966. Although the yield of revenue from import duties rose to ₦151.6 million in 1969 as a result of some easing in the import restrictions following substantial earnings from petroleum exports, the level of revenue from the source was no more than its 1964 level.

The substantial boost which the expansion of petroleum export receipts gave to the post-civil war reconstruction expenditure and the selective increase in import duties led to substantial improvements in the yield from import duties in the 1970 decade. At ₦215.6 million in 1970 import duties rose through ₦629.4 million in 1975 to ₦871.0 million in 1979.

Despite the absolute improvement in import tax revenue in the 1970s compared to the 1960s the relative contribution of import taxes in total Federal tax revenue was much lower in the former decade. The share ranged between 9.3 and 42.0 per cent in the 1970 decade whereas in the 1960 decade the corresponding figures were 46.8 and 69.7 per cent. The declining relative significance of import taxes as a source of tax revenue in Nigeria in the review period derived largely from the overwhelming revenue productivity of petroleum profits tax which dramatically boosted total federal tax revenue.

A similar declining trend was also evident in the share of import tax revenue in the GDP. Whereas the contribution of import tax in GDP averaged 4.3 per cent in the 1960 decade, it assumed 3.2 per cent in the 1970 decade.

### Excise Duties

Excise tax revenue increased progressively, except for the declines in the first two years of the civil war, from ₦12.0 million in 1960 to ₦273.0 million in 1979, an increase of nearly twenty three times or a compound growth rate of 17.9 per cent. As a proportion of total indirect tax revenue, excise taxes rose from 8 per cent in 1960 to 23.9 per cent in 1979 or an average of 22.0 per cent in the two decades reviewed. The growth is a reflection largely of the expansion generally in the manufacturing sector of the economy and to a lesser extent, of the upward movement in rates particularly since the civil war.<sup>1</sup>

Even so, excise duties have not contributed significantly to total federal tax revenue. Revenue from excise duties accounted for an average of only 12.3 per cent of total tax revenue in the review period. At 7.2 per cent in 1960, the ratio of excise tax revenue to total federal tax revenue rose to its highest level of 25.7 per cent in 1967 and had since that year persistently declined to 4 per cent in 1979. The declining trend in the relative contribution of excise taxes is due to a number of factors. The number of domestically produced goods which it would be possible to tax is quite limited. Moreover the Federal Government has always kept the rates of excise taxes much below those of import duties for purposes of ensuring protection for local manufacturing industries.<sup>2</sup> Finally, other tax handles, like the PPT

<sup>1</sup>See M. A. Uduebo, *Growth and Impact of Federal Government Fiscal Operations in Post-Independence Nigeria*, Oshkosh, Wisconsin, M.A. Thesis at the University of Wisconsin—Oshkosh, May 1975, page 102.

<sup>2</sup>See G. K. Helleiner, *Peasant Agriculture, Government and Economic Growth in Nigeria*, Illinois, Richard D. Irwin, 1966, page 226.

<sup>1</sup>See Federal Republic of Nigeria *Official Gazette* "Income Tax (Armed Forces and other Persons) (Special Provisions) Decree" No. 51, 1972, Vol. 59, No. 65 of 30th December, 1972.



overwhelmingly increased their yield to total tax revenue, particularly in the 1970 decade, thereby dwindling the relative contribution of excise duties.

### Export Duties

Revenue from export duties did not constitute a significant source of indirect tax revenue, averaging about 9 per cent, in the review period. At ₹29.2 million in 1960, the yield from export duties fluctuated upward to its highest level of ₹41.2 million recorded in 1970 and fell remarkably in subsequent years particularly from 1973, following the abolition of export duties on Marketing Board's produce as from 1st April of that year. Export duties actually yielded no revenue at all in 1979.

## PART II

### The Model:

In this section, an attempt is made to quantify the index of flexibility of our tax system, defined for the study as the change in gross<sup>1</sup> tax yield associated with the change in gross domestic product (GDP). The index is analogous to the "buoyancy" concept employed by H.M. Groves and C. H. Kahn in their notable article<sup>2</sup> and Sahota<sup>3</sup> and Ghai<sup>4</sup> in other contexts.

For the tax system as a whole flexibility/buoyancy is represented by

$$\frac{\Delta T_t}{\Delta Y} \times \frac{Y}{T} \dots \dots \dots (1)$$

and for any given tax, k, by

$$\frac{\Delta T_k}{\Delta Y} \times \frac{Y}{T_k} \dots \dots \dots (2)$$

where the tax yields, T, include discretionary changes in tax base and the rate schedule, and, Y, GDP at current prices. Equation (2) is decomposable into tax-to-base flexibility,  $\frac{\Delta T_k}{\Delta B_k} \times \frac{B_k}{T_k}$ , (flexibility of tax collected to the base) and base-to-income flexibility,  $\frac{\Delta B_k}{\Delta Y} \times \frac{Y}{B_k}$  (flexibility of the base to income). This relationship is expressed in the identity:

$$\frac{\Delta T_k}{\Delta Y} \times \frac{Y}{T_k} = \left\{ \frac{\Delta T_k}{\Delta B_k} \times \frac{B_k}{T_k} \right\} \left\{ \frac{\Delta B_k}{\Delta Y} \times \frac{Y}{B_k} \right\} \dots \dots \dots (3)$$

Equation (3) gives a year-to-year estimate of tax buoyancy. But given the need to have an estimate of average buoyancy over a period of years, we have adopted the regression analysis, linking tax receipts to changes in monetary GDP. The least squares regression employed is of the form

$$X = a Y^\beta \dots \dots \dots (4)$$

Taking the double log of (4) gives

$$\log X = \log a + \beta \log Y \dots \dots \dots (5)$$

- where  $\beta$  = buoyancy or measure of flexibility
- $X$  = gross tax yield
- $Y$  = GDP at current prices<sup>5</sup>
- $a$  = a constant

<sup>1</sup>The use of the word "gross" in this paper signifies yield from which effects of legislative changes in tax rates and the base have not been eliminated. This must be distinguished from the usual use of the word in the sense of "yield" exclusive of "collection charges".

<sup>2</sup>H. M. Groves & C. H. Kahn, "the Stability of State and Local Tax yields", *American Economic Review*, Vol.42 (March 1952) pp. 87-102.

<sup>3</sup>G. S. Sahota op. cit.

<sup>4</sup>D. P. Ghai op. cit.

<sup>5</sup>Since the tax yields have not been adjusted to take account of the effects of price change over time, the use of current-price national income is in order and consistent.

The buoyancy co-efficient  $\beta$ , is assumed to be constant over time and over the range of monetary income considered. This constancy requires that the proportionate response of the tax to an income change of 1 per cent will be the same, regardless of the level of income. Under this assumption the revenue function is therefore log linear in income and buoyancy is estimated by regressing the log of tax revenues against that of income.

Equation (5) was then run for each tax, tax group and overall tax structure with pre-determined time dimensions, partly to record period estimates of tax flexibility and partly to observe intertemporal changes, if any, in the behaviour of flexibility co-efficients. The periods were the 1960 decade (1960-1969), the 1970 decade (1970-1979) and the twenty-year data series (1960-1979), where feasible. War dummies, WD, were included in some of the regressions to take care of the possible parameters shift that could occur during the war years, 1967-69.

### A Priori expectation:

A tax is considered flexible if its yield increases or decreases more than proportionately in response to an increase or decrease in GDP with the tax parameters assumed unchanged. In other words, where the index of flexibility,  $\beta$ , exceeds unity, the tax or tax group is GDP — elastic or flexible. But where  $\beta$  is less than unity, the tax is GDP inelastic or inflexible. Such an inflexible tax would suggest a resort over time to discretionary alteration of the tax rate/base if reliance must be placed on revenue productivity of the tax.

## REGRESSION RESULTS

### Flexibility estimates 1960-79

The buoyancy/flexibility estimates,  $\beta$ s, generated from fitting tax revenue data for 1960-79 to a regression of equation form (5) may be read off as coefficients of log Y in the equations. The  $\beta$ s for the three periods, 1960-69, 1970-79 and, where possible, 1960-79, are presented in order to permit some measure of improvement in tax effort both before and after the civil war.

Several general observations on the  $\beta$ s may be made as follows: First, the  $\beta$ s were in most cases, higher during the 1970-79 and 1960-79 periods than in the 1960 decade. Second, the  $t$  statistics associated with the  $\beta$ s were highly significant for almost all tax revenue sources, the only exception being the  $t$  statistics for the export and personal income tax coefficients in the 1960-69 period. Third, the equation fits were good for almost all equations as measured by the  $t$  statistics, the  $F$  levels, and the  $R^2$ s, the exception being the poor fits exhibited by the personal income tax. The  $R^2$ s generally hovered around 80-90 per cent.

### Company Income Tax:

The results of regressions run for the company income tax are listed as follows:

1960-69

$$\log X_{11} = -2.1407 + 0.9229 \log^* Y + 0.3452^* WD^1 \dots \dots \dots (6)$$

(-1.6619) (2.4801) (-6.1861)

$$R^2 = 0.8918 \text{ SEE} = 0.776 \text{ DW} = 2.2558$$

$$F_{(2, 7)} = 28.8581$$

<sup>1</sup>The figures in parentheses in the equations are the  $t$  — statistics. One asterisk in the equations indicates that the independent variables are significant at 0.05 probability level. Two asterisks indicate that the independent variables are highly significant at 0.01 level.

<sup>1</sup>The buoyancy ratio is generally referred to as gross elasticity.

1970-79

$$\text{Log } X_{11} = 2.8680 + 1.2077 \log Y \dots\dots\dots (7)$$

(5.5779) (9.9260)

$$R^2 = 0.9249 \text{ SEE} = 0.1159 \text{ DW} = 1.9490$$

$$F_{(1, 8)} = 98.526$$

1960-79

$$\text{Log } X_{11} = 3.9091 + 1.4472 \log Y - 0.2776 \text{WD} \dots\dots\dots (8)$$

(15.268) (22.2084) (3.5324)

$$R^2 = 0.9677 \text{ SEE} = 0.1183 \text{ DW} = 1.524$$

$$F_{(2, 17)} = 255.004$$

In equation (6) for the 1960 decade the company income tax was GDP — inelastic with a flexibility co-efficient,  $\beta$ , at  $\beta = 0.92$ . This co-efficient, however, rose to  $\beta = 1.21$  in the 1970 decade (equation 7), indicating that the tax became GDP = elastic<sup>1</sup> in that period. This finding of GDP — elasticity or flexibility of company income tax was strengthened by the enhanced flexibility of the tax, at  $\beta = 1.45$ , observed over the entire twenty-year period. The results, however, also include the impact of government discretionary changes in company income tax rate and base alterations since the civil war.

**Personal Income Tax:**

The contribution of personal income tax (federally collected) in total tax revenue declined both absolutely and relatively in the twenty-year review period, due to constitutional/legislative changes in the collection of personal income tax which gave jurisdiction for personal income tax to the state governments. This explains the perverse results reproduced below:

1960-69:

$$\text{Log } X_{12} = 16.826 - 4.4869 \log Y - 0.5961 \text{WD} \dots\dots\dots (9)$$

(1.298) (1.2462) (1.1042)

$$R^2 = 0.3554 \text{ SEE} = 0.7505 \text{ DW} = 1.0945$$

$$F_{(2, 7)} = 1.9296$$

1970-79:

$$\text{Log } X_{12} = -10.8477 + 2.5844 \log Y \dots\dots\dots (10)$$

(2.8267) (2.9065)

$$R^2 = 0.5847 \text{ SEE} = 0.6676 \text{ DW} = 0.9519$$

$$F_{(1, 6)} = 8.448$$

1960-79:

$$\text{Log } X_{12} = 0.3569 + 0.0261 \log Y - 0.5776 \text{WD} \dots\dots\dots (11)$$

(0.1854) (0.0533) (0.9709)

$$R^2 = 0.686 \text{ SEE} = 0.8858 \text{ DW} = 1.067$$

$$F_{(2, 15)} = 0.5528$$

As indicated in equations (9) and (11) the personal income tax recorded a flexibility or buoyancy co-efficient of  $\beta = -4.49$  in the 1960 decade and  $\beta = 0.03$  in the 1960-79 period—thus indicating the inflexibility of federally collected personal income tax.

In the 1970 decade, however, the results of regression analysis gave a flexible co-efficient (2.58) to personal income tax but this has been disconfirmed by the results of indices approach to measuring flexibility<sup>1</sup>. In the indices approach, the index of GDP at current prices showed an increase of 629.9 per cent in 1979 over the base of 1970. Revenue from personal income tax increased by 300.0 per cent during the same period. Thus the flexibility of personal income tax to

index of GDP was  $\beta = 0.48$  in the 1970 decade. Thus the personal income tax remained an inflexible tax handle within the period reviewed.

**Petroleum Profits Tax:**

1970-79

$$\text{Log } X_{13} = -3.1901 + 1.4919 \log Y \dots\dots\dots (12)$$

(2.6399) (5.2173)

$$R^2 = 0.7729 \text{ SEE} = 0.2723 \text{ DW} = 1.039$$

$$F_{(1, 8)} = 27.2203$$

From the results of equation (12), the petroleum profits tax (PPT) was highly flexible at  $\beta = 1.49$  in the 1970 decade. The GDP flexibility of the PPT was partly due to the discretionary upward revision of the tax rate.

**Total direct taxes**

The interdependence of taxes is a widely recognised phenomenon that could influence the flexibility of particular taxes. Hence the need to calculate the flexibility of total taxes or tax group as proxy measure of this interdependence. The results are as follows:

1960-69

$$\text{Log } X_1 = -4.5527 + 1.7084 \log Y - 0.1933 \text{WD} \dots\dots\dots (13)$$

(2.2423) (2.9062) (2.1971)

$$R^2 = 0.7239 \text{ SEE} = 0.1222 \text{ DW} = 1.934$$

$$F_{(2, 7)} = 9.1774$$

1970-79

$$\text{Log } X_1 = 3.7154 + 1.6433 \log Y \dots\dots\dots (14)$$

(5.777) (10.798)

$$R^2 = 0.9358 \text{ SEE} = 0.1449 \text{ DW} = 1.3713$$

$$F_{(1, 8)} = 116.613$$

1960-79

$$\text{Log } X_1 = -6.274 + 2.2329 \log Y + 0.0654 \text{WD} \dots\dots\dots (15)$$

(13.968) (19.5322) (0.4741)

$$R^2 = 0.9613 \text{ SEE} = 0.2076 \text{ DW} = 0.749$$

$$F_{(2, 17)} = 211.212$$

The flexibility co-efficient for total direct taxes in the 1960 decade (equation 13) was  $\beta = 1.70$  and  $\beta = 1.64$  for the 1970 decade (equation 14). Over the twenty-year period, the flexibility of total direct taxes increased to  $\beta = 2.23$  (equation 15), suggesting the marked responsiveness of total direct taxes to economic growth.

**Import duties:**

The regression results for the flexibility of import taxes with respect to GDP are given by equations 16 to 18 as follows:

1960-69

$$\text{Log } X_{21} = 0.2416 + 0.6788 \log Y - 0.0501 \text{WD} \dots\dots\dots (16)$$

(0.2558) (2.4873) (1.2243)

$$R^2 = 0.4898 \text{ SEE} = 0.0569 \text{ DW} = 2.1869$$

$$F_{(2, 7)} = 3.2408$$

<sup>1</sup>The results of flexibilities based on indices approach are not reported in this paper.

1970-79

$$\text{Log } X_{21} = -0.7229 + 0.8114 \log Y \dots\dots\dots (17)$$

(0.2940) (6.1372)

$$R^2 = 0.8248 \text{ SEE} = 0.1259 \text{ DW} = 1.7974$$

$$F_{(2, 8)} = 37.666$$

1960-79

$$\text{Log } X_{21} = -0.6230 + 0.7882 \log Y - 0.5166 \text{WD} \dots\dots\dots (18)$$

(3.0592) (15.2062) (.8265)

$$R^2 = 0.9408 \text{ SEE} = 0.0941 \text{ DW} = 1.8376$$

$$F_{(2, 17)} = 135.131$$

It is clear from the results that import taxes were inflexible with respect to GDP over the periods investigated. The taxes recorded flexibility co-efficient of 0.68 in 1960-69, 0.81 in 1970-79 and 0.79 in the 1960-79 periods.

The finding of overall income inflexibility of import tax revenue is corroborated by the findings of Due and others<sup>1</sup> for LDC's that as development proceeds import taxes will become an income inelastic revenue source, following increased industrialisation and induced shift in import structure such that imports of LDCs become increasingly composed of raw materials and capital goods which usually attract relatively low rates of import taxation. In the Nigerian case, the import structure has indeed shifted significantly in favour of raw materials and capital goods which accounted for about 70 per cent of total imports in 1970 compared with 43 per cent in 1960<sup>2</sup>.

**Export Duties:**

The regression results for export duties are as follows:

1960-69

$$\text{Log } X_{22} = 0.1888 + 0.3639 \log Y + 0.0314 \text{WD} \dots\dots\dots (19)$$

(0.2564) (1.7105) (0.9867)

$$R^2 = 0.4298 \text{ SEE} = 0.0443 \text{ DW} = 1.5710$$

$$F_{(2, 7)} = 2.638$$

1970-79

$$\text{Log } X_{22} = 7.7634 - 1.6325 \log Y \dots\dots\dots (20)$$

(11.2807) (-10.0242)

$$R^2 = 0.9263 \text{ SEE} = 0.1551 \text{ DW} = 1.0844$$

$$F_{(1, 8)} = 100.485$$

1960-79

$$\text{Log } X_{22} = 4.9323 - 0.97776 \log Y - 0.01297 \text{WD} \dots\dots\dots (21)$$

(10.5369) (8.2062) (0.0903)

$$R^2 = 0.8156 \text{ SEE} = 0.2163 \text{ DW} = 0.4503$$

$$F_{(2, 17)} = 37.599$$

Export duties exhibited a high income inflexibility at  $\beta = 0.36$  in the 1960 decade (equation 19). This flexibility co-efficient was, however, completely eroded in the 1970 decade following the abolition of export duties on marketing

board's produce effective 1st April, 1973. In fact, in equation 20 for the 1970 decade, the flexibility co-efficient was negative at ( $\beta = -1.63$ ). Taking the entire twenty-year period into consideration, we still found a negative and inflexible co-efficient for the export taxes (equation 21).

**Customs duties:**

The combined import and export duties otherwise referred to as Customs duties have followed the sweep and pattern of income inflexibility of import tax revenue as indicated in equations 22 to 24.

1960-69

$$\text{Log } X_{23} = 0.0438 + 0.6213 \log Y - 0.0349 \text{WD} \dots\dots\dots (22)$$

(.5116) (2.5079) (0.938)

$$R^2 = 0.4755 \text{ SEE} = 0.05164 \text{ DW} = 2.0706$$

$$F_{(2, 7)} = 3.1735$$

1970-79

$$\text{Log } X_{23} = -0.3721 + 0.7330 \log Y \dots\dots\dots (23)$$

(0.6462) (5.3795)

$$R^2 = 0.7834 \text{ SEE} = 0.1298 \text{ DW} = 1.6527$$

$$F_{(1, 8)} = 28.9386$$

1960-79

$$\text{Log } X_{23} = -0.2459 + 0.7038 \log Y - 0.340 \text{WD} \dots\dots\dots (24)$$

(1.1914) (13.3976) (0.537)

$$R^2 = 0.9243 \text{ SEE} = 0.09539 \text{ DW} = 1.6688$$

$$F_{(2, 17)} = 103.803$$

The flexibility co-efficients for customs duties, as given in the above equations ranged from ( $\beta = 0.62$  (1960-69) to ( $\beta = 0.73$  (1970-79) but have however tended to be lower than their corresponding values for import duties.

**Excise duties:**

1960-69

$$\text{Log } X_{24} = -8.225 + 2.7642 \log Y + 0.319 \text{WD} \dots\dots\dots (25)$$

(3.9874) (4.6380) (3.5679)

$$R^2 = 0.8713 \text{ SEE} = 0.1242 \text{ DW} = 1.2423$$

$$F_{(2, 7)} = 23.6978$$

1970-79

$$\text{Log } X_{24} = 1.4196 + 0.1951 \log Y \dots\dots\dots (26)$$

(2.9123) (1.691)

$$R^2 = 0.2634 \text{ SEE} = 0.1098 \text{ DW} = 0.9472$$

(1,8)

$$F = 2.8605$$

1960-79

$$\text{Log } X_{24} = 1.8029 + 0.940 \log Y + 0.2832 \text{WD} \dots\dots\dots (27)$$

(3.4263) (7.025) (1.7535)

$$R^2 = 0.7453 \text{ SEE} = 0.2432 \text{ DW} = 0.4623$$

$$F_{(2, 17)} = 24.869$$

Results of regression equations 25 through 27 indicate that excise duties were highly income elastic in the 1960-69

<sup>1</sup>J. F. Due, *Indirect Taxation in Development Economics*, John Hopkins Baltimore, 1970; R. Musgrave, *Fiscal Systems*, Yale, New Haven, 1969; S. R. Lewis, "Revenue Implications of changing Industrial structure", *National Tax Journal*, December, 1967

<sup>2</sup>Federal Republic of Nigeria, *Second National Development Plan 1970 - 74* 1st Progress Report, CPO, Lagos, 1972 P. 74



period, with  $\beta = 2.76$ . Excise duties became income inflexible at  $\beta = 0.19$  (1970-79) and  $\beta = 0.94$  (1960-79) despite the expansion in its base – manufacturing industries – over the years. The income inflexibility in the latter decade is explained by the persistent reductions in the rates of excise taxes coupled with tax exemptions especially for the so-called import – substituting infant industries, granted by government in the pursuit of its industrialisation programme.

### Total Tax Revenue:

Despite marked income inflexibility of the various taxes, total tax revenue has exhibited income flexible co-efficients ranging from  $\beta = 1.04$  (1960-69) to  $\beta = 1.24$  in the 1970-79 period. The results are as follows:

1960-69

$$\text{Log } X_3 = -1.2966 + 1.0424 \log Y + 0.0505 \text{WD} \dots\dots\dots (28)$$

(2.1585)      (6.0065)      (1.9402)

$$R^2 = 0.8782 \text{ SEE} = 0.0362$$

$$F_{(2, 7)} = 25.237$$

1970-79

$$\text{Log } X_3 = -1.8310 + 1.2415 \log Y \dots\dots\dots (29)$$

(6.1702)      (17.6804)

$$R^2 = 0.9750 \text{ SEE} = 0.0669 \text{ DW} = 2.1644$$

$$F_{(1, 8)} = 312.595$$

The findings of overall income flexibility of total tax revenue compare favourably with those by Chelliah who estimated 1.4 as an average income elasticity of total taxes for 27 developing countries (1953-55, 1966-68) as a whole.<sup>1</sup> The flexibility of total tax revenue in the review period was largely accounted for by the flexibility of company income tax and especially by petroleum profit tax.

### Summary and Conclusion:

This paper has discussed the growth and flexibility of Federal Government of Nigeria tax revenue during 1960-1979, with a view to whether the tax system is responsive to income growth.

The results of the flexibility analysis seem to indicate that the tax system as a whole was positively responsive to income growth. The flexibility co-efficient,  $\beta$ , at  $\beta = 1.04$  in the 1960 decade rose slightly to  $\beta = 1.24$  in the 1970 decade. The enhanced flexibility of the tax system in the latter decade derived largely from the marked flexibility of both the company income tax and the petroleum profits tax.

Nevertheless, the various taxes considered showed mixed flexibility over the several sub-periods analysed. For instance, the company income tax was flexible and the degree of flexibility increased the longer the time profile investigated. At  $\beta = 0.92$  in the 1960 decade, the flexibility co-efficient for the company income tax rose through  $\beta = 1.21$  for the 1970 decade, to  $\beta = 1.45$  for the entire twenty year data series – a reflection of the impact of government fiscal policy intervention in company income tax rate and

base expansion in 1970s. The same characteristics existed for the PPT.

However, the personal income tax was inflexible, with a co-efficient of  $\beta = 0.03$  in the two decades under reference. The inflexibility of federally collected personal income tax derived from the legislative/constitutional changes following the creation of states in May 1967, which limited the jurisdiction of the Federal Government to impose individual income taxes to the Armed Forces personnel and a few other specified persons.

Import, export and excise duties exhibited varying degrees of inflexibility for reasons ranging from the changing structure of the economy to government discretionary actions. For instance, the shift in the import structure in favour of raw materials and capital goods between the 1960 and 1970 decades and the relatively low rates of import taxation on these types of imports have contributed to the observed inflexibility of import tax revenue. A good deal of the inflexibility of excise and export duties, apart from administrative problems of tax collection, derived from the characteristic low rates of taxation and the numerous exemptions consistent with government declared objectives to promote industrialisation and combat inflation in the review period.

An important implication of the results of the study for policy seems to be that government revenue from the tax system would remain grossly inadequate for development requirements unless the tax system is made much more flexible with respect to income than it is at present. This can be achieved through, *inter alia*, gradual moderate increases in the rates and a further expansion of the tax base, at least, in the inflexible area of import and excise duties and an improvement in the administration of the company income tax in line with the recommendations of the Report on the Task Force on Tax Administration (1979)<sup>1</sup>. However, an investigation into optimal magnitudes of such increases is beyond the scope of this study and therefore calls for further research.

S. E. Omoruyi  
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<sup>1</sup>R. J. Chelliah, "Trends in Taxation in Developing countries", *Reading in Taxation in Developing countries*, Ed. R. M. Bird and Oldman, 3rd Edition.

<sup>1</sup>Federal Republic of Nigeria, *Report of the Tax Force on Tax Administration*, Lagos, September, 1979.

**TABLE 1**  
**FEDERAL GOVERNMENT TAX REVENUE**  
(₦ million)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
<b>DIRECT TAXES</b>	14.8	17.5	15.2	14.9	36.1	33.6	37.4	36.4	43.0	43.8	144.2	451.2	624.4	852.9	3,032.1	2,990.2	3,852.4	4,731.9	3,961.7	5,754.2
Company Income tax <sup>1</sup>	8.9	11.9	11.4	10.8	9.6	13.0	16.8	22.4	27.6	33.2	45.8	63.0	80.4	75.5	146.6	261.9	222.2	373.0	526.9	575.0
Personal Income tax	5.9	5.6	3.8	4.1	4.9	5.8	6.2	8.2	4.8	0.8	0.8	λ	λ	1.2	11.1	15.9	3.5	3.9 <sup>c</sup>	3.0 <sup>c</sup>	3.2 <sup>c</sup>
Petroleum Profits tax	—	—	—	—	—	—	—	—	—	9.8	97.6	383.2	540.5	769.2	2,872.5	2,707.5	3,624.9	4,331.0	3,415.9	5,164.0
Other direct taxes <sup>2</sup>	λ	λ	λ	λ	21.6	14.8	14.4	5.8	10.6	λ	λ	5.0	3.5	7.0	1.9	4.9	1.8	24.0	15.9	12.0
<b>INDIRECT TAXES</b>	150.8	153.6	159.7	171.7	204.8	234.0	212.8	197.8	187.0	261.2	369.4	491.2	481.1	516.2	498.2	760.7	882.7	1,144.7	1,697.9	1,144.0
Import duties <sup>3</sup>	109.6	114.0	121.9	123.9	151.2	169.2	116.8	109.0	109.6	151.6	215.6	284.8	274.4	307.9	328.3	629.4	724.3	963.9	1,436.0	871.0
Export duties	29.2	26.2	23.7	28.4	29.4	31.6	28.6	28.0	29.0	37.6	41.2	37.8	26.9	12.3	5.5	5.8	6.1	4.0	2.9	0
Excise duties	12.0	13.4	14.1	19.4	24.2	33.2	67.4	60.2	49.0	72.0	112.6	168.6	179.8	196.0	164.4	125.5	152.3	176.8	259.0	273.0
<b>Total tax revenue</b>	165.6	171.1	174.9	186.6	240.9	267.6	250.2	234.2	230.0	305.0	513.6	942.4	1,105.5	1,369.1	3,530.3	3,750.9	4,735.1	5,876.6	5,659.6	6,898.2

Sources: Central Bank of Nigeria, *Annual Report and Economic and Financial Review*, various issues:

<sup>1</sup>Includes, since 1969, companies super tax and surcharge on pioneer companies.

<sup>2</sup>Includes casino, capital gains, airport, stamp duties, and betting winning taxes.

λ = Less than ₦0.5 million.

— = not applicable.

<sup>3</sup>Includes fees and penalties.

**TABLE 2**  
**PERCENTAGES OF TAXES IN TOTAL FEDERAL TAX REVENUE**

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
<b>DIRECT TAXES</b>	8.9	10.2	8.7	8.0	15.0	12.6	14.9	15.5	18.7	14.4	28.1	47.9	56.5	62.3	85.9	79.7	81.4	80.5	70.0	83.4
Company Income tax <sup>1</sup>	5.4	6.9	6.5	5.8	4.0	4.9	6.7	9.6	12.0	10.9	8.9	6.7	7.3	5.5	4.2	7.0	4.7	6.3	9.3	8.3
Personal Income tax	3.5	3.3	2.2	2.2	2.0	2.2	2.5	3.5	2.1	0.3	0.2	—	—	0.1	0.3	0.4	0.1	0.1	0.1	*
Petroleum Profits tax	—	—	—	—	—	—	—	—	—	3.2	19.0	40.7	48.9	56.2	81.4	72.2	76.6	73.7	60.3	74.9
Other direct taxes <sup>2</sup>	—	—	—	—	9.0	5.5	5.7	2.4	4.6	—	—	0.5	0.3	0.5	*	0.1	*	0.4	0.3	0.2
<b>INDIRECT TAXES</b>	91.1	89.8	91.3	92.0	85.0	87.4	85.1	84.5	81.3	85.6	71.9	52.1	43.5	37.7	14.1	20.3	18.6	19.5	30.0	16.6
Import Taxes <sup>3</sup>	66.2	66.7	69.7	66.4	62.8	63.2	46.8	46.8	47.4	49.7	42.0	30.2	24.8	22.5	9.3	16.8	15.3	16.4	25.4	12.6
Export Duties	17.7	15.3	13.5	15.2	12.2	11.8	11.4	12.0	12.6	12.3	8.0	4.0	2.4	0.9	0.2	0.2	0.1	0.1	*	—
Excise Duties	7.2	7.8	8.1	10.4	10.0	12.4	26.9	25.7	21.3	23.6	21.9	17.9	16.3	14.3	4.6	3.3	3.2	3.0	4.6	4.0
<b>Total tax revenue</b>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

\*Less than 0.1 per cent.

**TABLE 3**  
**FEDERAL GOVERNMENT TAX REVENUE AS A PERCENTAGE OF GROSS DOMESTIC PRODUCT**

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
<b>DIRECT TAXES</b>	0.7	0.7	0.5	0.5	1.1	1.0	1.0	1.2	1.5	1.2	2.6	6.6	8.7	7.5	16.2	13.9	14.1	14.6	12.7	14.1
Company Income tax <sup>1</sup>	0.4	0.5	0.4	0.4	0.3	0.4	0.5	0.7	1.0	0.9	0.9	0.9	1.1	0.7	0.8	1.3	0.8	1.1	1.7	1.4
Personal Income tax	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.2	*	*	—	—	*	0.1	0.1	*	*	*	*
Petroleum Profits tax	—	—	—	—	—	—	—	—	—	0.3	1.7	5.6	7.6	6.7	15.3	12.5	13.3	13.4	10.9	12.7
Other direct taxes <sup>2</sup>	—	—	—	—	0.7	0.4	0.3	0.2	0.3	—	—	0.1	*	0.1	*	*	*	0.1	0.1	*
<b>INDIRECT TAXES</b>	6.7	6.5	5.7	5.8	6.5	7.0	5.9	6.7	6.5	6.9	6.6	7.2	6.7	4.5	2.6	3.5	3.2	3.5	5.4	2.8
Import duties <sup>3</sup>	4.9	4.8	4.4	4.2	4.8	5.0	3.2	3.8	3.8	4.0	3.9	4.1	3.8	2.7	1.7	2.9	2.7	3.0	4.6	2.1
Export duties	1.3	1.1	0.8	1.0	0.9	0.9	0.8	0.9	1.0	1.0	0.7	0.6	0.4	0.1	*	*	*	*	*	—
Excise duties	0.5	0.6	0.5	0.6	0.8	1.0	1.9	2.0	1.7	1.9	2.0	2.5	2.5	1.7	0.9	0.6	0.5	0.5	0.8	0.7
<b>Total tax revenue</b>	7.4	7.2	6.2	6.3	7.6	8.0	6.9	7.9	8.0	8.1	9.2	13.8	15.0	12.0	18.8	17.4	17.3	18.1	18.1	16.9

<sup>1</sup>Includes since 1969, compares super tax and surcharge on pioneer companies.



TABLE 4  
NIGERIA: SELECTED ECONOMIC INDICATORS

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	
GDP at Current prices <sup>1</sup> (₦million)	2,245	2,373	2,791	2,946	3,145	3,361	3,614	2,950	2,879	3,792	5,584	6,851	7,137	11,388	18,771	21,577	27,292	32,360	31,295	40,757	50,599	56,941	
Merchandise exports <sup>2</sup> (₦million)	339	347	337	379	429	537	568	484	422	636	885	1,293	1,434	2,277	5,795	4,925	6,751	8,674	6,064	10,837			
Merchandise imports <sup>2</sup> (₦million)	432	443	406	415	507	550	513	447	385	497	756	1,079	990	1,225	1,727	3,717	5,149	7,297	8,212	7,473			
Index of manufacturing production <sup>2</sup>	141.0	152	161	100.0	123.7	143.7	164.5	171.8	172.8	211.9	81.0	92.8	100.0	123.6	119.5	147.7	170.6	193.5	220.2	237.5			
	1958 = 100			1963 = 100						1972 = 100													
Index of Manufacturing production (1960 = 100)	100.0	107.8	114.2	70.9	87.7	101.9	116.7	121.8	122.6	150.3	57.4	65.8	70.9	87.7	84.8	104.8	121.0	137.2	156.2	168.4			
Population <sup>3</sup> (million)	52	53	54	56	57	58	60	61	63	65	67	69	71	73	75	77	78	79	81	83			
Per Capita income	43.2	44.8	51.7	52.6	55.2	57.9	60.2	48.4	45.7	58.3	83.3	99.3	100.5	156.0	250.3	280.2	349.9	409.6	386.4	491.0			

Sources:

<sup>1</sup>Figures for 1960-1969 from *Second Progress Report on the Second National Development Plan* while figures for 1973-1977 are taken from National Accounts of Nigeria 1973/74 to 1977/78 published by Federal Office of Statistics (April 1980) And *4th National Development Plan*, 1981-1985 Vol. I.

<sup>2</sup>Central Bank of Nigeria: *Economic And Financial Review*; Various Issues

<sup>3</sup>United Nation *Demographic Year Book* And Federal Office of Statistics, *Mid-Year Population Projection*.

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