REVENUE PERFORMANCE OF NATIONAL GOVERNMENT TAXES,
1975 - 1985

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1.0 Introduction

Various cross country studies (Lotz and Morsa, 1967; Shin, 1969; Chelliah, 1971; Bahl, 1971; Chelliah, Baas and Kelly, 1975; Tait, Gratz and Eschengreen, 1979) indicate that the Philippine tax performance as measured either by the tax to GNP ratio or by the tax effort or international tax comparison index is low. On a secular basis, what worries fiscal planners, is evidence of a perceptible downward trend in the ratio of tax revenues to GNP over the last decade, from 12 per cent in 1975 to 9.64 per cent in 1984.

An evaluation of the performance of the Philippine tax system from the perspective of resource mobilization is an imperative task at this stage. Two measures of the responsiveness of tax yields will be employed in this study: (1) tax buoyancy and (2) tax elasticity.

Tax buoyancy is defined as the ratio of the percentage change in tax revenue to the percentage change in aggregate income, GNP, with the revenue changes inclusive of the increment in revenue brought about by discretionary factors. Discretionary changes in collections may be brought about by one or a combination of the following: statutory reforms in the tax rates, modifications in the legal definition of tax bases, and significant changes in the administrative aspect of tax collection. Tax elasticity, on the other hand, is
defined as the ratio of the proportional change in tax yields to the proportional change in GNP with the effects of discretionary factors siphoned out of revenue increases.

Tax elasticity, $\Sigma_{TY}$, is the product of two components:

1. the base elasticity which is elasticity of the base with respect to aggregate income, and,
2. the rate elasticity which is elasticity of the tax yield with respect to the base.

To wit,

$$
\Sigma_{TY} = \frac{\Delta T_i/T_i}{\Delta Y/Y} = \frac{\Delta T_i/T_i}{\Delta B_i/B_i} \cdot \frac{\Delta B_i/B_i}{\Delta Y/Y}
$$

where $T_i$ is the tax revenue from tax category $i$, $B_i$ is base of tax category $i$, $Y$ is aggregate $Y$.

The value of $\Sigma_{T_iB_i}$ depends on progressivity of the rate structure and changes in the distribution of the base among the rate brackets. The value of $\Sigma_{BY}$ depends on the sensitivity of the base to changes in GNP. A decomposition analysis of tax elasticity will also be carried out to further enhance our analysis of the tax elasticity. A high (or low) total elasticity may be traced to a high (or low) responsiveness of tax yield with respect to the base, or to a high (or low) responsiveness of the base with respect to GNP.
There are a number of earlier studies on tax elasticity/buoyancy in the Philippines. Sicat (1971) estimated total tax buoyancy to be 1.097 based on General Auditing Office, GAO, (now Commission on Audit, COA) data covering the period 1954 – 1970. Sinay (1974) computed buoyancy of aggregate taxes at 1.31 and elasticity at 1.04 for 1961 – 1972 using National Tax Research Center, NTRC, data. She cleaned the revenue series of the impact of discretionary tax changes by applying what she called the "crude" method. Trinidad and de Perio (1983) using the revenue series of the Ministry of the Budget, MOB, calculated total tax buoyancy to be 1.13 and total tax elasticity to be 1.08 for 1977 – 1980. The revenue data series was cleaned of the yield of new tax measures by simply subtracting estimates of the revenue impact of discretionary tax measures from actual tax collections. Llanto (1983) estimated the buoyancy of total tax revenues to be 1.07 for 1961-1981. While these works indicate an elastic tax system, Caballes (1975) and IMF Mission (1976) provide evidence of tax elasticity below unity. Caballes using GAO data estimated tax buoyancy at 1.07 for 1970. The IMF Mission computed tax buoyancy to be 1.31 and tax elasticity to be .90 for 1960 – 1972 based on the NTRC tax series. Tax revenues were adjusted for discretionary changes by applying the constant rate method. NTRC (1975), Gaffud (1979), Manasan (1981) and Diokno (1985) analyzed buoyancy and elasticity of particular tax categories. NTRC
and Diokno concentrated on income taxes, Gaffud investigated excise taxes while Manasan studied various types of internal revenue taxes. All of these studies except those of Caballes and Trinidad and de Perio obtained their buoyancy/elasticity estimates from alternative specifications of regression equations relating tax revenue to aggregate income/proxy base. Caballes and Trinidad and de Perio, on the other hand, computed buoyancy and elasticity by taking the ratio of the growth rate of revenue to the growth rate of GNP. It should be noted that the different studies cited utilized different data series and the buoyancy and the elasticity estimates generated are thus not comparable. Also, most of these studies were based on data from the fifties through the seventies. This paper updates and improves on the earlier works in this area by presenting buoyancy and elasticity estimates computed based on 1975-1985 Ministry of Finance tax revenue series by employing the proportional adjustment method and the dummy variable technique of adjusting the revenue data for discretionary effects.
2.0 Salient Features of the Philippine Tax System, 1975 - 1985

The purpose of this section is to describe the main features of the Philippine tax system. Emphasis will be given on the more important tax measures enacted in the period 1975 - 1985 to gain a better knowledge of the factors that influence tax buoyancy and tax elasticity.

2.1 The Individual Income Tax

The individual income tax is best described as a schedular tax. Compensation income taxed on a modified gross income basis at marginal rates which progresses through a 9 step graduation from 1 per cent on taxable income over P2,500 to 35 per cent on taxable income over P500,000. On the other hand, business and professional incomes are taxed on a net income basis at marginal rates which start at 5 per cent for net income less than P10,000 and rises through 5 steps to 60 per cent for net income over P50,000. Modified gross income is defined as gross compensation income less personal and additional exemptions. Personal exemptions are P4,000, P5,500, and P8,500, respectively, for single, head of families and married taxpayers. Additional exemptions equal to P3,000 may be claimed for each dependent of the taxpayer. Personal and additional exemptions were increased three times during the period; in 1981, 1983, 1985. Net income, on the other hand,
is defined as gross business/professional income (which includes income derived from professions, vocations, trades, business, commerce, etc.) less allowable deductions and personal and additional exemptions. Allowable deductions include the following: (1) business expense, i.e. necessary expenses incurred in the operation of business or practice of profession, (2) interest payments, (3) taxes, (4) losses, (5) bad debts, (6) depreciation and (7) charitable contributions. In lieu of these allowable deductions, the taxpayer may instead claim a "standard deduction" equal to 10 per cent of gross income. Passive income like interest income, and royalties and dividends are subject to a final withholding tax of 17.5 per cent and 15 per cent respectively.

However, prior to the implementation of Batas Pambansa 135 (BP 135) popularly known as the Modified Gross Income Tax Law (MGIT) in 1981, and Presidential Decree 1800 (PD 1800) which introduced the final withholding tax on passive income in 1981, the personal income tax is a global tax levied on a net income basis. There was no distinction among compensation, business/professional and passive income. The definition of gross income was all embracing and included wages, salaries, commissions, business and professional income, interest, dividends, royalties, gains from sale of property, etc. Allowable deductions covered, in addition to items that are permissible at present,
medical expenses, basic tuition fees (up to high school) of dependents, and 10 percent of gross income of working wife. The rate structure progresses steeply from a marginal rate of 3 per cent for taxable net income less than $2,000 to a marginal rate of 70 per cent for taxable net income over $500,000 through a total of 37 steps.

In 1977, withholding tax scheme for wages and salaries, interests, and dividends was instituted under Presidential Decree 1156 and 1158 to improve the efficiency of tax administration.

2.2 The Corporate Income Tax

The corporate income tax is a dual rate tax based on net income. First $100,000 of net income is taxed at 25 per cent while net income in excess of $100,000 is levied a tax of 35 per cent. No major changes were introduced in 1976-1985.

2.3

The locally produced goods. The tax base for imports is the tariff inclusive landed cost (i.e. home consumption value (HCV) plus 10 per cent of HCV plus postage, commission and other charges except freight and insurance) and that for domestically manufactured goods is gross selling price. Exports, goods subject to specific tax, goods subject to
miller's tax, firearms and ammunitions sold to the Armed Forces are not subject to the sales tax. The tax rates on original sale collected at the manufacturer's level or at the port, in the case of imports, are differentiated according to "essentiality" of the goods: 50, 30, 20, 10 and 0 per cent for non-essentials, semi-essentials, ordinary, essentials and agricultural products, respectively. 1/ Automobiles are taxed at 30, 35, 40, and 50 per cent depending on engine displacement. Since 1985, a turnover tax of 1.5 per cent of gross selling price is levied on each subsequent sale of any article except that of manufactured oils and other fuels (excluding lubricating oil, processed gas, grease, wax and petroleum) and publications which appear at regular intervals like newspapers, magazines, and agricultural products. All sales, specific or miller's tax paid on raw materials and components that are physically incorporated in the finished product may be credited against the sales tax due on the original sale of this product, except when the finished product is an agricultural product. 2/ The advance sales

1/ Between 1969 to 1978, non-essential, semi-essential ordinary and essential products were taxed at 70, 40, 7, and 5 per cent, respectively. From 1978 to 1985, the rate structure was 50, 25, 10 and 5, respectively, based on Presidential Decree 1358. The classification of commodities under the different categories was also modified in 1978.

2/ The tax credit provision for taxes paid on raw materials was introduced only in April 1978 under PD 1358. This was intended to eliminate tax cascading which results if goods are taxed repeatedly as they passed through the different stages of production and distribution.
on imported articles are allowed as credit against the sales tax due on the original sale of these imported goods. No tax credit is permitted against sales tax on subsequent sale.

Before the issuance in October 1985 of Presidential Decree 1991 which unified the sales tax rates on semi-essential and essential articles and which eliminated the mark-up provision, higher effective sales tax rates were imposed on imported goods relative to their domestically manufactured counterparts. For instance, imported automobiles were subject to a sales tax of 100 - 200 per cent while locally manufactured ones were taxed at 15 - 45 per cent; imported airconditioners were taxed at 35 per cent as against the 25 per cent levied on domestically produced ones; imported semi-essential articles like pens, ballpens, chairs, sofas, beds, watches, electric fans, electric, gas and oil stoves, phonographs, tape recorders, televisions, refrigerators etc. were subject to a flat 25 per cent sales tax while locally produced versions were taxed at graduated rates depending on price with 25 percent as the maximum rate; a 10 per cent tax was imposed on imported processed meat, milk, fish, medicine, laundry soap, writing pads, pencils while only 5 percent was applicable if the same were domestically manufactured; and a 10 per cent tax was levied on imported agricultural products as against 1 per cent for local products. Furthermore, the base of the sales tax on domestic goods was the gross selling price while that on
imports was the tariff inclusive landed cost plus a mark-up equal to 25 per cent of this total value.

2.4 The Excise (Specific) Tax

Specific taxes are excises on certain domestically produced and imported goods like petroleum, tobacco, and alcoholic products, cinematographic films, fireworks, coal, saccharine, and matches. The specific tax used to be a unit tax based on volume of production/sales. Starting September 1984, an ad valorem component was added to and, in certain cases, replaced the unit tax on most products subject to specific tax. In particular, compounded liquors, kerosene, asphalt, diesel fuel oil, liquefied petroleum gas used for motive power and matches are subject to an ad valorem tax only; distilled spirits, wines, tobacco products, cigars, lubricating oils, processed gas, greases, waxes, petroleum, denatured alcohol, fireworks, coal, cinematographic films, video tapes and saccharine are levied a unit tax only; and fermented liquors, cigarettes, naphtha, regular, premium and aviation gasoline, thinners and solvents, liquefied petroleum gas except those used for motive power, aviation turbo fuel, and bunker fuel oils are subject to both unit and ad valorem tax.

3/ The mark-up was 25, 50 and 100 percent, respectively, for ordinary/essential, semi-essential and non-essential articles prior to the implementation of Executive Order 883 in March 1983.
Like the sales tax, the specific tax used to discriminate between imports and domestically produced products with the former being subject to higher unit tax rates than the latter. However, in November 1983 harmonization of rates on imported and local goods took effect.

2.5 Tariffs

Tariffs on imports is an ad valorem tax with rates ranging from free to 50 per cent. At present, three items are free, 30 items are taxed at 5 per cent and all the rest are taxed at higher rates. The Tariff Reform Program (TRP) initiated in 1981 has reduced the average nominal rate from 43 per cent to 28 per cent. The tax base is the home consumption value plus 10 per cent of the same plus postage commission and other charges except freight and insurance. In December 1982, an additional duty of 3 percent was imposed on all imports. This additional duty was later on increased to 5 percent in November 1983, then to 8 percent in March 1984, and finally to 10 percent in June 1984. It was then reduced to 5 percent in January 1985 and finally increased back to 8 per cent in November, 1985.

2.6 Export Taxes

When import taxes were first introduced in 1970, they were known as stabilization tax, and were imposed on the
following products: logs, lumber, veneer, plywood, copra, coconut oil, dessicated coconut, copra meal/cake, copper ore and concentrates, iron ore and concentrates, chromite ore and concentrates, bunker fuel oil, centrifugal sugar, molasses, unmanufactured abaca, unmanufactured tobacco, and canned pineapples. In 1973, the list of products subject to the export tax was expanded to include gold, clinker cement, portland cement, petroleum pitch, bananas, shrimps and prawns. Through the years, the export tax on particular products have been sporadically lifted, reimposed, raised or decreased depending on how the affected commodities fared in the international market.

The export tax is an ad valorem tax levied on the gross f.o.b. value of taxable exports. At present, exports of logs are taxed at 20 per cent, copra at 15 per cent, coconut oil at 9 per cent, copra meal/cake and dessicated coconut at 8 per cent, lumber and veneer, abaca, pineapple and pineapple juice at 4 per cent, and banana at 2 per cent.

2.7 Tax Incentives/Tax Expenditures

The Board of Investment (BOI) administered tax incentive system for selected industrial activities is the most viable form of tax expenditure. Batas Pambansa 391 of January 1981 introduced a shift from incentives which are available up front to the firms and which exhibit a capital cheapening effect like accelerated depreciation, tax and
duty exemptions on importation of capital equipment, expansion reinvestment allowance, etc. to incentives which are performance oriented and which are factor neutral like the tax credit on net value earned and tax credit on net local content of exports. BP 391 also provides teeth to government's export promotion policies. While so-called pioneer enterprises were the most favored sector under the earlier incentive packages, export firms benefit the most with the implementation of BP 391.

In addition to BP 391, there exist a wide variety of other incentive packages which are more sector specific, e.g. the Export Processing Zone Authority, the MARINA for shipping, the Bureau of Mines administered package for mining, etc. Furthermore, various government corporations and private entities, e.g. National Food Authority (NFA), National Power Corporation (NPC), Philippine Airlines (PAL), Regional water districts, radio/TV stations, etc. were entitled to tax exemptions under numerous Presidential Decrees. Presidential Decree 1931 and 1955 of 1984 withdrew the tax exemptions of all government corporations and private enterprises. However, a considerable number of exemptions have been restored since then. The revenue leakage from these tax privileges is considered significant by most fiscal analysts.
3.0 Methodology

Changes in tax revenues during a given period is the sum total of changes due to the responsiveness of the tax structure to changes in economic activity (automatic effects) and changes due to discretionary tax measures (discretionary effects). Tax buoyancy is a measure of the responsiveness of the tax system to the aggregate of these two changes. Modifications in the statutory rates and bases and extraordinary changes in the degree of administrative efficiency constitute discretionary tax measures. The growth in tax revenues after adjustments are made for discretionary changes reflects the growth attributable to changes in economic base and to trend changes in administrative efficiency. Thus, tax elasticity which is based on revenue changes after adjusting for discretionary effects is a measure of the responsiveness of tax revenues to automatic changes in economic activity and tax administration.

3.1 Estimation of Tax Buoyancy

Tax buoyancy in this study is estimated econometrically by regressing actual or unadjusted tax receipts on aggregate income or GNP, in either of the following forms:

\[ T_t = a_0 + b_0 Y_t \] (1)

or
\[
\log T_t = \alpha_o + \beta_o \log Y_t \tag{2}
\]

where \( T_t \) is actual tax revenue inclusive of the revenue impact of discretionary tax measures at time \( t \), and \( Y_t \) is GNP at time \( t \).

\( b \), the coefficient of aggregate income when the linear specification is used, is the marginal tax rate. It is the derivative of tax revenue with respect to GNP, \( dT/dY \), i.e. it is the change in tax yield per unit change in income. Tax buoyancy, \( n \), may be derived from \( b \) by the following adjustment:

\[
n = b_o \left( \frac{y_j}{T_j} \right) \tag{3}
\]

Tax buoyancy when calculated from the coefficient of a linear regression equation is variable and its value depends on the values of \( Y \) and \( T \) used in equation (3). Usually, tax buoyancy is evaluated at the means, i.e. mean values of \( Y \) and \( T \) in the estimation period are utilized; or at the end year, \( n \), of the estimation period, i.e., \( Y_n \) and \( T_n \) are plugged in equation (3).

The coefficient \( \beta_o \) of the double logarithmic specification, equation (2), is by itself an estimate of tax buoyancy. Implicit in the use of (2) is the assumption that tax buoyancy is constant or invariable in the estimation period.
3.2 Estimation of Tax Elasticity

To estimate the built-in elasticity of a tax with respect to GNP, it is necessary to adjust the actual tax yield series for discretionary effects. The various methodologies of cleaning the historical tax revenue series of discretionary effects are well expounded in Chelliah and Chand (1974) and Bahl and Chelliah (1972). The exposition that follows draw a great deal from these papers.

3.2.1 Cleaning the Tax Series of Discretionary Effects

There are three major approaches to adjusting historical tax receipts series for the revenue impact of discretionary tax measures, namely: (1) constant rate structure method, (2) proportional adjustment method and (3) dummy variable technique. The constant rate structure method requires the calculation of the effective tax rate per income bracket (or commodity grouping) for the chosen reference year and then these rates are applied to the distribution of taxable income (values) across income brackets (commodity groupings) in all other years to generate the "cleaned" tax series, i.e. a tax receipt series that has the same rate structure as the reference year. The feasibility of using the constant rate structure method depends on the availability of data on effective tax rates per income bracket (commodity grouping) for the reference year and the distribution of taxable income (values) by
income (commodity) groupings for each year of the estimation period. While the former is readily accessible, the latter is not, especially if one is concerned with building a series long enough for econometric work.

Unlike the constant rate structure method, the other two approaches to cleaning the tax series of discretionary effects are less demanding in terms of data requirements. Primarily for this reason, this study uses the two remaining methods.

3.2.1.1 Proportional Adjustment Method

The proportional adjustment method (PAM) is usually attributed to Prest (1962). However, Bahl and Chelliah (1972) and Chelliah and Chand (1974) have demonstrated that the Prest procedure yields a series each element of which is equal to a constant multiple of the corresponding element in the series generated by an approach developed by Sahota (1961). Thus, tax elasticities computed from the Prest series and the Sahota series are equal. The data needed to apply the proportional adjustment technique are the actual tax yield series and the revenue effect of each year's discretionary tax measures.

The proportional adjustment method involves a two-step process of adjusting the historical tax series for

4/ The multiplier is $T$, the actual tax yield in the reference year.
discretionary effects. First, the revenue effect of a discretionary tax measure is eliminated from the actual tax receipt in the year in which the measure is enacted, i.e. year 2 receipts are converted to year 1 rates, year 3 receipts to year 2 rates, etc. Second, the yield in all the years are converted to the reference year rates by multiplying the “adjusted” annual changes, e.g. year t receipts expressed in year t - 1 rates, as obtained in step 1, less actual tax receipts in years t - 1, by the ratio of the preceding year’s tax receipts stated in the reference year rates to that year’s actual receipts. In symbols, let

\[ T_j \] be actual receipts in the j'th year

\[ T_{i,j} \] be j'th year receipts adjusted to the i'th year rates,

\[ D_j \] be revenue effect of discretionary action in the j'th year.

Then if year 1 is chosen as the reference year the cleaned tax series based on the proportional adjustment method is as follows:

\[ T_{1,1} = T_1 \]
\[ T_{1,2} = T_2 - D_2 \]
\[ T_{1,3} = T_{1,2} + (T_3 - D_3 - T_2) \cdot \frac{T_{1,2}}{T_2} \]

or
\[ T_{1,3} = T_{1,2} + (T_{2,3} - T_2) \cdot \frac{T_{1,2}}{T_2} \]

\[ T_{1,j} = T_{1,j-1} + (T_j - D_j - T_{j-1}) \cdot \frac{T_{1,j-1}}{T_{1,j-2}} \quad (4) \]
or \[ T_{1,j} = T_{1,j-1} + (T_{j-1,j} - T_{j-1}) \frac{T_{1,j-1}}{T_{j-1}} \] (4')

\[ T_{1,2} = T_2 - D_2 \]
\[ T_{1,3} = T_{1,2} + (T_3 - D_3 - T_2) \frac{T_{1,2}}{T_2} \]

or \[ T_{1,3} = T_{1,2} + (T_{2,3} - T_2) \frac{T_{1,2}}{T_2} \]

\[ T_{1,j} = T_{1,j-1} + (T_j - D_j - T_{j-1}) \frac{T_{1,j-1}}{T_{j-1}} \] (4)

or \[ T_{1,j} = T_{1,j-1} + (T_{j-1,j} - T_{j-1}) \frac{T_{1,j-1}}{T_{j-1}} \] (4')

Step 1 of the procedure generates the series \( T_{1,1}, T_{1,2}, T_{2,3}, \ldots, T_{j-1, j}, T_{n-1}, n \) while step 2 generates the series \( T_{1,1}, T_{1,2}, T_{1,j}, \ldots, T_{1,n} \). Note the expression in parenthesis in the expression for \( T_{1,j} \) is the nondiscretionary change in revenue between years \( j-1 \) and \( j \).

Prest also derived the cleaned series with the last year of the period, year \( n \), as reference year. Chelliah and Chand (1974) showed that the \( T_{n,j} \) series is a multiple of the \( T_{1,j} \) series to wit,

\[ T_{n,j} = \lambda T_{1,j} \]

where \( \lambda = \frac{T_n}{T_{1,n}} \)
Given a tax series that is cleaned by applying the proportional adjustment method, tax elasticity may then be estimated by regressing this series of tax receipts on GNP using either the linear or the double log specification. The coefficients from these regressions may be interpreted in a fashion similar to that of tax buoyancy. If the linear specification is used with the \( T_{1,j} \) series initially such that

\[
T_{1,j} = a_0 + b_0 Y_j
\]

then, the marginal tax rate of the \( T_{n,j} \) series, \( d T_{n,j} / dY_j \), is \( \lambda b_o \) which is equal to \( \lambda (dT_{1,j} / dY_j) \) because of the multiplicative relationship between the \( T_{1,j} \) and the \( T_{n,j} \) series. On the other hand, if the double log specification is employed such that

\[
\log T_{1,j} = \alpha_0 + \beta_0 Y_j
\]

then

\[
\sum T_{1,j} Y = \sum T_{n,j} Y = \beta_0.
\]

These results suggest that once the historical tax receipts series is adjusted to a given year's structure using the method of proportional adjustment then it is a breeze to translate the analysis in terms of any other year as reference year.

Inherent in the proportional adjustment method is the assumption that "the revenue effect of any discretionary measure grows in proportion to total revenue, i.e. that discretionary measures alter the level of yield
but do not change the elasticity of the system" (Chelliah and Chand, 1974). This implies that the tax elasticity that is measured is the average of the tax elasticity of the different structures that existed during the estimation period. Nevertheless, the method is an appropriate one in cases where (1) the discretionary measures are applied on flat rate taxes, either income or commodity taxes, such that the elasticity is neutral with respect to rate changes, and (2) the discretionary action is assumed not to affect the base of the tax.

3.2.1.2 Dummy Variable Technique

The dummy variable technique (DVT) is an econometric method of simultaneously adjusting for discretionary revenue effects and estimating tax elasticity. Suppose that the estimation period is from year 1, 2,..., n and that a discretionary change occurred in year k, which affected both the levels of revenue and the elasticity of the system; then a dummy variable may be introduced in an equation like (1) to indicate the change in structure with:

\[ \log T_t = \alpha_1 + \beta_1 \log Y_t + \gamma_1 D_{tk} + \delta_1 D_{tk} \log Y_t \]

where

- \( D_{tk} = 0 \) for \( t = 1, 2, \ldots, k-1 \), (period 1)
- \( D_{tk} = 1 \) for \( t = k, k+1, \ldots, n \) (period 2)

The elasticity of the system given the earlier structure is \( \beta_1 \), while the elasticity of the latter system is \( (\beta_1 + \delta_1) \),
the change in the level of revenue yield due to the discretionary change after adjusting for a change in the elasticity of the tax system. Testing the significance of the parameters $\gamma_1$, and $\delta_1$ is equivalent to testing the hypotheses that the discretionary change has affected the level of revenue and the elasticity of the tax system.

If for a priori reasons, one would rather work with the linear specification then the dummy variable will be incorporated in the estimation equation as follows:

$$T_t = a_1 + b_1 Y_t + c_1 D_t + d_1 D_t^2 Y_t$$  \hspace{1cm} (8)

$b_1$ is the marginal tax rate in the period 1 while $(b_1 + d_1)$ is the marginal tax rate in period 2, and $c_1$ is the change in level of tax receipts due to the discretionary action holding the marginal tax rate constant.

If more than one discretionary tax action took place during the estimation period, equations (7) and (8) may be generalized to include additional dummy variables. However, if discretionary changes occurred too often, then one is confronted with the problem of insufficient observations.

Chelliah and Chand (1974) suggested that tax series adjusted by the proportional adjustment method may be investigated for evidence that the tax elasticity was changed by discretionary action by introducing dummy variables, i.e.
\[ T_{t, t} = a_1 + b_1 Y_t + d_1 D_t (Y_t - Y_k) \]  

(9)

and \[ \log T_{t, j} = d_1 + b_1 \log Y_t + d_1 D_t (\log Y_t - \log Y_k) \]  

(10)

where

\[ D_t = 0 \text{ for } t = 1, 2, \ldots, k - 1 \]

\[ = 1 \text{ for } t = k, k + 1, \ldots, n \]

Statistical applying the dummy variable technique to "cleaned" tax series is more efficient than applying it to raw data because of the one degree of freedom saved for each discretionary action.

### Decomposition of Tax Elasticity

Tax elasticity may be partitioned into two factors:

1. The rate elasticity, i.e., the elasticity of the tax yield with respect to the tax base, \( B \), and
2. The base elasticity, i.e., the elasticity of the tax base with respect to GNP. This is seen from the following:

\[ \varepsilon_{T_t Y} = \left( \frac{\Delta T_t}{T_t} \right) \left( \frac{\Delta Y}{V} \right) \]

\[ = \frac{\Delta T_t}{T_t} \frac{\Delta B_t}{B_t} \left( \frac{\Delta B_t}{B_t} \right) \left( \frac{\Delta Y}{V} \right) = \varepsilon_{T_t B_t} \varepsilon_{B_t Y} \]

\( \varepsilon_{T_t B_t} \) may be estimated econometrically by regressing tax receipts on tax base while \( \varepsilon_{B_t Y} \) may be obtained by regressing tax base on GNP.
4.0 The Data

The data on tax receipts of the National Government for 1975 to 1985 were obtained from the Ministry of Finance (MOF). The MOF tax series is on a cash basis, i.e., revenue remitted by authorized collecting banks to the National Treasury. Tax receipts are classified into two major headings: (1) domestic based taxes and (2) international trade taxes. The former consists of the individual income tax, the corporate income tax, the excise taxes, sales taxes and licenses and other domestic taxes. The latter includes imports duties and taxes and export duties.

Estimates of the revenue impact of discretionary tax measures in the year these actions were introduced were provided by the National Tax Research Center (NTRC) and are presented in Appendix Table 1. The availability of these estimates is essential to the implementation of the proportional adjustment method. To the authors' knowledge the present study is the first one to employ the proportional adjustment method in calculating tax elasticity.

The data on aggregate income or GNP as well as most of the tax base variables like personal income, corporate income, and gross value added in various sectors were taken from the National Income Accounts Staff of the National Economic and Development Authority (NEDA). Data on imports and exports values were from the Central Bank (CB) Statistical Bulletin.
5.0 Analysis

In this section, the buoyancy and elasticity estimates of various types of taxes and tax groupings based on the methodology outlined in Section 3 are analyzed in light of the tax changes that took place during the estimation period as highlighted in Section 2. In the discussion that follows, the buoyancy/elasticity estimates that are presented are obtained from regression equations of the double logarithmic form not only because of the convenience of using this specification when one wants to study these parameters but also because empirically in the present paper there is no significant difference in the goodness of fit of the linear and double logarithmic regression equations.

5.1 Income Taxes

Income taxes are composed of two components: the individual income tax and the corporate income tax. The buoyancy and elasticity of the taxes on income and profits are close but still less than one at .97 and .81,2 respectively, with the corresponding R statistic of .97 and .98. These imply that income taxes are inelastic. The discussion below will show that while the corporate income tax is elastic the personal income tax is not. One may infer, therefore, that the latter exerted a stronger influence on the buoyancy and elasticity estimates of the aggregate of the two taxes on income. 15.1 per cent of the
historical growth in revenue rise from discretionary effects.

5.1.1 Individual Income Tax

The buoyancy and elasticity estimates of the individual income tax are presented in Table 1. The buoyancy is below unity at .81 while the average built-in elasticity based on the proportional adjustment method is .45 for 1975 - 1985. The contribution of discretionary actions to the historical growth of tax receipts is large at 44.4 per cent. This figure is obtained by taking the difference from 100 per cent of the percentage ratio of the elasticity to the buoyancy.

An examination of whether the reform of the personal income tax system in 1981 which includes among other changes, the introduction of the MGIT has affected its elasticity, yields a positive result. Pre - 1981 elasticity stand at .91 while post - 1981 elasticity is .17. In the last decade, the personal income tax has become more revenue inelastic.

The elasticity is then partitioned into its rate and base elasticities using the personal income series from the NAS as proxy base. It is observed that the low income elasticity of the personal income tax is attributable to the low tax to base elasticity. The rate elasticity averaged .45 for 1975 - 1985. There is a dramatic reduction in the
Table 1. Buoyancy and Elasticity of the Individual Income Tax, 1975 – 1985a/

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<thead>
<tr>
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<tbody>
<tr>
<td>Buoyancy</td>
<td>0.81</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.85)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Elasticity</td>
<td>0.45</td>
<td>0.91</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>(0.84)</td>
<td>(0.87)</td>
<td>(0.87)</td>
</tr>
<tr>
<td>Rate Elasticity</td>
<td>0.42</td>
<td>0.96</td>
<td>0.16</td>
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<tr>
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<td>(0.83)</td>
<td>(0.87)</td>
<td>(0.87)</td>
</tr>
<tr>
<td>Base Elasticity</td>
<td>1.05</td>
<td>0.95</td>
<td>1.09</td>
</tr>
<tr>
<td></td>
<td>(0.99)</td>
<td>(0.99)</td>
<td>(0.99)</td>
</tr>
</tbody>
</table>

a/ The elasticity estimates presented are based on the PAM. The regression equations based on the JVT did not yield statistically significant results for the 1981 changes. This should not be considered a problem since, on theoretical grounds, the former approach is preferred to the latter for efficiency considerations. The numbers in parenthesis are the R2 statistics. Unless otherwise indicated the coefficients are significant at 5 per cent.
rate elasticity from .96 for 1975 - 1980 to .16 for the remaining period. The base to GNP elasticity is greater than unity on the average for the entire estimation period. The base elasticity improved but to a lesser degree than the deterioration of the rate elasticity increasing from .95 in period 1 to 1.09 in period 2. This may be attributed to the faster growth of personal income relative to GNP. These estimates, together with the progressive nature of the personal income tax, strengthen our conviction on the desirability as well as the feasibility of raising more revenues from direct taxation.

The analysis above suggests that the 1981 reform package has had deleterious effects on the revenue raising performance of the individual income tax. Four basic and independent modifications constitute this reform. The revenue impact of these changes is not uniform. First, the MGIT disallows personal deductions in the computation of taxable income for compensation. This feature of the MGIT broadens the tax base for compensation income and has a positive influence on tax collections from this source. Second, 1981 marks the shift to scheduler taxation, i.e. income from different sources are taxed based on different rate schedules and different base definitions. This has led to a reduction in revenues due to the possibility of income splitting where the first slabs of income from different sources are taxed at the bottom rates of each schedule. For example, a taxpayer which has a taxable income from various
sources amounting to a total of ₱60,000 divided equally between compensation and business income will be taxed at the marginal rates of 11 and 15, respectively, for the compensation and business income components. Compare this to a marginal rate of 15 per cent if the taxable income is purely derived from compensation or to a marginal rate of 30 per cent if it is completely sourced from business or to a 48 per cent marginal rate under the old system under which income splitting is impossible. Third, there has been a lowering of the nominal marginal tax rates applicable to the top income bracket from 70 per cent to 35 per cent for compensation income and 60 per cent for professional/business income. A loss in tax receipts is expected from this feature of the reform. BIR (1984) has shown that the revenue impact of this reduction in the nominal rates is not compensated by that of the change in the base definition as the effective tax rate on the top bracket of compensation income has gone down from 48 to 32 per cent. Fourth, passive income like interest, dividends, etc. is subjected to a final withholding tax since 1981. This move will tend to increase tax collections by improving tax compliance as it eliminates the possibility of income under reporting in the case of passive income.

It should be pointed out that although the impact of some aspects of the 1981 reform package is on the tax base, this is not reflected in our estimates of base elasticity. This arises from the fact that the personal income
data which is used as proxy base is broader than the legal tax base because of the inclusion in the former of exemptions and deductions. As such any broadening of the statutory tax base is to be translated to higher effective rates and, consequently, to higher rate elasticity based on the chosen proxy base while the base elasticity is unaffected.

It is surprising to find that the individual income tax has a total tax elasticity below unity. Given the progressive nature of the tax, theoretically its rate elasticity is greater than 1. Since the base elasticity is empirically over 1 also, then the total elasticity should be greater than unity. The fact that this is not the case then leads us to conclude that tax administration is inefficient and that personal income tax evasion have been growing.

5.1.2 Corporate Income Tax

Of the major taxes examined, the corporate income tax exhibited the highest buoyancy at 1.26. Its elasticity is likewise greater than unity at 1.03 proving that the corporate income tax is an effective automatic stabilizer. Comparing these two measures, it is observed that 19.0 per cent of the growth in corporate income tax revenues is due to discretionary measures.

Although no major change was instituted in the corporate tax sphere in the period under study, it was nonetheless, tested empirically if the elasticity has changed. The estimation period is arbitrarily divided in
the middle. Period 1 covers 1979 to 1979 and period 2 is from 1980 to 1985. Both the PAM and the DVT yielded statistically significant estimates in this regard (see Table 2). The corporate income tax is the only tax heading which manifested an increased elasticity between the two periods. Period 1 elasticity is .85 while that of period 2 is 1.21 based on PAM. The corresponding DVT estimates are .77 and 1.23.

Partitioning the total elasticity into its components, it is observed that the rate elasticity averaged a high 1.49 over the whole period while the base elasticity is rather low at .72. The movement in the total elasticity is mirrored in the movement in the rate elasticity. The tax to base elasticity increased from .77 to 1.92 based on PAM in the two periods (DVT estimates from .73 to 2.04). The base elasticity decreased considerably from 1.05 in the first period to 1 to .62 in the second period. But this negative development is not enough to offset the improvement in the rate elasticity. The proxy base used is gross value added in the nonagricultural sector in current prices from NAS. The corporate income series from NAS was also tested as proxy base but it was later dropped because of its weak relationship with GNP.
### Table 2. Buoyancy and Elasticity of the Corporate Income Tax, 1975 - 1985

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Buoyancy</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>(0.98)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Elasticity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAM</td>
<td>1.02</td>
<td>0.85</td>
<td>1.21</td>
</tr>
<tr>
<td></td>
<td>(0.97)</td>
<td>(0.98)</td>
<td>(0.98)</td>
</tr>
<tr>
<td>DVT</td>
<td></td>
<td>0.77</td>
<td>1.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.98)</td>
</tr>
<tr>
<td>Rate Elasticity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAM</td>
<td>1.49</td>
<td>0.77</td>
<td>1.82</td>
</tr>
<tr>
<td></td>
<td>(0.96)</td>
<td></td>
<td>(0.97)</td>
</tr>
<tr>
<td>DVT</td>
<td></td>
<td>0.73</td>
<td>2.04</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(0.97)</td>
</tr>
<tr>
<td>Base Elasticity</td>
<td>0.72</td>
<td>1.05</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>(0.99)</td>
<td></td>
<td>(0.99)</td>
</tr>
</tbody>
</table>

\*The numbers in parenthesis are the R statistics. The coefficients are all significant at 5 per cent level.*
The improvement in the rate elasticity is unexpected since there has been no major change in the rate structure of the corporate tax in 1975 - 1985. However, because the income brackets have not been altered over the years either it is likely that distribution of taxable income between the two brackets has shifted towards the top bracket because of inflation. BP 391 of 1983 which repeals the BOI administered fiscal incentives replaced incentives that erode the statutory tax base like accelerated depreciation, expansion reinvestment allowance, reduced income tax, etc. with provisions for tax credit on net value earned and net local content chargeable against all types of tax liabilities. The same caveat discussed with regards to the broadening of the legal base of the individual income tax and the proxy base applies here. Thus, BP 391 may be associated with a higher rate elasticity of the corporate income tax. Furthermore, PD 1931 and PD 1955 of 1984 withdrew the tax exemptions of all government corporations and private enterprises. While some of the exemptions had been reinstated later, the lifting of the other exemptions has stuck. The implication of this development on tax collections is positive. Finally, the increase of the tax to base elasticity in the second period may also be explained by improvements in administrative efficiency over time.
The decline in base to aggregate income elasticity may be traced to the sluggish growth of GWA in the second period particularly during the recession years of 1984/1985. On the other hand, Dickwo (1985) attributes the low and declining base to aggregate income elasticity of the corporate income tax to the shift of entrepreneurial activity from the formal sector to the underground economy. This is an intuitively appealing hypothesis but at present no hard evidence is available.

5.2 Taxes on Domestic Goods and Services

Excise taxes, license and sales taxes on domestic goods and other domestic based taxes comprise this subgrouping we denoted as taxes on domestic goods and services. The buoyancy and elasticity of taxes on domestic goods and services are both less than one at \( 0.91 \) and \( 0.22 \) respectively, with \( R \) of 0.99 and 0.48. The built-in tax to GNP elasticity is low indicating the large contribution (76 per cent) of discretionary measures to growth in revenue.

5.2.1 License and Sales Tax on Domestic Goods

License and sales taxes on domestic goods are not responsive to changes in GNP with a buoyancy estimate of 0.91 between 1975 - 1985. Total elasticity is computed to be 0.88 for the same period implying that only 3.3 per cent of growth in actual tax collections is due to discretionary changes.
The rate structure as well as the classification of commodities across the "essentiality" categories were altered in 1978. The evidence suggests that these changes have affected the elasticity of the tax in the two periods. Total elasticity averaged 1.39 between 1975 - 1977 and this coefficient is statistically different from that in the remaining period of .6. Decomposing total elasticity, it is observed that both the rate and the base elasticities are less than one at .88 and .72, respectively. The proxy-base used is gross value added in non-agricultural sector in current prices. Both the tax to base and the base to GNP elasticities deteriorated between 1975 - 1977 and 1978 - 1985. The rate elasticity dropped by 25 per cent from 1.18 in period 1 to .84 in period 2 while the base elasticity declined by 41 per cent from 1.05 in period 1 to .62 in period 2 (see Table 3).

The lower rate elasticity in the second period may be ascribed to the reduction in the sales tax rates as well as the expansion of the tax credit provision in 1978. Although some upward adjustments in the rates have occurred in 1985, these changes are too recent to be adequately covered in the analysis.
Table 3. Buoyancy and Elasticity of License and Sales Taxes on Domestic Goods, 1975 - 1985

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Buoyancy</td>
<td>0.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Elasticity</td>
<td>0.77</td>
<td>1.39</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>(0.93)</td>
<td>(0.96)</td>
<td>(0.96)</td>
</tr>
<tr>
<td>Rate Elasticity</td>
<td>0.88</td>
<td>1.18</td>
<td>0.84</td>
</tr>
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<td></td>
<td>(0.96)</td>
<td></td>
<td>(0.97)</td>
</tr>
<tr>
<td>Base Elasticity</td>
<td>0.72</td>
<td>1.05</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>(0.99)</td>
<td></td>
<td>(0.99)</td>
</tr>
</tbody>
</table>

\[a/\] The elasticity estimates presented are based on PAM. The results of the application of DVT were not statistically significant. The numbers in parenthesis are the R² statistics. All coefficients are significant at the 5 per cent level unless otherwise indicated.

\[b/\] Significant at 10 per cent level.
5.2.2 Excise Taxes on Domestic Goods

Excise taxes displayed a buoyancy of 1.05 in 1975 to 1985. The total elasticity estimate for excise taxes based on PAM is -0.18 and is not significantly different from zero while its corresponding R coefficient is low at 0.15. On the other hand, very frequent changes in excise taxes give a priori reason to doubt the applicability of the DVT inspite of the high R statistic and the highly significant coefficients (see Table 4). In a sense, what the DVT captures in this particular case is the change in the buoyancy estimates for 1975 - 1979 and 1980 - 1985. The decision to divide the estimation period at 1979/1980 is an arbitrary one since no single discretionary measure stand out.

The low R statistic for the PAM regressions as well as the inadequacy of the DVT in the face of nu

discretionary measures carried out in the excise tax arena leads to a fall back on some intuitive analysis of the elasticity of the excise tax. The statutory base of excise taxes is the volume of production of all the readily available statistics, it is the gross value added in the
Table 4. Buoyancy and Elasticity of Excise Taxes, 1975 - 1985

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Buoyancy</td>
<td>1.05</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Elasticity</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PAM</td>
<td>-0.18 N.S.</td>
<td>0.16 N.S.</td>
<td>-0.56 N.S.</td>
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<td>(0.15)</td>
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<td>(0.32)</td>
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<tr>
<td>DVT</td>
<td>1.65</td>
<td>1.08</td>
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<td></td>
<td></td>
<td>(0.97)</td>
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</tr>
<tr>
<td>Rate Elasticity</td>
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<td></td>
</tr>
<tr>
<td>PAM</td>
<td>0.50</td>
<td>0.06 N.S.</td>
<td>-3.36 N.S.</td>
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<td>(0.05)</td>
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<td>(0.16)</td>
</tr>
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<td>DVT</td>
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<td>-7.57</td>
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<tr>
<td></td>
<td></td>
<td>(0.92)</td>
<td></td>
</tr>
<tr>
<td>Base Elasticity</td>
<td>-0.32</td>
<td>0.20</td>
<td>-0.10</td>
</tr>
<tr>
<td></td>
<td>(0.82)</td>
<td></td>
<td>(0.88)</td>
</tr>
</tbody>
</table>

Notes:

1/ The numbers in parentheses are the R statistics. Unless otherwise indicated, all the coefficients are significant at 5 per cent level.

N.S. not statistically significant.
manufacture of beverages, tobacco and petroleum products in constant prices (GVABTPK) that most closely approximates the legal base. If there were no modifications in the excise tax rates since 1975 and assuming that the distribution of excisable commodities remain constant, i.e., if the tax series is "cleaned" of discretionary effects, then the growth rate of the "cleaned" series of excise taxes will be equal to the growth rate of the volume of production of goods subject to excise tax which in turn is best approximated by the growth rate of GVABTPK. Total elasticity may then be calculated by dividing the growth rate of GVABTPK by the growth rate of GDP. Total elasticity averaged .03 in 1975 - 1985. The estimate for 1975 - 1979 is .18 while that for 1980 - 1985 is .07 (see Table 5). These figures are closer to the PAH estimates than to the DVT estimates in Table 4. Given this evidence, it can be concluded that discretionary measures account for a significant portion if not for all of the historical growth in revenue from excise taxes, a point to which will be discussed later. Furthermore, it is observed that the total elasticity has changed from a low positive value in the first period to a negative value in the second. This may be better understood by partitioning the total elasticity estimates.

The tax to base elasticity is computed by taking the ratio of the percentage change in tax collections exclusive of discretionary effects to the percentage change in GVABTPK. Recall that the rate of growth of "cleaned"
Table 5. Elasticity of Excise Taxes Computed
Based on Rate of Growth of GVA in Beverages,
Tobacco and Petroleum in Constant Terms

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>% Δ in GVABTPK</td>
<td>0.48</td>
<td>3.11</td>
<td>(1.23)</td>
</tr>
<tr>
<td>% Δ in GNP</td>
<td>17.92</td>
<td>17.49</td>
<td>18.22</td>
</tr>
<tr>
<td>Ety</td>
<td>0.03</td>
<td>0.18</td>
<td>-0.07</td>
</tr>
<tr>
<td>Etb</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Eby</td>
<td>0.03</td>
<td>0.18</td>
<td>-0.07</td>
</tr>
</tbody>
</table>
revenues from excise taxes is approximated by the growth in GVABTPK so that ETE is equal to 1 in all periods. The base to aggregate income elasticity is calculated as the ratio of the growth rate of GVABTPK to the growth rate of GNP and is identical to the total elasticity estimate. The low and declining base elasticity may be explained by the specific nature of the tax, i.e., the excise tax is based on volume of production so that price adjustments are not included in the base and by the contraction of GVABTPK in the second period. In turn, the contraction of GVABTPK may be ascribed to the decreased consumption of petroleum products in the second period, particularly during the recession of 1983-1985.

The excise tax was the fastest growing tax in 1975 - 1985. Consequently, its share in total national government tax revenue rose from 13 per cent in 1975 to 23 per cent in 1985. Discretionary measures played a major role in this growth in as much as this tax is inherently inelastic. What is perhaps even more surprising is the increasing effective tax rates (in value terms) over time from .29 in 1975 to .47 in 1985. In effect, discretionary tax measures made possible adjustments in tax rates which are more than what would be warranted by inflation alone. This is especially true in 1975 - 1979 and

---

5/ Computed as the ratio of unadjusted excise tax receipts to gross value added in manufacture of beverages, tobacco and petroleum products as measured in current prices.
in 1983 - 1985 (see Table 6). In particular, it has been pointed out elsewhere (Lamberte, et. al 1984) how petroleum products have been increasingly taxed during the economic crisis of 1983 - 1984. Thus, the observed increasing reliance of the government's fiscal managers on a narrow based tax which may only be explained by the relative administrative ease of extracting tax from a highly visible tax base. Lamberte, et. al suggests that the costs to society of this propensity to rely on excise taxes are the detrimental effects not only on income distribution but on inflation and efficiency as well.

5.3 Taxes on International Trade

International trade taxes are composed of tariffs and other taxes (advance sales, excise and other taxes) on imports and export duties. The buoyancy of these taxes taken together averaged .72 in 1975 - 1985. Elasticity is low at .45. Discretionary tax measures contributed 37 percent to the historical growth in revenue from this source.

5.3.1 Tariffs and Other Taxes on Imports

Import taxes are not very responsive to GNP even if discretionary effects are included and buoyancy for 1975 - 1985 averaged .78. Total elasticity is even lower at .49. Discretionary effects contributed 37 percent to the historical increment in revenue during this period. The

<table>
<thead>
<tr>
<th></th>
<th>% Δ in Excise Tax Revenue</th>
<th>All in Price of BTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-1985</td>
<td>22.8</td>
<td>16.6</td>
</tr>
<tr>
<td>1975-1979</td>
<td>32.8</td>
<td>10.7</td>
</tr>
<tr>
<td>1979-1983</td>
<td>7.6</td>
<td>17.3</td>
</tr>
<tr>
<td>1983-1985</td>
<td>36.5</td>
<td>27.1</td>
</tr>
</tbody>
</table>
elasticity of import taxes with respect to total imports, its proxy base, is very low at .12 while the tax base to GNP elasticity is high at 1.25. The base elasticity of import taxes is, in fact, the highest among all the tax headings.

The estimation period was divided in 1981 which marks the introduction of the Tariff Reform Program (TRP). Both total elasticity and rate elasticity declined between the two periods investigated. Total elasticity dropped from .82 to .09 while rate elasticity decreased from .84 to .05 based on PAM. The DVT yields a similar trend, the only difference being the higher estimate in the second period. The base elasticity improved from .93 in period 1 to 1.32 in period 2 (see Table 7).

The reduction of both total and rate elasticity between the two periods may be attributed to the implementation of the TRP in 1981 as well as the move towards the harmonization of sales tax rates applicable to imports and local products and the estimation of the mark up provision in the tax base of the sales tax on imports. The higher DVT elasticity estimate in the second period relative to that of PAM may be ascribed to the fact that PAM made adjustments for (1) the removal in 1984 of the exemption from taxes and tariff enjoyed by a considerable number of government corporations and private enterprises, and (2) the additional import surcharge imposed from 1982 and which increased through 1984 while the DVT may not have been adequately corrected for these.
Table 7. Buoyancy and Elasticity of Tariffs and Other Taxes on Imports, 1975-1985

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Buoyancy</td>
<td>0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Elasticity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAM</td>
<td>0.49</td>
<td>0.82</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>(0.81)</td>
<td>(0.93)</td>
<td></td>
</tr>
<tr>
<td>DVT</td>
<td></td>
<td>0.92</td>
<td>0.62 N.S.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.96)</td>
</tr>
<tr>
<td>Rate Elasticity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAM</td>
<td>0.12</td>
<td>0.84</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>(0.81)</td>
<td>(0.95)</td>
<td></td>
</tr>
<tr>
<td>DVT</td>
<td></td>
<td>0.89</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.98)</td>
</tr>
<tr>
<td>Base Elasticity</td>
<td>1.25</td>
<td>0.93</td>
<td>1.32</td>
</tr>
<tr>
<td></td>
<td>(0.96)</td>
<td></td>
<td>(0.99)</td>
</tr>
</tbody>
</table>

\textsuperscript{a/} The numbers in parentheses are the \( R^2 \) statistics. Unless otherwise specified, all coefficients are significant at the 5 per cent level.

\textsuperscript{b/} Significant at 10 per cent level.

N.S. not statistically significant.
The high elasticity of imports with respect to GNP may explain the attractiveness of this revenue source to government finance managers particularly in the early part of the estimation period when collections from import taxes constituted the bulk (30 per cent) of total tax revenues of the national government. A reorientation of economic policy at the macro level has caused fiscal planners to veer away from import taxes in the second period. On the other hand, the increase in the base elasticity in the two periods may have resulted from the faster growth of imports relative to GNP which is expected as a consequence of the lowering of tariff rates since 1981.

5.3.2 Export Duties

The buoyancy and elasticity estimates for export taxes are generally characterized by low R and t statistics implying poor fit and an erratic relationship between growth of tax receipts and aggregate income(exports (see Table 8). This may be explained by the government's tendency to increase, decrease, suspend, reimpose, etc. export taxes depending on how exports are faring in the international market. Thus, discretionary measures account for 35 percent of the growth in revenues as may be gleaned from a buoyancy of .96 and an elasticity of .66.

Only the base to aggregate income elasticity measuring over unity at 1.06 yield a high R statistic. There are indications that the tax elasticity, both tax to
Table 8. Buoyancy and Elasticity of Export Taxes,
1975 - 1985

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Buoyancy</td>
<td>0.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.28)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Elasticity</td>
<td>0.66 N.S.</td>
<td>-1.86</td>
<td>1.42</td>
</tr>
<tr>
<td></td>
<td>(0.13)</td>
<td>(0.56)</td>
<td></td>
</tr>
<tr>
<td>Rate Elasticity</td>
<td>0.12</td>
<td>-1.27</td>
<td>1.39</td>
</tr>
<tr>
<td></td>
<td>(0.21)</td>
<td></td>
<td>(0.65)</td>
</tr>
<tr>
<td>Base Elasticity</td>
<td>1.06</td>
<td>1.09</td>
<td>1.19 N.S.</td>
</tr>
<tr>
<td></td>
<td>(0.97)</td>
<td></td>
<td>(0.97)</td>
</tr>
</tbody>
</table>

\( a / \) The numbers in parenthesis are the \( R^2 \) statistic. Unless otherwise indicated, the coefficients are significant at 5 per cent level. The elasticity estimates presented are based on PAM. The coefficients of the DVT regressions were not statistically significant and were not presented here.

\( b / \) Significant at 10 per cent level.

N.S. Not significant.
base and tax to GNP, increased over time. This may be due to the higher export and premium duties imposed starting in 1980.

5.4 Total Tax Revenues of the National Government

Total taxes exhibited a buoyancy of .88 and in elasticity of .25 for 1975 - 1985 implying that discretionary effects accounted for a high 71 per cent of the growth in total tax revenues. The elasticity is very low suggesting the need for alterations that will increase the built-in elasticity of the system.

The total elasticity of aggregate taxes declined from .62 in 1975 - 1979 to .11 in 1980 - 1985. This is but a reflection of the decrease in the elasticity of most tax headings except corporate income tax and export taxes.
6.0 Conclusions and Recommendations

The buoyancy estimates for all tax headings with the exception of excise and the corporate income tax are below the critical value of 1 for 1975-1985. This is ironic because numerous tax measures aimed at increasing revenue have been enacted year after year. The only major tax change with a projected negative impact on revenue which the government consciously undertook is the general reduction in tariff rates under the TRP. This is but one of the many indications that the Philippine tax system is performing poorly.

The elasticity estimates provide an even sadder story. Only the corporate income tax posited an elasticity estimate over 1 and average elasticity for the aggregate of all taxes is very low at .25. In principle, the low elasticity may be due to any one or a combination of the following factors: (1) the underlying structure of the different taxes, (2) the tax bases have lagged behind GNP in terms of growth and (3) inefficient tax administration. The first reason does not apply to the income, sales, and import taxes. The progressive nature of income taxes on one hand, and the ad valorem characteristic of sales and import taxes, on the other, implies that their theoretical elasticities are greater than or equal to one. Only the low elasticity of excise taxes may be explained by the first argument. Empirically, tax base story is true only for the corporate income tax and the license and sales taxes and at that, in
the second half of the estimation period only. These leads us to argue that the low tax elasticity may be ascribed to a large extent on poor tax administration.

Furthermore, the evidence from both buoyancy and elasticity estimates, suggests that the performance of the Philippine tax system in generating revenue has deteriorated during the estimation period. With the exception of that of the corporate income, the buoyancy estimates based on growth rates of every major tax heading declined (see Appendix Table 2). A similar trend is observable for the elasticity of tax categories other than the corporate and the export taxes. The reasons for this are varied and have been discussed in detail in section 5.

The heavy reliance of the system on revenues from indirect taxes is a major cause of concern among fiscal analysts not only because indirect taxes are regressive in nature but also because they are distortionary and as such do not promote economic efficiency. Some writers have argued that while it is desirable to shift away from indirect to direct taxation, this may not be feasible given their very low contribution. However, both the study's buoyancy and elasticity estimates for direct taxes (i.e. income and profits tax) and indirect taxes provides hopeful indications in this respect. First, buoyancy of direct taxes at .97 is higher than that of indirect taxes at .81. Second, elasticity of direct taxes is equal to .81 and is
greater than that of indirect taxes which averaged .36 in the estimation period. These two measures confirm the better performance of direct relative to indirect tax in 1975-1985. Third, the base of the individual income tax is highly responsive to GNP. Given the inherently progressive nature of the personal income tax, improvements in tax administration and a reversal of the charges that induced the drop in its rate elasticity in the second half of the estimation period, ought to improve its revenue mobilization potential. Finally, the corporate income tax is not only buoyant but elastic as well despite the erosion of the tax base by the multiplicity of exemptions and special privileges. All these augur well for the larger role of direct taxation in the future.

The analysis of the revenue performance of different taxes in the previous section suggests the following recommendations:

(1) A return to the global system of individual income taxation should be implemented to promote equity within as well as between different groups of taxpayers. This measure will also increase revenues since the possibility of the "first slabs of income from different sources" being taxed at the bottom rates of the two schedules which is inherent under the schedular approach is eliminated.

(2) The top rates of the individual income tax should be
adjusted upwards so as to recoup some of the revenue lost when these rates were reduced by BP 391 in 1981. The recommendation is in contrast to that of the 1986 Tax Reform Program to further slash the rates of top brackets.

(3) Measures should be instituted to prevent/minimize the abusive use of deduction by professional/business individual income taxpayers as well as by corporate ones. The NTRC has conducted studies regarding the possibility of using standardized deductions for business/professional income. Fixing legitimate ceilings on allowable deductions should, however, go hand in hand with the improvements in tax administration. This will not only improve the progressivity of the personal income tax on business/professional income but will also increase revenues.

(4) To promote tax compliance and a more equitable system, the "withholding at source" characteristic of taxes on interest and royalties should be retained but taxpayers should be allowed to claim it as a credit against personal income tax so as to avoid undue burden on small taxpayers. Furthermore, the rates should be raised to 20 percent as also suggested by NTRC.

(5) Since there is no economic basis for taxing corporate income on a graduated basis, a uniform corporate income tax rate of 35 percent should be imposed.
(6) A review of special rates granted to selected corporations as well as special rates on selected sources of corporate income be reviewed and rationalized.

(7) The turnover tax which leads to cumulative taxation as goods pass through successive stages of production and distribution should be abolished to promote economic efficiency. In its place, a general value added tax that extends up to the wholesale or retail stage should be instituted. This move should increase revenues as the trade sector which escapes taxation to a large extent at present will be covered more effectively under such a scheme. A recent IMF study (1984) suggests that a general VAT up to the wholesale level is feasible within two to three years given that adequate accounting records are available from 78 per cent of a sample of 5,445 trade establishments. The extension of the VAT to the retail stage may require more time and study.

(8) To simplify tax administration and improve collection efficiency, the rate schedule of the sales tax system should be simplified by reducing the number of rates as NTRC has previously recommended and by reviewing the classification of commodities under each rate grouping.
(9) The appropriateness of imposing a mark up of 25 per cent in the computation of the advance sales tax in view of the need to eliminate the protective element in the sales tax should be studied.

(10) The difference between the compensating tax and the advance sales tax, i.e. the 25 per cent mark-up provision should be eliminated in as much as the basis for distinguishing between direct importers and traders is not well defined and offers opportunities for tax evasion. In other words, a uniform mark up at rates based on (10) for both the advance sales tax and the compensating tax is recommended.

(11) The recent trend of imposing ad valorem rates on some goods subject to excise tax is in the right direction in terms of improving the built-in elasticity of the excise tax system. To carry this development to its full extent and to further simplify the system, the specific tax rates should be abolished altogether and replaced with ad valorem rates for all goods subject to excise tax. This ad valorem rates will likewise lead to an even treatment of local and imported goods. Furthermore, the rates should be so set as to reflect fully the sumptuary nature of this tax.

(12) The rates of the excise tax on petroleum products should be reviewed given equity, efficiency and
inflationary considerations.

(13) A review of taxes on natural resources e.g. forest charges, rentals and royalties on mineral lands. licenses on municipal fishing should be undertaken with the view of the government capturing a fair share of the monopoly rents from the exploitation of natural resources.

(14) All tax exemptions/incentives outside the BOI system should be withdrawn.

(15) The coverage of the BOI incentive system should be reviewed especially with regard to the incentives to domestic industries.

(16) To enable the BIR to deal adequately with tax avoidance and tax evasion, the Bank Secrecy Act should be amended.

(17) More resources, financial, personnel and computer support, should be given BIR/BOC to enable it to fight underreporting of income and at times outright evasion of taxes.

Recommendations (1), (3), (4), (6), (8), (9) and (15) are already incorporated in the so called Tax Reform Program of 1986. However, this program views (1), (6) and (8) as long term goals and their implementation are still pending.
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