INCOME AND PRICE ELASTICITIES OF CENTRAL AND STATE TAXES

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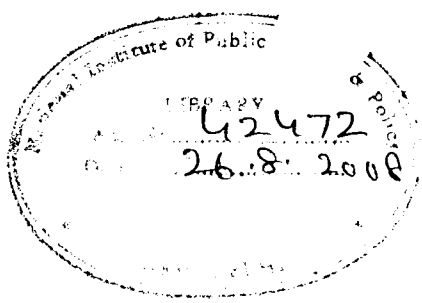

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I. Introduction

The working Group set up by the Planning Commission to study the potential as well as the instruments for Domestic Resource Mobilisation for Financing Public Sector Outlay constituted, inter-alia, a Sub-Group on Budgetary Savings with Dr. R.J. Chelliah as the convenor. At its first meeting, held on July 10, 1983, the Sub-Group identified the specific areas that required detailed examination. In pursuance of this, the Sub-Group requested the National Institute of Public Finance and Policy to undertake a Study on "Inflation - Elasticities of Central and State Taxes".

II. Scope of the Study

2. Noting that the tariff policy is often guided by objectives other than that of raising revenue, the Sub-Group expressed the view that the custom duties may be excluded from the purview of the study. The specific taxes that the Sub-Group identified were personal income tax, corporate income tax, and union excise duty, belonging to Union list; and sales tax, State excise duty, stamp duty and registration fees, entertainment tax and the electricity duty, belonging to the State list.

3. The specific coefficient estimates that the NIPFP was requested to provide for each one of the taxes were :

(1) Nominal income elasticity,
(2) Price and real income elasticities, and
(3) Tax-to-base and base-to-income elasticities.

4. The Group decided that the reference period for the study could be restricted to the years 1970-71 through 1980-81. With respect to the measures to be followed, the decisions

reached by the Sub-Group were: (i) the income measure to be used for the purposes of estimating nominal income elasticities could be the GDP (at factor cost) measured at current prices, and (ii) the real income and price variable to be used for the purposes of estimating the real income and price elasticities could be the GDP (at factor cost) measured at 1970-71 prices and implicit GDP deflator with 1970-71 as the base respectively. Similarly, with respect to the measures to be used for the purposes of decomposing nominal income elasticity into tax-to-base and base-to-GDP elasticities, the decisions reached by the Group were :

(a) GDP from sectors other than agriculture, forestry, logging and fishing(NA-GDP) be taken as the proxy base for personal income tax;

(b) GDP from organised sectors (GDP-SEL) be taken as the base for corporate income tax. It should comprise industrial sectors of agriculture, forestry and logging, manufacturing, mining and quarrying, electricity generation and supply, banking and insurance, trade, hotel and restaurants, transport, storage and communication, and construction; and

(c) The value of output of the registered manufacturing sector (VOP-REG) be taken as the proxy base for Union excise duties.

5. While accepting the guidelines given by the Sub-Group, the NIPFP thought that it would be better to experiment with some additional proxy bases for the purposes of decomposing the nominal income elasticities into tax-to-base and base-to-GDP elasticities. The details of the additional proxy bases were as follows :

(a) Personal income net of income from agriculture, forestry, logging and fishing (NA-PI) - an alternative proxy base for personal income tax;

(b) Profits of the specified industrial sectors included under GDP-SEL - an alternative proxy base for corporate income tax;

(c) Gross value added of registered manufacturing sector - proxy base for sales tax;

(d) Gross value added of transport sector less the value added of railways - proxy base for vehicles tax;

(e) Gross value added of real estates, ownership of dwellings and business services (GDP-ROW) - proxy base for stamp duty and registration fee; and

(f) Gross value added of electricity generation and supply - proxy base for electricity duty.

III. Methodology

6. Following the general approach, the nominal income elasticity of a tax can be estimated through a least squares fit of the following double-log linear relationship:

$$\log T = \log a0 + a1 \log x + u \qquad (1)$$

where,

T = Tax receipts net (exclusive) of discretionary changes introduced in the reference period;
X = GDP at factor cost measured at current prices; and
u = Stochastic error term.

7. The estimates of real income elasticity and price elasticity of a tax can be estimated through a least squares fit of the following relationship:

$$\log T = \log b0 + b1 + \log X^* + b2 \log p + v \qquad (2)$$

Where,

T = Tax receipts net of the revenue effects of the attempted in the sample period;
x* = GDP at constant prices;
P = Implicit GDP deflator; and
v = Stochastic error term.

8. The decomposition of the nominal income elasticity of a tax into tax-to-base and base-to-GDP elasticities can be attempted through the least squares fit of two regression relationships, namely :

$$\log T = \log a0 + a1 \log Z + v \qquad (3)$$

and

$$\log Z = \log d0 + a1 \log X + w \qquad (4)$$

Where, Z represents tax base and all other variables are as defined above.

9. Application of the methodology outlined above necessitates a prior cleaning of the observed receipts of a tax for the revenue effects of the discretionary measures that have been undertaken with respect to the tax during the reference period. A variety of methods could be followed for this purpose. Amongst these alternatives, keeping the nature of the available data in view, the method commonly known as the ' proportional adjustment method' has been considered as the best that could be followed for the purposes of the present analysis.

10. Meaningful application of the proportional adjustment method to a practical situation necessitates adjustment for the revenue effects of all discretionary changes undertaken in the sample period. They should be inclusive of the revenue effects of the changes introduced through annual budgets as well as the changes introduced through non-budgetary measures. Further, the revenue effects in a part of the year as well as in the full year should be taken into account.

11. In majority of the investigations which had provided elasticity estimates of the Central and State taxes, the cleaning of the historical receipts of the taxes was confined primarily to the revenue effects given for a financial year in the annual budgets. To ensure exclusion of the possible biases that such restriction would give rise to, in the present study, the full-year effects are taken note of along with the (partial) current year revenue effects. This adjustment is attempted through a dummy change treatment accorded to the difference between the full year and the partial year revenue effects.

12. The estimates of the revenue effects of some of the discretionary changes given in the budgets, particularly those related to the personal income tax, were reported to have been developed with an optimistic view of the compliance that follows a reduction in the tax rates and/or a rise in the exemption

limit. For instance, though the Finance Minister estimated that the exchequer would lose Rs. 36 crore in the partial year and Rs. 60 crore in the full year because of the tax rate reductions introduced in the year 1974-75, but he did not take note of this loss in his budget calculations. It was believed that the estimated loss would be compensated for through better tax compliance. The reasonableness of such hypotheses is questioned by many researchers. At the same time, none of them could provide satisfactory evidence to either contradict or support the contention maintained by the Finance Minister. Hence, a via-media approach is followed in the present study. The details of the method followed for estimating the revenue losses that could have resulted because of the changes introduced with respect to tax rates and the exemption limits are given in Annexure 1.

IV. The Data

13. The data on the receipts of the personal income tax and of the corporation income tax were taken from the annual *Reports of the Comptroller and Auditor General of India*. The data on the receipts of the Union excise duty were taken from the *Explanatory Memoranda* of the annual budgets of the Central Government. The data on the receipts of selected State taxes are taken from different issues of the *RBI Monthly Bulletin*.

14. The receipts of personal income tax and of corporation income tax given in the above mentioned data source are inclusive of the receipts realised through the Voluntary Disclosure Scheme introduced in October-December 1975. As these receipts do not fail within the class of the receipts attributable to those representing the effects of the discretionary changes normally introduced through the budgets, they were kept outside the purview of the present analysis. That is, the series used in the present study for the purposes of estimating elasticity coefficients were taken net of the effects of Voluntary Disclosure Scheme.

15. Using nature of a levy as the guiding norm, the receipts of Union excise duty were initially grouped into three broad categories, namely, (i) receipts from *ad valorem* levies; (ii) receipts from specific levies; and (iii) receipts from *ad valorem* -cum- specific levies. Further, using the commodity categories as the basis, the receipts of Union excise duty were classified into nine commodity-groups, namely, (i) food and beverages, (ii) vegetable oils and fats, (iii) tobacco, (iv) chemicals, (v) petroleum products, (vi) metals, (vii) manufactured goods, (viii) machinery and transport equipment, and (ix) miscellaneous. Of these, for obvious reasons, the ninth group was kept outside the purview of the analytical exercises of the present study.

16. In the case of Union taxes, the revenue effects of the discretionary changes introduced through annual budgets were approximated with the differences of the estimates of total revenue given in the proposed budgets and those given in the finally adopted budgets. Because of the non-availability of the two sets of budget papers, this procedure was not followed in respect of the State taxes. Instead, the required aggregate ARM series are approximated with the sums of the ARM series given for each one of the taxes by the individual States in their *Memoranda of Forecasts of Revenue and Expenditure* submitted to the Sixth, the Seventh, and the Eighth Finance Commissions.

17. In the case of personal income tax, for some years the ARM estimates given in the budgets were found exclusive of some of the changes introduced in the relevant years. They were unaccounted under the assumption that the losses would be compensated for more than proportionately through the likely improvements in tax compliance. In such cases, the missing estimates were approximated on the basis of data provided in different issues of *All-India Income Tax Statistics*.

18. As noted earlier, in the case of Union excise duty, the ARM series are developed on the basis of the information given in the *Explanatory Memoranda*. Thus, in the case of Union excise duty, the revenue effects of the changes introduced outside the annual budgets were left unaccounted. The possible influence of this omission on the elasticity of the tax cannot be determined *a priori*. At the same time, as the estimates of the revenue effects of the changes introduced outside the budgets are not recorded systematically by any official or unofficial agency, the given data base would not be able to capture these effects.

19. The data on GDP at factor cost, non-agricultural GDP at factor cost, GDP of selected industrial sectors, and the value of output of the registered manufacturing sector measured at current prices are taken from the *National Accounts Statistics* (NAS), January, 1979 and February 1983. The series of some of the variables at 1970-71 prices and data related to the proxy bases of the State taxes were also taken from the NAS of the same years.

V. Results

20. As noted earlier, the sample period for the present analysis is restricted to the years 1970-71 through 1980-81. This small sample period does not permit the use of the DW statistics for examining randomness of the error terms included in the relationships that have been identified as the basis for estimating the elasticities of the taxes under examination. As of date, the significance values of the DW statistics are available only for samples comprising 15 and more observations. On account of this constraint, the auto-correlation nature of the error terms is examined through the use of a non-parametric test, namely, the 'Run test'.

21. In the case of multiple regression relationships, the use of OLS method would ensure stable estimates of concerned parameters if and only if the explanatory variables are free of

the problem of multicollinearity. In case they are found collinear, the OLS estimates obtained for the relationship may not be taken as stable. In such cases, though (under certain assumptions) the OLS estimates can be adopted for forecasting purposes, they should be applied with a degree of caution in exercises aimed at drawing any major policy inference.

22. The nominal income (GDP at current prices) elasticities of different taxes are presented in Table 1. The 'Run test' applied to the OLS residuals obtained for each one of the taxes individually revealed that the reported elasticity estimates were free from the auto-correlation problem.

23. The tax-to-base and base-to-GDP elasticities of the different taxes are presented in Table 2. The Run test applied to the OLS residuals of the regression relationships which yielded these estimates revealed that the estimates are free from the auto-correlation problem.

24. The real income and price elasticities of the different taxes are presented in Table 3. The error terms of the OLS estimates of the specifications that gave these estimates were free from the problem of auto-correlation. However, the two explanatory variables that have been used to obtain these elasticities are found correlated to the order of 0.89. Such a high correlation between explanatory variables of the error terms indicate that the estimates of the partial elasticity may have to be considered with certain constraints for drawing up any major policy decision.

V.1 Personal income tax

25. For the personal income tax, elasticity estimates are obtained with two alternative sets of ARM series. While the estimates arrived at on the basis of the ARM series given in the budgets are designated as set (B), the estimates arrived at on the basis of the ARM series developed by the NIPFP are

designated as set (A). These two alternatives are reported mainly to give an idea about the extent to which the estimate of elasticity of the tax is likely to differ under alternative assumptions.

26. The results indicate that if the realised tax receipts are believed to reflect the optimistic hypothesis maintained with respect to the changes in the tax laws and the tax compliance, the personal income tax structure may not be considered to have a very satisfactory built-in elasticity. The results indicate that a one per cent increase in GDP was accompanied by a 0.90 per cent automatic increase in the tax receipts. On the other hand, if the observed series are believed to reflect a conservative hypothesis (maintained with respect to the rate reduction and tax compliance), the behaviour indicated by the receipts may not be considered as unsatisfactory. The results suggest that a one per cent increase in GDP was followed by a 1.04 per cent automatic increase in tax receipts.

27. For the period under examination, the buoyancy of the tax worked out to be 0.98. This, taken along with an elasticity of 1.04 suggests that the changes introduced in the reference period had tended to reduce the yield of personal income tax. However, as the difference between these two estimates is not statistically significant, the observed divergence between buoyancy and elasticity estimates can be taken as indicative, rather than affirmative, evidence of deterioration in the yield of personal income tax.

28. Two alternative proxy measures, namely, non-agricultural GDP at factor cost (NA-GDP) and non-agricultural personal income (NA-PI) are considered for the decomposition of nominal income elasticity of the personal income tax into tax-to-base and base-to-GDP elasticities. The results indicate that the observed low nominal income elasticity of the tax is the resultant of the low tax-to-base elasticity. While the NA-GDP and NA-PI indicated 1.23 and 1.18 elasticities with respect to GDP,

the tax-to-NAGDP and tax-to-NA-PI elasticities worked out to 0.79 and 0.73 or 0.88 and 0.84, respectively, depending upon the ARM series used for purposes of netting out the effects of the discretionary changes followed over the years.

29. A variety of factors could be identified as being responsible for the observed low tax-to-base elasticity. With the available data base, quatification of the effects of each one of these forces is not feasible. However, some tentative hypothesis can be formulated with regard to the major factors. Theoretically, given the tax rate structure, four factors, namely, (i) the pace of the creation of tax demand; (ii) the time structure of tax arrears; (iii) the distribution pattern of potential tax base; and (iv) the changes in the degree of tax evasion and avoidance over time, could be considered as the major forces that influence the tax-to-base elasticity of the personal income tax. If the percentage of the pendency of assessments increases over time, it would adversely affect the tax realisations and accordingly the tax-to-base elasticity would be lower. Similarly, if an increasing proportion of the created tax demand is locked up in arrears, the tax-to-base elasticity would be affected adversely. So far as the distribution pattern of the tax base is concerned, given the degree of progressivity of the structure of the tax, the tax-to-base elasticity would be directly related to the degree of inequality in the distribution pattern of the tax base. If the distribution is skewed in favour of the higher income classes, the elasticity would be affected favourably. Turning to the fourth factor, its possible influence on tax-to-base elasticity does not require any explanation.

30. The details of the tax assessments given in the annual *Reports of the Comptroller and Auditor General of India* indicate that over the years the per cent share of the assessments completed in the total number of assessments at disposal has gone down quite significantly - from 74 per cent in 1970-71 to 60 per cent in 1980-81. As far as the tax arrears are concerned, the available data do not suggest any perceptible increase of their

share in the created tax demand. On the contrary, there exists some evidence to suggest that over the years the share of arrears has come down sizeably. while in 1971-72 the arrears accounted for 62 per cent share in the total realisation, in 1980-81 they accounted for about 14 per cent share. As far as the distribution patterns of NA-GDP and NA-PI (the two proxy bases that have been used in the present study for the purposes of estimating tax-to-base elasticities) are concerned, the available data bases reveal little. However, some idea about these can be formed on the basis of the consumption surveys conducted by the NSS and the time structure of the saving ratio given by the NAS. The NSS results suggest that the per cent shares of the expenditures accounted by the bottom 30 per cent, the next 40 per cent and the highest 30 per cent of the people living in the rural and the urban areas had remained virtually unchanged during the period covering 1970-71 to 1977-78. while during 1970-71 the three groups accounted for 15.40, 35.10 and 49.50 per cent shares in the rural areas and 13.70, 31.80 and 54.50 per cent shares in the urban areas, in 1977-78 their respective shares were 15.0, 33.0, 51.90 per cent in the rural areas, and 13.60, 32.40 and 54.0 per cent in the urban areas. According to NAS, during the eleven-year period under examination, household saving rate (measured in terms of the ratio of household saving to personal income) has gone up by 45 per cent, from 10.43 per cent in 1970-71 to 15.15 per cent in 1977-78 and to 16.12 per cent in 1980-81. This increase in the saving rate, under the assumption that rate of saving would be positively related to the income level taken along with the constant shares that the population belonging to different expenditure classes had accounted for, could be taken to indicate an increase in income inequality.

31. Thus, of the first three factors, neither (ii) nor (iii) could be considered as responsible for the observed low tax-to-base elasticity. To some extent, it could be attributed to (i) i.e., the increase in the pendency of assessment settlements. So far as the fourth is concerned, the available statistics would prove inadequate to come to a definite

conclusion. The data provided in the *All India Income Tax Statistics* do provide some evidence to suggest that over the years the proportion of income claimed as deductions has increased from 3.60 per cent in 1971-72 to 6.10 per cent in 1980-81. This may be taken as an indirect evidence to suggest that over years the practice of tax planning techniques had led to a reduction in the growth of tax revenue. This could be attributed to the practice of tax avoidance. similarly, over the years, while the NA-GDP and NA-PI grew as 14.20 per cent and 14.80 per cent, respectively, income assessed grew at the rate of 10.10 per cent only. These differences in the growth rates of NA-GDP or NA-PI and of assessed income could be taken as indirect evidence suggestive of an increase in the incidence of tax avoidance and evasion.

32. In an inflationary period, the nominal incomes of all classes of people would tend to move in an upward direction. Accordingly, while the incomes of some of the non-taxpayers might fall into taxable income-brackets, the increased nominal incomes of the taxpayers would attract higher marginal rates of the tax. As a result, other things remaining unchanged, if the rates of increase of nominal incomes and price level do not differ or the increase in nominal incomes is of a higher order, the personal income tax receipts would tend to exhibit a high degree of elasticity with respect to changes in the price level. Though one can hypothesize that the elasticity estimate should assume a value greater than unity, *a priori* it is difficult to specify the value that the coefficient should assume. That is, if the estimate turned out with a value that is greater than unity in the conventional statistical sense, the performance of the tax could be judged satisfactory. The partial elasticity estimates of the personal income tax given in Table 3 indicate that, so far as the price response is concerned, the performance of the tax may not be classified as unsatisfactory. The estimates indicate that during the period under review, a one per cent increase in the price level was accompanied by a more than one per cent increase in the receipts of the personal income tax. Further,

besides being significantly different from zero, the estimate has assumed a value that is significantly greater than unity. This behaviour is indicated irrespective of the ARM series used for the purposes of cleaning the realised receipts for the revenue effects of the changes attempted in the reference period.

33. Turning to real income elasticity, the results indicate that the value that the concerned coefficient assumed depends upon the nature of the ARM series. While the use of one set of ARM has given an estimate of 0.45, the use of the other set of ARM has resulted in an estimate of 0.82. In neither of the two cases the estimate is found to differ significantly from the null value. To some extent this unstable and insignificant nature of the estimate could be attributed to the high collinear nature of the two explanatory variables (i.e., the real GDP and the GDP deflator) that have been used to obtain the estimates. The inelastic nature that the coefficient has indicated with respect to real income deserves some examination, however. *Prima facie*, one might tend to argue that the indicated response may not be interpreted as real income elasticity, for the income measure that has been used is inclusive of incomes that do not form part of personal income tax base. This, however, may not be considered as the explanation for the observed low income elasticity, for during the reference period of this study the proxy bases of the personal income tax (NA-GDP and NA-PI) witnessed higher growth rates than aggregate GDP these two income measures would come more closer to the base of the tax. Further, it may be observed that according to the AIITS the income assessed for personal income tax grew at the rate of 10.10 per cent as against 14.20 per cent and 14.80 per cent growth rates recorded by NA-GDP and NA-PI. This slow growth of assessed income in particular could be taken as indicative of increase in tax leakages, attributable to evasion and avoidance practices. Thus, the observed low income elasticity of personal income tax may not be explained in terms of slow growth in potential tax base, but a resultant of increase in the degree of evasion and avoidance practices.

V.2 Corporation income tax

34. The estimates of the buoyancy and the elasticity coefficients of corporation income tax indicate that the collections of the tax, on the average, were not only buoyant but also elastic with respect to changes in GDP at current prices. The elasticity coefficient of the tax indicate that a one per cent change in GDP was accompanied by a 1.06 per cent automatic increase in corporate tax receipts. This relationship between the CDP and the tax receipts suggests that even if none of the parameters of the tax were changed in the reference period, the yield of the corporate income tax would have grown at a rate faster than that of GDP.

35. A comparison of the elasticity estimate obtained for the reference period of this study with those obtained for earlier periods by other investigators discloses that over the years the built-in responsiveness of the tax has improved quite significantly. Many of the earlier investigations pointed that the observed low elasticity of corporate tax receipts was mainly because of the inelastic relationship that the receipts had shown with respect to the base of the tax. It would, therefore, be of considerable interest to know the extent to which the observed improvement in tax-to-GDP elasticity has come through an improvement in tax-to-base elasticity in particular. To facilitate such examination, the 1.06 tax-to-GDP elasticity needs to be decomposed into tax-to-base and base-to-GDP elasticities. The results obtained for this examination (wherein the base of corporate income tax is approximated with GDP of selected industrial sectors) indicate that in the reference period while a one per cent increase in GDP was accompanied by 1.23 per cent increase in the proxy base, a one per cent increase in proxy base was accompanied by only 0.87 per cent increase in corporate tax receipts. These show that, had the GDP of selected industrial sectors not grown at the rate at which it grew in the reference period, the receipts of corporate income tax would have remained inelastic to the changes in aggregate GDP.

36. At this juncture, it would be of considerable interest to know the extent to which the indicated low tax-to-base elasticity can be attributed to the variations in the growth patterns of the different components that constitute the GDP of selected industrial sectors. The need for such examination arises from the fact that of the components that constitute the chosen proxy base, only one, i.e., the profits component attracts corporate income tax. The estimates that could through some light on this aspect are also presented in Table 2 (row 4). An examination of these indicate that, in the reference period, while a one per cent increase in profits was accompanied by only 0.89 per cent increase in the GDP of selected sectors was accompanied by 0.97 per cent increase in profits component, a one per cent increase in profits was accompanied by only 0.89 per cent increase in corporate tax revenue. These suggest that the low tax-to-base elasticity of corporate tax revenue is not due to inadequate growth of the component that attracts the tax. It is mainly due to the inelasticity of tax revenue with respect to the profits component of the GDP of the selected industrial sectors.

37. Like in the case of personal income tax, a variety of factors could be identified as being responsible for the recorded inelasticity of corporate tax revenue with respect to profits. Three of these factors, namely, (i) increase in the degree of accumulation of arrears, (ii) increase in the divergence between book profits (the measure used by the NAS for decomposition of sector wise GDP into factor incomes) and profits that attract the tax, and (iii) increase in the degree of incidence of evasion and avoidance, could be identified as the most important factors. Accordingly, an examination of the time structure of each one of these factors would prove to be of considerable use. So far as (i) is concerned, the data given in the Report of the *Comptroller and Auditor General of India*, indicate that the share of arrears in tax demand has come down quite sizeably in the reference period. While in 1970-71 the arrears had accounted for 32.10 per cent in total corporate tax demand, in 1980-81, the arrears

accounted for 17.40 per cent share only. Thus, accumulation of arrears could not be identified as the factor responsible for the observed low tax-to-profit elasticity.

38. As per the statutes of the tax law, the accounts of all corporate enterprises should necessarily be audited by a qualified auditor or accountant. The books of accounts thus prepared, form the basis for fixation of corporate tax liability. Further, with the emergence of professional management, the diffusion of share ownership and the growth of institutional share-holding, the concept of ownership of corporate enterprises has undergone significant changes over the years. These suggest, so for as corporate income tax is concerned, there exits little incentive for companies to indulge in tax evasion. Accordingly, the low tax-to-profits elasticity cannot be attributed to the increase in tax evasion. The overlapping exemptions, allowances, and other relief measures introduced in the tax, however, provide ample scope for companies to indulge in manipulation of their incomes in a fashion that would diminute their book profits, leading to sizeable reductions in the profits that attract the tax. If, in the reference period of this study, companies which earned substantial book profits had resorted to such manipulation, the low tax-to-profits elasticity could be attributed to increase in tax avoidance. This is because the profits measure used in the calculations represent book profits and these, in the presence of tax avoidance practices, differ substantially from the profits that form the base for tax realisations. The incidence of tax avoidance on the elasticity under examination, however, cannot be quantified with the available statistics. At best, the statistics could be merely indicative. Other things remaining unchanged, given the proportionate nature of the tax, one would expect the effective tax rate to remain uniform across all companies. Contrary to this expectation, the data given in the RBI sample studies relating to company finances indicate substantial variations in the effective tax rates recorded for companies belonging to different size-classes, size being measured in terms of paid-up capital.

The statistics indicate an inverse relationship between size and effective tax rates. On the assumption that the level of profits would be positively related to the size of a company, the indicated inverse relationship could imply an effective use of tax avoidance methods by companies particularly those belonging to the 'large' category. The statistics of 220 giant companies that the Economic Times Research Foundation had compiled recently also provide some corroborative evidence. According to these data, in 1981-82, 78 companies had recorded zero effective tax rate and 86 had recorded 0.1 to 50 per cent rate, as against the minimum statutory rate of 50 per cent fixed by the Act. The fact that some highly profitable companies have not paid any income tax or have paid a relatively small proportion of their profit as income tax, is acknowledged even by the Ministry of Finance. It was disclosed in the Lok Sabha that of the 70 companies that earned more than Rs.1 crore book profits in each one of the years 1977-78 to 1981-82, 23 had made zero tax payment in 1977-78, 24 in 1978-79, 27 in 1979-80, 29 in 1980-81 and 30 in 1981-82 (USQ, No.6520, dated April 8, 1983). This indirect evidence affirms that the low tax-to-profit elasticity could be attributed to increase in tax avoidance.

39. The partial elasticity estimates of the corporation income tax, given in Table 3, indicate that while a one per cent increase in real GDP was accompanied by 1.73 per cent increase in corporate tax revenue, a one per cent increase in price level was followed by only 0.77 per cent increase in the tax revenue. The large difference between the two elasticities conforms to what one would expect from the tax structure. In a period characterized by price rise, business expectations tend to run high, leading to a spurt in investment activity. Under a scheme of taxation which provides investment-linked relief, such investment would result in sizeable reductions in the tax liabilities of companies implementing plans for expansion, modernisation, replacements, etc. This would tend to show inelastic relationship between tax revenue and the price level. With regard to income elasticity, a rise in real income tends to

generate demand for industrial products, leading to a rise in the level of taxable corporate income. Accordingly, other things remaining unchanged, a rise in real income could be expected to be accompanied by a more than proportionate rise in corporate tax revenue.

40. According to the NAS, in the eleven-year period ending 1980-81, the public and the private sectors' investments in plant and machinery grew at the rate of 17.43 per cent per annum. The time structure of these investments disclose that the level of investments undertaken in 1980-81 was four times of the level undertaken in the fiscal year 1970-71. On account of these investments, a sum of about Rs. 172 crores might have been claimed as deductions from the income that would have been subjected to corporate income tax. The low price elasticity indicated by the results of this study may therefore be taken as indicatives of the diminute effect of the different investment-linked reliefs that the tax has been offering since some years.

V.3 Union excise duty

41. The estimates of the yield from the Union excise duty indicate that the excise system is deficient of the desired built-in elasticity with respect to changes in nominal GDP. While a one per cent increase in nominal GDP was accompanied by a 1.17 per cent increase in the gross yield of the excise duties, a similar increase in nominal GDP was accompanied by only 0.77 per cent increase in the automatic yield of the excise duties. This inelasticity of the excise duties can be attributed primarily to the basic features of the scheme of excise taxation being practiced.

42. As noted earlier, on the basis of the nature of the rate structure, the excise duties can be grouped into three broad categories, namely, *ad valorem* rate levies; specific rate levies; and *ad valorem*-cum-specific rate levies. Application of this classification to the yield of excise duties discloses that, in

the reference period, while the yield from *ad valorem* rate levies accounted for 35 per cent of total receipts, that of specific rate levies accounted for 55 per cent of total receipts. The elasticity estimates of the yields from the three categories reveal that the yield of specific rate levies had, in particular, responded poorly to the changes in nominal GDP. Against the 0.95 and 1.05 elasticities that the yields of *ad valorem* rate and *ad valorem*-cum-specific rate levies had indicated for the reference period, the elasticity of the yield of specific rate levies worked out to only 0.50. Basing on these variations in the elasticities and their per cent contributions to total receipts, the inelastic relationship that the yield of the aggregate system had indicated with respect to nominal GDP can be attributed to the heavy reliance (that the system had placed) on the specific rate levies.

43. The decomposition of the income elasticity of the yield from the excise duties into the tax-to-base and the base-to-GDP elasticities would also throw some light on the extent to which the indicated inelasticity be attributed to the inherent deficiency of the very structure of the excise system. An examination of such estimates of aggregate excise receipts, given in Table 2, indicates that in the reference period, while a one per cent, increase in GDP was accompanied by 1.40 per cent increase in the value of the output of registered manufacturing sector (the proxy base of excise duties), a one per cent increase in the proxy base was accompanied by only 0.50 per cent increase in the automatic yield of excise duties. These estimates indicate that though the potential base of the excise duties grew at a rate faster than that of GDP, the yield of excise duties grew at half the rate at which the base had grown. This means, the indicated inelasticity of the excise receipts cannot be attributed to the inadequate growth of excisable commodities.

44. The elasticity estimates of the eight major commodity-groups covered by the Union excise system are also presented in Table 1. A scrutiny of these elasticities reveals that only three

of the eight groups had an elasticity greater than 1. They are : Chemicals (1.35), manufactured goods (1.04), machinery and transport equipment (1.14). In regard of the remaining five groups, the elasticities of two groups, namely, food and beverages, and petroleum products, had an elasticity of only 0.35. And the elasticities of the remaining were of the orders of 0.50, 0.76, and 0.86, respectively, for tobacco, metals, and vegetable oils and fats. An analysis of the yield of the excise duties reveals that, in the reference period, while the groups which had an elasticity of 0.50 or less together accounted for 50 per cent in total receipts, the groups which had an elasticity greater than 1 accounted for only 30 per cent in total receipts. The elasticity indicated by the receipts of the excise duties is nothing but a weighted average of the elasticities of the yields of the individual commodity-groups. Given the above mentioned variations in the elasticities and the per cent contributions of the yields relating to the eight commodity-groups, the inelasticity of the aggregate excise duties may be attributed to the inelasticities of yields of the duties levied on the commodities belonging to the groups of tobacco, food and beverages, petroleum, and metals.

45. Like in the case of aggregate excise duties, the tax-to-GDP elasticity estimates of the yields of the eight commodity-groups were also decomposed into tax-to-base and base-to-GDP elasticities. For the purpose of these calculations, the proxy bases are identified with sums of the value of output of concerned industrial groups. The elasticity estimates obtained through the use of the proxy bases are presented in Table 2. The most notable feature of these elasticity estimates is that while the base-to-GDP elasticity of each of of the eight commodity-groups is 1 or more, the tax-to-base elasticity of some of the groups is 0.50 or less. The groups that had an elasticity of 0.50 or less are: petroleum products (0.17), food and beverages (0.26), tobacco (0.47) and metals (0.54). These four groups, thus, may be identified as responsible for low tax-to-base elasticity of the aggregate receipts.

46. The low tax-to-base elasticity indicated by the yield representing the duties on petroleum products is understandable. The specifications of the duties applied to petroleum products are specific rate levies. As against this, in the tax-to-base elasticity estimation, like in the cases of all other commodity groups, the base of petroleum products is also measured in value terms. And in the reference period, while the index of production of petroleum products registered an increase of about 60 per cent, the wholesale price index of petroleum products moved up by more than 2000 percentage points. Thus, the difference between the proxy base that has been used and the base that should have been used explains the indicated low tax-to-base elasticity of petroleum products.

47. In the case of the metals group, the yield from *ad valorem* rate levies accounted for less than 10 per cent in the relevant total, specific rate levies accounted for more than 60 per cent of the total receipts from the group. This feature, taken along with the differential rates of growth of production and the wholesale price indices of metal products explains the low tax-to-base elasticity for the group. In the course of the eleven-year period covered by the present study, while the index of production of metal products increased by about 40 per cent, the wholesale price index of the group increased by 186 per cent. Further, amongst the commodities included under this group, the prices of the commodities covered by *ad valorem* rate duties moved at lower rates than the prices of the goods covered under specific and *ad valorem*-cum-specific levies.

48. In the case of the goods covered under the gourds of food and beverages, tobacco, vegetable oils and fats and chemicals, the inelasticities indicated by the results cannot be explained in terms of the dependence on specific rate levies. While a substantial proportion of the goods covered under these groups were taxed at *ad valorem* rates, in most of the cases, the goods which were not subject to ad valorem rates were subject to *ad valorem*-cum-specific rates. Only in the case of tobacco

products a sizeable proportion of the product not subject to *ad valorem* rates was subject to specific duties. Thus, though to some extent the low elasticity of the duty on tobacco products can be attributed to the specific nature of the duties applied to some varieties of those products, the low elasticities of all other groups require a closer examination of the rates applied to different varieties of products subject to *ad valorem* levies and the rates of growth of the products taxed at different tax rates.

49. Available relevant statistics indicate that the excise revenue from tobacco products was inelastic mainly because of the lower rate of growth of the commodities subject to higher rates of tax and conversely. For example, of the commodities covered under the tobacco group, chewing tobacco, hookah tobacco and carrots were taxed at lower rates than cigars and smoking mixtures. In the reference period, as per the production and clearance statistics, the growth rates of production of the commodities subject to lower rates were comparatively high. Similarly, in the case of commodities subject to specific duties, items such as manufactured tobacco which were taxed at higher rates had registered lower growth rates than those taxed at lower rates for instance, biries and snuff.

50. As is true with goods covered under the tobacco group, in the case of chemicals the available data indicate that the low elasticity was due to the changes in the commodity basket of the group in the reference period. The commodities subject to lower rates of tax grew at disproportionately higher rates than those subject to higher rates of tax. For instance, commodities such as cosmetics, toilet preparations, plastic materials, synthetic rubber and dyestuffs, which attracted higher rates of tax had registered comparatively lower rates of growth.

51. Since more than 90 per cent of the excise revenue from vegetable oils and fats came from *ad valorem* duties, the low tax-to-base inelasticity of the group would indicates the need for

a close scrutiny of its rate schedule. Though such scrutiny can be done without difficulty, with the given data base, one would find it difficult to offer any meaningful explanation for the low elasticity of the group.

52. The explanation of the commodity-wise elasticities of excise duties attempted above suggests that while the dependence of the excise system on specific duties could be considered a factor responsible for the inelasticity of the overall receipts, it cannot be identified as the only factor. The variations in the growth rates of different commodities, and more specifically, the slower rates of growth registered by the physical clearances of the goods subject to the higher rates of tax, the slower rates of growth of the prices of the commodities subject to higher rates of tax and the negative rates of growth registered by the clearances of some categories of goods, should also be taken as contributory factors.

53. The real income and price elasticities of the yield from Union excise duty are presented in Table 3. These indicate that while a one per cent increase in real GDP was accompanied by a more than proportionate (1.09 per cent) increase in the revenue from excise duties, a one per cent increase in price level was accompanied by only 0.62 per cent increase in excise receipts. Given the fact that the revenue series used for the purposes of this exercise were the aggregate yield from the excise duties, the low price elasticity is understandable. It could, to some extent, be attributed to the dependence that the excise system has been placing on the specific rate levies. The extent to which this specific factor had influenced the price elasticity of the aggregate yield of Union excise duties can be examined through a re-estimation of the price and the income elasticities, using the series exclusive of the receipts attributable to specific rate levies. It may be recalled that all commodities which were not subjected to specific rate levies were not subjected to only *ad valorem* rate levies either. Some were subjected to a mix of *ad valorem*-cum-specific rate levies, while

in the case of some, the specification of the rate structure has changed from either specific rate to *ad valorem* rate or *vice-versa*. Considering this, it would be better if the price and the income elasticities were obtained separately for the three categories of excise duties, namely, *ad valorem* rate levies, *ad valorem*-cum-specific rate levies and specific rate levies, separately.

54. The price and income elasticities obtained for the three categories of excise receipts indicate that the recorded low price elasticity of aggregate excise receipts may be attributed to the high dependence that the excise receipts may be attributed to the high dependence that the excise system had placed on specific rate duties. It can be seen that as far as the receipts related to *ad valorem* rate duties are concerned, the price elasticity was close to unity and its deviation from the real income elasticity cannot be considered as of significant order in conventional statistical sense. Further, in the case of *ad valorem*-cum-specific rate levies, while the income elasticity has assumed a value close to 2, the price elasticity was only 0.64. The results related to *ad valorem*-cum-specific levies need to be considered with cautious note. This is because some of the receipts included in this group do not adhere to the strict sense in which the *ad valorem*-cum-specific rate duties are generally understood. Even the receipts related to some commodities whose rate specifications were changed from specific to *ad valorem* rates, or from *ad valorem* to specific rates were also included in the receipts attributable to *ad valorem*-cum-specific levies.

55. The main conclusion that emerges from the results discussed above is that so far as the price inelasticity of the Union excise duties is concerned, the problem has arisen primarily because of the dependence that the system has placed on specific rate levies. This suggests that the price elasticity of the excise duties, if desired, can be improved through a gradual shift from specific and *ad valorem*-cum-specific rate levies to *ad valorem* rate levies.

V.4 State Taxes

56. Buoyancy and elasticity estimates have been computed for all major State taxes at the all-States level, using GDP at current prices as the income variable. These are also presented in Table 1. An examination of these results indicates that, by and large, the State tax systems are not only buoyant but also elastic with respect to the changes in nominal GDP. They also reveal that the additional resource mobilisation efforts of the States were not confined to any one tax, but were spread across all major taxes. The additional efforts contributed to 30 per cent or more of the gross receipts of each one of the taxes, the exception being the sales tax. In the case of sales tax, the share of additional tax effort accounted for 20 per cent. Despite of this, the sales tax receipts had exhibited a greater degree of buoyancy as compared to all the remaining State taxes examined in this study.

57. The estimates of elasticity coefficients of the selected State taxes reveal that their respective responses to the changes in GDP (at current prices) differ substantially. Of the six taxes, only two had not responded proportionately or more than proportionately to the changes in GDP. They are: the stamp duty and registration fees (0.86) and the electricity duties (0.90). As far as the other four taxes are concerned, while the receipts of two taxes, namely, the State excise duties and the vehicles taxes, recorded proportionate response to the changes in GDP. These variations in the responses of the individual taxes can be attributed to the varying dependence that the taxes have been placing on the parameters of specific nature. The greater the role that the specific parameters were assigned to play in the determination of the receipts of a tax, the lower was its response to the changes in nominal GDP.

58. In the reference period, the six taxes accounted for 52.50 (sales tax), 3.90 (entertainment tax), 12.21 (State excise

duties), 10.31 (vehicle taxes), 6.37 (stamp duties and registration fees), and 3.36 (electricity duties) per cent in the aggregate receipts of the States' own tax receipts. These shares taken along with the elasticities recorded by the different taxes, indicate that even if none of the parameters of these tax structures had undergone any change in the reference period, the receipts of the States' own taxes would have grown at least at the rate at which the nominal GDP has grown.

59. The most notable feature that the estimates indicate is that each one of the State taxes had better income responsiveness than the responsiveness displayed by the prime Union tax, namely, the Union excise duty. Also, to be noted that while the receipts of the Union excise duty had an elasticity of only 0.77, the sales tax receipts had an elasticity of 1.27. This marked difference can be attributed mainly to the varying weights that the two taxes have been placing on parameters of specific nature. It may be recalled that of the receipts derived from the Union excise duty, about 50 per cent was due to specific rate levies. Against this, the sales tax structures of all States are based on *ad valorem* rates only.

60. The decomposition of the nominal income elasticities of the vehicles taxes, the stamp duty and registration fees, and the electricity duty into tax-to-base and base-to-GDP elasticities reveal that their respective low income responses could be attributed to the inadequacies in their tax-to-base responses. To some extent these inadequacies can be attributed to the characteristic features of the structural specifications of the three taxes. It may be noted that the specifications of *none* of these taxes take an explicit note of the influence that a price rise may exert on their receipts - by and large, the bases of these three taxes were defined in specific terms. This suggests that the tax-to-base elasticities of these taxes should necessarily be attempted in terms of bases measured in real terms rather than in nominal terms. This procedure, however, was not followed in the present study. Instead, the estimates were based

on proxy bases defined in nominal terms.

61. With the exception of the sales tax, all the State taxes that have been taken up for examination are structured essentially in specific terms. The decomposition of the nominal income elasticity of each one of the State taxes into price and real income elasticities would, therefore, mean little. Accordingly, the opted decomposition is attempted here in the case of the sales tax alone. The estimates obtained through this process reveal that, while a one per cent increase in real GDP was accompanied by 1.67 per cent automatic increase in sales tax revenue, a one per cent increase in the price level was accompanied by 1.09 per cent automatic increase in the sales tax revenue. A comparison of these estimates with those obtained for the yield from Union excise duties belonging to the category of *ad valorem* rate levies indicates that the low elasticities reported for the excise duties may be due to the scope that the excise system gives for misclassification of excisable goods.

62. While the above discussed estimates of the State taxes give some idea about the average behaviour of the taxes, they conceal inter-state variations. To this extent, if the basic intention of the exercise is to facilitate more realistic appraisal of the income responses of the concerned taxes, the reported estimates would prove deficient. The estimates should necessarily be developed on the basis of individual State-wise tax receipts and incomes. However, if the State-wise estimates do not differ substantially the picture depicted by the aggregate estimates need not be doubted for possible distortions. To examine this, the elasticity estimates were computed for each one of the six taxes for four individual States. These are also presented in Table 4. A glance at these estimates reveals that the income responses of the taxes differ substantially from State to State and within a State across different taxes. They also reveal that while for none of the States, the elasticity of the sales tax is less than 1.0 (indicating that the sales tax collections increased faster than State incomes in all the

States), such a high degree of elasticity is not found uniformly across all States for any of the remaining five taxes. To be more specific, against the range of 1.24 to 1.48 indicated by the elasticities related to sales tax collection, the collections of the entertainment tax, the State excise duty, the vehicles taxes, the stamp duty and registration fees and the electricity duty, registered ranges of 0.92 to 1.74, 0.63 to 1.51, 0.79 to 1.81, 0.57 to 1.22, and 0.37 to 1.44, respectively.

63. The results given in Table 4. also reveal that for majority of the taxes, while the elasticities indicated by the collections realised by the State of Madhya Pradesh were highest, the elasticities indicated by the collections realised by the State of West Bengal were the lowest. It can be seen that in the case of West Bengal the elasticities of four of the six taxes were less than 1, and amongst these, the values assumed by three taxes were less than even 0.60. Evidently, these low elasticities cannot be attributed to the inadequacies in the growth patterns of the taxes' bases.

64. The wide ranges indicated by the State-level estimates are understandable. Besides being influenced by the administrative efficiencies of the respective State machineries, the variations could be due to the dissimilarities in the policies and the approaches followed by the States as well. To illustrate, as far as the State excise duties are concerned, the State of Gujarat has been "dry" since its inception, the State of Karnataka has been "wet" all through the reference period. As a result of the prohibition policy followed by Gujarat, its base for State excise duties differs substantially from the bases of the other three States.

65. The price and the income elasticities obtained for the State-wise sales tax collections are presented in Table 5. For the purposes of these calculations, while the real SDP of the concerned State is taken as the income variable, the implicit SDP deflator of the concerned State is taken as the price variable.

These estimates indicate that both the price as well as the income elasticities given by the aggregate (all States) receipts of the sales tax need be accompanied by a cautious note. As against the price elasticity of 1.09 indicated by the aggregate series, the price elasticities given by the State-wise collections were in the range of 1.29 to 1.60. Similarly, while the aggregate series placed the income elasticity of sales tax in the neighbourhood of 1.67, the State-wise estimates indicate the range of 0.75 to 1.13.

VI. Summary

66. An attempt has been made in this study to identify the factors that contribute to an improvement in the income (nominal as well as real) and the price elasticities of the major taxes in the Union and State lists. The taxes that were taken up for examination are : the personal income tax, the corporation income tax and the Union excise duties belonging to the Union list; the sales tax, state excise duties, stamp duty and registration fees, vehicles taxes, the entertainment tax and the electricity duty belonging to the State list. The yields from the selected taxes were initially examined for their respective elasticities with respect to changes in nominal GDP. Later these elasticities were decomposed into tax-to-base and base-to-GDP elasticities. The real income and price elasticities were estimated with the help of a set of multiple regression relationships, wherein the real GDP and GDP deflator were regressed on the automatic yields of different taxes. To facilitate capturing probable inter-state variations in the elasticities of the State taxes, the respective yields were analysed individually for the four States, namely, Gujarat, Karnataka, Madhya Pradesh and West Bengal. In these exercises, income and price variables were approximated with the real SDP(s) and the SDP deflators of the concerned States.

67. The nominal income elasticity estimates of the taxes that have been taken up for examination revealed that the yields of majority of the taxes had not responded satisfactorily to the changes in nominal GDP. Indeed, the yields of a good number of taxes had not responded even proportionately to the changes in nominal GDP. The decomposition of the nominal income elasticities into tax-to-base and base-to-GDP elasticities indicated that the reported poor nominal income responses could primarily be attributed to the low tax-to-base responses. With respect to the real income and the price elasticities of the taxes, the high (0.90) correlation of the two explanatory variables suggests that the reported estimates need to be approached cautiously in the context of any major policy decision.

68. The main results of the empirical exercises in the present study, with respect to different taxes, are summarised as follows:

VI.1. Personal income tax:

a. The discretionary changes that were introduced in the structure of the personal income tax seem to have led to a deterioration rather than an improvement in the buoyancy of the tax.

b. If the estimates of the revenue effects of the discretionary changes provided by the Finance Ministry were to be considered as unbiased estimates, a one per cent increase in nominal GDP was followed by only 0.90 per cent increase in the automatic yield of the personal income tax.

c. The poor income response of the tax cannot be attributed to inadequate growth in the tax base. It is a result of low tax-to-base elasticity. Notwithstanding the measures that has been used as a proxy base, the tax-to-base elasticity has turned out to be less than 1.

d. To some extent the low tax-to-base elasticity can be attributed to the increase in the pendency of the assessments. However, tax avoidance and evasion as a contributory factor cannot be ruled out.

e. The price elasticity of the tax may not be classified as unsatisfactory. A one per cent increase in the price level was followed by more than one per cent increase in the receipts of the tax.

f. The real income elasticity of the tax is unsatisfactory. A one per cent increase in real GDP was not accompanied by more than 0.84 per cent increase in the receipts of the tax.

VI.2. Corporation income tax:

a. The discretionary changes that were introduced in the corporate tax structure have resulted in an improvement in the buoyancy of the tax.

b. A comparison of the elasticity estimate obtained by the present study with the estimates reported for different periods by some of the earlier studies discloses that over the years the built-in elasticity of the tax has improved quite substantially.

c. As in the case of the personal income tax, the low tax-to-GDP elasticity of the corporation income tax may not be attributed to the inadequate growth of the tax base. It is a result of low tax-to-base elasticity.

d. The low tax-to-base elasticity may not be attributable to an increase in tax evasion. It is primarily due to the very nature of the measure that has been chosen as the base for the tax. With the variety of incentive schemes that have been introduced in the tax structure, the corporate entities can reduce their tax liability to zero level, and this seems to have happened in the reference period.

e. The price elasticity of the tax is unsatisfactory. A one per cent increase in the price level was followed by only 0.77 per cent increase in tax receipts.

f. By all standards, real income elasticity of the receipts of the corporation tax may be classified as satisfactory. A one per cent increase in GDP was followed by 1.73 per cent increase in the tax receipts.

VI.3. Union excise duties:

a. As in the case of the corporation tax, the discretionary changes that were introduced in the Union excise system contributed to an improvement in

the income response of the Union excise duties.

b. The built-in nominal income elasticity of the excise duties is unsatisfactory. A one per cent increase in nominal GDP was followed by only 0.77 per cent increase in excise receipts.

c. The low built-in elasticity of the excise duties cannot be attributed to the inadequate growth of the excisable commodities. Over the years, the value of the excisable commodities grew at a rate higher than that at which nominal GDP has grown. As against this, the revenue from the excise duties grew at a rate that works out to half of the growth rate of the value of the excisable commodities.

d. The low tax-to-GDP and tax-to-base inelasticities of the excise duties may be attributed primarily to the heavy reliance that the excise system has been placing on specific rate levies.

e. Like in the case of the corporation income tax, the price elasticity of the yield from the excise duties is not satisfactory. A one per cent increase in the price level was followed by only 0.62 per cent automatic increase in the yield of the excise duties.

f. The real income elasticity of the excise duties is not unsatisfactory. A one per cent increase in real GDP was followed by more than proportionate increase in the yield from the Union excise duties.

g. The price elasticities of the three categories, into which the excise duties could be classified on the basis of their nature, namely, *ad valorem* rate levies, specific rate levies and *ad valorem*-cum-specific rate levies, indicate that the price elasticity of the aggregate yield of the excise duties can be improved through a gradual substitution of the specific and the *ad valorem*-cum-specific rate levies with *ad velorem* rate levies.

h. The group-wise elasticities of the excise duties indicated that only three of the eight commodity-groups had an elasticity greater than 1. They are : chemicals, manufactured goods, and machinery and transport equipments. A further probe into the group-wise elasticities disclosed that the groups which had an elasticity lower than 1 had low tax-to-base elasticities. To a large extent, these low tax-to-base elasticities are due to their respective rate specifications - the majority of the duties applied to the commodities covered under these groups are specific rate levies.

VI.4. State taxes:

a. By and large, the State taxes were not only buoyant but also elastic with respect to the changes in nominal GDP.

b. Of the six taxes examined in the study, the receipts of only two taxes, namely, stamp duty and registration fees, and electricity duty, were found inelastic with respect to the changes in nominal GDP.

c. The degree of elasticity of a tax is directly related to the specifications of the tax structure - higher the dependence that the structure places on *ad valorem* features, the greater its revenue responsiveness.

d. The income response of each one of the State taxes is better than that of the prime union tax, namely, the Union excise duty.

e. The tax-to-base elasticities of the State taxes too are not of satisfactory nature, exception being the sales tax.

f. The price elasticity of the sales tax may not be considered unsatisfactory. A one per cent increase in the price level was followed by more than proportionate increase in the tax receipts.

g. The reasonably satisfactory price elasticity of the sales tax, taken along with the low price elasticity of the Union excise duties, affirms the inference that a change in the excise system in favour of *ad valorem* rate levies would contribute to an improvement in the price elasticity of the Union excise duties. This may perhaps hold good even in the case of State excise duties.

h. Across States the elasticities of the State taxes differ substantially. These suggest that the elasticities of the State taxes developed on the basis of their aggregate (all States) receipts need be taken with a caution.

Table 1

Estimates of Nominal Income Elasticity and Buoyancy of Major Union and State Taxes
(1970-71 to 1980-81)

Tax Head	Elasticity estimates: Coefficient	t-ratio	R^2	Buoyancy estimates: Coefficient	t-ratio	R^2
I. a. Personal Income Tax (A)	1.0378	13.28	0.95	0.9879	9.30	0.91
b. Personal Income Tax (B)	0.8984	11.74	0.93	0.9879	9.39	0.91
II. Corporation Income Tax	1.0690	12.51	0.94	1.2118	11.11	0.96
III. Union Excise Duty						
a. Total	0.7652	18.61	0.97	1.1740	20.18	0.96
b. Ad-Valorem	0.9470	23.31	0.98	1.3010	22.81	0.98
c. Specific	0.4072	77.97	0.88	0.7314	9.84	0.91
d. Ad-Valorem-cum-specific	1.0544	12.12	0.95	1.7337	13.09	0.95
Commodity Group:						
a. Food & beverages	0.3158	4.86	0.72	0.5956	8.87	0.90
b. Vegetable oils & fats	0.8466	11.63	0.94	0.9358	11.19	0.93
c. Tobacco	0.5271	11.54	0.94	1.0863	19.50	0.98
d. Chemicals	1.3528	15.76	0.97	1.6068	14.10	0.96
e. Petroleum products	0.3579	3.76	0.61	0.6618	8.25	0.86
f. Metals	0.7642	7.08	0.85	1.2213	8.42	0.89
g. Manufacturing goods	1.0445	16.59	0.97	1.3435	17.34	0.97
h. Machinery & transport equipments	1.1437	17.39	0.97	1.7407	17.61	0.97
IV. State Taxes						
a. Sales Tax	1.2705	27.05	0.99	1.5022	23.35	0.98
b. State excise duties	0.9781	23.98	0.98	1.2251	26.38	0.99
c. Entertainment tax	1.0778	23.56	0.98	1.4016	21.86	0.98
d. Vehicles taxes	0.9603	24.28	0.98	1.2769	25.29	0.99
e. Stamp duties & registration fees	0.8556	13.83	0.96	1.1207	22.30	0.98
f. Electricity duties	0.9090	9.40	0.91	1.1665	10.67	0.93

(A) Based on the estimates of ARM developed by NIPFP.
(B) Based on the estimates of ARM given in the budgets.

Table 2

Tax-to-Base and Base-to-GDP Decompositions of Nominal Income Elasticities of Major Union and State Taxes

Tax Head	Tax-to-base elasticity			Base-to-GDP elasticity		
	Coeffi-cient	t-ratio	R2	Coeffi-cient	t-ratio	R2
I. Personal Income Tax (1)						
(A)	0.8759	14.59	0.96	1.1847	32.25	0.99
(B)	0.7562	12.05	0.94	1.1847	32.25	0.99
Personal Income Tax (2)						
(A)	0.8438	14.05	0.96	1.2273	30.850.99	
(B)	0.7916	14.62	0.96	1.2273	30.85	0.99
II Corporation Income Tax (3)	0.8746	15.93	0.96	1.2303	33.51	0.99
Corporation Income Tax (4)	0.8892	14.04	0.95	0.9712	18.64	0.97
III Union Excise Duty						
a. Total	0.5518	19.52	0.98	1.3870	26.43	0.98
b. Food & beve-rages	0.2553	4.21	0.64	1.1680	17.93	0.97
c. Vegetable oils & fats	0.7195	16.42	0.97	1.1782	27.84	0.98
d. Tobacco	0.4700	15.38	0.96	1.0942	10.58	0.92
e. Chemicals	0.8665	24.09	0.98	1.5700	31.42	0.99
f. Petroleum products	0.1669	3.92	0.60	2.1402	16.23	0.98
g. Metals	0.5487	8.18	0.87	1.4084	22.74	0.98
h. Manufactured goods	0.9129	25.54	0.99	1.1453	23.42	0.98
i. Machinery & transport equipments	0.8555	24.45	0.98	1.3358	23.50	0.98
IV. State Taxes						
a. Sales Tax	1.0593	36.19	0.99	1.1988	37.55	0.99
b. State Excise Duty	NC			NC		
c. Vehicles Taxes	0.7132	33.75	0.99	1.3457	32.56	0.99
d. Entertainment Tax	NC			NC		
e. Stamp Duties & Registeration fees	0.9165	21.07	0.98	0.9353	20.11	0.98
f. Electricity duty	0.6216	19.30	0.98	1.4783	13.06	0.95

Notes : (1) Tax base is taken to be NA-GDP
(2) Tax base is taken to be NA-PI
(3) Tax base is taken to be GDP from selected sectors
(4) Tax base is taken to be profits component of (3).

Table 3

Estimates of Real Income and Price Elasticities of Major Union and State Taxes

Tax Head	Income Elasticity		Price Elasticity		
	Coefficient	t-ratio	Coefficient	t-ratio	R^2
I Personal Income Tax (A)	0.8239	1.47	1.1340	4.32	0.95
Personal Income Tax (B)	0.4474	0.85	1.1012	4.44	0.94
II Corporate Income Tax	1.7327	3.04	0.7706	2.88	0.94
III Union Excise Duty					
a. Total	1.0934	4.00	0.6176	4.83	0.97
b. Ad-valorem	0.9630	4.20	0.9798	3.05	0.96
c. Specific	0.7481	4.12	0.3844	1.28	0.96
d. Ad-Valorem-cum-specific	1.9677	3.95	0.6437	2.77	0.95
IV Sales Tax	1.6682	4.38	1.0928	4.59	0.96

Table 4

Estimates of Elasticity and Buoyancy of Selected Taxes - State-wise

State and Tax	Elas-ticity	t-ratio	R^2	Buo-yancy	t-ratio	R^2
Gujarat						
1. Sales tax	1.2436	11.80	0.94	1.4558	12.28	0.94
2. State Excise duty	1.5128	9.10	0.90	1.5128	9.10	0.90
3. Vehicle tax	0.7893	10.27	0.92	1.1020	11.17	0.93
4. Stamp duty & registration fees	0.8848	7.07	0.85	1.2515	8.78	0.90
5. Entertainment tax	1.1194	9.25	0.90	1.3809	9.22	0.90
6. Electricity duty	1.0495	10.82	0.93	1.5799	10.83	0.93
Karnataka						
1. Sales tax	1.4820	10.63	0.93	1.7885	10.10	0.92
2. State Excise duty	1.3551	14.06	0.96	1.5649	15.40	0.96
3. Vehicle tax	0.8924	8.42	0.89	1.4981	8.33	0.89
4. Stamp duty & registration fees	1.2159	5.09	0.74	1.4136	6.27	0.91
5. Entertainment tax	1.7403	4.75	0.96	2.2496	13.33	0.95
6. Electricity duty	0.6352	2.85	0.47	0.6352	2.85	0.47
Madhya Pradesh						
1. Sales tax	1.3769	8.67	0.89	1.6085	8.93	0.90
2. State Excise duty	1.1409	11.53	0.94	1.3153	11.10	0.93
3. Vehicle tax	1.5125	6.85	0.84	1.9123	7.16	0.85
4. Stamp duty & registration fees	0.9564	9.73	0.91	1.2965	9.53	0.91
5. Entertainment tax	0.9198	7.33	0.86	1.4282	10.14	0.92
6. Electricity duty	1.4408	7.53	0.86	1.8266	6.88	0.84
West Bengal						
1. Sales tax	1.2623	19.50	0.98	1.5865	20.14	0.98
2. State Excise duty	0.6300	10.47	0.92	1.0825	10.21	0.92
3. Vehicle tax	1.1485	8.69	0.89	1.5199	9.96	0.92
4. Stamp duty & registration fees	0.5719	6.98	0.84	1.1607	17.56	0.97
5. Entertainment tax	0.9154	6.51	0.82	1.5278	14.31	0.96
6. Electricity duty	0.3718	2.70	0.45	0.6969	6.03	0.80

Table 5

Estimates of Real Income and Price Elasticities of Sales Tax for Selected States

State	Income Elasticity		Price Elasticity		R^2
	Coeffi-cient	t-ratio	Coeffi-cient	t-ratio	
Gujarat	0.7300	2.53	1.5583	8.19	0.96
Karnataka	1.1370	1.44	1.6010	5.27	0.93
Madhya Pradesh	0.9998	1.36	1.4600	6.36	0.90
West Bengal	1.2312	2.43	1.2740	6.36	0.98

Details of Adjustments in ARM Series Used for Estimating Elasticity Coefficients of Personal Income Tax

i. 1970-71

A revenue loss of Rs. 3 crore in the current year and Rs. 5 crore in a full year should have resulted from the upward revision of exemption limit from Rs.4000 - 4800 depending on the status of the taxpayers: whether the taxpayer is married or not and whether the taxpayer has children or not, to a uniform exemption limit of Rs.5000 for all the income taxpayers. In the budget, the revenue effect of this change was not taken into account under the assumption that the revenue loss will be compensated by the improvements in tax administration resulting from this simplification. It is difficult to quantify the extent to which the improvements in tax administration had actually compensated for the loss in the revenue. It is assumed herein that the expected improvement in the tax administration compensated for 50 per cent of this loss in revenue and hence taken into account only 50 per cent of this loss due to the change under consideration. Accordingly, the revenue losses related to this change are placed at Rs.1.5 crore for the current year and at Rs.2.5 crore for the full year.

ii. 1974-75

It was stated in the budget speech of the Finance Minister that the reduction in marginal rates of tax would result in a loss of Rs. 36 crore in the current year and Rs.60 crore in the full year. But this loss was not taken account of in the budget as it was expected to be more than compensated by better tax compliance.

iii. 1974-75

A revenue loss of Rs. 12 crore in the current year and Rs. 20 crore in the full year should have resulted from the shift from a separate deduction in respect of travelling, books, taxes on professions, and expenditure incurred in the performance of duties, to a system of standard deduction upto a maximum of Rs.3500. In the budget, the revenue effect of this change was not taken account of.

iv. 1975-76

The exemption limit for the taxpayers was raised from Rs.6000 to Rs.8000 through the Finance (Amendment) Act, 1975, i.e., outside the budget. The estimates of revenue loss due to this change are placed at Rs.12 crore for the current year and Rs.21 crore for the

full year.

v. 1976-77

A revenue loss of Rs. 60 crore in the current year and Rs. 100 crore in the full year should have resulted from the reduction in marginal rates of tax. But, in the budget, no revenue loss was taken into account as it was expected to be compensated by better tax compliance due to reduction in rates of taxation.

vi. 1980-81

Through the budget 1980-81, marginal tax relief was given to the taxpayers in the income range Rs.10,000 to Rs.12,000. In the budget, no revenue loss was taken into account in respect of this change. The estimates of loss from this specified change work out to be of the order of Rs.4.8 crore for the current year and of the order of Rs. 8 crore for the full year.

vii. 1980-81

A revenue loss of Rs. 54 crore in the current year and Rs. 90 crore in the full year is estimated to result from reduction of surcharge from 20 per cent to 10 per cent. In the budget, the revenue effect of this change was not taken into account as the change was expected to evoke better tax compliance and compensate for the expected loss.

Annexure 2

Effective Tax Rates of Corporation Income Tax by Size Size Measured in Terms of Paid-up-Capital

A. Medium and Large Public Limited Companies

(Rs. Lakhs)

Year	Paid-up Capital						
	5-10	10-25	25-50	50-100	100-200	200-500	More than 500
1970-71	63.2	63.8	58.9	53.7	46.2	42.5	37.3
1971-72	100.8	75.0	70.0	55.1	51.8	44.5	41.8
1972-73	74.8	54.3	49.7	49.5	48.9	46.1	42.7
1973-74	53.5	52.9	40.4	49.1	46.9	46.2	45.9
1974-75	60.9	56.7	54.5	48.8	51.9	51.6	44.9
1975-76	85.6	75.5	44.7	44.9	70.0	58.3	48.1
1976-77	82.5	76.5	55.5	60.3	71.4	60.4	49.4
1977-78	65.1	68.2	54.0	89.4	63.2	59.9	49.3
1978-79	92.7	62.6	50.2	61.5	56.5	57.6	45.5
1979-80	88.6	54.1	46.8	45.7	46.6	52.5	43.7
1980-81	104.0	56.0	47.8	40.8	45.9	46.7	38.9

B. Medium and Large Private Limited Companies

(Rs. lakhs)

Year	Paid-up Capital					
	5-10	10-15	15-25	25-50	50-100	More than 100
1970-71	84.0	64.7	63.6	62.7	60.6	61.4
1971-72	79.8	65.8	76.6	65.7	56.3	62.8
1972-73	64.3	62.4	45.3	55.2	61.5	61.2
1973-74	53.2	58.6	49.1	47.9	57.6	60.1
1974-75	66.7	67.2	66.2	55.6	59.1	62.1
1975-76	70.3	87.4	71.3	58.4	67.6	68.0
1976-77	89.8	70.6	74.6	60.8	64.2	57.9
1977-78	88.9	66.2	59.0	61.4	57.2	57.4
1978-79	67.4	56.4	66.1	65.9	63.9	55.1

Source : RBI Bulletins.