# PROJECTIONS OF REVENUES FROM MAJOR TAXES OF THE STATES AND OF REVENUE FROM FOREST FOR THE PERIOD OF THE SEVENTH FIVE YEAR PLAN
## (1985-86 to 1989-90)
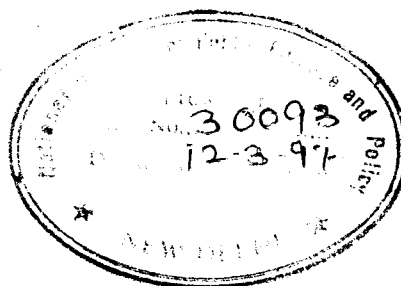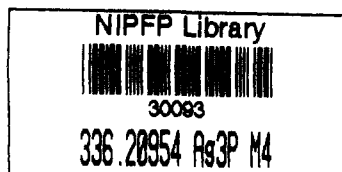
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Seventh Five Year Plan
(Final Report)

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# Acknowledgements

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# PROJECTIONS OF REVENUES FROM MAJOR TAXES OF THE STATES AND OF REVENUE FROM FOREST FOR THE PERIOD OF THE SEVENTH FIVE YEAR PLAN
## (1985-86 to 1989-90)

## I. Introduction

1.          The sub-group on States' Resources for the Seventh Five Year Plan entrusted the responsibility of providing projections of revenues from six major taxes of the states, namely, sales tax, state excise duty, vehicles tax (motor vehicles tax and passengers and goods tax taken together), stamp duty and registration fees, entertainment tax, and electricity duty, and also of revenue from a non-tax item, namely, forest for the period of the Seventh Five Year Plan (1985-86 to 1989-90) to the National Institute of Public Finance and Policy. Sales tax includes General sales tax, Central sales tax, tax on motor spirit and cess on sugarcane.

2.          At the meetings of the sub-group, following decisions were taken :

   i.     with all the states taken together, nominal income buoyancy and elasticity estimates should be provided for each of the six taxes;

   ii.    in regard of each one of the six taxes, along with nominal income elasticities, the elasticity estimates with respect to real income and price to facilitate gauging the effects of inflation of revenue response should also be provided;

   iii.   the income measure to be used for the purposes of estimating buoyancy/elasticity coefficients may be approximated with the Gross Domestic Product (GDP) at factor cost - measured at current prices;

   iv.    the price variable to be used for the purposes of estimating inflation elasticity may be approximated with the GDP implicit price deflator;

   v.     projections of revenue from each of the six taxes are to be based on the real income and price elasticities of taxes;

   vi.    projections of revenues are to be made at the rate structures of 1984-85;

   vii.   two sets of projections of revenues should be provided: one at the constant prices of 1984-85 and the other at the current prices. These projections should be based on the assumptions of 5 per cent increase in the GDP at factor cost-measured at constant prices and 5 per cent increase in the whole sale price index (WSPI).

Further, the sub-group felt that the reference period for the exercise could be restricted to the years running through 1970-71 to 1981-82.

## II. Methodology

4.     Projections of revenue from a tax can be made either on the basis of growth rates - historically observed or assumed, or on the basis of buoyancy/elasticity of the tax. The growth rate approach assumes either that the tax revenues are not related to the economic conditions prevailing in the States of if they are, the conditions that prevailed during the period that has been taken for the estimation of growth rates, would merely replicate during the period for which projections are required. The buoyancy/elasticity approach allows freedom to identify economic variables affecting revenue from a tax and use one's value judgement about the economic conditions which would prevail during the period for which projections are required and also to identify the effect of inflation on the yield. The buoyancy/elasticity approach is more scientific than the growth rate approach for making projections.

5.     As is well documented in the literature, elasticity/buoyancy estimate of a tax can be arrived through least square fits of a linear equation of the form:

$$\text{Log } T = \text{Log } a + b \text{ Log } x + u$$

Where T represents tax receipts,
x represents GDP at factor cost, and
u represents stochastic error term.

If 'T' in the above specification is measured in gross terms, i.e., in terms of historical tax receipts, the resultant estimate of b is identified as buoyancy estimate. Instead, if 'T' is measured net of the revenue effects of discretionary changes attempted during the years covered by the reference period, the resultant estimate of b is identified as the elasticity estimate.

6.     The isolation of the inflationary effects on the buoyancy/elasticity estimates can be approached through least square fits of the linear equation of the form:

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$$\text{Log } T = a_2 + b_2 \, (\log x^*) + b_3 \, (\log p) + u,$$

where
x* represents GDP at constant prices,
p represents the implicit price deflator, and
u represents stochastic error term.

7.      The above described methodology indicates that estimation of elasticity of a tax, necessitates a priori cleaning of its historical receipts for the revenue effects of the discretionary measures attempted during the reference period. In the literature, a variety of methods have been advocated to facilitate this cleaning process. The choice among these depend much upon the availability of the required data details in quantity terms. Of these alternative methods, the method most commonly known as proportional adjustment method is considered as the appropriate and feasible in the situations wherein the revenue effects of the annual discretionary measure alone are available on annual basis. This method is explained in the Annexure.

8.      If the revenue effects of the discretionary changes introduced in a year, are available for the current year as well as for the succeeding years included in the empirical exercise then the observed revenue minus the aggregate revenue effect of the discretionary changes introduced in the current year and in the previous years succeeding the base year would give the required cleaned series at the rate structure of the base year.

9.      For the purposes of making projections of revenues, estimates of the values of the implicit GDP deflator corresponding to the values which the wholesale price index (WSPI) would take during the years for which projections of revenue are required can be obtained by fitting a double-log-linear equation of the form:

$$\text{Log (implicit GDP deflator)} = a_0 + a_1 \text{ Log (WSPI)} + u$$

where u represents stochastic error term.

## III. The Data

**10.**          The series representing gross revenue yields of all the six taxes: Sales tax, State excise duty, Vehicles tax, Stamp duty and Registration fees, Entertainment tax, and Electricity duty and also of the non-tax item forest are taken from the Reserve Bank of India Bulletin, for different years.

**11.**          The data representing annual discretionary changes are compiled from the State Memoranda submitted by the States to the Finance Commissions. These are designated as Set I. However, the latest estimates of revenue effects of the discretionary changes introduced during 1980-81 and 1981-82 are available in the state Memoranda submitted by the States to the Planning Commission. Accordingly, some adjustments have been attempted for these two years in regard of the revenue effects and the series thus arrived are referred as Set II. Set I takes into account some corrections made in the Memoranda is consultation with the States. The adequacy of these adjustments is open to discussion.

**12.**          For both the Sets I & II, data are also compiled for a set of six special category States, and the data for the set of other sixteen States are arrived at by subtracting the data for the set of six States from the corresponding data for the set of all States.

## IV. Results

**13.**          Nominal income buoyancies of State taxes for all the States taken together and for sets of sixteen States and six States (special category States) are given in Table 1. The details of these estimates are presented in Tables 7 to 9. Buoyancies of all the taxes and also of forest are greater than one for all the three sets of States. Although the taxes are more buoyant for the set of six States than that for the set of sixteen States, the contribution of the former set in influencing buoyancy of the taxes for the set of all States is small because the weight of revenue from this set in the tax revenue from all the States is less than one per cent for all the taxes. Buoyancy estimates for the set of six States are higher than those for the set of sixteen States. The estimates for the set of all States lie between those for the sets of sixteen States and six States, and closer to those for the former.

**14.**          Nominal income elasticities of State taxes are obtained with two sets of data: Set I and Set II. These estimates for three sets of States, i.e., for all the States taken together and for sets of sixteen States and six States are summarised in Table 2. The details of these

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estimates are given in Tables 10 to 14. The estimates of nominal elasticities do not differ widely between the two sets of data. However, the results with set I are preferable from the point of view that in this set the revenue effects of the discretionary changes are based on a single source of information while set II combines two sources.

**15.** Like in the case of buoyancy estimates, elasticities of all the taxes and also of forest for the set of six States are higher than those for the set of sixteen States and the estimates for the set of all States are closer to the estimates for the former. The estimates for the set of all States are more or less the weighted averages of the estimates for the sets of sixteen States and six States. Therefore the estimates for the set of all States can be used to make projections of tax revenues from States taxes. The elasticity estimates for all States taken together are greater than or closer to one for Sales tax, State excise duty and Entertainment tax and, less than one in the cases of Vehicles tax, Stamp duty & registration fees, and Electricity duty. The low elasticities of the latter three taxes are attributable to their nature of specific levy which will become further clear from the decomposition of these elasticity estimates into real income and price elasticity estimates.

**16.** The estimates of partial elasticities with respect to real income and price are also obtained with two sets of data for all the three sets of states. A summary of these estimates is given in Table 3. The details of these estimates are presented in Tables 15 to 19. Like in the case of nominal elasticities, the real income and price elasticity estimates do not differ widely between the two sets of data. However, the estimates with data set I are preferable from the view point expressed earlier.

**17.** The estimates of both the income and price elasticities for the set of all States are closer to the estimates for the set of sixteen States. In the case of set of six States, income elasticity is not significant for any of the taxes except Electricity duty. Therefore, it would be appropriate to base projections of tax revenues on the elasticity estimates obtained by taking all the States together rather than making projections separately for the sets of sixteen states and six states. Therefore, in the case of electricity duty, nominal income elasticities for the set of all States are used for making projections.

**18.** While the price elasticities of Sales tax, State excise duty and Entertainment tax are centred around one, the elasticities of Vehicles tax, Stamp duty & registration fees,

and Electricity duty are less than one. The low price elasticities of the latter three taxes can be attributed to their nature of specific levy. The income elasticities are greater than one for all the taxes except State excise duty.

**19.** For the purposes of making projections of revenues the increase in implicit GDP deflator corresponding to the 5 per cent increase in WSPI is estimated from the following estimated equation for the period 1970-71 to 1981-82.

$$\text{Log D} = 23.724 + 0.796 \text{ Log (WSPI)}$$

D = implicit GDP deflator
t value of coefficient = 40.59
R-square = 0.99

This equation gives 4 per cent increase in the implicit GDP deflator corresponding to the 5 per cent increase in WSPI. Therefore, for the purposes of making projections at current prices, a 4 per cent increase in the implicit GDP deflator is assumed to hold good during the period of the Seventh Five Year Plan.

**20.** For making projections, the growth rates of revenues are calculated for all the taxes and for forest for the period of the Seventh Five Year Plan both at current prices and at constant prices by using the income and price elasticities. If $e_y$ and $e_p$ denote income and price elasticities of a tax then the growth rate (R) at current prices is given by

$$R = (1.05)^{e_y} \quad (1.04)^{e_p} - 1$$

In order to calculate the growth rates at constant prices, the term $(1.04)e_p$ in the above equation is replaced by 1.00.

In the case of electricity duty, growth rate at current prices is calculated by using nominal income elasticity $e_{y*}$ as follows:

$$R = (1.09)^{e_{y*}} - 1$$

The growth rates of revenues for all the taxes and for forest, thus arrived at, are given in Table 4. Given the base year revenue figures, the projections for the period of the Seventh Five Year Plan can be made by using these growth rates.

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**21.**     The latest year for which revenue figures (accounts) are available is 1982-83. Therefore projections of revenues are made at the rate structures of 1982-83 by using the revenue figures of 1982-83 as the base year figures. Projections of revenues at current and constant prices are made by applying the relevant growth rates of revenues from Table 4 to the base year revenue figures. Projections are made with two sets of data: Set I and Set II. The year-to-year revenue projections made at the rate structures of 1982-83 and at current prices are given in Table 5 and those made at constant prices of 1982-83 are given in Table 6. The aggregates of revenue projections for the period 1985-86 to 1989-90 (in short 1985-90) are also provided. The projections based on the data Set I are preferable for the reasons given earlier.

**22.**     For making projections of revenues at the rate structures of 1984-85, the base year figures of revenues are arrived at by adding the revenue effects in the year 1984-85 of the discretionary changes attempted during the years 1983-84 and 1984-85 to the projections of revenues at the rate structures of 1982-83 for the year 1984-85 at current price. The projections of revenues at the rate structures of 1984-85 at current and constant prices of 1984-85 are made by applying the relevant growth rates from Table 4 to these base year revenue figures. These projections are given in Table 20.

**23.**     In the end, it would be worth to comment on the buoyancy/elasticity estimates which had gone into the exercises of the Sixth five Year Plan. Those estimates are based on the period 1966-67 to 1978-79, and the sources of data then used were different from those used in the present exercise for the period 1970-71 to 1981-82. Even the series of Gross Domestic Product used in the current exercise is a revised series which would differ from the series that might have been used for the exercises done for the Sixth Five Year Plan. Besides the qualitative differences in the data used for exercises in these two periods there might have been some structural changes owing to the growth of the economy. Some of the fiscal incentives are increasingly given through tax incentives and loss in revenue on this account is not necessarily taken as negative resource mobilisation, e.g., the recent exemptions of some of the small scale industries from sales tax. Therefore, due to qualitative changes in the recent years, the buoyancy/elasticity estimates obtained in the current exercise might differ from those obtained in the exercise that was done for the Sixth Five Year Plan. The buoyancy and elasticity estimates of all the taxes but Stamps duty and registration fees obtained in the current exercise are lower than those used in the exercises of the Sixth Five Year Plan.

## Table 1

### Summary Table of Nominal Income Buoyancies of State
### Taxes and of Forest - All States
### (1970-71 to 1981-82)

| Tax | All States | Sixteen States | Six States |
|---|---|---|---|
| 1. Sales tax | 1.4881 | 1.4854 | 2.3111 |
| 2. State excise duty | 1.2586 | 1.2517 | 1.8915 |
| 3. Vehicles tax | 1.2271 | 1.2240 | 1.8455 |
| 4. Stamp duty & Registration fees | 1.1338 | 1.1323 | 1.5960 |
| 5. Entertainment tax | 1.3420 | 1.3431 | |
| 6. Electricity duty | 1.1432 | 1.1404 | 3.9779 |
| 7. Forest | 1.3188 | 1.3352 | 1.0036 |

Notes: For details of the estimates see Tables 13 to 15.

# Table 2

## Summary Table of Nominal Income Elasticities of Major
## Taxes of the States and of Forest - All States
## (1970-71 to 1981-82)

| Tax | With Data Set I | | | With Data Set II | | |
|---|---|---|---|---|---|---|
| | All States | Sixteen States | Six States | All States | Sixteen States | Six States |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| 1. Sales tax | 1.2695 | 1.2677 | 1.9263 | 1.2723 | 1.2705 | 1.9292 |
| 2. State excise duty | 0.9662 | 0.9594 | NS | 0.9661 | 0.9593 | NS |
| 3. Vehicles tax | 0.9130 | 0.9075 | 1.7614 | 0.9253 | 0.9200 | 1.7614 |
| 4. Stamp duty & Registration fees | 0.8808 | 0.8797 | 1.2586 | 0.8810 | 0.8799 | 1.2586 |
| 5. Entertainment tax | 1.0474 | 1.0476 | 0.9582 | 1.0498 | 1.0501 | 0.9582 |
| 6. Electricity duty | 0.8649 | 0.8619 | 3.9035 | 0.8823 | 0.8893 | 3.9035 |
| 7. Forest | 1.2750 | 1.2896 | 1.0036 | | | |

Notes:

1. For details of these estimates see Tables 10 to 14.

2. The series of revenue effects of the discretionary changes as compiled from the State Memoranda Submitted by the States to the Finance Commissions are designated as Set I.

3. Data set II refers to the Data Set I adjusted in regard of latest estimates of revenue effects of the discretionary changes introduced in 1980-81 and 1981-82 given in the State Memoranda submitted by the States to the Planning Commission.

4. The set of six States consists of six special category States, namely, Himachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim and Tripura.

5. The Set of 16 States excludes six special category States.

6. NS = Not significant even at 90 per cent level of confidence.

7. The buoyancy/elasticity estimates of forest are obtained for the period 1973-74 to 1981-82.

## Table 3

### Summary Table of Real Income and Price Elasticities of Major Taxes of the States and of Revenue from Forest
### (1970-71 to 1981-82)

| | Tax | With Data Set I | | | | | |
|---|---|---|---|---|---|---|---|
| | | All States Coefficient of | | Sixteen States Coefficient of | | Six States Coefficient of | |
| | | Income | Price | Income | Price | Income | Price |
| | | (1) | (2) | (3) | (4) | (5) | (6) |
| 1. | Sales tax | 1.6633 | 1.0909 | 1.6646 | 1.0875 | NS | 2.5979 |
| 2. | State excise duty | 0.8262 | 1.0297 | 0.8329 | 1.0169 | NS | NS |
| 3. | Vehicles tax | 1.2102 | 0.7782 | 1.2193 | 0.7662 | NS | 2.9334 |
| 4. | Stamp duty & Registration fees | 1.4415 | 0.6263 | 1.4585 | 0.6170 | NS | 2.6889 |
| 5. | Entertainment tax | 1.1971 | 0.9794 | 1.2125 | 0.9728 | NS | 2.2242 |
| 6. | Electricity duty | 2.1938 | NS | 2.1783 | NS | 15.7109** | NS |
| 7. | Forest | 2.1029 | 0.8195 | 2.1581 | 0.8117 | NS | NS |

(Contd..)

**Table 3 (Contd.)**

| Tax | With Data Set II | | | | | |
|---|---|---|---|---|---|---|
| | All States Coefficient of | | Sixteen States Coefficient of | | Six States Coefficient of | |
| | Income | Price | Income | Price | Income | Price |
| | (7) | (8) | (9) | (10) | (11) | (12) |
| 1. Sales tax | 1.6681 | 1.0927 | 1.6695 | 1.0894 | NS | 2.6000 |
| 2. State excise duty | 0.8260 | 1.0295 | 0.8327 | 1.0168 | NS | NS |
| 3. Vehicles tax | 1.2297 | 0.7874 | 1.2387 | 0.7754 | NS | 2.9334 |
| 4. Stamp duty & Registration fees | 1.4418 | 0.6264 | 1.4589 | 0.6172 | NS | 2.6889 |
| 5. Entertainment tax | 1.2001 | 0.9817 | 1.2155 | 0.9751 | NS | 2.2242 |
| 6. Electricity duty | 2.2230 | NS | 2.2156 | NS | 15.7109** | NS |

Notes :

** For the period of 1972-73 to 1981-82

1. For details of these estimates see Tables 15 to 19.

2 to 7. Same as for Table 2

# Table 4

## Growth Rates of Revenues from Major Taxes of the States and of Revenue from Forest for the Period of the Seventh Five Year Plan (1985-86 to 1989-90)
### All States

| Tax | With Data Set I at | | With Data Set II at | |
|---|---|---|---|---|
| | Current Prices | Constant Prices | Current Prices | Constant Prices |
| | (1) | (2) | (3) | (4) |
| 1. Sales tax | 13.19 | 8.44 | 13.24 | 8.47 |
| 2. State excise duty | 8.39 | 4.11 | 7.78 | 4.11 |
| 3. Vehicles tax | 9.37 | 6.08 | 9.51 | 6.18 |
| 4. Stamp duty and Registration fees | 9.95 | 7.29 | 9.95 | 7.30 |
| 5. Entertainment tax | 10.18 | 6.30 | 10.20 | 6.03 |
| 6. Electricity duty | 7.75 | 11.30 | 7.89 | 11.46 |
| 7. Forest | 14.42 | 10.80 | | |

Notes: Same as for Table 2.

1.   For details of these estimates see Table 20.

2 to 5. Same as for Table 2

# Table 5

Projections of Revenues from Major Taxes of the States
and of Revenue from Forest for the Period of the
Seventh Five Year Plan at Current Prices and at the
Rate Structures of 1982-83 : All States
(1985-86 to 1989-90)

| Year\Tax | Sales tax With data set | | State excise duty With data set | | Vehicles tax With data set | |
|---|---|---|---|---|---|---|
| | I | II | I | II | I | II |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| 1982-83 | 5491.8 | 5491.8 | 1343.3 | 1343.3 | 983.0 | 983.0 |
| 1983-84 | 6216.2 | 6218.9 | 1456.0 | 1447.8 | 1075.1 | 1076.5 |
| 1984-85 | 7036.1 | 7042.3 | 1578.2 | 1560.4 | 1175.8 | 1178.9 |
| 1985-86 | 7964.1 | 7974.7 | 1710.6 | 1681.9 | 1286.0 | 1291.0 |
| 1986-87 | 9014.6 | 9030.5 | 1854.1 | 1812.7 | 1406.5 | 1413.7 |
| 1987-88 | 10203.6 | 10226.2 | 2009.6 | 1953.7 | 1538.3 | 1548.2 |
| 1988-89 | 11549.5 | 11580.1 | 2178.3 | 2105.7 | 1682.5 | 1695.4 |
| 1989-90 | 13072.9 | 13113.4 | 2361.0 | 2269.6 | 1840.1 | 1856.6 |
| 1985-90 | 51804.7 | 51924.9 | 10113.6 | 9823.6 | 7753.4 | 7805.0 |

(Contd..)

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## Table 5 (Contd.)

| Year\Tax | Stamp duty and registration fees With data set | | Entertainment tax With data set | | Electricity duty With data set | |
|---|---|---|---|---|---|---|
| | I | II | I | II | I | II |
| | (7) | (8) | (9) | (10) | (11) | (12) |
| 1982-83 | 590.0 | 590.0 | 346.0 | 346.0 | 324.8 | 324.8 |
| 1983-84 | 648.7 | 648.7 | 372.8 | 373.3 | 350.0 | 350.4 |
| 1984-85 | 713.3 | 713.3 | 401.7 | 402.8 | 377.1 | 378.1 |
| 1985-86 | 784.2 | 784.2 | 432.8 | 434.5 | 406.3 | 407.9 |
| 1986-87 | 862.2 | 862.2 | 466.4 | 468.8 | 437.8 | 440.1 |
| 1987-88 | 948.0 | 948.0 | 502.5 | 505.8 | 471.7 | 474.8 |
| 1988-89 | 1042.4 | 1042.4 | 541.5 | 545.7 | 508.3 | 512.3 |
| 1989-90 | 1146.1 | 1146.1 | 583.4 | 588.8 | 547.7 | 552.7 |
| 1985-90 | 4782.9 | 4782.9 | 2526.6 | 2543.6 | 2371.8 | 2387.8 |

(Contd..)

## Table 5 (Contd.)

| Year/Tax | All the six taxes With data set | | Forest |
|---|---|---|---|
| | I | II | |
| | (13) | (14) | (15) |
| 1982-83 | 9078.9 | 9078.9 | 642.6 |
| 1983-84 | 10118.8 | 10115.6 | 735.3 |
| 1984-85 | 11282.2 | 11275.0 | 841.3 |
| 1985-86 | 12584.0 | 12574.2 | 962.6 |
| 1986-87 | 14041.6 | 14028.0 | 1101.4 |
| 1987-88 | 15673.7 | 15656.7 | 1260.2 |
| 1988-89 | 17502.5 | 17481.6 | 1442.0 |
| 1989-90 | 19551.2 | 19527.2 | 1649.9 |
| 1985-90 | 79353.0 | 79267.7 | 6416.1 |

Notes:

1. These projections are made by applying the growth rates of different taxes at current prices as reported in Table 4 to the 1982-83 actuals.

2 to 5. Same as for Table 2.

## Table 6

Projections of Revenues from Major Taxes of the States
and of Revenue from Forest for the Period of the
Seventh Five Year Plan at Constant Prices of
1982-83 and at the Rate Structures of
1982-83 : All States
(1985-86 to 1989-90)

| Year\Tax | Sales tax With data set | | State excise duty With data set | | Vehicles tax With data set | |
|---|---|---|---|---|---|---|
| | I | II | I | II | I | II |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| 1982-83 | 5491.8 | 5491.8 | 1343.3 | 1343.3 | 983.0 | 983.0 |
| 1983-84 | 5955.3 | 5957.0 | 1398.5 | 1398.5 | 1042.8 | 1043.7 |
| 1984-85 | 6457.9 | 6461.5 | 1456.0 | 1456.0 | 1106.2 | 1108.3 |
| 1985-86 | 7003.0 | 7008.8 | 1515.8 | 1515.8 | 1173.4 | 1176.7 |
| 1986-87 | 7594.0 | 7602.4 | 1578.1 | 1578.1 | 1244.8 | 1249.5 |
| 1987-88 | 8235.0 | 8246.4 | 1643.0 | 1643.0 | 1320.4 | 1326.7 |
| 1988-89 | 8930.0 | 8944.8 | 1710.5 | 1710.5 | 1400.7 | 1408.7 |
| 1989-90 | 9683.7 | 9702.5 | 1780.8 | 1780.8 | 1485.9 | 1495.7 |
| 1985-90 | 41445.7 | 41504.9 | 8228.2 | 8228.2 | 6625.2 | 6625.3 |

(Contd..)

TABLE 6 (Contd.)

| Year\Tax | Stamp duty and registration fees With data set | | Entertainment tax With data set | | Electricity duty With data set | |
|---|---|---|---|---|---|---|
| | I | II | I | II | I | II |
| | (7) | (8) | (9) | (10) | (11) | (12) |
| 1982-83 | 590.0 | 590.0 | 346.0 | 346.0 | 324.8 | 324.8 |
| 1983-84 | 633.0 | 633.1 | 366.9 | 366.9 | 361.5 | 362.0 |
| 1984-85 | 679.2 | 679.3 | 389.0 | 389.0 | 402.4 | 403.5 |
| 1985-86 | 728.7 | 728.9 | 412.4 | 412.4 | 447.8 | 449.8 |
| 1986-87 | 781.8 | 782.1 | 437.3 | 437.3 | 498.4 | 501.3 |
| 1987-88 | 838.8 | 839.2 | 463.7 | 463.7 | 554.7 | 558.7 |
| 1988-89 | 899.9 | 900.4 | 491.6 | 491.6 | 617.4 | 622.8 |
| 1989-90 | 965.5 | 966.2 | 521.3 | 521.3 | 687.2 | 694.1 |
| 1985-90 | 4214.7 | 4216.8 | 2326.3 | 2326.3 | 2805.5 | 2826.7 |

(Contd..)

**TABLE 6 (Contd.)**

| Year/Tax | All the six taxes | | Forest |
| | With data set | | |
| | I | II | |
| | (13) | (14) | (15) |
|---|---|---|---|
| 1982-83 | 9078.9 | 9078.9 | 642.6 |
| 1983-84 | 9758.0 | 9761.2 | 712.0 |
| 1984-85 | 10490.7 | 10497.6 | 788.9 |
| 1985-86 | 11281.1 | 11292.4 | 874.1 |
| 1986-87 | 12134.4 | 12150.7 | 968.5 |
| 1987-88 | 13055.6 | 13077.7 | 1073.1 |
| 1988-89 | 14050.1 | 14078.8 | 1189.0 |
| 1989-90 | 15124.4 | 15160.6 | 1317.4 |
| 1985-90 | 65645.6 | 65760.2 | 5422.1 |

Notes:

1.  These projections are made by applying the growth rates of different taxes at constant prices as reported in Table 4 to the 1982-83 actuals.

2 to 5.  Same as for Table 2.

**Table 7**

**Nominal Income Buoyancies of Major Taxes of the States
and of Revenue from Forest - All States
(1970-71 to 1981-82)**

| | Tax | Constant term | Buoyancy | R-square | DW-statistic |
|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) |
| 1. | Sales tax | -4.4152 | 1.4881 (27.98) | 0.99 | 1.51 |
| 2. | State excise duty | -3.2793 | 1.2586 (29.91) | 0.99 | 1.91 |
| 3. | Vehicles tax | -3.1238 | 1.2271 (24.91) | 0.98 | 1.38 |
| 4. | Stamp duty and registration fees | -2.5410 | 1.1338 (27.18) | 0.99 | 0.76 |
| 5. | Entertainment tax | -5.3834 | 1.3420 (21.81) | 0.98 | 0.86 |
| 6. | Electricity | -3.3049 | 1.1432 (12.65) | 0.95 | 1.05 |
| 7. | Forest | -4.4071 (5.34) | 1.3188 (17.98) | 0.98 | 0.87 |

**Table 8**

**Nominal Income Buoyancies of Major Taxes of the States
and of Revenue from Forest - Sixteen States
(1970-71 to 1981-82)**

| | Tax | Constant term | Buoyancy | R-square | DW-statistic |
|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) |
| 1. | Sales tax | -4.3894 (7.40) | 1.4854 (27.91) | 0.99 | 1.51 |
| 2. | State excise duty | -3.2194 (6.99) | 1.2517 (30.25) | 0.99 | 1.94 |
| 3. | Vehicles tax | -3.0975 (5.66) | 1.2240 (24.90) | 0.98 | 1.37 |
| 4. | Stamp duty and Registration fees | -2.5313 (5.38) | 1.1323 (26.82) | 0.99 | 0.74 |
| 5. | Entertainment tax | -5.4015 (7.95) | 1.3431 (22.02) | 0.99 | 0.87 |
| 6. | Electricity | -3.2752 (3.27) | 1.1404 (12.67) | 0.94 | 1.06 |
| 7. | Forest | -4.6340 (5.15) | 1.3352 (16.68) | 0.97 | 0.81 |

# Table 9

## Nominal Income Buoyancies of Major Taxes of the States and of Revenue from Forest - Six Special Category States (1970-71 to 1981-82)

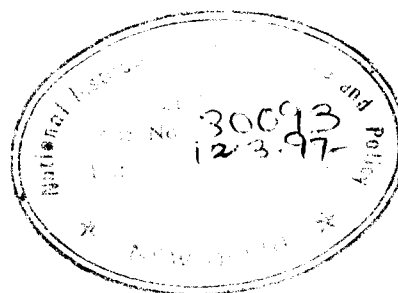| | Tax | Constant term | Buoyancy | R-square | DW-statistic |
|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) |
| 1. | Sales tax | -19.0947 (7.01) | 2.3111 (9.45) | 0.90 | 1.45 |
| 2. | State excise duty | -14.4808 (4.35) | 1.8915 (6.32) | 0.80 | 1.22 |
| 3. | Vehicles tax | -14.8030 (4.14) | 1.8455 (5.75) | 0.77 | 1.19 |
| 4. | Stamp duty and Registration fees | -12.7705 (3.83) | 1.5960 (5.33) | 0.74 | 1.18 |
| 5. | Entertainment tax | -8.7716 (2.64) | 1.1721 (3.93) | 0.61 | 0.68 |
| 6. | Electricity | -41.9943 (7.78) | 3.9779 (8.21) | 0.87 | 1.14 |
| 7. | Forest | -4.0599 (2.09) | 1.0036 (5.82) | 0.81 | 1.42 |

## Table 10

### Nominal Income Elasticities of Major Taxes of the States
### and of Revenue from Forest with Data Set I - All States
### (1970-71 to 1981-82)

| | Tax | Constant term | Buoyancy | R-square | DW-statistic |
|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) |
| 1. | Sales tax | -2.1190 (4.95) | 1.2695 (33.04) | 0.99 | 1.71 |
| 2. | State excise duty | -0.2280 (0.60) | 0.9662 (28.31) | 0.99 | 2.04 |
| 3. | Vehicles tax | 0.1928 (0.42) | 0.9130 (22.17) | 0.98 | 1.21 |
| 4. | Stamp duty and Registration fees | 0.1135 (0.19) | 0.8808 (16.81) | 0.97 | 0.58 |
| 5. | Entertainment tax | -2.3485 (5.16) | 1.0474 (25.62) | 0.19 | 1.55 |
| 6. | Electricity | -0.3635 (0.40) | 0.8649 (10.47) | 0.92 | 1.07 |
| 7. | Forest | -3.9341 (4.77) | 1.2750 (17.39) | 0.97 | 0.85 |

# Table 11

## Nominal Income Elasticities of Major Taxes of the States and of Revenue from Forest with Data Set I - Sixteen States (1970-71 to 1981-82)

|  | Tax | Constant term | Buoyancy | R-square | DW-statistic |
|---|---|---|---|---|---|
|  |  | (1) | (2) | (3) | (4) |
| 1. | Sales tax | -2.1023<br>(4.90) | 1.2677<br>(32.93) | 0.99 | 1.70 |
| 2. | State excise duty | -0.1702<br>(0.46) | 0.9594<br>(28.98) | 0.99 | 2.15 |
| 3. | Vehicles tax | 0.2429<br>(0.53) | 0.9075<br>(22.25) | 0.98 | 1.21 |
| 4. | Stamp duty and Registration fees | 0.1191<br>(0.20) | 0.8797<br>(16.59) | 0.96 | 0.57 |
| 5. | Entertainment tax | -2.3582<br>(5.23) | 1.0476<br>(25.87) | 0.99 | 1.59 |
| 6. | Electricity | -0.3311<br>(0.36) | 0.8619<br>(10.48) | 0.92 | 1.07 |
| 7. | Forest | -4.1412<br>(4.60) | 1.2896<br>(16.11) | 0.97 | 0.79 |

# Table 12

## Nominal Income Elasticities of Major Taxes of the States and of Revenue from Forest with Data Set I - Six Special Category States
### (1970-71 to 1981-82)

| | Tax | Constant term | Buoyancy | R-square | DW-statistic |
|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) |
| 1. | Sales tax | -14.9857 (5.24) | 1.9263 (7.49) | 0.85 | 1.29 |
| 2. | State excise duty | -11.3130 (0.46) | -0.6989 (1.40) | 0.16 | 0.79 |
| 3. | Vehicles tax | -13.8944 (3.79) | 1.7614 (5.36) | 0.74 | 1.13 |
| 4. | Stamp duty and Registration fees | -9.2315 (2.76) | 1.2586 (4.20) | 0.64 | 1.06 |
| 5. | Entertainment tax | -6.4653 (1.78) | 0.9582 (2.93) | 0.46 | 00.60 |
| 6. | Electricity | -41.2054 (4.94) | 3.9035 (5.27) | 0.78 | 1.11 |
| 7. | Forest | -4.0599 (2.09) | 1.0036 (5.82) | 0.81 | 1.42 |
| 8. | Sales Tax ** | -15.0172 (5.25) | 1.9292 (7.51) | 0.85 | 1.30 |

Notes:

1.  **    Shows results with data Set II (described in Table 19) and the results for all other taxes remain unchanged with data Set II.

2&3.  Same as for Table 2.

# Table 13

## Nominal Income Elasticities of Major Taxes of the States and of Revenue from Forest with Data Set II - All States (1970-71 to 1981-82)

| | Tax | Constant term | Buoyancy | R-square | DW-statistic |
|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) |
| 1. | Sales tax | -2.1492 (5.02) | 1.2723 (33.13) | 0.99 | 1.72 |
| 2. | State excise duty | -0.2267 (0.60) | 0.9661 (28.30) | 0.99 | 2.04 |
| 3. | Vehicles tax | 0.0593 (0.14) | 0.9253 (24.38) | 0.98 | 1.29 |
| 4. | Stamp duty and Registration fees | 0.1115 (0.19) | 0.8810 (16.80) | 0.97 | 0.58 |
| 5. | Entertainment tax | -2.3755 (5.29) | 1.0498 (26.05) | 0.99 | 1.56 |
| 6. | Electricity duty | -0.5531 (0.61) | 0.8823 (10.91) | 0.92 | 1.06 |

Notes: Same as notes 2 and 3 for Table 2.

# Table 14

## Nominal Income Elasticities of Major Taxes of the States and of Revenue from Forest with Data Set II - Sixteen States
### (1970-71 to 1981-82)

| | Tax | Constant term | Buoyancy | R-square | DW-statistic |
|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) |
| 1. | Sales tax | -2.1325 (4.98) | 1.2705 (33.02) | 0.99 | 1.71 |
| 2. | State excise duty | -0.1688 (0.46) | 0.9593 (28.97) | 0.99 | 2.15 |
| 3. | Vehicles tax | 0.1081 (0.26) | 0.9200 (24.48) | 0.98 | 1.25 |
| 4. | Stamp duty and Registration fees | 0.1170 (0.74) | 0.8799 (26.58) | 0.96 | 0.57 |
| 5. | Entertainment tax | -2.3853 (5.36) | 1.0501 (16.30) | 0.99 | 1.60 |
| 6. | Electricity | -0.6253 (0.70) | 0.8893 (11.05) | 0.92 | 1.07 |

Notes: Same as notes 2 and 3 for Table 2.

## Table 15

## Real Income and Price Elasticities of Major Taxes of the
## States and of Revenue from Forest with Data
## Set I - All States
## (1970-71 to 1981-82)

| | Tax | Constant term | Coefficient of | | R-square | DW-statistic |
| | | | Income | Price | | |
|---|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) | (5) |
| 1. | Sales tax | -11.2621 (4.59) | 1.6633 (5.79) | 1.0909 (8.12) | 0.99 | 2.16 |
| 2. | State excise duty | -3.5050 (1.48) | 0.8262 (2.98) | 1.0297 (7.95) | 0.99 | 2.09 |
| 3. | Vehicles tax | -6.5002 (2.35) | 1.2102 (3.74) | 0.7782 (5.13) | 0.98 | 1.39 |
| 4. | Stamp duty and Registration fees | -8.6374 (2.61) | 1.4415 (3.72) | 0.6263 (3.45) | 0.97 | 0.71 |
| 5. | Entertainment tax | -8.4256 (2.96) | 1.1971 (3.60) | 0.9794 (6.30) | 0.99 | 1.58 |
| 6. | Electricity | -15.4730 (3.53) | 2.1938 (4.28) | 0.2619 (1.09) | 0.95 | 1.83 |
| 7. | Forest | -16.3190 (5.02) | 2.1029 (5.27) | 0.8195 (3.63) | 0.98 | 1.56 |

Note: Same as notes 2 and 3 for Table 2.

**Table 16**

**Real Income and Price Elasticities of Major Taxes of
the States and of Revenue from Forest with
Data Set I - Sixteen States
(1970-71 to 1981-82)**

| | Tax | Constant term | Coefficient of | | R-square | DW-statistic |
| | | | Income | Price | | |
|---|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) | (5) |
| 1. | Sales tax | -11.2642 (4.59) | 1.6646 (5.79) | 1.0875 (8.09) | 0.99 | 2.16 |
| 2. | State excise duty | -3.5293 (1.53) | 0.8329 (3.10) | 1.0169 (8.08) | 0.99 | 2.19 |
| 3. | Vehicles tax | -6.5465 (2.40) | 1.2193 (3.82) | 0.7662 (5.13) | 0.98 | 1.42 |
| 4. | Stamp duty and Registration fees | -8.7783 (2.63) | 1.4585 (3.73) | 0.6170 (3.38) | 0.97 | 0.71 |
| 5. | Entertainment tax | -8.5629 (3.05) | 1.2125 (3.69) | 0.9728 (6.33) | 0.99 | 1.63 |
| 6. | Electricity duty | -15.3225 (3.50) | 2.1783 (4.25) | 0.2645 (1.10) | 0.95 | 1.83 |
| 7. | Forest | -16.9136 (4.65) | 2.1581 (4.84) | 0.8117 (3.22) | 0.98 | 1.45 |

Note: Same as notes 2 and 3 for Table 2.

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**Table 17**

**Real Income and Price Elasticities of Major Taxes of
the States and of Revenue from Forest with
Data Set I - Six Special Category States
(1970-71 to 1981-82)**

| | Tax | Constant term | Coefficient of | | R-square | DW-statistic |
|---|---|---|---|---|---|---|
| | | | Income | Price | | |
| | | (1) | (2) | (3) | (4) | (5) |
| 1. | Sales tax | -11.4647 (0.65) | 0.4462 (0.22) | 2.5979 (2.70) | 0.86 | 1.48 |
| 2. | State excise duty | 19.2305 (0.55) | -1.2601 (0.31) | -0.4442 (0.23) | 0.16 | 0.78 |
| 3. | Vehicles tax | -0.3819 (0.02) | -0.8213 (0.32) | 2.9334 (2.44) | 0.77 | 1.38 |
| 4. | Stamp duty and Registration fees | 11.3626 (0.59) | -1.8934 (0.85) | 2.6889 (2.58) | 0.70 | 1.54 |
| 5. | Entertainment tax | 12.4809 (0.58) | -1.8317 (0.73) | 2.2242 (1.88) | 0.53 | 0.78 |
| 6. | Electricity duty | -152.0723 (7.55) | 15.7109 (6.35) | -2.5926 (1.86) | 0.95 | 1.57 |
| 7. | Forest | -7.9096 (0.81) | 0.9055 (0.76) | 1.0576 (1.56) | 0.81 | 1.44 |
| 8. | Sales Tax ** | -11.5239 (0.66) | 0.4508 (0.22) | 2.6000 (2.71) | 0.86 | 1.48 |

Notes:

1.    **    Shows results with data Set II, and the results for all other taxes remain unchanged with data Set II.

2&3.  Same as for Table 2.

# Table 18

## Real Income and Price Elasticities of Major Taxes of the States and of Revenue from Forest with Data Set II - All States (1970-71 to 1981-82)

| | Tax | Constant term | Coefficient of | | R-square | DW-statistic |
| | | | Income | Price | | |
|---|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) | (5) |
| 1. | Sales tax | -11.3219 (4.62) | 1.6681 (5.82) | 1.0927 (8.14) | 0.99 | 2.18 |
| 2. | State excise duty | -3.5027 (1.48) | 0.8260 (2.98) | 1.0295 (7.94) | 0.99 | 2.08 |
| 3. | Vehicles tax | -6.7460 (2.66) | 1.2297 (4.21) | 7874 (5.67) | 0.99 | 1.44 |
| 4. | Stamp duty and registration fees | -8.6416 (2.61) | 1.4418 (3.71) | 0.6264 (3.45) | 0.97 | 0.71 |
| 5. | Entertainment tax | -8.4684 (3.02) | 1.2001 (3.66) | 0.9817 (6.40) | 0.99 | 1.59 |
| 6. | Electricity duty | -15.8415 (3.79) | 2.2230 (4.54) | 0.2739 (1.20) | 0.96 | 1.88 |

Notes: Same as notes 2 and 3 for Table 2.

## Table 19

### Real Income and Price Elasticities of Major Taxes of
### the States and of Revenue from forest with
### Data Set II - Sixteen States

| Tax | | Constant term | Coefficient of | | R-square | DW-statistic |
|-----|-----|-----|-----|-----|-----|-----|
| | | | Income | Price | | |
| | | (1) | (2) | (3) | (4) | (5) |
| 1. | Sales tax | -11.3240 (4.62) | 1.6695 (5.82) | 1.0894 (8.12) | 0.99 | 2.17 |
| 2. | State excise duty | -3.5264 (1.63) | 0.8327 (3.09) | 1.0168 (8.07) | 0.99 | 2.19 |
| 3. | Vehicles tax | -6.7971 (2.74) | 1.2387 (4.27) | 0.7754 (5.71) | 0.99 | 1.54 |
| 4. | Stamp duty and Registration fees | -8.7825 (2.63) | 1.4589 (3.73) | 0.6172 (3.37) | 0.97 | 0.71 |
| 5. | Entertainment tax | -8.6060 (3.11) | 1.2155 (3.75) | 0.9751 (6.43) | 0.99 | 1.64 |
| 6. | Electricity duty | -15.8253 (3.78) | 2.2156 (4.53) | 0.2874 (1.25) | 0.96 | 1.89 |

Notes: Same as notes 2 and 3 for Table 2.

# Table 20

## Projection of Revenue from Major Taxes of the States at the Rate Structures of 1984-85 at current and Constant Prices of 1984-85 for the Period of the Seventh Five Year Plan: All States (1985-86 to 1989-90)

(Rs crore)

| Year\Tax | Sales tax at | | State excise duty at | | Vehicles tax at | |
|---|---|---|---|---|---|---|
| | Current prices | Constant prices | Current prices | Constant prices | Current prices | Constant prices |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| 1984-85 | 7330.6 | 7330.6 | 1689.5 | 1689.5 | 1228.7 | 1228.7 |
| 1985-86 | 8297.5 | 7949.3 | 1831.2 | 1758.9 | 1343.8 | 1303.4 |
| 1986-87 | 9391.9 | 8620.2 | 1984.9 | 1831.2 | 1469.7 | 1382.7 |
| 1987-88 | 10630.7 | 9347.8 | 2151.4 | 2151.4 | 1906.5 | 1466.7 |
| 1988-89 | 12032.9 | 10136.7 | 2331.9 | 1984.9 | 1758.1 | 1555.9 |
| 1989-90 | 13620.1 | 10992.3 | 2527.6 | 2066.4 | 1922.8 | 1650.5 |
| 1985-90 | 53970.2 | 47046.3 | 10827.0 | 9547.9 | 8101.9 | 7359.2 |

(Contd.)

Table 20 (Contd.)

(Rs crore)

| Year\Tax | Stamps and registration fees at | | Entertainment tax at | | Electricity duty at | |
|---|---|---|---|---|---|---|
| | Current prices | Constant prices | Current prices | Constant prices | Current prices | Constant prices |
| | (7) | (8) | (9) | (10) | (11) | (12) |
| 1984-85 | 739.1 | 739.1 | 425.8 | 425.8 | 409.6 | 409.6 |
| 1985-86 | 812.6 | 793.0 | 461.1 | 451.5 | 455.9 | 455.9 |
| 1986-87 | 893.5 | 850.8 | 516.9 | 478.7 | 507.4 | 507.4 |
| 1987-88 | 982.4 | 912.8 | 569.5 | 507.6 | 564.7 | 564.7 |
| 1988-89 | 1010.2 | 979.4 | 627.5 | 538.2 | 628.6 | 628.6 |
| 1989-90 | 1187.6 | 1050.8 | 691.4 | 570.6 | 699.6 | 699.6 |
| 1985-90 | 4886.3 | 4586.8 | 2874.4 | 2546.6 | 2856.2 | 2856.2 |

(Contd.)

**Table 20 (Contd.)**

| Year\Tax | All the Six Taxes at | |
| --- | --- | --- |
| | Current prices | Constant prices |
| | (13) | (14) |
| 1984-85 | 11823.3 | 11823.3 |
| 1985-86 | 13210.1 | 12712.0 |
| 1986-87 | 14764.3 | 13671.0 |
| 1987-88 | 16506.2 | 14706.1 |
| 1988-89 | 18389.2 | 15823.7 |
| 1989-90 | 20649.1 | 17030.2 |
| 1985-90 | 83519.0 | 73943.0 |

Note: In the case of electricity duty, revenue yield at current prices is taken to be the same as at constant prices as it does not respond to prices.

## PROPORTIONAL ADJUSTMENT METHOD FOR CLEANING THE REVENUE SERIES FOR ESTIMATING ELASTICITY

The procedure of estimating hypothetical yield at a constant rate structure from actual yield of a tax by using proportional adjustment method with first year as the base year involves two steps. The first step involves estimation of partially cleaned series, cleaned with respect to the revenue effects of the discretionary changes made in the current year. The second step involves estimation of final series by further cleaning the partially cleaned series, with respect to the revenue effects of the discretionary changes made in the earlier years since the base year. This procedure is explained below.

Let $T_1$, $T_2$,......., $T_n$ denote the series of actual tax yield in the n years, and $D_1$, $D_2$,........$D_n$ denote the estimated revenue effects of the discretionary changes made (through the budget and outside the budget) in n years. Further, let $T_1'$, $T_2'$......., $T_n'$ denote the cleaned series of tax revenue in the n years, cleaned with respect to the first year as the base year. The working -out of this cleaned series can be shown as follows:

| Actual tax yield | Revenue effect of discretionary changes | Cleaned series of tax revenue | |
|---|---|---|---|
| | | Partially cleaned (1) - (2) | Fully cleaned (final series) |
| (1) | (2) | (3) | (4) |
| $T_1$ | $D_1$ | $T_1$ | $T_1' = T_1$ |
| $T_2$ | $D_2$ | $T_2 - D_2$ | $T_2' = T_2 - D_2$ |
| $T_3$ | $D_3$ | $T_3 - D_3$ | $T_3' = (T_3 - D_3)(T_2'/T_2)$ |
| $T_4$ | $D_4$ | $T_4 - D_4$ | $T_4' = (T_4 - D_4)(T_3'/T_3)$ |
| . | . | . | . |
| . | . | . | . |
| . | . | . | . |
| . | . | . | . |
| $T_i$ | $D_i$ | $T_i - D_i$ | $T_i' = (T_i - D_i)(T_{i-1}'/T_{i-1})$ |
| . | . | . | . |
| . | . | . | . |
| . | . | . | . |
| . | . | . | . |
| $T_n$ | $D_n$ | $T_n - D_n$ | $T_n' = (T_n - D_n)(T_{n-1}'/T_{n-1})$ |

Note: Since we have taken the first year as the base year for cleaning the series of tax revenue, the revenue in the first year does not call for any adjustment with respect to the revenue effect of the discretionary changes made in this year.