

Savings Behaviour in Gujarat

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WHILE the savings behaviour at the national level has been the subject matter of many detailed studies by economists,^[1] savings behaviour in the states has received much less attention. The chief reason has been that the data on savings at the state level are just not available. The purpose of this paper is to explore the possibilities of generating data in Gujarat and to undertake an analysis of the determinants of savings.

The paper is organized into three sections. The first section examines the current difficulties experienced by the states in data gathering and presents a workable model for arriving at fairly reasonable estimates on a consistent time-series basis. The second section deals with the procedure for estimating the determinants of savings

and offers certain empirical results. The final section lists out the implications arising out of the study.

I. Estimation of Savings

The domestic savings of a state can be categorised into three sectors, namely, household, private and public sectors. This follows the conventional pattern adopted at the national level.

The share of the household sector in the domestic savings of the country is about 70%. There is every likelihood of a contribution of similar proportion from the household sector in Gujarat to its domestic savings. However, there may be a slight difference between the national and state savings in regard to composition

* Command Area Development Commissioner, Mahi-Kadana Irrigation Project, Ahmedabad. The paper is based only on published data of the state government. However, the author had several rounds of discussions with Shri V.M. Patel, Joint Director and Shri S.P. Patel, Research Officer in the State Bureau of Economics and Statistics and is grateful to them for providing many valuable insights into the problem. But he alone is responsible for any errors and omissions. The author also thanks Shri R.M. Patel, Shri K.H. Vasavada, and Shri A.P. Patel for programming assistance and the Government Computer Centre, Gandhinagar for all facilities.

of households into rural and urban sectors. This is for the reason that the ratio of population living in cities and towns to population living in rural areas in Gujarat is much higher than the national average. [2] Presently no data are available to prepare estimates of household savings in the state. Surveys on income, expenditure and investments by households in financial and physical assets need to be undertaken at least on a sample basis in each year in different parts of the state covering both rural and urban sectors. The only survey data available on the subject is with regards to rural sector and the period of reference is 1971-72. This survey was conducted by the Reserve Bank of India as part of the All India Rural Debt and Investment Survey and detailed information on capital formation in farm business, non-farm business and residential plots and buildings for cultivator households and non-cultivator households is available. [3] But statistics for the urban sector are totally lacking. Due to this vital gap in information, it is not possible to generate household savings data for the state even for one year, not to speak of data for other years to form a time-series.

With reference to the private sector, other than the households, it is the corporate sector which makes a modest contribution to total savings in the state. But often it happens that the major part of the corporate sector in the state keeps accounts at the metropolitan cities away from the state, such as Bombay or Calcutta and by virtue of the geographical locations, they are not part of the state savings in the accounting sense. However, as the proportion of corporate savings to aggregate savings is of a small magnitude, lack of data in this regard can at least be ignored. But what is most disturbing is

the inadequacy of arrangements to collect data in regard to public sector, especially those of local bodies such as village, taluka and district panchayats and municipal bodies. Today the only savings figures available on a year to year basis relate to the state government's administrative departments. This is because of the efforts of the state's Bureau of Economics and Statistics from 1963-64 in making a meaningful economic and functional classifications of the state government's budget published each year. But the non-departmental undertakings of the government such as corporations and companies have yet to be brought into the total picture of the public sector savings. The Bureau of Public Enterprises located in the finance department of the state government can usefully take it up not only from now on but also for the past period so that a time-series can be evolved.

In the case of local bodies, non-availability of published budgets, especially for village and nagar panchayats, has posed a major problem. In regard to higher-level bodies such as taluka and district panchayats, though their budgets are available in published form, non-uniformity in the matter of presentation has rendered the economic analysis difficult.

Yet another problem is in regard to public sector operations of the central government in Gujarat. Both the savings of the central departments and non-departmental enterprises operating in the state are presently reflected in the central public sector savings.

Given these formidable constraints, an attempt is made to present a time-series of aggregate state savings on the basis of national income figures. Utilising the national data on net domestic savings

per capita and net domestic product per capita of the country over the seventeen-year period (1960-61 to 1976-77) presented in Table 1, a linear per capita savings and per capita income relationship is fitted by a regression equation as follows:

$$S_{I,t} = a + by_{I,t} + u_{t,h} \quad \dots (1)$$

where,

s_i = net domestic savings per capita of India in current prices,

y_i = net domestic product per capita of India in current prices,

a = intercept,

b = marginal propensity to save per capita,

u = error term, and

t = time period under consideration.

Since the value of the estimated 'b' represents the average national per capita marginal propensity to save (mps) and since the per capita net domestic product of Gujarat is uniformly higher than the national average, the corresponding value of 'b' for the state has to be higher than the national figure. This is for the reason that the propensity to save at the margin out of a higher income is likely to be higher. However, in the absence of any reliable data a simplistic assumption has been made that the 'mps' is higher by the size of the proportion of per capita income of Gujarat to national per capita income. In symbols, the per capita marginal propensity to save for Gujarat for the

year 't' is:

$$b_{G,t} = b \frac{y_{G,t}}{y_{I,t}} \quad \dots (2)$$

where,

$b_{G,t}$ = marginal propensity to save per capita for Gujarat in period t,

$y_{G,t}$ = per capita net domestic product of Gujarat in current prices, and

$y_{I,t}$ = per capita net domestic product of India in current prices in period t.

Net savings per capita of Gujarat in current prices in period 't' is obtained by the substitution in the linear relationship obtained in (1).

$$\begin{aligned} s_{G,t} &= a + b_{G,t} \cdot y_{G,t} \\ &= a + b \frac{y_{G,t}^2}{y_{I,t}} \quad \dots (3) \end{aligned}$$

Thus, for each year of the seventeen-year period, figures of per capita net savings are generated and when multiplied by the estimate of population for each year, they yield the net aggregate savings of the state in current prices for each year.

The estimated regression equation yielding the per capita marginal propensity to save for India is given below:

$$S_{I,t} = -35.161 + 0.192y_{I,t} \quad (-5.56) (20.93)$$

$$R^2 = 0.9663 \quad \text{degrees of freedom: 15}$$

DW Statistic⁴: 0.9249
(Figures in parentheses denote 't' values.)

Table 1

Per Capita Net Domestic Product, Savings and Aggregate Net Savings : India and Gujarat
(In Current Prices)

Year	India			Gujarat		
	Per capita net domestic product (Rs.)	Per capita net domestic savings (Rs.)	Net domestic savings (Rs. crores)	Per capita net domestic savings (Rs.)	Estimated figures Per capita net domestic savings (Rs.)	Estimated figures Net domestic savings (Rs. crores)
1960-61	305.6	30.58	1327 (10.01)	362	47.37	96.66 (13.09)
1961-62	315.0	28.85	1281 (9.15)	397	61.15	127.81 (15.39)
1962-63	325.9	34.01	1544 (10.42)	390	54.67	117.01 (19.99)
1963-64	365.9	39.33	1825 (10.72)	414	55.01	121.01 (13.29)
1964-65	422.0	42.68	2023 (10.10)	494	76.16	172.12 (15.45)
1965-66	425.5	52.82	2562 (12.41)	498	77.03	177.95 (15.45)
1966-67	481.8	62.87	3112 (13.05)	564	91.92	217.85 (16.28)
1967-68	554.4	58.08	2939 (10.48)	652	112.44	274.36 (17.27)
1968-69	552.3	58.13	3011 (10.53)	605	92.41	231.04 (15.29)
1969-70	597.5	78.05	4129 (13.06)	693	119.55	306.07 (17.22)
1970-71	637.1	85.34	4617 (13.42)	842	179.38	471.79 (21.32)
1971-72	663.0	90.58	5018 (13.66)	836	165.75	452.93 (20.08)
1972-73	713.6	94.49	5348 (13.24)	762	156.77	432.67 (20.05)
1973-74	873.7	123.94	7164 (14.18)	1092	227.56	644.01 (20.08)
1974-75	1007.2	150.20	8862 (14.91)	1033	162.87	472.34 (15.76)
1975-76	1008.3	166.42	10002 (16.51)	1205	242.05	718.89 (20.09)
1976-77	1048.6	187.88	11517 (17.92)	1341	294.96	896.69 (22.02)

NOTE:—Figures in parentheses denote percentages of net domestic products.

SOURCE:—Central Statistical Organization: *National Accounts Statistics, 1960-61 to 1974-75, October 1976 and 1970-71 to 1975-76, January, 1978.*

The estimated figures of per capita net savings and aggregate net savings of Gujarat, following the procedure outlined above, are given in Table 2. Per capita net domestic product of Gujarat for each year during the seventeen-year period is higher than that of India. The estimated figures of per capita net savings of Gujarat for each year also follow the same pattern.

At all-India level, net savings in the recent years formed 14 to 17 % of net domestic product. In 1975-76 it was 16.51% and in 1976-77, 17.92%. In Gujarat, net savings formed 20.00% in 1975-76 and 22.02% in 1976-77. During the seventeen-year period, the percentage figures of Gujarat's net estimated savings to net domestic product are higher than those at the all-India level.

As observed earlier, figures relating to net savings of government of Gujarat are available from 1963-64 onwards mainly because of the economic and functional classification procedure of budgets of the state government. Table 2 provides these figures along with estimated aggregate net savings for the period 1963-64 to 1976-77. If we subtract the government net savings from the estimated net savings, we may arrive at the residual figure which can be called non-government savings of the state. The residual figure would incorporate in itself savings of local bodies, non-departmental undertakings of government, corporate sector, central government's departmental and non-departmental savings and the households, both the rural and urban sector. Government net savings formed less than 10% of aggregate net savings until 1970-71 and rose substantially in 1974-75 to the extent of 18.9%, whereas the proportion of residual

net savings declined in percentage terms over the period.

The next section is an attempt to find out the determinants of government net savings and residual net savings.

II. Determinants of Savings

Departing from the simple Keynesian hypothesis of a saving function, let us postulate that savings as a variable is affected by various factors besides income. These include tax rate and price level.[5] It is held that fiscal policy as a means of mobilizing savings is an important variable in the determination of domestic savings.[6] If we separately consider government savings, there might be a positive relationship between government savings and tax revenues. However, this direct relationship has been questioned by Plese [7] who suggested that the marginal propensity to consume by government out of increased revenues is extremely high and that in several cases increased taxation might have led to reduced national saving. In a functional relationship between government savings and taxes, the latter may have a positive coefficient, but it may emerge with a negative coefficient in the relationship with private savings. Thus, there is a belief that the increase in government savings would be more than offset by a decrease in the rate of private savings.[8]

As regards price level, a commonly held hypothesis is that higher prices by lowering the value of assets and thus by discouraging consumption might encourage savings.[9] But a contrary view also prevails that higher prices caused by monetary policy changes might be associated with lower interest rates which might

discourage savings.[10] An attempt was also made to distinguish between the effects of absolute price level and the effects of changes in price level on private savings in particular. It is hypothesised that a rise in absolute price level would reduce the capacity to save by making fixed income earners worse off. Thus, it is suggested that there exists a negative relationship between private savings and price level.[11] On the other hand, expectation of price changes leads to changes in the pattern of consumption. If the consumer expects a rise in price, he would spend more on consumer durables and a more well-placed consumer would go in for durables such as housing, which is recorded as saving. Thus the expectational effect of rising prices is to increase savings and, therefore, there is a positive relationship between price level changes representing expectations and private savings. [12]

The above relationships are formulated in the model given below:

$$S = f(Y, T, P, P^*, u)$$

where,

- S = real net savings,
- Y = real net domestic product,
- T = real tax revenues,
- P = price level,
- P* = expected price level, and
- u = error term.

A simple linear form of the regression equation may be written as follows:

$$S_t = a_0 + a_1 Y_t + a_2 T_t + a_3 P_t + a_4 (P_t - P_{t-1}) \dots (4)$$

The above can be simplified for estimation purposes:

$$S_t = a_0 + a_1 Y_{st} + a_2 T_t + b_1 P_t + b_2 P_{t-1} \dots (5)$$

where,

$$\begin{aligned} b_1 &= a_3 + a_4 \text{ and} \\ b_2 &= -a_4. \end{aligned}$$

Another model which can be thought of is the one dealing with proportional relationship:

$$\frac{S}{Y} = f\left(\frac{T}{Y}, \frac{\Delta Y}{Y_{t-1}}, \frac{\Delta P}{P_{t-1}}\right)$$

The regression equation for operational processes would be

$$\left(\frac{S}{Y}\right)_t = a_0 + a_1 \left(\frac{T}{Y}\right)_t + a_2 \left(\frac{\Delta Y}{Y_{t-1}}\right) + a_3 \left(\frac{\Delta P}{P_{t-1}}\right) \dots (6)$$

Government net savings and the estimated residual savings, both expressed at constant prices (1970-71) were made subject to regression analysis and equation (5) and (6) were fitted to the data presented in Table 2. In regard to taxes, one can distinguish between the state taxes (Ts) and central taxes (Tc). While data on revenue from state are available, data on collection of revenue from various central taxes in the state are not readily available. Further, due to share-in procedure of central tax revenues, only some part of central taxes form parts of the state revenues and the rest of the revenues is retained by the centre. Since data on shared revenues from central taxes are available, they have been taken as such to

Table 2

Estimated Aggregate Net Savings, Government Net Savings and Residual: Gujarat State

(Rs. crores)

Year	Estimated aggregate net savings in current prices	Government net savings in current prices*	Residual net savings in current prices	Government net savings at constant prices	Residual net savings at constant prices
1963-64	121.02	11.46 (9.5)	109.56 (90.5)	19.16	183.21
1964-65	171.12	14.14 (8.2)	157.91 (91.8)	20.95	234.04
1965-66	177.95	12.24 (6.9)	165.71 (93.1)	16.84	227.94
1966-67	217.85	13.68 (6.3)	204.17 (93.7)	16.52	246.58
1967-68	274.36	22.77 (8.3)	251.59 (91.7)	24.64	272.28
1968-69	231.04	17.57 (7.6)	213.53 (92.4)	19.18	233.88
1969-70	306.07	12.58 (4.1)	293.49 (95.6)	13.27	309.59
1970-71	471.79	32.63 (6.9)	439.16 (93.1)	32.63	439.16
1971-72	452.93	61.59 (13.6)	391.34 (86.4)	58.32	370.58
1972-73	432.67	43.86 (10.1)	388.81 (89.9)	37.75	334.60
1973-74	644.01	37.05 (5.8)	606.96 (94.2)	26.52	434.47
1974-75	472.34	89.34 (18.9)	383.00 (81.1)	51.08	218.98
1975-76	718.34	122.02 (17.0)	596.88 (89.0)	70.53	345.02
1976-77	896.69	93.67 (10.5)	803.02 (89.5)	53.22	456.26

NOTE:—Figures in brackets denote percentages to aggregate net savings.

*Government of Gujarat, Bureau of Economics and Statistics, *A Note on the Existing Position Regarding Availability of Data on Savings* (Mimeo.), 1978.

represent the variable, central taxes, in the regression equation. The assumption behind the analysis is that a constant proportion of total central taxes collected in the state is transferred to the state revenues each year during the period under study. No doubt this is a very restrictive assumption but, under the circumstances of data constraints, such an assumption seems necessary.

The fitted equations for government net savings (SG) are:

$$\begin{aligned} S_{G,t} &= -10.362 + 0.002Y_t + 0.094T_{st} \\ &\quad (-0.35) \quad (0.06) \quad (0.18) \\ &+ 0.152 T_{ct} - 0.037 P_t + 0.341 P_{t-1} \\ &\quad (0.36) \quad (0.10) \quad (0.65) \end{aligned}$$

$R^2 = 0.6989$ degrees of freedom: 8

DW = 1.987

$$\left(\frac{S_G}{Y}\right)_t = -0.0172 + 0.673 \left(\frac{T_s}{Y}\right)_t$$

(-1.88) (3.10)

$$-0.138 \left(\frac{T_c}{Y}\right)_t + 0.095 \left(\frac{\Delta Y}{Y_{t-1}}\right)$$

(-0.42)

$$+ 0.013 \left(\frac{\Delta P}{P_{t-1}}\right)$$

(0.56)

$R^2 = 0.5975$ degrees of freedom: 9

DW = 2.263

(Figures in parentheses denote 't' values.)

Equation fitting the Government net savings in absolute form emerged as a poor fit. None of the variables was found significant, the level of significance chosen being 5%. But the equation fitting the average relationship between savings and income was observed to be more meaningful, though only one variable, namely, ratio of state taxes to income, was found to be significant at 5% level applying the two-tailed 't' test. This would mean that state government was able to save more out of the increased revenue through its own taxation, rejecting Please's hypothesis that the Government tends to consume more out of its revenue increases. Both contral taxes and changes in income were dropped from the equation and regression was run again. A statistical test was carried out whether the dropped variable had any impact on the dependent variable. The F test showed that the omitted variables were not found significant. The new equation is as follows:

$$\left(\frac{S_G}{Y}\right)_t = -0.0165 + 0.611\left(\frac{T_G}{Y}\right)_t + 0.93\left(\frac{\Delta P}{P_{t-1}}\right)$$

(−1.91) (3.96)

(0.58)

$R^2 = 0.5898$ degrees of freedom: 11

$DW = 1.0281$

The coefficient of ratio of state taxes to income has come out with a higher magnitude and confirms the positive direction of change associated with tax and government savings.

The estimated regressions for residual net savings (SR) of the economy of the state are the following:

$$S_{R,t} = -324.967 + 0.356 Y_t - 0.399 T_{s,t} + 1.41 T_{c,t} - 0.143 P_t - 0.16 P_{t-1}$$

(6.72) (8.77) (−0.45) (16.3) (−0.20) (−0.19)

$R^2 = 0.9663$ degrees of freedom: 8

$DW = 1.6789$

$$\left(\frac{SR}{Y}\right)_t = 0.082 + 1.076\left(\frac{ST}{Y}\right)_t + 0.520\left(\frac{TC}{Y}\right)_t + 0.156\left(\frac{\Delta Y}{Y_{t-1}}\right) - 6.078\left(\frac{\Delta P}{P_{t-1}}\right)$$

(2.52) (1.47) (0.49) (3.40) (1.10)

$R^2 = 0.6241$ degrees of freedom: 9

$DW = 2.5412$

(Figures in parentheses denote 't' values.)

In the equation with residual savings as dependent variable only income is found to have a significant positive association with net residual savings of the economy. The magnitude of the coefficient is also quiet high. But the remaining variables are found to be non-significant, the level of significance chosen being 5% and the 't' test being two tailed-one.

In regard to the equation with ratio of residual net savings to net domestic product as dependent variable, only changes in the net domestic product is found to be a significant variable.

To sum up, the regression analyses

performed to find out the determinants of savings, other than government net savings shows that the only significant determinant was income and the other variables including the absolute and expected price variables were found to be of no consequence. As regards government savings, no clear relationship emerged but ratio of state taxes to state income was found to be positively associated with the government savings expressed as a proportion of state net domestic product. Though the "weak" hypothesis of Please was refuted by the analysis, the strong hypothesis could not be either rejected or accepted since the coefficient of the ratio of state taxes to income in the functional relationship of residual savings expressed as a propoertaion of state domestic product was found to be non-significant, though it had the positive sign.

III. Summary and Conclusions

This paper focussed attention on the difficulties experienced by the states in regard to data on savings despite the availability of data on state domestic product. However, under certain restrictive assumptions, the data on national per capita income and per capita savings and state per capita income were used to generate aggregate savings data.

From the estimated aggregate net savings of the state, the government net savings data reported by the Bureau of Economics and Statistics were subtracted to arrive at savings of residual nature, incorporating the savings of households, corporate sector and local bodies and central public sector in the state.

The determinants of both government net savings and the residual savings were sought to be found out through multiple

regression analysis. The variables used in the analysis were income, taxes and price level. Only income was found to be a significant determinant of savings other than government savings. In regard to government net savings expressed as a proportion of income, state tax ratio emerged as a significant variable. Thus, state taxation relative to income is a significant instrument to mobilize savings of the government. Further, the commonly held hypothesis that government tend to consume more out of the increased revenues at the margin has been found rejected. In the case of savings of the rest of the economy, taxation has no impact as its coefficient was found to be not significant.

The policy implications are the following:

- While it is conceded that savings data are lacking in the states and that there are insurmountable difficulties, the data on public sector savings can still be collected by the state government. The steps necessary are: (a) to bring the public sector companies and corporations of the state into the picture, (b) to take into account the savings of central governments departmental and non-departmental enterprises in the state, and (c) to require the local bodies to prepare account on state lines and to present their budgets in a uniform acceptable manner in accordance with the state's economic and functional classification; and
- fiscal policy can be utilised in a more aggressive manner to mobilize government savings.

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