The Budget, Money and Credit

A Macroeconometric Analysis

Srinivasa Madhur

Pulin Nayak

Prannoy Roy

The authors here present a model of the fiscal and monetary sectors of the Indian economy for short-term macro economic forecasting and policy formulation and, in particular, for analysing the implications of the annual budget of the Central government for the economy at large. The effect of the budget on certain key macro variables such as money, credit and inflation is sought to be studied with the help of the model

It is seen that many of the policy variables in the monetary sector which earlier investigations seemed to find insignificant can in fact be important and effective instruments in the hands of policy-makers. It is also found that in formulating its interest rate policy, it is futile for the central bank to raise or lower all rates of interest by a common factor — it needs, instead, to use an appropriate structure of differential interest rates to achieve its stated objectives.

The authors' fiscal sector equations go to show why actual budget deficits differ from those estimated by the Finance Ministry. Here the results obtained highlight how important feedback effects from the real sector are and, consequently, the need for the government to be able to accurately predict inflation and the growth rate of the economy.

I

Introduction

THIS paper presents a model of the fiscal and monetary sectors of the Indian economy with the primary objective of using this framework for purposes of short term macroeconomic forecasting and policy formulation. The model may be used, in particular, to analyse the implications of the annual budget of the Central government for the economy at large. The usual studies that analyse the impact of the budget are either qualitative in nature or quantitative predictions are at best based on casual empiricism. Our attempt here is to systematically analyse the effect of the budget on certain key macro variables such as money, credit and inflation with the help of a macro model of the Indian economy.

Although macroeconometric modelling of the Indian economy is at a rather primitive stage, in the last decade there have been several attempts at analysing the interrelationship among key macro variables [see, for example, Ahluwalia (1979), Bhattacharya (1982), Desai (1973), Pandit (1973), Pani (1977) and Srivastava (1981), among others]. While the works cited above have contributed in varying degrees towards our understanding of the economy, they are generally couched in a framework which is not readily amenable to analysing the implication of the annual Central government budget or for short term forecasting purposes. Our model is an attempt towards filling this gap.

In view of the recent IMF loan, additional significance is attached to short term monitoring of the Indian economy. The model outlined below has been geared to provide forecasts for many of the variables for which the IMF has set annual targets — the growth rates of commercial bank credit to the government and commercial sector separately, the rate of inflation, the growth of money supply, to name a few. These targets can be traced back through the equation system to the policy variables and an assessment can be made of the importance of different instruments in terms of specific goals.

The plan of the present paper is as follows:

Section 2 : Model Specification
Section 3 : Econometric Results
Section 4 : Forecasts of Key Monetary and Fiscal Variables for 1982-83
Section 5 : Concluding Remarks

II

Model Specification

It should be mentioned at the outset that the model of the fiscal and monetary sectors presented here is in the nature of work in progress. Thus there exists substantial scope for improvement in the specifications of individual equations and in the model as a whole, particularly in the direction of greater disaggregation. The specification of individual equations have been dictated by the need to forecast and one has to realise that there often exists a trade off between analytical niceties, and the practicality/feasibility of the specifications to readily obtain computable predictions. For example, while we would have preferred to work with the economic classification of the Central government budget, we have had to do without it because the government issues these data rather late in the financial year, and hence these are not of much use for immediate short-run forecasting. Similarly, other such sacrifices in the choice of data and specifications are the rule rather than the exception in any forecasting exercise.

Conceptually the model divides the economy into four basic sectors:

i The Fiscal Sector
ii The Monetary Sector
iii The Foreign Trade Sector, and
iv The Real Sector.

The real sector, in turn, is divided into (a) agriculture and allied (primary), (b) manufacturing and allied (secondary) and (c) services (tertiary).

The model, in a nutshell, is as follows: The fiscal and the foreign trade sectors determine the stock of high powered money, or the unborrowed monetary base. Given the stock of high-powered money, the cash reserve ratio of commercial banks, the spectrum of interest rates and the spread of banking habits, the monetary sector determines the stock of money (M3), aggregate deposits and total bank credit. It also determines the division of the bank credit into (a) bank credit to commercial (or private) sector, and (b) bank credit to the government sector.[1] Given the stock of money and credit, their interaction with the real sector determines the rate of inflation, the relative price of agriculture to manufacturing along with the GNP and its sectoral components. The real sector feeds back into the fiscal sector through the dependence of tax revenues (and, to a limited extent, also government expenditure) on the rate of inflation and the growth rate of real income in the non-primary/secondary sector. These feed back effects are carried on to the monetary sector through the government budget constraint which determines the major component of the high powered money, *viz*, net RBI credit to the government sector. The simultaneous nature of the model is evident in the interdependence of the real and financial sectors — cf, flow chart.

In the present paper, we focus on only the fiscal and the monetary sectors of the economy.[2] These are perhaps the least understood but the most important channels through which the major instrument/policy variables — such as the ones contained in the budget and the RBI policy variables — affect the economy in the short as well as in the long run. In a separate paper we intend to present our formulation of the foreign trade and the real sectors of the economy. One need hardly emphasise that it is the interplay of all the four above mentioned sectors that would determine the magnitude of the key macro variables.

THE MONETARY SECTOR

The monetary sector is modelled within the overall framework of the money-multiplier (hereafter referred to as m-m) theory of money-stock determination originally developed in Cagan [1963] and Friedman and Shwartz [1965] and used by a number of authors since. More specifically, the stock of broad money and aggregate deposits are determined by the following relations (see Appendix for derivations).

(2.1) $M_3 = [1+k)/(k+r-g)]\ H^*$

(2.2) $D = [1/(k+r-g)]\ H^*$

The bracketed expressions in equations (2.1) and (2.2) are the familiar money and deposit multipliers of the m-m model. These multiplier values, in turn, depend on three asset ratios[3]: the currency to deposit ratio of the public: k, the reserve to deposit ratio of banks: r, and the borrowings (from the Reserve Bank of India) to deposit ratio of banks: g.

It is sometimes argued that the m-m model provides a mechanistic explanation of money-stock determination and as such abstracts from all the main operational problems facing the policy marker in achieving a desired level of money-stock [see Majumdar (1976); Shetty, *et al* (1976) and RBI (1977)]. Following this line of reasoning, the Second Working Group of the RBI, RBI [1977], was critical of the m-m model on the grounds that the m-m model abstracts from the operational problems of policy making. This criticism appears to be based on the mistaken belief that the m-m model takes the asset rotios (and hence the money-multiplier) as constants.

It is, however, important to appreciate that the constancy of the asset ratios is not a necessary condition for the applicability of the m-m model. It is quite possible [see Gupta (1979)] to incorporate into the m-m model, behavioural hypotheses regarding the determinants of the asset ratios. Given these behavioural hypotheses, the policy maker can plan for a desired stock of money either by controlling the unborrowed monetary base, H* and/or by influencing the asset ratios. Thus, from the policy maker's point of view, the knowledge of the channels through which policy variables affect the asset ratios is of extreme importance for the practical formulation of monetary policy. It is against this background that we model the determinants of the three asset ratios paying special attention to the effects of the policy variables on them. In an earlier attempt, Swamy [1974] found that (for the period 1951-52 to 1970-71) the policy variables of the RBI were unimportant in determining the value of the money-multiplier. In contrast, the empirical results presented here (for the period from 1951-52 to 1979-80) show that these policy variables are extremely significant in the determination of the money-multiplier.

The currency to deposit ratio is basically a decision variable of the public. It can be viewed as the relative demand for currency *vis-a-vis* deposits by the public. Thus interpreted, the determinants of it can be classified into two 'meaningful categories:

i the banking habits of the public, and
ii the rate of interest on deposits relative to that on currency.

In a developing economy like India, the banking habits of the public can be expected to depend essentially on the spread of banking facilities in general and in the rural areas in particular. The relative rate of interest on deposits *vis-a-vis* currency can be reasonably well represented by the rate of interest on one year time deposits of banks. We thus have the following specification for the currency to deposit ratio:

$$(2.3)\quad k=k\,(\underset{-}{NCB},\ \underset{-}{NRCB/NCB},\ \underset{-}{RDEP})$$

Whereas the currency to deposit ratio is basically a decision variable of the public, the reserve to deposit ratio is largely a decision variable of the commercial banks. More specifically, the reserve ratio can be formalised as an asset-demand function of the banks normalised in terms of deposits. It can thus be specified as a function of the statutory cash reserve ratio of banks, the yield that commercial banks can earn on substitutes to reserves and the cost of obtaining reserves from the Central Bank. An increase (decrease) in the statutory cash reserve ratio can be expected to have a positive (negative) effect on the reserve ratio. On the other hand, an increase (decrease) in the yield on substitutes to reserves relative to the cost of borrowings from the Central Bank has a negative (positive) effect. The major alternatives to holding reserves open to commercial banks in India, are two: lending to the private or commercial sector and lending to the government sector. Accordingly, we select the weighted advance rate of commercial banks and the weighted yield rate of Government of India rupee securities as the measures of the yield on substitutes to holding reserves. The bank rate is used as a proxy for the cost to the commercial banks of borrowings from the RBI. We then have

$$(2.4)\quad r=r\,(\underset{+}{SCRR},\ \underset{+}{ICRR},\ \underset{-}{RAD},\ \underset{-}{RG},\ \underset{+}{RB})$$

As an alternative to equation (2.4) it is possible to deduct the statutory cash reserve ratio of banks from the actual reserve ratio and relate the resulting excess reserve ratio to the spectrum of interest rates [see Mammen (1967), Gupta (1973) and Chitre (1976)]. The implicit assumption here is that there is a one-to-one relation between the statutory cash reserve ratio and the actual cash reserve ratio of banks. Put differently, it implies that the excess reserve ratio of banks is invariant to the statutory cash reserve ratio. However, it is quite possible that whenever the statutory cash reserve ratio is increased, banks economise on reserves and hence raise their actual reserve ratio by less than the corresponding increase in the former. In such a case, the excess reserve ratio would not be invariant to the statutory cash reserve ratio. Equation (2.4) makes allowance for any such economising by the banks and hence is more general than the alternative specification that relates the excess reserve ratio to the spectrum of interest rates.

Regarding the banks' borrowings (from the RBI) to deposit ratio, two alternative specifications are conceivable: one is to view the ratio as a decision variable of the commercial banks and the other is to treat it as a policy variable of the RBI. The former can be rationalised on the grounds that the RBI fixes the cost of its lending and the banks determine the actual volume of borrowings. The latter hypothesis implies that the RBI fixes the actual volume of its lending to the banks and consequently the cost of its lending becomes an endogenous variable. The assumption that the RBI fixes the cost of its lending — in the form of the bank rate — appears to be an appropriate characterisation of the RBI's monetary policy. Accordingly, we specify the borrowings to deposit ratio as a portfolio-choice equation of the banks:

$$(2.5)\quad g = g\,(\underset{+}{\text{RAD}},\ \underset{+}{\text{RG}},\ \underset{-}{\text{RB}},\ \underset{+}{\text{SCRR}},\ \underset{+}{\text{ICRR}})$$

Given the policy determined values of the spectrum of interest rates (namely, RDEP, RAD, RB and RG), the statutory reserve ratios (namely, SCRR and ICRR) and the banking facility proxies (namely, NCB and NRCB/NCB), equations from (2.1) through (2.4) determines the stock of money and aggregate deposits for given values of the unborrowed monetary base, H*.

Aggregate deposits are the liabilities of commercial banks. The counterpart of deposits on the asset side of the banks is aggregate credit, i e, the sum of credit to the commercial sector and to the government sector. The following equation links the aggregate deposits to aggregate credit

$$(2.6)\quad C = c\,(\underset{+}{D})$$

It is important to mention here that equation (2.6) does not imply any causal relationship between aggregate deposits and aggregate credit. It simply serves to establish the link between the two.

According to the portfolio choice theory, the allocation of aggregate credit between the commercial and the government sectors can be hypothesised to depend upon the rates of interest on the loans to the two sectors and the cost of borrowings from the RBI. However, it is sometimes argued that in the Indian context, the sectoral allocation of commercial bank credit is also influenced by the statutory liquidity ratio. Some go so far as denying any role to the interest rates in the sectoral allocation of credit and argue that it is determined basically by the statutory liquidity ratio [see Sheshadri (1976) and Avadhani (1978)]. Treating this view as a testable hypothesis, rather than as a maintained hypothesis, we specify the following equation for the sectoral allocation of credit:

$$(2.7)\quad h = h\,(\underset{+}{\text{RAD}},\ \underset{-}{\text{RG}},\ \underset{-}{\text{RB}},\ \underset{-}{\text{SLR}})$$

Once the aggregate commercial bank credit and the commercial bank credit to the commercial sector are determined, commercial bank credit to the government sector is derived residually.

Once the asset ratios are known, the stock of money, deposits and credit depend on the unborrowed monetary base, H*. Thus H* is the crucial variable for monetary analysis and predictions. In macro-analysis, it is typical to treat H* as a policy determined, variable.[4] This is, however, a reasonably good assumption only in the case of certain components of H*. We have accordingly attempted to model the important components of H*:

$$(2.8)\quad H^* \equiv \text{RBINCG} + \text{RBICCS} + \text{RBINFER} - \text{RBINNML}$$

We treat the RBI credit to commercial sector, RBICCS as a decision variable of the RBI. However, purely for prediction purposes we experimented with a simple hypothesis that in any year the RBI fixes the level of its credit to the commercial sector as a mark-up over its levels in the preceding years. Interestingly enough, this simple hypothesis appears to capture the essence of RBI's decision-making reasonably well.

Since the RBI's net non-monetary liabilities, RBINNML, are essentially in the nature of a residual item, we assume that it is exogenous. Variations in the net foreign exchange reserves of RBI, RBINFER, depend on the balance of payments position. The latter depends on the imports relative to exports and the net remittances from abroad. These are modelled in our foreign trade sector.

We are thus left with the RBI's net credit to the government sector which is the end-product of the fiscal sector equations.

The Fiscal Sector

Data compulsions involved in economic forecasting compel us to adopt a two step procedure in estimating the combined budget deficit of the Centre, states and Union Territories. With the announcements of state budgets dragging on well into the fiscal year it becomes necessary first to determine the receipts and expenditure of the Centre and, next, to blow these up to get the receipts and expenditure of the government sector as a whole. The budget constraint of the government is then used to arrive at the overall budgetary deficit.

Changes in net credit to the government by the RBI, which enters as a major variable determining the growth of the unborrowed monetary base (H*) are determined largely by the overall budgetary deficit of the Centre, states and Union Territories. This then forms the crucial link between the fiscal and monetary sectors of the model.

The basic aim of the fiscal sector is to identify the non-random factors that cause actual government receipts and expenditure to differ from those announced in the budget. Our model is therefore geared to throw light on why actual government deficits diverge from, and are typically larger than, the Finance Ministry's estimated deficits. Once these factors are systematically identified, more accurate fiscal information can be fed into the other sectors of the model.

Consequently our forecasting model of the fiscal sector differs from earlier models [cf, Bhattacharya (1982), Ahluwalia (1979), Srivastava (1981)] both in its objectives and in its approach. With short term policy as the primary aim we use the *ex ante* intentions of the government as revealed in the budget as an important basis of the underlying trend. The deviations of the actual magnitudes from the budgeted may arise as a result of systematic and deliberate misrepresentation — what we might call the 'fudge factor' —

or due to the government's inability to accurately forecast inflation and real growth in the economy or due to random occurrences, or some combination of the above three factors.

On the receipts side of the Central government budget we focus mainly on the four major sources of tax revenue: personal income tax, corporate income tax, Union excise duties and customs duties. Non-tax revenue and net capital receipts are assumed to be exogenous. A simple specification is used for all four tax revenue equation:

$$T_a = R_a \cdot P_a \cdot B_a \qquad (1)$$

$$T_b = R_b \cdot P_b \cdot B_b \qquad (2)$$

where

T = tax revenue,
R = tax rate,
P = price level,
B = tax base in real terms.

Subscripts

a = actual,
b = government budget.

$$\frac{T_a}{T_b} = \frac{R_a}{R_b} \cdot \frac{P_a}{P_b} \cdot \frac{B_a}{B_b} \qquad (3)$$

If we assume that the government's estimates each year are some proportion/mark up of the previous year's levels, then the average proportionality for the period reviewed may be specified as:

$$R_b^t = \alpha \ R_a^{t-1} \qquad (4)$$

$$P_b^t = \beta \ P_b^{t-1} \qquad (5)$$

and

$$B_b^t = \gamma \ B_a^{t-1} \qquad (6)$$

Substituting (4), (5) and (6) in equation (3) we get

$$\frac{T_a^t}{T_b^t} = \frac{R_a^t}{\alpha R_a^{t-1}} \cdot \frac{P_a^t}{\beta P_a^{t-1}} \cdot \frac{B_a^t}{\gamma B_a^{t-1}}$$

or

$$\text{Log} T_a^t = -\text{Log}\, \alpha\beta\gamma + \text{Log}(R_a^t/R_a^{t-1}) + \text{Log}(P_a^t/P_a^{t-1}) + \text{Log}(B_a^t/B_a^t) + \text{Log} T_b^t \qquad (7)$$

Equation (7) forms the basic regression equation from which the following properties can be expected: (i) the coefficients of all the independent variables should be of unit value, (ii) if the government has static expectations and α, β, γ are equal to one, then the constant term should not be significantly different from zero. (Of course, constant term not significantly different zero does not necessarily confirm static expectations as γ, β and γ might take values different from unity but their product may be unity).

Essentially equation (7) represents broad dependence of actual on budgeted receipts for trend values, with deviations from trend being explained by changes in tax rates and the tax base.[5] The basic hypothesis here is that the budgeted tax revenue is based on the government's expectation regarding the effective rate of tax, and the tax base. As a first approximation, these expectations are assumed to be extrapolative, i e, the government expects the base and the rate in period t to be a linear function of the rate and base prevailing in the previous period.[6] Therefore, should the actual rate and base in year t turn out to be different from the values anticipated by the government, the actual revenue from the tax would be different from its budgeted level.

The 'fudge factor' referred to above is highlighted in the co-efficient of $\log T_b^t$. If this co-efficient is significantly less than one, it indicates that even after accounting for other deviations from trend, the finance ministry systematically reports a higher expected revenue from tax receipts than it actually hopes to get.

On the expenditure side of the Central government budget the two broad heads that we look at are revenue expenditure and capital expenditure.[7] As mentioned earlier, it would have been preferable to use the economic classification but this information is published much after the budget presentation. We have, therefore, had to restrict our model formulation to make use of data that is presented in the Central government budget.

We postulate that government revenue expenditure (actual) is explained by the budgeted revenue expenditure and two other factors. The first is the ratio of the actual net external loan to its budgeted value. The hypothesis is that if the ratio is less than unity then this presents an important constraint on government spending. On the other hand, if the ratio is greater than unity then there is a slack in the government budget constraint to the extent of the excess of the actual over the budgeted. The second factor is a dummy variable for the wars of 1962, 1965 and 1971. The hypothesis is that public expenditure goes up in discrete jumps in events of major national disturbances such as wars. This hypothesis is related to, but not quite the same as, the Wagner's law of public expenditure [Wagner (1958)].

The capital expenditure of the Central government (actual) is assumed to depend on its budgeted value and the NDP deflator of the secondary sector. We have also tried to use an alternate specification where, in addition to the two variables mentioned above, we have used the ratio of net external loans (actual to budgeted).

It should be pointed out here that all the fiscal sector regression equations have been estimated for log linear specifications.

Next, the revenue and capital receipts of the Centre as well as its revenue and capital expenditures are blown up to obtain the revenue and capital receipts and the revenue and capital expenditures of the Centre plus states plus the Union Territories. This gives us now the overall budget deficit of the government sector as a whole.

We finally use the fiscal monetary link equation with relates the change in the RBI net credit to the government to the magnitude of the overall budgetary deficit.

In the next section we present the econometric results on estimating the above equations of the fiscal and monetary sectors.

III

Econometric Results

All the equations of the fiscal and monetary sectors have been estimated using single-equation ordinary least squares (OLS). While two stage least squares and other more sophisticated methods could possibly have been used, there are well known trade-offs that justify the use of OLS [see, for example, Klein and Young (1980)].

Monetary Sector Results

Currency to Deposit Ratio: 1951-52 to 1979-80

We estimated alternative versions of equation (2.3) for the currency to deposit ratio. Out of the various equations that we have experimented with, the following has been chosen:

$$(3.1) \quad k = \underset{(5.56)}{3.159} - \underset{(9.33)}{0.1319}\text{RDEP} - \underset{(2.75)}{0.00001}\text{NCB} - \underset{(2.71)}{2.326}\left(\frac{\text{NRCB}}{\text{NCB}}\right)$$

$$R^2 = 0.948$$
$$= 1.18.$$

In line with the *a priori* specification, all the three explanatory variables in equation (3.1) have negative co-efficients that are significant. The co-efficient of the time deposit rate is quite large in magnitude and highly significant, suggesting substantial interest-sensitivity of the currency to deposit ratio. Dropping the time deposit rate from the regression leads to an overall deterioration of the statistical results; in particular, it leads to a considerable fall in the Durbin-Watson statistic — a result which further confirms the importance of the time deposit rate as a determinant of the currency to deposit ratio. Since the time deposit rate is a policy variable under direct control of the RBI, it follows that the RBI can control the currency to deposit ratio by appropriate adjustments in the time deposit rate. Equation (3.1) also suggests that in addition to the overall spread of banking facilities, the distribution of banking facilities between the rural and the urban areas has a significant effect on the currency to deposit ratio.

However, equation (3.1) has one disturbing feature and that is the rather low value of the Durbin-Watson statistic. Upon examination we find that the time-profile of the residuals of equation (3.1) is characterised by cyclical fluctuations. It would thus be interesting in future research in this area to examine this cyclical nature of the residuals in more detail.

Reserve to Deposit Ratio: 1952-53 to 1979-80

A feature of the regression results relating to the reserve to deposit ratio which is worth mentioning in the very outset is that in spite of extensive experimentation, the yield rate on government securities, RG, appeared with insignificant co-efficients in almost all the equations in which it was included. Consequently, we ran a set of regressions without including this variable. One such regression equation is presented below:

$$(3.2)\quad r = \underset{(8.99)}{0.062} + \underset{(4.45)}{1.028SCRR} + \underset{(2.87)}{0.175ICRR} - \underset{(3.71)}{0.00959RAD} + \underset{(2.18)}{0.00991RB}$$

$$\bar{R}^2 = 0.844 \qquad DW = 1.39$$

Judged from the point of view of theoretical considerations as well as statistical criteria, equation (3.2) seems to perform well. Each one of the policy variables exhibits a statistically significant co-efficient with the expected sign. Note that the co-efficient of the statutory cash reserve ratio, SCRR is not significantly different from unity. This implies that there is a one-to-one relation between the statutory cash reserve ratio and the actual reserve ratio of banks. Hence, there is no evidence of banks' economising on the reserves following a change in the statutory cash reserve ratio. This is in contrast to the result obtained by Bery [1980] who finds that for every one rupee increase (decrease) in the statutory cash reserves, the actual reserves of banks increase (decrease) by only 0.7 rupee.

It is also interesting to observe from equation (3.2) that the absolute magnitude of the co-efficients of the two interest rates are very close to each other. This suggests that it is the difference between the rate of interest on earning assets and the cost of borrowings from the RBI that matters for the reserve ratio determination, irrespective of whether this difference is due to a change in the rate of interest on earning assets or due to that in the cost of borrowings. Once again, this result is quite different from the results of some of the earlier studies. For example, Gupta [1973] finds that the bank rate has almost no effect on the excess reserves of banks whereas the advance rate has a substantial negative effect. The same is true of the results obtained by Bery [1980]. In one of her formulations, Swamy [1974] obtains a significant negative co-efficient for the advance rate and an insignificant negative co-efficient for the bank rate.

Equation (3.2) thus provides important insights both for monetary analysis and monetary planning in India, It provides substantial evidence of the important role that policy variables play in the determination of the stock of money and credit in India.

Borrowings (from RBI) to Deposit Ratio: 1952-53 to 1979-80

As in the case of the reserve ratio, the yield rate on government securities turned out to be an unimportant explanatory variable in the regressions concerning the borrowings to deposit ratio. Consequently, after preliminary experimentation we dropped that variable from the regressions. It was also found that there was a sudden dip in the borrowings to deposit ratio around 1970-71. This dip in the ratio was largely in the form of a structural shift in the ratio. To take account of this structural shift we included a shift dummy variable, DUM70 in our regressions and re-estimated a few versions of equation (2.5), one of these equations is presented below:

$$(3.3)\quad g = \underset{(3.11)}{0.048} + \underset{(3.65)}{0.02114RAD} - \underset{(3.11)}{0.02926RB} - \underset{(0.17)}{0.00078SCRR} - \underset{(2.06)}{0.0217DUM70}$$

$$\bar{R}^2 = 0.474 \qquad DW = 1.76.$$

Once again, the co-efficients of the two interest rate variables, RAD and RB are not significantly different from each other — which stresses the fact that for portfolio decisions of banks, it is the interest rate differential that is important irrespective of the movements in the individual interest rates. Unlike in the case of the reserve ratio, the statutory cash reserve ratio does not have a significant effect on the borrowings to deposit ratio. This implies that for every increase in the statutory cash reserve ratio there is a corresponding increase in the unborrowed-reserves to deposit ratio of banks.

In terms of its explanatory power, equation (3.3) compares poorly with the other two asset ratio functions. There is undoubtedly scope for further refinement in its specification. Perhaps, it is possible that besides fixing the cost of its lending, the RBI also controls the actual volume of its lending to the banks within certain broad limits. For example, during periods of high inflation the RBI may persuade the banks not to borrow more than a specified limit. Under such circumstances, the actual volume of borrowings then becomes a mixed product of portfolio choice of banks and the RBI's policy directive. Hence, in future research it may be worthwhile exploring the possibilities of incorporating the RBI's 'discretionary element' in the determination of the actual volume of banks' borrowings.

The Credit to Deposit Relation: 1952-53 to 1980-81

Estimation of the equation linking the commercial bank credit with the aggregate deposits gave the following result:

$$(3.4)\quad C = \underset{(0.06)}{3.946} + \underset{(128.4)}{1.030D} + \underset{(6.14)}{1013.66DUM70}$$

$$\bar{R}^2 = 0.999 \qquad DW = 0.71$$

DUM70 is a dummy variable included to capture the structural shift caused by the revision of the credit data by the Second Working Group on Money Supply Complication in India.[8]

The Sectoral Allocation of Credit: 1952-53 to 1979-80

The statutory liquidity ratio and the yield rate on government securities always appeared with positive and significant co-efficients in our regressions of the sectoral credit allocation function — a result which is contrary to *a priori* expectations. After extensive experimentation with these variables we dropped them and estimated the sectoral credit allocation function. One such regression equation is reported below:

(3.5a)
$$h = \underset{(30.14)}{0.618} + \underset{(4.29)}{0.0352}\,RAD - \underset{(2.97)}{0.0369}\,RB - \underset{(3.82)}{0.74}\,DPL480 + \underset{(2.03)}{0.0379}\,DUM70$$
$$\bar{R}^2 = 0.862 \quad DW = 1.19$$

DPL480 is a dummy variable included to capture the unusual increase in the commercial banks investments in government securities in 1958-59 and 1959-60 consequent on the institutional arrangements of keeping the PL480 counterpart funds with the State Bank of India. After 1959-60 these funds were gradually transferred from the State Bank of India to the RBI.

The two interest rates, RAD and RB have significant co-efficients with theoretically expected signs. What is more important the absolute magnitude of the two co-efficients are once again very close to each other — a result that we have obtained in the case of the reserve ratio and the borrowings to deposit ratio.

In an attempt to see whether the inclusion of the differential between RAD and RG leads to better empirical results we replaced RAD by the difference between RAD and RG and re-estimated equation (3.5a). The resulting regression is:

(2.5b)
$$h = \underset{(22.55)}{0.699} + \underset{(3.18)}{0.0306}(RAD - RG) - \underset{(1.73)}{0.0195}\,RB - \underset{(3.80)}{0.0826}\,DPL480 + 0.0434\,DUM70$$
$$\bar{R}^2 = 0.828 \quad DW = 0.85$$

The introduction of the interest rate differential leads to the reversal of the perverse sign of the co-efficient of RG and now this co-efficient has the correct sign. However, the introduction of the interest rate differential has atleast two undesirable side effects — one is the deterioration in the already low value of the Durbin Watson statistic and the other sharp reduction in the t-value of the co-efficient of the bank rate, RB.

It is difficult to make a firm choice between equations (3.5a) and (3.5b). Both, however, give a reasonably good flavour of the factors determining the sectoral allocation of commercial bank credit.

RBI Credit to Commercial Sector: 1951-52 to 1977-78

The RBI's lending to the commercial sector in a given year is captured by a distributed lag function of its lending in the preceding years:

(3.6)
$$\Delta RBICCS = \underset{(0.99)}{4.80} + \underset{(2.49)}{0.440}\,\Delta RBICCS_{t-1} + \underset{(2.99)}{0.660}\,\Delta RBICCS_{t-2}$$
$$\bar{R}^2 = 0.700 \quad DW = 2.57$$

FISCAL SECTOR RESULTS

The four equations specifying the various tax revenue receipts are presented first with the independent variables arranged in the order of price changes, real growth, rate changes and budget estimates for each equation:

Customs Duties: 1961-62 to 1979-80

(3.7)
$$CUDA = \underset{(0.89)}{-0.59} + \underset{(5.04)}{1.158}\,\dot{PM} + \underset{(4.28)}{0.985}\,\dot{M} + \underset{(5.22)}{0.878}\,\dot{CURT} + \underset{(30.83)}{1.008}\,\dot{CUDE}$$
$$\bar{R}^2 = 0.985 \quad DW = 2.01$$

Union Excise Duties: 1961-62 to 1979-80

(3.8)
$$UEDA = \underset{(0.54)}{-0.031} + \underset{(2.51)}{0.730}\,\dot{PSEC} + \underset{(2.01)}{0.762}\,\dot{YSEC} + \underset{(3.12)}{0.771}\,\dot{URT} + \underset{(70.77)}{0.987}\,UEDE$$
$$\bar{R}^2 = 0.997 \quad DW = 1.55$$

Personal Income Tax: 1960-61 to 1980-81

(3.9)
$$PITA = \underset{(0.35)}{+0.032} + \underset{(1.58)}{1.032}\,PSEC + \underset{(2.39)}{2.131}\,\dot{YSEC} + \underset{(2.16)}{0.489}\,PRT + \underset{(26.25)}{0.959}\,\dot{PITE}$$
$$\bar{R}^2 = 0.977 \quad DW = 1.05$$

Corporate Income Tax: 1961-62 to 1980-81

(3.10)
$$CITA = \underset{(0.32)}{-0.023} + \underset{(1.93)}{0.995}\,\dot{PSEC} + \underset{(1.08)}{0.753}\,YSEC + \underset{(4.13)}{0.753}\,\dot{CRT} + \underset{(31.82)}{0.953}\,\dot{CITE}$$
$$\bar{R}^2 = 0.985 \quad DW = 1.18$$

The results of each of the above equations tend to confirm the underlying hypothesis in the specification derived in section 2 of this paper. Three characteristics of these equations are worth noting:

(i) The co-efficients of the variables representing price changes, real growth rates and tax rate changes are all not significantly different from unity (except in the case of the change in the personal income tax rate which perhaps requires a different formulation for the government's expectations).

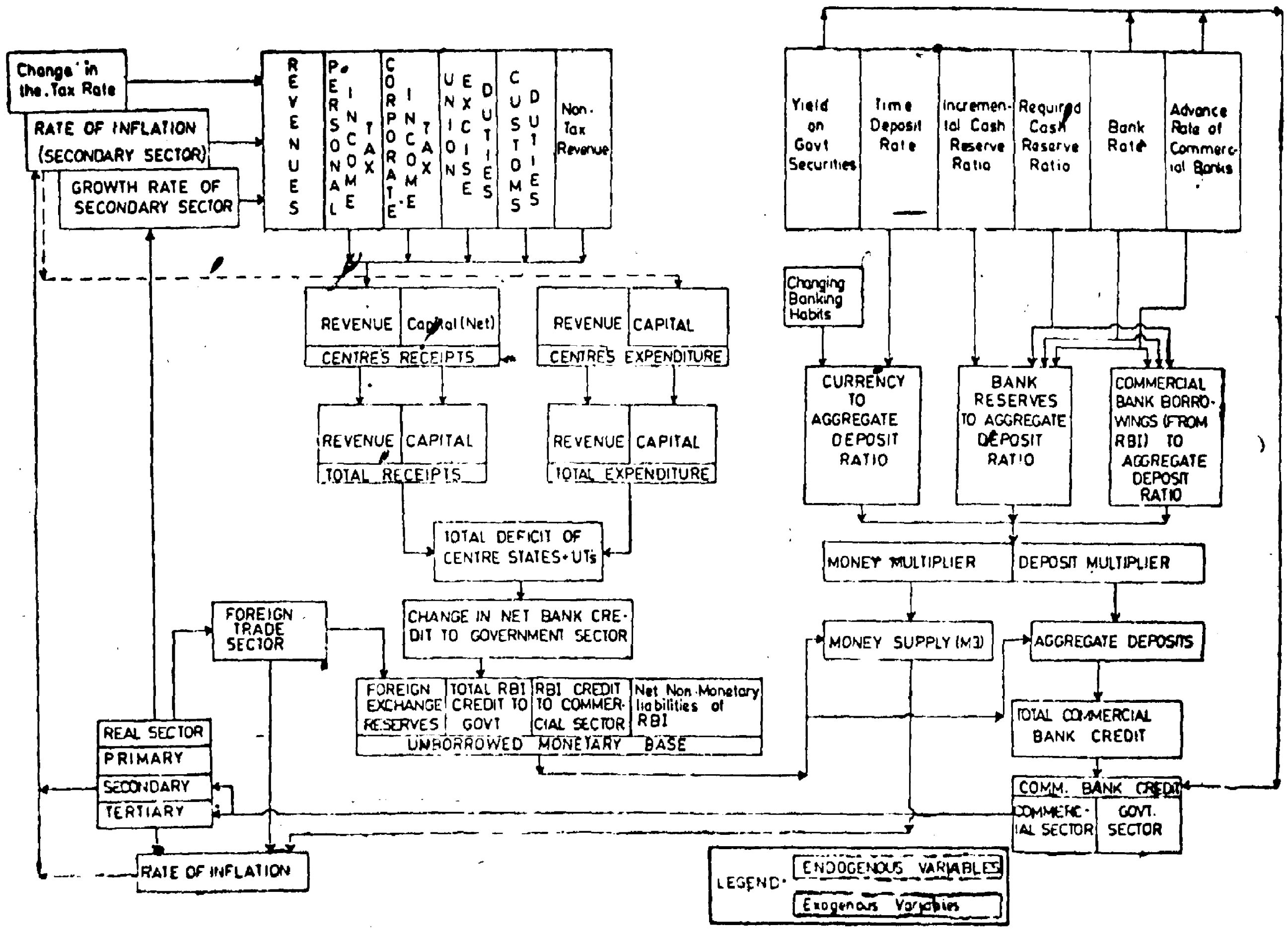
(ii) The constant term in each equation is not significantly different from zero which can be construed to broadly hint towards static expectations by the government, particularly on the price and real growth fronts.

(iii) The co-efficients of the budget estimates for tax revenues are generally less than one except for customs duties which indicates that there may be a consistent policy to report in the budget higher revenues from taxes than are actually expected — the fudge factor.

On the whole, these equations seem to explain fairly well the deviations of actual tax collections from those estimated. The equations also show how important the feedback effects from the real sector of the economy are in determining the extent of revenues and hence the budget deficit. It is also clear how critically important it is for the government to be able to generate accurate short term forecasts — especially for forecasting changes in the price level and real growth rates — if it wishes to accurately predict tax revenues.

The remaining revenue receipts are determined exogenously as are capital receipts excluding, of course, commercial bank credit to the government

FLOW CHART OF THE FISCAL AND MONETARY STRUCTURE OF THE INDIAN ECONOMY



which emerges from the monetary sector equations.

On the expenditure side of the budget we report the aggregate revenue and capital expenditure equations. For the latter we provide two alternate specifications to indicate the possible importance of inflation in determining capital outlays of the government.

Revenue Expenditure :
1961-62 to 1980-81

(3.11) ERA =

$$-0.036 + \underset{(2.83)}{0.069}\ NEXLR + \underset{(3.61)}{0.010}\ DUMWAR + \underset{(92.90)}{1.022}\ ERE$$

(0.84)

$$R^2 = 0.980 \quad DW = 1.65$$

Capital Expenditure :
1960-61 to 1980-81

(3.12a) ECA =

$$\underset{(0.31)}{0.035} + \underset{(1.70)}{0.805}\ PSEC + \underset{(28.57)}{0.998}\ \dot{E}CE$$

$$R^2 = 0.980 \quad DW = 1.65$$

(3.12b) ECA =

$$\underset{(0.80)}{0.079} + \underset{(0.87)}{0.375}\ PSEC + \underset{(2.82)}{0.160}\ NEXLR + \underset{(33.73)}{1.001}\ \dot{E}CE$$

$$\bar{R}^2 = 0.986 \quad DW = 1.77$$

For the revenue expenditure equation of the government, we tried a large number of alternative specifications particularly with a view to testing the role of inflation in causing actuals to exceed budget estimates. Notwithstanding the use of this aggregated variable, which really represents a hotch-potch of expenditures, it seems very likely that price changes are not a cause of actuals differing from estimates for revenue expenditure. This negative result is significant in that it suggests that revenue expenditures are probably allocated by the government in nominal terms (and, therefore, if there is inflation quantity cut backs are resorted to). Another reason why inflation is not significant may be because the ministries and department heads incorporate certain inflationary expectations while formulating their demand for grants. The co-efficient of the budget estimate variable is significantly higher than unity which indicates that the government consistently spends more on its revenue account than it reports in the budget.

Inflation seems to affect the government's capital expenditure — it is significant when regressed independently of the external loan constraint. This could be due to capital expenditure on projects being fixed in real terms. However, only expenditures on projects that are of a time bound nature are likely to cause the inflation variable to be significant. Expenditure on projects that can be extended into subsequent financial years may be fixed in nominal terms on a year to year basis.

Exogenous Variables and Blow-up Equations

Exogenous variables are all specified with actuals as a function of budget estimates. Once the expenditure and receipts (revenue ond capital separately) of the Central government have been estimated, these are then used to

TABLE

Variable	1981-82*	1982-83 Forecast
(1) Budget Deficit of the Central Government	Rs 1700 crore	Rs 2,150 crore (Budget estimate = Rs 1,365 crore)
(2) Growth in M3	17.9%	11.5%
(3) Growth in Commercial Bank Credit		
— to the Commercial Sector	18%	10.7%
— to the Government	27.3%	14.4%
(4) Inflation (WPI)	9% (2% on a March 31 to March 31 basis)	7% (13% on March 31 to March 31 basis)

* All figures for 1981-82 are provisional.

estimate the overall budgetary position of Centre, states and Union Territories. The fiscal sector is finally linked to the monetary sector by making the change in RBI's net credit to the government a function of the overall budget deficit.

The equations reported below are explanatory:

Non-Tax Revenue (exogenous): 1961-62 to 1979-80

(3.13) NTAX =

$$0.027 + 1.025\ NTAXE - 0.244\ DUM0790 - 0.265\ DUM0730$$
$$(0.54) \quad (44.36) \quad (3.16) \quad (3.69)$$
$$\bar{R}^2 = 0.992 \quad DW = 2.49$$

Net Domestic Capital Receipts (exogenous): 1961-62 to 1979-80

(3.14) NDLA =

$$0.277 + 0.933\ NDLE$$
$$(1.59) \quad (15.48)$$
$$\bar{R}^2 = 0.930 \quad DW = 1.04$$

Revenue Expenditure of States and Union Territories: 1960-61 to 1980-81

(3.15) ERAS =

$$1.297 + 0.714\ ERA$$
$$(1.16) \quad (40.34)$$
$$\bar{R}^2 = 0.988 \quad DW = 1.51$$

Revenue Receipts of States and Union Territories: 1960-61 to 1980-81

(3.16) RRAS =

$$-4.962 + 0.895\ RRA$$
$$(2.52) \quad (28.45)$$
$$\bar{R}^2 = 0.976 \quad DW = 1.15$$

Capital Expenditure of States and Union Territories: 1960-61 to 1980-81

(3.17) ECAS =

$$-5.045 + 0.291\ ECA$$
$$(3.03) \quad (8.43)$$
$$\bar{R}^2 = 0.778 \quad DW = 1.73$$

Capital Receipts of States: 1960-61 to 1980-81

(3.18) RCAS =

$$-0.579 + 0.099\ RCA$$
$$(0.67) \quad (4.8)$$
$$\bar{R}^2 = 0.524 \quad DW = 1.87$$

Link Equation: 1960-61 to 1980-81

(3.19) $\triangle$RBINCG =

$$-14.703 - 1.216\ DEFT$$
$$(0.09) \quad (7.18)$$
$$\bar{R}^2 = 0.716 \quad DW = 2.98$$

IV

Forecasts of Key Monetary and Fiscal Variables for 1982-83

Using the model described above in its simultaneous integration with the real and foreign sectors, short term forecasts were computed for fiscal 1982-83. These are presented in the Table and figures for last year (1981-82) are provided for purposes of comparison. All growth rates refer to average figures for the year over the previous year, unless otherwise stated.

The story that the forecasts tell is of a sharp curtailment in credit growth and money supply. The extent of this reduction in growth rates is probably greater than the RBI would perhaps have liked and one may expect some relaxation in policy during the year 1982-83.[9]

Even though the model forecasts a central budget deficit that is almost 60 per cent higher than the government estimate, this is still not a large deficit when seen in the context of the unborrowed monetary base of the economy. Over the last few years the monetary base has expanded so rapidly that one can now view Central budget deficits of under Rs 2,500 crore as fairly modest in size.

Inflation is, of course, a difficult figure to predict before one has knowledge of the monsoon. We have assumed a normal monsoon in arriving at the forecast but this may be revised in August or September once a clear picture of the rains this year is available.

All these forecasts obviously only incorporate the current economic policies of the government.[10] Exogenous variables (other than those that are a function of budget estimates) are predicted with the use of ARIMA where possible or other more simple extrapolation techniques.

V

Concluding Remarks

The novelty of this exercise lies not merely in the fact that it tries to explain the relationships between important macro variables of the Indian economy, but in that the model has been specifically geared to short term policy making and forecasting. This approach clearly necessitates the construction of a readily computable macro-econometric model, a consideration that may not have guided some earlier studies.

Some of the achievements of this study can only really be understood when the result are seen in the light of the negative findings of many earlier studies. Our study shows that many of the policy variables in the monetary sector which earlier specifications seemed to find insignificant, can in fact be important and effective instruments at the hands of the policy makers. We have also found that in formulating its interest rate policy, it is futile on the part of the central bank to raise or lower all rates of interest by a common factor — it needs, instead, to use an appropriate structure of differential interest rates to achieve its stated objectives. The fiscal sector equations go some way towards showing why actual budget deficits differ from those estimated by the finance ministry. Here the results obtained highlight how important feedback effects from the real sector are, and consequently, the need for the government to be able to accurately predict inflation and the growth rate in the economy.

In a readily usable macro model one often has to adopt a cavalier approach to data because of delays in publication, and the problem of provisional estimates awaiting revision etc. Whenever we have had to use data for which an alternative source would have been preferable, this has been specifically mentioned in the text. One cannot but lament the fact that although India's data base is probably unparalleled in its extensiveness and reliability among developing nations, there are long and unjustifiable delays in the release of the data for general use.

Macroeconometric models still have a long way to go before they may be used effectively for short term forecasting and fine tuning the Indian economy. But there is little doubt in our minds that the aim is a feasible one, notwithstanding the many sceptics who believe that the Indian economy is far too complex to be captured in a macro-econometric model.

Notes

[Financial support by International Computers Indian Manufacture (ICIM) for this research project is gratefully acknowledged.]

1 These magnitudes assume significance especially because of the conditionality attached to the IMF loan.

2 From the point of view of the government the fiscal and the monetary sectors may be regarded as intermediate target variables which eventually affect the final targets such as the desired rate of growth, the rate of inflation.

Thus it is absolutely essential to understand how the policy parameters affect the intermediate target variables.

3 It is quite common in m-m models to split the currency to deposit ratio into two: currency to demand deposit ratio and demand to time deposit ratio. We have not followed this procedure since this would require the data on demand and time deposits separately. Due to certain definitional changes introduced by the RBI in 1977, data on the break up of aggregate deposits into demand and time not comparable between the two periods — before and after 1977. Hence, the specification of the money-multiplier in terms of currency to aggregate deposit ratio was basically dictated by the availability of data.

4 Notable exceptions to this in the Indian context are Gupta [1973] and Bhattacharya [1982] and Srivastava [1982].

5 For corporation income tax, personal income tax and Union excise duties the proxy base used is national income in the secondary sector whereas for customs duties the base used is the value of imports.

6 We are currently trying out some alternative specifications of the government's expectation formation, particularly with respect to tax rates.

7 In earlier exercises we have disaggregated the expenditure side of the budget considerably. However, we only report the aggregate equation results here.

8 For details of the revision refer to RBI (1977).

9 A beginning has already been made in this direction with the required increase in the cash reserve ratio of banks from 7.75 per cent to 8.0 per cent being cancelled.

10 We were not able to incorporate the effects of the recently announced trade liberalisation measures in arriving at the forecasts.

Notations

M3 Money supply (currency + aggregate deposits).
D Aggregate deposits with the public.
k Currency to aggregate deposit ratio.
r Bank reserves to aggregate deposits ratio.
g Bank borrowings (from RBI) to aggregate deposit ratio.
H* Unborrowed monetary base.
NCB Number of commercial bank offices.
NRCB Number of commercial bank offices in rural and semi-urban areas.
RDEP Rate of interest on 1 year time deposits.
SCRR Statutory cash reserve ratio of commercial banks.
ICRR Incremental cash reserve ratio.
RAD Weighted advance rate of scheduled commercial banks.
DUM70 Dummy variable (1's for 1970-71 onwards and 0's for other years).
RG Weighted yield rate on Government of India rupee securities.
RB Bank rate.
DPL480 Dummy variable (1's for 1958-59 and 1959-60 and 0's for other years).
C Aggregate commercial bank credit.
h Ratio of commercial bank credit to commercial sector to aggregate commercial bank credit.
SLR Statutory liquidity ratio.
RBINCG RBI net credit to government sector.
RBICCS RBI credit to commercial sector.
RBINFER RBI net foreign exchange reserves.
RBINNML RBI net non-monetary liabilities.

Central Government Budget :

CUDA Revenue from customs duties (actuals).
CUDE Revenue from customs duties (budget estimates).
PITA Personal income tax revenue (actuals).
PITE Personal income tax revenue (budget estimates).
CITA Corporation income tax revenue (actuals).
CITE Corporation income tax revenue (budget estimates).
UEDA Revenue from Union excise duties (actuals).
UEDE Revenue from Union excise duties (budget estimates).
PM Unit value index of imports (1970-71 = 100).
M Imports at constant prices.
CURT Rate of customs duties (Ratio of CUDA to value of imports).
URT Rate of Union excise duties (Ratio of UEDA to secondary sector income).
PRT Rate of personal income tax (Ratio of PITA to secondary sector income).
CRT Rate of corporation income tax (Ratio of CITA to secondary sector income).
YSEC Income from secondary sector (constant prices).
PSEC Price deflator of secondary sector (1970-71 = 100).
NTAXA Non-tax revenue (actuals).
NTAXE Non-tax revenue (budget estimates).
NDLA Net domestic capital, receipts (actuals).
NDLE Net domestic capital receipts (budget estimates).
ERA Revenue expenditure (actuals).
ERE Revenue expenditure (budget estimates).
NEXLR Ratio of net external loans (actual to budgeted).
DUMWAR Dummy variable for wars (1's for 1962, 1965 and 1971, and 0's for other years).
ECA Capital expenditure (actuals).
ECE Capital expenditure (budget estimates).
RRA Revenue receipts net of States' share of Union excise duties and personal income tax (actuals).
RCA Capital receipts (actuals).

Centre, States and Union Territories:

RRAT Revenue receipts (actuals).
ERAT Revenue expenditure (actuals).
RCAT Capital receipts (actuals).
ECAT Capital expenditure (actuals).
DEFT Overall budgetary deficit of the government sector.
Δ Change in.
. Ratio of current year's to previous year's value.
t time period.

Appendix

Derivation of Equations (2.1) and (2.2)

The money and the deposit equations specified in Section 2 are derived from the following asset demand functions of the public and the banks and the equilibrium condition for the high powered money market.

(1) $CU = kD \quad k > 0$
(Demand for currency by the public) where CU is currency with the public.

(2) $R = rD \quad 0 < r < 1$
(Demand for reserves by banks) where R is reserves with banks.

(3) $B = g.D \quad 0 \leq g < 1$
(Demand for borrowed reserves of

banks) where B is borrowings (from the RBI) by banks.

(4) $H^{*d} = CU + R - B$
(Definition of the demand for unborrowed high powered money.)

(5) $H^{*d} = H^{*}$
(Equilibrium condition in the high powered money market).

(6) $M_3 = CU + D$
(Definition of Money Supply).

Substituting (1), (2) and (3) in (4) and the resulting expression in (5) we have:

(7) $(k + r - g)\, D = H^{*}$

Transposing terms in (7) we have the deposit equation specified in the text:

(8) $D = [1/(k + r - g)]\, H^{*}$

Substituting (1) and (8) in (6) and transposing terms we have the money supply equation specified in the text:

(9) $M_3 = [(1 + k)/(k + r - g)]\, H^{*}$

Bibliography

Agarwala, R [1970], "An Econometric Model of India 1948-61", London, Frank Cass and Co Ltd.

Ahluwalia, I J [1979], "Behaviour of Prices and Outputs in India: A Macroeconometric Approach", Macmillan (India).

Avadhani, V A [1978], "Theory and Practice of Central Banking in India", Somaiya Publications.

Bery, Suman [1980], "The Monetary Policy Instruments of the Reserve Bank of India", The World Bank, *Mimeo.*

Bhattacharya, B B [1982], "The Government Budget, Inflation and Growth in India", Institute of Economic Growth Working Paper.

Cagan, P [1965], "Determinants and Effects of Changes in the Stock of Money 1875-1960", Princeton University Press.

Chitre, V S [1978], "An Econometric Study of the Consolidated Portfolio of Indian Scheduled Commercial Banks, 1951-1952", *Artha Vijnana,* March.

Desai, M J [1973], "Macroeconometric Models for India: A Survey", *Sankhya,* Series B.

Friedman, M and A Schwartz [1963], "A Monetary History of the United States 1867-1960", Princeton University Press.

Gupta, G S [1973], "A Monetary Policy Model for India", *Sankhya,* Series B.

Gupta, S B [1979], "Monetary Planning for India", Oxford University Press.

Khetan, C P, J Handa and R R Waghmare [1976], "The Monetary Structure of the Indian Economy", Macmillan (India).

Klein, L R and Young, R M [1980], "An Introduction to Econometric Forecasting and Forecasting Models", Lexington.

Madhur, Srinivas [1976], "Money Supply Analysis", *Economic and Political Weekly,* June 6.

Mammen, T [1967], "An Econometric Study of the Money Market in India", Ph D dissertation, University of Pennsylvania.

Majumdar, N A [1976], "Money Supply Analysis — Mechanistic and Economic Explanations", *Economic and Political Weekly,* February 28.

Pandit, V N [1973], "Income and Price Level in India 1950-51 to 1965-66, A Macroeconomic Analysis", *Sankhya,* Series B.

Pani, P K [1977], "A Macroeconometric Model of the Indian Economy", Macmillan (India).

RBI [1977], Money Supply: Concepts, Compilation and Analysis (Report of the Second Working Group)", *Reserve Bank of India Bulletin,* January.

Sheshadri, R K [1976], "Gilt-Edged Investments", *RBI Bulletin,* September.

Shetty, S L, Avadhani, V A, and Menon, K A [1976], "Money Supply Analysis — Further Comments", *Economic and Political Weekly,* April 10, 571-4.

Srivastava, D K [1981], "Policy Simulations with a Macroeconometric Model of the Indian Economy", *Journal of Policy Modelling.*

Swamy, Gurushri [1975], "The Determinants of Changes in the Stock of Money in India 1951-52 — 1970-71", Ph D dissertation, University of Delhi.

Wagner, Adolph [1958], "Three Extracts on Public Finance", in Richard A Musgrave and Alan Peacock *(eds),* "Classics in the Theory of Public Finance", Macmillan.

Bank of Baroda

BANK OF BARODA recorded all-round progress in its operations during 1981. Its global deposits reached a level of Rs 3,711 crore, registering a growth rate of 23 per cent. Advances of the bank increased by Rs 384 crore to Rs 2,055 crore, showing a growth rate of 23 per cent. Priority Sector advances accounted for 37.5 per cent of Bank's total advances in India. Net profits increased by Rs 34 lakh to to Rs 6.25 crore. Owned funds of the Bank were augmented by Rs 4.64 crore to Rs 28.14 crore through plough-back of operating surpluses. The Bank opened 120 new branches during the year taking the total number of branches to 1,669, including 58 offices abroad. The Bank occupies the top position amongst the nationalised banks in India in terms of global deposits, capital funds, net profits and the overseas branch network. Highlighting the performance of the Bank with sectorwise details, Y V Sivaramakrishnayya, Chairman and Managing Director, told a press conference in Bombay that the global deposits of the Bank increased by Rs 695 crore to Rs 3,711 crore during the year, registering a growth of 23 per cent. Deposits in India increased by 18.1 per cent as compared to the average growth rate of 17.7 per cent for the banking industry as a whole. The number of deposit accounts in India rose by over 7 lakh to 68 lakh. Deposits of overseas branches of the Bank increased by Rs 251 crore to Rs 810 crore registering a growth of 44.9 per cent.

The Bank's global credit expansion during 1981 was of the order of Rs 384 crore to register a total of Rs 2,055 crore. Indian advances increased by Rs 290 crore to Rs 1,646 crore, registering a growth of 21.4 per cent. Priority sector advances increased by Rs 111 crore to Rs 617 crore. The percentage of Priority Sector Advances to the total Indian advances increased to 37.5 per cent as at the end of December 1981. Agricultural advances accounted for 16.7 per cent of the total Indian advances and the share of direct advances to the total agricultural credit disbursed was as high as 68 per cent as at the end of the year 1981. Advances under Differential Rate of Interest (DRI) Scheme amounted to Rs 16.64 crore or 1.23 per cent of the Indian advances as at the end of December 1981. About 59.2 per cent of the DRI advances was granted to Scheduled Castes and Scheduled Tribes.

During the year, the Bank opened 120 branches in India taking the total number of branches to 1669 inclusive of 58 overseas offices located in 13 countries. Of the 120 branches opened in India, 94 were in rural areas, 8 in semi-urban areas and the remaining 18 in the urban and metropolitan areas. Out of the 1,611 branches in India, 1,118 branches i e, 69.4 per cent are in rural and semi-urban areas. The Bank also has majority shareholding and management interest in two commercial banks in India and one bank abroad. It also has an associate Deposit Taking Company (DTC) in Hong Kong. During the year 1981, major emphasis was placed on effective implemention of the Annual Action Plans (AAPs) in all the 31 lead districts of the Bank. Aggregate credit deployed under these AAPs in 1981 amounted to Rs 66.90 crore as against the original commitment of Rs 49.15 crore.