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All correspondence regarding subscriptions should be addressed to the Administrative Officer, Economic Department. All other correspondence should be addressed to :

The Editor,
Reserve Bank Staff Occasional Papers,
Reserve Bank of India,
Economic Department,
Post Box No. 1036,
Bombay 400 001.

FLOW-OF-FUNDS ACCOUNTS

V.V. DIVATIA AND T.R. VENKATACHALAM@

Introduction

The beginnings of flow-of-funds work can be placed at about the early forties of this century. The comparatively late start of work in this area may perhaps be explained in terms of the absence of a well knit and commonly accepted theory of finance in step with the treatment accorded to the production and distribution of real goods and services and related markets. 'The lack of generally accepted theoretical principles is one of the reasons why a survey of financial accounts must present a picture of statisticians groping along never clearly marked routes, each hoping that he will be able to develop a satisfactory set of account'. These earlier pursuits towards a fuller portrayal of the financial side of the economy in terms of its own institutions, instruments and markets may be broadly classified into five categories. They are

(*i*) The balance sheet approach (Hicks, 1942)

(*ii*) The flow-of-funds approach (Wesley Mitchell, 1944)

(*iii*) The monetary survey approach (Triffin, 1946)

(*iv*) The liquidity approach (Holtrop, 1953) and

(*v*) The Sectorwise financial surplus/deficit approach (Annual Operations of the Monnet Plan, 1954).

The first approach focuses attention on the inadequacy of the national income and expenditure accounts to judge the performance of an economy and, therefore, suggests the addition of a national balance sheet. Following this line of thought, pioneering work was undertaken by Goldsmith, Lipsey, Mendelson, Kendrick

@ V.V. Divatia is Statistical Adviser and Head of the Department of Statistics. T.R. Venkatachalam is Director, Econometrics Division of the Department of Statistics.

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and others for the U.S.A. and by J.R.S. Revell for U.K. to mention only a few. The second approach lays emphasis on the incomings and outgoings of funds for each of the transactors in the economy. Essentially this implies suitably combining the income-expenditure statement and the changes in the balance sheet for each transactor. The monumental work of Morris A. Copeland "A study of money flows in the United States" closely follows this approach. It is fairly obvious that information contained in these accounts overlap a good deal with national accounts of income and expenditure and, therefore, could be profitably pruned. The original accounts have thus undergone considerable revision and the 'most publicised' set of financial accounts for U.S.A. brought out by the Federal Reserve Board follows this revised procedure. The third and fourth approaches are not comprehensive enough in so far as their scope is limited to only that part of the spectrum of financial claims such as money or liquid assets. They (probably) underline the importance of money and near money assets in financial analysis and may be reasonably good approximations to reality for economies with a relatively less-developed financial system. Particularly the monetary survey approach has gained popularity largely because of the initiative shown by the International Monetary Fund. The International Financial Statistics presents the monetary surveys for over ninety countries today. The fifth and the last approach highlights the importance of financial surpluses and deficits of sectors which in simpler terms would represent their respective saving—investment gaps. Stress is laid on financing and related aspects of inter-sectoral lending and borrowing much in contrast to the highly aggregated macro-approaches treating funds lent or borrowed as 'rather irrelevant balancing transfers'. Apart from presenting a disaggregated picture of the financial sector, this approach enables one to identify precisely the sector (s) exerting expansionary (or contractionary) pressures within the economy.

The broad contours of the influence exerted by the developments in regard to economic theorising on practical analysis, are now becoming clear. Economic theory having been preoccupied with the 'real' side for several years—there is no place for money or finance in the national income accounts as originally conceived or in its analysis which runs in terms of income and expenditure—extended gradually its scope to take note of money, initially in a narrow sense but later on in much broader terms and the institutions which are the main repositories of money, namely, banks. Since fifties, the scope has been further enlarged

to cover the entire financial sector embracing the non-bank financial institutions as well. A set of accounts designed to depict transactions of all entities whether they (i.e. the entities) are non-financial such as households, business firms or government, or financial, namely, banks, co-operatives, insurance companies, provident funds, etc. is called the flow-of-funds accounts. These accounts are comprehensive enough to perceive the important inter-relationships not only among financial institutions and financial markets but also between the financial activity and real activity.

Work on developing a suitable flow-of-funds accounts for the Indian economy was initiated in 1956 under the joint auspices of the Central Statistical Organisation and the Reserve Bank of India. Later in 1959, a model set of accounts which could be followed was suggested by a working group constituted for this purpose taking due note of the statistics then available, work already done in the country including the important study carried out by Prof. H.W. Arndt of the University of Australia in 1959 (Financial Flows of Indian Economy, 1951-52 to 1957-58) in consultation with the CSO, Ministry of Finance and the RBI. The group in its report has given sector-wise accounts compiled for some of the years, particularly, for 1957-58.

2. Concepts underlying flow-of-funds accounts

The eternal process of production, consumption and accumulation is described by a system of national accounts. The financial flow-of-funds system forms one part of the national accounts, the other three being standard set of national income accounts, input-output tables, and the national balance sheet. The standard national income accounts set out income, expenditure, savings and investment flows ; the input-output tables exhibit inter-dependence of different industries or commodities and services in the production processes. These tables bring out technological relationships that subsist among industries or commodities and services. The national balance sheet, including the sectoral components thereof, relate the flows to assets and liabilities. Regarding financial flows accounts, the UN's monograph entitled 'A System of National Accounts' (monograph Series No. 2, Rev. 3, 1968) states thus : 'A considerable, though smaller, amount of effort has been put into separating out the many financial sectors of the economic system and into examining in detail their issue (or redemption) of different kinds

of financial liability and their acquisition of different kinds of financial assets.....A number of countries have also prepared flow-of-funds tables which show the flows of financial claims that enable the surplus saving of some groups of financing units to provide the external funds needed by sectors whose capital expenditure exceeds their saving'.

In an integrated set of national accounts, the financial flows should inevitably have a link with the capital finance accounts of the nation. Thus, conceptually, the income and outlay accounts show the operating part of the economy which yield saving generated in the economy as a balancing entry. The capital finance accounts show the saving and investment in various sectors with balancing entry of net surplus or deficit, which would result in net acquisition of financial assets or liabilities. In the flow-of-funds accounts, this balancing entry is the starting point or the opening entry and the set of accounts are further developed to bring out the borrowing and lending patterns of individual sectors. This can be seen in terms of symbols as follows. For the economy as a whole,

$$Y = C+I+X-M \text{ or } Y-C-I-X+M = 0$$

where Y = Income
C = Consumption
I = Investment (real)
X = Exports
M = Imports

Suppose the economy is sub-divided into different sectors such as Government, Private Corporate Business, Households and Rest of the World Sectors, then each of the elements in the above identity could be allocated to one or the other sectors in the following manner.

TABLE 1

	Income	Current transfers (Net)	Consumption	Capital transfers (Net)	Investment	Balance of goods and services	Financial surplus/deficit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Households ..	Y_1	$\pm T_1$	$-C_1$	$\pm R_1$	$-I_1$	— =	F_1
Corporate Business	Y_2	$\pm T_2$	—	$\pm R_2$	$-I_2$	— =	F_2
Government ..	Y_3	$\pm T_3$	$-C_3$	$\pm R_3$	$-I_3$	— =	F_3
Rest of the World	—	$\pm T_4$	—	$\pm R_4$	—	$-X+M$ =	F_4
Total	Y	0	$-C$	0	—	$I-X+M$ =	0

The algebraic summation over the first three columns with respect to each 'domestic' sector yields the saving of that sector and the entries in the last column denote their respective saving—investment gap. For the foreign sector the latter represents the current account deficit/surplus in the balance of payments. Briefly put, they pinpoint the sectors which are the 'ultimate' lenders experiencing an excess of saving over their investment and similarly the 'ultimate' borrowers for whom their own saving out of current income falls short of their needs to invest. For the nation as a whole, these surpluses and deficits adding up to zero signifies aggregate investment equals aggregate saving ; this follows from the familiar identity

$$Y=C+S$$
$$Y=C+I$$
and so, $S=I$

One point that is not still evident is how do the above entries represent the financial surpluses and deficits ? This can be best explained by means of changes in a typical balance sheet.

TABLE 2

Liabilities	Assets
Reserves (W)	Real Assets (K)
Capital Transfers (R_L)	Capital Transfers (R_A)
Liabilities (L)	Financial Assets (A)
Total Liabilities	**Total Assets**

$$W + L + R_L = K + R_A + A$$
$$\triangle W^1 + \triangle L = \triangle K + \triangle A$$

where $\triangle$s denote the corresponding changes during any year and $\triangle W^1 = \triangle W + \triangle R_L - \triangle R_A$. The balance sheet depicts the liabilities and assets position as at a point of time (Say April 1, 1973). Difference between two successive balance sheets will

yield the net changes under each of the items. Thus $\triangle K$ represents capital formation, $\triangle A$ net acquisition of financial assets, $\triangle L$ net change in liabilities incurred and $\triangle W^1$ net change in reserves during the year. It may be borne in mind that $\triangle L$ represents different claims issued to other sectors ; for instance, it covers also capital issues of companies other than bonus issues. The statement so obtained is called the Sources and Uses of funds statement. Net acquisition of financial assets is nothing but net lending to others much the same way as net incurrence of liabilities (or net issue of financial claims) is net borrowing from others. The other two 'non-financial' items respectively denote investment and saving provided we temporarily abstract from the vexed problem of adjusting the valuation difference and capital gains or losses. For all sectors put together it is self-evident that total Sources and Uses would tally with each other. What is more important to note is the equality of total financial sources and financial uses at the overall level for the reasons that total claims issued should match total claims held and as a corollary from the identity aggregate saving equals aggregate investment. However, at the sectoral level only financial and non-financial sources when taken together will tally with similar total on the uses side but not separately for the two components of non-financial and financial. Particularly the difference between financial sources and financial uses represents either net lending or net borrowing of the sector concerned. The magnitude of the saving-investment gap ($\triangle W^1 - \triangle K$) tallies with the difference in lending and borrowing ($\triangle A - \triangle L$). Some may prefer to show the sources and uses of funds statement on 'gross' basis although it would call for additional information about the draw down of financial assets including cash (sources of funds) and/or the repayment of past liabilities (uses of funds). There are others who distinguish money and other financial assets and hence show them separately on the uses side. These are a few theoretical niceties which depend upon the objectives in view but may not in all cases be practicable for want of data.

Saving-Investment and lending-borrowing gap

It is admittedly an indirect approach to read saving as changes in reserves specially when it is customary to measure it directly as current income *plus* transfers (net) less current expenditure (vide Table 1). But it is precisely through saving that the final link up of current accounts with the sources and uses of funds statement is achieved as revealed from the following accounts.

TABLE 3

Sources	Uses
Current Receipts	Current Expenditures Saving ($\triangle W$)
$\triangle W^1$ (Saving adjusted for net capital transfers)	$\triangle K$ (Real Investment)
$\triangle L$ (Borrowing)	$\triangle A$ (Lending)
Total sources (Non-financial plus financial)	Total uses (Non-financial plus financial)

Essentially the above statement constitutes the flow-of-funds accounts and such accounts could be visualised for each entity or for a group of entities which are institutionally or functionally homogeneous. Usually the sector accounts are shown after eliminating the intra-sectoral lending and borrowing which are always equal. Seldom will the two magnitudes of borrowing from and lending to other sectors (i.e.) external to the sector concerned, be equal.

The foregoing discussion makes it abundantly clear that the saving-investment gap equals the difference between lending and borrowing. The relationship holds good whether the two are measured on gross or net basis. This indeed provides the rationale in the caption given to the last column of table 1. But more importantly it has established the interrelated character of the saving-investment process with the lending and borrowing operations of savers and investors in the economy.

Non-financial and Financial flows

Since it is the saving-investment gap that is filled by financial flows, the surplus sectors assisting the deficit sectors, it should be obvious that only those funds which are exchanged against financial instruments can be admitted to the category of financial flows. Thus loans and advances, borrowed funds, external aid flows from rest of the world sector and the likes are examples of financial flows. Stated otherwise, increase or decrease in liabilities as a result of external borrowings or repayments to the outside sector as well as increase or decrease in financial assets are all financial flows. To illustrate, increase in paid-up capital of the corporate sector as a result of transfers from reserves to paid-up

capital item (e.g. bonus shares) is not a financial flow, but subscription to right shares or new issues by economic agents outside the corporate entity is a financial flow to the corporate sector. Own funds spent on creation of real capital formation evidently do not constitute financial flows since we are primarily concerned with sectoral saving-investment gaps. Unilateral transfers like donations, gifts, etc. are not financial flows. Also all intra-sectoral flows even if financial, do not get reflected in financial flow-of-funds since they cancel out within the sector. In this discussion, attention is paid only to financial flow-of-funds even when for brevity the term flow-of-funds is mentioned.

Financial Instruments

In the most primary stage of economic development one can visualise an economic agent producing investment goods for its own needs, even as that agent produces commodities for its own current consumption. Thus, a household produces its own food and clothing for current consumption, and builds its own little house with its own labour and materials. Money does not enter in these intra-household activities. A slightly higher level of economic development results in barter deals, exchanging surplus commodities that one produces with those of others that they are in a position to dispense with. Still money does not appear. Money gets its justification when the economy expands, diversifies, becomes functionally more specialised, and when human wants increase in terms of number of products. The existence of money enlarges potential buyers and sellers and facilitate transactions without the need for bringing together at the same place and time buyers and sellers with the same objectives and complementary demands. In a similar manner, financial instruments facilitate transfer of saving of economic agents to those who need them for investment activities, without the savers going directly to investors and vice versa. The separation of saving and investment functions is essentially an aspect of economic development and the degree of separation is itself an index of the level of economic development. A developing country like India may find that about 40 to 50 per cent of the household sector saving is used for its own physical investment, and even here, about 12 per cent of rural capital expenditure in 1961-62 may not involve even intra-household sector money transfers, this investment taking place in terms of its households' own imputed labour and own goods and services for which no payment may be involved. In highly developed societies such direct uses of funds within its own sector would be very much less.

It is here that another engaging aspect of financial flow-of-funds accounts becomes evident, *viz.* the study of the development of financial intermediation. The function of financial institutions is to draw the saving of the economic agents into its fold and provide them to the needy economic sectors for investment activities. This function is performed through the creation of financial instruments which becomes the assets of those who provide the funds and an acknowledgement of the liabilities of the borrowing financial institutions. In turn, the latter hold financial claims on the investors which become the assets of the financial institutions and acknowledgement of liabilities of the investing sectors. In performing this primary function, financial intermediaries not only meet the preferences of a variety of savers, expressed in terms of safety and liquidity, but also make funds available to investors often at costs lower than what would have prevailed otherwise. Such benefits accruing to the economy partly reflect their increasing specialisation in the art of lending/borrowing and is also in part due to the pooling of risk over millions of savers and investors. By catering to the specific needs of the saving they may perhaps also encourage saving and motivated by profits they tend to allocate funds to most productive ventures. Where economic growth is brought about by a process of planning and social priorities, specialised financial institutions could achieve these aims without impairing saving motivation. Largely for these reasons, the post war period has witnessed an impressive growth in financial intermediaries both in developed and developing so-called free-market economies as well as in countries where government planning is central to economic development. As economic development progresses the extent and the depth of financial intermediation increases and the spectrum of financial instruments widens ; there would be layering effect in the sense that one type of financial intermediaries may transfer funds available with it to another type which in turn may pass them on to some investing sectors who make demands for funds ; or each type may share the saving of different sectors. To a limited extent they compete among themselves and afford different choices to those who want to make over their surplus saving to the financial institutions. Similarly, investors may approach one or the other financial institutions (or in the days of high degree of liquidity, the other way round) of their choice. The entire pattern has to be laid bare by the flow-of-funds accounts.

Financial Intermediation

There may be several reasons why the saver does not always go in for direct investment on his own account ; but two main reasons may be stated here. First, an individual's saving arise from his earning activity ; he may be a salaried worker, entrepreneur, self-employed worker, etc. It is not always possible for him to directly invest the funds available with him in an activity other than in which he is engaged. He may not have that extra-entrepreneurial expertise, or he may not just have time to go in for other economic activities. May be, he invests part of his saving in constructing a house for his family and himself, in which case there is deployment of funds directly into creation of physical goods. But, by and large he may prefer to hand over his saving to financial institutions which in turn efficiently allocate them among investors. The second main reason is the largeness of the investment projects. One's saving will not be adequate to cope with the financial requirements of a project, let alone the expertise required to choose the project in which he can invest his surplus. Nor can a group of individuals cope up with this task. The financial intermediaries with their vast resources, their expertise and specialised services can look after this function. The organisation of the producing entity also cannot be confined to a small group of individuals but may have to be a corporate one or the Government itself has to set up the unit to carry out huge projects.

The reasons why individual savers choose one form of financial instrument and/or one type of financial institution and build up a particular type of asset portfolio are many and varied. One may try to rationalise the choice through asset preference theories but this may not wholly explain the choice. The very assumption of rationality may be in doubt. Some transfers of saving are no doubt compulsory like the contribution to provident funds ; some like taking out an insurance even while knowing that in inflationary days, and with much less risks now to life than in days gone by, insurance policy may not be worthwhile and may yield negative incomes. Some savers may put their funds in, say, Unit Trust knowing fully well that if they were to try a little more, they could well operate on stock exchange, buy corporate stock and take advantage of either capital gains or higher dividend incomes or both. But they may not undertake any of these extra activities, in order to have peace of mind and concentrate on their work. In any case, the flow-of-funds accounts cannot throw any light on the causation of

the pattern that one sees ; but they do unfold the behavioural pattern and provide an apparatus or a basis on which the analysts could ponder and speculate. Indeed, relating variations in some typical fund-flows (e.g. different types of deposits, and external sources of corporate funds) to the variables like the GNP, prices, interest rates, etc. has been an interesting subject matter of studies.

3. Uses of flow-of-funds accounts

Among the various uses of the flow-of-funds accounts, the following may be mentioned in particular. It is with these uses that we shall examine in some detail the recent developments.

1. A wide variety of financial instruments get created in the process of movement of financial flows. How wide is this pattern of financial instruments, how it develops over time, how it compares with other countries, and what composition prevails for different economic sectors and what changes occur in these sectoral compositions of financial instruments can be seen through the financial flows accounts. These claims and obligations form the basis for constructing national balance sheet of financial assets and liabilities and changes in these between two points of time yield the financial flows over the period.

2. The temporal and cross-sectional comparisons should provide insight into changing patterns of the degree of development of financial intermediation, the increasing distance between the saver and the investor and the paths which take the savings to the investing sectors. Some measures which seek to gauge the development of financial intermediation are discussed in Section 6.

3. A comparison of financial flow accounts of a country over time can give us the changing pattern of the evolving financial structure and the mode of financing the real investment as time passes ; a comparison of such accounts with those of other countries would throw up the differences in the financing pattern for investments. Secondly, the volume of financial flows when compared to an index of economic activity, say, GNP or NNP, could serve as an indicator of the growing use of financial instruments and complexity of financial structure in the economic development of a country. Such temporal and cross-sectional analysis could give some idea about the develop-

ing complexities of financing as the economy grows and diversifies its economic base.

4. The inter-sectoral financial flows and sectoral saving and investment can be set out in the form of an input-output type of table showing the same sectors in their dual role of lenders of funds and users and/or borrowers for investment. Once this transaction matrix is constructed it is possible to use it for financial planning and show how a given sectoral saving pattern would result in a unique pattern of sectoral investment given the behaviouristic pattern of inter-sectoral disposition of funds. This aspect of financial planning is often ignored in macro-planning, it being assumed that so long as the total magnitude of investment is matched by total supply of savings (including external resources), the consistency between the financial and physical aspects of a plan will be ipso facto achieved. This aspect is treated in Section 8. Its importance to under-developed countries for which conscious planning rather than operation of undisturbed market forces is the basis of development is quite considerable. Not only does it show clearly the need for consistent patterns of sectoral saving and investment given the flow-of-funds pattern (which is a behaviouristic phenomenon), but it seeks solution to problems as to what should be done to achieve the consistency between given saving-investment sectoral patterns, *i.e.* what changes should be brought about in the flow-of-funds pattern given certain constraints.

4. Limitations and scope of further work

The above is undoubtedly an impressive list of actual and possible uses. But a variety of problems still remain to be overcome. These may broadly be grouped into four categories, namely, (*i*) valuation differences, (*ii*) timing differences, (*iii*) problems in sectoring and (*iv*) the time lag and other deficiencies in required data. The first two arise in the context of the basic identity of lending and borrowing for the nation. The most important problem is of course the first one which causes discrepancies between the value of claims issued as per the issuing sector accounts and the value of claims reported to be held in the holding sector accounts. This is but natural as it is the 'issue' price with which the issuer is concerned whereas the holder records it either at current market price or at the price paid in acquiring it. Associated with this is the difficulty of adjusting for capital gains or losses which even out at the national level

but not necessarily at the sectoral levels. For instance saving by definition excludes capital gains or losses. Similarly investment estimates should exclude purchase and sale of second hand assets because such transactions represent no addition to the stock of physical assets and so are mere transfers from one sector to another. In India, investment estimates at the overall level are prepared following the commodity flow approach and therefore only new physical assets acquired during the year are taken into account. At the sectoral level, however, the data available do not permit such fine segregation of total capital expenditure on (*a*) new assets or additional improvement of existing assets and (*b*) towards purchase of second hand assets from others. On the other hand the saving estimates available at the sectoral level invariably exclude capital gains and losses and as such the saving-investment gap measured for a given sector will not match with the difference between its lending and borrowing. Timing differences arise because all sectors do not have common accounting years. Sectoring also occasionally gives rise to alternatives depending on the stress laid to functional or institutional homogeneity. In the Indian context the treatment of government companies provides an illustration in this regard. Should they be grouped along with private companies or should they be covered under the government sector ? They were heavily dependent in the early stages on the latter, the central government in particular, for most of their requirements of finance but lately they have begun to have recourse to the banking system with the exception of departmental undertakings such as Railways and Post and Telegraph. To club them with companies would lend a touch of artificiality to the emerging financial relationships at the sectoral level which have particular relevance to the capital market. On the other hand, left to remain in government sector the significance of such borrowings from government gets somewhat reduced being intra-sectoral in character. This difficulty arises in the context of planning, government have also come to assume the role of a financial intermediary apart from being an investor too. Not to confound the effects of the two distinct functions of intermediation and investment, it is perhaps better to have a separate sector for public sector undertakings so that government or banking sector lendings to this new sector come out quite clearly in the flow-of-funds accounts. This is not to say that one way of grouping is better than the other but to indicate that sectoring is as delicate as the art of surgery. This issue is analogous to the controversy of industry versus commodity in drawing the input-output table. Any one method

will have to be followed depending on the objectives in view. In our accounts, government companies are separately grouped and shown.

Regarding time lag, the latest accounts available for the Indian economy are for 1972-73. The delay of about four years, no doubt, detracts the utility of such information for a review of current events of significance or for forecasting though not for other analytical studies. In countries like USA and UK, the flow-of-funds accounts are constructed for each quarter. The accounts in our case are for the whole year mostly for the reason that even half-yearly data for many sectors are simply not there. In the process flows representing sums borrowed and repaid during the year will get netted. The annexure gives an exhaustive list of the source material used including the Combined Finance and Revenue Accounts for government and the various surveys conducted by the Bank. This should make it clear the extent to which the delays can be remedied. Compilation time can be kept down to a minimum but the receipt of basic publications of outside agencies continues to be slow. As regards inadequacy of data, relatively speaking the short-comings are more in respect of the 'non-financial' sectors than in the case of financial institutions. For the financial part, difficulties are experienced in getting the requisite break-up of investments by type of financial claims like shares, debentures, etc., as in the case of co-operatives or by sectors for example, the sectoral break-up of trade debt and trade credit of corporate sector. Details are also wanting in respect of transfers among non-financial sectors. For the government sector, gaps exist in respect of State Governments and Local Authorities. For the former, compilation of financial accounts involves Economic Classification of their budgets and this is being done to a limited extent in the Flow-of-funds section of the Bank. Lately, a few State Governments (for example, Maharashtra, Gujarat and Tamil Nadu) are publishing such classified accounts and this would be of considerable use. Again, the undertakings of these two agencies, like the State Electricity Boards, Housing Boards, Road Transport Undertakings and so on are not fully covered for want of accounts.

As regards corporate sector, the data used are from the various studies on finances of sample joint-stock companies undertaken in the Department of Statistics of the Reserve Bank of India and the figures for the entire sector are obtained by suitably blowing-

up the sample figures based on paid-up capital. The procedure involves several implicit assumptions which could be cleared if only a Census is undertaken periodically, say, at five year intervals.

Household sector is essentially a residual sector for the purposes of the flow-of-funds analysis. It is the largest single domestic surplus sector. It covers besides 'pure' households, household enterprises as well as unincorporated establishment based enterprises, both registered and unregistered, non-profit making institutions such as educational, religious and charitable institutions and private trusts. Above all, indigenous bankers and money lenders also get clubbed here so that in a behavioural sense it represents a curious admixture of heterogeneous institutions, savers and investors and agents of real economic activity as well as financial activity alike. Under the circumstances, it is not possible to measure separately the changes in the habits of the pure households or non-corporate enterprises in regard to their dealings with organized money and finance market and against their dealings with unorganized market. This situation is evidently undesirable for analytical studies and needs to be corrected. Data presently available, however, severely handicap such important improvements.

5. Flow-of-funds accounts for the economy

Statements presenting the flow-of-funds could be prepared for homogeneous groups of financial institutions on the lines shown in Table 3 after suppressing the non-financial items. It is significant to note that for most financial institutions their own saving and investment are relatively small compared to their total sources or uses of funds.

Confining attention to only the financial accounts, it is possible to put down the financial sources and financial uses of funds for all non-financial as well as financial sectors ; in other words for the entire economy. Looking through the entries on the sources side of one sector, it could be readily seen that sooner or later the same figures would appear on the uses side of other sectors. This indicates that total lending and borrowing at the national level would always be equal. The inter-sectoral financial transactions could thus be neatly depicted in the form of a matrix, the use of which will be seen towards the concluding part of this article. The matrix so drawn up for the Indian economy for the period 1969-70 to 1971-72 appears in Statement I.

It is relevant to emphasise here that the figures are generally given on 'net' basis and not on 'gross' basis. That is to say, net lending by sector A to sector B or net borrowing by sector B from sector A. It is possible to work with gross figures and indeed such figures would indicate the correct volume of flows in the economy; but since these flows are calculated on the basis of outstandings at two end-points of a given period, it is usually not possible to have gross figures.

6. Some Important Financial Indicators

So far no reference is made about financial claims as such except in a broad way. There are a variety of financial claims in the economy—for instance, currency, bank deposits, treasury bills and dated securities ; Corporate and other private securities ; social security funds consisting of life insurance and provident funds ; loans and advances and so on. In its widest sense, it covers all forms of borrowings (or liabilities) including items such as borrowings and trade debt of companies ; the flow-of-funds accounts use this wider definition. Summing over all these claims one could possibly think of a total debt or credit for the entire nation, although it is essential to keep in mind the distinct characteristics of different types of claims in regard to risk, liquidity and maturity period. The ratio of total debt to total stock of physical assets is called the Financial Inter-Relations Ratio (FIR).

Total debt broadly consists of two parts, the first part representing the value of all 'primary' securities issued by the 'non-financial' sectors and the second, that of 'indirect' securities supplied by all financial intermediaries.

If financial intermediation is necessarily concomitant with economic growth, it would be interesting to look at the 'intermediation ratio' calculated as the ratio of the total value of indirect securities excluding intra-sectoral issues of financial institutions to that of primary securities which indicates (*a*) the relative importance of financial institutions in the financial superstructure and (*b*) the reliance on indirect financing by non-financial sectors for finance.

The ratio of 'primary' securities issued to physical assets or the 'new issue' ratio, would throw light on the extent of external financing or the complementary aspects of self-financing of capital

stock. Yet another aspect of the financial institutions is the pyramidal structure. The three-tier structure of government administration (a large financial intermediary in India) at the Centre, State and Local levels and similarly that of co-operative institutions are suitable illustrations in this context. The percolation of finance from the apex to lower levels, the proportion of their own liabilities which banks voluntarily or statutorily keep with the Central Bank, etc. indeed inflate the total magnitude of flows and this effect is referred to as 'layering effect.' The proportions of inter-institutional issues among financial institutions to their issues to non-financial sectors is known as the layering ratio. This may not be strictly relevant from the angle of flow-of-funds since the intra-sectoral transactions have been eliminated. But the layering ratio retains its significance if, instead, stock data found in national balance sheet exercises were to be used. The ratios given in the accompanying table, based as they are on flow-of-funds data, are marginal ratios and not averages.

The relationship of the FIR and its determinants can be conveniently expressed in the form :

$$F = Y \cdot M \cdot K \cdot E. \; [1 + R \; (1 + L)]$$

$$FIR = \frac{F}{Y \cdot M \cdot K}$$

Where F stands for all financial claims.
Y national income, M monetisation ratio, K the physical assets to monetised income ratio, E the new issue ratio, R the intermediation ratio and L the layering ratio. Please note the following :

$Y \cdot M.$ = Monetised National Income
$Y \cdot M \cdot K.$ = (Monetised) Capital formation (Item 5)
$Y \cdot M \cdot K \cdot E.$ = Net issues of non-financial sectors (Item 2)
$Y \cdot M \cdot K \cdot E \cdot R.$ = Net issues of financial institutions to non-financial sectors (Item 1)
$Y \cdot M \cdot K \cdot E \cdot R \cdot L.$ = Net issues of financial institutions to financial sectors.

The above ratios constitute a set of summary measures to perceive important developments on the financial side. They indeed show that the second plan period clearly marked the beginning of growth and diversification of our financial system in

TABLE 4 : INDICATORS OF FINANCIAL DEVELOPMENT IN INDIAN ECONOMY—FLOWS DURING THE PLAN PERIODS

(Amount in Rs. crores)

	First Plan	Second Plan	Third Plan	1966-67 to 1968-69	1969-70 to 1971-72
	1	2	3	4	5
1. Issues of Financial Institutions (Indirect) to Non-financial Sectors	590 (*1.3*)	2003 (*3.4*)	3838 (*4.4*)	3628 (*4.5*)	5916 (*5.8*)
2. Issues of Non-financial Sectors	1792 (*3.8*)	4822 (*8.2*)	8227 (*9.5*)	7485 (*9.3*)	9381 (*9.1*)
3. Issues of Rest of the World	—178 (*—0.4*)	—542 (*—0.9*)	74 (*0.2*)	12 (—)	261 (*0.2*)
4. Total (F) (1 to 3)	2204 (*4.7*)	6283 (*10.7*)	12139 (*14.1*)	11125 (*13.8*)	15558 (*15.1*)
5. Net Physical Assets Formation (Y·M·K.) (at current prices)	3489 (7.4)	7428 (12.7)	12378 (14.3)	11903 (14.7)	14700 (14.4)
6. Financial Inter-Relations Ratio FIR—(Ratio of 4 to 5) ..	0.63	0.85	0.98	0.93	1.06
7. Investment financed by Financial Institutions (Ratio of 1 to 5)	0.17	0.27	0.31	0.30	0.40
8. Intermediation Ratio (Ratio of 1 to 2)	0.33	0.42	0.47	0.48	0.63
9. New Issue Ratio (Ratio of 2 to 5)	0.51	0.65	0.66	0.63	0.64
10. Ratio of Foreign (Rest of the World) Financing (Ratio of 3 to 4)	—0.08	—0.09	0.01	—	0.02

Note : Figures in brackets represent percentages to national income.

terms of the institutions and to a lesser extent, perhaps, of instruments. New issues (incremental) of financial institutions steadily rose from the annual average of Rs. 118 crores or 1.3 per cent of national income during first plan period to about Rs. 1972 crores or roughly 5.8 per cent of national income by 1969-70 to 1971-72. But the jump from 1.3 to 3.4 per cent occurred during the second plan. There were a host of promo-

tional and other measures initiated by Reserve Bank and the Government—the nationalisation and reorganisation of the then Imperial Bank of India (State Bank of India) in 1956, greater vigilance over the working of other banks, stress laid on cooperative credit, progressive extension of the EPF Act to cover many more new industrial establishments and so on—which are responsible for this. Although some criticism is often made that second plan had too much accent on physical investment, it is seen here that development of financial infra-structure was not entirely lacking. The rising trend continued over later periods, but at slower pace. Mention should be made of the recognition given to (*a*) the aspect of term lending initially and later on of development banking and (*b*) the emerging class of smaller investors both from the view point of industrial development through the establishment of Industrial Development Bank of India (IDBI) and Unit Trust of India (UTI) in 1964 closely followed by the Agricultural Refinance & Development Corporation (ARDC).

The increasing resort to indirect financing via the financial institutions is reflected in the rising intermediation ratio. The reliance on credit (or external finance) for investment purposes, revealed by the new issue ratio, also has gone up from 0.51 during first plan to 0.66 in the third plan period but in the subsequent years it remained at about 0.64. The rise in both the ratios would be even more impressive if only the governmental issues are split up into two parts representing separately the effects of intermediation and investment and grouped under indirect and primary issues respectively. As referred to earlier it is not possible to measure the layering ratio from flow-of-funds accounts but the estimates obtained from balance sheet data show that it has also followed the same trend and is around 0.15 to 0.18 in recent years. These changes are all embodied in FIR* which has risen from 0.63 during first plan to about 1.06 during 1969-70 to 1971-72. In other words, for a rupee of investment in physical assets, investors issued (or created) financial claims worth 63 paise during the first plan years whereas lately they create claims worth one rupee and six paise. This is a pointer to the growing complexity of the financial system which inevitably accompanies modernisation and growth.

* Excludes the large effect.

The claimwise and sectorwise distributions of total debt appear in Statement II. Briefly stated (using sources side figures), for the period under study the share of monetary claims has risen from 15 per cent in the first plan period to 24 per cent during the first three years of the fourth plan and of loans and advances from 29 per cent in first plan to 42.5 per cent during the annual plan years. Thereafter the proportion for loans and advances dipped to 32 per cent, the decline being shared by both the government and private corporate sectors. The former is partly due to the growth of banking sector and in part because of deficit financing ; substantial aid from abroad is one of the factors underlying the latter. Within monetary claims the share of currency in particular (not shown separately) has somewhat shrunk mainly due to the comparatively faster growth of deposits. Social security funds have improved from 9.4 per cent during second plan to 11.9 per cent for 1969-70 to 1971-72, the fall in share from first to second plan being partly due to differences in the sources of data used to estimate them.

Classified broadly by the sector of issues namely, government and non-government sectors, the share of the former has varied between 38 and 53 per cent thereby showing the dominance of government. If the influence indirectly exercised through ownership of institutions is also taken note of, the dominance will be even greater. The measure supplements other measures such as public sector's share in aggregate investment or in income generated, widely used to bring out the 'commanding heights' attained by the government.

7. Integrated Picture of Financial Flows—Saving and Investment

Financial flows integrated with saving and investment are given sectorwise for the different sub-periods in the following tables. The scope of the discussion, however, is confined to certain sectoral aspects such as the pattern of financing of deficit sectors like government and private corporate sectors and the pattern of lending of the main surplus sector, namely, households, in that order.

Government Sector

The accounts presented below are essentially derived from Statement II and the available estimates of sectorwise saving and investment.

TABLE 5

(Amount in Rs. crores)

	First Plan	Second Plan	Third Plan	1966-67 to 1968-69	1969-70 to 1971-72
	(1)	(2)	(3)	(4)	(5)
1. Saving	614	1044	2293	1167	1932
	(43)	(27)	(32)	(22)	(30)
2. Investment	1419	3877	7096	5332	6363
	(100)	(100)	(100)	(100)	(100)
3. Investment-Saving gap (2-1)	805	2833	4803	4165	4431
	(57)	(73)	(68)	(78)	(70)
4. Borrowing	966	3357	5446	5052	6125
5. Lending	83	441	1040	953	1302
6. Financial Deficit (4-5)	883	2916	4406	4099	4823
	(100)	(100)	(100)	(100)	(100)
7. Discrepancy (3-6)	—78	—83	397	66	—392
8. Deficit financed by net issues					
(a) From Sectors					
(i) Banking	371	1502	1489	1031	2079
	(42)	(52)	(34)	(25)	(43)
(ii) Other Financial Institutions	136	390	514	360	844
	(16)	(13)	(12)	(9)	(17)
(iii) Private Corporate Business	—38	—89	—115	—41	—177
	(—4)	(—3)	(—3)	(—1)	(—3)
(iv) Households	237	509	541	433	345
	(26)	(17)	(12)	(11)	(7)
(v) Rest of the World	98	842	2211	2038	1140
	(11)	(29)	(50)	(50)	(24)
(vi) Others	79	—238	—234	278	592
	(9)	(—8)	(— 5)	(6)	(12)
(b) By Instruments					
(i) Currency and Deposits	98	70	—12	—66	44
	(11)	(2)	(—)	(—2)	(1)
(ii) Securities	400	2063	2037	1303	1739
	(45)	(71)	(46)	(32)	(36)
(iii) Loans and Advances	—72	511	1640	1627	1257
	(—8)	(17)	(37)	(40)	(26)
(iv) Small Savings	240	403	670	413	471
	(27)	(14)	(15)	(10)	(10)
(v) Provident Fund	100	172	327	282	506
	(11)	(6)	(8)	(7)	(10)
(vi) Foreign claims not elsewhere classified	40	—57	—82	—14	—164
	(5)	(—2)	(—2)	(—)	(—3)
(vii) Others	77	—246	—174	554	970
	(9)	(—8)	(—4)	(13)	(20)

Note : Figures in brackets against items 1 and 3 are percentages with respect to item (2) and for those shown against items 8(a) and 8(b) are in relation to item 6.

Before proceeding to grasp the trends depicted by the figures presented, it may be necessary to add a few prefatory remarks for the sake of clarity. And this broadly applies to the other two sectors dealt with below. The table shows the saving–investment gap. The saving and investment estimates used are from the RBI studies until 1959-60 and for later years, the information available with the RBI has been supplemented with the data published by the Central Statistical Organisation (CSO) particularly in regard to the estimates of capital formation in the government non-departmental undertakings and household sectors. The saving-investment gap shown covers net capital transfers. In the flow-of-funds such transfers are not shown being non-financial in character. Therefore, the discrepancies shown also include the net capital transfers. Besides, the patterns of financing, sectorwise and instrumentwise, are on a net basis and would, therefore, differ from those worked out from gross sources. In other words, if government sector has borrowed resources in one form or another from any other sector but has also lent some amount, then only the 'net' figure is shown. Nevertheless, it may be worthwhile to keep in view such 'uses' in interpreting trends.

Government saving has indeed risen in absolute terms but has not kept pace with the steadily rising level of its investment. In fact as proportion to the latter, it fluctuated alternatingly and declined from 43 per cent of the investment in the first plan period to 30 per cent during 1969-70 to 1971-72. In meeting these widening deficits, it has resorted to borrowing both from the domestic and foreign sectors. There has been a few significant changes in the pattern of financing. The foreign sector has emerged as the most important lender eclipsing other domestic sectors like banks, other financial institutions and households which are net lenders to government. However, since third plan years it has reached a plateau of about 50 per cent of the government deficits and has steeply declined thereafter to 24 per cent reflecting among others, the stress laid on self-reliance in planning. The negative and small magnitudes of 1-4 per cent for the private corporate business not only represent their disinvestment of smaller holdings of government securities but more importantly the loans received from government for modernisation and other purposes. The same factors account for the declining share of household sector. Securties (including shares of government bodies) and loans and advances constitute the important form of government borrowing.

Private Corporate Sector

Private corporate sector covers all non-government non-financial joint-stock companies as well as non-credit co-operatives. Their performance may be read from the following :

TABLE 6

(Amount in Rs. crores)

	First Plan	Second Plan	Third Plan	1966-67 to 1968-69	1969-70 to 1971-72
	(1)	(2)	(3)	(4)	(5)
1. Saving	178	396	634	231	549
	(*44*)	(*29*)	(*24*)	(*16*)	(*31*)
2. Investment	404	1374	2663	1432	1785
	(*100*)	(*100*)	(*100*)	(*100*)	(*100*)
3. Investment-Saving gap (2-1)	226	978	2029	1201	1236
	(*56*)	(*71*)	(*76*)	(*84*)	(*69*)
4. Borrowing	493	934	1735	1244	1210
5. Lending	77	110	138	110	153
6. Financial Deficit (4-5)	416	824	1597	1134	1057
	(*100*)	(*100*)	(*100*)	(*100*)	(*100*)
7. Discrepancy (3-6)	—190	154	432	67	179
8. Deficit financed by net issues					
(a) **From Sectors**					
(*i*) Banking	63	363	813	695	450
	(*15*)	(*44*)	(*51*)	(*61*)	(*43*)
(*ii*) Other Financial Institutions	40	82	354	226	211
	(*10*)	(*10*)	(*22*)	(*20*)	(*20*)
(*iii*) Government	29	95	115	68	143
	(*7*)	(*12*)	(*7*)	(*6*)	(*13*)
(*iv*) Households	275	281	253	89	292
	(*66*)	(*34*)	(*16*)	(*8*)	(*28*)
(*v*) Rest of the World	8	61	62	60	—60
	(*2*)	(*7*)	(*4*)	(*5*)	(—*6*)
(*vi*) Others	1	—58	—	—4	21
	(—)	(—*7*)	(—)	(—)	(*2*)
(b) **By Instruments**					
(*i*) Currency & Deposits	—48	—28	—60	—21	—102
	(—*12*)	(—*3*)	(—*4*)	(—*2*)	(—*10*)
(*ii*) Securities	199	257	457	178	203
	(*48*)	(*31*)	(*29*)	(*16*)	(*19*)
(*iii*) Loans & Advances	239	672	1290	1056	850
	(*57*)	(*82*)	(*81*)	(*93*)	(*81*)
(*iv*) Trade Credit	24	—62	—90	—78	81
	(*6*)	(—*8*)	(—*6*)	(—*7*)	(*8*)
(*v*) Others	2	—15	—	—1	25
	(*1*)	(—*2*)	(—)	(—)	(*2*)

Note: Figures in brackets against items 1 and 3 are percentages with respect to item 2 and for those shown against items 8(a) and 8(b) are in relation to item 6.

There is a steady fall in the proportion of self-financing of investment from 44 per cent during the first plan to 16 per cent during the annual plan period (1966-67 to 1968-69). The decline in the levels of saving and investment in the three-year period succeeding the third plan, is attributable to the recessionary trends which prevailed in the industrial sector. Since then the proportion of self-financed investment has risen to 31 per cent reflecting partly the shift from the excessive reliance on external finance particularly from commercial banks in the wake of measures initiated such as social control and credit planning. Until 1969-70, the Saving-Investment gap of this sector has been increasingly met by the banking sector, its share rising from 15 per cent in the first plan years to 61 per cent during the period 1966-67 to 1968-69. For the next three years the share is found lower at 43 per cent for reasons already referred to above. Other financial institutions such as IDBI, Industrial Finance Corporation of India, State Financial Corporations, Provident Funds, Life Insurance Corporation and UTI have also improved their share of lending from about 10 per cent for the initial period to 20 per cent for the last period. Households, on the other hand, have been lending less and less directly, but more through banks and other financial institutions. The share of securities in raising finance has declined steeply whereas that of loans and advances have increased in importance. Loans and advances is the most preferred form of finance for companies.

Household Sector

Households constitute the most important surplus sector in any country in so far as they experience a substantial surplus of saving over their investment needs. In India, direct investment is found to be over 50 per cent of their own saving, the balance being lend to others in the form of financial assets. The pattern of lending is vividly brought out in the Table 7.

Households keep their financial surpluses with banks and other financial institutions and such placements have steadily grown both relatively and in absolute terms. This is evident, for the former, from the sizeable monetary claims they hold—share rising from 36 per cent during first plan to 91 per cent during 1969-70 to 1971-72 and about the latter representing mostly life insurance and provident funds—their combined shares going up from 33 to about 50 per cent over the same period. Similar to what is observed for the government sector, net direct lending

TABLE 7

(Amount in Rs. crores)

	First Plan	Second Plan	Third Plan	1966-67 to 1968-69	1969-70 to 1971-72
	(1)	(2)	(3)	(4)	(5)
1. Saving	2546	4023	5858	7475	10289
	(*100*)	(*100*)	(*100*)	(*100*)	(*100*)
2. Investment	1653	2139	2576	5075	6502
	(*65*)	(*53*)	(*44*)	(*68*)	(*63*)
3. Saving-Investment gap (1-2)	893	1884	3282	2400	3787
	(*35*)	(*47*)	(*56*)	(*32*)	(*37*)
4. Lending	1227	2415	4328	3588	5832
5. Borrowing	334	531	1046	1188	2045
6. Financial Surplus (4-5)	893	1884	3282	2400	3787
	(*100*)	(*100*)	(*100*)	(*100*)	(*100*)
7. Discrepancy (3-6)	—	—	—	—	—
8. Surplus lent (Through purchases of net issues)					
(a) To Sectors					
(*i*) Banking	213	675	1646	970	1824
	(*24*)	(*36*)	(*50*)	(*40*)	(*48*)
(*ii*) Other Financial Institutions	168	419	843	908	1326
	(*19*)	(*22*)	(*26*)	(*38*)	(*35*)
(*iii*) Private Corporate Business	275	281	253	89	292
	(*31*)	(*15*)	(*8*)	(*4*)	(*8*)
(*iv*) Government	237	509	540	433	345
	(*26*)	(*27*)	(*16*)	(*18*)	(*9*)
(b) By Instruments					
(*i*) Currency & Deposits	326	1057	2290	1817	3432
	(*36*)	(*56*)	(*70*)	(*76*)	(*91*)
(*ii*) Securities	265	385	89	—	—50
	(*30*)	(*20*)	(*3*)		(—*1*)
(*iii*) Loans & Advances	—253	—437	—806	—953	—1741
	(—*28*)	(—*23*)	(—*25*)	(—*40*)	(—*46*)
(*iv*) Small Savings	231	358	574	345	191
	(*26*)	(*19*)	(*17*)	(*14*)	(*5*)
(*v*) Life Fund	116	189	445	475	660
	(*13*)	(*10*)	(*14*)	(*20*)	(*17*)
(*vi*) Provident Fund	184	389	777	752	1249
	(*20*)	(*21*)	(*24*)	(*31*)	(*33*)
(*vii*) Trade Debt	24	—57	—87	—76	81
	(*3*)	(—*3*)	(—*3*)	(—*3*)	(*2*)
(*viii*) Others	—	—	—	40	—35
				(*2*)	(—*1*)

Note: Figures shown in brackets against items 2 and 3 are percentages with respect to item 1 and those shown against 8(a) and 8(b) are in relation to item 6.

by households in the form of securities to corporate sector drastically fell from 30 per cent for 1951-55 to a small net disinvestment of securities in the last period. There is a falling trend in the share of net loans and advances. The declining share indicates that borrowings of households from banks and other financial institutions have increased at an even faster rate. Falling share of lending to government reflects rising quantum of the flow of financial assistance from government to households besides disinvestment in marketable government securities. The negative magnitudes for loans and advances indicate that such inflows into the household sector are in the form of loans and advances.

8. Financial Planning

A reference is already made about the use of flow-of-funds accounts and sectoral saving and investment data in financial planning. For an economy where planning mechanism works and investment and saving patterns are projected, it becomes important to ascertain, whether in the light of the prevailing behaviouristic pattern of disposition of surplus funds, the projected sectoral saving and investment patterns are consistent. For this purpose, 6 x 6 transaction matrix is constructed. The six sectors and the inter-sectoral flows are given in Statement II. While a number of sectors can be considered in order to increase the utility of this operational technique for more detailed financial planning, for purposes of the illustration only six sectors are considered. The degree of disaggregation that can be attempted depends on the extent of availability of detailed data. It may also be mentioned that the flows are in *net* terms. Here again, it is possible to work on the basis of 'gross' flows, but for the sake of clarity attention is confined to net flows. It would be seen that since corresponding to a flow from Sector A to Sector B there could be also a flow from Sector B to Sector A, we net out these flows and show the positive residue.

The elements of the matrix will represent borrowing and lending between any two sectors. There are inevitably two figures associated with each element (or cell) of the matrix, one from the borrowing sector account and the other from the lending sector account. The two figures in the cell will, however, generally differ. This is due to limitations of data in terms of valuation practices, timing of the recording of data, etc. In such cases, an average of the two figures is taken to represent the actual flow.

The basic assumption in making use of the transaction matrix for future planning is that the behaviouristic pattern of disposition of funds by the sectors remains unchanged over the period of projection. The shorter this period, the better this assumption holds. Also since annual patterns of flows show considerable fluctuations, the average for a three or five year period is adopted for a more stable pattern.

The matrix has two financial sectors and four non-financial or productive sectors. Each row depicts the lending pattern for a given sector and each column, the borrowing pattern for the given sector. The matrix when sub-divided into four sub-matrices as shown below leads to a more clear understanding of the flows.

$$X = \begin{array}{c|cccc|cccc|c} & & & & & & & & & \text{Row totals :} \\ & x^1_{11} & x^1_{12} & x^1_{13} & \ldots x^1_{1n} & x^3_{11} & x^3_{12} & x^3_{13} & \ldots x^3_{1m} & t_1 \\ & x^1_{21} & x^1_{22} & x^1_{23} & \ldots x^1_{2n} & x^3_{21} & x^3_{22} & x^3_{23} & \ldots x^3_{2m} & t_2 \\ & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ & x^1_{n1} & x^1_{n2} & x_{n_3} & \ldots x^1_{nn} & x^3_{n1} & x^3_{n2} & x^3_{n3} & \ldots x^3_{nm} & t_n \\ \hline & x^2_{11} & x^2_{12} & x^2_{13} & \ldots x^2_{1n} & x^4_{11} & x^4_{12} & x^4_{13} & \ldots x^4_{tm} & s_1 \\ & x^2_{21} & x^2_{22} & x^2_{23} & \ldots x^2_{2n} & x^4_{21} & x^4_{22} & x^4_{23} & \ldots x_{2m} & s_2 \\ & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ & x^2_{m1} & x^2_{m2} & x^2_{m3} & \ldots x^2_{mn} & x^4_{m1} & x^4_{m2} & x^4_{m3} & \ldots x_{mm} & s_m \\ \text{Column totals} & t_1 & t_2 & t_3 & \ldots t_n & i_1 & i_2 & i_3 & \ldots i_m & \end{array}$$

$S' = \begin{Bmatrix} s_1 \\ s_2 \\ \vdots \\ s_m \end{Bmatrix}$ are the net savings of the 'm' producing sectors

$I = (i_1, i_2 \ldots i_m)$ are the net investments in the 'm' producing sectors.

$T' = \begin{Bmatrix} t_1 \\ t_2 \\ \vdots \\ t_n \end{Bmatrix}$ are net uses of the 'n' financial intermediaries.

$T = (t_1, t_2 \ldots t_n)$ are the net sources of the 'n' financial intermediaries.

The transaction matrix can be partitioned into four meaningful sub-matrices. Then

$$X = \left\{ \begin{array}{c|c} X_1 & X_3 \\ \hline X_2 & X_4 \end{array} \right\}$$

Sub-matrix X_1 represent flows from one financial sector to another financial sector. The diagonal elements are zero because, as financial intermediaries, these sectors do not have their own saving. If they are there, these can be imputed to other sectors on the basis of some agreed rules ; or, to the extent that these sectors do contribute to physical asset formation through their saving, the two sectors can again be listed as producing sectors and then there can be an 8 x 8 matrix. This device separates out the pure financial intermediation and investment functions of the financial agencies. Sub-matrix X_2 represents, row-wise, lendings of surpluses of producing sectors to the financial institutions. Column-wise, the figures give borrowings by financial institutions from the producing sectors. Sub-matrix X_3 gives the lendings by financial intermediaries to the producing sectors and sub-matrix X_4 gives the lending-borrowing interactions among the producing sectors. The diagonal entries here represent the disposition of each producing sector's saving for its own investment. It is in fact through this sub-matrix that flow-of-funds is linked up with saving and investment. The row and column totals also deserve comment. The row totals of X_1 and X_3 give the lendings by each of the financial institutions and all row totals aggregate to the total lendings by financial intermediaries. This figure is represented by T. Since these intermediaries lend to other sectors after borrowing funds from the producing sectors, the column totals of X_1 and X_2 should also total upto T. The matrix, seen in compartments thus gives the total quantum of funds flowing through the financial intermediaries. Similarly, row totals of X_2 and X_4 give the savings of each domestic producing sector plus net lending by the rest of the world sector. The column totals of X_3 and X_4 give investment pattern of the producing sectors. Since column and row totals of financial sectors are equal, the identity that investment equals saving *plus* net borrowings from abroad always holds good.

It may be useful at this stage to demonstrate how the suggested technique of financial planning could be applied in actual practice. For illustrative purpose, the exercise considered is based on the sectorwise estimates of saving and investment as envisaged in the Fourth Plan document. The matrix of structural coefficients, i.e., the ratio of each cell value to the row total, is first calculated as the average for the third plan period. Given these structural coefficients and the envisaged saving distribution, the fourth plan sectoral investment pattern emerges from the following identity:

$$I = SA_2 \ (\pi - A_1)^{-1} \ A_3 + SA_4,$$

where the A matrices are the parameterised versions of the X matrices, row-wise, and π is a unit matrix of the same order as A. It is to be remembered that with the given data, i.e., structural coefficients and saving distribution totals for different producing sectors, this is the only consistent investment pattern. Any other pattern would mean imbalance in the economy. Also, if another investment pattern is to be achieved, the flow-of-funds pattern and the saving distribution have to be altered. What changes need to be done, therefore, in the structural coefficients and the saving distribution has to be studied. The second exercise is that if a certain investment pattern and total as envisaged in fourth plan are given, the corresponding saving pattern consistent with the given investment distribution and structural coefficients can also be worked out. The only thing that needs to be done is to calculate the structural coefficients as ratios of cell figures to the corresponding column totals. And the matrix algebra is slightly modified. In both these cases, the associated total of financial flows through financial intermediaries is also obtained. The results thus worked out can be compared with the Planning Commission's projections for the fourth plan. These comparisons are given below.

TABLE 8

(Rs. crores)

	Saving projections		
	Plan Document	Estimated	Difference
Financial Institutions	372	287	85
Companies	790	533	257
Government	4609	4225	384
Households	12090	11466	624
Rest of the World	2644	3994	—1350
Total	**20505**	**20505**	—

The differences indicate that if third plan of flow-of-funds pattern prevails during the fourth plan, then evidently, plan investment pattern cannot be achieved. For that to happen more reliance on rest of the world lending is inevitable. This, of course, is no commentary on Planning Commission's estimates. It had

already envisaged drastic cuts in foreign aid. But whether it has considered what other changes in the flow-of-funds patterns are necessary in order to restore this imbalance is not quite clear.

Similarly, if one takes the saving distribution of Fourth Plan and structural coefficients or the matrix as given, the following investment pattern emerges :

TABLE 9

(Rs. crores)

	Investment		
	Plan Document	Estimated	Difference
Companies	1825	3544	—1719
Government	12635	11446	+1189
Households	6045	5515	+530
Total	**20505**	**20505**	—

Here, it is seen that if the third plan pattern prevails, investment in corporate sector has to be more by about Rs. 1700 crores. The government investment has to be lower by almost Rs. 1200 crores. The problem to make the given investment and saving pattern consistent may then lie in drawing more funds from corporate to the government sector. What effect it will have on the flow-of-funds pattern has to be studied.

It was mentioned that a higher degree of disaggregation of sectors is possible provided data are available. Also, one can work with gross figures. This in fact has been attempted. Without going into details, it may be useful to see the differences in the results. An 11 x 11 matrix was set up in place of the 6 x 6 matrix discussed here. Gross flows were considered for the larger matrix.

TABLE 10

(Rs. crores)

	Investment	
	Gross matrix (11 x 11)	Net matrix (6 x 6)
Companies	3456	3493
Government	10686	10552
Households	5513	5610
Total	**19655***	**19655***

*Excluding Rs. 850 crores of deficit financing.

These results show that there is not much difference in the final investment distribution. Differences would naturally occur in respect of the total financial flows. These are worked out at about Rs. 14,000** crores for the gross, larger matrix and Rs. 5,000** crores for the net, smaller matrix.

The changes occuring in the structural coefficients are themselves of interest. The matrix evolved enables one to grasp these changes readily. For instance, in regard to the fourth plan, it is of interest to compare the third plan values with the values worked out on the basis of financing of the fourth plan investment targets.

As for the households, its investment depends entirely on its own saving and being surplus, it is net lender rather than borrower. It is, therefore, safe to assume that the structural coefficient for demand for funds as unity in the diagonal cell, household-household, for both these periods. In regard to the government and private corporate sectors, the following figures emerge.

TABLE 11

Lender	Private Corporate		Government	
	Fourth Plan	Third Plan	Fourth Plan	Third Plan
Banking	0.287	0.339	0.161	0.187
Other Financial Institutions ..	0.292	0.174	0.204	0.081
Private Corporate Business ..	0.242	0.288	—	—
Government	0.019	0.058	0.388	0.334
Households	0.110	0.134	0.018	0.084
Rest of the World	0.050	0.007	0.229	0.314
Total	**1.000**	**1.000**	**1.000**	**1.000**

Structurally, therefore, in the fourth plan, the relative reliance of private corporate structure on banking, households and government is proposed to be reduced, that on other financial institutions and rest of the world increased. In the case of government sector, its relative reliance on other financial institutions,

** For details see 'Financial Flows in the Indian Economy—1966-67 and 1967-68,' Reserve Bank of India Bulletin, February 1972.

its own saving and on households is proposed to be increased, whereas that on banking and rest of the world is proposed to be reduced. What actually happens in reality can be measured only when the complete data in regard to flow-of-funds and saving-investment patterns become available.

In this review article we have attempted to cover a wide field of measuring the financial transactions in the economy through an appropriate set of accounts so that the movement of surplus funds to deficit areas could be readily identified. In doing so, stress is laid on the important aspects of financial investments and intermediation. The use of the matrix of financial transactions for financial planning purposes has also been illustrated.

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ANNEXURE

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STATEMENT I : MATRIX OF FINANCIAL SOURCES AND USES OF FUNDS FOR THE INDIAN ECONOMY

1969-70 to 1971-72

(Rs. in crores)

Debtor \ Creditor	SOURCES							Creditor \ Debtor	USES						
	1	2	3	4	5	6	Total		1	2	3	4	5	6	Total
1. Banking ..	—	1.02	3.67	13.47	0.71	10.04	**28.91**		—	1.85	0.89	0.56	—0.11	22.12	**25.31**
2. Other Financial Institutions	2.25	—	1.31	5.46	—	0.80	**9.82**		0.84	—	—	0.22	0.12	9.36	**10.54**
3. Private Corporate Business	0.63	—	—	0.35	—0.02	0.02	**0.98**		4.08	2.07	—	1.50	—0.62	1.90	**8.93**
4. Government	3.36	0.27	0.96	—	0.96	1.86	**7.41**		15.61	6.97	0.08	—	9.15	4.14	**35.95**
5. Rest of the World ..	—1.06	0.20	—0.37	8.16	—	—	**6.93**		0.93	—	—	1.11	—	—	**2.04**
6. Households	21.38	9.04	1.84	4.00	—	—	**36.26**		10.39	0.83	0.02	1.93	—	—	**13.17**
7. Others ..	2.57	0.39	0.12	6.64	—0.03	—	**9.69**		0.76	0.02	—0.01	3.06	0.23	—	**4.06**
Total ..	**29.13**	**10.92**	**7.53**	**38.08**	**1.62**	**12.72**	**100.00(1)**		**32.61**	**11.74**	**0.98**	**8.38**	**8.77**	**37.52**	**100.00(2)**

(1) Actual Amount is Rs. 16083.6 crores.
(2) Actual Amount is Rs. 15543.4 crores.

STATEMENT II : FINANCIAL FLOWS IN THE INDIAN ECONOMY—

	Banking		Other Financial Institutions	
	Sources	Uses	Sources	Uses
SECTOR				
1. Banking	—	—	9.3	18.7
2. Other Financial Institutions ..	8.5	1.1	—	—
3. Private Corporate Business ..	49.1	100.4	—	41.7
4. Government	—35.5	241.4	12.0	129.4
5. Rest of the World	—49.0	—112.3	11.3	5.5
6. Households	384.8	171.3	203.3	35.4
7. Items not elsewhere classified ..	10.1	—	4.0	—
INSTRUMENTS				
1. Currency and Deposits	**327.5**	**47.9**	**—**	**18.7**
2. Investments	**19.8**	**62.4**	**18.3**	**157.9**
(*a*) Government securities	—	193.0	—	120.5
(*b*) Others	19.8	—130.6	18.3	37.4
3. Loans and Advances	**6.0**	**265.8**	**8.1**	**45.7**
4. Small Savings	**—**	**—**	**—**	**8.4**
5. Life Insurance Fund	**—**	**—**	**126.3**	**—**
6. Provident Fund	**—**	**—**	**83.2**	**—**
7. Trade Debt or Credit	**—**	**—**	**—**	**—**
8. Foreign claims not elsewhere classified	**1.3**	**25.8**	**—**	**—**
9. Other items not elsewhere classified	**13.4**	**—**	**4.0**	**—**
TOTAL	**368.0**	**401.9**	**239.9**	**230.7**

Figures in brackets represent percentages to total.

FIRST PLAN PERIOD : 1951-52 TO 1955-56

(Rs. in crores)

Private Corporate Business		Government		Rest of the World		Households		Total	
Sources	Uses	Sources	Uses	Sources	Uses	Sources	Uses	Sources	Uses
118.8	56.0	278.9	—91.9	—110.1	—71.7	171.3	384.8	468.2 (21.1)	295.9 (14.9)
39.9	—	144.0	7.5	—	—	35.4	203.3	227.8 (10.3)	211.9 (10.7)
—	—	—0.5	37.4	—	21.7	8.1	282.9	56.7 (2.5)	484.1 (24.4)
37.4	8.3	—	—	—46.7	48.4	118.8	356.3	86.0 (3.9)	783.8 (39.6)
8.1	—	92.2	—5.4	—	—	—	—	62.6 (2.8)	—112.2 —(5.6)
282.9	8.1	356.3	118.8	—	—	—	—	1227.3 (55.2)	333.6 (16.8)
5.8	4.6	94.8	16.2	—21.7	—36.5	—	—	93.0 (4.2)	—15.7 (—0.8)
7.5	55.9	—1.2	—99.4	—	—7.2	—	325.6	333.8 (15.0)	341.5 (17.2)
207.8	8.9	401.9	1.5	1.2	0.1	—	265.2	649.0 (29.2)	496.0 (25.0)
—	8.2	399.6	—	—	—5.2	—	73.1	399.6 (18.0)	389.6 (19.7)
207.8	0.7	2.3	1.5	1.2	5.3	—	192.1	249.4 (11.2)	106.4 (5.3)
247.2	8.1	98.1	169.8	—56.5	15.1	333.6	80.4	636.5 (28.7)	584.9 (29.5)
—	—	239.8	—	—	—	—	231.4	239.8 (10.8)	239.8 (12.1)
—	—	—	—	—	9.8	—	166.5	126.3 (5.7)	126.3 (6.4)
—	—	100.4	—	—	—	—	183.6	183.6 (8.3)	183.6 (9.3)
24.6	—	8.5	2.8	—	—	—	24.6	33.1 (1.5)	27.4 (1.4)
—	—	34.2	—5.5	—	—	—	—	35.5 (1.6)	20.3 (1.0)
5.8	4.1	84.0	13.4	—123.2	—55.9	—	—	—16.0 (—0.8)	—38.4 (—1.9)
492.9	77.0	965.7	82.6	—178.5	—38.1	333.6	1227.3	2221.6 (100.0)	1981.4 (100.0)

STATEMENT II: FINANCIAL FLOWS IN THE INDIAN ECONOMY—

	Banking		Other Financial Institutions	
	Sources	Uses	Sources	Uses
SECTORS				
1. Banking	—	—	12.6	16.2
2. Other Financial Institutions ..	29.6	18.7	—	—
3. Private Corporate Business ..	61.0	428.3	—	88.1
4. Government	68.8	1396.9	22.5	374.3
5. Rest of the World	253.9	—571.0	16.4	—0.7
6. Households	1064.7	389.9	427.8	8.4
7. Items not elsewhere classified ..	68.9	—	19.3	—8.5
INSTRUMENTS				
1. Currency and Deposits	1418.4	17.5	—	12.9
2. Investments	87.7	718.6	27.9	359.6
(*a*) Government securities ..	—	1321.1	—	316.1
(*b*) Others	87.7	—602.5	27.9	43.5
3. Loans and Advances	12.8	888.1	32.2	68.7
4. Small Savings	—	—	—	45.1
5. Life Insurance Fund	—	—	202.1	—
6. Provident Fund	—	—	217.3	—
7. Trade Debt or Credit	—	—	4.9	—
8. Foreign claims not elsewhere classified	—13.6	38.6	—	—
9. Other items not elsewhere classified	41.6	—	14.2	—8.6
TOTAL	1546.9	1662.8	498.6	477.7

Figures in brackets represent percentages to total.

SECOND PLAN PERIOD : 1956-57 TO 1960-61—(*Contd.*)

(Rs. in crores)

Private Corporate Business		Government		Rest of the World		Households		Total	
Sources	Uses	Sources	Uses	Sources	Uses	Sources	Uses	Sources	Uses
426.6	64.0	1506.8	4.9	—617.2	281.4	389.9	1064.7	1718.7 (27.2)	1431.2 (22.8)
81.9	—	410.0	20.2	3.1	—1.6	8.4	427.8	533.0 (8.4)	465.1 (7.4)
—	—	—7.8	81.1	—4.7	48.6	16.5	297.5	65.0 (1.0)	944.6 (15.0)
81.1	—13.9	—	—	90.2	831.5	116.7	625.5	379.3 (6.0)	3214.3 (51.2)
61.0	—	974.1	131.3	—	—	—	—	1305.4 (20.6)	—440.4 (—7.0)
297.5	16.5	625.5	116.7	—13.7	7.0	—	—	2401.8 (38.0)	538.5 (8.6)
—14.6	43.4	—151.8	86.7	—	8.4	—	—	—78.2 (—1.2)	129.9 (2.0)
32.2	59.8	38.6	—31.1	—	226·2	—	1057.0	1489.2 (23.5)	1342.3 (21.4)
289.9	33.4	2098.6	35.3	—600.6	240.6	—	385.2	1903.5 (30.1)	1772.7 (28.2)
—	—14.3	1858.2	—	—	—0.4	—	74.5	1858.2 (29.4)	1697.0 (27.0)
289.9	47.7	240.4	35.3	—600.6	241.0	—	310.7	45.3 (0.7)	75.7 (1.2)
688.6	16.5	754.9	244.2	—20.7	734.5	531.5	94.3	1999.3 (31.6)	2046.3 (32.6)
—	—	403.4	—	—	—	—	358.3	403.4 (6.4)	403.4 (6.4)
—	—	—	—	—	12.8	—	189.3	202.1 (3.2)	202.1 (3.2)
—	—	171.8	—	—	—	—	389.1	389.1 (6.2)	389.1 (6.2)
—62.6	—	90.6	67.8	—	—	—	—57.7	32.9 (0.5)	10.1 (0.2)
—	—	45.3	102.1	101.8	—	—	—	133.5 (2.1)	140.7 (2.2)
—14.6	0.3	—246.4	22.6	—22.8	—37.8	—	—	—228.0 (—3.6)	—23.5 (—0.4)
933.5	110.0	3356.8	440.9	—542.3	1176.3	531.5	2415.5	6325.0 (100.0)	6283.2 (100.0)

STATEMENT II: FINANCIAL FLOWS IN THE INDIAN ECONOMY—

	Banking		Other Financial Institutions	
	Sources	Uses	Sources	Uses
SECTORS				
1. Banking	—	—	47.4	90.5
2. Other Financial Institutions ..	114.8	54.0	—	—
3. Private Corporate Business ..	90.3	757.8	1.8	340.9
4 Government	290.7	1585.4	177.7	736.5
5. Rest of the World	—62.0	—8.8	38.2	2.8
6. Households	2304.4	658.5	897.7	54.7
7. Items not elsewhere classified ..	47.2	9.9	52.5	—1.3
INSTRUMENTS				
1. Currency and Deposits	2490.5	—22.2	—	5.0
2. Investments	180.2	1365.2	63.4	748.4
(*a*) Government securities	—	1340.0	—	533.3
(*b*) Others	180.2	25.2	63.4	215.1
3. Loans and Advances	77.8	1680.8	233.4	381.6
4. Small Savings	—	—	—	95.9
5. Life Insurance Fund	—	—	430.6	—
6. Provident Fund	—	—	450.0	—
7. Trade Debt or Credit	—	—	2.2	—
8. Foreign claims not elsewhere classified	—2.6	19.4	—	—
9. Other items not elsewhere classified	39.5	13.6	35.7	—6.8
TOTAL	2785.4	3056.8	1215.3	1224.1

Figures in brackets represent percentages to total.

THIRD PLAN PERIOD : 1961-62 TO 1965-66—(*Contd.*)

(Rs. in crores)

Private Corporate Business		Government		Rest of the World		Households		Total	
Sources	Uses	Sources	Uses	Sources	Uses	Sources	Uses	Sources	Uses
908.2	95.7	1581.5	93.0	56.1	17.4	658.5	2304.4	**3251.7** (*26.4*)	**2601.0** (*21.9*)
353.7	—	693.1	179.4	—1.2	26.1	54.7	897.7	**1215.1** (*9.9*)	**1157.2** (*9.7*)
—	—	—6.8	107.5	—3.6	—31.2	47.8	300.8	**129.5** (*1.0*)	**1475.8** (*12.4*)
107.7	—7.4	—	—	28.6	2080.0	284.9	825.2	**889.6** (*7.2*)	**5219.7** (*43.9*)
62.0	—	2317.8	106.4	—	—	—	—	**2356.0** (*19.2*)	**100.4** (*0.8*)
300.8	47.8	825.2	284.9	—	—	—	—	**4328.2** (*35.2*)	**1045.9** (*8.8*)
2.2	2.1	35.4	269.2	—6.1	12.9	—	—	**131.2** (*1.1*)	**292.8** (*2.5*)
33.9	94.4	50.8	62.3	—	—66.6	—	2290.4	**2575.2** (*20.9*)	**2363.3** (*19.9*)
450.3	—6.9	2109.3	72.2	41.7	176.8	—	89.4	**2849.9** (*23.1*)	**2445.1** (*20.6*)
—	—8.4	1788.2	—	—	—6.8	—	—1.8	**1788.2** (*14.5*)	**1688.2** (*14.2*)
450.3	1.5	321.1	72.2	41.7	183.6	—	257.7	**1056.8** (*8.6*)	**755.3** (*6.4*)
1338.0	47.8	2344.6	705.1	—7.3	2042.7	1045.9	239.9	**5032.4** (*40.9*)	**5097.9** (*42.9*)
—	—	669.8	—	—	—	—	573.9	**669.8** (*5.5*)	**669.8** (*5.6*)
—	—	20.2	—	—	6.1	—	444.7	**450.8** (*3.7*)	**450.8** (*3.8*)
—	—	327.4	—	—	—	—	777.4	**777.4** (*6.3*)	**777.4** (*6.5*)
—89.8	—	149.9	108.4	—	—	—	—87.6	**62.3** (*0.5*)	**20.8** (*0.2*)
—	—	2.5	84.5	16.3	—	—	—	**16.2** (*0.1*)	**103.9** (*0.8*)
2.2	2.9	—228.3	7.9	23.1	—53.8	—	—	**—127.8** (*—1.0*)	**—36.2** (*—0.3*)
1734.6	138.2	5446.2	1040.4	73.8	2105.2	1045.9	4328.1	**12301.2** (*100.0*)	**11892.8** (*100.0*)

STATEMENT II : FINANCIAL FLOWS IN THE INDIAN ECONOMY—

	Banking		Other Financial Institutions	
	Sources	Uses	Sources	Uses
SECTORS				
1. Banking	—	—	30.0	186.6
2. Other Financial Institutions ..	201.3	23.6	—	—
3. Private Corporate Business ..	37.1	669.3	0.3	325.7
4. Government	260.2	1115.9	144.9	639.0
5. Rest of the World	177.9	74.0	61.7	9.6
6. Households	1840.3	870.7	984.6	76.5
7. Items not elsewhere classified ..	69.1	31.4	51.9	2.5
INSTRUMENTS				
1. Currency and Deposits ..	**2262.5**	**—11.7**	**—**	**125.4**
2. Investments	**244.7**	**1112.2**	**68.9**	**616.7**
(*a*) Government securities ..	—	997.0	—	442.3
(*b*) Others	244.7	133.2	68.9	174.4
3. Loans and Advances	**3.2**	**1697.6**	**209.3**	**436.1**
4. Small Savings	**—**	**—**	**—**	**68.3**
5. Life Insurance Fund	**—**	**—**	**472.1**	**—**
6. Provident Fund	**—**	**—**	**469.8**	**—**
7. Trade Debt or Credit	**—**	**—**	**2.0**	**—**
8. Foreign Claims not elsewhere classified	**10.4**	**—44.6**	**—**	**—**
9. Other items not elsewhere classified ..	**65.1**	**31.4**	**61.3**	**—6.6**
TOTAL	**2585.9**	**2784.9**	**1273.4**	**1239.9**

Figures in brackets represent percentages to total.

ANNUAL PLANS PERIOD : 1966-67 TO 1968-69—(*Contd.*)

(Rs. in crores)

Private Corporate Business		Government		Rest of the World		Households		Total	
Sources	Uses	Sources	Uses	Sources	Uses	Sources	Uses	Sources	Uses
749.3	53.8	1230.8	199.5	—16.9	92.5	870.7	1840.3	2863.9	2372.7
								(25.2)	(21.7)
225.9	—	505.7	145.9	—1.0	—5.9	76.5	984.6	1008.4	1148.2
								(8.9)	(10.5)
—	—	49.1	90.5	—4.4	—20.5	54.8	143.7	136.9	1208.7
								(1.2)	(11.0)
64.8	—3.2	—	—	39.8	2188.3	186.0	619.0	695.7	4559.0
								(6.1)	(41.6)
60.2	—	2068.2	30.3	—	—	—	—	2368.0	113.9
								(20.9)	(1.0)
143.7	54.8	619.0	186.0	—	—	—	—	3587.6	1188.0
								(31.6)	(10.8)
0.5	4.6	579.4	300.7	—5.0	25.0	—	—	695.9	364.2
								(6.1)	(3.4)
32.6	53.6	31.5	97.0	—	158.0	—	1816.9	2326.6	2239.2
								(20.5)	(20.4)
178.7	—	1443.5	140.6	69.3	130.0	—	0.3	2005.1	1999.8
								(17.7)	(18.3)
—	—4.6	1423.1	—	—	11.6	—	—105.6	1425.1	1320.7
								(12.6)	(12.1)
178.7	4.6	20.4	140.6	69.3	118.4	—	105.9	582.0	679.1
								(5.1)	(6.2)
1110.8	54.8	2309.9	682.6	2.2	1990.5	1188.0	234.9	4823.4	5096.5
								(42.5)	(46.5)
—	—	413.0	—	—	—	—	344.7	413.0	413.0
								(3.6)	(3.8)
—	—	16.5	—	—	13.5	—	475.1	488.6	488.6
								(4.3)	(4.5)
—	—	281.7	—	—	—	—	751.5	751.5	751.5
								(6.6)	(6.8)
—78.2	—	190.9	—	—	—	—	—76.2	114.7	—76.2
								(1.0)	(—0.7)
—	—	—	14.0	14.0	—	—	—	24.4	—30.6
								(0.2)	(—0.3)
0.5	1.6	365.2	18.7	—73.0	—12.6	—	40.4	409.1	72.9
								(3.6)	(0.7)
1244.4	110.0	5052.2	952.9	12.5	2279.4	1188.0	3587.6	11356.4	10954.7
								(100.0)	(100.0)

STATEMENT II: FINANCIAL FLOWS IN THE INDIAN ECONOMY—

	Banking		Other Financial Institutions	
	Sources	Uses	Sources	Uses
SECTORS				
1. Banking	—	—	163.7	287.7
2. Other Financial Institutions ..	361.6	130.5	—	—
3. Private Corporate Business ..	102.1	634.6	0.3	321.9
4. Government	540.5	2426.0	43.5	1083.1
5. Rest of the World	—170.4	144.9	32.7	0.2
6. Households	3438.3	1614.6	1454.4	128.2
7. Items not elsewhere classified ..	413.1	118.3	61.7	3.3
INSTRUMENTS				
1. **Currency and Deposits**	3828.2	—35.0	—	123.2
2. **Investments**	400.9	1845.5	132.6	907.7
(*a*) Government securities ..	—	1676.6	—	625.4
(*b*) Others	400.9	168.9	132.6	282.3
3. **Loans and Advances**	53.8	3103.2	186.8	548.7
4. **Small Savings**	—	—	—	280.0
5. **Life Insurance Fund**	—	—	633.5	—
6. **Provident Fund**	—	—	742.5	—
7. **Trade Debt or Credit**	—	—	—0.4	—
8. **Foreign claims not elsewhere classified**	—7.8	36.9	—	—
9. **Other items not elsewhere classified**	410.1	118.3	61.2	—35.2
TOTAL	4685.2	5068.9	1756.3	1824.4

Figures in brackets represent percentages to total.

FOURTH PLAN PERIOD : 1969-70 TO 1971-72—(*Concld*).

(Rs. in crores)

Private Corporate Business		Government		Rest of the World		Households		Total	
Sources	Uses	Sources	Uses	Sources	Uses	Sources	Uses	Sources	Uses
589.7	139.5	2166.3	87.1	114.6	—16.8	1614.6	3438.3	4648.9 (28.9)	3935.8 (25.3)
211.2	—	878.7	34.7	—0.7	19.5	128.2	1454.4	1579.0 (9.8)	1639.1 (10.6)
—	—	56.1	233.2	—3.6	—97.0	3.6	296.0	158.5 (1.0)	1388.7 (8.9)
154.7	12.0	—	—	155.9	1422.3	299.0	643.5	1193.6 (7.4)	5586.9 (35.9)
—60.1	—	1312.2	171.9	—	—	—	—	1114.4 (6.9)	317.0 (2.0)
296.0	3.6	643.5	299.0	—	—	—	—	5832.2 (36.3)	2045.4 (13.2)
18.9	—2.1	1068.3	476.0	—5.0	35.0	—	—	1557.0 (9.7)	630.5 (4.1)
39.2	141.4	29.7	—14.3	—	259.3	—	3432.0	3897.1 (24.2)	3906.6 (25.1)
217.1	13.9	1954.3	215.3	98.6	60.6	—	—50.1	2803.5 (17.4)	2992.9 (19.3)
—	10.6	1879.3	—	—	36.1	—	—162.2	1879.3 (11.7)	2186.5 (14.1)
217.1	3.3	75.0	215.3	98.6	24.5	—	112.1	924.2 (5.7)	806.4 (5.2)
853.7	3.6	2068.1	811.6	13.7	1050.5	1988.4	247.0	5164.6 (32.1)	5764.6 (37.1)
—	—	471.3	—	—	—	—	191.3	471.3 (2.9)	471.3 (3.1)
—	—	23.1	—	—	—3.9	—	660.5	656.6 (4.1)	656.6 (4.2)
—	—	506.2	—	—	—	—	1248.7	1248.7 (7.8)	1248.7 (8.0)
81.5	—	483.5	—	—	—	—	81.1	564.6 (3.5)	81.1 (0.5)
—	—	—	164.1	164.1	—	—	—	156.3 (1.0)	201.0 (1.3)
18.9	—5.9	588.9	125.2	—15.2	—3.5	57.0	21.7	1120.9 (7.0)	220.6 (1.4)
1210.4	153.0	6125.1	1301.9	261.2	1363.0	2045.4	5832.2	16083.6 (100.0)	15543.4 (100.0)

AGRICULTURAL PRODUCTION IN INDIA TRENDS AND PROSPECTS

R.V. RAO
A. SESHAN@

I. Introduction

Objective of Study

Accelerated growth in agricultural production has been one of the principal aims of the Government from the beginning of the First Five Year Plan. It has assumed an added urgency in recent years in the context of the increasing pressure of population on land and the heavy cost of importing agricultural commodities, particularly foodgrains. Agriculture accounts for the largest proportion of national income and the vicissitudes of this sector have their repercussions throughout the economy. It is the objective of this note to review the trends in agricultural production at the all-India level, with particular reference to foodgrains, during the period 1949-50 to 1974-75 and discuss the prospects for the rest of the Fifth Five Year Plan period. Though such a study at a lower level of aggregation will be desirable it cannot be attempted due to the non-availability of the required data. The data and methodology used and their limitations are given in the Technical Appendix. In Section II, trends in agricultural production during the reference period are discussed. The performance of the agricultural sector in the Fourth Plan period is reviewed in Section III. The prospects for the rest of the Fifth Plan period are explored in Section IV. The conclusions of the study are summed up in Section V.

Variation in Growth Rates due to Changes in Base/Terminal Years

Growth rates are affected by changes in base and terminal years. In order to test the sensitivity of agricultural growth rates (in respect of area, productivity, i.e., yield, and production) to changes in base and terminal years, the years in the period of reference were classified into those with favourable seasonal conditions and those with unfavourable seasonal conditions based on the information available in the Plan documents and the Annual Reports of the Ministry

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@ R. V. Rao and A. Seshan are Deputy Directors in Economic Department. The authors gratefully acknowledge statistical assistance received from Shri P. N. Karkera, Smt. M. C. Mandlik and Smt. I. Vaidyanathan.

dealing with agriculture in the Government of India. Further important developments bearing on the growth of agriculture were also kept in view. Growth rates were compiled for the following crops and groups of crops for seven different periods to see how much they varied due to changes in base and terminal years : rice, jowar, bajra, maize, wheat, pulses, foodgrains, sugarcane, groundnut, oilseeds, cotton, jute, tea, coffee and tobacco. The sets of base and terminal years for which growth rates were compiled are given below along with the rationale for the relative choice of years.

(i) **1949-50 to 1965-66**

Comparable data on area, productivity and production, based on index numbers compiled by the Government of India, are available from 1949-50. The first reference period covers 1949-50 to 1965-66, the latter being the terminal year of the Third Plan period. The High-Yielding Varieties Programme (HYVP) was introduced in 1966-67. Hence it will be useful to study the trends which prevailed during the pre-HYVP era covering the first three Plan periods. Six out of 17 years in this period had unfavourable seasonal agricultural conditions.

(ii) **1950-51 to 1964-65**

In 1964-65 the output of practically all the crops reached new record levels. On the other hand, 1965-66 was one of the worst years in Indian agriculture, when a serious drought brought down the production of foodgrains by about 20% from the previous year's level ; the index of aggregate agricultural output was lower by about a sixth. Thus it should be of interest to find out the long-term growth rate in the pre-HYVP era by considering the years 1950-51 to 1964-65, i.e., from the year on the eve of the First Plan to the best year in the pre-HYVP period. Five out of 15 years were bad from the point of view of agriculture in this reference period.

(iii) **1966-67 to 1970-71**

The post-HYVP years are analysed in four ways. In the first place, the years 1966-67 (the commencement of the HYVP) to 1970-71 are taken into account, the latter year being one of high achievements in the so-called "Green Revolution", after which there has been a setback to its progress due to various reasons. Only one year (1966-67) was very unfavourable in this reference period.

(iv) 1967-68 to 1970-71

Secondly, after dropping 1966-67, which had unfavourable seasonal conditions, the years 1967-68 to 1970-71 are considered.

(v) 1966-67 to 1974-75

Thirdly, the post-HYVP trends are analysed up to the latest year (1974-75) for which data are available. Three out of 9 years were bad years in this reference period.

(vi) 1967-68 to 1974-75

Fourthly, the post-HYVP trends are estimated by excluding 1966-67.

(vii) 1949-50 to 1973-74

A long-term growth rate is also compiled for the years 1949-50 to 1973-74, the latter being the terminal year of the Fourth Plan period. This is relevant to consider in view of the fact that, by and large, the new technology did not leave any impact on many crops during this period. Eight out of 25 years were unfavourable in this period.

II. REVIEW OF GROWTH RATES OF AGRICULTURE

The following table presents the growth rates of area, productivity and total production of foodgrains during the different sets of periods under consideration.

TABLE 1—ALL-INDIA COMPOUND RATES OF GROWTH OF AREA, PRODUCTIVITY AND PRODUCTION OF FOODGRAINS

(Per cent per annum)

Period	Area	Productivity	Production
	1	2	3
(*i*) 1949-50 to 1965-66	1.3	1.2	2.5
(*ii*) 1950-51 to 1964-65	1.4	1.6	3.1
(*iii*) 1966-67 to 1970-71	1.7	6.1	8.4
(*iv*) 1967-68 to 1970-71	0.9	2.8	4.8
(*v*) 1966-67 to 1974-75	0.5	1.9	3.0
(*vi*) 1967-68 to 1974-75	0.1	0.5	1.3
(*vii*) 1949-50 to 1973-74	0.9	1.4	2.5

Trends in Growth Rates of Foodgrains

During the period 1949-50 to 1965-66 and 1950-51 to 1964-65, which more or less fell in the first three Plan periods, area and productivity growth rates were almost equally important. The variations in the characteristics under study between the two sets of periods were also relatively of a small order. On the other hand, the growth rate of productivity has been a more decisive factor in the growth of foodgrains production in recent years. The normality of agricultural seasons and the introduction of HYVP have had a greater impact on productivity and production than on area in recent years, given the limited scope for extension of cultivated area in the country. Among the various periods under study, the period 1966-67 to 1970-71 recorded the highest growth rate of production at 8·4 per cent, as a result of a combination of circumstances, viz., the initiation of the HYVP in the base year which, however, was not agriculturally a favourable year and good seasonal conditions in the remaining years. Growth rates of productivity and area were also the highest at 6·1 per cent and 1·7 per cent, respectively. The success of HYVP in certain areas of the country provided an incentive to bring marginal lands under cultivation besides increasing the intensity of cropping due particularly to the development of minor irrigation facilities. The lowest growth rates in area, production and productivity were during 1967-68 to 1974-75. The occurrence of both the highest and the lowest growth rates in the post-HYVP sets of periods indicates the extent to which these rates are sensitive to changes in climatic conditions. It is also a pointer to the loss of momentum of the so-called Green Revolution.

Crop-wise Analysis

Crop-wise analysis for similar periods reveals certain features (Appendix Table I). The highest growth rates of production of rice (7·4 per cent), maize (7·0 per cent), wheat (18·1 per cent), sugarcane (10·0 per cent) and groundnut (5·5 per cent) relate to the period 1966-67 to 1970-71, the same as for total foodgrains production. The highest rates for such groups as pulses (6·9 per cent) and oilseeds (5·7 per cent) also belong to this period. Among the crops mentioned above, it is only in respect of wheat, to a large extent, and rice to some extent, that the high rates could be attributed to HYVP. While for rice increase in productivity was much higher at 5·6 per cent than for area at 1·6 per cent, for wheat, area growth at 8·3 per cent was near about as important as yield growth at 9·0 per cent. The diversion of lands from

other crops to wheat, the cultivation of marginal lands hitherto not profitable to bring under the plough and higher intensity of cropping supported by the development of minor irrigation facilities as well as availability of increased institutional credit in such areas as Punjab were consequences of the successful develoment of high-yielding varieties of wheat which resulted in a high growth rate of area under this crop.[1] In the case of the remaining crops mentioned above, there was not such a high level breakthrough in the development of high-yielding varieties. However, growth of productivity was mainly responsible for the increased production of rice, pulses and groundnut. Contrary to this trend the growth of area under sugarcane during 1966-67 to 1970-71 was higher at 5·7 per cent than that of yield at 4·2 per cent. Crops other than rice, wheat and sugarcane were mainly rain-fed (Appendix Table II). Though crop-wise data on use of fertilisers are not available, it may be inferred from recent studies that the bulk of fertiliser use is accounted for by irrigated areas in the country. It may, therefore, be said that the high growth rates achieved in maize, pulses, oilseeds, in general, and groundnut in particular, were primarily the result of weather conditions. This is further brought out by the sharp fall in growth rates for these crops when 1966-67 is dropped from consideration and the period 1967-68 to 1970-71 is considered. Such a change is observed in respect of rice and wheat also though the growth rates still remain fairly high in respect of the latter. A similar feature can be seen in respect of the periods 1966-67 to 1974-75 and 1967-68 to 1974-75.

In the case of jowar, cotton, jute and tobacco, the highest production growth rates at 2·6 per cent, 4·2 per cent, 3·3 per-cent and 3·1 per cent, respectively, were achieved during the period 1950-51 to 1964-65. Even these modest results should be attributed partly to favourable weather conditions and partly to the availability of lands for being brought under cultivation. Apart from poor irrigation facilities, there was not much of fertiliser use in the country as a whole during this early phase of the Plan period. It may also be observed that jowar production declined in the recent periods of reference (1966-67 onwards) as a result of decrease in area as well as a fall in productivity caused by frequent droughts in imporant jowar-producing areas like Maharashtra. The record of tobacco also cannot be deemed satis-

1. Institutional Credit System in India: Regional Variations and Loan Policy and Procedural Arrangements—A Case Study, B. S. Mavinkurve and A. Seshan, FAO—Agricultural Credit Case Studies—Working Paper No. 7.

factory. Area under jute has decreased in recent periods. The shifting of jute areas to other crops, particularly paddy, whenever relative profitability warrants it, in such areas as West Bengal is responsible for this situation. Cotton is one crop in this group which had a satisfactory yield growth (3·5 per cent) since 1966-67.

The rather spectacular production growth rate of 18.0 per cent and 19.9 per cent recorded by bajra and coffee, respectively, during 1967-68 to 1970-71 was primarily due to high yields. While the HYVP had some part to play in the case of bajra, seasonal conditons seem to have been the predominant factor in respect of both the crops in the improvement in yields. The year 1970-71 was an outstanding one particularly for these two crops when the yields were at a record level. With intensity of cultivation and high-yield potential of crops the problem of pests and diseases has cropped up for bajra in recent years. From 1966-67 to 1974-75 the output decreased due to a fall in area as well as yield. On the other hand, the performance of coffee in these years has been satisfactory, the growth rate of production being of the order of 4 to 6 per cent thanks mainly to the increase in area under the crop.

The highest growth rates of yield and production for tea at 2.8 per cent and 3.6 per cent, respectively, were achieved during 1967-68 to 1974-75. The variations in growth rates have been narrow for tea as between different periods. They ranged from 0.6 per cent to 1.4 per cent for area, 0.9 per cent to 2.8 per cent for yield and 2.0 per cent to 3.6 per cent for production.

With the exception of tea, all other crops have shown large variations in the growth rates between different periods under study. The growth rates of production compiled for various combinations of the periods since 1966-67 can be considered to be uniformly satisfactory only for wheat, sugarcane, tea and coffee. It should be a matter of concern to note that the index numbers of production of bajra, pulses, groundnut and jute, for 1974-75 were either near about the same as, or lower than, the figures for 1958-59. This is too serious a matter to be explained away by any deficiencies in data base.

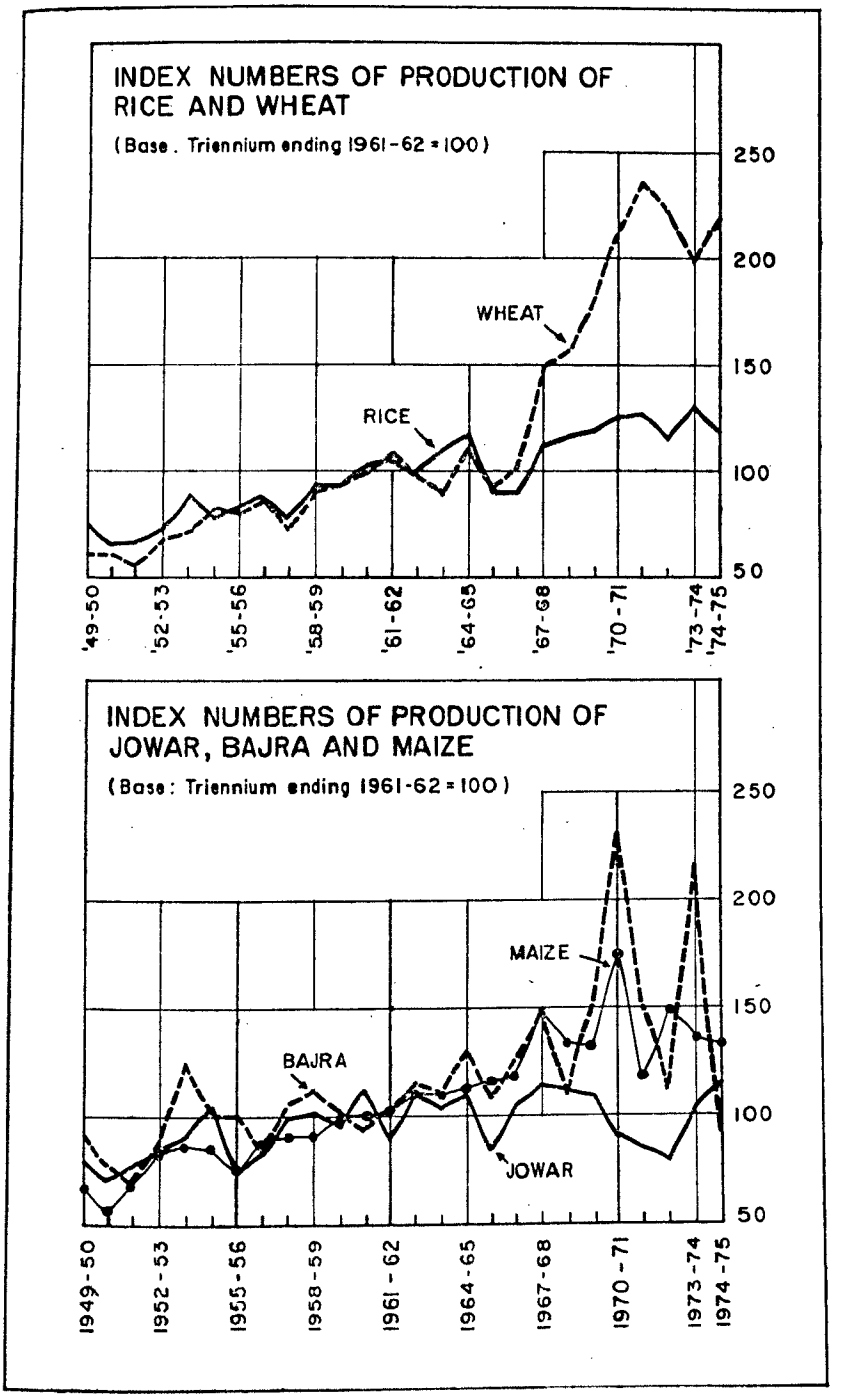
The long-term growth rates of production of individual crops (1949-50 to 1973-74) may be classified as below :

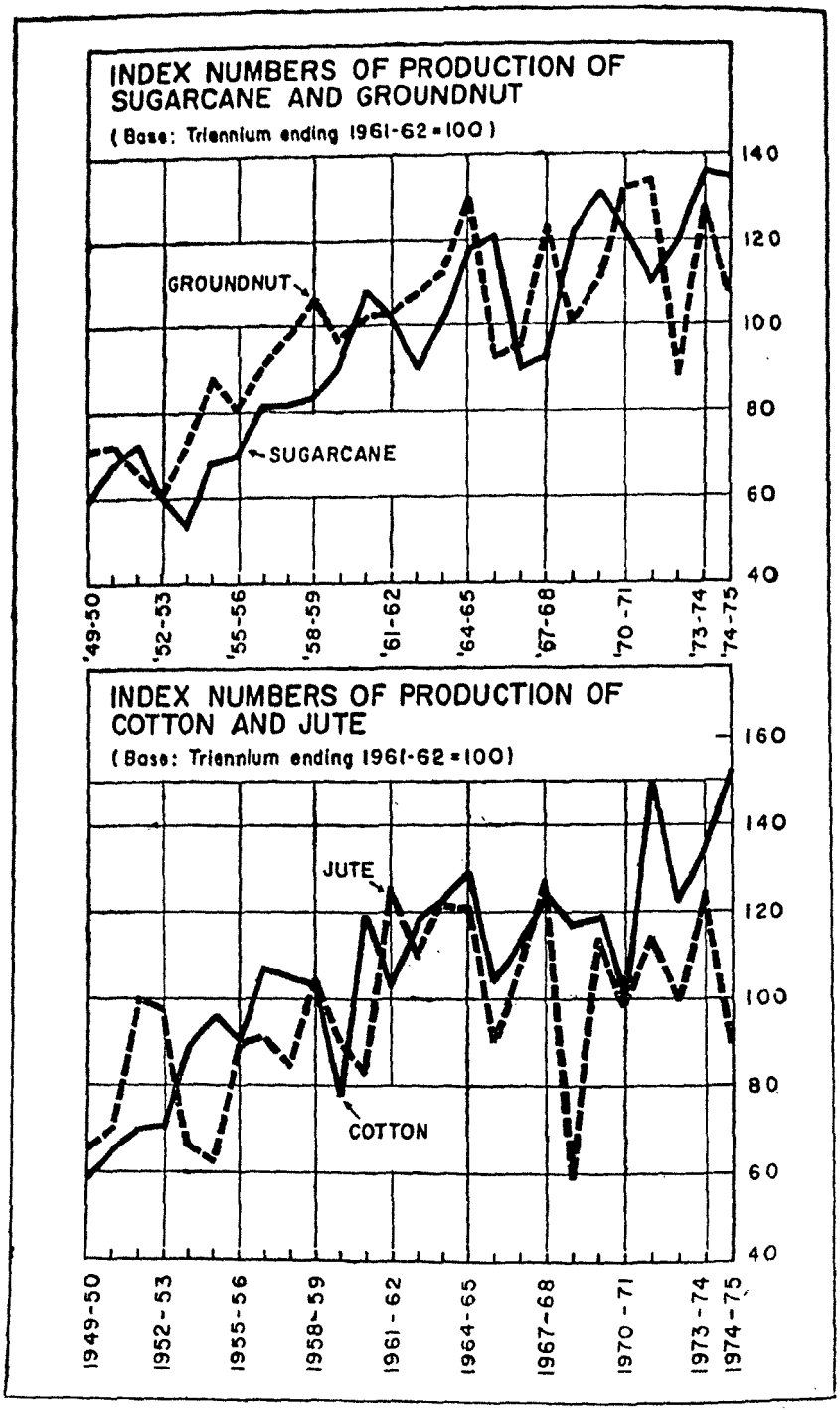
Growth Rates	Crops/Groups of Crops
(*i*) 1 per cent or less	Jowar, Pulses
(*ii*) More than 1 per cent and less than 2.5 per cent	Groundnut, Oilseeds, Jute, Tea and Tobacco
(*iii*) 2.5 per cent or more	Rice, Bajra, Maize, Wheat, Foodgrains, Sugarcane, Cotton and Coffee.

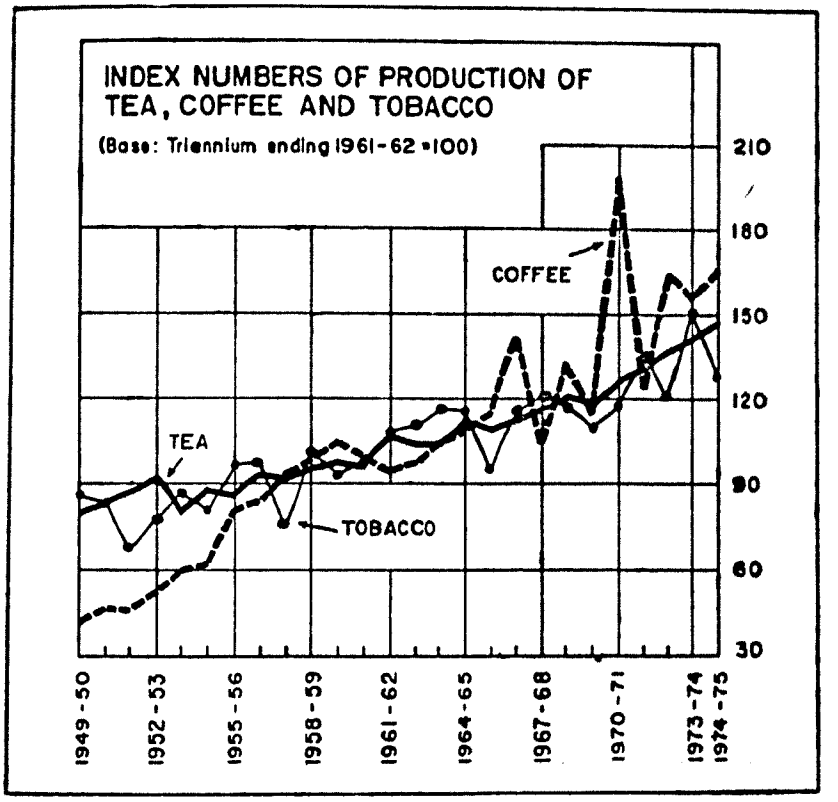
The growth rates of the first two categories should be considered to be low. As for the third category if population growth rate is taken to be 2.5 per cent, the growth rate of some of the crops should be deemed to be just sufficient to meet the needs of the growing population.[2] The highest growth rates are for wheat and coffee being about 5.5 per cent. With the exception of these two crops, the yield growth of all the crops in the long-run has been 2 per cent or less.

The scope for increasing the area under the plough is limited. The prospects of increasing the area under double cropping are not bright in the immediate future unless irrigation facilities are developed. Hence any substantial increase in production has to be achieved through increases in productivity of individual crops. Looked at from this point of view, the stagnation in the yields of most of the crops under study should be a matter of concern. It is particularly to be noted that the yield growth of jute and tobacco —crops important from the standpoint of exports— has been at the most around 1 to 2 per cent, taking all periods into account. The performance of jowar, a staple food for vast sections of disadvantaged people in many parts of rural India, is even less satisfactory, the highest growth rate of yield being a moderate 1.6 per cent in an earlier period.

2. This is relevant particularly for commodity groups like foodgrains. In the case of individual crops it has to be borne in mind that they may not be consumed by the entire population (eg. coffee).


INDEX NUMBERS OF PRODUCTION OF RICE AND WHEAT
(Base. Triennium ending 1961-62 = 100)
250
200
150
100
50
WHEAT
RICE
'49-50
'52-53
'55-56
'58-59
'61-62
'64-65
'67-68
'70-71
'73-74
'74-75
INDEX NUMBERS OF PRODUCTION OF JOWAR, BAJRA AND MAIZE
(Base: Triennium ending 1961-62 = 100)
250
200
150
100
50
MAIZE
BAJRA
JOWAR
1949-50
1952-53
1955-56
1958-59
1961-62
1964-65
1967-68
1970-71
1973-74
1974-75


INDEX NUMBERS OF PRODUCTION OF SUGARCANE AND GROUNDNUT
(Base: Triennium ending 1961-62=100)
GROUNDNUT
SUGARCANE
140
120
100
80
60
40
'49-50
'52-53
'55-56
'58-59
'61-62
'64-65
'67-68
'70-71
'73-74
'74-75
INDEX NUMBERS OF PRODUCTION OF COTTON AND JUTE
(Base: Triennium ending 1961-62=100)
JUTE
COTTON
160
140
120
100
80
60
40
1949-50
1952-53
1955-56
1958-59
1961-62
1964-65
1967-68
1970-71
1973-74
1974-75



III. AGRICULTURAL PRODUCTION IN FOURTH PLAN

Growth Rate in Fourth Plan

One of the main objectives of the Fourth Plan in the agricultural sector was to create conditions necessary for a sustained increase of about 5 per cent per annum over the succeeding decade.[3] For the purpose of the Plan a base level production of 98 million tonnes of foodgrains was assumed for 1968-69 and the target was fixed at 129 million tonnes for the terminal year of the Plan, thus implying an annual growth rate of 5.6 per cent. However, the base and terminal year production of foodgrains turned out to be 94 million tonnes and 104 million tonnes, respectively, and the underlying annual compound growth

3. Draft Fifth Five Year Plan, 1974-79 Vol. II, Government of India, Planning Commission.

rate worked out to 2.1 per cent.[4] The momentum in agricultural production gained in the later half of the sixties reached its peak in 1970-71 when a level of 108 million tonnes of food production was achieved. There was a declining trend in the subsequent two years with one of the worst droughts experienced in 1972-73. Even the improvement in foodgrains production in 1973-74 (103 million tonnes) was lower than the estimated level in 1970-71. It should, however, be noted that the recent peak and trough in food output have been at a much higher level than the previous peaks and troughs.[5] This indicates that the underlying trend is one of growth and that the steps taken for increasing food production are basically on the right lines.

The position relating to the attainment of targets for production of important crops revealed wide variations (Table 2).

TABLE 2—FOURTH PLAN TARGETS AND ACHIEVEMENTS IN PRODUCTION OF IMPORTANT CROPS

	Unit	Target for 1973-74	Achievement in 1973-74	Percentage of Col. 3 to Col. 2
	1	2	3	4
Rice	Million tonnes	52.0	43.7	84.1
Jowar	,,	15.0	9.0	59.9
Bajra	,,	7.0	7.1	101.3
Maize	,,	8.0	5.6	70.5
Wheat	,,	24.0	22.1	92.0
Other cereals	,,	8.0	6.3	79.0
Pulses	,,	15.0	9.8	65.0
Total foodgrains	,,	129.0	103.6	80.3
Sugarcane (in terms of cane)	,,	150.0	137.8	91.9
Oilseeds	Lakh tonnes	105.0	86.8	82.7
Cotton	Lakh bales@	80.0	59.6	74.5
Jute	Lakh bales@	74.0	64.8	83.5

@ Bale = 180 kgs.

Sources : (*i*) *Draft Fifth Five Year Plan* 1974-79, *Vol. II*, Government of India, Planning Commission, for Col. 2

(*ii*) *Economic Survey*, 1974-75, Government of India, for Col. 3.

4. This is calculated using the compound interest formula $P_t = P_o(1 + r)^t$. The least-squares exponential trend line, compiled with the help of index numbers, indicates a compound growth rate of 1.6 per cent. See Technical Appendix to this note.

5. *Economic Survey 1973-74* Government of India.

While the target was achieved in the case of bajra and there was a marginal shortfall in wheat and sugarcane, in the case of other crops the percentage of achievement to target ranged from 60 per cent (jowar) to 84 per cent (rice).

HYVP

In the Fourth Plan strategy for increasing food production, a crucial role was assigned to the High-Yielding Varieties Programme. As much as two-thirds (21 million tonnes) out of the targeted additional production of 31 million tonnes of foodgrains was proposed to be achieved through the extension of area under high-yielding varieties. The target for extension of area under high-yielding varieties was exceeded for wheat and bajra; the excess achievement was substantial for wheat (Table 3). There were shortfalls in achievement—to a small extent for rice and to a large extent for jowar and maize. The achievement of production was also less than the targets for these crops, as seen earlier. Though seasonal conditions in the last few years of the Fourth Plan were not favourable, it may not be right to hold weather alone responsible for the lower than anticipated achievements. A number of technical difficulties bedevilled the HYVP. Even high-yielding varieties of wheat, which had a successful start, developed problems. The decline in wheat output after 1971-72 (for the first time since 1967-68) was attributable to a new rust disease which affected Kalyan Sona, one of the popular varieties grown in North India.[6] This points out the need for continuous research in developing newer varieties even for crops which have proved successful in the past. As for rice, though the area under high-yielding varieties has increased more than three times, there has been no proportionate impact on production in the traditional rice-growing areas.[7] Since the major portion of rice is produced in *Kharif* season during the South-West Monsoon, water management, a necessary condition for the sucessful cultivation of high-yielding varieties, has posed a problem. The susceptibility of rice to pests and diseases seems to be particularly marked in the absence of proper water management. The slow development of varieties to suit the different agro-climatic zones in the country is also a reason for the low growth of rice production.

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6. *Economic Survey, 1974-75*, Government of India.
7. *Economic Survey, 1973-74*, Government of India.

TABLE 3—FOURTH PLAN TARGETS AND ACHIEVEMENTS IN AREA UNDER HIGH-YIELDING VARIETIES AND CONSUMPTION OF FERTILISERS

	Unit	Target for 1973-74	Achievement in 1973-74	Percentage of Col. 3 to Col. 2
	1	2	3	4
Area under HYVP				
Rice	Million hectares	10.1	9.7	96.2
Jowar	,,	3.2	1.2	36.3
Bajra	,,	2.8	3.3	117.1
Maize	,,	1.2	0.8	65.0
Wheat	,,	7.7	10.9	141.7
Consumption of Fertilisers				
N	Lakh tonnes	26.0	18.0	69.4
P_2O_5		8.1	6.5	79.9
K_2O		5.2	3.6	69.0
Total	,,	39.3	28.1	71.5

Sources : (i) *Draft Fifth Five Year Plan 1974-79, Vol. II,* Government of India Planning Commission and *The Fourth Plan Mid-term Appraisal, Vol. II,* Government of India, Planning Commission, for Col. 2.
(ii) *Annual Plan 1975-76,* Government of India, Planning Commission, for Col. 3.

On the positive side, a welcome trend has been the cultivation of paddy and wheat in non-traditional areas. Thus while wheat cultivation has spread to Eastern India, rice cultivation has become popular in the traditional wheat-growing areas of North India, particularly Punjab.

Among coarse grains the record of bajra has been relatively more satisfactory than that of jowar and maize. In the case of jowar and maize also, susceptibility to pests and diseases and lack of suitable varieties for different areas in the country are responsible for the poor record in productivity.

It was only towards the close of the Fourth Plan that a centrally-sponsored Intensive Pulses District Programme including demonstrations, seed multiplication of improved varie-

ties, adoption of package of improved practices, etc., was initiated. As yet, no effective high-yielding varieties have been discovered for pulses.[8]

As regards the so-called "commercial crops", a substantial growth in production was envisaged after the mid-term appraisal of the Fourth Plan. Thus, special programmes like Intensive Cotton District Programme and schemes for jute, soyabean, sunflower, etc., were started rather late in the Fourth Plan, so much so their impact could not be expected to be fully felt during the Plan period itself. The cultivation of most of the "commercial crops" (or non-food crops) under rain-fed conditions and technical difficulties in the development of high-yielding varieties for crops like groundnut have also made it difficult to achieve the targets laid down for production.

Consumption of Agricultural Inputs

Coming to agricultural input supplies, the consumption of chemical fertilisers was much below the targets. Thus as against the original target of 55 lakh tonnes and the revised target of 39 lakh tonnes of NPK, only 28 lakh tonnes were consumed in 1973-74 (Table 3). It should be remembered that the successful cultivation of high-yielding varieties of crops is dependent, among other things, on the application of high dosages of fertilisers. According to broad estimates, the application of fertiliser has been around half of the recommended dose of nitrogenous and about one-third of phosphatic and potassic fertilisers in the areas under the high-yielding varieties programme.[9] The low level of fertiliser application is also responsible for the non-realisation of production targets.

The power requirements of the agricultural sector have traditionally been met through the use of human and bullock labour. However, there has been a remarkable growth in the use of mechanical and electrical power in recent years, especially after the commencement of HYVP. Thus, electric power used by agriculture increased from 833 million KWH in 1960-61 to 5,918 million KWH in 1972-73. The installation of power-driven pumps and diesel engines took place on a substantial scale in many parts of the country during this period (Appendix Table III). The use of agricultural tractors has also increased

8. *Economic Survey 1974-75*, Government of India
9. *Draft Fifth Five Year Plan*, 1974-79, *Vol. II*, Government of India, Planning Commission

significantly, particulary in States like Punjab. It should, however, be noted that in spite of the good progress made in the extension of irrigation facilities, consequent to the installation of pump-sets and such devices, the percentage of gross irrigated area to gross sown area has not recorded any sharp increase ; this percentage, which was 18.3 in 1960-61, rose to only 24.2 in 1972-73. Further, inadequate and irregular power supply in more recent years has affected not only the full capacity utilisation of fertiliser factories but also the utilisation of pump-sets for irrigation.

Another area where good progress has been made is in the provision of institutional credit for agriculture. The total co-operative credit made available in 1960-61 was Rs. 214 crores. This went up to Rs. 920 crores in 1973-74. After the introduction of social control, and especially after nationalisation, leading commercial banks in the country have involved themselves in financing agriculture on an appreciable scale. Thus commercial bank (direct) finance to agriculture outstanding at the end of March 1974 was Rs. 436 crores whereas it had been negligible a few years earlier. However, loans overdue for repayment have clogged the institutional credit channels in many areas.

Arrangements for seed multiplication and distribution and for plant protection left much to be desired. It is estimated that the supply of certified seeds formed barely 30 per cent of the requirements in 1973-74.[10] Inadequacy in the availability of pesticides in 1973-74, particularly BHC for which a substantial demand arose on account of anti-malarial operations, hampered plant protection measures.[11] Besides there is, as yet, not as much awareness, on the part of farmers, on the need for using pesticides as in the case of chemical fertilisers, as revealed in many field studies.

IV. Prospects For Fifth Plan Period

The Draft Fifth Five Year Plan envisaged an average annual growth rate of 4·67 per cent for value of output and 3·89 per cent for value added for the agricultural sector over

10. *Economic Survey 1973-74*, Government of India.
11. *Annual Plan 1974-75*, Government of India, Planning Commission.

the Plan period.[12] To be more specific, the targeted growth rates in production were 4·2 per cent for foodgrains, 4·9 per cent for sugarcane, 5·8 per cent for oilseeds, 4·3 per cent for cotton and 2·9 per cent for jute and mesta (Appendix Table IV). These growth rates were generally lower than those postulated for the Fourth Five Year Plan. Obviously the various difficulties experienced on the agricultural front during the Fourth Plan period necessitated a more moderate approach in the current Plan period. However, these rates of growth were based on certain assumed base level production which has turned out to be lower than anticipated in some cases. This means that, to attain the originally envisaged physical production levels, the growth rates will have to be much higher than those indicated for some crops in the Draft Fifth Plan. Thus, in the case of wheat the growth rate required to achieve a peak production level of 38 million tonnes in 1978-79 is now 11·8 per cent as against the original rate 4·8 per cent (Appendix Table IV). The review of trends in the growth rates in the past has revealed that the highest growth rate achieved was 18·1 per cent. This related to a base level of 11·4 million tonnes in 1966-67 as against higher base level (estimated production) of 21·8 million tonnes in 1973-74. Further, the targeted growth rate in the Draft Fifth Plan was based upon an assumed base level of 30·0 million tonnes as against the estimated production of 21·8 million tonnes in the base year. Thus, it would have called for intensive efforts to achieve the required growth rate of 11·8 per cent in wheat production to reach the physical target in the Fifth Plan period. In the case of maize, jowar, pulses, oilseeds and cotton the growth rates required for reaching the targeted production level at 6·6 per cent, 3·9 per cent, 6·9 per cent, 7·0 per cent and 6·1 per cent, respectively, are higher than what were laid down in the Draft Plan at 4·2 per cent, 3·0 per cent, 4·0 per cent, 5·8 per cent and 4·3 per cent, respectively. In the best of circumstances in the past, such growth rates were not realised for jowar, cotton and oilseeds. The position is better for rice, bajra, sugarcane and jute and mesta in view

12. In the Draft Fifth Plan, unlike in the earlier Plans, the targets of production were laid down for the Plan period as a whole, the intention being to determine the tasks of the Plan against the time horizon of the entire Plan period and thereby even out fluctuations on account of seasonal factors. "The success of the Plan will be measured primarily by the extent to which these targets are fulfilled irrespective of the weather conditions in the terminal year of the Plan" (*Draft Fifth Five Year Plan* 1974-79, *Vol. II*, Government of India, Planning Commission). However, for operational purposes, peak production levels were indicated for the terminal year of the Plan.

of either the actual production in base year being equal to assumed level or even higher. Hovewer, to the extent that the bulk of the area under individual crops is cultivated under rain-fed conditions, their production performance will continue to be subject to the influence of weather. Considering past experience, the sucessful discovery of new high-yielding varieties is also a condition for ensuring the achievement of growth rates of the order visualised.[13]

Provisional estimates relating to the achievements in the first two years of the Fifth Plan period reveal them to be generally better in the second than in the first year (1974-75) in respect of coverage of area under HYVP and total production. The impact of good seasonal conditions in the second year (1975-76) has to be borne in mind in this connection. (Appendix Table V). Achievements in agricultural output in the first year of the Fifth Plan period fell considerably short of targets except in the case of sugarcane and cotton. The production of foodgrains, oilseeds and jute and mesta revealed a shortfall in achievements by about 15 per cent whereas that of others recorded only a marginal deficit. While gross cropped area, minor, medium and major irrigation and soil conservation reached more or less targeted levels in both the years, there was a gap of 20 to 25 per cent in the consumption of fertilisers and 10 to 12 per cent in the case of pesticides. It should be pointed out that, for the first time in many years, the absolute level of consumption of fertilisers registered a decrease of 2·5 lakh tonnes in 1974-75 from the level in the previous year. The steep increase in fertiliser prices effected in the beginning of 1974-75 and the consequent deterioration in cost-price relationship was partly responsible for this break in fertiliser consumption trend.[14] There has been some improvement in the second year of the Plan in the consumption of fertilisers.

Sources of Future Growth in Production—Irrigation

The growth rates in production in the future could not always be expected to be of as high an order as in the past because of the higher base level on which it has to be built up. The bulk of any growth in agricultural production in the future can come through increased productivity only (In Appendix Table VI the relative positions of area

13. In the light of the analysis, the scaling down of targets by the Planning Commission seems to be appropriate. See Appendix Tables IV and VI.

14. "Fertiliser Consumption in Indian Agriculture", A. Seshan, *Reserve Bank Staff Occasional Papers*, June 1976.

and productivity in the targeted growth rates of production in the Fifth Plan period are given). Since area increases are postulated for many crops it is obvious that the growth in area under one crop would be at the expense of another crop unless primarily there is a higher intensity of cropping (besides land reclamation) and the gross cropped area increases.[15] The intensity of cropping is dependent to a large extent on irrigation facilities. Further, irrigation by itself can contribute to accelerated growth in agricultural output even in the absence of chemical fertilisers. The application of fertilisers is also greatly facilitated if irrigation facility is available. Since water management during the South-West Monsoon season is difficult, the success of high-yielding varieties for crops other than wheat will depend upon their adoption in the *rabi* season, which again will hinge upon the availability of irrigation. In this connection the relatively better performance of high-yielding varieties of rice under controlled conditions of water supply during the *rabi* seasons is a pointer to the development of future efforts for achieving a break-through in the production of this important cereal. Thus the expansion of irrigation facilities could act as a broad-spectrum remedy for many of the ills of the agricultural sector counteracting the adverse effects of unfavourable weather. Understandably the extension of irrigation facilities has been included in the 20-Point Programme.

Dry Farming Technology

Since pulses, coarse grains and most of the "commerical crops" are grown under rain-fed conditions, a higher priority needs to be attached to the development of a suitable technology for dry farming areas, in case irrigation facilities cannot be increased to the required extent. The experience of Emergency Agricultural Production Programme implemented during the *rabi* season of 1972-73 needs to be recalled in this connection. An unbroken spell of drought in *rabi* jowar-growing areas, occurence of early hot winds (in February-March) and of rust in wheat areas and shortage of power for lift irrigation adversely affected the *rabi* foodgrains production.[16] Thus it seems that the success of short-term production programmes is also dependent upon the implementation of long-term schemes relating to supply of agricultural inputs.

15. *Draft Fifth Five Year Plan, 1974-79, Vol. II*, Government of India, Planning Commission.
16. *Economic Survey 1973-74*, Government of India.

Small Farmers

Considerable production potential exists on small farms which is not fully tapped. Field studies have indicated that the extent of adoption of improved seeds and chemical fertilisers is less for small than for large farmers. In a recent study it was found that the relatively poor performance of small farmers in the adoption of improved farm inputs was not so much due to any credit or supply constraints as due to such factors like lack of irrigation and poor extension efforts.[17] For many farmers who are either not using fertilisers, or are using them only on a small part of their land, it should still be profitable, in spite of the high cost, to use them where they have not been used, provided the necessary supporting facilities (irrigation, dry farming techniques, etc.) are available. The development agencies started for small and marginal farmers have an important role to play in this connection.

V. Conclusions

The study of trends in agricultural production since 1949-50, using various combinations of base and terminal years, has revealed that, in recent years, the highest growth rate achieved was 8·4 per cent during 1966-67 to 1970-71 and the lowest growth rate was 1·3 per cent during 1967-68 to 1974-75 in respect of foodgrains production. The long-term growth rate has been 2·5 per cent for food production. The HYV Programme has been an important element in accelerating the growth of productivity, as well as production, of wheat and, to some extent, of paddy. In the absence of irrigational facilities, most of the crops have shown fluctuations in growth rates due to the influence of seasonal conditions. The productivity of such crops as jute and tobacco which are important from the export point of view has been more or less stagnant. Jowar, the staple food for the disadvantaged sections of the population in many parts of the country, has recorded a fall in productivity in recent years. With the exception of wheat and coffee the long-term growth of productivity of the remaining crops can also hardly be considered to be satisfactory.

The growth rates of foodgrains in the Fourth Plan period at 2·1 per cent was less than a half of the projected rate of 5·6 per cent. The shortfall in achievement was not due to adverse

17. See, in this connection, "*The Small Farmers (1967-69)— A Field Study*", B. S. Mavinkurve and A. Seshan, Reserve Bank of India.

seasonal conditions alone. It was also the result of a number of factors like susceptiblity of the hitherto successful high-yielding varieties of wheat to diseases, technical difficulties in the development of suitable high-yielding varieties for many crops in different agro-climatic zones and inadequate use of chemical fertilisers, pesticides and power for irrigation. However, the expansion of area under HYVP was satisfactory.

The lower levels of achievement in production of some agricultural commodities at the end of the Fourth Five Year Plan means base levels which are lower than what were originally envisaged for the Fifth Plan targets. Consequently, the growth rates required to achieve the physical targets of production in the terminal year of the Fifth Plan period have to be much higher than what were originally planned for jowar, maize, pulses, oilseeds and cotton. In this connection it needs to be noted that the achievements in agricultural output in the first year of the Fifth Plan period were short of targets except in the case of sugarcane and cotton. The better performance in respect of most of the crops in the second year was due to favourable seasonal conditions. It is likely to be difficult to achieve high growth rates, particulary in respect of crops like jowar, cotton and oilseeds, considering that such rates of growth were not realised in the best of circumstances in the past. The absolute fall in fertiliser consumption in 1974-75 should in this context, be noted. Though in the subsequent year, there has been some improvement, trends in fertiliser use need to be constantly monitored if production targets are to be achieved. Extension of irrigation and a break-through in developing high-yielding varieties for many crops will be crucial elements in attaining satisfactory levels of growth in productivity as well as production in the remaining years of the Fifth Plan period. Besides, the development of a suitable high-yielding technology for dry farming areas and greater involvement of small farmers in agricultural production programmes are also potential sources of future growth.

TECHNICAL APPENDIX

Data, Methodology and Limitations

The absolute figures of area and production of crops, published annually by the Directorate of Economics and Statistics, Ministry of Agriculture and Irrigation, Government of

India, are not strictly comparable due to changes in coverage and method of estimation. While these changes have improved the reliability of the absolute official estimates, particularly after the Third Plan period, they have also introduced an element of non-comparability in the data over time. To allow for these changes and to provide time series suitable for trend studies, the Directorate has prepared all-India index numbers for agricultural production, area under crops and productivity (yield) with the triennium ending 1961-62 as the base.[18] Growth rates presented in Appendix Table I have been computed using these index numbers. A State-wise analysis of growth rates could not be attempted because comparable index numbers of area under crops, agricultural production and productivity are not readily available for all the States. Hence it is not possible to juxtapose the trends in growth rates emerging from this study with similar trends in the States. *The limited number of observations used in the growth rates of some of the recent periods and the known limitations of trend analysis should also be kept in mind.* The following exponential equation was fitted with time (X) as the independent variable and index numbers of area/productivity/production as the dependent variable (Y).

$$Y = AB^X \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

The fitting of the curve was done through logarithmic transformation of the data. The least squares estimator was used for the estimation of the parameters of the equation. Growth rates are derived by deducting 1 from the value of B.

In Section IV dealing with prospects for the Fifth Plan period, the methodology described above cannot be used for the compilation of growth rates for obvious reasons. Hence compound growth rate formula of the following type has been employed.

$$P_t = P_o (1 + r)^t \quad \ldots\ldots\ldots\ldots\ldots (2)$$

Where P_t = Production in the 't' th year

P_o = Production in the base year

r = Compound growth rate (per cent per annum)

18. *Estimates of Area and Production of Principal Crops in India 1974-75*, Directorate of Economics and Statistics, Ministry of Agriculture and Irrigation, Government of India. The indices for the years from 1966-67 are subject to revision.

t=number of years

To obtain (1) from (2)[19]

let $P_1 = Y$, $P_o = A$, $(1 + r) = B$ and $t = X$

The difference in the two formulae is that while in (2) only the base and the terminal year data are used, in (1) the data for all the years in the period of reference are taken into account and the least squares line gives the best fit in the sense that, subject to the usual assumptions, the variances of the estimated values of the parameters are minimum among the variances of all possible unbiased linear estimates of the parameters.

19. *Introduction to Economic Statistics*, William C. Merrill and Karl A. Fox, John Wiley & Sons, Inc.

APPENDIX TABLE I—ALL-INDIA COMPOUND RATES OF GROWTH OF AREA, PRODUCTIVITY AND PRODUCTION OF CROPS

(Per cent per annum)

		Area	Productivity	Production
		1.	2.	3.
RICE				
(*i*)	1949-50 to 1965-66	1.3	1.6	3.0
(*ii*)	1950-51 to 1964-65	1.4	2.3	3.8
(*iii*)	1966-67 to 1970-71	1.6	5.6	7.4
(*iv*)	1967-68 to 1970-71	1.1	2.3	3.6
(*v*)	1966-67 to 1974-75	0.7	2.1	2.8
(*vi*)	1967-68 to 1974-75	0.5	0.7	1.2
(*vii*)	1949-50 to 1973-74	1.0	1.5	2.5
JOWAR				
(*i*)	1949-50 to 1965-66	0.8	1.0	2.0
(*ii*)	1950-51 to1964-65	0.9	1.6	2.6
(*iii*)	1966-67 to 1970-71	—0.7	—2.3	—2.9
(*iv*)	1967-68 to 1970-71	—2.1	—4.8	—6.7
(*v*)	1966-67 to 1974-75	—2.2	0.8	—1.4
(*vi*)	1967-68 to 1974-75	—2.7	1.0	—1.6
(*vii*)	1949-50 to 1973-74	0.2	0.7	0.9
BAJRA				
(*i*)	1949-50 to 1965-66	1.0	0.8	2.1
(*ii*)	1950-51 to 1964-65	0.8	1.5	2.7
(*iii*)	1966-67 to 1970-71	0.8	11.9	12.7
(*iv*)	1967-68 to 1970-71	0.6	17.2	18.0
(*v*)	1966-67 to 1974-75	—0.2	0.1	—0.2
(*vi*)	1967-68 to 1974-75	—0.5	—0.9	—1.5
(*vii*)	1949-50 to 1973-74	1.0	2.0	3.0
MAIZE				
(*i*)	1949-50 to 1965-66	2.6	1.1	3.8
(*ii*)	1950-51 to 1964-65	2.7	1.2	4.0
(*iii*)	1966-67 to 1970-71	3.4	3.5	7.0
(*iv*)	1967-68 to 1970-71	1.6	2.9	4.6
(*v*)	1966-67 to 1974-75	1.4	—0.8	0.6
(*vi*)	1967-68 to 1974-75	0.7	—1.6	—0.9
(*vii*)	1949-50 to 1973-74	2.7	0.8	3.5
WHEAT				
(*i*)	1949-50 to 1965-66	2.3	1.2	3.6
(*ii*)	1950-51 to 1964-65	2.7	1.3	4.0
(*iii*)	1966-67 to 1970-71	8.3	9.0	18.1
(*iv*)	1967-68 to 1970-71	6.4	6.3	13.1
(*v*)	1966-67 to 1974-75	4.3	3.9	8.3
(*vi*)	1967-68 to 1974-75	3.1	2.3	5.4
(*vii*)	1949-50 to 1973-74	2.8	2.8	5.5

APPENDIX TABLE I (*Contd.*)

	Area	Productivity	Production
	1.	2.	3.
PULSES			
(*i*) 1949-50 to 1965-66	1.6	—0.4	0.9
(*ii*) 1950-51 to 1964-65	2.0	—0.3	1.4
(*iii*) 1966-67 to 1970-71	0.1	6.9	6.9
(*iv*) 1967-68 to 1970-71	0.2	0.7	0.7
(*v*) 1966-67 to 1974-75	0.2	0.4	0.3
(*vi*) 1967-68 to 1974-75	0.3	—2.0	—2.1
(*vii*) 1949-50 to 1973-74	0.5	—0.2	0.1
FOODGRAINS			
(*i*) 1949-50 to 1965-66	1.3	1.2	2.5
(*ii*) 1950-51 to 1964-65	1.4	1.6	3.1
(*iii*) 1966-67 to 1970-71	1.7	6.1	8.4
(*iv*) 1967-68 to 1970-71	0.9	2.8	4.8
(*v*) 1966-67 to 1974-75	0.5	1.9	3.0
(*vi*) 1967-68 to 1974-75	0.1	0.5	1.3
(*vii*) 1949-50 to 1973-74	0.9	1.4	2.5
SUGARCANE (in terms of gur)			
(*i*) 1949-50 to 1965-66	3.5	1.1	4.6
(*ii*) 1950-51 to 1964-65	3.1	1.4	4.6
(*iii*) 1966-67 to 1970-71	5.7	4.2	10.0
(*iv*) 1967-68 to 1970-71	8.5	0.9	9.4
(*v*) 1966-67 to 1974-75	2.6	1.6	4.3
(*vi*) 1967-68 to 1974-75	2.1	0.6	3.4
(*vii*) 1949-50 to 1973-74	2.3	1.1	3.4
GROUNDNUT			
(*i*) 1949-50 to 1965-66	4.0	—0.2	3.7
(*ii*) 1950-51 to 1964-65	3.9	0.7	4.6
(*iii*) 1966-67 to 1970-71	—0.5	6.1	5.5
(*iv*) 1967-68 to 1970-71	—0.9	3.9	3.0
(*v*) 1966-67 to 1974-75	—0.4	1.4	0.9
(*vi*) 1967-68 to 1974-75	—0.6	—	—0.4
(*vii*) 1949-50 to 1973-74	2.4	0.1	2.4
OILSEEDS			
(*i*) 1949-50 to 1965-66	2.6	—0.3	3.0
(*ii*) 1950-51 to 1964-65	2.6	0.2	3.6
(*iii*) 1966-67 to 1970-71	—	5.0	5.7
(*iv*) 1967-68 to 1970-71	0.2	3.5	4.0
(*v*) 1966-67 to 1974-75	0.3	1.7	2.3
(*vi*) 1967-68 to 1974-75	0.2	0.9	1.4
(*vii*) 1949-50 to 1973-74	1.6	0.1	2.3

APPENDIX TABLE I *(Concld.)*

	Area	Productivity	Production
	1.	2.	3.
COTTON			
(*i*) 1949-50 to 1965-66	2.2	1.7	4.0
(*ii*) 1950-51 to 1964-65	1.9	2.3	4.2
(*iii*) 1966-67 to 1970-71	—0.9	—1.6	—2.4
(*iv*) 1967-68 to 1970-71	—1.4	—4.6	—5.7
(*v*) 1966-67 to 1974-75	—0.4	3.5	3.0
(*vi*) 1967-68 to 1974-75	—0.4	3.5	3.1
(*vii*) 1949-50 to 1973-74	0.9	1.7	2.7
JUTE			
(*i*) 1949-50 to 1965-66	2.7	0.2	2.9
(*ii*) 1950-51 to 1964-65	2.5	0.8	3.3
(*iii*) 1966-67 to 1970-71	—2.7	—0.1	—2.8
(*iv*) 1967-68 to 1970-71	—1.1	—0.2	—0.8
(*v*) 1966-67 to 1974-75	—0.7	1.2	0.6
(*vi*) 1967-68 to 1974-75	—0.1	1.4	1.4
(*vii*) 1949-50 to 1973-74	1.2	0.5	1.6
TEA			
(*i*) 1949-50 to 1965-66	0.7	1.4	2.0
(*ii*) 1950-51 to 1964-65	0.6	1.4	2.0
(*iii*) 1966-67 to 1970-71	1.0	1.4	2.4
(*iv*) 1967-68 to 1970-71	1.4	0.9	2.3
(*v*) 1966-67 to 1974-75	0.7	2.7	3.4
(*vi*) 1967-68 to 1974-75	0.7	2.8	3.6
(*vii*) 1949-50 to 1973-74	0.8	1.4	2.1
COFFEE			
(*i*) 1949-50 to 1965-66	2.5	4.8	6.7
(*ii*) 1950-51 to 1964-65	2.6	4.8	6.7
(*iii*) 1966-67 to 1970-71	1.5	6.5	8.1
(*iv*) 1967-68 to 1970-71	1.8	17.8	19.9
(*v*) 1966-67 to 1974-75	2.9	—0.5	4.0
(*vi*) 1967-68 to 1974-75	3.3	0.5	5.8
(*vii*) 1949-50 to 1973-74	2.3	3.5	5.4
TOBACCO			
(*i*) 1949-50 to 1965-56	1.4	1.0	2.3
(*ii*) 1950-51 to 1964-65	1.7	1.4	3.1
(*iii*) 1966-67 to 1970-71	1.4	—1.8	—0.4
(*iv*) 1967-68 to 1970-71	1.6	—2.8	—1.3
(*v*) 1966-67 to 1974-75	0.3	2.1	2.3
(*vi*) 1967-68 to 1974-75	0.1	2.4	2.6
(*vii*) 1949-50 to 1973-74	1.3	1.0	2.2

APPENDIX TABLE II—PERCENTAGE OF GROSS IRRIGATED TO CULTIVATED AREA UNDER FOOD CROPS AND NON-FOOD CROPS

CROP	1953-54	1966-67	1970-71	1972-73£
	1	2	3	4
FOOD CROPS				
Rice	33.5	37.8	39.7	39.2
Jowar	3.1	4.1	3.6	3.3
Bajra	3.2	3.2	4.0	4.2
Maize	11.5	15.7	15.8	18.9
Wheat	36.4	47.8	53.9	57.6
All Cereals	20.6	25.1	28.1	29.2
Gram	14.2	18.7	15.6	15.7
All Pulses	9.4	10.9	8.9	8.2
All Foodgrains	18.4	22.4	24.6	25.5
NON-FOOD CROPS				
Sugarcane	69.3	72.3	73.8	74.8
Groundnut	1.6	4.9	7.9	6.7
Rapeseed and Mustard		8.6	9.7	23.9
Oilseeds	1.0	3.5*	6.6	7.1
Cotton	8.5	15.9	16.9	20.8
Tobacco	10.6	15.3	22.6	..

* Relates to 1965-66.

.. Not available

£ Figures are provisional.

Sources: 1. *Estimates of Area and Production of Principal Crops in India*—1968-69, 1972-73 and 1974-75, Directorate of Economics and Statistics, Ministry of Agriculture and Irrigation, Government of India.

2. *Indian Agricultural Statistics*—1961-62, *Vol. I*, Government of India.

APPENDIX TABLE III—CONSUMPTION OF SELECTED AGRICULTURAL INPUTS (1960-61—1975-76)

July-June	Percentage of gross irrigated area to total gross cropped area under all crops	Chemical fertilisers£ ('000 tonnes)	Pesticides (Tonnes-Technical Grade)	Electric power utilised in agriculture (M. KWH)	Electric motor pump-sets (No. in '000)	Diesel pump-sets (No. in '000)	Agricultural tractors (No. in '000)
	1	2	3	4	5	6	7
1960-61 ..	18.3	294	..	833	193	230	..
1961-62 ..	18.2	384	..	991	..	..	31+
1962-63 ..	18.8	478	..	1,104	..	..	..
1963-64 ..	18.9	574	..	1,153	..	..	..
1964-65 ..	19.3	653	..	1,397	..	..	..
1965-66 ..	20.1	757	..	1,892	513	465	..
1966-67 ..	20.9	1,203	..	2,107	651	531	54@
1967-68 ..	20.2	1,166	..	2,585	851	604	..
1968-69 ..	22.2	1,675	..	3,466	1,090	687	..
1969-70 ..	21.7	1,990	..	3,774	..	..	71‡
1970-71 ..	23.3	2,177	24,320	4,470	..	..	..
1971-72 ..	23.5	2,623	29,535	5,006	1,620	1,150	170$*
1972-73 ..	24.2$	2,699	35,160	5,918	..	..	..
1973-74 ..	..	2,839	45,000	..	2,442	1,752	..
1974-75 ..	..	2,591	49,864	..	..	..	..
1975-76 ..	..	2,898	58,814	..	..	..	..

APPENDIX TABLE III—CONSUMPTION OF SELECTED AGRICULTURAL INPUTS (*Concld.*)
(1960-61—1975-76)

	Co-operative credit advanced to farmers during the year (Rs. crores)				Direct finance from commercial banks advanced to farmers during the year (Rs. Crores) £			Commercial bank credit to farmers outstanding at the end of the year (Rs. crores) @@
	Short-term	Medium-term	Long term	Total (8+9+10)	Short term	Medium-term and Long-term	Total (12+13)	
	8	9	10	11	12	13	14	15
1960-61 ..	182.8	19.9	11.6	214.3	..	..	..	5.5£
1961-62 ..	205.4	22.9	16.0	244.3	..	..	..	..
1962-63 ..	232.2	25.2	25.5	282.9	..	..	..	4.1£
1963-64 ..	268.0	29.1	30.5	327.6	..	..	..	..
1964-65 ..	287.4	28.8	39.5	355.7	..	..	..	4.0£
1965-66 ..	304.8	36.8	58.0	399.6	..	..	..	..
1966-67 ..	325.1	39.7	57.6	422.4	..	..	..	4.3£
1967-68 ..	393.2	35.0	94.7	522.9	..	..	..	..
1968-69 ..	456.4	47.5	148.2	652.1	..	..	..	53.6
1969-70 ..	487.8	52.3	155.5	695.6	..	..	..	183.9
1970-71 ..	519.3	58.5	170.4	748.2	..	..	..	236.4
1971-72 ..	540.9	73.6	154.4	768.9	..	..	..	267.7
1972-73 ..	612.7	163.3	181.8	957.8	..	..	..	341.7
1973-74 ..	690.5	71.1	158.1	919.7	105.4	113.8	219.2	435.5
1974-75 ..	782.6	118.2	160.7	1,061.5$	143.3$	140.7$	284.0$	563.6
1975-76 ..	887.4	66.0	285.0	1,238.4$	194.9$	174.1$	369.0$	745.7$

(Data from the last year of the Second Five Year Plan are given since comparable data for all the items are not available for earlier years)

.. = Not Available
£ = Figures relate to financial year (April-March)
$ = Provisional
† = Figures as at the end of 1961
@ = Figures as at the end of 1966
‡ = Figures as at the end of 1969
• = Figures as at the end of 1972
@@ = Inclusive of short-term, medium-term and long-term loans.

Sources;
1. *Basic Statistics relating to the Indian Economy, 1950-51 to* 1970-71, Planning Commission, Government of India.
2. *Statistical Abstract—India,* Central Statistical Organisation, Government of India
3. *Fertiliser Statistics,* The Fertiliser Association of India.
4. *Statistical Statements relating to the Co-operative Movement in India,* Reserve Bank of India.
5. *Eleventh All-India Livestock Census, 1972* (Provisional figures)
6. *Problems of Farm Mechanization, Seminar Series IX,* The Indian Society of Agricultural Economics
7. *Report on Currency and Finance,* Reserve Bank of India.
8. *Estimates of Area and Production of Principal Crops in India, 1974-75,* Government of India.
9. *Financial Express* dated June 5, 1973.
10. *Economic Times,* dated October 19, 1976.
11. Pesticides Association of India.

APPENDIX TABLE IV—DRAFT FIFTH PLAN TARGETS OF CROP PRODUCTION

Crop	Unit for Cols. 2,3,4 and 6	Target for five years of the Fifth Plan	Assumed base level (1973-74)	Peak targeted production (1978-79)	Targeted growth rate @	Actual production in base year (1973-74)	Growth rate required to reach the target under Col. 4@
	1	2	3	4	5	6	7
Rice	Million Tonnes	254.0	44.0	54.0	4.2	44.0	4.1
Jowar	,,	51.0	9.5	11.0	3.0	9.1	3.9
Bajra	,,	37.0	6.5	8.0	4.2	7.5	1.3
Maize	,,	37.0	6.5	8.0	4.2	5.8	6.6
Wheat	,,	168.0	30.0	38.0	4.8	21.8	11.8
Total pulses ..	,,	65.0	11.5	14.0	4.0	10.0	6.9
Total foodgrains	,,	645.0	114.0	140.0 (125.0)	4.2	104.7	5.9 (3.6)
Sugarcane	,,	775.0	134.0	170.0 (165.0)	4.9	140.8	3.9 (3.2)
Groundnut ..	,,	..	6.0	7.7	5.1	5.9	5.4
Oilseeds§	,,	55.0	9.4	12.5 (12.0)	5.8	8.8	7.0 (6.1)
Cotton	Lakh bales	£360.00	65.0	80.0 (75.6)@@	4.3	59.6	6.1 (4.9)
Jute and Mesta ..	,, £	360.00	67.0	77.0 (77.0)	2.9	76.8	— (—)

.. = Not available — = negligible

@ Compound growth rate in per cent per annum.

@@ 80 lakh bales of 170 Kgs. each

£ Bale = 180 Kgs.

§ Include five major oilseeds *viz.* groundnut, rapeseed/mustard seed, sesameseed, linseed and castorseed.

Note ; Figures in brackets are based upon targets in the final Fifth Plan. Peak targeted production (1978-79) has been indicated only for foodgrains (as a group), sugarcane, oilseeds (as a group), cotton, jute and mesta. In order to allow for variations in the effect of weather, provisions have been made in individual State Plans on a slightly higher scale so that the total production is not materially lowered even if some part of the country is affected.

Sources; (1) *Draft Fifth Five Year Plan*, 1974-79, Vol. II, Government of India, Planning Commission.

(2) *Economic Survey*, 1975-76, Government of India.

(3) *Fifth Five Year Plan 1974-79*, Government of India, Planning Commission.

APPENDIX TABLE V—TARGETS AND ACHIEVEMENTS IN AGRICULTURE FOR 1974-75 AND 1975-76

Programme	1974-75 Target	1974-75 Actual achievement	Percentage of Col. 2 to Col. 1	1975-76 Target	1975-76 Anticipated achievement	Percentage of Col. 5 to Col. 4
	1	2	3	4	5	6
1. Area under high-yielding varieties (Million hectares)						
a. Paddy	11.00	10.78	98.0	12.50	12.97	103.8
b. Wheat	12.20	11.21	91.9	12.50	13.56	110.2
c. Maize	0.75	0.66	88.0	0.90	0.92	102.2
d. Jowar	1.35	1.31	97.0	1.30	2.19	168.5
e. Bajra	3.40	2.53	74.4	2.80	2.72	97.1
TOTAL	**28.70**	**26.49**	**92.3**	**30.00**	**32.38**	**108.3**
2. Production Units						
a. Foodgrains Million tonnes	118.00	101.00	85.6	114.00	114.00	100.0
b. Oilseeds ,, ,,	10.00	8.36	83.6	10.00	10.50	105.0
c. Sugarcane (Cane) ,,	141.00	140.20	99.4	145.00	144.80	99.9
d. Cotton Million bales	6.80‡	6.67‡	98.0	7.20@	6.90@	95.8
e. Jute and Mesta ,,	6.90‡	5.81‡	84.2	6.70‡	5.80‡	86.2
3. Consumption of chemical fertilisers (Lakh tonnes)						
a. Nitrogenous (N) ..	23.00	17.74	77.1	25.00	21.48	85.9
b. Phosphatic (P_2O_5) ..	6.50	4.78	73.5	7.00	4.66	66.6
c. Potassic (K_2O) ..	4.50	3.39	75.3	4.00	2.78	69.5
TOTAL	**34.00**	**25.91**	**76.2**	**36.00**	**28.92**	**80.3**
4. Consumption of pesticides (tonnes)	45,500	41,186	90.5	56,000	49,670	88.7
5. Gross cropped area (Million hectares)	171.61	168.42$	98.1	171.00	171.20	100.1
6. Minor irrigation (Million hectares)	24.90	26.67	107.1	26.35	27.64	104.9
7. Medium and major irrigation						
a. Potential (Million hectares) ..	22.12	21.80*	98.6	..	22.50	..
b. Utilisation (Million hectares) ..	19.63	19.50*	99.3	..	20.20	..
8. Soil conservation on agricultural land (Million hectares)	17.29	17.68	102.3	18.40	18.71	101.7

.. = Not available.
@ = Bale = 170 kgs
‡ = Bale = 180 kgs.
$ = Likely achievement.
* = Anticipated achievement.

Source: *Annual Plans 1975-76 and 1976-77*, Planning Commission, Government of India.

APPENDIX TABLE VI—TARGETS OF GROWTH RATES FOR IMPORTANT CROPS IN FIFTH PLAN PERIOD (1974-79)

(Per cent per annum)

Crop	Area	Productivity	Production
	1	2	3
Rice	0.8	3.4	4.2
Jowar	0.6	2.4	3.0
Bajra	0.8	3.4	4.2
Maize	1.6	2.6	4.2
Wheat	2.0	2.8	4.8
Pulses	1.3	2.7	4.0
Sugarcane	2.8	2.1	4.9
Oilseeds	2.4	3.4	5.8
Cotton	2.0	2.3	4.3
Jute and Mesta	1.8	1.1	2.9

Source : *Draft Fifth Five Year Plan* 1974-79 *Vol. II*, Government of India, Planning Commission.

Note : In the final Fifth Plan no separate growth rates have been worked out for various crops in respect of area and productivity (See Appendix Table IV).

THE DEBT-EQUITY RATIO

T. K. VELAYUDHAM*

The steady rise in project costs over the last few years due to inflation within the country and higher prices of imported machinery and equipment, has given rise to the view that the debt-equity ratio permitted at present is inadequate. This view has gained ground with the continuing credit discipline on the one hand and a none too favourable capital market, particularly the new issue market, on the other. Consequently, the corporate sector has been asking for a relaxation of the present debt-equity norm laid down by the Government.

This paper seeks to bring out the various economic aspects and the problems involved in establishing an appropriate relationship between debt and equity in a corporate enterprise. The concept and rationale of the debt-equity ratio is discussed in Section I while Section II deals briefly and in broad terms with the experience of some foreign countries in this regard. The trends in the debt-equity ratio in India are analysed in Section III and Section IV indicates areas where attention could be focussed in regard to the modification of the debt-equity norm. The main points of the paper are brought together in Section V.

I. Debt-Equity Ratio: Concept and Rationale

Concept

The concept underlying the debt-equity ratio is directly related to the role of capital in the operations of a business enterprise. The role of capital in an enterprise has to be viewed not merely in terms of its size but with reference to its structure i.e. the categories of capital and the terms on which a particular category of capital is obtained. Given the objective of maximising profits and wealth to the owners of business, capitalisation is important and is influenced by the need for the safest and the most economic capital structure, that is, a proper proportion between various types of securities making up the capital. In other words, capital structure represents an appropriate mix of various types of capital or the proportion which various kinds of securities bear to the total capitalisation. Decisions regarding a proper mix of capital depend

* T. K. Velayudham is Director, Division of Monetary Economics.

on a variety of factors such as the nature of industry, state of the capital market, the magnitude of the proposed investment, investor preferences, availability of institutional finance, interest rates, Government policies including taxation, etc.

The three basic patterns of capitalisation are : ordinary share capital also known as common stock; ordinary and preference share capital; and ordinary, preference and creditor capital also known as debentures. Of these three, the last combination, which is widely used, is essentially a question of proper proportion between debt and common stock, the latter being inclusive of preference shares; and this proportion is indicated by the debt-equity ratio. In other words, the term debt-equity ratio, known as "gearing" in U.K. and as "leverage" in U.S.A., refers to the arithmatical relationship between the funds provided by the owners of an enterprise (ordinary share capital) and funds obtained from sources external to that enterprise; that is, whether borrowings should equal share capital or should exceed it and by how much. The relationship is usually expressed as a number.

An important question concerning the debt-equity relationship is the nature of items constituting debt and those making up equity. However, there has been no unanimity of views on this question with the result that the content of debt and of equity varies from country to country depending upon the corporate practices and legal requirements obtaining in the countries concerned. Generally, the term "debt" is used to cover all long-term fixed interest obligations such as debentures, loans, deferred credits etc. Short-term borrowings i.e. borrowings for financing working capital needs are generally excluded from the term 'debt'. The term "equity" is intended to cover share capital (ordinary and preference) and all shareholders' reserves.

Rationale

The rationale of the debt-equity ratio is to be traced directly to the nature of funds made available to the enterprise and the advantages and risks attached to these funds. The significance of the use of these two categories of funds by an enterprise needs, therefore, to be appreciated. The use of debt in the financing of an enterprise has some important advantages. It tends to reduce the cost of capital and thus raise the over-all rate of return

to the enterprise. Raising debt is relatively cheaper than equity in terms of issuance costs as also interest costs. More important than these is the tax benefit derived from the use of debt; the interest payable on debt is a deductible expense for income-tax purposes unlike the dividend payable on equity. Another important advantage flowing from the use of debt financing is that it does not result in a dilution of control over the enterprise, of the existing shareholders.

Thus, while it is advantageous, from the promoters' or management's point of view to have more of debt in capitalisation, there are certain risks inherent in a higher debt proportion. For instance, the use of debt need not automatically improve the over-all return to the enterprise unless the profitability rates are higher than interest rates.[1] Besides, debt places a fixed burden on the enterprise by way of interest and principal payments; and this burden may become severe, if the earnings of the enterprise fluctuate. Above all, a relatively higher debt-equity ratio would reduce the earnings available to equity shareholders and thus discourage the investors who provide the risk capital for the enterprise.

There is thus an inherent conflict of interests between the creditors and the providers of risk capital ; in fact the latter seems to be at a disadvantage. Debt or borrowings carry a security i.e. a charge on the assets of the company in the event of failure to repay the capital sum; thus the funds made available in the form of debt or loans are generally protected. Similarly, the payment of interest on debt or borrowings is a contractual obligation and is payable out of pre-tax profits. Thus from the point of view of both capital and income, the creditors are well protected, though the risks assumed by them in providing funds are comparatively much less. In contrast, the equity-holders do not enjoy any guarantee as regards their capital or income. Thus the risks assumed by the equity-holders in providing funds seem to be comparatively large.

It is logical, therefore, that prior charges arising from the servicing of debt capital do not unduly reduce the after-tax earnings available to equity. With a view to ensuring this objective and at the same time making available to an enter-

1. Mathew J. Paniker, Rationale of Debt-Equity Ratio, Industrial Researcher, Vol. 1, No. 1, April 1974, p. 38.

prise the benefits of debt capital, some kind of norm for a balanced capital structure i.e. the proportion between debt and equity, has been devised as a method of control.

II. Debt-Equity Ratio : The Experience Abroad

The experience abroad, particularly of developed countries, in regard to the debt-equity ratio is interesting and varied. At one end of the scale are the Western countries where the use of debt is typically conservative and at the other is Japan which makes the most lavish use of debt financing.

Western Countries

A combination of historical, economic and other factors influenced the role of debt in corporate financing in Western countries. A high level of savings and their investment in financial assets coupled with highly developed capital markets facilitated the availability of larger risk capital to the business enterprises. These together with the non-intervention policies of Governments and the institutional facilities in the shape of industrial banks tended to obscure, at least in the pre-war days, the real role of debt in the capital structure of corporations. However, in the post-war years, with the increasing need for reconstruction and development and with the increase in the size of business enterprises and their scale of operations, borrowed funds have increased in importance in the corporate financing plans.

Available information[2] relating to the relative importance of debt and equity in the capital structure in respect of a few advanced countries is given in Statement I. Though the data are not strictly comparable as between individual countries, the increasing importance of debt capital is clearly seen. Thus, for instance, the debt-equity ratio in Canada which was less than 1 in 1964 has increased to 1·05:1 in 1974-75. In Italy the proportion of debt to total liabilities has increased between 1969 and 1974. Similarly, the proportion of equity to the balance sheet totals has steadily declined between 1965 and 1974 in West Germany, Sweden and Austria, indicating the increased role of borrowed funds in the over-all resources of the corporations.

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2. Sectoral Financial Problems under Inflation and Recession, Bank for International Settlements, Basle, April 1976.

The position does not seem to be very different in U.K., U.S.A. and Australia. In the sixties, internal sources and capital raised from the market formed between 68 per cent and 80 per cent of the total funds raised;[3] thus the role of debt or borrowing in the total resources was almost unimportant. However, more recent trends indicate that even in these countries the importance of borrowed funds has been increasing. The debt-equity ratio now seems to be around 1:2 in U.S.A. and between 1 and 2:1 in Europe and U.K.

Japan

The experience of Japan in regard to the debt-equity ratio is, however, unique even among advanced countries. It is well-known that borrowed funds have played a crucial role in the attainment of high rates of capital formation by the Japanese industry. This is due to historical and economic reasons and in the post-war period these forces received official encouragement so that reconstruction and development of the Japanese economy could proceed apace.

Due to severe restrictions on the entry of foreign capital and with no developed capital and stock markets and no specialised financial institutions, particularly in the pre-war period, the Japanese industry came to depend entirely on the banking system for both short-term and long-term funds. In the post-war years, the role of "bank-based" debt became much more important, as Japan required all the resources to rebuild its economy and as there was acute shortage of risk capital. The banks provide over 80 per cent of the external funds even for financing of plant and equipment; and these funds are provided on a short-term basis but renewed regularly.[4] In the result, the Japanese banks are in a constant state of "over-loaning" (i.e. a situation in which the credit-deposit ratio of banks far exceeds 100) while their corporate clients are "over-borrowed"; and this policy has been very actively encouraged by the Bank of Japan.

The typical debt-equity ratio in Japan is 80 per cent to 20 per cent i.e. 4:1 implying that much leverage can be obtained

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3. Report of Study Group on Term Loan Participation Arrangements, Reserve Bank of India, April 1971, p. 4.
4. D. F. Henderson, Foreign Enterprise in Japan : Laws and Policies, University of North Carolina Press, 1973, p. 134.

for relatively little (*owned*) money.[5] The high debt-equity ratio in Japan is not without its limitations, though these have been obscured by the very considerable advantages derived by the Japanese enterprise. The extravagant use of bank-based debt is part of the Japanese corporate strategy not only to obtain tax deductions for the interest paid but also to avoid dividend compulsions and thus regard shareholders' interest as secondary.[6]

III. Debt-Equity Ratio : The Indian Context

Capital Issues Control

The legal and operational basis for the debt-equity ratio in India is provided by the Capital Issues (Control) Act, 1947 and the rules and regulations framed thereunder, from time to time. The administration of this Act by the Government is influenced by two main considerations i.e. regulation of the financial structure of the companies and protection of the interests of the investing public, so as to ensure a healthy and rational growth of the corporate sector.

The guidelines issued by the Capital Issues Control in terms of the Act lay down that a higher ratio than 2:1 as between debt and equity is not generally permitted. However, a higher ratio is considered on merits for certain types of capital intensive industries such as shipping, fertilisers, petro-chemicals, etc. For purposes of calculating the debt-equity ratio, debts are deemed to include all fixed interest bearing securities e.g. debentures, loans and redeemable preference shares with a redemption period of less than 12 years. Equity is deemed to include paid-up ordinary shares, free reserves, share premium and redeemable preference shares with a redemption period of 12 years or more.

During the fifties and early sixties, when internal resources and capital raised contributed the greater part of the corporate funds (i.e. over 55 per cent), the dependence of the companies on debt was relatively much less. This was also a reflection of lack of adequate facilities for institutional finance at least till 1964. The net effect of the operation of these factors was that the debt-equity ratio remained a theoretical norm. Besides, as debt finance was raised mainly in the form of debentures floated in the market, debt came to be identified with debentures

5. D. F. Henderson, op. cit., p. 263 ; italics supplied.
6. Ibid p. 84.

and the question of debt-equity ratio attracted attention only at the time of issue of these debt securities.

Financial Institutions and the Ratio

With the depression in the capital market which followed the Chinese aggression in 1962, the increase in the size of investment projects as also their capital intensity and with the institutionalisation of industrial finance, reliance on debt i.e., term finance, has become an important feature of corporate financing. As borrowings from the financial institutions constitute the more important component of debt of the corporate sector, the need for observing the debt-equity norms has become more imperative. This is because a lower debt-equity ratio, apart from contributing to the financial soundness of the project, would strengthen the position of the financial institutions, which are primarily term-lenders. Consequently, the enforcement of the prescribed debt-equity ratios has become more imperative for the financial institutions.

The term-lending institutions, while observing the debt-equity ratio, have been applying the norm in a flexible and pragmatic manner. The debt-equity ratio is fixed by the institutions after taking into account the circumstances of each case such as the state of the capital market, nature of the project, ability of the project to service the debt and the calibre and experience of the promoters. The institutions relax the ratio (i.e. accept a higher debt-equity ratio) in the case of (i) projects in the priority or core sector including those producing essential goods, (ii) projects located in backward areas, and (iii) projects promoted by technician entrepreneurs.

The available details[7] indicate that the debt-equity ratios applied by the financial institutions range from 1·5:1 to 2·5:1. On the whole, the criteria employed by the financial institutions in regard to the debt-equity ratio seem reasonable and seem to have been applied realistically.

Trends in Debt-Equity Ratio

The debt-equity ratios and the relative shares of debt and equity in the total capital base in respect of medium and large public limited companies are shown in Statements II and III respectively. These are based on the data relating to joint-stock companies compiled and published periodically by the Reserve Bank of India. Debt is defined as all *long-term* borrowings including

7. Based on Annual Reports and other publications of the term-lending institutions particularly the IDBI, the ICICI and the IFCI.

long-term borrowings from commercial banks. Equity comprises paid-up capital, reserves and surplus.

The over-all debt-equity ratio for 17 industry groups, as may be seen from Statement II, is well below 1 for both the series shown in the statement i.e. 0·3:1 and 0·4:1. Industry-wise (for the latest series), the ratios are well above the over-all average in respect of shipping (1:1), electricity generation and supply (0·6:1), paper (0·4:1), cement (0·5:1), industrial chemicals (0·6:1), transport equipment (0·5:1), cotton textiles (0·5:1) and aluminium (0·4:1); all other industry groups have ratios well below the overall average. This trend is broadly confirmed by the data given in Statement III in respect of the relative shares of debt and equity in the total capital base of these companies.

It would be useful to group the number of companies according to the range of debt-equity ratios; however, such a grouping is not possible in respect of the companies covered in Statement II, as details of individual companies are not published by the Reserve Bank. In order to get an idea of the distribution of companies according to different debt-equity groups, data relating to individual companies were compiled from the Directory of the Bombay Stock Exchange for the year 1974-75, in respect of 11 industry groups comprising 124 companies. The industry groups chosen for this purpose correspond to those shown in Statement II.

The distribution of companies according to debt-equity ratio groups is shown in Statement IV. Of the 124 companies, 25 companies (or 21 per cent) did not have long-term debts during 1974-75. About 59 per cent of the companies (74) had debt-equity ratios below 0·5:1 while in the case of 10 companies (8 per cent) the ratio ranged between 0·5:1 and 1:1. The remaining 15 companies (12 per cent) were in the high ratio group i.e. over 1:1. Industry-wise distribution of companies according to debt-equity groups shows an interesting pattern. Of the 10 shipping companies 9 are in the high ratio group of over 1:1, the actual ratios in these cases ranging between 1·1:1 and 5·3:1. Over 60 per cent of the companies in each of the other industry groups except sugar, had ratios below 0·5:1.

The trend of low debt-equity ratios is not confined to old established companies, which generally have a strong equity

base built up from free reserves and surplus out of previous years' profits. An analysis of the prospectuses issued by 400 companies which entered the market during 1970-1973[8] shows that the proportions of debt and equity in the total investment envisaged ranged between 35:65 and 70:30. In fact, the proportion of debt was below 50 in respect of over 60 per cent (i.e. 250 out of 400) of the new companies which entered the new issue market during 1970-73.

The trend of low debt-equity ratio in the corporate sector seems to be the result of quite a few factors. At least till the advent of the term-lending institutions, loans were raised primarily through issues of debentures and the term 'debt' was closely identified with debentures. However, issues of debentures have all along accouted for a relatively smaller proportion of the total capital raised. Thus during the period 1961-62 to 1975-76, debentures issued averaged Rs. 15 crores a year or about 30 per cent[9] of capital raised. The comparatively small share of debentures in the capital raised may be attributed to a lack of a substantial market for this kind of security and a measure of unwillingness on the part of companies to resort to this method as it might impair their credit-worthiness in the eyes of their bankers.

Another important reason for the low debt-equity ratio, even after the advent of the term-lending institutions, seems to be the practice of the companies to meet part of their long-term capital needs by borrowing from banks on short-term basis and rolling it over. This is particularly true when it is difficult to raise long-term funds.[10] This practice must have enabled the companies to keep the long-term debt well below the permitted levels.

The low debt-equity ratio may also be explained with reference to the fact that the term 'debt' does not include deposits raised by companies from the public, though such deposits are

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8. B. Bhatia, New Issue Market of India, Vora & Co., Bombay, 1976 p. 109, Table 19.

9. This high percentage is due to the fact that 40 per cent of the total debentures during the period, were issued during 1966-67—1969-70, when capital market was in a bad shape due to industrial recession. If these are excluded, the share of debentures would be 20 per cent.

10. For a discussion of this, see Dehejia Committee Report, the summary of which was published in the Reserve Bank of India Bulletin, November, 1969.

in the nature of long-term liabilities and are obtained for periods of more than one year. Though, historically, these deposits have been one of the sources of long-term funds for the Indian corporate sector, their magnitude was relatively small till the sixties. More recently, these deposits spurted up, for a variety of reasons, from Rs. 505 crores in 1970 to Rs. 1,300 crores in 1975 i.e., these increased at the average annual rate of 21 per cent per annum during the period. According to the Report of the Study Group on Non-Banking Companies (page 9, Table 2·2), these deposits formed over 16 per cent in 1972-73 of the equity of 163 selected non-financial companies.

The size of the investment project also seems to have influenced the level of the debt-equity ratio. Of the 400 new companies which entered the capital market during 1958-73, 88 companies with an investment of Rs. 400 lakhs and above in each case accounted for a higher proportion of debt, the proportion ranging between 54 per cent and 59 per cent.[11] The remaining 312 companies accounting for an investment of Rs. 300 lakhs and below each had a debt proportion of 45 per cent and below. Similar investigations[12] indicate that the size of the company influences its capital structure and that companies with larger fixed assets are in a better position to assume more debt. In other words, large and capital intensive projects necessitate larger reliance on debt. At least till recently, there were not many large-sized projects in the private sector which generally involve large investment and therefore larger proportion of debt.

The main point that emerges from the trends in the debt-equity ratio is that the Indian corporate sector is trading on "thick equity", as it relies on debt capital to a much smaller extent.

IV. Debt-Equity Ratio : Some Aspects

In the light of the concept of debt-equity ratio and its rationale and also the trends in the ratio in the Indian corporate sector, some aspects of the problem may be considered as likely areas which require attention. Before doing so, some basic propositions relating to the debt-equity ratio may be touched upon.

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11. B. Bhatia, op. cit. p. 109, Table 19.
12. R. M. Srivastava, Debt-Equity Mix (two articles), Economic Times, September, 1975.

Basic Propositions

First, the purpose of the debt-equity ratio is to indicate the proportion of capital supplied by the owners and thus the asset "cushion" available to creditors in the event of liquidation.[13] The ratio, therefore, relates the creditors' claims on assets to the owners' claims. Implicit in this is the clash of interests ; thus the financial institutions, who are the major source of creditor capital to industry, would generally avoid an unduly high debt-equity ratio, as a low ratio would render the project financially viable and as the institutions have to ensure a better turn-over of their funds. For the promoters, a higher debt-equity ratio is generally desirable, as debt is relatively easier to raise than equity and as the promoters will have a greater control over the project with a given amount of equity contribution. Further, the effective cost of debt is much lower than the cost of equity funds, as interest paid on debt is an item of expense and is therefore deductible for tax purposes. Thus the interests of the promoters and of the financial institutions do not seem to coincide and the "trade-off" between the two has to be governed by practical considerations.

Secondly, there is clearly a limit to the availability of loan funds or institutional finance. No institution would provide the entire finance required by a project and it is only legitimate on the part of the institutions to expect the promoters to have a reasonable financial stake in the project. Thus the availability of debt is contingent upon the size of owned funds ; and here again due weight has to be given to practical considerations such as the size and nature of the project, state of the capital market, the gestation periods, etc.

A third basic proposition is that a given debt-equity ratio is not a fixed quantity. It is essential to note that a given ratio of an industrial unit has to decline over time, as otherwise, the project financed may not be regarded as viable. The financial viability of a project is reflected in the cash surpluses it generates and in the progressive liquidation of its debt obligations. Given the levels of performance of the borrowing companies and given the scope for further investment by them, debt-equity ratios differ from company to company and for the same company from time to time.

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13. Stephen Archer and Charles' Ambrosio, Business Finance : Theory and Management, Collier Macmillan International Edition, (Second Edition) 1972, p. 453.

Above all, the two practical considerations limiting the extent of indebtedness are : the ability of the company to service the debt and the likely effect of fixed obligations (i.e. interest, repayments, etc.) on the return to equity capital. Given the level of earnings, an increase in the debt-equity ratio would not only increase the debt-servicing burden but would reduce the after-tax earnings available to equity-holders, which in turn would reduce the attractiveness of equity investment of the company concerned ; such a situation needs to be avoided as otherwise the role of debt may prove counter-productive.

Suggestions

Keeping in view the basic propositions set out in the preceding paragraphs, the need for relaxation or modification of the debt-equity ratio may be considered. Recent developments in the economy seem to call for some rethinking on the present debt-equity norms. Increasing degree of institutionalisation of savings and the pre-emption of these savings by the Government sector have become an important factor in the availability of funds to the corporate sector. The household sector has tended more and more to shy away from the capital market for a variety of reasons, the more important of these being the relatively unattractive and uncertain rates of return on such investments. In the result, the corporate sector's ability to raise funds by way of new issue of stocks has become constricted.

Simultaneously, the need for larger funds for investment has grown due to several reasons such as rise in project costs due to inflation at home and abroad, sophisticated technology, the size as well as the capital intensive nature of the projects, etc. Further, certain policy measures of the Government such as encouragement to technician entrepreneur (whose only equity is his ideas and professional expertise), the development of backward areas and the growth of "core" industries have all pushed up the demand for investment capital. In the context of the continuing shortage of risk capital,[14] the rising demand for funds can be met through long-term borrowings and this would necessarily call for some dilution of the present debt-equity standards.

In the Indian context, therefore, the objective of the debt-equity ratio should be to supplement risk capital in a somewhat

14. The very fact that the I. F. C. I. had to set up risk capital foundation and the I. D. B. I. a Seed Capital Scheme brings into focus the shortage of risk capital.

liberal manner so that capital formation and rapid industrialisation are facilitated. This objective may be achieved not by relaxing or modifying the present norm but by evolving a new approach. As a standard debt-equity norm for all industrial units is neither desirable nor practicable, the new approach would indicate *different debt-equity ratios for different industry-groups*, based on the type of technology generally used, the quantum of capital normally required and the gestation lag. Thus viewed, the debt-equity ratio norms would be different for iron and steel, shipping, chemicals, paper, cement, etc., from those for cotton textiles, edible oils, sugar, etc. These industry-group norms could be suitably relaxed in the case of individual units within the industry group, to take into account availability or otherwise of risk capital, the relative backwardness of the region where the unit is to operate, the nature of demand for the product, whether promoters are technocrats and other relevant circumstances.[15]

In order to render the liberalised debt-equity norm more effective, suitable adjustments in repayment periods may also be necessary. This is particularly important in the case of projects in backward areas or projects with long gestation periods. Unless the repayment period is suitably adjusted (i.e. increased), a higher debt-equity ratio may be a burden rather than a boon to industrial units.

It also seems necessary to redefine debt and equity for purposes of computing the debt-equity ratio. As regards debt, the inclusion of preference shares redeemable within a period of 12 years, in the term "debt" does not seem logical. Preference shares are part of ordinary shares both legally and for accounting purposes. The fact that these shares carry a fixed dividend and a definite period of redemption does not make them comparable to other fixed income securities like debentures. In fact, the experience with preference shares in India shows that these do not possess the investment qualities of debt securities.[16] It seems necessary, therefore, to exclude preference shares redeemable within 12 years from debt and treat the whole of preference shares as equity irrespective of the period of their redemption.

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15. Sick industrial units are in a class by themselves ; their complex problems cannot be solved by manipulating the debt-equity ratio.

16. T. K. Velayudham, Convertible Debentures Further Considered, Reserve Bank of India Bulletin, October 1976.

There seems to be a case for treating as part of debt, loans carrying conversion clauses. Convertible loans or debentures are debt till conversion takes place ; and after conversion they cease to be debt thereby lowering the debt-equity ratio. As the inclusion of convertible loans or debentures in debt gives a measure of flexibility to the capital structure leading ultimately to the strengthening of the equity base, the debt-equity ratio may be raised for those companies issuing convertible debentures or taking loans with conversion clauses. This is more meaningful than to treat them as part of equity as suggested by some financial analysts.[17]

Another aspect worth considering is whether the deposits accepted by companies from the public can be included in debt for purposes of computing the debt-equity ratio. These deposits are mostly for periods of three years and more and as there is little to distinguish such deposits from the company's long-term borrowings, [18] there seems to be a case for including these deposits in debt for purposes of the debt-equity ratio. In fact, the inclusion of deposits in debt would serve to indirectly regulate the quantum of deposits obtained by the companies as also the interest rates offered on these deposits.

It is sometimes argued that for purposes of computing the debt-equity norm, the term 'debt' should include even short-term borrowings i.e. working capital, on the ground that these are often rolled over and are, therefore, semi-permanent as is the case with bank overdraft[19]. It does not seem practicable to include these short-term borrowings in debt for purposes of debt-equity ratio ; these borrowings are volatile and fluctuate in the course of a year and would thus affect the debt-equity ratio from day to day ; there is also the problem of taking the right amount for computation of the ratio i.e. whether it is the limit or the actual utilisation that is to be taken. In the context of credit discipline the scope for rolling over of short-term borrowings from banks is very much limited. In case, rolling over of such borrowings becomes sizeable, the financial institutions could seek from the

17. R. Viswanathan, Debt-Equity Norms for Giant Projects, State Bank of India Bulletin, August, 1975, p. 294-295.

18. The Study Group on Non-Banking Companies treats the deposits as being mostly in the nature of Working Capital. This may not be correct, as the deposits are available for three years and more and as they do not fluctuate with the level of operations.

19. Methew J. Paniker, op. cit., p. 37.

borrowing companies, specific information on short-term borrowings outstanding beyond two or three years.

The coverage of "equity" for purposes of debt-equity ratio, may also have to be redefined so as to be realistic. As mentioned earlier, the whole of preference shares may be treated as equity regardless of their redemption period. Besides, a uniform definition of equity as comprising paid-up capital and all free reserves may not suit all situations. An established enterprise may have sizeable reserves and may, therefore, have a larger base with reference to which debt-equity ratio could be computed. Thus an established enterprise may be at an advantage compared to a new enterprise which is yet to build up reserves. In the case of new projects including those sponsored by technician entrepreneurs, a higher debt-equity ratio could be allowed on the basis of the potential of the project. A measure of value judgement is unavoidable in these cases and the financial institutions may very well develop some expertise in this direction.

The efforts to make the debt-equity norms more practicable by redefining the coverage of both debt and equity and by taking an industry-group approach, should not lose sight of one fundamental fact, namely, that the debt ratio analysis is essentially a *static* analysis based on balance sheet, which itself is a static presentation of the financial conditions of an enterprise. While these ratios are useful as indicators over a period of time, they do not indicate the "debt-worthiness"of a firm which lies in its ability to repay both principal and interest.[20] In other words, a given debt-equity ratio, to be meaningful, will have to be viewed in relation to a firm's debt-servicing ability as reflected generally in the interest-coverage ratios.

The foregoing suggestions in regard to the debt-equity norm may in effect amount to raising the ratio generally or selectively, and the implications of this may have to be assessed. An increase in the ratio, selective or otherwise, would lead to an increased demand on the resources of the financial institutions which are already under strain ; and unless the resources of the term-lending institutions increase, there may be capital shortage. It is equally important to ensure that the increase in the debt-equity ratio does not lead to a lowering of the promoter's stake. In fact, there is no reason why the promoter's contribution should

20. Erich A. Helfert, Techniques of Financial Analysis, Dow Jones-Irwin, Inc, 1973, (Second Printing) p. 62.

vary in relation to the debt-equity ratio. A minimum by way of promoters' contribution may have to be insisted upon irrespective of the ratio. A more important question is whether there is scope for increasing the debt proportion in the capital structure of the Indian corporate sector. Our analysis of the trends in the debt-equity ratio has shown that the ratio in a majority of the industries is well below 1:1, a ratio generally considered good in respect of industrial enterprises. This together with profitability rates vis-a-vis the average cost of borrowing would indicate that the companies could absorb a little more of debt without risking their financial viability. It is of interest to note in this connection the recommendation of the Tandon Committee [21] that, as a measure of financial discipline, 25 per cent of the working capital gap (excluding bank borrowings) should be met by companies out of their own funds and long term borrowings. Though the effect of this may be to divert long-term funds for working capital purposes (and also lower the debt-equity ratio over a period) the primary objective of the recommendation is to ensure that cash generation capacity is adequate to take care of the debt-servicing obligations.

V. Summary

The various developments in the economy in recent years such as rise in project costs, capital intensity of the projects, state of the capital market, evolving nature of the corporate proprietorship, erosion in the value of real savings and the basic trend of decline in the flow of risk capital—all these have changed the context in which the debt-equity norm was originally fixed. There is thus the need for rethinking on the subject as also for a fresh approach to the problem.

It seems necessary to avoid the adoption of a uniform ratio for all industrial units irrespective of their size and nature and their capacity to raise funds in the new issue market. The alternative is not so much to relax the present norm as to evolve different norms for different industry groups based on technology, quantum of capital, nature of product, gestation-lag, etc. Simultaneously, the coverage of the terms "debt" and "equity" will have to be redefined for purposes of computing the ratio. Considering that the inclusion of convertible debentures imparts

21. Report of the Study Group to Frame Guidelines on Follow up of Bank Credit, Reserve Bank of India, 1975, Chapter 6.

built-in flexibility to the capital structure, companies making public issues of such debentures may be liberally treated as regards the debt-equity ratio, while at the same time, they may be encouraged to issue such debentures.[22]

No doubt the financial institutions have been operating the present norm in a flexible manner ; however, given the need for stepping up investment to facilitate rapid industrialisation, a relatively more liberal approach could be taken as regards the role of debt ; this is particularly important in a situation where the flow of risk capital is not adequate. The current foreign exchange situation seems to provide the right opportunity, as a liberal debt-equity ratio may make available matching rupee resources for utilising the substantial foreign exchange reserves.

The implications of a liberal debt-equity ratio, however, should not be lost sight of. The more important of these is whether the Indian corporate sector can absorb debt without risking their financial viability. An analysis of the trends in debt-equity ratio as also the trends in average cost of debt and profitability rates, suggests that there is scope for increasing the proportion of debt in the capital structure of the companies. Though the experience of Japan in regard to the debt-equity ratio cannot constitute a model for us, the role of debt in achieving high rates of capital formation and industrialisation in that country cannot be ignored altogether.

22. T. K. Velayudham, op. cit. pp. 663-664

STATEMENT—I RELATIVE IMPORTANCE OF DEBT/EQUITY IN THE FINANCIAL PATTERN OF CORPORATE SECTOR IN SELECTED COUNTRIES

	1965	1967	1969	1970	1971	1972	
1. Austria							
Ratio of shareholders equity to the balance sheet total	47.0	44.2	40.7	48.0	34.9	33.0	
	1964	1969	1970	1971	1972	1973	1974
2. Canada							
Debt-equity ratio	0.750:1	0.875:1	0.900:1	0.950:1	0.975:1	1.00:1	1.05:1
3. Germany	1965	1970	1971	1972	1973	1974	
(Capital & Reserves as percentage of Balance sheet total)							
All enterprises	29.8	26.7	26.0	24.7	24.0	23.7	
Manufacturing	33.1	30.0	29.4	28.4	27.4	26.6	
Chemical Industry	43.5	39.3	38.9	39.1	38.4	36.5	
Iron & Steel Products	36.8	34.1	32.4	30.7	29.6	30.2	
Motor Vehicle Mfg.	38.4	36.0	36.4	35.8	34.3	29.1	
Textiles	33.8	28.0	29.1	26.7	25.8	24.8	
Construction	14.9	11.4	10.4	9.7	8.4	7.8	
	1969	1970	1971	1972	1973	1974	
4. Italy							
Debt to total Liabilities ..	48.7	50.8	53.3	54.9	54.6	57.1	
	1971-72	1972-73	1973-74	1974-75			
5. Japan							
Ratio of debt to Capital@ ..	83.3	87.2	89.8	84.6			
6. Sweden	1965-69	1970	1971	1972	1973	1974	1970-74
Equity as percentage of Balance sheet total	38	32	31	30	29	29	30

Source : Sectoral Financial Problems Under Inflation and Recession—BIS ; Basle, April 1976

@ Ratio of institutional debt to total capital.

STATEMENT—II DEBT-EQUITY RATIOS FOR SELECTED INDUSTRY GROUPS

Industry	Series I (1965-66 to 1969-70)		Series II (1970-71 to 1974-75)	
	No. of Companies	Averages	No. of Companies	Averages
1. Edible vegetable and hydrogenated oils	14	23:100	14	22:100
2. Sugar	77	19:100	70	25:100
3. Cotton Textiles	261	38:100	271	54:100
4. Jute Textiles	44	23:100	44	24:100
5. Silk and Rayon Textiles	16	31:100	18	21:100
6. Woollen Textiles	9	17:100	10	25:100
7. Iron and Steel	2	28:100	2	20:100
8. Aluminium	4	60:100	4	40:100
9. Other non-ferrous metals (Basic)	7	43:100	8	30:100
10. Engineering	290	31:100	408	35:100
(*i*) Transport Equipment	44	41:100	48	49:100
(*ii*) Electrical machinery apparatus etc.	78	22:100	107	25:100
(*iii*) Machinery (other than transport & electrical)	91	28:100	133	32:100
(*iv*) Foundries & Engineering Workshops	18	41:100	47	48:100
(*v*) Ferrous/non-ferrous metal products	59	22:100	73	25:100
11. Chemicals	130	35:100	600	42:100
(*i*) Basic Industrial Chemicals	62	55:100	82	59:100
(*ii*) Medicines & Pharmaceutical preparations	39	9:100	46	11:100
(*iii*) Other chemical Products	29	17:100	48	15:100
12. Cement	16	41:100	18	45:100
13. Rubber and Rubber Products	13	28:100	17	34:100
14. Paper and Paper Products	30	53:100	37	42:100
15. Glass and Glassware	11	26:100	12	22:100
16. Electricity Generation & Supply	32	61:100	23	62:100
17. Shipping	13	87:100	16	108:100
18. Total (including others)	1501	33:100	1650	37:100

Series I —Relates to 1501 companies.
Series II—Relates to 1650 companies.

Source : (1) Financial Statistics of Joint Stock companies in India—1960-61 to 1970-71
(2) R. B. I. Bulletins—September 1975 and July 1976.

STATEMENT III—PERCENTAGE SHARE OF DEBT AND EQUITY IN TOTAL CAPITAL BASE IN RESPECT OF SELECTED INDUSTRIES

(Averages for 1970-71 to 1974-75)

Industry	Debt	Equity
1. Edible vegetable and hydrogenated oils	17.9	82.1
2. Sugar	19.6	80.4
3. Cotton Textiles	35.1	64.9
4. Jute Textiles	19.4	80.6
5. Silk and Rayon Textiles	17.3	82.7
6. Woollen Textiles	19.2	80.8
7. Iron & Steel	16.2	83.8
8. Aluminium	28.3	71.7
9. Other non-ferrous metals (basic)	22.9	77.1
10. Engineering	26.3	73.7
(*i*) Transport Equipment	33.0	67.0
(*ii*) Electrical machinery apparatus etc.	20.0	80.0
(*iii*) Machinery (other than transport and electrical)	24.2	75.8
(*iv*) Foundries and Engineering works	32.1	67.9
(*v*) Ferrous/non-ferrous metal products	19.9	80.1
11. Chemicals	29.2	70.8
(*i*) Basic Industrial Chemicals	36.0	64.0
(*ii*) Medicines & pharmaceuticals	10.0	90.0
(*iii*) Other chemical products	13.2	86.8
12. Cement	30.9	69.1
13. Rubber and Rubber products	25.5	74.5
14. Paper and Paper products	29.4	70.6
15. Glass and glassware	18.2	81.8
16. Electricity Generation & Supply	35.9	64.1
17. Shipping	51.8	48.2
Total (including others)	26.8	73.2

Source : Based on data published in the R. B. I. Bulletins—September 1975 and July 1976.

STATEMENT—IV DISTRIBUTION OF NUMBER OF COMPANIES ACCORDING TO DEBT-EQUITY RATIO GROUPS IN 1974-75

Debt-Equity Ratio (Per cent)	Alumin-ium	Edible Oil	Jute Textiles	Enginee-ring	Chemi-cals	Paper	Iron & Steel	Cement	Cotton Spg. & Wvg. Mills	Sugar	Shipping	Total
NIL			3	1	4	4	1	4	2	6		25
1-10 : 100			1	2	1	1	2	4	3	2		16
11-20 : 100	1		2	5	5	2	4		1	4		24
21-30 : 100	1	1	1	2	2	3	2		6			18
31-40 : 100	2		1	1	2	3	2				1	12
41-50 : 100				1		1			1	1		4
51-60 : 100												
61-70 : 100					1		1					2
71-80 . 100				1			2	1				4
81-90 : 00									1			1
100							1	1		1		3
Over 100 . 0				2		1		1	1	1	9	15
Total	4	1	8	15	15	15	15	11	15	15	10	124

Source : The Stock Exchange Official Directory— Bombay : Different Volumes.