

INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research

in

National Income

REGIONAL INCOME ESTIMATION IN INDIA

By

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HYDERABAD

16th - 19th January 1970

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7, Hyderabad, 1970

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# REGIONAL INCOME ESTIMATION IN INDIA

by

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## 1. Introduction

1.1 In a vast country like India meriting the description of a sub-continent, different regions show wide disparities in the level of development as reflected in the pattern of employment, income, productivity, capital formation, savings etc. In order to correct the regional imbalances, emphasis is being laid on regional economic planning. The regional income estimate as a single economic indicator reads off the progress made by the region in overall economic development. These estimates also bring out to some extent the regional economic disparities. Hence, the importance of the regional income estimates in the era of regional planning needs no emphasis.

## 2. Historical background

2.1 The regional income estimation in India - particularly State Income estimation - has a long history. The earliest estimates of State Income in India appeared in the Madras Year Book, 1923 (Dr. G. Slater). However, details of the method of estimation are not known. The first systematic attempt at preparing the State Income estimates in India was perhaps made by the Bureau of Economics and Statistics of the erstwhile Bombay Province. These estimates at the State level were prepared even before the official Series of National Income was initiated in the country. The estimates of State Income of the Bombay Province for the year 1948-49 appeared in the Quarterly Bulletin of the Bureau<sup>(1)</sup>. In this initial attempt at state income, all sectors of the provincial economy were not covered. For example, income from mining, fishery, small enterprises and of non-assessees in the tertiary sector was not estimated. The coverage was subsequently enlarged while releasing the estimates for the year 1949-50.<sup>(2)</sup> The Bureau prepared the estimates of the then Bombay Province upto the year 1951-52 and discontinued the estimation pending the Report of the National Income Committee<sup>3</sup>. The Indian Institute of Public Opinion prepared the estimates of State Income for all the States and published the same in its Quarterly Economic Report from time to time.<sup>(3)</sup> However, the methods of estimation adopted by the Indian Institute of Public Opinion are not described anywhere and the quality of these estimates cannot, therefore, be assessed. Some research workers also made individual attempts at preparing regional income estimates. Dr. S.G.Tiwari<sup>(4)</sup> and Dr. B.G. Kunte<sup>(5)</sup> in their doctoral thesis attempted to prepare the estimates of State Income by income accruing method. It may be stated here that barring these two individual attempts almost all the available estimates of State Income are prepared by the income originating method. A paper on State Income of Bihar prepared by Prof. S.R.Bose was published in the Quarterly Bulletin of Statistics, Government of Bihar in October, 1950 issue. Besides the Indian Institute of Public Opinion, other single agency preparing State

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<sup>3</sup> The Bureau again started preparing estimates of state Income from 1954-55 onwards.

Income estimates of all the States is the National Council of Applied Economic Research, New Delhi (NCAER) which presented in its publication (6) estimates of State Income by industrial origin for all the States. Subsequently, the NCAER brought out another publication on State Income (7) Dr. Mahinder D. Chaudhary prepared estimates of State Income of different States by allocating the National Income total for the year 1955-56 (8).

2.2 On account of the interest taken by the Joint Conference of Central and State Statisticians and the Central Statistical Organisation, the State Income estimation work in India is receiving increasing attention in various States in India. The Fifth Joint Conference of the Central and State Statisticians which was held in November - December, 1956 discussed the subject of State Income and recommended that the State Statistical Bureau (SSB's) should make every effort to prepare estimates of State Income broadly on the lines recommended by the National Income Committee. The Preliminary Conference on Research in National Income held in January 1957 also discussed regional income estimation at a technical level and recommended that a working group of active workers in the field should be set up to review the work at present being done on State Income with a view to formulating standard concepts, definitions and methods of estimation, under-taking the technical examination of estimates of State Income which are prepared by the SSB's and making recommendations on the important gaps in statistics and how they could be filled. The subject of State Income estimation was again brought before the Seventh Conference of the Central and State Statisticians held from 17th to 19th December, 1958. The subject was considered at length by the Subjects - Committee of the Conference which made the following recommendations

- (i) The work of State income estimation should be treated as an item of first priority in the programme of work of the SSBs and that in States where this work has not yet been taken up action should be initiated at a very early date.
- (ii) To bring maximum comparability between the State income estimates prepared by the respective SSBs and statewise breakdown prepared by the CSO, the SSBs, should in the first instance, prepare such estimates for the year 1955-56 and also for an earlier year, preferably, 1952-53. The technical aspects of these estimates can be discussed between the CSO and the SSBs concerned before detailed recommendation regarding uniformity in methodology to be adopted could be made. In this connection the need for better co-ordination between centre and states and interchange of information between them was noted.
- (iii) The SSBs should indicate to NSS in detail the type of data which they might require from it for state income estimation in specific sectors. The NSS should make every effort to make such information available to the SSBs.
- (iv) The Working Group on State Income (CSO) should examine and suggest methods of estimation in sectors like Railway, Post and Telegraph, etc., for which National Income Committee had prepared estimates. The desirability for CSO exploring availability of data for use to the SSBs with certain all-India agencies was recommended.

- (v) For the improvement of national income estimates the CSO should be kept informed about the fresh series of data prepared by the States.
- (vi) The SSBs might set up small study group of their own to examine the methodology adopted by them for their estimation purposes, within the broad framework of the National Income Committee's report and the recommendations of the Working Group on State Income in the CSO. The SSBs, other State Government Departments, local Universities or Research Institutions, including the ISI and CSO, can suitably form such study groups in each State.

2.3 The major handicap in the estimation of State Income is the absence of requisite statistical material. The National Sample Survey (NSS) machinery which was developed to fill in various gaps in statistics can be geared to obtain the data required for National Income and State Income estimation. Accordingly, a 'Working Group on requirements of NSS data for National Income and State Income' was formed in 1961. The Working Group discussed the type of data required for National Income and State Income estimation which could be collected through NSS and made recommendations for undertaking certain benchmark surveys and for collection of data for preparing number of indicators measuring changes in the volume of output in different sectors of the economy.

2.4 The Working Group on State Income met from time to time and has taken several steps towards encouragement and improvement of State Income work. Thanks to the efforts of the Working Group and the Central Statistical Organisation (CSO), now all the SSB's in the States (excluding Nagaland and a few Union territories) are engaged in estimation of State Income. In 1958, only eight SSB's viz. Assam, Bihar, Bombay, Himachal Pradesh, Madhya Pradesh, Punjab, Uttar Pradesh and West Bengal had undertaken estimation of State Income. Some of the important topics in State Income on which deliberations were held by the Working Group on State Income include uniform concepts, definitions and methods of estimation of State Income, uniformity in utilisation of basic statistics, interstate comparability, technical examination and co-ordination of work done (first meeting), basis of Statewise allocation of income generated by economic entities operating over a number of States, (third meeting) collection of data on earnings through type studies (fifth meeting), comparability of census economic data from 1951 and 1961 censuses (eighth meeting), projection of state income and consumption expenditure, preparation of district income estimates and gaps in statistics required for State Income estimation and proposals for filling them (eleventh meeting). The Working Group also carried out technical examination of the estimates of State Income of a few States. Besides the technical examination of the estimates of State Income carried out by the Working Group, the detailed on-the-spot examination of sources of data, type of data used for State Income estimation, collection of data and methods of estimation have been carried out in certain States by the Study Teams formed for the purpose by actual visits to the SSB's.

2.5 Several difficulties are encountered by the SSB's in preparing the estimates of State Income. The Seminar on State Income was, therefore, held at the Gokhale Institute of Politics and Economics, Poona from 14th December to 16th December, 1962 and the subject

'Problems of estimation of State Income' was discussed. Other subjects discussed at the seminar were 'income accruing to the residents' and 'allocation of national totals'. Various steps taken by the CSO and the Working Group are gradually improving the quality of the State Income estimates built up by the SSB's.

2.6 The meeting on State Income of the Directors of SSB's held at Bhopal on 24th November, 1963 recommended that the CSO, might get together notes indicating the methodology that was currently followed by each SSB in actual practice and then to see whether a suitable methodological manual could be prepared. Accordingly, the CSO prepared a series of questionnaires and issued them to the SSB's. The questionnaires were so framed as to indicate clearly the type of methodology that was recommended to be followed and the character of the basic material that was desired to be used for estimating the income. Five such brochures<sup>(10)</sup> summarising the replies from the SSB's question by question have been brought out. These brochures are intended to serve three purposes. Firstly they will help the CSO not only to consider whether a suitable methodological manual could be prepared on the basis of the available material but also to formulate and lay down a programme of work to enable each SSB to improve further the quality and comparability of the estimates prepared by it. Secondly, they will help each SSB to know what other SSB's are doing in an important field of common interest. Thirdly, they will permit the users of the estimates of State Income prepared by the SSB's to appreciate the statistical base of the present estimates.

### 3. Standard Methodology and Operational Instructions

3.1 The major development in the field of State Income estimation is the preparation of Standard Methodology and the Operational Instructions for preparing comparable estimates of State Income. The Central Technical Advisory Council in its first meeting held during 20th December to 23rd December, 1961 recommended that uniform concepts and methodology should be adopted for estimation of State Income by all SSB's and the CSO in consultation with the Working Group on State Income should lay down such Standard Methodology. The CSO and the Working Group on State Income are examining sector by sector method of estimation of State Income and taking into account the availability of data at the State level, issued detailed operational instructions for preparing State Income estimates. As the concept, coverage and method of estimation are standardised and actual computational methods are prescribed taking into account the availability of statistical data with the SSB's, such steps would go a long way in not only improving the State Income estimates but also would result in estimates of State Income which would be comparable from state to state. No such comparative picture could be obtained so far from the existing estimates of State Income. The standard methodology and operational instructions for the following sectors have been issued to the SSB's.

- 1) Agriculture
- 2) Animal husbandry
- 3) Forestry
- 4) Mining and quarrying
- 5) Fishery
- 6) Factory establishments
- 7) Electricity, gas, water supply and sanitary services
- 8) Public administration
- 9) Education

Thus for only six sectors viz. small-scale manufacturing, construction transport other than railway, trade, storage, hotels and restaurants, real estate and ownership of dwellings and services other than education and public administration, the Standard Methodology and Operational Instructions have remained to be finalised. For certain sectors like banking and insurance, railways and communications etc. where the activities are extended beyond the boundaries of one State, and therefore, statewise data are generally not available, the Working Group recommended that the estimates at the state level should be prepared by the CSO by allocation method.

#### 4. Gaps in Statistics required for State Income estimation

4.1 As pointed in the preceding paras, the subject of gaps in statistics required for State Income estimation has been discussed for a number of times in the Working Group meetings, Seminars and the Conferences. Such gaps in statistics are not enumerated again in this paper. One of the quickest ways of the filling-in the gaps in statistics is to conduct type-studies. "Though substantial improvement of national income statistics can only result from a properly rationalized and carefully coordinated approach towards collection of basic data through normal administrative activities of Central and State Governments, the scope offered by special studies needs hardly any emphasis. Apart from providing useful data for purposes of formulating development plans at regional level, they can also yield suitable information for working out certain relationships among various aggregates of interest. These relationships could then be used for estimating certain missing items by linking them up with known aggregates. A principal feature of such special studies would be to make it sufficiently intensive by way of details sought and results analysed and made available with the least time lag".<sup>(d)</sup> No follow-up action seems to have been taken in most of the States to conduct such type-studies to fill in the gaps in statistics which could not be taken care of by the systematic sample surveys. No doubt, the NSS machinery has been amply used for filling in such gaps in statistics. The important statistics which were not available previously and which have been collected through NSS include those pertaining to trade, profession and liberal arts, unorganised transport and small enterprises. But the NSS resources have not proved adequate to fill in all the important lacunae in statistics. Type-studies have, therefore, an important role to play in the field of State Income estimation. It is, therefore, unfortunate that most of the SSB's have ignored this convenient tool of supplementing statistical resources. The Working Group on State Income can be a guiding factor in this direction to the SSB's. While Operational Instruction would prescribe computational procedure on the basis of available data, the Working Group can indicate to the SSB's simultaneously how the important gaps in statistics can be filled through type-studies which can be followed subsequently by the systematic surveys. The Working Group itself can prepare a time table for conducting such type-studies. Since the District Statistical machinery exists in all the States and statistical personnel are also available at the Block (Community Development) level, the type-studies without incurring substantial cost are practicable. As regards NSS, a good many surveys have been carried out which make available data which were completely absent. But most of the estimates

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(d) 'Note on the improvement of National Income statistics through special studies' - Note circulated by the CSO for the 5th meeting of the Working Group on State Income held.



obtained from NSS are available for only one point of time and year to year variations are not discernible in any sector of the economy from the NSS. Since repetitive surveys are not always possible with the limited financial resources, the Working Group on requirements of NSS data for National Income and State Income estimation had as far back as in 1961 made recommendations regarding collection of data for preparing number of indicators measuring changes in the volume of output in different sectors of economy. But NSS has still not made available indicators of change in economic activity even though it is considerably cheaper to obtain data for preparing indicators than to repeat the benchmark year survey.

## 5. Comparable estimates of State Income

5.1 The formulation of Standard Methodology and the Operational Instructions is the right step taken by the Working Group on State Income and the CSO which would eventually result in the flow of estimates of State Income prepared by SSB's which would be comparable. As stated before, attempts have been made earlier by the Indian Institute of Public Opinion and the NCAER to prepare comparable estimates of State Income. Since the methods adopted by the Indian Institute of Public Opinion are not known, nothing can be said about their quality. The NCAER has brought out a comprehensive document<sup>(7)</sup> which gives methods of estimation in detail. It is evident that NCAER has taken pains to make the estimates comparable. Nevertheless, the Standard Methodology and Operational Instructions have dealt the subject of State Income more in depth not only to make the estimates of State Income comparable but also to improve the quality of estimates by making use of all the available data part of which may not be available to non-official agencies. It is, therefore, unfortunate that the Standard Methodology and Operational Instructions have still remained to be formulated for some sectors.

5.2 The major purpose of adopting uniform concepts and method of estimation of State Income is to enable the users of these estimates to make analytical studies regarding comparison of economic activity in various States. It is, however, doubtful whether the estimates of State Income obtained even by uniform methods will meet the purpose. For making comparison of the absolute level of output among various States, the estimates of State Income are required to be adjusted for variation in purchasing power of a rupee from State to State. Although a single currency is used throughout the country, the price level of various commodities varies considerably from State to State with the result that the estimates of value of output may not reflect the differences in prices. An isolated attempt at comparison of absolute level of net output in different States was made in a study<sup>(b)</sup> undertaken in the CSO in the past bringing out comparison of purchasing power of rupee and real State Domestic Products in certain States. The subject of comparison of absolute level of production among different States was brought before the Thirteenth meeting of the Working Group on State Income. The Working Group did not make any firm recommendation on this subject but expressed the view that the subject in question is fit for

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(b) "Comparison of State Domestic Product, Productivity and Purchasing Power of a Rupee in Madhya-Pradesh and Maharashtra".

the level of output alone but also the differences in

exhaustive discussion in one of the regular conferences of the Indian Association for Research in National Income and Wealth. Since the estimates of State Income are being put on a sound footing, it is necessary that the studies regarding comparison of real State Domestic Product in different States are initiated without much delay.

## 6. District Income estimation

6.1 With increasing emphasis on 'planning from below', the assessment of economic performance at the district level is receiving more and more attention. For such assessment, District Income estimates are necessary. Moreover to trace the regional disparities within a State and the extent of disparities, the appropriate indicators like District Income are useful. District Income estimation has already engaged attention of some of the SSBs. The Directorate of Economics and Statistics, Madhya Pradesh<sup>(15)</sup>, West Bengal<sup>(13)</sup> and Gujarat<sup>(14)</sup>, have also published their District Income estimates. The Office of the Economic Advisor to Government of Punjab has also prepared estimates of District Income for the districts of reorganised Punjab State but these have not been published. Besides the SSB's, the NCAR published District Income estimates for the districts in 14 States<sup>(11)</sup>.

6.2 The District Income estimation is much more difficult than the State Income estimation for the simple reason that most of the data required for estimation purposes are mostly not available. Thanks to the NSS machinery, important gaps in State Income Statistics have been bridged but NSS have not produced Districtwise estimates. To attempt to estimate District Income even before putting the estimates of State Income on sound footing would definitely defeat the very purpose for which the estimates of District Income are prepared. Some of the SSB's have used estimates of per worker output and certain rates and norms at the national level for preparing State Income estimates for certain sectors. If the District Income estimates are prepared, the same rates at the national level would be used at the District level. How far such estimates can be relied upon? It is futile to attempt District Income estimation without making special efforts to collect data on various sectors of the economy.

6.3 Because of non-availability of data, the Andhra Pradesh SSB, while preparing District Income estimates, had to assume the same ratio of gross income to net income in each district. When the cropping pattern, level of irrigation and price level varies considerably, how can such assumption be tenable? Similarly, in the Forestry Sector, the income per unit of area is assumed same for each district. There must be some dense forest areas in a few districts in Andhra Pradesh where income per unit area will be very high where as in others it might be just negligible. The estimates of income from small enterprises and all other services was allocated in proportion to the working force determined from 1951 census. Thus, no allowance is made for variation in earnings or productivity in different districts. In the case of West Bengal, the estimates of the value of production were worked out individually for every district in the case of agriculture, animal husbandry, tea and mining sectors. Similar figures were also obtained in the case of house property sector for individual districts from the data available at the district level. In the absence of satisfactory data, the districtwise

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compiled the District Income estimates for the year 1956-57 a decade ago. The SSB's of Andhra Pradesh<sup>(12)</sup>,

Even in the case of State Government and local bodies, income was allocated according to the working force based on 1951 census data.

estimates for the remaining 13 out of 18 sectors ( in which state income figures are presented) were obtained by distributing the total output in each of those sectors to the districts in proportion to the working force in those districts" (c). It will be evident that barring five sectors, for no other sector, the West Bengal SSB had districtwise information other than the data from the population census and still the District Income estimation was attempted. The Gujarat SSB built up the estimates of District Income for the year 1959-60. In the case of agriculture, even districtwise figures of production of major agricultural crops were not available and hence the districtwise pattern for the three year period ending 1958-59 was used. The ratio of gross income to net income was assumed same in each district. In the case of animal husbandry, state-wise output of milk and milk products per animal at the State level were assumed for each district. In the case of forestry, the districtwise income from forestry in the State was allocated to each district in proportion to the area under forests in each district the underlying assumption being that the forestry output per sq. km. of forest area in each district is the same. Will it be appropriate to assume that the forestry output per sq. km. of forest area in Dangs district which is known for dense valuable forest be the same as in Kutch district? The method of allocation of income from banking and insurance (where income in Baroda and Rajkot divisions is allocated according to the number of banking offices), professions and liberal arts (where income is allocated in proportion to the number of teachers in educational institutes) and public administration (where income is allocated in proportion to the number of State Government employees) may also appear not sufficiently refined to bring out the levels of disparities in various districts. Such methods of allocation or estimation have been made by the SSB's because of the absence of statistical data necessary for adopting rigorous methods of estimation. If the purpose of District Income estimation is to provide a quantitative measure of disparities among districts, it is futile to attempt District Income estimation without collecting districtwise information.

6.4 The NCAER in its study on inter-district and inter-State income differentials has adopted a different approach in estimation of District Income. According to the NCAER, "An important problem in the estimation of regional incomes is the set of prices and factor costs at which the output mix of different regions should be evaluated. There exists no unique solution to this problem. The solution should depend on the purpose for which the regional income estimates are needed. If the objective is to study inter-regional differentials in the volume of production of goods and services (i.e., in real incomes) the output mix of different regions should be evaluated at the same set of prices and factor costs; on the other hand, if the purpose is to study the differences in the monetary value of the volume of production in different regions it would be necessary to value the output mix of different regions at the prices and factor costs, prevailing in those regions.

The district income estimates for the year 1955-56, presented in this paper, are primarily intended for the purpose of studying the inter-district differences in the volume of production of goods and services within different States. Therefore, the same set of prices and factor costs have been utilized for estimating the net output of different districts within a State. State average prices (for the year 1955-56)

are used for estimating the district net output from agriculture, animal husbandry, fisheries, forestry, mining and factory establishments while the all-India averages relating to net value added or net earnings per person employed (for the year 1955-56) are used for estimating the district incomes originating from the remaining sectors".(d) It will be evident that NCAER adopted State average prices for evaluating district output from most of the commodity producing sectors and net value added or earnings per worker for obtaining income from rest of the sectors. The main point is whether such exercise would result in an estimate which can be called "District Income". In the case of factory establishments, data from Census of Manufacturing Industries which covered only a selected group were used. For non-commodity producing sectors, the earnings per worker at the national level were applied for every district assuming thereby that the productivity in each district is the same. Can one make such assumption which can stand the test of validity?

6.5 To make a comparison of real net output among the districts, it is necessary to arrive at estimate of District Income in the same manner as the State Income estimates are derived and then make adjustments for variation in purchasing power of a rupee in different districts. To obtain a measure of purchasing power of a rupee in different districts or to derive index of price levels in different districts involves considerable labour and requires large volumes of statistics. To use State average price or to use State average net output per worker to every district is a very crude way of getting over difficulties of compilation of spatial price index for deflation purposes.

6.6 Another major limitation of District Income estimation lies in the fact that 'income accruing' concept cannot be adopted for practical reasons. Since the District Income estimates are largely used to measure the income disparities, the District Income estimates by 'income accruing' concept are more relevant. The factor income flows over the boundaries of the districts are quite large and the estimates of District Income by 'income accruing' concept would be substantially different from the estimates by 'income originating' concept. It is, however, highly unlikely that estimation of District Income by 'income accruing' concept would be possible in the near future.

6.7 The subject of District Income estimation was discussed in the 11th meeting of the Working Group on State Income. Taking into account the paucity of data at present available at the district level, the Working Group expressed the view that the regular work on districtwise estimates might be taken in due course. For the present, attention and efforts should be concentrated and directed on organising statistics towards that end. Whenever any survey or data collection is undertaken it should be done with an eye on collection of data at district level. The CSO, in the mean time, should finalise the methodology for preparation of such estimates. 'It is amply clear that estimation of District Income without any special endeavour to collect the necessary statistical material would only be a premature attempt.'

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research

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National Income

RECENT TRENDS IN INCOME OF THE INDIAN UNION

By

Miss. R. POGGAVALLI

HYDERABAD  
16th - 19th January 1970

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## RECENT TRENDS IN INCOME OF TAMIL NADU AND INDIAN UNIC

by

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### Introduction:

An attempt is made in this paper to study the trends of National Income of India and the State Income Tamil Nadu in the years 1960-61 to 1966-67. The period covered for the analysis has been confined to the seven years as no comparable statistics are available for longer period stretching back to 1950-51, the pre-plan year. Apart from the changes in the aggregate Income, its composition has also undergone a change and to throw light on this aspect sectoral rates of growth have also been examined. The rate of growth of income has been correlated to the rate of growth of population with the object of studying the changes in the per capita Income which incidentally reflects the changes in the levels of living. The per capita income has been arrived separately for agricultural and non-agricultural populations to the extent possible based on the 1951 and 1961 census data. The ruling prices at 1960-61 have been adopted for this study.

Growth rates have been worked out in two ways viz. Compound Growth rate and Trend Growth rate. The former one does not reflect the fluctuation in the intervening years and is based on the increase in the final year over the base year. The trend growth rates have been computed from the relationship  $Y_t = AB^t$  where  $Y_t$  is the index of income,  $t$  is the time and  $A$  and  $B$  are parameters to be determined from the equation.

### Economy of Tamil Nadu:-

Tamil Nadu has an area of 130 thousand square km., and accounts for a population of 3.89 crores (1968 mid-year estimate). It ranks seventh in population of the country and has a density of population viz. 299 persons per sq. km, which is nearly double that of all India (164 per sq. km.) and stands 5th among the States. The State stands second in literacy with 31.4% (1961 Census) with Kerala taking the first rank.



Tamil Nadu with 26.7 per cent of urban population comes also second in regard to urbanisation. The distribution of population among workers and non-workers for Tamil Nadu was 46 per cent and 54 per cent as compared to 43 per cent and 57 per cent for all India. Judged by one of the important economic indicators viz. consumption of power, it is observed that the annual per capita consumption of electricity was 92.0 kwh. in Tamil Nadu against the national average of 54.1 kwh. It is a well known fact that Tamil Nadu occupies a foremost place in the country in respect of education with its innumerable Schools, Colleges, Polytechniques and Technical Training Institutes. An analysis of the income of Tamil Nadu are given in the following paragraphs.

Income of Tamil Nadu and India:-

The total Income of Tamil Nadu and India which stood at Rs.1,130 Crores and Rs.13,380 crores in the year 1960-61 rose to Rs.1,378 crores for the State and Rs.15,333 Crores for India in 1966-67 showing a compound growth rate of 3.37% and 2.35% respectively as will be seen from the Table below.

TABLE - I  
Aggregate Income of Tamil Nadu and India

Year	Total Income		Share of Tamil Nadu to All India (per cent)
	Tamil Nadu (Rs. in Crores)	All India (Rs. in Crores)	
1	2	3	4
1960-61	1,130	13,380	8.45
1961-62	1,185	13,891	8.53
1962-63	1,213	14,177	8.56
1963-64	1,245	15,000	8.30
1964-65	1,276	16,090	7.93
1965-66*	1,292	15,199	8.50
1966-67*	1,378	15,333	8.99
Compound Growth rate (per cent)	3.37	2.35	
Trend Growth rate(per cent)	2.96	2.63	
	*Provisional		

It will be seen from the Table above that the share of Tamil Nadu towards National Income has been consistently rising from 8.45 per cent in 1960-61 to 8.99 per cent in 1966-67 except for a sharp fall in the year 1964-65 which brought down the share to 7.93 per cent. Further, the overall growth rate for Tamil Nadu is observed to be 3.37 per cent, while that of All India is 2.35 per cent. It is also observed that the trend growth rate is 2.96 per cent for Tamil Nadu, while it is 2.63 per cent for India. In general, the rate of growth of Total Income for Tamil Nadu, is higher than that of All India.

Primary Sector:

The State is by and large an agricultural one accounting for 73.3 per cent of the rural population. The net area sown accounts for 45.6 per cent of the geographical area. The forests account for 14.6 per cent while the remaining may be classified under the broad non-agricultural land. The total area under irrigation is 2.5 million acres. The prosperity of the State would depend on the extent of success in the farm output. So there has been considerable emphasis on diversification and stepping up agricultural production and strengthening the base of the economy. The cropping pattern of the State is presented below:

TABLE - 3  
CROPPING PATTERN

Year	Food (hectares)	Per cent	Non-food (hectares)	Per cent	Total (hectares)	Per cent
1960-61	5522571	75.4	1797881	24.6	7320452	100
1961-62	5502069	75.7	1767731	24.3	7269800	100
1962-63	5510980	75.6	1778471	24.4	7289451	100
1963-64	5454173	75.8	1737578	24.2	7191751	100
1964-65	5527580	77.0	1648001	23.0	7175581	100
1965-66	5315684	75.2	1749914	24.8	7065598	100
1966-67	5528032	75.7	1776746	24.3	7304778	100

The total income from the primary Sector in the year 1960-61 was Rs.555 crores for Tamil Nadu and Rs.6,822 crores for India. The income rose to Rs.575 crores for Tamil Nadu while for India it has declined to 6411 crores during 1966-67. It is observed that the share of primary sector to the Total Income for India and Tamil Nadu is 41.80 per cent and 41.69 per cent respectively during 1966-67. The percentage share has been on the downward trend for All India and Tamil Nadu as seen from the Table below: The intensity is being more in the case of Tamil Nadu.

TABLE - 3  
TREND IN INCOME FROM PRIMARY SECTOR

Year	Income (Rs. Crores)		Share of Primary Sector		Share of Tamil Nadu to India (per cent)
	Tamil Nadu	India	Tamil Nadu (per cent)	India (per cent)	
1	2	3	4	5	6
1960-61	555	6822	49.13	51.00	8.14
1961-62	567	6891	47.88	49.60	8.23
1962-63	567	6704	46.74	47.30	8.46
1963-64	564	6898	45.31	46.00	8.18
1964-65	555	7519	43.55	46.80	7.38
1965-66	522	6421	40.44	42.30	8.13
1966-67	575	6411	41.69	41.80	8.97
Trend Growth rate (per cent)	- 0.30	-0.76			
Compound Growth rate (per cent)	+ 0.57	-1.03			

....5/-

It will be seen that the trend and Compound growth rates for Tamil Nadu and All India show a negative trend in regard to the income from Primary Sector. In the case of Tamil Nadu, however the compound growth rate shows a very small increase of 0.57 per cent. Nevertheless, the share of primary sector in Tamil Nadu was maintained more or less at the same level that of all India except for the year 1964-65.

Secondary Sector:

Tamil Nadu is considered as one of the most industrialised States and occupies the third rank with Maharashtra and West Bengal taking the first and second ranks respectively. From an entirely Textile-oriented beginning, the industrial base has been expanded to cover a more sophisticated, versatile complex. Besides spinning mills, several new lines of industrialisation are seen in the cement and refractories, rubber and paper industries, automobiles and components, cycles and scooters, road rollers and engines, type-writers and calculators; in the chemical complex caustic soda, fertilizers and sulphuric acid; in the field of electrical industries, manufacture of transformers, switch gears, cables, meters and insulators, radios and fans, again an aluminium smelter plant, the Neyveli Lignite Corporation, Photo-films, Surgical Instruments, Integral Coach and heavy vehicles, high pressure boilers and small arms, mining and quarrying of magnesite limestone, ilmenite etc, account for the emergence of a widely diversified Industrial base of the State.

There were in all 6644 factories in the State in the year 1966, of these 1112 were large factories with a productive capital of Rs. 659 crores and employing 3.59 lakhs workers. Tamil Nadu accounted for Rs. 611 crores in terms of value of gross output out of Rs. 7213 crores of All India contributing 8.5% of the total gross output. The shares of Income from secondary sector over the years is shown in Table below:

TABLE -- 4

TREND IN INCOME FROM SECONDARY SECTOR

Year	Income (Rs. in crores)		Share of Secondary Sector		Share of Tamil Nadu to India per cent
	Tamil Nadu	India	Tamil Nadu (per cent)	India (per cent)	
1	2	3	4	5	6
1960-61	181	2688	16.02	20.10	6.73
1961-62	203	2885	17.13	20.80	7.04
1962-63	210	3098	17.30	21.90	6.79
1963-64	225	3393	13.09	22.60	6.63
1964-65	250	3593	19.56	22.30	6.96
1965-66*	271	3651	20.98	24.00	7.42
1966-67*	280	3670	20.28	23.90	7.63
Trend Growth rate(%)	7.62	5.70			
Compound Growth rate(%)	7.51	5.32			

\*provisional

The total income from secondary sector increased from Rs.181 crores to Rs.280 crores during the period under review in Tamil Nadu, while it rose from Rs.2688 crores to 3670 crores for All India. It is seen that the share of the secondary sector in Tamil Nadu to the National Income has increased from 6.73% to 7.63% with slight fluctuations in the intervening years. It is also seen that the increase in Income in All India and Tamil Nadu from the year 1960-61 to 1966-67 has been

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5.32% and 7.51% respectively in terms of compound growth rate while they are 5.70% and 7.62% in terms of trend growth rate. Thus it will be seen that there has been a significant increase in the secondary sector during the period under study, in Tamil Nadu, as compared to All India. This fact is also substantiated from the index of Industrial Production given below:-

	Index of Industrial Production	
	Tamil Nadu	All India
1960	100.0	100.0
1961	110.4	109.1
1962	117.2	119.7
1963	123.4	129.6
1964	134.1	140.3
1965	148.6	153.6
1966	161.9	152.4

Tertiary Sector:

As a corollary to the industrial development in the State, there has been a rapid expansion in the fields of power, water, transport and communication, institutional financing and technical education in the State. It is observed that the State has been contributing a substantive share from the Tertiary Sector towards the Total Income in India being in the order of 10.0%. The total income from Tertiary Sector rose from Rs.394 crores in 1960-61 to Rs.524 crores during 1966-67 while the income from India rose from Rs.3870 to Rs.5252 crores.

TABLE - 5

TREND IN INCOME FROM TERTIARY SECTOR

Year	Income (Rs. in crores)		Share of Tertiary Sector		Share of Tamil Nadu to India (per cent)
	Tamil Nadu	India	Tamil Nadu (per cent)	India (per cent)	
1960-61	394	3870	34.85	28.90	10.18
1961-62	414	4115	34.99	29.60	10.06
1962-63	436	4375	35.96	30.80	9.97
1963-64	456	4709	36.60	31.40	9.68
1964-65	471	4978	36.89	30.90	9.46
1965-66 *	498	5127	38.58	33.70	9.71
1966-67 *	524	5252	38.03	34.30	9.98
Trend Growth rate (%)	4.77	5.45			
Compound growth rate (%)	4.89	5.22			

\* provisional

It will be seen from the Table above that the trend growth rate of Tamil Nadu and All India are 4.77% and 5.45%, while the corresponding compound growth rates are 4.89% and 5.22% respectively. The increase in the income of All India is perhaps due to the increase in employment opportunity created in Public Sector.

Per capita Income:

In the absence of better criteria, the per capita income is considered to reflect the levels of living of the country. A perusal of the per capita income of All India and Tamil Nadu shows that the per capita income of All India over the series of years depicted a Zig-Zag trend, while in Tamil Nadu, there has been an upward trend, though very small except for a slight fall during 1965-66. The low rate of income may be due to the ever increasing population and the unpredictable nature of agriculture in general.

TABLE - 6

PER CAPITA INCOME

Year	Per capita income for India Rs.	Index	Per capita income for Tamil Nadu Rs.	Index
1960-61	306.7	100.0	335.0	100.0
1961-62	310.7	101.3	345.0	103.0
1962-63	308.8	100.7	348.0	103.9
1963-64	319.2	104.1	352.0	105.1
1964-65	336.6	108.8	354.0	105.7
1965-66 *	307.3	100.2	353.0	105.1
1966-67 *	302.4	98.6	370.0	110.4

(\*) Provisional

An analysis of the per capita income among Agricultural and Non Agricultural population shows that the Per Capita Incomes of Agricultural population was Rs.270 and for non agricultural population Rs.436 in 1960-61 for Tamil Nadu. The per capita incomes were Rs.266 and Rs.512 respectively for Agricultural and Non-Agricultural Populations in 1966-67. This only shows that the pressure on land continues to be high in spite of significant increase in other sectors.



It is interesting to observe that the correlation coefficient between income and population for Tamil Nadu and All India are in the order of +0.97 and +0.87 which are satisfactorily significant.

Summary Results:

1. The share of Tamil Nadu towards National Income has been consistently rising from 8.45% in 1960-61 to 8.99% in 1966-67 except for a sharp fall to 7.93% in the year 1964-65.
2. The overall growth rate for Tamil Nadu is observed to be 3.37% while that of All India is 2.35%.
3. The share of Primary Sector to the Total Income is observed to be 41.80% for India and 41.69% for Tamil Nadu in 1966-67.
4. There has been a negative trend growth rate in regard to the Primary Sector both for All India and Tamil Nadu.
5. The share of Tamil Nadu in regard to Primary Sector is of the order of 8 to 9% of the Total Income from the Primary Sector for India.
6. The share of the Secondary Sector in Tamil Nadu with reference to All India has increased from 6.73% to 7.63% during the period 1960-61 to 1966-67.
7. The growth rate of secondary Sector for India and Tamil Nadu have been 5.32% and 7.51% respectively in terms of compound growth rate while they are 5.70% and 7.62% in terms of trend growth rate.
8. Tamil Nadu has been contributing a substantial share from the Tertiary Sector towards the Total Income in India being in the order of 10.00% during the period 1960-61 to 1966-67. The per capita income of Tamil Nadu has increased from Rs.335 to Rs.370 during 1960-61 to 1966-67 as against the per capita income of India which fell from Rs.307 to Rs.302.
9. The Per Capita Income of Agricultural and Non-Agriculture population are Rs.270 and Rs.436 for Tamil Nadu for 1960-61 while for 1966-67, per capita incomes are Rs.266 and Rs.512 respectively for the groups.
10. The correlation coefficient between income and population in Tamil Nadu is more satisfactorily significant than that of All India, the correlation coefficient being of the order of +0.97 and +0.87 respectively.

Conclusions:

The State Income of Tamil Nadu has increased at a higher rate than that of All India. Despite the negative rate of growth in the primary sector in this period of seven years the Index of per capita Income has risen by 10.4 points in the case of Tamil Nadu. In the case of India however there has been a fall of 1.4 points. The share of primary sector to the total income of Tamil Nadu has shrunk much more than India. Nevertheless the contribution from the Primary Sector to the total Income of India has been maintained at the same level. However, the disparity between the per capita incomes of Agricultural and non-agricultural population is widening and efforts have to be made to arrest this trend. It would mean that the imperative need is for agricultural development by the fullest use of fertiliser technology, high yielding seeds, multiple cropping and water management. No doubt the agricultural schemes which have been so oriented to accelerate the spread and intensification of the Green Revolution is bound to bring the desired effect. Besides, the population problems have also been clenched and programmes for population control through family planning are already there and effective implementation of these would go a long way in meeting the challenge.

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

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National Income

ECONOMIC GROWTH RATES IN MADHARASHTRA: 1951-52 to 1967-68

By

B.A. Chavan and M.V. Gokhale

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

ECONOMIC GROWTH RATES OF MAHARASHTRA: 1951-52 to 1967-68

by

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(Bureau of Economics & Statistics, Govt. of Maharashtra)

1. Introduction

1.1 In order to assess the economic performance of a State over a long period, the most appropriate barometer is the estimate of State Income. Estimates of State Income at constant prices for a series of years throw sufficient light on the growth of the economy. The work of estimation of State Income is receiving attention in Maharashtra for a long time and one of the earliest attempts at estimation of State Income were made in this State and the estimates (1) of State Income of the then Bombay Province for the years 1948-49<sup>(1)</sup> and 1949-50<sup>(2)</sup> were released much before the official series of National Income was initiated in India. Nevertheless, estimates of State Income for the State of Maharashtra as it exists today are not available for a long period. This is because the State has undergone various territorial changes during the last fifteen years. Prior to 1956, the then Bombay State consisted of 28 districts. After the re-organisation of States effected in November 1956, a bigger reorganised Bombay State was formed which included 24 districts of old Bombay State, 6 districts of Saurashtra and Kutch States, 8 districts of old Madhya Pradesh State and 5 districts of Hyderabad State. In May, 1960, the reorganised Bombay State was bifurcated into Maharashtra and Gujarat and the present Maharashtra with 26 districts came into existence.

1.2 After the formation of the Maharashtra State, the Bureau of Economics and Statistics, Maharashtra State brought out a series of State Income of Maharashtra State<sup>(3)</sup> starting from 1955-56. The series was later brought forward upto 1966-67<sup>(4)</sup>. In June 1969, the Bureau revised its series of State Income and published revised series from 1960-61 to 1967-68<sup>(5)</sup>. Thus, for Maharashtra State, estimates of State Income prior to 1960-61 according to revised series are not available. For the period earlier than 1955-56, even estimates of State Income according to the conventional series are not available.

1.3 An attempt was made earlier by Chavan<sup>(6)</sup> to study the growth from 1951-52 to 1966-67 but this study was confined only to commodity producing sectors<sup>6</sup>. In this paper, estimates of State Income covering all the sectors of the economy at 1960-61 prices are presented for the period 1951-52 to 1967-68 and the growth of the economy of Maharashtra is discussed. The estimates for the period 1960-61 to 1967-68 are reproduced from the Report of the Revised Series of State Income of Maharashtra<sup>(7)</sup> while the estimates for the earlier period are prepared specially for this paper. The estimation of State Income for the period

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@ Commodity sectors covered in the paper by Chavan were agriculture, animal husbandry, forestry, fishery, mining and manufacturing.

1951-52 to 1959-60 was beset with many difficulties as the requisite statistics for the present Maharashtra are not available due to territorial changes. Moreover, the available data even for the then existing States were very limited. Several adjustments and assumptions had to be made to take the series backwards upto 1951-52. The method of estimation of State Income for the period 1951-52 to 1959-60 is, there explained in some detail in the Appendix.

2. Growth from 1951-52 to 1967-68.

2.1 The State Income of Maharashtra which is essentially the State Domestic Product<sup>(b)</sup>, is estimated as Rs. 1,086 crores in 1951-52 at 1960-61 prices. The State Income increased to Rs. 1,933 crores in 1967-68 (at 1960-61 prices). Thus during 16 years from 1951-52 to 1967-68, the State Income of Maharashtra increased by 78.0 per cent. If these end years alone are considered, the annual growth rate works out to 3.67 per cent.

2.2 The annual growth-rate worked out by considering estimates pertaining to only two end-years gives a very misleading picture about the average rate of growth. This is because there are wide fluctuations in the income generated from year to year mainly due to variations in agricultural output. In Maharashtra, for instance, the index of agricultural production was 99.7 in 1954-55, declined to 86.8 in 1955-56, increased to 105.9 in 1958-59, went down to 97.5 in 1959-60, shot up to 125.1 and reached as low a level as 82.6 in 1965-66. The average annual growth rates are, therefore, worked out by fitting the following regression line which gives average annual compound growth rate.

$$Y = ab^t$$

where 't' is the year, Y the State Income and a and b are constant. The growth rate is determined from 'b'.

2.3 The average annual growth rate so worked out is 3.67 per cent in Maharashtra. At the national level, the growth rate in the National Income<sup>(c)</sup> (Net National Domestic Product) is estimated at

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(b) For the State of Maharashtra, the estimates of State Domestic Product could be prepared. The State Domestic Product itself is called State Income. State Income so defined is the State Income by 'income originating' concept and not by 'income accruing' concept as the net income from the 'rest of the world' sector is ignored.

(c) At the National level, estimates of National Income (i.e. Net National Domestic Product plus Net Income from abroad) are available. Since, estimates of State Domestic Product are available at the State level, estimates of Net National Domestic Product are used while calculating growth rates at the national level for making comparison with the growth rate at the State level.

3.45 per cent per annum. The population in the State has also risen substantially. According to 1951 and 1961 Censuses, the population during the decade increased by 23.6 per cent. The growth rate in the economy is, therefore, considerably reduced if measured on a per capita basis. The average growth of per capita State Income of Maharashtra is estimated at 1.33 per cent per annum. At the national level, the average growth rate in per capita National Income is 1.22 per cent.

3. Sectoral growth rates from 1951-52 to 1967-68.

3.1 Even though, the overall growth rate in the economy of the Maharashtra was as high as 3.67 per cent, the growth rate in the primary sector(d) was not even half as much as the overall growth rate. The growth rate in the secondary sector(e), on the other hand, was 5.87 per cent per annum. At the national level, the average growth rate was 1.91 per cent in the primary sector and 4.56 per cent in the secondary sector. The following table gives a synoptic view of the growth rates in the economy, of Maharashtra and the country.

Table no.1

Average annual growth-rates according to the broad sectors of the economy

(1951-52 to 1967-68)

Sector	(In per-centage)	
	Maharashtra	India
(1)	(2)	(3)
1. Agriculture, animal husbandry, forestry, fisheries etc.	1.39	1.91
2. Mining, industry, construction, electricity etc.	5.87	4.56
3. Transport and communication, trade, storage etc.	4.74	4.72
4. Banking and insurance, real estate and ownership of dwellings, public administration and other services	4.35	5.67
5. <u>Net domestic product</u>	3.67	3.45

(d) Primary sector covers agriculture, animal husbandry, forestry and fishery.

(e) Secondary sector includes manufacturing, electricity, gas, construction, mining etc.

4. Growth-rate during the First Five Year Plan

4.1 The growth rate during the First Five Year Plan<sup>(f)</sup> period in Maharashtra is estimated at 3.83 per cent per annum. At the national level, the growth rate was 3.64 per cent per annum. In the primary sector, the growth rate was 3.00 per cent per annum in the State as compared to 3.40 per cent in India. The growth rate in the secondary sector was 5.06 per cent in the State. At the national level, the growth rate was 3.73 per cent.

5. Growth-rate during the Second Five Year Plan

5.1 In Maharashtra, the average annual growth rate in the economy increased to 4.65 per cent during the Second Plan as against 3.83 per cent in the First Plan. At the national level, the average growth rate was 3.64 per cent which was the same in the First Plan. The average growth-rate in the primary sector increased to 3.98 per cent in the Primary sector and to 3.25 per cent in the secondary sector. The average growth rate in the country during the Second Five Year Plan was 3.07 per cent per annum in the primary sector and 3.26 per cent in the secondary sector.

6. Growth-rates during the Third Five Year Plan

6.1 During the Third Five Year Plan, the growth rate of the economy of Maharashtra deteriorated considerably mainly due to the adverse natural conditions resulting in poor performance in agriculture. The overall growth-rate during the Third Plan was as low as 1.83 per cent per annum. In the primary sector, the growth-rate was negative (4.0 per cent). In the agricultural field, the year 1960-61 was a bumper year and the level of agricultural production reached during 1960-61 was never reached in any of the years in the Third Plan. On the other hand, the year 1965-66 was one of the worst agricultural years in the State on account of failure of monsoon and the index of agricultural production reached as low a level as 82.58 as compared to 125.11 in 1960-61 and 113.90 in 1964-65. The growth-rate in the secondary sector was high (5.57 per cent) in Maharashtra during the Third Plan period but it was low when compared with the growth-rate during the Second Plan. At the national level, the overall average growth-rate during the Third Plan was also lower (3.30 per cent) than in the Second Plan but the national growth-rate was considerably higher than the State growth-rate during the Third Plan. At the national level, the net output from the primary sector declined by only 0.4 per cent per annum as against a fall of 4.0 per cent at the State level. Even in the secondary sector, the growth-rate in the State (5.57 per cent) during the Third Plan was lower than the growth-rate in country (6.73 per cent).

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(f) Since the estimates of State Income are prepared from 1951-52 onwards, the period considered while calculating growth-rate during First Five Year Plan is 1951-52 to 1955-56.

Net State Domestic Product  
at 1960-61 prices  
Maharashtra State

Year	Agriculture, animal husbandry, dry, forestry, fisheries etc.		Mining, industry, construction, electricity etc.		Communication, railways, transport, trade, storage etc.		Banking and insurance, real estate and ownership of dwellings, public administration, other services etc.		State Domestic Product	Per capita income (in Rs.)
	1.	2.	3.	4.	5.	6.	7.			
1951-52	482.6	253.6	179.6	169.9	1085.6	335.7				
1952-53	447.5	265.7	181.0	174.3	1068.7	323.5				
1953-54	521.3	279.5	199.0	183.1	1183.0	350.6				
1954-55	548.4	292.1	208.4	189.8	1238.6	359.4				
1955-56	505.6	309.5	208.0	194.2	1217.4	346.2				
1956-57	552.5	321.9	225.2	203.1	1302.7	362.7				
1957-58	553.8	349.2	235.1	209.9	1350.8	367.8				
1958-59	578.8	362.8	241.3	218.4	1401.2	373.5				
1959-60	545.6	378.4	241.8	224.4	1390.3	362.8				
1960-61	664.3	426.2	276.7	230.4	1597.4	409.0				
1961-62	598.7	460.2	286.9	249.9	1595.7	398.3				
1962-63	606.7	474.7	297.9	264.0	1643.2	399.8				
1963-64	618.9	501.0	313.9	278.5	1712.2	406.2				
1964-65	617.6	531.9	329.7	287.8	1767.1	408.6				
1965-66	488.3	564.9	336.2	302.2	1691.7	381.3				
1966-67	544.6	578.1	351.9	318.8	1793.3	394.1				
1967-68	633.4	594.5	370.3	334.8	1932.9	414.2				

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Figures may not add to totals due to rounding.



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6. Chavan B.W. - "Growth of material production in Maharashtra, 1951-52 to 1966-67". Paper submitted to the Fifth Conference of the Indian Association for Research in National Income and Wealth held at Bangalore from 3rd May to 5th May, 196
7. Central Statistical Organisation - "Brochure on Revised Series of National Product for 1960-61 to 1964-65"
8. Central Statistical Organisation. - "Estimates of national income 1948-49 to 1962-63"
9. Central Statistical Organisation. - "Estimates of National Product (Revised Series) 1960-61 to 1967-68"

## Appendix

### Method of estimation of State Income of Maharashtra

The various growth rates in the economy of Maharashtra are calculated on the basis of estimates of State Income of Maharashtra at 1960-61 prices prepared for the years 1951-52 to 1967-68. Similarly growth rates for national economy are derived from the estimates of Net National Domestic Product at 1960-61 prices prepared by the Central Statistical Organisation. The annual average compound growth rates are worked out by means of regression line as explained in para 2.2 of the present paper.

#### 2. National Income estimates

2.1 As regards National Income i.e. (Net National Domestic Product), estimates at 1960-61 prices are available according to the revised series for the years 1960-61 to 1967-68<sup>(9)</sup>. For the earlier years, the estimates of National Income are not available according to the revised series, but the estimates of National Income at 1948-49 prices are available according to conventional series<sup>(8)</sup>. The trends reflected in the estimates of National Income at 1948-49 prices according to the conventional series have been linked with the estimates of National Income at 1960-61 prices according to the revised series and comparable estimates of National Income are prepared for the years 1951-52 to 1959-60; at 1960-61 prices, the underlying assumption being that the trends in National Income according to the revised series at constant prices from 1951-52 to 1958-59 will be the same as the trends in National Income at constant prices according to the conventional series during the same period.

#### 3. State Income estimates

3.1 As regards estimates of State Income (State Domestic Product) of Maharashtra, the Bureau of Economics and Statistics has brought out a Report on Revised Series of State Income of Maharashtra which gives the estimates of State Income at 1960-61 prices for the period 1960-61 to 1967-68 according to the revised series. The estimates for the earlier period according to the revised series are not available. Hence, the estimates for this period are prepared specially for this paper as follows.

3.2 In the paper "Growth of Material Production in Maharashtra 1951-52 to 1966-67"<sup>(6)</sup>, the estimates of State Domestic Product (SDP) of Maharashtra from the commodity producing sectors for the years 1951-52 to 1966-67 evaluated at 1960-61 prices are available. These estimates are confined only to the commodity producing sectors. Most of the estimates presented in this paper are obtained by applying the methods of the revised series of State Income of Maharashtra State. However, in the revised series, some more refinements have been made by the State Statistical Bureau, Maharashtra. However, such refinements are quite marginal. Hence, the estimates of State Income in each of the commodity sector for the year 1960-61 according to the revised series are brought backwards upto the year 1951-52 by super-imposing the same trend as obtained in the estimates of net output from that sector presented in the paper<sup>(6)</sup>. In the case of Animal Husbandry sector, however, the revised rates of milk yield made available by the the Institute of Agricultural Research and Statistics used which

are different from the yield-rates assumed in Chaven's paper. Furthermore, in the case of small scale manufacturing, substantial revision has been made in the revised series of State Income and the method adopted in the revised series is quite different from the one adopted in the Chaven's paper. Hence, the estimates for the years 1951-52 to 1959-60 for the sector small scale manufacturing are prepared afresh according to the methods explained in the "Report on Revised Series of State Income of Maharashtra State". Again, for factory establishments, the net output in 1960-61 is brought backwards up to 1955-56 by using the trend in estimates of net output from factory establishments at 1955-56 prices according to conventional series. In order to estimate net output from factory establishments for the years 1951-52 to 1954-55 a regression equation is fitted relating net output from factory establishments with the electricity consumption for industrial purposes and average daily employment in factories and this relationship is used to estimate net output for the years prior to 1955-56.

3.3 For the non-commodity sectors, the estimates of SDP for the period 1951-52 to 1959-60 are prepared by bringing backwards the estimates for the year 1960-61 by making use of suitable indicators as explained below.

(i) Construction

The estimates are prepared by using working force as the indicator.

(ii) Communication, Railways, Public Administration and Transport other than railways.

The estimates of SDP by conventional method in the respective sectors for the years 1955-56 to 1959-60 are used as indicators and the estimates for the year 1960-61 are brought backwards upto the year 1955-56. For the years 1951-52 to 1954-55, the estimates are prepared by fitting the following regression equation.

$$Y = a + bx$$

where Y = SDP from particular sector  
x = the year.

The regression equation is fitted by using data for the years 1955-56 to 1960-61.

(iii) Trade, Storage, Hotels and Restaurants

The method as given in the "Report on Revised Series of State Income of Maharashtra" is mostly followed.

(iv) Banking and Insurance

The SDP from Banking and Insurance is linked up with the State Income from Trade, Storage and Hotels and Restaurants by means of a regression line fitted to the data for the year 1960-61 to

1967-68. The regression equation use is as given below

$$Y = a+bx$$

X = SDP from Trade, Storage and Hotels  
and Restaurants.

Y = State Income from Banking and  
Insurance.

(v) Real Estate

The indicator used is the working force.

(vi) Ownership of dwellings

In the case of SDP from urban ownership of dwellings, the estimate for the year 1960-61 is moved backwards upto the year 1955-56 by using index of number of houses in municipalities and municipal corporations. This index is built on the basis of data collected from these bodies. For the years 1951-52 to 1954-55, the estimates are built by using regression equation.

$$Y = a + bx$$

where Y = SDP from urban ownership  
of dwellings.

and x = the year

For moving SDP from rural ownership of dwellings, the index used is the number of houses for each year is estimated by interpolation of 1951 and 1961 number of houses.

(vii) Other Services

The index used in this sector is the working force.

4. Limitations of the estimates.

4.1 For the period 1960-61 to 1967-68, the estimates of SDP are prepared according to the revised series for which voluminous data are used. These estimates are, therefore, most reliable. The estimates for the period 1955-56 to 1959-60 refer to the period prior to the formation of Maharashtra State for which only limited data were available. The revised method of estimation could not therefore, be adopted for certain sectors particularly the non-commodity producing sectors and hence the trends reflected in the conventional series are mostly assumed for the period 1955-56 to 1959-60. Such assumptions are not uncommon and are usually made to link the revised series of index numbers of output, prices etc. with the old series. For the period, 1951-52 to 1954-55, the data available for Maharashtra are very meagre. And barring a few commodity sectors, the estimates for the remaining sectors are least precise. Nevertheless, it is felt that the trends obtained from such estimates to study the overall growth rates are not very much wide off the mark.

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research

in

National Income

A NOTE ON REGIONAL ECONOMIC GROWTH AND CONSUMER BEHAVIOUR

By

B.R. Guha Thakurta

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

A NOTE ON REGIONAL ECONOMIC GROWTH AND CONSUMER BEHAVIOUR  
by

B.K. Guha Thakurta

(Bureau of Applied Economics & Statistics, West Bengal)

1. Introduction : During the fifties, i.e., the first two plan periods, West Bengal experienced an almost steady economic growth. Per capita income (at constant price) of the State registered an average increase of about 1.24 per cent per year.<sup>1</sup> This had, naturally, influenced the consumer behaviour of the State. In the present note a study has been made of the impact of the growing per capita income of the State on the consumer behaviour of the most essential item of consumption viz. "cereals".

2. The data and the background.

The present author undertook a detailed study on the consumer behaviour of cereals in West Bengal for the period between 1948 and 1961. In the course of the study the following aggregative demand function was fitted :-

$$C_t = \alpha Y_t^{\beta} P_t^{\eta} Q_t^{\gamma}$$

when,

$C_t$  = per capita consumption of cereals at time "t".

$Y_t$  = Per capita State Income at constant price at time "t".

$P_t$  = Price of cereals at time "t" as represented by the corresponding retail price index.

$Q_t$  = Price of items of consumption other than cereals at time "t" as represented by the corresponding price index.

$\alpha$  = Constant.

and,

$\beta$  = Income elasticity of demand

$\eta$  = Price elasticity of demand

$\gamma$  = Cross elasticity of demand for cereals in respect of prices of items other than cereals.

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1. As estimated from the annual estimates of State Income for 1951-61 prepared by the State Statistical Bureau, West Bengal.

2. The results of this study formed the subject matter of a paper now being published in "Artha Vijnana".

The structural parameters were estimated after making comprehensive analysis of the income distribution of the consumers and detailed studies in respect of multicollinearity and serial correlation.<sup>3</sup> The estimates of the parameters are shown in Table-1.

Table - 1

Aggregative demand function for the consumption of cereals in West Bengal.

The model	The fitted <sup>4</sup> function	Income elasticity ( $\beta$ )	Price elasticity ( $\eta$ )	Cross elasticity with respect to the average price of non-cereals items ( $\nu$ )	R <sup>2</sup>
$\log C_t$ $= \log C_t$ $+ \beta \log Y_t$ $+ \eta \log P_t$ $+ \nu \log Q_t$	$\log C_t$ $= .46$ $+ .58 \log Y_t$ $- .16 \log P_t$ $+ .11 \log Q_t$	$+ .58$ $(\pm .25)$	$-.16$ $(\pm .10)$	$-.11$ $(\pm .14)$	.61

Note - The figures in parenthesis are the corresponding standard errors.

The estimates (especially that of the cross elasticity) are subject to high sampling errors. Therefore, it is not possible to draw any precise conclusion on the basis of these estimates. Nevertheless, these can provide us with a broad idea about the nature of the consumer behaviour of cereals in West Bengal for the period under study.

The income elasticity has been estimated as .58. This means that with a hundred per cent rise in income the corresponding rise in the consumption of cereals in respect of an average consumer of West Bengal has been fifty eight per cent during 1948-61. The estimate of price elasticity has been observed as -.16 meaning thereby that with a hundred per cent rise in the price of cereals the corresponding fall in the consumption of cereals in respect of an average consumer of West Bengal has been by sixteen per cent. The cross elasticity which has been estimated as -.11, indicates that with a hundred per cent rise in the average price of items of consumption other than cereals there has been a fall in the consumption of cereals by eleven per cent.

3. Details of these studies are given in the sources quoted earlier

4. The fit has been tested as satisfactory.

The above analysis of the elasticity coefficients leads to certain interesting conclusions. It seems that an average consumer has the tendency to spend a substantial portion of the additional income after cereals. Rising prices, however, put a curb on this tendency. A clearer idea of the behaviour of the consumer can be made from a study of Table - 2.

Columns (4), (7) and (10) of Table-2 show, for the period between 1951 and 1961, the actual contribution of income, price and cross elasticities of demand (expressed in percentages) towards rise or fall, as the case may be, of average annual consumption of cereals; column (11) shows the average annual overall rise in the consumption of cereals. The latter is nothing but the algebraic sum of the contributions of the different elasticities as given in columns (4), (7) and (10).

Table - 2

Percentage rise (+) or fall (-) in the average annual consumption of cereals in West Bengal due to different components - effects

Period	1951-61
Income elasticity of demand	+0.58
3. Average annual percentage rise (+) or fall (-) in income	+1.24
4. Average annual percentage rise (+) or fall (-) in consumption of cereals due to variation in income	+0.72
5. Price elasticity of demand	-0.16
6. Average annual percentage rise (+) or fall(-) in the prices of cereals.	+0.43
7. Average annual percentage rise (+) or fall (-) in consumption of cereals due to variation in the prices of cereals	-0.069
8. Cross elasticity	-0.11
9. Average annual percentage rise (+) or fall(-) in the prices of items other than cereals	+4.35
10. Average annual percentage rise (+) or fall (-) in consumption of cereals due to variation in the prices of items other than cereals	-0.48
Overall annual percentage rise (+) or fall (-) in the consumption of cereals col. (4) + col.(7) + col. (10)	+0.17



It is observed that there has been, on an average an annual rise in the consumption of cereals by about .17 per cent. This indicates that during the period under study there was a rising trend in the per capita consumption of cereals. This result, when examined in the light of the conclusions drawn earlier from an analysis of the estimates of the parameters as given in Table-1, goes to prove that with rising income an average consumer of the State prefers to spend a substantial part of his extra earning after the consumption of cereals. This tendency persists inspite of a rising trend in the price of cereals.

This phenomenon of rising demand, as reflected by rising consumption and average price of cereals simultaneously with increasing per capita income has also been noticed in studies on consumption of cereals or foodgrains undertaken in respect of other regions of India. In fact Prof. A. Ghosh has observed this phenomenon for the whole of the Indian Union.<sup>5</sup> It seems to have been the outcome of the various development programmes requiring large scale investments, in both Public and Private sectors. Especially with the launching of the Second Five Year Plan there occurred intense activities in the different sectors of the economy of the country. This led to increasing per capita income resulting in commensurate increase in the purchasing power of the community. In a subsistence economy like ours, the major portion of this purchasing power was utilised in the purchase of essential items of consumption such as cereals. This led to larger and larger consumption of cereals with the passage of time. But, as the supply of cereals could not keep pace with this rapidly increasing consumption rate, price was pushed upwards more and more.

In this connection the following excerpt from the report of the Price Enquiry Committee, Govt. of West Bengal, makes interesting reading:-

"In every country with a growing income level there is generally a diversion of demand from cereals to other types of food. Such a diversion is not appreciably effective in India, mainly because of the fact that the income levels at which the diversionary forces begin to be effective have not yet been reached. The result is that the total demand for cereals is increasing with the growth of population and income in both absolute and relative terms".

In other words the steadily increasing trend in cereal consumption is likely to persist during the course of the economic development of the country leading to rising per capita income until the economy has reached a turning point.

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5. Ref. Yojana, September 18, and December 11, 1966. The findings of the study made by Prof. Ghosh in respect of India have been similar to those of the present study, viz. that the check on the consumption of cereals that was expected to be effected by price rise has, in fact, been more than counter balanced by the effect of rising income. The net result has been a still further rise in price.

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REGIONAL INCOME ESTIMATION - A STUDY

By

S. Sasirekha

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors  
and not necessarily of the Organisations or Institutions to  
which they belong.

# REGIONAL INCOME ESTIMATION

## A STUDY

by

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### 1. INTRODUCTION:

The measurement of Regional Income has assumed great importance in recent decades. This has grown out of the broadening concern with problems of regional economic development. Local, state and regional or inter-state agencies, both private and governmental have been established to study and promote the economic development of particular areas. The whole tempo of development and of economic progress varies from one part of the country to another and to measure this the aggregate figures of National Income would not be enough. This paper actually is a sequel to a serious attempt at regional income estimation using the national accounts framework and tries to present both the conceptual issues and data problems involved in such a study.

### 2. CONCEPTUAL ISSUES:

National income is defined by the boundaries of the nation. The regional rest-of-the-world account is much less clearly defined than in its national counterpart. The regional income estimation is concerned with an essentially open economy where the distinction between intra and inter-regional transactions is blurred. The relative importance of transactions crossing area boundaries increases as the size of the area decreases. The main problem is thus the difference between the region of employment of production factors. The region of residence of the owners of these factors i.e. the difference between income received and produced or the difference between 'net geographical product' and 'net national product'. Hence, to eliminate this problem the concept of 'net geographic product' alone is followed while estimating Regional - State or district income.

### 3. METHODOLOGICAL PROBLEMS:

As in the estimation of National Income, Regional Income has to be estimated by combining both the product and Income approaches. Further, in respect of certain transactions falling beyond the boundaries of the state

the allocation method has to be followed. Though we are all agreed on the conceptual issues involved and hence estimation of "net Geographic Product" the present estimates of Regional (State) income suffer from limited comparability as between various states and between state and National Incomes. The Regional Income estimates should be the third dimension by which to test the reliability or otherwise of National totals. But this is not so to-day. The Central Statistical Organisation has evolved a standard methodology for the preparation of State Income Estimates to overcome this difficulty but this has not achieved the purpose because of (i) different sources of basic data utilised; (ii) gaps in the data available at the state level, (iii) heavy reliance of National Income estimates on sample surveys like National Sample Survey which have limited coverage and hence limited reliability at Regional level and (iv) projections of past relationships.

3.2 The regional i.e. State income estimates are fairly comparable with inter-state or National Income estimates in respect of the six commodity producing sectors like Agriculture, Fisheries, Animal Husbandry, Forestry, Mining and Large Scale Manufacture. However, even in respect of Agriculture, the Central Statistical Organisation has directed the use of certain yield rates in respect of minor crops and bye-products and Input-Output ratios based on the National Sample Surveys for the year 1950-51 to 1953-54. Much time has flown since then and these past relationships need to be looked into and revised now, in the light of new techniques of production, and intensive agricultural programmes.

The above mentioned problems (para 3.1) loom large when we consider the unorganised service sectors like Trade, Storage and Ware housing, transport by other means and other services. The Central Statistical Organisation relies very heavily on National Sample Survey data for both earning data and ratios of Principal to subsidiary workers. The former pertains to the year 1958-59 which is a bit outdated and as I have said before the need to have state-wise data of earnings is very much felt. This Bureau has been utilizing the earnings data collected through special surveys for the year 1962-63 and the Socio-Economic Survey data for 1958-59. The pooled results of Socio-Economic Surveys and National Sample Survey samples for the same is yet to be released.

3.3 In respect of sectors whose transactions fall beyond the boundaries of the state, whereas wages and salaries can be allocated on the basis of number of workers (census 1961) the method of allocation of capital expenditure and construction expenditure leaves much to be desired. In respect of the Corporate sector too there is no data available at the state level.

#### 4. SUGGESTIONS FOR IMPROVEMENT:

The problems mentioned above should not, however, dishearten us and give the impression that there is something fundamentally wrong with the basic approach of applying national accounts at the regional level. Many improvements in the sources and modes of collection of data are required to bring refinement and reliability to the Regional Income estimates. The following may achieve the task to a considerable extent.

- (1) Central Statistical Organisation should evolve a common programme of work for conducting studies on Input-Output models in all states for a specified period.
- (2) Special studies under the auspices of the Central Statistical Organisation should be conducted for assessing the yield rates of minor and by-products in the agricultural sector.
- (3) Surveys or Type studies statewide should be conducted for assessing the per-head earnings of persons in unorganised services under the supervision of the Central Statistical Organisation.
- (4) There should be a 1% sample survey to assess the relationship between the principal and subsidiary workers in each type of Industry. The Registrar General of India should be requested to include the enumeration of subsidiary means of livelihood in the future censuses.
- (5) The data so far collected through the National Sample Survey (All-India) and Socio-Economic Survey (State level) surveys should be pooled and the results released early.
- (6) The preparation of Indices of prices and products at state level which are still in its early stages should be made more reliable.
- (7) The time lag between the collection and release of Annual Survey of Industries (A.S.I.) data should be reduced.

5. DISTRICT INCOME ESTIMATES:

I take this occasion to also present the district income estimates prepared by this Bureau (Statements appended). The great significance in recent years of regional (district) planning and studies of regional imbalances within the state has necessitated this Bureau to take up these estimates.

METHODOLOGY: (1) AGRICULTURE: The gross values of the agricultural products are estimated at the district level utilizing the district level peak marketing period prices. The net income has been estimated following the cost patterns at the state level.

ANIMAL HUSBANDRY: The gross values of all products and by-products have been estimated at the level utilising districtwise production and prices. The Net Income has been estimated on the basis of state cost patterns.

MINING AND QUARRYING: The data districtwise of value and production of major minerals has been obtained from the Indian Bureau of Mines and of Minor minerals from the State Bureau of Mines. Here again the state cost ratios have been followed to arrive at the net income.

LARGE SCALE MANUFACTURING:- The total value added by manufacture and the number of employees covered by the A.S.I. are compiled, districtwise, for the years 1960-64. The residual working force is also compiled by districts on the basis of data, furnished by the Chief Inspector of Factories and on the basis of this the Sample Sector estimates are allocated among the districts and the total district income for this sector arrived at by adding the A.S.I. and the Sample parts.

In respect of all other sectors the State income was allocated among the districts, due to paucity of data at the district level, on the basis the working force in the respective sectors except for forestry sector, where district wise allocations made, utilizing area of forests in each district.

LIMITATIONS OF DISTRICT INCOME ESTIMATES:-

1. In respect of all sectors using the present approach the cost pattern as at state level has been utilized to arrive at the net income which is not correct.

2. In respect of all other sectors it is presumed that per head earnings is the same in all districts which does not truly reflect the differences in earning capacities.

The district income estimates are just an experiment only and as such are of limited use. However, systematic studies of Input-Output ratios should be initiated at district level to improve these estimates. Further, the Socio-Economic Survey Unit in the Bureau may be requested to attempt districtwise tabulations and see how far they will be reliable and useful for district income estimation. The National Sample Survey may also be approached to plan its centres in such a way that each district is adequately represented and also see that the sample base is widened to facilitate district level estimates.

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DISTRICT INCOME ESTIMATES AT 1960-61 PRICES

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(Preliminary Estimates)  
(Rupees in Crores)

District	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67
1	2	3	4	5	6	7	8
Srikakulam	58.87	66.10	59.14	66.17	71.33	54.50	60.46
Visakhapatnam	52.75	64.48	64.87	67.50	68.85	59.81	58.13
East Godavari	71.83	80.27	81.87	83.33	87.58	83.94	83.66
West Godavari	64.69	72.74	70.67	79.77	86.23	81.18	81.16
Krishna	70.26	73.99	71.79	78.57	82.69	76.62	77.17
Guntur	97.98	104.28	104.01	119.01	123.29	108.84	121.76
Nellore	60.48	68.59	67.48	72.63	68.43	61.00	70.77
COASTAL ANDHRA	476.86	530.45	529.83	566.98	588.40	525.89	553.09
Kurnool	55.99	53.83	56.15	61.21	66.34	56.05	61.48
Anantapur	56.11	50.72	59.37	59.69	61.01	46.19	56.90
Cuddapah	37.55	37.35	42.41	44.26	44.32	38.08	46.71
Chittoor	53.84	50.66	57.80	60.75	66.84	51.38	63.98
RAYALASEEMA	203.49	192.56	215.74	225.91	238.51	191.70	229.06
ANDHRA REGION:	680.35	723.01	745.57	792.89	826.91	717.59	782.15
Hyderabad	61.29	63.10	74.26	74.52	77.72	78.54	80.66
Nizamabad	35.55	36.72	33.86	37.35	41.59	39.47	39.66
Medak	26.00	28.90	27.86	31.01	32.30	32.02	30.38
Mahboob nagar	38.29	43.13	42.31	45.21	46.50	44.94	42.30
Nalgonda	36.04	43.42	40.93	41.56	42.97	37.78	37.45
Warangal	32.40	37.31	34.98	39.24	43.00	39.66	40.89
Khammam	29.07	31.57	34.35	36.58	39.91	36.69	37.96
Karimnagar	32.60	37.01	37.53	40.67	41.98	40.50	43.01
Adilabad	26.70	27.13	28.99	29.96	32.47	30.79	32.88
TELANGANA REGION:	317.94	348.29	355.07	376.10	398.44	380.39	335.19
ANDHRA PRADESH:	998.29	1071.30	1100.64	1168.99	1225.35	1097.98	1167.34



DISTRICT INCOME ESTIMATES AT CURRENT PRICES

(Figures in Rs. crores)

DISTRICT	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67
Srikakulam	58.87	68.27	72.44	79.37	90.39	77.57	95.95
Visakhapatnam	52.75	65.26	73.16	84.48	86.84	86.44	100.35
East Godavari	71.82	85.96	93.12	101.65	107.08	115.58	126.95
West Godavari	64.69	76.77	80.72	91.94	111.92	117.61	134.65
Krishna	70.26	76.50	79.33	97.22	103.93	108.76	119.57
Tuntur	97.98	105.10	114.26	130.48	143.59	142.88	162.74
Vellore	60.48	69.79	69.92	80.99	83.07	81.88	100.23
Coastal Andhra	476.85	548.65	582.95	666.04	725.82	721.72	841.42
Kurnool	55.99	55.5	58.06	69.91	84.70	80.18	94.21
Anantapur	56.11	50.44	59.28	67.88	77.51	67.93	94.15
Cuddapah	37.55	36.43	42.33	48.95	51.55	52.03	73.37
Chittoor	53.84	51.70	60.50	70.16	81.76	76.44	109.87
Ravalaseema	203.49	194.11	220.17	256.90	298.52	276.55	371.74
Andhra Region	680.34	742.76	803.12	922.94	1025.34	1008.27	1213.16
Hyderabad	61.29	65.25	78.61	83.43	93.75	103.10	114.14
Nizambad	35.55	37.06	39.67	46.58	51.01	55.85	64.87
Medak	26.00	29.64	30.55	38.37	41.89	46.99	48.37
Mahbubnagar	38.29	44.10	43.21	51.27	61.95	63.95	68.21
Nalgonda	36.01	45.20	40.46	47.15	54.63	54.89	59.34
Warangal	32.40	38.53	38.11	47.63	55.59	56.60	62.45
Chamman	29.07	32.87	37.30	43.63	50.53	52.21	56.06
Karimnagar	32.60	38.24	39.34	48.25	54.23	56.86	64.80
Adilabad	26.70	28.14	30.96	36.80	42.84	44.32	50.17
Telengana Region	317.94	359.03	378.21	443.76	505.42	521.77	585.62
Andhra Pradesh	998.28	1101.75	1181.33	1366.70	1530.75	1543.04	1798.78

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INTER-STATE DISPARITIES IN INCOME AND EXPENDITURE IN INDIA

By

Grace Lajundar

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INTER-STATE DISPARITIES IN INCOME AND  
EXPENDITURE IN INDIA

by

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New Delhi)

I. Introduction

1.1 It has been a recognised fact that inter-State disparities exist to a large extent in our country and attempts are being made to reduce these disparities by the process of Planning. Disparities exist in various aspects. For example - there are differences in the level of income and consumption, literacy, medical and health facilities, transport systems, opportunities of employment etc. and it is difficult to conceive of and obtain a single indicator which will measure the disparities covering all these aspects. But, for embarking on developmental efforts with emphasis on reduction in regional disparities, it is essential, first of all to know the extent of the existing disparities with relation to certain major items which will go in for the well-being of the people of the region. The best measure of development is perhaps the per capita state income. Another important indicator which has a bearing on the well-being of the population is the per capita consumer expenditure. Since the planning process with emphasis on regional development has been continuing for the past few years, it is meaningful not only to measure the inter-State disparity at one single point of time but also to measure the changes or shift or reduction in the inter-State disparity over a period of time. This will give some indication whether the investment planning has been in the right direction or not. An attempt has been made in this paper to put forward some statistical measure of inter-State disparity in income and expenditure in India based on the available data and also to measure the changes in this disparity in consumption expenditure over a period of time viz. between 1958-59 and 1964-65 and in income between 1960-61 and 1964-65.

1.2 The paper is divided into 5 sections. Section 2 gives some back-ground information on the data used in the paper. Section 3 presents the estimates of inter-State disparities, measured in terms of concentration ratios in consumer expenditure for the years 1958-59, 1963-64 and 1964-65. In Section 4 is given the inter-State disparity measures in income for the years 1960-61 and 1964-65. Section 5 gives the broad conclusions along with some of the limitations of study.

2. Sources of information on per capita consumer expenditure and income used in the study:-

2.1 Data relating to the consumer expenditure for each State have been obtained from the results of the various rounds of the National Sample Survey. Even though the NSS has been collecting information on the household consumption expenditure since 1949-50, the data at the State level were made available for the first time for the 13th round (September 1957 to May, 1958) of the NSS. Data relating to this round did not refer to a complete year and therefore may suffer from distortions due to seasonal variations. Partly because of this and partly because

a similar attempt (10) was made with the help of this data, it was decided not to use the data relating to this round. For the 14th round (July 1958 to June 1959), the data related to a complete year. The latest year for which such data are available in the NSS relate to the year 1964-65. The data as available in the NSS reports (1,2,3) relate to all the re-organised States and the Union Territories comprising of four non-contiguous areas viz. Delhi, West Bengal, Manipur and Tripura. The NSS does not cover some of the small areas of the Indian Union viz. Andaman and Nicobar Islands, the islands of Aminidivi, Laccadive and Minicoy, Tribal areas of Assam and Pondicherry and Goa. These areas which cover above 0.5 per cent of India's population have been left out of the study.

2.2 The data on household consumer expenditure was collected by interview method for the last 30 days preceding the date of the survey and the dates of enquiry for individual households are evenly spread over the whole round so that the data relates to the complete years of reference. The estimates are given by a pair of independent and inter-penetrating sub-samples and by the combined sample separately for rural and urban areas. The agreement between sub-sample estimates give some idea of the error of the combined estimate. The details of the duration of the survey, the sample size for the periods under study are as follows:-

Round	period of survey	Sample size (no. of household)	
		rural	urban
14th round	July, 1958-June, 1959	7589	2218
18th round	Feb. 1963-January 1964	21721	4257
19th round	July 1964-June 1965	14974	9943

It may be mentioned in this connection that the NSS consumption expenditure data have been used for different types of analysis and have been found to give generally reasonable results (6,7,8,9)

2.3 The population figures for rural and urban areas for each State for each year have been worked out on the basis of the growth-rates of population for quin-quennial period arrived at by the Expert Committee on Population Projections set up by the Planning Commission.

2.4 The estimates of per capita income used in the study relate to the years 1960-61 and 1964-65. For the year 1960-61, the figures have been obtained from the publication "Distribution of National Income by States 1960-61" (4) which gives comparable estimates of income for the 15 major States and other Union Territories. For the year 1964-65, per capita income for the 15 major States have been published (5) sometimes back on the basis of data made available by the Planning Commission. The details of the estimates for 1960-61 are available whereas for those relating to 1964-65, they are said to be worked out by following a uniform method of estimation. These two sets of estimates though suffer from some limitations can be

considered as the only two sets of figures which are comparable over States that are available at present.

### 3. Inter-State disparities in consumer expenditure

3.1 We have measured the inter-State disparities by means of concentration ratios. Concentration curves and ratio are generally defined for continuous distributions of non-negative variates where the concept of shares of different groups is meaningful. Concentration curves and ratios have been built up at all India level based on the consumption expenditure shared by different expenditure groups. The concentration curve is obtained by plotting the cumulative percentage of share of consumer expenditure against the corresponding cumulative percentages of population, i.e. if  $x_1, x_2, \dots, x_n$  are the per capita consumer expenditure in the  $n$  size classes of consumer expenditure and if  $p_1, p_2, \dots, p_n$  are the population corresponding to these per capita expenditure groups then the concentration curve is obtained by plotting the points  $(P_j, Q_j)$  where  $P_j = \sum_{i=1}^j p_i$

$$\text{and } Q_j = \frac{\sum_{i=1}^j b_i x_i}{\sum_{i=1}^n b_i x_i}$$

The corresponding concentration coefficient is calculated by the formula

$$C = 1 - \sum_{j=1}^n (P_j - P_{j-1})(Q_j + Q_{j-1}) \dots \dots \dots (e)$$

At all India level, the concentration ratios by the size class of consumer expenditure have been worked out on the basis of NSS data for a number of rounds and the value of the coefficient is of the order of 0.35(8).

3.2 Bhattacharya and Mahalanobis (10) have shown that this technique can be applied for finding the between region concentration ratios as well. If the average per capita expenditure of each state is attributed to relate to the total population of each State, forgetting about the within-State distribution of the consumer expenditure it is possible to construct the concentration curve and work out the concentration ratio as in the general case discussed in Section 3.1 above, i.e. in the calculation of inter-State concentration ratios,  $x_1, x_2, \dots, x_n$  will refer to the average per capita expenditure of the different States and  $p_1, p_2, \dots, p_n$  will refer to the population of the different States.

3.3 NSS gives the per capita consumption expenditure by rural and urban areas for each of the reorganised States and Union Territories. By taking the weighted average of the rural and urban per capita consumption figures with rural urban population as weights, the overall per capita expenditure at State level has been obtained. By multiplying the per capita expenditure by the population figure we arrive at the aggregates of consumption expenditure for each States. The percentage distributions of aggregate consumption expenditure ( $\%$ ) and that of population ( $\%$ ) are worked and they are presented along with the per capita expenditures in tables 1, 2 and 3 respectively for the years 1958-59, 1963-64 and 1964-65. For each of these periods,

the states are ranked in the ascending order of the per capita expenditure and the cumulative percentages of the proportion of consumer expenditure ( $K = \sum x_j$ ) and population ( $P_i = \sum p_j$ ) are worked out and presented in tables 4, 5 and 6. By applying the formula for  $\beta$  as at 'e' in Section 3.1, the inter-State concentration coefficient of consumption expenditure has been worked out. These coefficients for the years 1958-59, 1963-64 and 1964-65 are respectively 0.09, 0.06 and 0.05. It is seen from this that the inter-State concentration is rather small when compared to the overall concentration ratio which is of the order of 0.35. If more smaller and more homogeneous regions were taken instead of the States, the between region concentration would have been higher and in the limiting case when the region comes down to a household, the between and overall concentration would coincide.

3.4. The slightly decreasing trend in the concentration ratio over the period under study is also corroborated by the fact that the range of variation in per capita consumption expenditure has been narrowed down over the years. The index of per capita expenditure for each State with all-India as 100 has been worked out for each year and the presented in table 7. In 1958-59, the index varied from 70 percent in Orissa to 156 per cent in Union Territories whereas in 1963-64 (strictly comparable) it ranged from 83 percent in Orissa to 139 per cent in the Union Territories.

#### 4. Inter-State disparity in incomes:

4.1 In this Section we have attempted to measure the inter-State disparities with the help of concentration ratios based on per capita income of the different states and tried to measure the changes in disparity between 1960-61 and 1964-65, the only two recent years for which comparable estimates of per capita incomes are available in published form. The method of estimation of between State concentration ratios is exactly the same as those described in Section 3 with the change that instead of per capita expenditure, we have per capita income. Tables 8 and 9 gives the per capita income  $x_i$  of different States in ascending order, the percentages distribution of population ( $p_i$ ) and the percentage distribution of income ( $q_i$ ), the cumulative percentages of the population ( $P_i = \sum p_j$ ) and that of income ( $Q_i = \sum q_j$ ) respectively for the years 1960-61 and 1964-65. By applying the formula for the concentration coefficient as in (e) in Section 3.1, on the data presented in Tables 8 and 9, the concentration coefficient works out to be 0.13 for the year 1960-61 and 0.10 for the year 1964-65. On the basis of income also, the inter-State disparity coefficient shows a slight decline during the years under study.

#### 5. Conclusion

5.1 Before we make the concluding observations in this Section, it is appropriate to mention some of the limitations of the study which may have some bearing on the results which are as follows:-

(a) The price differences between the States have not been considered while measuring the inter-State concentration

for the different periods under study even though it is known that at the same point of time there are price differences between different States.

(b) The inter-State concentration in income and expenditure for different years have been worked out at current prices and the change in concentration coefficient noticed is based on current price calculations. Mukherjee (6) has shown that the overall concentration coefficient between different expenditure groups at current prices has decreased over years whereas when measured in real terms the disparity has increased. The price changes will affect the different expenditure classes differently and in a period where food prices have gone higher than those of other commodities, it is but natural that the lower expenditure groups' total expenditure in real terms have been reduced more than that of the higher expenditure groups. Hence in the measurement of disparities between people of different expenditure groups, when differential price deflators are applied to different size classes to reduce their expenditures to constant price levels, the disparity, i.e. the disparity in real terms is found to have increased. This phenomenon may not occur to the same extent in the case of inter-State concentration measurements. It is not unreasonable to assume that, even though there are variations in the price levels in different States at a given point of time, the proportionate increases in the overall price levels in different States between two time periods will more or less remain the same. If this assumption is not far off the mark, the changes in concentration coefficient measured in current prices may be considered to reveal the trends in real terms also.

5.2 In Sections 3 and 4, we have found that the inter-State concentration coefficient based on consumption expenditure has reduced from 0.09 in 1958-59 to 0.05 in 1964-65 whereas the inter-State income concentration coefficient has reduced from 0.13 in 1960-61 to 0.10 in 1964-65. This inter-State disparity coefficient which is very low does not show that the aspects of regional disparity as this does not take into account the variations within each State. It will be seen that in case of a distribution of expenditure or income by size class, a certain amount of grouping is implicit in the frequency table, in other words, the inequality among individuals or units in a size class is ignored. While this is unavoidable, in the extreme case, when variations within a State are ignored, the concentration ratio between States is bound to be low. If smaller and more homogeneous regions have been taken instead of States, a better indicator of regional disparity would have emerged even though it could not be expected to measure the disparity between States.

5.3 It is a known fact that the disparity in income will be higher than those of consumption. As is expected, it may be mentioned that for the year 1964-65 for which year we have worked out inter-State disparities based on both income and expenditure data, the inter-State concentration in income which is of the order of 0.10 is much higher than the inter-State concentration in expenditure viz. 0.05

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Table 1: Estimates of per capita consumer expenditure, the per centage distributions of population and consumer expenditure by states - 1958-59

State	per capita consumer expenditure (Rs.)			percentage distribution	
	rural	urban	total	popu- tation(%)	Cons. exp. (%)
1	2	3	4	5	6
Andhra Pradesh	16.49	24.27	17.82	8.34	6.85
Assam	24.77	38.57	25.79	2.65	3.15
Bihar	18.86	23.16	19.21	10.63	9.42
Gujarat	20.34	27.03	22.04	4.68	4.75
Jammu & Kashmir	23.78	27.68	24.41	0.84	0.94
Kerala	17.00	21.39	17.66	3.86	3.14
Madras	16.84	24.74	18.91	7.88	6.88
Madhya Pradesh	20.49	29.54	21.76	7.33	7.35
Maharashtra	17.42	32.56	21.59	9.04	9.00
Mysore	19.38	24.29	20.45	5.41	5.11
Orissa	14.35	28.17	15.19	4.00	2.80
Punjab	33.96	30.17	33.10	4.62	7.05
Rajasthan	25.38	30.07	26.14	4.56	5.50
Uttar Pradesh	21.28	22.95	21.67	17.01	17.00
West Bengal	21.33	36.20	24.90	7.84	9.01
Union Territories	22.76	48.32	33.86	1.31	2.05
Total	20.13	28.06	21.68	100.00	100.00

Table 2: Estimates of per capita consumer expenditure, the percentage distribution of population and consumer expenditure by states - 1963-64

State	per capita consumer expenditure (Rs.)			percentage distribution	
	rural	urban	total	popula- tion (b)	cons. e. (%)
1	2	3	4	5	6
1. Andhra Pradesh	20.76	28.16	22.08	8.15	7.40
2. Assam	26.43	46.64	28.09	2.74	3.17
3. Bihar	21.31	29.89	22.07	10.60	9.62
4. Gujarat	22.69	33.03	25.39	4.75	4.96
5. Jammu & Kashmir	27.89	31.60	28.52	0.80	0.94
6. Kerala	20.36	27.29	21.42	3.87	3.41
7. Madras	23.39	31.47	25.59	7.60	7.99
8. Madhya Pradesh	23.37	29.93	24.33	7.42	7.41
9. Maharashtra	21.72	37.24	26.19	9.08	9.78
10. Mysore	20.43	25.88	21.67	5.38	4.80
11. Orissa	19.35	31.92	20.18	4.00	3.32
12. Punjab	28.66	34.33	29.82	4.71	5.77
13. Rajasthan	23.13	32.53	21.68	4.65	4.73
14. Uttar Pradesh	21.31	29.17	22.34	16.81	15.44
15. West Bengal	23.69	41.66	28.17	8.04	9.31
16. Union Territories	23.67	45.98	33.74	1.40	1.94
Total	22.37	32.96	21.32	100.00	100.00

Table 3 : Estimates of per capita consumer expenditure, the percentage distribution of population and consumer expenditure by states - 1964-65

States	per capita consumer expenditure (Rs.)		total	percentage distribution	
	rural	urban		popula- tion(%)	cons.exp (%)
1	2	3	4	5	6
Andhra Pradesh	26.45	31.78	27.42	8.08	7.83
Assam	29.30	42.66	30.45	2.77	2.98
Bihar	26.60	32.41	27.14	10.58	10.15
Gujarat	26.98	31.19	28.09	4.78	4.75
Haryana	39.17	37.48	38.87	1.78	2.45
Jammu & Kashmir	28.32	29.80	28.58	0.78	0.79
Kerala	22.30	30.11	23.51	3.88	3.23
Madhya Pradesh	26.30	34.44	27.52	7.43	7.23
Madras	24.55	34.34	27.25	7.49	7.22
Maharashtra	25.16	44.48	30.82	9.11	9.92
Mysore	25.23	32.44	26.91	5.38	5.11
Orissa	20.61	31.79	21.38	3.98	3.01
Punjab	36.22	36.65	36.32	2.62	3.36
Rajasthan	30.55	34.21	31.15	4.70	5.18
Uttar Pradesh	27.09	30.05	27.48	16.75	16.27
West Bengal	23.18	41.13	30.05	8.08	7.93
Union Territories	29.75	56.81	40.43	1.81	2.59
Total	26.44	36.03	28.28	100.00	100.00

Table 4 : Ranking of States in ascending order of per capita consumer expenditure and cumulative percentages of consumer expenditure and population:- 1958-59

States	per capita Consumer Expenditure	Cumulative percentages of	
		population	Cons. Exp.
1	2	3	4
1. Orissa	15.19	4.00	2.80
2. Kerala	17.66	7.86	5.94
3. Andhra Pradesh	17.82	16.20	12.79
4. Madras	18.91	24.08	19.67
5. Bihar	19.21	34.71	29.09
6. Mysore	20.45	40.12	34.20
7. Maharashtra	21.59	49.16	43.10
8. Uttar Pradesh	21.67	66.17	60.20
9. Madhya Pradesh	21.76	73.50	67.55
10. Gujarat	22.01	78.18	72.30
11. Jammu & Kashmir	24.41	79.02	73.24
12. West Bengal	24.90	86.86	82.25
13. Assam	25.79	89.51	85.40
14. Rajasthan	26.14	94.07	90.90
15. Punjab	33.10	98.69	97.95
16. Union Territories	38.53	100.00	100.00
Total	21.68	-	-

Table 5 : Ranking of States in ascending order of per capita consumer expenditure and cumulative percentages of consumer expenditure and population - 1963-64

States	per capita consumer expenditure	cumulative percentage of	
		population (P)	cons-expen (Q)
1	2	3	4
Orissa	20.18	4.00	3.32
Kerala	21.42	7.87	6.73
Mysore	21.67	13.25	11.53
Bihar	22.07	23.85	21.15
Andhra Pradesh	22.08	32.00	28.55
Uttar Pradesh	22.34	48.81	43.99
Madhya Pradesh	24.33	56.23	51.41
Rajasthan	24.68	60.88	56.14
Gujarat	25.39	65.63	61.10
Madras	25.59	73.23	69.09
Maharashtra	26.19	82.31	78.87
Assam	28.09	85.05	82.04
West Bengal	28.17	93.09	91.35
Jammu & Kashmir	28.52	93.89	92.89
Punjab	29.82	98.60	98.06
Union Territories	33.74	100.00	100.00
Total	24.32	-	-

Table 6: Ranking of states in ascending order of per capita consumer expenditure and cumulative percentages of consumer expenditure and population - 1964-65

State	per capita consumer expenditure	cumulative population (P <sub>i</sub> )	percentage of Cons. exp. (Q <sub>i</sub> )
(1)	2	3	4
1. Orissa	21.38	3.98	3.01
2. Kerala	23.51	7.96	6.24
3. Mysore	26.91	13.24	11.45
4. Bihar	27.14	23.82	21.50
5. Madras	27.25	31.31	28.72
6. Andhra Pradesh	27.42	39.39	36.55
7. Uttar Pradesh	27.48	56.14	52.82
8. Madhya Pradesh	27.52	63.57	60.05
9. Gujarat	28.09	68.35	64.80
10. Jammu&Kashmir	28.58	69.13	65.59
11. West Bengal	30.05	77.21	73.52
12. Assam	30.45	79.98	76.50
13. Maharashtra	30.82	89.09	86.42
14. Rajasthan	31.15	93.79	91.60
15. Punjab	36.32	96.41	94.96
16. Haryana	38.87	98.19	97.41
17. Union Territories	40.43	100.00	100.00
Total	28.28	-	-

Table 7 : Index of per capita consumer expenditure in different states with All India = 100

State	Index of per capita expenditure		
	1958-59	1963-64	1964-65
1	2	3	4
. Orissa	70	83	76
. Kerala	82	88	83
. Mysore	82	89	95
. Bihar	87	91	96
. Madras	89	91	96
. Andhra Pradesh	94	92	97
. Uttar Pradesh	100	100	97
. Madhya Pradesh	100	102	97
. Gujarat	100	104	99
. Jammu & Kashmir	102	105	101
. West Bengal	113	108	106
. Assam	115	116	108
. Maharashtra	119	116	109
. Rajasthan	121	117	110
. Punjab	153	123	128
. Haryana			137
. Union Territories	156	139	143
Total	100	100	100

Table 8 : Ranking of States, according to per capita income, distribution of population and income and their cumulative percentages, 1960-61

States	per capita income (Rs.)	percentage distribution of		Cumulative percentages	
		population (%)	income (%)	pop. (P)	income (Q)
1	2	3	4	5	6
1. Bihar	221	10.6	7.0	10.6	7.0
2. Rajasthan	267	4.6	3.7	15.2	10.7
3. Orissa	276	4.0	3.3	19.2	14.0
4. Madhya Pradesh	285	7.4	6.3	26.6	20.3
5. Andhra Pradesh	287	8.2	7.1	34.8	27.4
6. Jammu & Kashmir	289	0.8	0.7	35.6	28.1
7. Uttar Pradesh	297	16.8	15.0	52.4	43.1
8. Mysore	305	5.4	4.9	57.8	48.0
9. Kerala	315	3.9	3.6	61.7	51.6
10. Himachal Pradesh	328	0.3	0.3	62.0	51.9
11. Tripura	330	0.3	0.3	62.3	52.2
12. Assam	333	2.7	2.7	65.0	54.9
13. Madras	334	7.7	7.7	72.7	62.6
14. Other states	371	0.4	0.4	73.1	63.0
15. Gujarat	393	4.7	5.5	77.8	68.5
16. Punjab	451	4.6	6.3	82.4	74.8
17. West Bengal	465	8.0	11.0	90.4	85.8
18. Maharashtra	468	9.0	12.6	99.4	98.4
19. Delhi	872	0.6	1.6	100.0	100.0
All India	335	100.0	100.0		



Table 9 : Ranking of States according to per capita income, distribution of population and income and their cumulative percentages, 1964-65

States	per capita income (Rs.)	percentage dis-tribution of		cumulative percent- age of	
		popula- tion (%)	income (%)	popula- tion (%)	income (%)
1	2	3	4	5	6
Bihar	299	10.78	7.72	10.78	7.72
Jammu & Kashmir	341	0.81	0.66	11.59	8.38
Orissa	347	4.06	3.37	15.65	11.75
Rajasthan	356	4.76	4.06	20.41	15.81
Madhya Pradesh	373	7.56	6.75	27.97	22.56
Uttar Pradesh	374	17.08	15.29	45.05	37.85
Kerala	393	3.95	3.71	49.00	41.56
Mysore	420	5.48	5.51	54.48	47.07
Madras	434	7.68	7.98	62.16	55.05
Andhra Pradesh	438	8.26	8.66	70.42	63.71
Assam	441	2.81	2.96	73.23	66.67
West Bengal	498	8.21	9.78	81.44	76.45
Paryana	504	1.80	2.18	83.24	78.63
Gujarat	523	4.85	6.07	88.09	84.70
Maharashtra	526	9.26	11.66	97.35	96.36
Punjab	575	2.65	3.64	100.00	100.00
	422	100.00	100.00	-	-

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

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National Income

Regional Income Estimates and Capital Formation in Electricity Industry

By

Sumer Chand

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily the Organisations or Institutions to which they belong.

SUREN CHAND

Despite its modest share of about one per cent in the total national product, electricity industry has a pivotal role to play in the process of economic growth with far reaching influences on different sectors of the economy because of its being one of the most essential inputs in the production process and in household consumption. Indeed it can be regarded as one of the strategic infrastructures of a developing economy. Lack of adequate supply of electricity and its excessive costs may not only hinder the successful initiation of major industrial projects but also adversely affect the consumer demand for electricity. In view of its vital importance to overall economic growth, it is, therefore, one of the most important tasks before the planners to ensure a regular, dependable and adequate supply of electricity to industry, transport, agriculture and the household sector etc. Further this has to be ensured at the lowest possible cost to individuals and the economy through the most careful husbanding of the country's resources with sufficient flexibility and freedom of choice for full benefits to be derived from the technological developments since this ultimately helps the economy. Most important, since electricity is not an end in itself but a vital factor which influences general economic growth, is its supply adequate at the right time and place. Such a planning would result in further accelerating the economic growth in several key sectors of the economy which largely depend on the supply of electricity.

2. It is because of its crucial role in economic development that an attempt has been made here to prepare (i) all India estimates of gross and net product at current and constant (1960-61) prices for the period 1950-51 to 1965-66 along with the projections for 1973-74 at constant prices, (ii) regional estimates of gross/net product at constant prices and (iii) estimates of gross and net capital formation at current and constant prices. These estimates, it is hoped may facilitate the task of the planners and administrators in allocating the given resources between different regions and also in formulating the economic policies so as to bring about a balanced regional development. The methodology and the source material used in preparing these estimates is briefly described in the following paragraphs:-

3. It may be mentioned here that in the conventional series estimates of net product from 'electricity' industry were included in the erstwhile factory establishments sector and those for the years 1948-49 to 1950-51 were based on the CWFC

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The views expressed in this paper are of the author and not of the organisation to which he belongs. The grateful to S/Shri S.N.Goswami and S.C. Kushwaha who assisted him in the preparation of this paper.

data where as for the latter years the estimates were obtained by carrying forward the 1953-54 SSMI data with the help of corresponding indices of industrial production and wholesale prices of manufactured articles.

4. In the revised series, estimates have been prepared by analysing the annual accounts of each of the electricity undertakings. Such estimates are readily available from 1960-61 onwards; however, for the back years, access to individual accounts has not been possible. As such the estimates of gross/net product for the year 1950-51 to 1959-60 have been prepared by analysing the 'Consolidated Revenue' and 'Appropriation accounts' of Government departments/boards/ power corporations, municipalities and private companies as available in the 'Public Electricity Supply - All India Statistics - General Review' published by the CWFC. Having obtained the estimates of gross/net product at current prices, estimates of gross product at 1960-61 prices have been obtained by moving the base year figures of gross product by the total quantity of electricity sold to different categories of consumers. The estimates of net product at constant prices have been obtained by subtracting the allowance for depreciation deflated with the EA's index number of wholesale prices of machinery from the corresponding estimates of gross product. Table 1 provides the gross/net product at current and constant prices from 1950-51 to 1965-66, and projections of gross and net product for the year 1973-74 at 1960-61 prices. The projected estimates are based on the data published in the Draft Fourth Five Year Plan.

5. Perusal of the estimates of gross/net product exhibits a steady increase from 1950-51 to 1955-56 and after that there has been an accelerated increase in the national income estimates. This could be largely attributed to the fact that most of the electricity boards were constituted after 1955-56 and that there has been growing emphasis on the development of electricity industry since the commencement of the Five Year Plans more so after the First Five Year Plan.

6. Attempts have also been made to prepare statewise estimates. The availability of such estimates is of considerable interest for purposes of studying the development of different states and regions. Although State income estimates are being regularly prepared by individual State Statistical Bureaus for their States, but such estimates are not strictly comparable with the all India estimates of gross product. Moreover separate estimates for electricity industry are not available for some of the States.

7. The Central Statistical Organisation has already prepared standard methodology for the commodity producing sectors and for Railways, Communications, Banking and Insurance and public administration, the CSO is already engaged in the preparation of state-wise estimates on the basis of firm data, as available at the Centre and in the States, vide recommendation of the 11th meeting of the Working Group on State Income.

The Standard Methodologies have already been evolved for the industries pertaining to electricity, gas and water supply, public administration (states), local authorities, other services (education, medical & health and sanitary services). For the remaining industries viz. small scale manufacturing, construction, other transport, trade, storage, hotels & restaurants, real estates & ownership of dwellings, other services (others), the finalisation of the standard methodologies is also under process. Statewise estimates of gross and net product at constant prices have been prepared on the basis of standard methodology prescribed for the electricity industry by the Central Statistical Organisation. These estimates have been prepared only for the period 1960-61 to 1965-66. The statewise estimates for the year 1960-61 have been prepared on the basis of the analysis of annual accounts of individual electricity undertakings in various states. The statewise estimates at 1960-61 prices for subsequent years have been worked out by moving the benchmark estimates of each state with the total statewise quantity of electricity sold as available from the CWFC. These estimates, as seen from table 2, exhibit an increasing trend for all the states, although the rates of increase exhibit wide variations between states and it is the highest for the state of Punjab. These estimates may be subject to the limitation arising out of moving the base year estimates with the help of total quantity of electricity sold, nevertheless, these estimates do exhibit regional trends.

8. Finally an attempt has also been made to prepare the estimates of gross/net capital formation in electricity industry. Such estimates reflect the investment pattern in the industry. The estimates of capital formation have been prepared on the analysis of the consolidated accounts viz. 'Capital Account' and 'General Balance-sheet' of Government departments/boards, power corporations, municipalities, and private companies as available in the 'Public Electricity Supply- All India Statistics - General Review' of the CWFC. The Capital formation has been taken to constitute expenditure on land, building, other construction, plants/machinery and other office equipment, transport equipment, capital work in progress and changes in inventories. Depreciation has been excluded to get the estimates of net capital formation.

9. The estimates of gross/net capital formation at 1960-61 prices have been obtained by deflating the estimates of different items of capital formation at current prices with suitable available indicators. In respect of buildings, the estimates have been deflated with the index of urban housing whereas estimates of other construction and work in progress have been deflated with the index of general pucca construction. Similarly the E.As' index numbers of wholesale prices of machinery and transport equipment has been used to deflate the estimates of machinery and transport equipment. Depreciation has, however, been deflated with the E.As' index number of wholesale prices of Machinery. The estimates of changes in inventories which largely constitute stocks of coal, oil,

petrol & lubricants etc. have been deflated with the E.As' index number of wholesale prices of Fuel, Power, light and lubricants. Table 3 presents the estimates of gross and net capital formation at current and constant price. It is seen from the table that there has been an accelerated growth of investment in the electricity industry.

10. Although the estimates of national product from electricity could be taken to be fairly reliable, since these are based on the analysis of the annual accounts of the individual electricity undertakings, still the data available in these accounts suffer from a few limitations viz. non-availability of separate data on compensation of employees for some of the boards. Of late, however, efforts have been made in the CSO to get break-up of such data.

Table 1: Gross/net Product From 'Electricity' industry at current and constant prices (Rs. lakhs)

	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
	<u>At current prices.</u>															
Generation	766	909	989	1064	1097	1183	1420	1730	2077	2334	1982	2327	2688	3065	3568	4600
Transmission & Distribution	251	294	286	302	702	743	1188	1562	2063	2466	3045	3630	3978	4768	4715	8100
Construction	689	753	775	859	543	759	976	602	<del>426</del> (669)	669	960	903	1153	2032	1332	9000
Production	1706	1956	2050	2225	2342	2685	3584	3894	4566	5469	5987	6860	7819	9865	11615	13400
Transmission & Distribution	382	397	418	439	558	681	910	1069	1472	1612	1700	1938	2393	2755	3087	3500
Construction	2088	2353	2468	2664	2900	3366	4494	4963	6038	7051	7687	8798	10212	12620	14702	17300
	<u>At 1960-61 prices.</u>															
Production	2230	2722	2859	3152	3516	4009	4470	5275	6040	7015	7687	8930	10177	12273	13552	15000
Transmission & Distribution	1775	2183	2372	2637	2859	2326	3454	4114	4470	5331	5987	7048	7938	9818	10888	12100





Table 3: Gross/net Capital Formation in Electricity industry at current and constant prices

Items	(Rs. lakhs)							
	1950-51	1955-56	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
Fixed assets.	<u>At current prices.</u>							
i) land	26	86	47	48	294 (-)	239 (-)	84	4
ii) buildings	110	183	154	1688	1438	976	567	19
iii) other construction	733	2593	1906	7497	6194	3397	6941	157
iv) plant, machinery & other equipment	570	2759	2339	6357	2518	8441	3579	189
v) transport equipment	30	91	73	362	125 (-)	53	64	3
vi) capital work in progress	410	1230	844 (-)	2696	4526	12249	13407	22
Total fixed assets (gross)	1879	6942	5363	13256	15155	24771	24474	396
<u>Changes in inventories.</u>	251	558	523	521	2367	3448	2510	2
Gross capital formation.	2130	7500	5886	13777	17522	28219	26984	42
<del>DEPRECIATION</del> Depreciation	382	681	1700	1938	2393	2755	3087	
Net capital formation.	1748	6819	4186	11839	15129	25464	23897	3
	<u>At Constant prices.</u>							
Gross capital formation	2822	9192	5886	13304	16345	19091	23388	3
Net capital formation	2267	8409	4186	11422	14106	16636	20724	3

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research

in

National Income

All India and Regional Growth in 'Other Transport' and 'Trade,  
Storage, Hotels and Restaurants'

By

Sumer Chand and S.N.Goswami

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

All India and Regional Growth in 'other transport'  
and 'trade, storage, hotels and restaurants'.

( SUMER CHAND AND S.N.GOSWAMI )

Transport has been regarded as one of the strategic infrastructures of a developing economy because of its important role in the process of economic growth. Indeed transport is a necessary means for the expansion of both domestic and international trade and through such market enlargement, it brings numerous small isolated economic units into a wide exchange economy, thus stimulating further specialisation and an increase in output and efficiency. In addition to the widening of the markets, transport also helps to make accessible new resources and leading to the establishment or expansion of related industries. What is true of transport is no less true of trade, however, it must be pinpointed that much of the trade to-day will not be feasible but for development of transport, since extension of markets to national and international regions is possible only with transport. Therefore, in view of the many faced role of these industries in the pursuit of development objectives, an attempt has been made here to prepare revised estimates of gross and net product at 1960-61 prices for the back years 1950-51 to 1959-60 which have not so far been officially prepared. The availability of such estimates will help in studying the trends in growth over different plan periods. The paper also provides statewise estimates of gross and net product at 1960-61 prices for the period 1960-61 to 1965-66, besides the all-India estimates of gross product at 1960-61 prices for the year 1973-74 projected on the basis of different indicators as available in the Fourth Five Year Plan, 1969-74. The source material used and the methodology adopted for the purposes of preparing these estimates is briefly described below:-

2. In the conventional series, estimates of net product at 1948-49 prices were prepared for the combined sectors 'other commerce and transport' by moving the base year estimates to other years using a specially prepared index relating to the value of marketable surplus at 1948-49 prices for agriculture, mining and manufacturing industries. The revised series provide separate estimates of gross and net product for the two industries. In the case of 'other transport', which constitutes (i) mechanised road transport, (ii) non-mechanised road transport, (iii) organised water transport, (iv) unorganised water transport, (v) transport by air and (vi) services incidental to transport, the bench-mark estimates for the year 1960-61 have been prepared by analysing the annual accounts of the transport undertakings for the organised

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We are grateful to S/Shri J.Sinha and V.K.Bhatnagar who helped us in the preparation of this paper. The views expressed in this paper are of the authors and not of the organisation to which they belong.

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sectors whereas for the un-organised sectors, the estimates are based on the working force and estimated earnings per person. After obtaining the gross and net product for the benchmark year, estimates for other years at 1960-61 prices have been prepared by moving the benchmark estimates with different indicators. In the case of mechanised road transport, the benchmark estimates have been moved with the help of total working force estimated on the basis of total number of vehicles whereas for the non-mechanised road transport, a combined weighted index of industrial and agricultural production has been used to move the benchmark estimates to obtain estimates at 1960-61 prices. For shipping companies, the indicators pertain to the number of passenger and total cargo handled by shipping companies with earnings in 1960-61 from these two sources as weights; whereas for the port trusts, the volume of traffic handled both for coastal and foreign trade has been used as an indicator. Similarly volume of cargo handled by sailing vessels has been used as an indicator for un-organised sea-transport. The indicator for air-transport has been obtained by combining the two indices relating to the number of passenger kilometres and net tonne kilometres, the weights being in proportion to the passenger revenue and freight revenue in the base year 1960-61. The net product is, however, obtained by deducting the deflated value of the estimates of depreciation at current prices. The index number of wholesale prices of transport equipment is used to deflate the depreciation allowance at current prices for all categories of transport, except in the case of Port trusts, wherein index number of wholesale prices of machinery has been used.

3. Similarly the benchmark estimates of net product for the industry 'trade, storage, hotels and restaurants' have been prepared separately for trade, storage, hotels and restaurants. In case of trade, hotels and restaurants, estimates for the corporate sector are based on the analysis of their annual accounts whereas those for non-corporate sector the estimates are based on the NSS earnings data and the 1961 census population adjusted for income tax assesses. To these have been added the business profits of other bodies and individuals liable to income tax to arrive at the total net product from trade, hotels and restaurants. In order to obtain estimates of net product at 1960-61 prices for the back years 1950-51 to 1959-60, the benchmark estimates have been moved with the help of a specially prepared index of trading activity. The index of trading activity has been constructed by estimating the total value of marketable surplus from the total gross value of output of all commodity producing sectors at 1960-61 prices, and then applying the percentage trade and transport margins. The benchmark estimates for storage have been prepared on the basis of the analysis of the annual accounts of the warehousing corporations, the ASI data and the total estimated employment. For the back years, the estimates at 1960-61 prices have been prepared by moving the benchmark estimates with the total quantity handled by the warehousing corporation and the employment. The gross product for the two industries viz. trade, hotels and restaurant have been arrived at by adding arbitrarily 2.5 per cent of the net product as depreciation allowance. For

warehousing corporation/s and other storage, the depreciation at current prices has been deflated with the help of index numbers of building construction and those for cold storage have been deflated by the IAs' index number of wholesale prices of machinery to arrive at the corresponding estimates at constant prices. Tables 1 (a) & 1 (b) provide the benchmark estimates for the industries 'other transport' and 'trade, storage, hotels and restaurants' whereas table 2 provides estimates of gross and net product for different categories of transport and the industry group 'trade, storage, hotels and restaurants' at 1960-61 prices. The estimates of gross and net product projected on the basis of the available indicators for the year 1973-74 are also presented in the same table.

4. Having obtained the all India estimates of gross and net product, Statewise estimates of gross/net product at 1960-61 prices have been prepared for the years 1960-61 to 1965-66. It may be stated here that, although the SSB's are regularly preparing and publishing such estimates of their States, but these are not useful for making inter-state comparison and also for the purposes of planning, mainly because of the considerable differences in the estimation procedure. Therefore to meet the requirements of the planning authorities and for purposes of inter-state comparisons, it is necessary that the estimates are built on the basis of uniform concepts and methodology. It is with these objectives in view that an attempt has been made here to prepare separately the statewise estimates for the two industries at constant prices. Accordingly, statewise estimates for the mechanised road transport are based on the Statewise data on total number of vehicles as available from the 'Basic Road Statistics of India' and the Statewise gross/net product per person obtained from the data contained in the 'Statistical Bulletins of State Road Transport Undertakings in India' issued by the Ministry of Transport & Shipping. For non-mechanised road transport, the estimates are based on the statewise data on the estimated number of working days as available from the NSS Report No. 105:- Tables with Notes on Household Non-Mechanised Transport and utilisation of Working Animals. This procedure has been adopted because of the non-availability of statewise data on maund miles and Passenger miles which would have been a better indicator. For port trusts, Statewise data on traffic handled by major ports has been used. For other categories of transport, the corresponding statewise data on working force as available from the 1961 population census has been used in the absence of any other statewise indicators.

5. Similarly for 'trade, storage, hotels and restaurants' statewise estimates for the benchmark year 1960-61 have been first prepared and then estimates for other years have been obtained. According to the procedure that has been adopted, statewise income data from wholesale and retail trade assessed to income tax have been directly obtained from the Income Tax Revenue Statistics. From the total all India figure, the income from trade assessed to income tax has been deducted

and the rest of the income has been allocated among different States in proportion to 1960-61 working force adjusted for the number of assessee<sup>\*\*</sup>. Having obtained the benchmark statewise estimates for the year 1960-61, the estimates for other years at constant (1960-61) prices have been obtained by moving the Statewise estimates with the help of the total value of gross output at 1960-61 prices of the commodity producing sectors for which the Statewise comparable estimates are being prepared.

6. Table 3 provides the statewise estimates of gross/net product from 'other transport' whereas table-4 presents the statewise estimates of net product from 'trade, storage, hotels and restaurants' at 1960-61 prices.

7. It may be mentioned here that these estimates have an obvious limitation of greater reliability due to the paucity of statewise data at the centre. To that extent, these estimates are of tentative nature, nevertheless the estimates do provide a broad picture of the regional disparities in these two sectors.

8. It may be observed from table 2 that there has been an increasing trend in the gross/net product from these two industries since 1950-51, the rate of increase was, however, interrupted in 1965-66 due to the set-back in the agricultural development which affected the industrial activity both through a reduction in the supply of agricultural raw materials and a fall in the purchasing power of the population depending upon agriculture. The Statewise estimates also depict a similar trend.

9. Finally, it is worth mention here that, though the estimates of gross/net product have undergone improvements both empirically and methodologically, yet there are many gaps in data which affect the accuracy of the estimates at the all India as well as at the State level. Some leeway in this direction is already afoot in the core schemes of the Fourth Five Year Plan, wherein surveys on goods traffic by road and distributive trade are to be undertaken to collect data on important characteristics of each industry viz. employment, output, input, wages and salaries, other factor payment made by an enterprise, value of and addition to capital stock, source of finance etc. at national and State level. The availability of such data from these surveys, it is hoped, would further improve the national income estimates in these sectors.

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\*\* 1 assessee = 3 individuals vide page 15 'Report of the committee on distribution of Income and levels of Living' Planning Commission.

Table 1 (a): Gross and net Product from 'other transport; 1960-61

(Rs. lakhs)

Category of transport	Gross Product			Net Product		
	Rural	Urban	Total	Rural	Urban	Total
1. <u>Transport by road</u>						
i) Mechanised	4036	12174	16210	3089	9316	12405
ii) Non-mechanised	3379	5207	8586	2886	5123	8009
2. <u>Transport by water</u>						
i) organised	-	4216	4216	-	3455	3455
ii) Un-organised	267	1472	1739	254	1108	1362
3. <u>Transport by air</u>	-	1478	1478	-	1156	1156
4. <u>Services incidental to transport</u>	-	376	376	-	338	338

Table 1 (b): Net product from 'trade, storage, hotels and restaurants:' 1960-61

(Rs. lakhs)

Item	Rural	Urban	Total
1. total net earnings from wholesale & retail trade	<u>32007</u>	<u>90454</u>	<u>122461</u>
(i) non-corporate sector (excluding entrepreneurs subject to income tax)			
net earnings from Principal activities	23758	40056	63814
earnings from secondary activities	8249	6394	14643
total	32007	46450	78457
(ii) add business profits of entrepreneurs subject to income tax	-	<u>33969</u>	<u>33969</u>
(iii) Corporate sector	-	10035	10035
2. hotels and restaurants	<u>1518</u>	<u>5446</u>	<u>6964</u>
(i) non-corporate sector	1518	5240	6758
(ii) Corporate sector	-	206	206
3. Storage and warehousing	-	<u>215</u>	<u>215</u>

Table 2: Gross and net product from 'trade storage, hotels & restaurants' and 'other transport' (at 1960-61 prices)

	(Rs. lakhs)								
	1950- 51	1951- 52	1952- 53	1953- 54	1954- 55	1955- 56	1956- 57	1957- 58	1958- 59
<b>GROSS PRODUCT</b>									
1. <u>Other transport</u>	17292	18279	19791	20961	21388	24077	23357	24053	27922
i) transport by road	13942	14201	15527	16535	17156	19065	18003	17811	21457
a. mechanised	8614	8773	9667	10266	10713	12114	11438	11599	13862
b. non-mechanised	5328	5428	5860	6269	6443	6951	6565	6212	7595
ii) transport by water	3007	3269	3358	3218	3195	3793	3945	4878	5023
a. organised	2021	2205	2191	2146	2123	2548	2646	3327	3278
b. un-organised	986	1064	1167	1072	1072	1245	1299	1551	1745
iii) transport by air	635	596	675	696	787	938	1136	1067	1132
iv) services incidental to transport	208	213	231	242	250	281	273	297	310
2. Trade storage, hotels and restaurants.	82107	88129	88950	92412	97413	104723	111495	110507	115088
<b>NET PRODUCT</b>									
1. <u>Other transport</u>	14846	15353	16624	17227	17788	19910	19641	19930	22952
i) transport by road	11555	11766	12864	13693	14195	15760	14831	14622	17673
a. mechanised	6592	6713	7398	7857	8199	9271	8753	8876	10608
b. non-mechanised	4963	5053	6466	5836	5996	6489	6078	5746	7065
ii) transport by water	2559	2805	2774	2723	2698	3104	3600	4169	4101
a. organised	1713	1887	1858	1807	1763	2128	2466	2837	2740
b. unorganised	846	918	916	916	915	976	1200	1332	1361
iii) transport by air	542	586	576	591	668	792 (792)	959	872	899
iv) services incidental to transport	190	196	210	220	227	254	261	267	279
2. Trade, Storage, hotels and restaurants.	80087	85961	86759	90139	95018	102150	108756	107798	112270



(Rs. lakhs)

	1959- 60	1960- 61	1961- 62	1962- 63	1963- 64	1964- 65	1965- 66	1973-74
<u>GROSS PRODUCT</u>								
1. <u>Other transport</u>	29775	32605	35171	37817	40041	42957	44362	77936
i) transport by road	23166	24796	26880	28813	30403	32757	33781	56727
a. mechanised	15135	16210	17907	19662	20736	22320	23735	39898
b. non-mechanised	8031	8586	8973	9151	9667	10437	10046	16829
ii) transport by water	5043	5955	6191	6339	7014	7207	7641	13729
a. organised	3512	4216	4432	4863	5218	5549	5870	11384
b. un-organised	1531	1739	1759	1776	1796	1658	1771	2545
iii) Transport by air	1230	1478	1695	1915	2095	2157	2376	6534
iv) services incidental to transport	336	376	405	450	499	536	564	1006
2. Trade, storage, hotels & restaurants	122327	133413	142150	149117	161137	172119	172183	280048
<u>NET PRODUCT</u>								
1. Other transport	24600	26725	28811	31003	32789	35101	35956	63307
i) transport by road	19081	20414	22077	23606	24916	26835	27596	46315
a. mechanised	11583	12405	13705	15047	15870	17082	18164	30534
b. non-mechanised	7498	8009	8372	8559	9046	9753	9132	15781
ii) transport by water	4233	4817	5033	5432	5687	5750	5936	10856
a. organised	2964	3455	3609	4022	4242	4452	4633	8909
b. un-organised	1269	1362	1424	1410	1445	1298	1303	1947
iii) transport by air	984	1156	1377	1560	1737	2034	1916	5230
iv) services incidental to transport	302	336	364	405	419	482	508	906
2. Trade, storage, hotels and restaurants.	119326	130140	138662	145748	157184	167899	167954	273134

Table 3: Statewise estimates of gross and net product in 'other transport'  
(at 1960-61 prices)

(Rs. lakhs)

States	GROSS						NET					
	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
Uttar Pradesh	3457	4654	4728	4930	5140	5145	2743	3514	3585	3735	3903	3892
Andhra	714	698	848	753	817	823	575	568	687	613	667	671
Madhya Pradesh	1233	1242	1514	1514	1619	1618	1020	1038	1256	1259	1347	1343
Gujarat	1556	1432	1648	1655	1740	1889	1236	1155	1329	1336	1402	1496
West Bengal	158	159	169	186	206	203	140	141	152	166	183	182
Madhya Pradesh	1586	1890	1963	2151	2314	2316	1344	1540	1601	1715	1868	1856
Uttar Pradesh	984	1052	1071	1112	1215	1243	785	843	862	893	976	992
Madhya Pradesh	6263	6465	6906	7824	8332	8679	5085	5296	5691	6428	6813	6999
Uttar Pradesh	1618	1881	1980	2052	2213	2295	1307	1518	1599	1653	1782	1838
Uttar Pradesh	680	732	755	806	978	957	500	541	558	595	714	698
Punjab (old)	1839	2005	1877	1992	2173	2257	1616	1774	1668	1767	1924	1994
Rajasthan	986	1019	1116	1180	1294	1297	829	861	938	994	1086	1086
Tamil Nadu	2809	3011	3228	3400	3554	3741	2204	2404	2563	2692	2800	2928
Uttar Pradesh	4053	4157	4256	4451	4644	4740	3525	3639	3730	3908	4084	4143
West Bengal	3063	3137	3388	3586	4027	4115	2551	2632	2862	3023	3372	3390
Uttar Pradesh	669	730	751	817	920	960	555	607	634	692	779	803
Central Union Territories	937	877	1619	1632	1771	2084	710	740	1288	1290	1403	1645
Total	32605	35171	37817	40041	42957	44362	26725	28811	31003	32789	35103	35956

Table 4:  
Statewise net product from trade, storage, hotels and restaurants.  
(at 1960 - 61 prices)

(Rs. lakhs)

States	Years					
	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66
Andhra Pradesh	11192	12396	12900	13502	14449	14332
Assam	2762	3024	3009	3558	3775	4153
Bihar	6875	7283	7767	8236	8434	9583
Gujarat	8936	9749	10812	11827	12901	12470
Jammu & Kashmir	369	368	382	423	437	380
Kerala	5109	5272	5727	6255	6494	6099
Madhya Pradesh	5919	6037	6252	7013	7260	6572
Maharashtra	18465	19635	20942	22554	22833	23559
Mysore	6645	7301	7934	8660	8863	8003
Orissa	2006	2250	2327	2784	3185	3046
Punjab (old)	6065	6397	6764	7397	8113	4999
Rajasthan	4691	5416	5631	5252	6009	6176
Tamil Nadu	12744	13803	14637	15524	15724	17267
Uttar Pradesh	14428	15084	15328	15598	18166	19177
West Bengal	18077	19328	19905	22650	24493	24144
Delhi	3704	4135	4181	4549	5346	6026
Other Union Territories	1153	1184	1250	1402	1417	1968
Total	130140	138662	145748	157184	167899	167954

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research

in

National Income

STATEWISE ESTIMATES OF GROSS RENTAL FROM DWELLINGS  
1960-61 to 1964-65

By

V.S. Puri

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

Statewise Estimates of Gross Rental From Dwellings  
1960-61 to 1964-65

By

Shri V.S. Puri

The gross rental from dwellings consists of gross rental income accruing from ownership of dwellings. Gross rental from owner occupied dwellings has been imputed on the basis of rent paid by tenant occupied houses. Actually the rent per house in respect of urban areas is based on rental data either assessed by municipalities directly or estimated on the basis of tax demand and tax rate supplied by various municipalities.

In this paper an attempt has been made to estimate gross rental in respect of each State and Union Territory from 1960-61 to 1964-65. The estimates have been prepared separately for rural and urban areas.

For the year 1960-61 statewise estimates of gross rental in respect of urban dwellings have already been prepared on the basis of rental per person and estimated population. The statewise estimates for future years have been prepared by making use of the available data though not sufficient. The data are in respect of municipalities and comprise of house rent, house tax, no. of houses etc. etc.

In case of rural dwellings, the data from village panchayats comprising of house tax, value of houses and population were received from good number of States covering about 25 per cent of the village population. The analysis of the available data revealed that the rental per person in rural areas, as a whole, was approximately one third of the rental per person for the urban areas. On this basis statewise gross rental per person as well as per house has been worked for 1960-61. The base year estimates have been projected for future years on the basis of change in respect of rental per building observed in areas having population less than 20,000.

II

The estimates were prepared from whatever data were available. Wherever data were not available or were scanty, use was made of the data available for the adjoining state. To smoothen out the wide gaps from year to year an average for all the years or some years was taken. In case of urban areas data were available for Andhra Pradesh, Gujarat, Kerala, Madhya Pradesh, Madras, Maharashtra, Punjab, Rajasthan, Uttar Pradesh and West Bengal. For the remaining states and Union Territories the principle of applying change in respect of rental per building for the adjoining state was used. The following table gives the account of states/union territories where data in respect of adjoining state has been used.

<u>Name of the State/ Union Territory</u>	<u>Name of the adjoining State in r/o which data have been used.</u>
1. Assam	West Bengal
2. Bihar	Uttar Pradesh
3. Jammu & Kashmir	Punjab
4. Orissa	Madhya Pradesh

In respect of rural areas data are comparatively scarce. They are available for Madhya Pradesh, Madras, Maharashtra, Mysore, Punjab and West Bengal. For the remaining States and Union Territories as in the case of urban areas the principle of applying rate of change available for the adjoining state has been used. The following table gives the account of States/Union Territories where data in respect of the adjoining state has been used.

<u>Name of the State/ Union Territory</u>	<u>Name of the adjoining State r/o which data have been used</u>
1. Andhra Pradesh	Madras
2. Assam	West Bengal
3. Bihar	West Bengal
4. Gujarat	Maharashtra
5. Kerala	Madras
6. Jammu & Kashmir	Punjab
7. Orissa	Madhya Pradesh
8. Uttar Pradesh	Bihar

### III

#### URBAN AREAS

Gross rental in each state was obtained by multiplying rent per person with the estimated population for 1960-61. This was divided by the number of houses to obtain rental per census house. Rental per Census house was moved forward for future years on the basis of change observed in rental per building from year to year.

#### RURAL AREAS

In case of rural dwellings statewide <sup>gross</sup> rental was worked out by using two methods namely (i) by taking one third of per person rental for urban areas (ii) by taking one third of rental per house of urban areas. In this way the statewide gross rental for 1960-61 was worked out and the same were projected for future years on the basis of change observed in respect of rental per building in areas having population less than 20,000.

The results are given in tables No.1 to 3.

IV

URBAN AREAS

During the year 1960-61 gross rental in respect of urban dwellings crossed the mark of Rs.20 crores in five states only namely; Gujarat, Madras, Maharashtra, Uttar Pradesh and West Bengal. The greatest increase during the period 1960-61 to 1964-65 was of the order of Rs.35 crores in Gujarat. Next in order was West Bengal which showed an increase of Rs.16 crores. Increase in case of Gujarat appears to be high and might to be further examined when fresh data are available. High gross rental income in the base year is due to a high number of census houses as well as a higher estimated rental per census house. For example in Gujarat total no. of houses in 1960-61 was 955 thousand and the rental per census house was Rs.225.55 while in West Bengal number of houses was 1630 thousand and rental per census house was Rs.232.76 only with the result that base year rental income in the latter state is Rs.16 crores higher than that in the former.

RURAL AREAS

In respect of rural dwellings, gross rental income crossed the mark of Rs.20 crores, during the year 1960-61 in eight states namely, Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh, Madras, Maharashtra, Uttar Pradesh, and West Bengal. Total rural rental income is higher than the urban rental income due to larger number of rural houses. The number of rural houses compensates for lower rental per house.

The rural estimates have been arrived at by two different methods and give different results for each state. This is due to the reason that the first method depends upon population and rental per person while the second method depends upon dwellings and rental per dwelling. This also shows the limitations of per person method in the estimation of national income from ownership of dwellings.

V

On the basis of statewise proportions of gross rental for the year 1960-61 the all India figures of gross rental for the years 1961-62 to 1964-65 have been apportioned to obtain statewise gross rental for the years 1961-62 to 1964-65 both in case of rural as well as urban areas. Thus statewise estimates of gross rental in respect of rural as well as urban dwellings have been estimated for the years 1960-61 to 1964-65 by allocation method. Comparative estimates of gross rental by allocation method and statewise method are given in tables No.4, 5 and 6. The comparative figures of percentage increase in gross rental in 1964-65 over 1960-61 by using allocation method and by using method of statewise estimates in case of urban areas and also in case of rural areas are given in tables No.7 and 8.

VI

Table No.9 gives the All-India results in consolidated form. It will be observed that difference between the allocation method and statewise method is negligible so far as urban areas are concerned. In respect

of rural areas according to first estimates the difference ranges from Rs.23 crores to Rs.54 crores. According to second method difference ranges from Rs.9 crores to Rs.46 crores.

The above analysis goes to substantiate the observation that all-India estimates made on over-all basis would not tally with the all-India total of statewise estimates. The extent of difference would depend upon the difference in the basic data. It further goes to reveal the limitations of allocation method for statewise estimation.

## VII

The relationship between urban rents and rural rents needs further examination for each state and bigger union territories. The relationship may be one fourth or one third depending upon the data collected. It may be different for each state. It may even be different for each district. Theoretically there is no basis for assuming a uniform relationship between rural and urban rents though in practice the relationship may hold true for various regions. All these points will become much more clear when more and recent data are collected and analysed for each state.





State/ Union Territory	1960-61		1961-62		1962-63		1963-64		1964-65	
	no. of houses	Gross rental (Rs.)	no. of houses	Gross rental (Rs.)	no. of houses	Gross rental (Rs.)	no. of houses	Gross rental (Rs.)	no. of houses	Gross rental (Rs.)

Andhra Pradesh	51,07	2957	59,72	5885	5980	4176	81,67	6077	4965	95,50	6175	5897	
Assam	52,11	2001	55,36	2056	1097	54,64	2112	1154	55,95	2170	1214	57,29	2230
Bihar	35,56	6267	36,41	6260	2279	37,28	6253	2331	38,17	6246	2384	39,09	6239
Gujarat	75,18	2740	82,70	2804	2319	90,97	2870	2611	100,07	2937	2939	110,08	3006
Jammu & Kashmir	49,00	484	54,44	479	261	60,48	474	287	67,19	469	315	74,65	464
Kerala	31,40	2400	52,68	2451	1291	54,01	2604	1357	55,78	2558	1427	57,40	2612
Madhya Pradesh	37,90	5345	41,50	5422	2250	45,44	5500	2499	49,76	5578	2776	54,49	5658
Maharashtra	80,83	4068	88,91	5167	4594	97,80	5267	5151	107,58	5369	5776	118,34	5472
Mysore	51,11	3292	59,82	3301	2011	70,02	3431	2402	81,96	3504	2672	95,93	3577
Orissa	28,79	3090	31,53	3112	981	34,52	3134	1082	37,80	3156	1193	41,39	3178
Punjab	37,05	2667	41,16	2713	1117	45,73	2759	1262	50,81	2805	1425	56,45	2853
Rajasthan	45,83	2651	47,85	2707	1295	49,96	2765	1381	52,16	2823	1472	54,46	2833
Tamil Nadu	34,33	4935	75,23	5003	3764	87,97	5071	4461	102,87	5141	5289	120,30	5211
Uttar Pradesh	54,36	10475	55,56	10633	5908	56,89	10793	6140	58,26	10957	6384	59,66	11122
West Bengal	77,59	4844	79,45	5003	3975	81,36	5167	4204	85,31	5336	4445	85,31	5511
A & N Islands	33,33	9	34,13	10	3	34,95	11	4	35,79	12	4	36,65	13
Dadra & Nagar Haveli	-	10	-	10	-	-	11	4	-	12	-	-	12
Delhi	150,53	46	167,24	45	75	185,80	45	84	206,42	43	89	229,33	42
Himachal Pradesh	33,33	233	37,03	237	88	41,14	241	99	45,71	245	112	50,78	249
Madhya Pradesh	63,33	130	64,85	132	86	66,41	134	89	68,00	136	92	69,63	138
Tripura	77,77	169	79,64	177	141	81,55	135	151	83,51	194	162	85,51	203
L.M. & Islands	-	4	-	4	-	-	4	-	-	4	-	-	4
Goa, Daman & Diu	50,20	104	99,22	106	105	109,14	108	118	120,05	110	132	132,06	112
N.E. States	-	3	-	3	-	-	4	-	-	5	-	-	5
Nagaland	41,67	74	42,67	78	33	43,69	82	36	44,74	86	38	45,81	91
Pondicherry	61,30	50	72,39	60	36	84,65	51	43	98,99	53	52	115,76	54
<b>Total</b>	<b>33789</b>	<b>37224</b>	<b>41122</b>	<b>45555</b>	<b>50609</b>								

Rural



(1960-61 to 1964-65)

(Rs. Lakhs)

State/Union Territory	1960-61		1961-62		1962-63		1963-64		1964-65	
	by allo- cation method	Statewise estimates	by allo- cation method	Statewise estimates	by allo- cation method	Statewise estimates	by allo- cation method	Statewise estimates	by allo- cation method	Statewise estimates
Andhra Pradesh	1739	1739	1874	2040	2063	2396	2310	2810	2532	3298
Assam	246	246	265	275	292	311	327	349	358	391
Bihar	655	655	706	690	777	730	870	771	954	815
Gujarat	2154	2154	2321	2747	2554	3503	2860	4464	3135	5692
Jammu & Kashmir	123	123	133	133	146	145	164	164	179	181
Kerala	577	577	622	655	685	747	767	853	841	969
Madhya Pradesh	954	954	1028	1041	1131	1134	1267	1236	1389	1348
Madras	2671	2671	2878	2873	3167	3090	3547	3327	3889	3578
Maharashtra	5075	5075	5469	5325	6019	5592	6740	5870	7389	6161
Mysore	1406	1406	1515	1485	1667	1567	1867	1655	2046	1749
Orissa	183	183	197	204	217	226	243	252	267	278
Punjab	948	848	914	924	1006	1006	1127	1095	1235	1192
Rajasthan	683	683	736	716	810	751	807	788	994	826
Uttar Pradesh	2440	2440	2629	2515	2894	255	3240	2676	3552	2759
West Bengal	3795	3795	4090	4141	4502	4516	5040	4928	5525	5378
Andaman & Nicobar Islands	3	3	3	3	3	3	3	3	4	4
Delhi	1411	1411	1520	1494	1673	1583	1873	1676	2055	1775
Goa, Daman & Diu	45	45	49	47	54	43	50	52	66	56
Himachal Pradesh	13	13	14	14	15	15	17	17	18	19
L.M. & C. Islands	-	-	-	-	-	-	-	-	-	-
Manipur	20	20	22	27	24	39	27	58	29	84
Nagaland	5	5	5	6	6	6	7	9	7	11
N.E.F....	-	-	-	-	-	-	-	-	-	-
Pondicherry	25	25	27	29	30	30	34	36	37	39
Tripura	28	28	30	33	33	39	37	44	40	50
<b>Total</b>	<b>25099</b>	<b>25099</b>	<b>27047</b>	<b>27417</b>	<b>29768</b>	<b>30072</b>	<b>33334</b>	<b>33133</b>	<b>36541</b>	<b>36653</b>

TABLE D. UNIMPAID RENTALS BY STATES AND TERRITORIES (1960-61 to 1964-65)

(Rs. Lakhs)

State/Union Territory	1960-61		1961-62		1962-63		1963-64		1964-65	
	by allocation method	Statewise estimates by taking 1/3rd of per capita rental in urban areas	by allocation method	Statewise estimates by taking 1/3rd of per capita rental in urban areas	by allocation method	Statewise estimates by taking 1/3rd of per capita rental in urban areas	by allocation method	Statewise estimates by taking 1/3rd of per capita rental in urban areas	by allocation method	Statewise estimates by taking 1/3rd of per capita rental in urban areas
Andhra Pradesh	4144	2757	4333	3277	4581	3894	5014	4627	5280	5498
Assam	1244	1011	1301	1064	1376	1119	1506	1177	1585	1239
Bihar	1233	2396	3382	2451	3574	2507	3913	2564	4120	2623
Gujarat	2225	2074	2325	2335	2458	2629	2691	2959	2833	3332
Jammu & Kashmir	284	207	297	222	314	250	344	275	362	302
Kerala	1544	1092	1615	1148	1707	1206	1868	1268	1967	1333
Madhya Pradesh	2307	1927	2937	2140	3113	2377	3397	2640	3577	2936
Maharashtra	2414	4319	3570	4844	3774	5431	4131	6090	4350	6827
Mysore	2204	1637	2305	1956	2437	2338	2668	2794	2809	3339
Orissa	1770	926	1851	1021	1957	1126	2142	1242	2256	1369
Punjab	1036	1125	1606	1271	1698	1436	1859	1622	1957	1833
Rajasthan	1705	1170	1783	1247	1885	1330	2063	1418	2172	1516
Tamil Nadu	2512	2462	2627	2919	2776	3459	3039	4101	3200	4861
Uttar Pradesh	6924	5539	7241	5758	7654	5985	8379	6221	8822	6466
West Bengal	2627	3912	2434	4137	2573	4375	2816	4627	2965	4893
Andaman & Nicobar Islands	4	4	4	5	4	5	5	6	5	6
Dadra & Nagar Haveli	8	-	8	-	8	-	9	-	10	-
Delhi	27	61	28	66	30	74	33	78	34	85
Goa, Daman & Diu	65	46	68	52	72	58	79	65	83	73
Himachal Pradesh	123	89	129	100	136	114	149	128	167	145
L.M. & C. Islands	4	-	4	-	4	-	4	-	4	-
Manipur	81	66	84	69	89	71	98	74	103	77
Nagaland	38	32	40	35	42	37	47	40	49	43
N.E.F. etc.	33	-	40	-	42	-	47	-	49	-
Pondicherry	27	28	28	33	30	39	32	47	34	57
Tripura	115	95	121	102	127	109	139	117	147	125
<b>Total</b>	<b>63491</b>	<b>52375</b>	<b>60161</b>	<b>36258</b>	<b>62451</b>	<b>39969</b>	<b>6472</b>	<b>44180</b>	<b>48930</b>	<b>48980</b>

Table 6. Comparative Estimates of Gross-rental in rural areas - Second Method  
(1960-61 to 1964-65)

(Rs. Lakhs)

State/Union Territory	1960-61		1961-62		1962-63		1963-64		1964-65	
	by allocation	method	by allocation	method	by allocation	method	by allocation	method	by allocation	method
Andhra Pradesh	4144	2957	4333	3515	4581	4176	5014	4963	5280	5897
Assam	1244	1043	1301	1097	1376	1154	1506	1214	1585	1278
Bihar	3233	2229	3382	2279	3574	2381	3913	2384	4120	2439
Gujarat	2223	2060	2325	2319	2458	2611	2691	2939	2833	3309
Jammu & Kashmir	284	237	297	261	314	287	344	315	362	346
Kerala	1544	1229	1615	1291	1707	1357	1868	1427	1967	1499
Madhya Pradesh	2607	2026	2937	2250	3103	2499	3397	2776	3577	3083
Maharashtra	3414	4096	3570	4594	3774	5151	4131	5776	4350	6476
Mysore	2204	1683	2305	2011	2437	2402	2668	2872	2809	3431
Orissa	1770	890	1851	981	1957	1082	2142	1193	2256	1315
Punjab	1536	988	1606	1117	1698	1262	1859	1425	1957	1611
Rajasthan	1705	1215	1783	1295	1885	1381	2063	1472	2172	1570
Tamil Nadu	2512	3175	2627	3764	2776	4461	3039	5289	3200	6269
Uttar Pradesh	6924	5684	7241	5908	7654	6140	8379	6384	8822	6635
West Bengal	2327	3758	2434	3975	2573	4204	2816	4445	2965	4701
A & N Islands	4	3	4	3	4	4	5	4	5	5
Dadra & Nagar Haveli	8	-	8	-	8	-	9	-	10	-
Delhi	427	69	28	75	30	84	33	89	34	96
Goa, Daman & Diu	65	94	68	105	72	118	79	132	83	148
Himachal Pradesh	123	78	129	88	136	99	149	112	157	126
L.M. & A Islands	4	-	4	-	4	-	4	-	4	-
Mumbai	81	82	84	86	89	89	98	92	103	96
Nagaland	38	31	40	33	42	36	47	38	49	42
N.E.F.A.	38	-	40	-	42	-	47	-	49	-
Pondicherry	27	31	28	36	30	43	32	52	34	63
Tripura	115	131	121	141	127	151	139	162	147	174
Totals	33101	33789	40161	37224	42451	41122	46472	45555	48930	50609

Table 7 Statewise percentage increase in gross rental in 1964-65 over 1960-61 in urban areas.

States/Union Territories	Percentage increase in Gross rental in 1964-65 over 1960-61	
	by allocation method	by statewise estimate method
Andhra Pradesh	45.6	89.7
Assam	45.5	58.9
Bihar	45.7	24.4
Gujrat	45.5	164.3
Jammu & Kashmir	45.5	47.2
Kerala	45.8	67.9
Madhya Pradesh	45.6	41.3
Madras	45.6	34.0
Maharashtra	45.6	21.4
Mysore	45.2	24.4
Orissa	45.9	51.9
Punjab	45.6	40.6
Rajasthan	45.5	20.9
Uttar Pradesh	45.6	13.1
West Bengal	45.6	41.7
A & N Islands	33.3	33.3
D & N Haveli	-	-
Delhi	45.6	25.8
Goa, Daman & Diu	46.7	24.4
Himachal Pradesh	38.5	46.2
L.M. & A Islands	-	-
Manipur	45.0	320.0
Nagaland	40.0	120.0
N.E.F.A.	-	-
Pondicherry	48.0	56.0
Tripura	42.9	78.6
Total:	45.6	46.0

Table No.8

Percentage increase of the estimates of gross rental in rural areas  
from 1960-61 to 1964-65

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State/Union Territory	Percentage increase in gross rentals in 1964-65 over 1960-61		
	by allocation method	by taking 1/3 of rent per capita in ur- ban areas	by taking 1/ of rent per house in ur- ban areas
(1)	(2)	(3)	(4)
Aidhra Pradesh	27.4	99.4	99.4
Assam	27.4	22.6	22.5
Bihar	27.4	9.5	9.4
Gujrat	27.4	60.7	60.6
Jammu & Kashmir	27.5	45.9	46.0
Kerala	27.4	22.1	22.0
Madhya Pradesh	27.4	52.5	52.2
Maharashtra	27.4	58.1	58.1
Mysore	27.4	104.0	103.9
Orissa	27.5	47.8	47.8
Punjab	27.4	62.9	63.1
Rajasthan	27.4	29.6	29.2
Tamil Nadu	27.4	97.4	97.4
Uttar Pradesh	27.4	16.7	16.7
West Bengal	27.4	25.1	25.1
A & N Islands	25.0	50.0	66.7
D & N Haveli	25.9	-	-
Delhi	25.9	39.3	39.1
Goa, Daman Diu	27.7	58.7	57.4
Himachal Pradesh	27.6	62.9	61.5
L.M. & A Islands	-	-	-
Manipur	27.2	16.7	17.1
Nagaland	28.9	34.4	35.5
N.E.F.A.	28.9	-	-
Pondicherry	25.9	103.4	103.2
Tripura	27.8	31.6	32.8
Total :	27.4	48.5	49.8



Table No. 2

## COMPARISON OF TOTAL GROSS RENTAL BY DIFFERENT METHODS

Year	RURAL AREAS						(Rs. Lakhs)		
	First Method			Second Method			allocation	statewise	difference
	allocation	statewise	difference	allocation	State-	Diffe-	method	method	
	method	estimation		method	wise	rence			
		method			estimation				
					method				
(1)	(2)	(3)	(4)=(3)-(2)	(5)	(6)	(7)=(6)-(5)	(8)	(9)	(10)=(9)-(8)
1960-61	38401	32971	-5426	38401	33789	-4612	25099	25099	-
1961-62	40161	36258	-3903	40161	37224	-2937	27047	27417	+ 370
1962-63	42451	39969	-2482	42451	41122	-1329	29768	30072	+ 304
1963-64	46472	44180	-2292	46472	45555	-917	33334	33133	- 201
1964-65	48930	48980	+ 50	48930	50609	+1679	36541	36653	+ 112

PRELIMINARY & CONFIDENTIAL

LRIIW/70/1.12

INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

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REGIONAL INCOME ESTIMATION - BROAD  
SECTOR AGRICULTURE

By

G.K. Nathur & S.K. Aggarwal

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## REGIONAL INCOME ESTIMATION - RURAL SECTOR AGRICULTURE

by

G. . . Pathur & S. J . Aggarwal

### INTRODUCTION

The estimates of income at regional level can be prepared either from independent data available at State level or through the allocation of national totals to the States. The paucity of data at State level will usually force the estimator to use a combination of both the methods. In case of commodity producing sectors, with the exception of small scale industries, there are data generally available at State level that would enable us to estimate the value added from these industries for each State separately. In case of other industries, where the data permits estimation of value added only at national level, the value added from these industries is distributed between the different States on the basis of suitable indicators.

2. The CSO has made available to the State Statistical Bureaus, the standard methodologies for the preparation of comparable estimates of State domestic product for commodity producing industries. These are now followed by the standard methodologies for other industries. The State Statistical Bureaus have started preparing the estimates of state domestic product for commodity producing industries following broadly these standard methodologies.

3. In the case of commodity producing industries, excluding small scale industries, namely agriculture including livestock, forestry and logging, fishing, mining and quarrying and large scale manufacturing, the value added approach is adopted for the estimation of State domestic product. This is done by first estimating the value of gross output and then deducting the inputs of materials and services used up in the process of production in that industry. The result is called the 'value added'.

4. The aim of the present paper is to give the methodology for preparing the estimates of State domestic product only for the broad industry agriculture, i.e. agriculture including livestock, forestry and logging and fishing. A brief description of the methodology followed is given below:

#### Agriculture (proper)

5. The estimates of agricultural production are available at State-level. The crops included under agricultural

production are divided broadly into four groups, viz., (i) principal forecast crops, (ii) minor crops, (iii) miscellaneous and unspecified crops and (iv) other products and by-products.

6. The periodic estimates of area and yield of principal crops are initially prepared by the concerned State agencies and are coordinated by the Directorate of Economics and Statistics, Ministry of Food, Agriculture Community Development & Cooperation (LESag) and are issued in the form of final estimates for 35 crops (1) generally known as forecast crops. The final estimates are subject to revision in the light of subsequent information. The estimates of outturn of a crop are obtained by multiplying the area under it by the estimated average yield per hectare. Information on area is based on village records maintained by the State revenue authorities except West Bengal, Kerala and Orissa, where it is estimated on the basis of random sample surveys. The average yield rate of principal food crops and some non-food crops are based on the results of crop cutting experiments which have now become the principal means of yield estimation. But the coverage of such experiments vary from state to state.

7. The figures of land utilisation and area and production of principal crops are published by the LESag. in the 'Indian Agricultural Statistics' and 'Estimates of area and production of principal crops' respectively. The individual states also publish these statistics in respect of their state in the 'Season and crop reports'.

8. The State-wise estimates of area and production in respect of minor crops(2) are also made available by the LESag. The estimates of yield of these crops are based on the subjective methods of crop estimation and are not based on crop cutting experiments. In view of their commercial importance, special efforts are made by the LESag. to collect the figures of area and production from each state. The publications of the LESag. and the State Governments along with the annual returns of unpublished data obtained from the States are utilised in preparing these estimates.

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- (1) These are rice, wheat, jowar, bajra, barley, maize, ragi, small millets, gram, arhar, urid, moong, masoor, other pulses, linseed, sesamum, groundnut, castor, rape and mustard, coconut, sugarcane, cotton, jute, mesta, sannhemp, tobacco, dry chillies, dry ginger, black pepper, turmeric, potato, arecanut, niger seed, guar seed and safflower.
- (2) These are indigo, opium, sweet potato, tapioca, banana, cashewnut, cardamom, tea, coffee and rubber.

9. In addition to the crops mentioned above, there are certain crops/products for which production estimates are not available in the form these are required; a brief account of each is given below:

10. The estimates of gur production are prepared on the basis of the quantities of sugar cane used for gur production which is obtained by deducting the quantities of cane utilised for seed, chewing, juice extracting and sugar manufacturing from the total production of sugarcane and the state-wise conversion ratios from cane to gur obtained from the periodic estimates of sugarcane. The information on state-wise utilisation rate of sugarcane has been collected from the DMI's unpublished report on 'Marketing of gur'. The utilisation rates in respect of the state of Madhya Pradesh have been taken from 'Facts and figures' published by the Agriculture Department., Madhya Pradesh. The seed rate of sugarcane have also been given in the reports on cost of production of sugarcane for the states of Andhra Pradesh, Bihar and U.P. These rates are different from those of the DMI and are being further examined.

11. The state-wise production estimates of grapes and citrus fruits, as obtained from the relevant marketing report of the DMI, are projected to later years on the basis of the area figures given in the agricultural statistics. These yield rates relate to the year 1943 and, therefore, need improvement by conducting a fresh enquiry.

12. In case of mangoes, the production estimates given in the report on the 'Marketing of Mango in India, 1958' have been used except A.P., Kerala, E.P. and Tamil Nadu in which case estimates are framed on the basis of the yield rates obtained from the SSDs and the area figures taken from the agricultural statistics.

13. The miscellaneous and unspecified crop groups comprise of eleven unspecified crop groups(3). There are no outturn estimates available in respect of these crop groups, each of which might include a large number of items within it. In the absence of any current data on either area under each of these items or prices thereof, they could not be considered separately. Data on area under these unspecified crop groups are, however, available in the Agricultural Statistics. The value of production of such crop groups has been estimated by applying appropriate

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(3) These are other cereals, other oilseeds, other sugars, other fibres, other dyes and tanning material, other drugs and narcotics, other condiments and spices, other fruits and vegetables, fodder, miscellaneous food crops and miscellaneous non-food crops.

average value of yield per hectare to the corresponding area figures for each group separately. Under the group 'other oilseeds', nigerseed is evaluated separately in P.W. and Orissa and nigerseed and safflower in case of Mysore and lemon grass in case of Kerala. Type studies were conducted by the SSB Tamil Nadu and SSB Gujarat in 1966-67 and 1967-68 respectively to ascertain reliable estimates of value per hectare of selected minor crops. Since the estimates of value of yield per hectare thrown up by these enquiries are very much different from those being used, these are, therefore, being further examined in the light of the data available from other sources.

14. In respect of fodder, data on production is not available and the estimates at all-India level have been framed on the basis of consumption data available from the NSS report No.65 entitled 'Tables with notes on animal husbandry'. The all-India estimates of total production, thus prepared have been allocated to different states on the basis of area under fodder. SSB Maharashtra conducted a survey in 1967 to estimate the area and production of fodder but the results as obtained by the SSB are quite different from those being used. The estimates have not been adopted as it is thought desirable to have similar results from other States.

15. The important products and by-products covered are stalks and straw, grass, farmyard wood, bagasse, cotton sticks, sesamum sticks, jute sticks, arhar sticks, rice bran, rice husk and cane trash. The yield rates of stalks and straw have been culled out from the NSS report No.32 entitled 'Some aspects of cost of cultivation' but these are available only at zonal level and relate to the years 1951-54. The yield rates for each state have been assumed to be the same as for the zone in which it falls. These yield rates have, however, been inflated by 14.4 per cent to account for possible under-coverage on the basis of consumption data available from NSS Report No.65. Similar in case of grass, all-India estimates have been prepared on the basis of consumption data given in NSS report No.65 and these are allocated between the States on the basis of combined area under permanent pastures and other grazing lands, miscellaneous tree crops and groves, culturable waste, fallow lands and net area sown. In case of jute sticks, arhar sticks, sesamum sticks, cotton sticks, bagasse and cane trash only the all-India yield rates are available which have been collected from various research institutions and in some cases, these relate to one or two states only, e.g., arhar sticks for Rajasthan, sesamum sticks for Punjab, cotton sticks for Punjab and Tamil Nadu and the same have been assumed to hold good for all the remaining States.

16. The total quantity of farmyard wood from trees outside forests have also been estimated at all-India level on the basis of data given in the report on Timber, Trends and Prospects issued by the Ministry of Food & Agriculture, C.I. & Cooperation and have been apportioned to different states in proportion to the area under miscellaneous tree crops and groves and area under fruits excluding banana and grapes. These are carried forward to later years on the basis of movement of combined area under relevant categories.

17. The yield rates of rice bran and rice husk are, however, available at state-level from the Rice-milling Committee report, 1959-60. Changes in these rates need to be reviewed mainly due to change in the variety of seed and the method of cultivation.

18. The state-wise evaluation of the physical output of agricultural crops raises two main problems. The first is conceptual, relating to the nature of prices. This is particularly important in India because of the need to impute a value to subsistence output. The second problem is a practical one, which is what should be the appropriate price to evaluate the physical output. The scope of agriculture includes various types of ancillary activities of the primary producers such as transporting the crop output to the market using his own means. This in turn suggests that the farm output be evaluated at prices that accrue to the producers at the first point of sale. This requires evaluation at different prices prevailing in different areas, and knowledge of the quantity marketed at each price, with separate pricing for different varieties or grades of crops. This is still a distant objective due to the non-availability of the relevant data. A close approximation of this procedure for evaluating the physical output of field crops is to evaluate them at average prices prevailing during the peak marketing period.

19. Therefore, the output of each crop in each state has been valued at a weighted average of prices prevailing over the peak marketing period. The weights used are the outturn of the crop in each district. In respect of cereals and gram, state-wise weekly wholesale prices for different centres are collected from the BESAg. These prices are available with a time lag of about two months and are quite comprehensive and cover most of the important primary marketing centres from the point of view of each state and are representative of important mandis, producing and consuming, surplus, deficit and self-sufficient regions. These prices are collected by the BESAg under their marketing intelligence scheme. For the remaining crops,

price data obtained from the State Governments or collected from the statistical supplements to the state gazettes or the State bulletins on wholesale prices are used.

20. There are a number of commodities for which the price data is collected only for a very few centres and for some products and by-products such as grapes, fodder, grass, rice husk, etc. the prices are not available at all. Although LESAG is collecting prices for as many as 130 commodities (including 27 livestock products) but the coverage of centres is not adequate to give a fair average representative price. In many cases it has been observed that the prices are not reported in certain districts even though the production is in sufficient quantity. In certain cases and for some states direct prices are not available and as such use is being made of the prices prevailing in the adjoining states or the previous years. Prices are projected according to trend in prices observed in similar crops.

21. Information at present is not available on total market arrivals of different crops. Such information, if available, will enable valuation of each crop at a weighted average of twelve monthly prices, the weights used being the quantity arrived during each month. The peak marketing period at best represents about 60 per cent of the total production being brought to the market. The present procedure, therefore, is a close approximation of the method to be ultimately adopted.

22. With the change in the volume of production, the mode of transport and in the cropping pattern a number of new marketing centres have come into existence and the markets which were primary previously, have now become secondary and vice versa. This needs regular review of the markets and requires additions or deletions in the list of marketing centres.

#### Livestock

23. At present no direct information on output of various livestock products is available on annual basis. The marketing reports on several commodities, published by the L.I. do, however, furnish rough estimates of a number of these products at State level. The year of reference, however, differs from product to product. Besides, most of the information available in these marketing reports has become out of date and is not directly useful for arriving at the estimates of production for the current year. Recently the L.I.S. has conducted objective



surveys in a number of States and have furnished bench mark estimates of a few important livestock products for recent years for these States.

24. In the absence of any other reliable information on the subject, the only course available for estimating the current production in each State has been to carry forward the IARS/DRI bench mark estimates by relating them to the movement over time in the number of livestock of the relevant categories. It is, therefore, necessary to determine first the annual estimates of livestock population of relevant categories to serve as controlling totals for estimating the output of livestock products. The source of information for the livestock population at State level is the result of the various livestock censuses which are conducted at an interval of every five years throughout the country. Figures for the inter-censal years are interpolated and projected from the census results. Only in Madhya Pradesh, information on number of livestock is collected on an annual basis through the village patwari. This is published in the Season & Crop Report of the State. On examination it has been found, that proper check is not maintained and these figures suffer from misclassification and incomplete coverage. Such data, if collected regularly, by all States will furnish the actual figures of livestock population even for the inter-censal years. Otherwise for years affected by drought or floods, the estimation of livestock population becomes difficult. Moreover, these data can also throw light on slaughtering, import or export trade and migration of animals between the States. The method and the source material used in building up the production estimates for different livestock products is discussed below:

25. In principle, the quantity of milk produced in each state is arrived at by using the state-wise yield rates and the livestock population of the relevant category in that state. For this purpose it is also necessary to find the percentage of animals in milk to total milch animals. The information on State-wise yield rates of milk and percentage of animals in milk to total milch animals is available for 12 States(4) and are based on the results of objective surveys of the IARS. For the

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(4) These States are: Andhra Pradesh, Bihar, Gujarat, Kerala, Madhya Pradesh, Tamil Nadu, Maharashtra, Mysore, Orissa (Coastal region), Rajasthan, Uttar-Pradesh and erstwhile Punjab.

remaining States, the yield rates supplied by the LMI/State Governments are used. Milk is sold by the producers either as it is, in fluid form, or after being converted into ghee or desi butter. State-wise information on utilisation of milk and conversion factors of milk to milk products is obtained from the LMI. The relevant information is, however, not available separately for each type of milk, viz., buffalo milk, cow milk and goat milk.

26. The estimates of meat production are prepared on the basis of the state-wise yield rates supplied by the LMI. The number of animals slaughtered for each category of livestock including those slaughtered outside the slaughter houses and the number of animals fallen relating to the year 1958-59 have been taken from the LMI report on the Marketing of Animal Fats and Important By-products in India, 1961. The number of hides and skins are estimated from animals slaughtered for production of meat and animals fallen due to natural death.

27. A sample survey was conducted by the SSB, UP, during 1965-66, to estimate the number of animals slaughtered, meat yield rates, and production of meat and other products relating to different types of animals. The results of this survey could not be used as these were based on a very small sample and, therefore, suffered from incomplete coverage.

28. The SSB, Maharashtra has also undertaken a survey in 1967-68 to estimate the number of animals slaughtered, yield rates of meat and meat products, viz., meat, head and legs, horns, hoofs, fat, etc. The results of this survey are used for official estimates.

29. Recently, the IARS has conducted pilot sample surveys in the states of Tamil Nadu and Haryana to estimate the total meat production. The report relating to Tamil Nadu has already been made available and on comparison with the LMI results, it has been observed that the yield rates of meat estimated by IARS are higher than the corresponding rates of LMI in respect of all categories with the exception of buffalo, but the IARS estimates of total meat production are only 42.5 per cent of the corresponding LMI estimates. It is mainly due to the reason that the number of animals slaughtered estimated by the IARS are lower than those of the LMI.

30. Number of animals slaughtered in recognised slaughter houses in various states are also being collected by the State Animal Husbandry departments and published in the Statistical Bulletins of the SSBs. These figures are

generally based on incomplete coverage. SSB, Maharashtra has collected this information with the help of the District Statistical Officers and thus non-reporting of these figures is kept to the minimum.

31. The average yield of wool per sheep, based on the results of the objective surveys conducted by the IAS, are available for the States of A.P., Gujarat, Mysore, Rajasthan and Mizoram Pradesh. In the case of States for which information is not available, the results of the adjoining states are adopted. Wool is pulled out of many of the sheep that die. The estimates of pulled wool are prepared on the basis of yield rates supplied by the D.M. In the case of U.P. and Bihar, the State Departments of Animal Husbandry collected the information through sample surveys on the average annual yield of wool per sheep. These yield rates of wool are utilised to estimate the production of wool in these states.

32. The IAS has conducted sample surveys in A.P., Gujarat, Kerala, West Bengal, Bihar, Maharashtra, Mysore and Punjab, to estimate the yield rates of eggs laid per hen in rural and urban areas. For the remaining states, the yield rates of hen eggs have either been taken from the D.M. report on eggs or are determined on the basis of the data of the adjoining states. Yield rates used for duck and other poultry are those given in the marketing report on eggs. The utilisation rates of various types of eggs, i.e. eggs used for table consumption, eggs retained for hatching, etc., are again taken from the marketing report on eggs. No information is available on the number of various birds killed for meat production. This is estimated by assuming 50 per cent of the adult poultry killed plus the excess of the chickens produced during the year over the number required for maintaining the estimated growth rate of poultry.

33. Information on the average quantity of dung collected from bovines in cattle sheds has been estimated by IAS on the basis of their surveys conducted in the States of A.P., Gujarat, Maharashtra, Punjab, and U.P. These are, however, not available for different categories. The proportions of dung used for manure, fuel and cleaning purposes is also obtained from the IAS surveys. For the states, for which the information is not available, the results of the adjoining states have been utilised.

34. The increment in stock is estimated from the figures of different categories of livestock population estimated earlier.

35. The state-wise data on production of honey and silk worm cocoons are obtained from the khadi and village Industries Commission and Central Silk Board, Bombay, respectively.

36. For estimating the state average prices of various livestock products, information on wholesale prices available from different sources, viz. SSBs, Director of land records, DES, supplements to State Gazettes, etc. is pooled together and averages worked out over each year. These prices mostly relate to urban centres. The States of Assam, M.P., Maharashtra, H.P., Punjab, Tamil Nadu and U.P. have started the collection of wholesale prices in rural areas also but the coverage of area is inadequate. In case of Punjab, Haryana, M.P. and E.P., prices paid to producers are available for a number of livestock products and the same are used for evaluation. For miscellaneous livestock products, such as fats, tail stumps, horns, hoofs, etc., no data on prices are available. Therefore the all-India prices published in the D.I report on 'Animal Fats and Certain Important By-products in India (1961)' are used uniformly for all States duly adjusted for the change in prices with the help of the EA's index number of wholesale prices of meat. Prices are not reported separately for cow and buffalo milk in the states of Gujarat and Mysore. Dung is an important livestock product and it is used as a fuel and also for manuring purposes. Prices of dung are not collected at all and as such dung fuel is evaluated at 50 per cent prices of firewood in forestry and logging industry. Prices of various types of animals are collected, but these are quoted in wide ranges and there are wide fluctuations from one period to another. The SSBs may collect the prices of maximum number of livestock products from the maximum number of centres situated in rural and urban areas. To keep the flow of prices regular, the LSO's may be asked to scrutinise the data collected relating to their district.

37. Information on trade and transport margins and rural and urban price differentials are not available. Type studies may be undertaken at State-level to collect such information, which will be quite useful for arriving at the producers' prices.

38. From the total gross value of output, deductions are made for the value added by the rice-milling industry and for foodgrains procured by the Central and State Governments.

39. Data in respect of the proportions of rice milled in each state has been obtained from the 'Rice-milling Committee Report 1955'. The report on the 'Price Spread of rice-studies in costs and margins, 1959-60' issued by the LMI provides information on state-wise estimates of various components of milling charges per unit of paddy milled. The charges per unit of paddy as obtained from the said report, relate to the year 1959-60 and the current price estimates are prepared by using the change in index of the wages of rural skilled workers.

40. The principal source of information on the quantity and price per unit of various foodgrains procured at state-level is the 'Bulletin on Food Statistics' published by the DESag.

41. To arrive at the value of net product from agriculture the costs incurred in production are to be deducted from the gross value of output. The principal items taken into consideration are (i) seed, (ii) manures, (iii) pesticides and insecticides, (iv) feed of livestock, (v) market charges, (vi) diesel oil; (vii) electricity used on farms; (viii) irrigation charges, (ix) current repairs and maintenance of fixed assets and other operational cost and (x) depreciation of fixed assets.

42. The quantity of seed used as input in respect of the output of each crop is estimated separately for each state on the basis of information on seed rates given in the marketing reports of the LMI. As stated earlier, the data contained in the LMI reports relate to distant past and are based on trade enquiries. To the extent information on seed rate is not available from these reports, yield rates given in the NSS report No.32 are used. NSS results pertain to the year 1951-54 and are available at zonal/all-India level. Zonal rates have been assumed to hold true for each individual State within a zone. Recently there have been radical changes in the agricultural practices and these results may not be applicable now. Farm management studies reports pertaining to a number of states too contain data on seed rate which has been given in value terms rather than in quantitative terms. As these relate to two contiguous districts of each state, the results of these studies may not be representative for the whole state.

SSB Madhya Pradesh has undertaken a study to estimate the seed rate of various agricultural crops, the results of which have not been released so far.

43. Seed prices are not available and as such the price data used for evaluation of output is used for estimating the cost of seed for each state.

44. The value of organic manure used per hectare has been estimated at state-level from the NSS Report No.32. With the change in the composition of manure and in its usage over time, the NSS rates might require revision. Statistics of compost production both for rural and urban areas at state-level are compiled by the Ministry of Food, Agriculture, C.B. & Cooperation and are published in the Fertilizer Statistics. But this does not include farmyard manure, the figure for which has been roughly estimated at all-India level. Moreover, the prices of compost as well as farmyard manure are not available. The states of A.P. and Tamil Nadu have conducted studies on the use of urban compost in their respective States under 'Evaluation of Compost Programme'. Such data if collected for more states may be usefully employed for the evaluation of organic manure.

45. At present no firm data are available on pesticides and insecticides except its value of consumption at all-India level from the Directorate of Plant Protection, Ministry of Food, Agriculture, C.B. and Cooperation. This is allocated among the States on the basis of area covered under plant protection.

46. SSE, Maharashtra collected the data on pesticides and insecticides for their State from Block Development Officers for the year 1963-64 and collected similar information for 1966-67 and interpolated the figures for the intermediate years. This is not considered appropriate as the use of pesticide cannot be assumed to be uniform throughout a series of years, as revealed by the acreage covered under plant protection.

47. The items to be deducted for livestock feed are the cost of fodder, rice bran, grass, stalks and straw, cereals, gram, oil cakes, cotton seed, medicines and other miscellaneous feed. It is a difficult task to attempt such estimates. Feeding varies between different animals, different regions and even between different years in the same region and type of animals, depending on rainfall and severity of the winter. Information is required to be collected on the type and quantity of food given to different categories of livestock.

However, the procedure adopted and the assumptions made for the estimation of livestock feed at state-level on the basis of available data are as follows:-

48. The entire value of fodder crops, rice bran and grass and 95 per cent of the value of stalks and straw have been assumed to contribute towards livestock feed. The proportions of cereals fed to cattle have been obtained at all-India level from the 'Population and Food Planning in India, 1947' by Baljit Singh and used uniformly for all the states. Similarly, the expenditure on oil cakes at all-India level has been estimated on the basis of information given in marketing reports on oil seeds and used uniformly for all the states. In case of gram and cotton seed, the percentage fed to cattle is taken as 35 per cent and 85 per cent respectively and has been allocated among the states in proportion to its net availability in 1960-61. The expenditure on medicines etc. has been estimated on the basis of NSS Report No.65. The total feed thus estimated was allocated between agriculture and non-agriculture industries on the basis of information on classification of cattle and buffaloes by their broad use as revealed by the 1966 Indian Livestock Census results.

49. Since the physical output of each crop is valued at wholesale prices prevailing in the primary markets, these values have to be adjusted for the market charges, which the farmers have actually paid. The market charges have been estimated at all-India level on the basis of information given in the RBI's report on 'Rural Credit Survey, 1951-52'. The value of market charges as a proportion of total agricultural production as worked out for 1951-52 has been applied uniformly for all the States and for all the years. With regard to animal husbandry sector, information on market charges at all-India level is available for ghee and meat from the DMI reports and have been estimated for later years in the same manner as for agriculture.

except U.P. for which the proper- in sup- lled by the is used/

50. The number of diesel engines/tractors in use are available from the livestock census on quinquennial basis. These are interpolated/extrapolated for other years on the basis of trend revealed by these censuses. The average consumption of diesel oil per tractor at all-India level is given in the Planning Commission's Paper entitled 'Development of Agriculture in India, 1960-61 to 1975-76'. Consumption of diesel oil in diesel engine is assumed to be 1/3rd than that of tractor. The quantity of diesel oil used has thus been estimated. Use of tractors and diesel engines

has increased considerably during the past few years and consumption of diesel oil has assumed greater importance amongst the inputs, which, therefore, necessitates the study to estimate the consumption of diesel oil at state-level.

51. The RBI's survey on Rural Debt and Investment held in 1961-62 furnishes useful information in respect of the average cost of repairs, maintenance of machinery and other fixed assets used in agriculture along with the information on the value of fixed assets. This information was supplemented by the data on number of agricultural machinery, bullock carts etc contained in livestock censuses and their average cost and average working life obtained from some of the SSBs. On the basis of these data, the cost of repairs and maintenance and depreciation of machinery, bullock carts, plantation and orchards, reclamation of land, bunding and other land improvements, wells and other irrigation resources and farm buildings have been prepared at all-India level and allocated to different states on the basis of suitable indicators. These estimates will need revision when the estimates of capital formation become available at State-level. Further, these estimates are prepared for the bench mark year only and are projected to later years using certain indicators.

52. Data on electricity charges are obtainable from the Central Water and Power Commission, which provide data on the consumption of electricity and price per unit thereof used on farms for different states and may be considered fairly reliable. Similar remarks hold good for the information on irrigation charges paid by the farmers to the Government which is available directly from the budget documents of the states in the form of revenue received on account of sale of water for agricultural purposes.

#### Forestry and logging

53. The production under this industry includes timber, fuelwood and minor forest products. The Indian Forest Statistics (IFSt) issued by the DESAg publishes statewide estimates of the quantity and value of timber and fuelwood and value of the minor forest products based on the returns received from the State Forest Departments. The value figures of timber and fuelwood given in this publication are the aggregate government revenue from the forest produce and, therefore, do not represent their actual economic value. Similarly, the value of minor products represents only the seigniorage value of the produce.



54. The statistics of areas managed by the state forest departments are generally covered fully while those under the ownership rights of corporate bodies, civil authorities and private individuals are not.

55. The production data even in respect of reported areas represent only authorised exploited forest resources and do not take account of the unauthorised removal of forest products, whose magnitude is quite considerable. Thus all unauthorised removals of industrial or fuelwood are missed from official production data. Reliable data in respect of outturn of minor forest products are not available. The collection of data in physical terms in respect of some minor products have already been started but at present their coverage is not adequate. Data relating to the production of ballecs and charcoal in Rajasthan, Sandalwood in Tamil Nadu and lemongrass in Kerala are available on a regular basis and the same have been adopted for estimation purposes for these states.

56. Attempts have been made in TTS<sup>1</sup> and TTP<sup>2</sup> reports to arrive at the estimates of unrecorded production and unauthorised removal of timber and fuelwood at all-India level. The approach adopted for these estimates has been from consumption side by end uses of forest products. The extent of unrecorded production and unauthorised removal at all-India level for the year 1957-58 in the above reports have been used uniformly for all the states. Accordingly an allowance of 10 per cent of the value of recorded production has been made to cover all such unrecorded production for major forest products. The total estimated value of recorded and unrecorded production of major forest products thus estimated roughly works out at four times the value of revenue from major forest products reported in the IFSt. For minor products also the same ratio has been adopted to reported figures to arrive at their economic value uniformly for all years and for all states except Rajasthan and U.P. In case of Rajasthan and U.P., this factor, however, has been taken as 6 times and 3.6 times respectively of the reported value of minor products as suggested by the respective SSPs.

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1. Timber Trends Study for the Far East-Country Report for India 1958, issued by the Inspector General of Forests, Government of India and published by the Ministry of Food & Agriculture.
  2. Timber Trends & Prospects in India 1960-1975 issued by the Ministry of Food & Agriculture (Department of Agriculture).

57. An adjustment has also been made to account for new plantations on the basis of data relating to the expenditure on such plantations estimated in the budget documents of the State Governments and Union Territories.

58. The price to be used for evaluation of forest produce should include in addition to the stump price, the costs of felling, rough hewing, lopping and topping of round wood etc and their transportation to the permanent lines of transport. In the absence of such price data, wholesale prices of certain important varieties of timber and fuelwood pertaining to primary timber assembling centres covered in each state have been used for evaluation. These prices available from the State Chief Conservator of Forests/SSBs contain certain elements of trade and transport margins, as such the average prices worked out for each state have been deflated at a flat rate of 25 per cent to allow for such margins implicit in them. The deflation factor of 25 per cent has been worked out at all-India level by comparing the average prices with the production of timber as given in the TTS report and used uniformly for all the states.

59. Information is not available on inputs and these are arbitrarily assumed to be 5 per cent of value of gross output. This percentage has been further split up into (i) the value of repairs, maintenance and other operational costs and (ii) allowance for depreciation in the ratio of 4:1 on the basis of information on the purchase of commodities and services etc for Government forest, gathered from the budget documents of the State Governments.

#### Fishing

60. The statistics of production available for estimating the net product from this industry are broadly classified under two main heads viz. production of marine fish and production of inland fish.

61. The estimates of marine fish landings are framed by the Central Marine Fisheries Research Institute, Mandapam (CMFRI) on the basis of the sample surveys and are made available at state-level. State Fisheries Departments (SFDs) of Maharashtra and Tamil Nadu are also preparing the estimates of marine fish production for their respective states by using similar sampling designs but with a larger sample size. Fishery departments of other maritime states also frame the estimates of marine fish production on the basis of accounts maintained at the landing centres and curing yards. In Gujarat

the production estimates of fish (both inland and marine) are based on the royalty system after suitable adjustment for local consumption. Similarly, in case of West Bengal, the total production of fish is estimated from (a) per capita consumption of fish provided by the family budget survey conducted by the SSB, West Bengal, (b) estimates of population in the current year and (c) import into and export of fish from the State.

62. With regard to inland fish, the estimates of production are prepared by the SFLs on ad-hoc basis using varying methods of estimation. The coverage of the basic data, on which the State estimates rest also varies from state to state. In A.P., the estimates are prepared on the basis of the returns of market arrivals at selected centres submitted by the field staff of the SFL. In Assam the data on consumption provided by the NSS for rural areas and the state sample survey of consumption expenditure for urban areas, have been used for framing the estimates of inland fish production. The data on inland fish in Tamil Nadu continue to be based on the returns received from the regional administrative and research staff stationed at different fish curing yards and major water reservoirs. As regards Maharashtra, the estimates are prepared considering the conditions obtaining in each region, the extent of pisciculture activities and the estimated man-power employed in fishing industry. Recently the SFL, Orissa has prepared some tentative estimates of fish production on the basis of information contained in the 'Techno-Economic Survey of Orissa, 1962' published by the National Council of Applied Economic Research.

63. In pursuance of the recommendations of the all-India Fisheries Conference (1956), the Directorate of NSS has carried out a pilot survey of the inland fisheries in Orissa in 1961-62 in collaboration with the State Government to develop a suitable sampling technique for the estimation of the total catch of inland fish. This survey covered only three districts viz. Cuttack, Sambalpur and Nayurbhanj.

64. In preparing the estimates of net product from fishing the C.F.F.I data on estimated landing of marine fish by states have been used except for the states of Maharashtra, Kerala, Gujarat and the Union Territories of Pondicherry and Goa, Daman and Diu in which case the estimates prepared by the respective SFLs/SSBs have been adopted due to their better coverage.

65. Recently a Technical Committee on Fisheries Statistics has been constituted by the Government of India, consisting of the then Fisheries Development Adviser to the Government of India (as Chairman) and representatives from the CSO, the DESag, the IARS, Planning Commission and the Directorate of NSS. The main task of this committee would be to undertake a periodical review of the plans and results of the Mandapam Institute Survey. The Committee would also co-ordinate and review all fisheries statistics collected by all agencies like the CFRI, the NSS, State Governments etc. The committee will advise on the problems relating to concepts, definition, classification and methodology for collecting, tabulating and analysing the operational fisheries statistics required for administrative purposes. It will also provide necessary guidance to the statistical cells in the state Fisheries Department with regard to their programmes for development of fisheries statistics.

66. Prices accruing to producers implicit in the records on quantity and value of marine fish landings relating to the landing centres and the curing yards are adopted for evaluation. In the case of inland fish, the average prices at which the departmental catch is sold are used. In certain cases the average wholesale prices are used after making necessary adjustments for trade and transport margins.

67. No objective enquiry has so far been conducted in any state to prepare the estimates of subsistence fishing. Recently the SFL, Mysore, on the basis of local enquiries has estimated that it forms 12.5 per cent of gross value of output of inland fish in that state. In the official estimates the percentage rate available by the SFL, Mysore has been adopted for all States other than Assam, Madhya Pradesh, Tamil Nadu, Uttar Pradesh and Kerala, where the percentages used are 20, 0.1, 2.5, 8.75 and 25 respectively as suggested by the SSBs in consultation with their SFLs.

68. Value added by salting and sundrying is estimated on the basis of data on (i) utilization of fish (ii) quantity of raw fish let in and cured fish let out or (iii) the value of salt issued obtained from the SFLs in the maritime States.

69. Due to the non-availability of data on the production and value of various sea products, viz. pearls, chanks, oysters and sea weeds etc., the estimates of net product have been arrived at by multiplying the estimated number of persons engaged in such activities by the estimated net product per person for every state except Tamil Nadu, where use has been made of the independent estimates of the value of output prepared by the SSB.

70. Value of various inputs include the value of repairs, maintenance of boats, nets etc. and other operational costs and allowance for depreciation of fixed assets. These have been estimated on the basis of information on (i) total quantity and value of fish landed (ii) number, average price and average life of boats and nets by types (iii) average annual expenditure on repairs and maintenance on boats and nets by types obtained from the SFIs of Maharashtra, Gujarat, Kerala and West Bengal. In case of marine fish it has been assumed uniformly for all States that (i) the allowance for depreciation and (ii) repairs, maintenance and other operational costs each form 10 per cent of the gross value of output. For inland water fish however, it has been assumed that allowance for depreciation and repairs, maintenance and other operational costs together forms only 10 per cent of the value of gross output, with allowance for depreciation alone accounting for 4 per cent.

71. The description of the above methodology has shown a number of gaps and defects in the statistical material required for the estimation of state income for the broad sector agriculture. At present there are serious problems of time lag and out dated data. In a number of cases the statewise data are not available and the all-India estimates have been allocated to different states on the basis of suitable indicators. Attempts have, however, been made to bridge certain gaps by conducting type studies or sample surveys but these are confined to one or two states only. It can, therefore, be concluded that the types of gaps indicated in the methodology may be of assistance to the state governments and various other agencies in providing a frame work for the collection of statistics on various gaps needed for the estimation of state income from these industries as well as a guide to the improvement of existing statistics.

72. The details of the state-wise estimates of the net product from agriculture including livestock, forestry and logging and fishing for the year 1965-66, based on the fully revised data of agricultural production, are given in the enclosed table.

STATEWISE ESTIMATES OF NET PRODUCT FROM BROAD INDUSTRY AGRICULTURE  
1965-66 (at current prices)

Item	Value Rs. lakhs.			
	Uttar Pradesh	Assam	Bihar	Gujarat
(1)	(2)	(3)	(4)	(5)
<b>1. Agriculture and Livestock</b>				
<b>Agriculture (proper)</b>				
(i) foodgrains	37514	15976	68421	18721
(ii) oilseeds	9323	788	1306	9994
(iii) sugars	5883	704	3376	1570
(iv) fibres	1027	1614	2057	10102
(v) spices and condiments	5666	1593	1031	1042
(vi) fruits and vegetables	9261	4923	5706	2955
(vii) other crops and by-products	16525	8570	8945	9403
<b>Livestock</b>				
(viii) milk and milk products	11600	1217	9390	9420
(ix) meat and meat products	1883	324	603	1104
(x) hides and skins	664	67	470	261
(xi) eggs and poultry	1822	829	1280	273
(xii) other livestock products	1687	598	1987	1042
(xiii) total value of output from agriculture including livestock *	101832	36764	104238	66169
(xiv) value of inputs including depreciation	21991	5881	21379	16932
(xv) net product from agriculture †	81048	31033	83308	49777
<b>2. Forestry and Logging</b>				
(i) major forest products	714	703	1200	3445
(ii) minor forest products	592	276	220	136
(iii) other forest activities	32	14	43	22
(iv) gross value of output	1338	993	1463	603
(v) net product	1265	940	1381	568
<b>3. Fishing</b>				
(i) inland fish	1117	1410	1650	-
(ii) marine fish	706	-	-	403
(iii) other fishing activities	142	176	208	80
(iv) gross product	1826	1500	1757	443
(v) net product	1711	1444	1691	403
<b>Total broad industry agriculture</b>	<b>84024</b>	<b>33417</b>	<b>86380</b>	<b>50748</b>

Contd.

Item	Value Rs. lakhs.			
	Haryana (6)	J&K (7)	Kerala (8)	Madhya Pradesh (9)
<b>Agriculture and Livestock</b>				
<b>Agriculture (proper)</b>				
(i) foodgrains	12893	3811	7756	39748
(ii) oilseeds	1069	354	13478	5974
(iii) sugars	3834	8	323	1114
(iv) fibres	1879	16	52	2287
(v) spices and condiments	72	18	4644	443
(vi) fruits and vegetables	1211	279	10538	4011
(vii) other crops and by-products	4060	1206	5767	12970
<b>Livestock</b>				
(viii) milk and milk products	7703	1367	1704	8882
(ix) rest and leat products	187	487	341	1893
(x) hides and skins	122	57	75	817
(xi) eggs and poultry	95	281	784	662
(xii) other livestock products	1139	302	209	3338
(xiii) total value of output from agriculture including livestock*	33847	8208	45512	81973
(xiv) value of inputs including depreciation	8266	1502	8851	28245
(xv) net product from agriculture	25922	6729	41826	53965
<b>Forestry and Logging</b>				
(i) major forest products	38	1348	949	4246
(ii) minor forest products	12	12	40	1540
(iii) other forest activities	18	7	43	28
(iv) gross value of output	68	1483	1032	5814
(v) net product	62	1407	972	5518
<b>Fishing</b>				
(i) inland fish	10	48	80	114
(ii) marine fish	-	-	549	-
(iii) other fishing activities	-	-	57	-
(iv) gross product	9	45	626	111
(v) net product	9	43	568	109
<b>Total broad industry agriculture</b>	<b>25993</b>	<b>8179</b>	<b>43366</b>	<b>59592</b>

Item.	Value Rs. lakhs.			
	Maha- rashtra (10)	Mysore (11)	Orissa (12)	Punjab (13)
<b>Agriculture and Livestock</b>				
<b>Agriculture (proper)</b>				
(i) foodgrains	32562	35353	24061	20530
(ii) oilseeds	8227	7485	1597	2210
(iii) sugars	8097	4036	1309	3091
(iv) fibres	7259	1982	584	4925
(v) spices and condiments	2919	4612	606	303
(vi) fruits and vegetables	8034	4649	6758	2805
(vii) other crops and by-products	15155	10954	7660	6453
<b>Livestock</b>				
(viii) milk and milk products	8716	4720	2008	11306
(ix) meat and meat products	3572	1057	240	239
(x) hides and skins	784	370	95	133
(xi) eggs and poultry	2287	1292	769	333
(xii) other livestock products	885	2071	2017	1726
(xiii) total value of output from agriculture including livestock*	98576	77379	49736	53734
(xiv) value of inputs including depreciation	28030	17600	11051	13327
(xv) net product from agriculture	71177	60479	39416	41161
<b>Forestry and Logging</b>				
(i) major forest products	1984	-	1894	554
(ii) minor forest products	476	-	640	20
(iii) other forest activities	78	-	24	34
(iv) gross value of output	2538	1871**	2558	608
(v) net product	2395	1766	2426	571
<b>Fishing</b>				
(i) inland fish	104	200	351	14
(ii) marine fish	710	125	83	-
(iii) other fishing activities	75	30	59	2
(iv) gross product	812	330	463	15
(v) net product	737	310	441	14
<b>Total broad industry agriculture</b>	<b>74309</b>	<b>62555</b>	<b>42283</b>	<b>41746</b>



Contd.

Item	Value Rs.lakhs.		
	Rajasthan	Tamil Nadu	Uttar Pradesh
	(14)	(15)	(16)
<b>Agriculture and Livestock</b>			
<b>Agriculture (proper)</b>			
(i) foodgrains	25194	32519	99366
(ii) oilseeds	2864	12338	19437
(iii) sugars	501	6480	29637
(iv) fibres	483	2134	868
(v) spices and condiments	1455	2609	391
(vi) fruits and vegetables	781	5504	12092
(vii) other crops and by-products	12277	8802	28034
<b>Livestock</b>			
(viii) milk and milk products	13724	6582	23795
(ix) meat and meat products	896	2378	1970
(x) hides and skins	365	539	685
(xi) eggs and poultry	133	1035	389
(xii) other livestock products	3405	1799	6675
(xiii) total value of output from agriculture including livestock*	62622	80828	222735
(xiv) value of inputs including depreciation	20441	18574	49723
(xv) net product from agriculture	42956	62787	174683
<b>Forestry and Logging</b>			
(i) major forest products	-	254	3672
(ii) minor forest products	-	223	1030
(iii) other forest activities	-	42	125
(iv) gross value of output	842**	519	4827
(v) net product	799	484	4561
<b>Fishing</b>			
(i) inland fish	32	486	274
(ii) marine fish	-	1271	-
(iii) other fishing activities	5	186	25
(iv) gross product	35	1787	282
(v) net product	34	1640	271
<b>Total broad industry agriculture</b>	<b>43789</b>	<b>64911</b>	<b>179515</b>

(contd.)

Item	Value Rs.lakhs.		
	West Bengal	Union territories and Nagaland	All-India
	(17)	(18)	(19)
<b>Agriculture and Livestock</b>			
<b>Agriculture (proper)</b>			
(i) foodgrains	43420	8487.8	526332.8
(ii) oilseeds	945	741.0	98130.0
(iii) sugars	1233	218.0	71414.0
(iv) fibres	4554	333.9	42656.9
(v) spices and condiments	645	281.5	28330.5
(vi) fruits and vegetables	10672	2096.5	92275.5
(vii) other crops and by-products	9965	4721.5	171467.5
<b>Livestock</b>			
(viii) milk and milk products	6433	3393.7	131960.7
(ix) meat and meat products	2880	795.8	20849.8
(x) hides and skins	195	111.9	5810.9
(xi) eggs and poultry	1587	424.0	14275.0
(xii) other livestock products	1667	518.5	31065.5
(xiii) total value of output from agriculture including livestock*	82240	22159.5	1228552.5
(xiv) value of inputs including depreciation	10839	3212.3	280986.3
(xv) net product from agriculture	71737	18954.2	956816.2
<b>Forestry and Logging</b>			
(i) major forest products	-	-	20488.9
(ii) minor forest products	-	-	5740.7
(iii) other forest activities	-	-	515.1
(iv) gross value of output	1191**	2936.9***	30684.9
(v) net product	1123	2789.8***	29027.8
<b>Fishing</b>			
(i) inland fish	2975	123.2	8988.2
(ii) marine fish	-	200.7	4047.7
(iii) other fishing activities	8	29.5	1082.5
(iv) gross product	2805	325.9	13171.9
(v) net product	2686	301.0	12412.0
<b>Total broad industry agriculture</b>	<b>75546</b>	<b>21903.0</b>	<b>998256.0</b>

uly adjusted for non-reporting areas, lower value of procured food-grains and rice-milling charges.

Estimates based on revenue figures.

\*The estimates of Manipur are prepared on the basis of revenue figures.

includes net product from operation of government irrigation system.

PRELIMINARY & CONFIDENTIAL

IARNIW/70/1.13

INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research  
in  
National Income

PROBLEMS OF PREPARING COMPARABLE STATE INCOME ESTIMATES

By  
V.M. Patel

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors  
and not necessarily of the Organisations or Institutions to  
which they belong.

## PROBLEMS OF PREPARING COMPARABLE STATE INCOME ESTIMATES\*

by

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### 1. Introduction:

1.1 Considering that State income estimates are useful for planning and economic policy of a State, as are the National income estimates for the country, the computation of the State income estimates had been initiated by the State Statistical Bureaus. The estimates are prepared by adopting the income originating concept. State income estimates on accruing basis or personal income estimates are not attempted at present, as they require data on inter-State transfers which are not available. The available State income estimates have been generally used for measuring the growth of the economies of the States. The per capita State income estimates have been used by the Planning Commission and the Fifth Finance Commission as indicators of levels of economic development of different States. The estimates have also been used for measuring the tax efforts (State taxes as percentage of State income) made by different States.

1.2 Looking to the increasing demand of State income estimates, efforts for improvement and for achieving comparability of the State income estimates prepared by SSB's are being made by the Working Group on State Income. The Working Group on State Income has evolved standard methodologies which are to be adopted by the SSB's for preparing comparable State income estimates. But despite the efforts of the Working Group in evolving standard methodologies some problems relating to comparability will remain unsolved because of some inherent difficulties involved in preparing usable comparable State income estimates. Some of the factors which disturb inter-State comparability have been discussed in this paper. After discussing the problems in preparing comparable State income estimates, the utility of the State income estimates prepared by following income originating basis have been discussed and then suggestions for developing alternative indicators are made.

### 2. Conceptual Problems:

#### Restrictions on Free Movement of Commodities.

2.1 In the course of State Income Seminar held in Poona, Dr. V.K.R.V. Rao emphasised the difficulties in having a concept of State income similar to the National income and pointed out that -

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\*The author is grateful to Shri V.V. Divatia and Shri P.B. B. for their valuable suggestions.

"The free movement of the following sectors between States which exist by law make it practically impossible to have a concept of income for the State corresponding to that for the nation as a whole.

- i) Inter-State mobility of labour which is non-existent between countries.
- ii) Free movement of capital which is restricted by law across national frontiers.
- iii) Free movement of commodities between States which requires complete recording and accounting for inter-country flows".

Free movement of commodities between States has been considered as posing problems from the view point of recording and accounting inter-country flows, but a new dimension to the problem is added when restrictions on inter-State movement of some commodities are put. When free movement of some commodities does not take place between different regions of a country, then the price differentials of such commodities prevalent in different regions can also be attributed to non-economic factors. The economies of the regions to that extent can be treated as closed economies. Zonal restrictions on movement of foodgrains, groundnut etc. are examples of this. The extent to which such ban on movement of commodities acts on producer's prices in both the regions cannot precisely be known. The use of prevailing prices introduces differences in the purchasing power of the currency in the States and therefore the State incomes expressed in the same monetary unit do not remain strictly comparable.

#### Structural Differences in the Market Economies.

2.2 There are structural differences in the market economies of the States. The proportion of marketable surplus of agriculture, animal husbandry and fisheries sectors differ from State to State. Generally, a large percentage of the production of commercial crops like cotton, groundnut, tobacco, sugar and garden crops enter the market economy. This is not so in the case of foodgrains. The proportion of marketable surplus of foodgrains also differ from State to State depending on the production, consumption pattern and other factors. The evaluation of the retained part of the produce, at the same price as used for evaluation of marketed part of the production, will have different effects; and will thus affect the comparability of State income estimates.

/The economic value of such items which are not marketed differ

2.3 Similar to the problem, arising as a result of differences in market economy, is the problem of evaluation of products, which generally do not enter the market economy at all. Examples of such products are grass grown in pastures, cotton sticks and other by-products used as fuel, dung etc. / from areas to areas. Cotton sticks in some districts of Gujarat State are burnt away in the fields because there are no buyers and therefore have little economic value. Evaluation of grass production in the State, at the prices prevalent in other areas has raised the feed cost of the animal husbandry sector higher than the gross income of the sector. This is cited only to point out the problems arising when attempts are made to evaluate items which are not marketed, and/to rule out the possibility /not that on occasion costs may exceed output.

The above three factors do not assume much importance in national income estimation, but the factors become important, the moment, the regional level estimates, which are prepared for building the national level totals, are used for comparison of income originating in different regions.

#### Allocation of Operating Surplus

2.4 The problem of allocation of operating surplus arises while estimating the income of organisations whose activities cover more than one State, e.g. the railways, Post & Telegraph (Communication), Insurance and Banks etc. The operating surplus does not create any problem while estimating the national income. But any attempt to distribute the surplus among States is likely to introduce an unknown degree of differential between States and consequently disturb inter-State comparability of income estimates. Prima facie it would appear that one simple method by which the operating surplus can be distributed among States would be to allocate the national level estimates among the States on the basis of some indicators/criteria. But the only advantage of such a method would be that the net domestic product originating in the concerned sector when summated over the States would give the national level estimates. Such a procedure, however, is likely to distort the inter-State comparability. Some idea of the magnitude of the problem can be had from the total of the operating surpluses of the three sectors viz. (i) Railways, (ii) Communication and (iii) Banks & Insurance. The total of the operating surpluses of these sectors, which has to be distributed for preparing State level income estimates of these sectors, is Rs.187 crores for the year 1963-64. For 1964-65, the total is Rs.154 crores. The totals for these years were higher than the national income from some of the small sectors like fisheries, communication and electricity.

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3. Data Problems:

3.1 The factors vitiating inter-State comparability, arising as a result of (i) restrictions on movement of commodities from one region to other, (ii) differences in the market economies of regions and (iii) allocation of operating surplus have been discussed above. The above factors can be considered as conceptual problems and it is not possible to do away completely with them. The other factors which are more important and affect the comparability in a larger measure are problems whose origin can be traced to inadequate and obsolete data, and information of varying reliability from State to State used for preparing income estimates. Many of the major problems concerning inadequacy of data required for preparing State income and national income estimates are well known and are therefore not discussed here. Weaknesses of the comparable income estimates based on available data, of the three important commodity producing sectors viz. Agriculture, Animal Husbandry and Factory Establishment, are high-lighted.

3.2. Income from Agriculture

3.2.1 The reliability of income estimates of the agriculture sector is directly associated with the reliability of the estimates of production of the crops. The estimates of production of major crops are prepared both by traditional method and scientific crop cutting survey method as all the crops are not covered by crop cutting method. The percentage of area under principal crops on which crop cutting surveys have been conducted to total area under these crops and percentage of production based on crop cutting surveys to total production for the year 1967-68 are shown in Appendix 1. The value of crops which are covered by the crop cutting experiments amounted to Rs. 48 abja in 1960-61. The value adjusted for production not covered under crop cutting experiments is placed at Rs. 43 abja. The value of remaining crops (major and minor) is estimated at Rs. 13 abja. Details are given in Appendix 2. The value of estimates of such crops are prepared on the basis of production estimates prepared by traditional methods or value per acre basis. Out of the total value of all crops, about 31 percent of the value is based on production estimates prepared by traditional method or value per acre basis. The reliability of this almost one third part of the income estimate is not known. These components of income, reliability of which are not known, are not worked out according to States. The percentage contribution of this part of income will vary from State to State and for some of the States, it can be expected to be higher than

3.2.2. The estimates of value of by-products like straw, rice husk, rice bran, cotton sticks, tur sticks, sesamum sticks, bagasse and cane trash are prepared by adopting certain ratios. The estimates of grass, fuel wood and industrial wood are obtained by allocation of the national level estimates prepared by the Central Statistical Organisation. Due to the paucity of price data, the estimates at State level are also prepared by adopting the prices used for the national level by the Central Statistical Organisation. The contribution of such items to the gross income from agriculture at the national level is about 13 percent. But at the State level, the contribution in some States is found to be as high as twenty percent. The percentage contribution of these items to the gross income of various States is given below (Details are given in Appendix -3).

State	Value of by-products, grass, etc. as percentage of gross income from Agriculture.
1. Andhra	12.5
2. Assam	15.0
3. Bihar	11.7
4. Gujarat	10.2
5. Jammu & Kashmir	22.9
6. Kerala	7.6
7. Madhya Pradesh	19.2
8. Tamil Nadu	8.9
9. Maharashtra.	13.4
10. Mysore	13.3
11. Orissa	19.9
12. Punjab	11.3
13. Rajasthan	19.2
14. Uttar Pradesh	15.4
15. West Bengal	9.3
16. Himachal Pradesh	25.5
17. Tripura	18.8
18. Other Union Territories	13.5
19. All India	13.5



3.2.3 In 1960-61 the value of agricultural products, estimates of which are not based on crop cutting experiments and the value of by-products, accounted for about 40 per cent of the gross national income from agriculture. A significant proportion of the gross income at the national level is based on estimates the reliability of which is not known and the proportion if worked out for State levels would vary around this, with some higher proportions at least for some States. While working out the net income, the value of straw, grass, trach fodder etc. appears as deduct items since it forms part of the feed cost of animals. It is therefore believed that the net income would be relatively more reliable than the gross income. This may be true for the estimates at national level, but not necessarily for the State level estimates, since value of fodder, grass etc. needs to be adjusted for inter-State movement at the State level and adjustments are not made for inter-State movement. Moreover, the reliability of the net income also depends on the category of estimates of other feed items like grains, cotton seed, gram etc., and estimates of other inputs.

3.3 Income from Animal Husbandry

3.3.1 The major portion of income of this sector comes from the value of milk and milk products and dung. The percentage contribution of these two items to the gross income from Animal Husbandry according to States is given below. (Details are given in Appendix - 4 )

State	Percentage of the value of milk and milk products.	Percentage of the value of dung used as fuel and other dung.
1. Andhra Pradesh	69.5	8.9
2. Assam	36.4	18.1
3. Bihar	61.9	18.3
4. Gujarat	77.3	7.4
5. Jammu and Kashmir	48.2	15.5
6. Kerala	57.0	9.4
7. Madhya Pradesh	49.5	26.1
8. Tamil Nadu	54.0	15.0
9. Maharashtra	57.8	11.7

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States	Percentage of the value of milk and milk products.	Percentage of the value of dung used as fuel and other dung.
10. Mysore	42.3	15.6
11. Orissa	42.7	30.9
12. Punjab	75.1	15.9
13. Rajasthan	69.7	16.6
14. Uttar Pradesh	67.9	21.1
15. West Bengal	45.5	17.5
16. Himachal Pradesh	72.8	14.2
17. Tripura	31.7	15.6
18. Other Union Territories	74.1	7.5
19. All India	62.0	16.5

3.3.2 The reliability of the income estimates of this sector is dependent on the reliability of the estimates of milk production, dung production and prices. Estimates of milk production for some of the States are available from the sample surveys conducted by IARS in different States and in different years. The average daily milk yield rates, percentage of animals in milk to breeding animals are also available from the results of these surveys. Unfortunately, these useful surveys have not been repeated after 1963-64. For instance, the estimates of milk production for Gujarat State have therefore to be prepared by using the 1963-64 daily yield rates. A comparison of milk yield rates of buffaloes available for the year 1958-59 and 1963-64 have shown significant increase. Milk yield rates are also dependent on the availability of fodder and of other items of feed, as also on upgrading of existing milk-stock. Use of 1963-64 survey results without these adjustments is therefore not likely to give the representative estimates of production of milk. Projection of livestock population, adjustment for inter-State migration of animals and deaths during draught years poses serious problems at the State level, while estimating the number of animals in the years other than the livestock census years. The estimates of milk production other than the survey years are therefore not satisfactory for reflecting inter-State differences.

3.3.3 Non-availability of prices of dung used as fuel and for other purposes, and problems of estimation of livestock population (in years other than census years); are the main problems which beset attempts of preparing satisfactory estimates of income from dung.

#### 3.4 Income from Factory Establishment.

3.4.1 Income estimates at current prices can be prepared without difficulty at the State levels, since the required information is available from the Annual Surveys of Industries. However, the information on industrial production of various items at State level required for preparing constant price estimates is not found adequate at the State level, at least in the case of Gujarat. At the all India level, the constant price estimates are prepared by adjusting the value added in the base year, with the indices of industrial production at the industry group levels. The double deflation method is not followed for preparing the constant price estimates for the national level, since it is not found suitable considering the present availability of data. The reasons for not adopting the double deflation method are discussed in the chapter on "Income from Large Scale Manufacturing" in the paper on the Revised Series of National Income prepared by the C.S.C. and discussed at the Udaipur Seminar and therefore have not been repeated here.

3.4.2 The SSB Gujarat has prepared an index of Industrial Production for the State. The index is used for obtaining the income at constant prices. For preparing the index, the method similar to the one adopted for the all India Index is followed. However, the index for the State level is not found to be sensitive enough, because of the very high weight claimed by the cotton textile industry. The items for which production data are available for preparing the sub-group index of this industry at the State level and national level are the same. Information on yarn spun in the mills, according to five count groups and cloth woven according to four categories (coarse, medium, fine and superfine) is used for preparing the sub-group index of the cotton textile industry at the All India level. Similar information from the same source available for the State level is used for preparing the State level index of this industry. But the cotton textile industry has a weight of 62 out of 100, while it has a weight of only 25 at the national level out of 100 of the manufacturing division. Therefore, the sub-group index has comparatively preponderant effect on the overall index at the State level as compared to the effect at the national level.

3.4.3 The pattern of production of the cotton textile industry has undergone considerable changes during the last decade. Information with more detailed break down of production of clothes according to various categories, and post manufacture

process and treatment, mercerizing (e.g. pre-shrinking, tabilization etc.), production of cloth from blended man made fabrics etc. is essential if an index, which can reflect more correctly the changes in the industrial production at the State level is to be prepared. For preparing the all India index, the data available for cotton textile industry may be deemed adequate but it is not so at the State level. Similar situation may also obtain in the case of States, where one or two industries get high weights.

3.5 In the Revised Series of National Income, the CSO has employed the commodity flow method for improving the income estimates of the construction sector. Indicators of physical output or input have been used for preparing the constant price estimates of the small industries sector, while physical indicators reflecting changes in the volume of trading activity have been used for obtaining the constant price estimates of the trading sector. Such better methods which have been developed for the income estimation at the national level, unfortunately cannot be employed for improvement of State level estimates, due to the obvious difficulties in compiling information on stock, imports, exports or availability of inputs, required for preparing State level indicators. The data base of the construction, small industries, trade, transport and services is admittedly weak. An overall view apparently indicates that the gap between the available data and required data, for preparing usable State income estimates is wide. No doubt, efforts for additional collection of data to bridge the existing gaps in statistics are being made, but it may not be possible to have satisfactory comparable State income estimates in the near future and it is but necessary to think of developing alternate indicator.

#### 4. Utility of State Income Estimates

4.1 National income estimates are indispensable tools for planning and economic policy formulation at the national level, but utility of the State income estimates for planning and economic policy at the State level is considerably reduced because of the inadequate control of the State on various sectors of the economy and the role of the State Government which is confined to formulation of the schemes of the public sector outlay of the State Planning of balances between aggregate and sector plans is not done at the State level. The macro-economic projections of State income, savings, exports, imports or requisite production of commodities are not attempted by the State Governments. The projections made by the Planning Commission are also for the national level only and their break down according to States is not attempted.

4.2 The interest in State income is mainly centred at present as a measure of economic development of the State over time or in comparison to other States. For measuring the disparities in income of the States, Working Group appointed by the Planning Commission for identification of backward areas has also recommended per capita income of a State as one of the criteria for identification of backward areas. The States are administrative regions and not necessarily homogeneous economic regions, therefore there would also be imbalances in the economic development of various areas within the State. The Planning Commission has also suggested to the State Governments that while formulating plans for the State, they should identify imbalances in the economic development of the various regions of the State and make special provisions for minimising the imbalances. The State Governments are, therefore, interested in incomes of regions below the State level, for formulation of plans of the State. There have been suggestions for preparing district incomes and attempts have been made for preparing district income estimates. The Committee on Dispersal of Industries has recommended per capita income of a district as an indicator for classification of industrially backward districts. The Planning Commission has accepted a district as the unit for local planning. The demand for estimates of income of areas below the State level, for identification of imbalances in the economic development will increase. But preparation of income estimates for areas below the State level, would involve more complex problems than those confronted while preparing State income estimates. Looking to the need of the State Governments, the problems of preparing income estimates below the State level and non-availability of reasonably accurate State income estimates, the development of consumer expenditure series needs consideration as an alternate indicator of income. The advantages of developing the consumer expenditure series are discussed in the following paragraphs.

#### 5. Consumer Expenditure : An Alternate to State Income.

5.1 Importance of developing the consumer expenditure series for State levels has also been advocated before, + but it seems that consumer expenditure have not yet received the attention and importance it deserves. The presently available estimates of consumer expenditure for State level are not satisfactory as the estimates at State level have large error element and are not useful for inter State comparison. The advantages of having better estimates of consumer expenditure over the State income estimates at present are:-

- i) It is not possible to have satisfactory State income estimates at present, which would permit inter-State comparison of disparities in income. Reasonably accurate estimates of consumer expenditure can be prepared for the States and can be used in place of State income estimates.

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+ 'Certain problems concerning estimation of income, output and expenditure aggregates as well as preparation of social accounts at a regional level.' - B. Roy, M. Mukherjee, and B. Roy.

- ii) It may not be possible to prepare useful income estimates for districts or any area below the State level. The consumer expenditure estimates can be prepared for any area. The consumer expenditure estimates for areas below State level would be useful for identification of imbalances in the economic development of various areas in the State.
- iii) As a measure of welfare (which is closely related with the economic development of the State) of the people of the State, per capita consumer expenditure is a more relevant indicator than the per capita income (originating basis). With quantitative estimates of consumption of various commodities, the utility of consumer expenditure could be enhanced since it would facilitate comparison of levels of expenditure after elimination of price differentials among States.
- iv) The major portion of tax revenues of the States comes from Sales Tax and estimates of consumer expenditure with detailed break down of expenditure on various items would be more useful to the State Governments for taxation policies and forecasting tax receipts.
- v) The need for developing the series of personal income by States needs no emphasis. But the computation of this ideal series is not possible at Present since it requires data on inter-State transfers which are not available. In the absence of this series consumer expenditure series could be considered as a series nearer to it. Moreover receipts from direct taxes like income tax and land revenue are available according to States. The estimates of consumer expenditure along with the receipts from direct taxes would give a closer series to the personal income series. In spite of several limitations this series may prove useful in the absence of personal income estimates by States.

## 6. Conclusion:

6.1 In the above paragraphs, the problems of having comparable State income estimates in the near future have been discussed. The discussion reveals that even if standard methods and uniform sources are used for preparation of State income estimates, the inadequacy of data and quality of data differing from State to State are major factors which introduce incomparability in State income estimates. Till satisfactory State income estimates are available, the consumer expenditure can be used for inter-State comparison of disparities in economic development of State. There is an urgent need to prepare consumer expenditure estimates which would permit inter-State comparability from the consideration of alternative indicator for State income and its usefulness for plans and policy purposes of the State Governments.

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Appendix - I

Percentage of Area and production of principal crops on which crop-cutting surveys have been conducted to the total area and total production; 1967-68

Sr. No.	Crop	Percentage of area under principal crops on which c.c. surveys have been conducted to total area.	Percentage of production based on c.c. surveys to total production
1.	2.	3.	4.
<u>Cereals</u>			
1.	Rice	95.5	95.1
2.	Jowar	99.7	99.8
3.	Bajara	99.7	99.6
4.	Maize	91.7	93.9
5.	Ragi	77.8	75.4
6.	Small Millets	30.0	20.2
7.	Wheat	98.7	99.2
8.	Barley	99.0	99.4
9.	Total cereals	93.6	94.6
<u>Pulses</u>			
10.	Gram	98.6	99.4
11.	Gur	77.8	83.8
12.	Other kharif pulses	2.1	2.4
13.	Other rabi pulses	-	-
14.	Total pulses	45.7	61.3
15.	Total food grains	84.7	90.4
<u>Oil seeds</u>			
16.	Groundnut	91.7	90.5
17.	Castorseed	72.0	54.5
18.	Sesamum	59.3	51.2
19.	Rapeseed & mustard	23.4	19.4
20.	Linseed	40.4	39.5
21.	Total oil seeds	65.9	72.7
<u>Fibres</u>			
22.	Cotton	91.3	78.8
23.	Jute	98.6	98.6
24.	Hesta	12.2	15.5
<u>Other crops</u>			
25.	Tobacco	65.1*	68.5*
26.	Sugarcane	93.0	94.8
27.	Potato	44.7	42.2
28.	Chillies	6.5	3.7

\* Relates to the year 1964-65.

Source: - Area, Production and yield of principal crops in India 1949-50 to 1967-68 Directorate of Economic and Statistics, Ministry of Food, Agriculture, Community Development and Cooperation Government of India, 1968.

Appendix - 2

Gross value of crops, by products and Gross income from Agriculture  
All India 1960-61

(value in Rs. Lakhs)				
Sr. No.	Crop	Gross value +	Percentage of pro- duction based on % c. surveys to total production 1967-68	Value of producti based on c.c. surveys to total production (Rs. Lakhs)
1.	2.	3.	4.	5.
1.	Rice	194528	95.1	184996
2.	Jowar	33923	92.8	33855
3.	Bajara	13461	99.6	13407
4.	Maize	13352	93.9	12538
5.	Ragi	7549	75.4	5692
6.	Small millets	5233	20.2	1057
7.	Wheat	44568	99.2	44211
8.	Barley	8603	99.4	8551
9.	Gram	22122	99.4	21989
10.	Tur	7388	83.8	6191
11.	Groundnut	31499	90.5	28507
12.	Castorseed	676	54.5	368
13.	Sesamum	3488	51.2	1786
14.	Rape and mustard	10092	19.4	1958
15.	Linseed	2690	39.5	1063
16.	Cotton(Kapas)	27234	78.8	21460
17.	Jute	7947	98.6	7836
18.	Mesta	1702	15.5	264
19.	Sugarcane(gur)	25954	94.8	24604
20.	Potato	5783	42.2	2440
21.	Chillies	8804	3.7	326
22.	Tobacco	7645	68.5	5237
23.	Total (1 to 22)	484241		428336
24.	Other crops(excluding By-products)	133306		
25.	By-products	96422		
26.	Gross Income	713789		

(+ Information on Gross value is extracted from Table 2.4, chapter II on Agriculture. Revised series of National Income paper of the Central Statistical Organisation; discussed at Udaipur Seminar).



APPENDIX - 3

Value of grass, straw, farmyard wood and by-products and gross output in Agriculture 1960-61

(Value in lakh Rs.)

State	Total value of gross output	Total value of gross output of grass, straw and farmyard wood and by-products	Col. 3 as percentage of Col. 2
1.	2.	3.	4.
1. Andhra Pradesh	60477	7586	12.54
2. Assam	25968	3888	14.97
3. Bihar	54310	6370	11.73
4. Gujarat	35667	3650	10.23
5. Jammu & Kashmir	4254	976	22.94
6. Kerala	25508	1937	7.59
7. Madhya Pradesh	59889	11510	19.22
8. Madras	57164	5069	8.87
9. Maharashtra	72126	9685	13.43
10. Mysore	41040	5476	13.34
11. Orissa	27593	5477	19.85
12. Punjab	43213	4880	11.29
13. Rajasthan	31374	6016	19.18
14. Uttar Pradesh	114596	17626	15.38
15. West Bengal	53613	4986	9.30
16. Himachal Pradesh	1964	501	25.51
17. Tripura	2066	389	18.78
18. Union Territories	2967	400	13.48
19. All-India	713789	96422	13.51

Source: - Chapter II on Agriculture, Revised series of National Income, Paper of the CSO discussed at Udaipur Seminar.

APPENDIX - 4

Value of Milk Products and Dung, and Gross Income from Animal husbandry.

(Rs. in Lakhs)				
Sr. No.	State	Value of Milk and milk products	Value of dung used as fuel and other purposes.	Gross income from Animal husbandry
1.	Andhra Pradesh	12052 (69.5)	1542 (8.9)	17342 (100.00)
2.	Assam(incl.NEFA)	1034 (36.4)	515 (18.1)	2843 (100.00)
3.	Bihar	7259 (61.9)	2146 (18.3)	11716 (100.00)
4.	Gujarat	6767 (77.3)	650 (7.4)	8758 (100.00)
5.	Jammu & Kashmir	565 (48.2)	182 (15.5)	1172 (100.00)
6.	Kerala	1403 (57.0)	231 (9.4)	2463 (100.00)
7.	Madhya Pradesh	5711 (49.5)	2952 (25.6)	11532 (100.00)
8.	Maharashtra	7055 (57.8)	1431 (11.7)	12194 (100.00)
9.	Madras	6327 (54.0)	1760 (15.0)	11712 (100.00)
10.	Mysore	2863 (42.3)	1060 (15.6)	6774 (100.00)
11.	Orissa	2048 (42.7)	1482 (30.9)	4793 (100.00)
12.	Punjab	10236 (75.1)	2168 (15.9)	13627 (100.00)
13.	Rajasthan	12195 (70.1)	2891 (16.6)	17403 (100.00)
14.	Uttar Pradesh	18091 (67.9)	5633 (21.1)	26647 (100.00)
15.	West Bengal	3670 (45.5)	1409 (17.5)	8064 (100.00)
16.	Himachal Pradesh	493 (72.8)	96 (14.2)	677 (100.00)
17.	Tripura	65 (31.7)	32 (15.6)	205 (100.00)
18.	Other union territories	1000 (74.1)	101 (7.5)	1350 (100.00)
19.	All India	98834 (62.0)	26281 (16.5)	159272 (100.00)

Figures in brackets are percentages

Source:- Chapter II on Agriculture, Revised Series of National Income, paper of the CSC, discussed at Udaipur Seminar.

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research  
in  
National Income

GROSS CAPITAL FORMATION IN CONSTRUCTION IN INDIA

STATE-WISE ESTIMATES : 1960-61 TO 1965-66

By

R. N. LAL

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors  
and not necessarily of the Organisations or Institutions  
to which they belong.

GROSS CAPITAL FORMATION IN CONSTRUCTION IN INDIA -  
STATE-WISE ESTIMATES: 1960-61 to 1965-66\*

By  
R.N. LAL

1. Capital formation in construction accounts for the largest share in the aggregate Capital formation in India : According to the CSO study on 'Capital Formation in India: 1960-61 to 1965-66', hereafter referred to as 'the CSO paper', the contribution of gross Capital formation in construction (GCFC) to gross fixed domestic Capital formation is estimated to be of the order of about 55 per cent in the year 1960-61. The aim of this paper is to present the estimates of GCFC by States for the period covered by the CSO paper<sup>2</sup>. All India figures of GCFC provided in the CSO paper have been accepted as the controlling totals for the State-wise estimates framed for this paper.

2. The estimates of the CSO paper have been built up in two segments. Segment 1 is devoted to the framing of the part of the estimates covered by the commodity-flow (product) approach. Segment 2, on the other hand, attempts to construct the estimates related to the construction which falls outside the scope of the commodity-flow approach and is based on expenditure approach. The aggregates of the two segments give the estimates of the total Capital formation in construction in India for the years under study. Further, with a view to check the accuracy of the estimates of GCFC thus arrived at, an attempt has also been made by the CSO to prepare the estimates purely by expenditure approach. In this connection estimates in regard to expenditure on Capital formation in construction were worked out by the CSO for (i) the government sector (ii) non-departmental commercial undertakings (NDCUs), (iii) private corporate sector and (iv) the household sector. Attempts have been made in this

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\*1. The author is grateful to Shri A.L. Dasgupta, Joint Director and Head of the National Income Division, C.C. under whose guidance this paper has been written. Thanks are also due to Assistant Director Shri B. Vinayakam, who has worked hard for the preparation of Tables included in this paper.

2. The concept and scope of construction for the purpose of this paper is the same as accepted for the CSO paper. It includes all construction (contractual as well as own-account) attached to land. The estimates of Capital formation in construction, however, excludes the value of repairs and maintenance and construction for defence.

paper to prepare State-wise estimates for each of these sectors. No separate estimates have been prepared for Jaland. It remains included in Assam. The paper contains five sections. Section 1 is devoted to the preparation of the State-wise estimates for the government sector. Section 2 presents estimates for NDCUs. Section 3 works out the estimates for the private corporate sector. Section 4 deals with the household sector and lastly in section 5 consolidation of the estimates for all the four sectors for each State has been attempted.

### 1. GOVERNMENT SECTOR

3. Government sector consists of administrative departments and the departmental commercial undertakings (DCUs) of the Central Government, State governments and the local authorities. Expenditure on Capital formation in construction of the State governments and the local authorities in regard to the administrative departments and the DCUs are recorded in their budget documents<sup>3</sup>. State-wise estimates for these two agencies, therefore, have been worked out on the basis of information contained therein. The estimates are in conformity with the CFO estimates in respect of these two agencies. Estimates of GFCF worked out from the budget documents of these authorities are given below in table 1.

TABLE 1. EXPENDITURE ON CAPITAL FORMATION IN CONSTRUCTION BY STATE GOVERNMENTS AND LOCAL BODIES.  
(at current prices)

State	(Rs. crores)					
	:1960-61:	1961-62:	1962-63:	1963-64:	1964-65:	1965-66
1. Andhra Pradesh	38.5	34.4	38.1	43.4	53.7	65.7
2. Assam	12.1	10.3	13.4	14.0	20.7	24.7
3. Bihar	27.4	28.8	28.1	30.9	33.4	40.2
4. Gujarat	31.7	29.1	29.5	29.0	31.0	39.2
5. Jammu & Kashmir	9.6	12.5	12.6	10.3	10.8	15.1
6. Kerala	10.4	12.4	15.3	14.7	14.8	17.0
7. Madhya Pradesh	21.3	20.4	26.0	32.0	24.9	34.0
8. Maharashtra	42.8	46.4	46.0	48.1	58.5	81.9
9. Mysore	36.5	41.1	43.3	48.2	44.9	43.1
10. Orissa	18.3	18.6	23.3	33.9	48.6	32.6
11. Punjab	27.2	30.6	29.7	29.8	29.1	18.5
12. Rajasthan	26.0	24.6	27.6	23.3	26.4	42.9
13. Tamil Nadu	23.2	24.3	29.0	32.0	36.7	39.2
14. Uttar Pradesh	34.9	36.3	45.9	53.1	65.5	66.2
15. West Bengal	28.0	23.3	29.4	29.9	34.0	41.1
All States	387.9	393.1	437.2	472.6	533.0	601.4

3. Budget documents, however, give the value of land and buildings together. It is not possible to segregate the value of land from the total expenditure. Therefore the total value of expenditure has been treated as the value of construction. Again, the data given in the budget documents relate to the actual cash expenditure and not to accrual. It might be stated that letters were addressed to all the Chief Engineers of the States to supply information relating to expenditure on construction with a view to compare the estimates as worked out from the budget documents.

4. Difficulties arise, however, in regard to the preparation of the estimates of Central Government expenditure on construction in different States. Demand for grants of the Central Government does not provide information on the State-wise expenditure on construction by the Central Government. Similarly, the budget documents of the railways and the demand for grants of the posts and telegraphs (P&T) department also do not contain details of State-wise expenditure on new and replacement construction.

5. For expenditure incurred on construction by P&T Department letters were addressed to the Posts and Telegraphs Directorate (P&TD) to supply information separately for buildings and construction other than buildings. Provisional estimates of expenditure under both these heads have been obtained by the CSO.<sup>4</sup> All India estimates for P & T in respect of buildings based on information contained in the demand for grants as prepared in the CSO were compared with annual totals for all the States and Union Territories as supplied by the P & TD and the State-wise estimates for each year were adjusted to the totals built-up in the CSO. For construction other than buildings the State-wise break-up for the totals worked out in the CSO have been provided by the P & TD. Approximate State-wise estimates of expenditure on construction of buildings as supplied by the P & TD and the adjusted State-wise estimates appear in appendix 1.1. State-wise break-up of construction other than buildings appears in appendix 1.2.<sup>5</sup> Table 2 presents the State-wise estimates of Capital formation in

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4. Author of this paper feels greatly obliged to the head of the Statistical Cell of the P&TD Dr. S. L. Srivastava for having exerted personally a great deal to build up State-wise estimates for us in a very short span of time.

5. The pattern of expenditure on construction work (other than buildings) does not show a definite pattern with respect to States as well as points of time. This is because development projects related to coaxial cable laying, electrification, microwave links etc., were executed only in some States and at different intervals of time. Moreover, in some States, expenditure other than normal was incurred on construction work on border States during emergency. It might be stated in this connection that prior to July 1963 construction of building was done mainly by the Central Public Works Department (CPWD). Since then the work has progressively been transferred to the Civil Wing of P & T. The estimates presented here relate to the total expenditure on construction of buildings.

construction by P & T Department.

TABLE 2: GROSS CAPITAL FORMATION IN CONSTRUCTION - POSTS & TELEGRAPHS  
(at current prices)

States	(Rs. crores)					
	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
1. Andhra Pradesh	0.3	0.3	0.4	0.7	0.9	0.6
2. Assam	0.2	0.2	0.3	0.5	0.6	0.4
3. Bihar	0.7	0.7	1.0	1.6	1.7	1.3
4. Gujarat	0.3	0.3	0.4	0.6	0.8	0.5
5. Jammu & Kashmir	0.3	0.3	0.5	0.8	1.1	0.8
6. Kerala	0.3	0.4	0.5	0.9	1.1	0.7
7. Madhya Pradesh	0.5	0.5	0.7	1.1	1.3	1.0
8. Maharashtra	0.7	0.8	1.1	1.7	2.1	1.4
9. Mysore	0.4	0.5	0.7	1.1	1.2	0.8
10. Orissa	0.3	0.3	0.4	0.6	0.7	0.5
11. Punjab	0.5	0.5	0.8	1.3	1.6	1.1
12. Rajasthan	0.7	0.8	1.2	1.8	2.1	1.4
13. Tamil Nadu	0.8	0.7	1.2	1.9	2.1	1.5
14. Uttar Pradesh	0.8	0.8	1.3	1.8	2.2	1.4
15. West Bengal	1.1	1.1	1.7	2.7	3.2	2.4
16. Union Territories	2.2	2.4	2.8	4.0	5.8	3.5
All India	10.1	10.6	15.0	23.1	28.5	19.3

6. For railways the letters were addressed to all the zonal Chief-engineers. They are nine in numbers. Till now only partial information has been received from four zones comprising eight States. Attempts are continuously being made to obtain full information from all the zones. In the absence of complete information attempt has therefore been made to divide the total value of GCFC by railways as worked out from the budget documents of the railways on the basis of the proportions attributed to different States and Union Territories for allocating taxes from railways' fares<sup>6</sup>. This decision is based on the assumption that construction work on the existing lines as well as the old lines would be governed a great deal by the number of passengers travelling in different States. The estimates thus worked out for different States are presented in table 3 given below.

6. These proportions as worked out for the second and third Finance Commissions are based on route mileage and number of passengers attributable to States.

TABLE 3: GROSS CAPITAL FORMATION IN CONSTRUCTION - RAILWAYS  
(at current prices).

States	(Rs. crores)					
	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
1. Andhra Pradesh	12.4	12.7	16.1	19.4	20.3	19.1
2. Assam	3.8	3.9	4.9	5.9	6.2	5.8
3. Bihar	13.1	13.5	17.1	20.5	21.5	20.2
4. Gujarat	7.5	7.7	9.8	11.8	12.3	11.6
5. Jammu & Kashmir	-	-	-	-	-	-
6. Kerala	2.5	2.6	3.3	3.9	4.1	3.9
7. Madhya Pradesh	11.6	11.9	15.1	18.1	18.9	17.8
8. Maharashtra	15.2	15.5	19.6	23.5	24.7	23.2
9. Mysore	6.3	6.4	8.2	9.8	10.3	9.7
10. Orissa	2.5	2.6	3.3	3.9	4.1	3.9
11. Punjab	11.3	11.5	14.7	17.6	18.5	17.5
12. Rajasthan	9.5	9.7	12.3	14.8	15.5	14.6
13. Tamil Nadu	9.1	9.3	11.8	14.2	14.8	14.0
14. Uttar Pradesh	26.1	26.7	33.9	40.7	42.7	40.2
15. West Bengal	8.8	9.0	11.4	13.7	14.4	13.5
16. Union Territories	0.4	0.4	0.5	0.6	0.6	0.5
All-India	140.1	143.5	182.0	218.4	228.9	215.5

7. With a view to obtain the estimates of Central Government expenditure in States in regard to the administrative departments and DCUs other than railways and posts and telegraphs a number of agencies were approached<sup>7</sup>. In spite of our repeated attempts only partial success has been attained till now. Data have been received for some States in respect of some items. It has, therefore, not been considered desirable to use this data at this stage. The alternative procedure that has been adopted is as follows:-

The estimates in regard to the aggregate value of GCFC by the Central Government in all the States and Union Territories, has however been worked out in the CSO for all the years under study on the basis of information contained in the budget documents of the Central government<sup>8</sup>. From these estimates, the estimates of GCFC for railways and P & T have been deducted. The remaining sums are attributable to all the States and Union Territories. Of all the Union territories

7. Letters were addressed to the office of the Engineer-in-Chief CPWD, New Delhi and the Chief Engineers (CPWD) of New Delhi Zone, Northern Zone, South Western Zone, Western Zone and Food Zone for supply of information in regard to construction of buildings (residential and non-residential) road, bridges, river valley projects, other construction and works etc.

8. This information is also available in the annual publication on Economic Classification of the Central Government Budget issued by the Ministry of Finance. There are some discrepancies in the estimates worked out in the CSO and in the Ministry of Finance. For the purpose of this paper the estimates worked out in the CSO have been used.



some useful information has, however, been received for Delhi but it is difficult to make use of the same in the absence of information about other Union Territories. We have been able to get full information for all the years under study about construction of foodgrain godowns in different States and Union Territories. These have been taken for granted for this paper. The annual report of the Ministry of Works, Housing and Urban Development provides a list of important construction works undertaken by the Central Government each year indicating the places of location as well as the cost of each work. The list gives information in regard to the works completed during the year, works in progress and the works likely to be taken up soon. The entire value of cost shown against each work should not be treated as expenditure incurred during the year. But in the absence of other evidences relating to backward and forward spill over of the expenditure, the value of cost indicated in the report for each work has been accepted as representing the expenditure for the year. These works (exclusive of food-grain godowns) have been classified into different States and the State-wise value for each year has been worked out. After making a further deduction for expenditure on food-grain godowns (the data for which were obtained directly as stated above) from the sum attributable to States and Union Territories (exclusive of Railways and P&T), the remaining aggregate value of GCFC for each year for all the States and Union Territories has been divided into the States and Union Territories on the basis of the proportions obtained in regard to State-wise estimates worked out for each year based on information contained in the annual report referred to above. State-wise estimates of expenditure in different States (exclusive of Railways and P&T and inclusive of construction of foodgrain godowns) are given in table 4 presented below.

TABLE 4: GROSS CAPITAL FORMATION IN STATES - CENTRAL GOVERNMENT+  
(at current prices)

States	(Rs. crores)					
	: 1960-61:	1961-62:	1962-63:	1963-64:	1964-65:	1965-66
1. Andhra Pradesh	-	-	-	-	3.5	2.1
2. Assam	-	-	-	2.4	2.5	5.5
3. Bihar	-	-	-	3.6	1.5	3.3
4. Gujarat	-	-	-	5.2	4.4	3.6
5. Jammu & Kashmir	-	-	-	1.6	1.5	0.7
6. Kerala	-	-	-	-	1.0	2.7
7. Madhya Pradesh	-	-	-	8.5	5.1	9.9
8. Maharashtra	5.1	2.2	18.0	32.4	27.9	20.0
9. Mysore	-	-	-	-	-	-
10. Orissa	-	-	-	-	1.3	1.0
11. Punjab	5.7	5.0	-	2.6	3.1	3.5
12. Rajasthan	-	-	-	-	-	1.3
13. Tamil Nadu	-	-	14.2	9.4	4.5	4.1
14. Uttar Pradesh	-	0.9	1.0	7.5	5.5	9.3
15. West Bengal	1.9	1.6	4.8	18.6	6.5	8.5
16. Union Territories	49.8	59.6	55.7	47.5	82.7	76.9
All-India	62.5	69.3	93.7	139.3	151.0	152.4

+ Exclusive of railways and P&T.

2. NON-DEPARTMENTAL COMMERCIAL UNDERTAKINGS

8. NDCUs are of two types - financial as well as non-financial. Annual statements of accounts (balance-sheets) of these companies contain data not only on the aggregate value of the fixed assets but also the value of additions to fixed assets including construction. The gross value of additions to fixed assets in construction measures the value of new as well as replacement construction which would, in turn measure the value of GCFC. For the purpose of framing the estimates of GCFC we have taken into account gross additions to buildings (residential as well as non-residential), work-in-progress, other construction and expenditure during construction. For all the years under study data were obtained directly from the undertakings. For the undertakings which failed to supply data, attempts have been made to analyse their annual statements of accounts to work out the estimates for them. State-wise division of these companies have been made on the basis of the States in which they are located. Some of the Undertakings, however, have more than one branches located in different States. These undertakings were requested to furnish data on Capital formation in construction (under each head stated above) for each branch together with the names of the States in which the branches were located. The total value of GCFC as obtained by aggregating the value of GCFC for all the States and Union territories, however, differed with the totals given in the CSO paper on Public Sector accounts presented at Udaipur seminar on Revised Series of National Product. The magnitude of difference has, however not been large. We have, for the purpose of this paper, accepted the CSO estimates for the years under study as the controlling totals. The estimates for the Union territories as worked out by us has been kept in tact. Therefore we have deducted the estimates for the Union Territories from the CSO totals and the remaining estimates of the CSO have been divided amongst the States in accordance with the proportions obtained on the basis of the totals for each State worked out by us. Table 5 gives the State-wise estimates of GCFC in construction. The estimates pertaining to Union Territories are presented in a consolidated form.

States	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
1. Andhra Pradesh	3.4	5.3	6.5	10.5	18.7	35.5
2. Assam	2.8	5.2	8.7	18.8	18.6	3.3
3. Bihar	11.9	16.4	29.6	39.0	33.0	63.2
4. Gujarat	3.4	5.1	7.1	11.5	12.2	12.7
5. Jammu & Kashmir	-	-	-	-	-	-
6. Kerala	1.4	5.6	7.5	12.1	24.6	20.8
7. Madhya Pradesh	11.8	13.1	12.5	40.0	38.2	23.3
8. Maharashtra	4.7	8.0	16.0	21.3	14.9	16.0
9. Mysore	3.8	4.9	10.6	19.3	13.2	7.8
10. Orissa	5.9	4.8	6.2	8.0	7.6	16.7
11. Punjab	5.5	14.6	7.8	14.3	17.5	23.0
12. Rajasthan	0.4	3.4	3.2	6.7	9.3	14.9
13. Tamil Nadu	2.3	15.4	19.8	25.2	26.3	23.4
14. Uttar Pradesh	4.1	8.4	9.6	19.1	32.9	91.5
15. West Bengal	11.0	24.3	37.5	37.5	32.5	64.5
16. Union Territories	4.6	3.4	4.2	11.5	9.7	3.6
All India	77.0	137.9	186.8	294.8	309.2	420.2

3. PRIVATE CORPORATE SECTOR

9. The only source of information pertaining to GCFC in the private corporate sector is the RBI analysis of the sample companies published in the RBI Bulletins from time to time. The Studies relate to the finances of Indian Joint Stock Companies. The RBI analysis covers all types of companies in the private sector including the branches and the subsidiaries of the foreign companies. For the purpose of this paper, the uses of funds for GCFC as available for all the sample companies have been accepted to represent the estimates for the entire corporate sector. No adjustment has been made for the undercoverage. This is based on the assumption that a large number of small companies (not covered by the RBI Studies) which would account for not more than 30 per cent of the total paid up Capital might not have their own buildings.

10. State-wise distribution of GCFC as worked out for the sample companies, have been attempted on the basis of the State-wise addition to the paid up capital of the companies in the private sector (public as well as private) 10. There might be a number of companies which are having branches or units of operation in the States other than those where they are registered. To the extent this is so the picture of State-wise estimates gets vitiated. But it is hoped that the distribution would not hold true only in one or two cases. State-wise estimates

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10. State-wise paid up capital of the non-government joint stock companies are available in the publication 'Joint Stock Companies in India' issued by the Department of Company Affairs. The figures are available up to 1964-65 only. The figures for the year 1965-66 have been obtained by fitting a straight line to the totals of the paid up capital of the companies for the years 1960-61 to 1964-65 the trend of which was found to be linear. The total of the paid-up capital thus obtained is taken to be as on 31st March 1966 and has been distributed among the States on the basis of the state-wise proportions available for the year ending on 31st March, 1965. The differences between the paid up Capital as on 31st March, 1965 and 1966 have been worked out for each State and treated as additions to paid up Capital for the year 1965-66.

of Capital formation as worked out on the basis of the methodology stated above are given below in table 6.

TABLE 6. GROSS CAPITAL FORMATION IN CONSTRUCTION  
- PRIVATE CORPORATE SECTOR  
(at current prices)

States	(Rs. crores)					
	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
1. Andhra Pradesh	-	0.1	1.6	-	8.5	1.3
2. Assam	2.2	3.0	0.7	0.1	0.6	1.7
3. Bihar	5.0	-	0.5	45.1	-	0.7
4. Gujarat	39.4	4.7	5.3	0.4	5.2	4.1
5. Jammu & Kashmir	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
6. Kerala	-	0.2	0.6	-	3.6	1.3
7. Madhya Pradesh	-	-	0.5	-	6.3	1.4
8. Maharashtra	-	14.6	21.8	3.0	20.5	27.3
9. Mysore	3.2	1.9	1.0	-	4.0	1.5
10. Orissa	1.0	3.3	2.0	-	0.1	0.8
11. Punjab	1.2	0.3	0.2	0.2	-	0.7
12. Rajasthan	-	-	1.3	0.3	-	1.0
13. Tamil Nadu	6.2	7.1	5.3	1.5	3.6	6.3
14. Uttar Pradesh	1.1	0.1	0.2	-	10.1	1.9
15. West Bengal	23.0	11.5	11.1	5.0	15.7	22.8
16. Union Territories	3.8	0.5	4.8	3.9	0.4	2.8
All India	86.1	47.3	56.9	64.5	78.6	75.6

#### 4. HOUSEHOLD SECTOR

11. State-wise estimates of GCFC in the household sector have been based on the information contained in the report of All-India Rural Debt and Investment Survey (AIRDIS) 1961-62 and the NSS draft report No.133, seventeenth round (urban), the former containing information on Capital formation for the rural household sector and the latter for the urban household sector. First, the all India as well as the state-wise estimates were worked out for the year 1961-62. The estimates were worked out in two parts; (i) residential and non-residential buildings and (ii) other construction and works. The methodology adopted in respect of each of these two parts is given below.

12. State-wise estimates of Capital formation in rural residential buildings for the year 1961-62 is available in the AIRDIS report. The report also contains information in respect of non-residential buildings in farm and non-farm business. These estimates fall short of the total GCFC in residential and non-residential buildings for the reason that a sizeable part of the replacement expenditure remained included in the estimates of repairs and maintenance.

11. Data pertaining to repairs and maintenance for all the items of Capital formation in the rural sector have been obtained from the RDI directly.

which could not be segregated because of practical difficulties. Following the procedure adopted in the CSO paper two-third of the value of repairs and maintenance in respect of both residential as well non-residential buildings have been treated as replacement expenditure and in the absence of State-wise break-up of the value of repairs and maintenance the same has been added to the State-wise estimates of Capital formation on the basis of the proportions obtained for Capital formation. State-wise estimates of GCFC in residential and non-residential buildings in the urban household sector for the year 1961-62 have been worked out on the basis of information contained in the NSS draft report No.133 and the same have been adjusted with the estimates worked out in the CSO for urban residential and non-residential buildings dependent upon commodity-flow and expenditure approaches. The aggregate state-wise estimates for residential and non-residential buildings, thus obtained for the year 1961-62 have been moved to other years on the basis of a combined index of growth in population and income in each State. Estimates at 1961-62 prices for all the years under study thus worked out, have been converted into current price estimates with the help of deflators prepared for the purpose. The weights allotted to different inputs for preparing the deflators are (i) cement 7 .... (ii) iron and steel 7 .. (iii) bricks and tiles 18 (iv) timber and round wood. 28 (v) lime 8; (vi) labour 32. These weights have been determined on the basis of weights allotted for different inputs in respect of rural and urban housing indicated in the CSO paper. Weightage for the rural and urban housing for the purpose has been provided in accordance with the relative value of these in 1961-62. Finally, the State-wise estimates at current prices thus worked out have been adjusted to the all-India figures worked out for the CSO paper.

13. Other construction and works include (i) reclamation of land, bunding, terracing and other land improvement (ii) new plantations and addition to existing orchards and plantations (iii) wells and (iv) other minor irrigation resources. State-wise estimates for the rural household sector for the year 1961-62 in respect of these items are available in the report on AIRDIS. These estimates are also neither completely net nor gross, because a part of the replacement expenditure on these items gets reflected in the estimates of repairs and maintenance. Following the CSO methodology fifty per cent of the value of repairs and maintenance in regard to these items has been treated as replacement expenditure and added to the State-wise estimates of Capital formation under each head on the basis of the proportions obtained for Capital formation. State-wise estimates of other construction and works for the year 1961-62 in regard to the urban household sector is available in the NSS draft report No.133 stated above under the Title 'land development'. Having no break-up of this item as in the case of rural household sector, the same has been added to group (i) referred to above in regard to the rural household sector. State-wise estimate pertaining to each group has been moved to other years with the help of different indicators. Group (i) has been moved with the help of index of growth in the utilization of land in each State; group (ii) with the help of index of growth in the area under fruit cultivation; group (iii) on the basis of trend observed in regard to area irrigated by wells and lastly group (iv) on the basis of trend obtained in respect of area irrigated by minor irrigation schemes.

Estimates at 1961-62 prices, thus obtained have been converted into estimates at current prices with the help of index of wages of rural skilled labour as has been done in the CSO paper. State-wise estimates thus worked out for all the years have further been adjusted to the all India aggregates worked out following the methodology in the CSO paper. Table 7 gives State-wise aggregate estimates of GCFC in the household sector. The break-up of the estimates into buildings and other construction and work appear in appendix 1.3.

TABLE 7: GCFC IN THE HOUSEHOLD SECTOR  
(at current prices)

States	(Rs. crores)					
	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
1. Andhra Pradesh	70.5	87.4	77.8	70.4	79.5	92.1
2. Assam	12.4	13.5	12.6	12.1	13.1	15.3
3. Bihar	31.6	37.8	33.5	30.1	33.4	40.4
4. Gujarat	22.4	26.9	23.9	22.3	25.4	29.7
5. Jammu & Kashmir	9.8	10.6	9.2	8.5	9.1	11.3
6. Kerala	41.6	48.3	43.0	38.4	43.6	53.5
7. Madhya Pradesh	45.7	52.8	46.7	52.9	81.3	67.7
8. Maharashtra	50.7	57.3	52.5	52.1	64.1	67.6
9. Mysore	46.9	53.4	50.0	50.6	60.9	63.5
10. Orissa	15.9	18.1	17.0	16.3	17.7	20.6
11. Punjab	29.7	36.2	31.0	27.9	33.8	40.5
12. Rajasthan	28.6	34.4	30.9	27.7	32.3	37.4
13. Tamil Nadu	43.0	49.8	55.6	51.7	46.6	56.0
14. Uttar Pradesh	79.0	92.4	82.1	73.9	85.3	102.1
15. West Bengal	23.3	31.4	27.9	25.0	29.0	34.2
16. Union Territories	3.0	3.7	3.2	2.8	3.2	3.8
All India	554.1	654.0	596.9	552.7	658.3	735.7

#### 5. GROSS DOMESTIC CAPITAL FORMATION IN CONSTRUCTION IN INDIA

14. Table 8 as given below presents the consolidated picture of the State-wise estimates of GCFC for the country as a whole. The estimates have been based on expenditure approach and attempts have been made to tally these with the CSO estimates based mainly on commodity-flow approach. It might be stated here that the estimates presented for the household sector are inclusive of the estimates attributable to urban non-corporate non-household sector<sup>12</sup>. This is because the NSS estimates (1961-62) for the urban residential and non-residential construction has been adjusted to the CSO estimates and the CSO estimates for the urban household sector in this regard

12. For the purpose of this paper Co-operative societies are included in the non-corporate non-household sector

have been arrived at by deducting the estimates for the entire government sector of the economy, NDCUs and the private corporate sector consisting of Joint Stock Companies only.

TABLE 8. GROSS DOMESTIC CAPITAL FORMATION IN CONSTRUCTION  
IN INDIA - STATE-WISE ESTIMATES  
(at current prices)

States	(Rs. crores)					
	: 1960-61 :	1961-62 :	1962-63 :	1963-64 :	1964-65 :	1965-66
1. Andhra Pradesh	125.1	140.2	140.5	144.4	185.1	216.4
2. Assam	33.5	36.1	40.6	53.8	62.3	56.7
3. Bihar	89.7	97.2	109.8	170.8	124.5	169.3
4. Gujarat	104.7	73.8	76.0	80.8	91.3	101.4
5. Jammu & Kashmir	19.7	23.4	22.3	21.2	22.5	27.9
6. Kerala	56.2	69.5	70.2	70.0	92.8	99.9
7. Madhya Pradesh	90.9	98.7	101.5	152.6	176.0	155.1
8. Maharashtra	119.2	144.8	175.0	187.1	212.7	237.4
9. Mysore	97.1	108.2	113.8	129.0	134.5	126.4
10. Orissa	43.9	47.7	52.2	62.7	80.1	76.1
11. Punjab	81.1	98.8	84.2	93.7	103.6	104.8
12. Rajasthan	65.2	72.9	76.5	74.6	85.6	113.5
13. Tamil Nadu	84.6	106.6	136.9	125.9	134.6	144.5
14. Uttar Pradesh	146.0	165.6	174.0	196.1	244.2	312.6
15. West Bengal	97.1	102.2	123.8	132.4	135.3	187.0
16. Union Territories	63.8	70.0	71.2	70.3	102.4	91.1
All-India	1317.8	1455.7	1568.5	1765.4	1987.5	2220.1

LIMITATIONS OF THE STUDY - The estimates presented above for different sectors and sub-sectors differ in quality. For instance, the estimates presented for the sectors like State Governments and local authorities, P&T department and NDCUs may be treated as firm. There are little chances of improvement in them. Estimates for the household sector are based mainly on the methodology adopted for the CSO paper. Scope for improvement in these estimates is rather limited. The estimates presented for the railways and the Central Government other than railways and P & T are, however, the weakest links in the study and they should be treated as tentative. There is scope for considerable improvement in them. Direct contact with the Zonal Offices in-charge of construction in respect of these agencies, as has been made, it is hoped, would yield fruitful results and the revised estimates for those sectors are expected to be better. For the corporate sector better results can be expected in due course of time when efforts have been made at the Central or State levels to analyse the balance sheets of all the companies with a view to cull out State-wise information. As a number of companies would have branches in more than one State, the best thing would be that statistical agencies of each State government initiate action to collect data from the companies and the branches of the companies operating in each State. Even with all these steps the estimates

would still remain weak as the construction estimates pertaining to private non-corporate non-household sector (rural) remain in oblivion. The value of estimates for this narrow area completely left out might not be so large. Still the gap requires to be filled up. Information in regard to the whole of non-corporate and non-household sector needs to be collected with the help of surveys and type studies. In the end I do not know to what extent the estimates presented here would be acceptable but I do know that the challenges thrown up by this paper would at least be accepted.



APPENDIX

CAPITAL FORMATION IN CONSTRUCTION (BUILDINGS) -

POSTS & TELEGRAPHS  
(at current prices)

(Rs. Lakhs)

Name of States	provisional estimates as supplied by P. & T		estimates built-up on the basis of CSO figures												
	1960-61	1961-62	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	
1. Andhra Pradesh	4.3	3.5	5.2	8.2	8.8	8.9	8.9	8.9	7	4	7	10	11	13	
2. Assam	1.8	1.3	2.2	4.2	6.9	5.7	5.7	5.7	3	1	3	5	9	8	
3. Bihar	12.0	10.9	18.1	27.4	24.8	29.6	29.6	29.6	18	11	25	35	32	43	
4. Gujarat	4.6	3.1	5.2	8.1	11.8	8.1	8.1	8.1	7	3	7	10	15	12	
5. Jammu & Kashmir	3.7	2.8	4.7	6.5	12.7	7.1	7.1	7.1	6	3	7	8	16	11	
6. Kerala	4.3	3.9	6.2	10.5	13.9	12.4	12.4	12.4	7	4	9	13	18	18	
7. Madhya Pradesh	8.2	7.5	13.6	21.4	23.8	23.1	23.1	23.1	12	8	19	27	30	34	
8. Maharashtra	6.2	5.4	11.9	21.2	22.7	21.2	21.2	21.2	9	5	17	27	29	31	
9. Mysore	4.7	4.7	8.8	13.2	16.0	14.8	14.8	14.8	7	5	12	17	20	22	
10. Orissa	3.5	3.6	5.8	8.2	8.9	8.8	8.8	8.8	5	4	8	10	11	13	
11. Punjab	6.2	5.5	8.8	15.3	22.5	15.5	15.5	15.5	9	6	12	21	29	23	
12. Rajasthan	7.6	7.9	13.8	24.2	29.0	25.2	25.2	25.2	12	8	19	31	37	37	
13. Tamil Nadu	11.0	10.5	18.3	32.1	33.8	31.6	31.6	31.6	17	11	26	41	43	46	
14. Uttar Pradesh	7.9	7.7	14.7	24.3	28.8	25.4	25.4	25.4	12	8	21	31	36	37	
15. West Bengal	7.5	8.0	16.5	31.2	33.8	35.4	35.4	35.4	11	8	23	40	43	52	
16. Union Territories	20.7	22.6	32.6	60.9	87.4	57.4	57.4	57.4	32	23	46	78	111	84	
Total.	114.2	108.9	186.4	316.9	385.6	330.2	330.2	330.2	174	112	201	404	490	484	

APPENDIX 1.2

CAPITAL FORMATION IN CONSTRUCTION (Other than buildings) POSTS AND TELEGRAPHS  
(at current prices)

Name of States	(Rs. Lakhs)					
	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
1. Andhra Pradesh	24	28	37	61	75	47
2. Assam	12	15	30	49	48	35
3. Bihar	54	57	76	124	142	85
4. Gujarat	20	25	35	52	64	39
5. Jammu & Kashmir	26	30	45	75	90	65
6. Kerala	27	33	44	76	87	54
7. Madhya Pradesh	35	40	53	87	102	62
8. Maharashtra	65	72	96	142	178	114
9. Mysore	34	42	56	89	105	63
10. Orissa	20	22	30	48	59	37
11. Punjab	44	48	64	112	126	90
12. Rajasthan	64	71	99	150	178	98
13. Tamil Nadu	59	70	94	144	174	104
14. Uttar Pradesh	68	76	96	148	186	98
15. West Bengal	96	98	150	234	274	186
16. Union Territories	192	218	234	318	468	270
Total	840	945	1,239	1,909	2,356	1,447

APPENDIX 1.3

STATEWISE ESTIMATES OF CAPITAL FORMATION IN CONSTRUCTION  
BY HOUSEHOLD SECTOR  
(at current prices)

States :	Items	(as Lakhs)					
		1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
1. Andhra Pradesh	i) buildings	5756	7251	6275	5500	6132	7279
	ii) Other construction	1293	1488	1501	1539	1818	1935
2. Assam	i) buildings	601	744	634	564	638	807
	ii) other construction	636	611	626	649	674	727
3. Bihar	i) buildings	2604	3175	2744	2368	2639	3278
	ii) other construction	561	605	608	637	704	756
4. Gujarat	i) buildings	1481	1862	1585	1372	1559	1907
	ii) other construction	762	831	805	859	975	1063
5. Jammu & Kashmir	i) buildings	693	837	721	616	680	843
	ii) other construction	291	220	198	235	229	291
6. Kerala	i) buildings	3635	4372	3817	3320	3714	4703
	ii) other construction	527	457	480	522	640	646
7. Madhya Pradesh	i) buildings	2818	3523	3027	2744	3273	3948
	ii) other construction	1753	1756	1641	2550	4854	2825
8. Maharashtra	i) buildings	2989	3572	3070	2686	3002	3716
	ii) other construction	2080	2161	2179	2522	3410	3046
9. Mysore	i) buildings	2337	2841	2475	2158	2397	2976
	ii) other construction	2348	2499	2524	2898	3696	3373
10. Orissa	i) buildings	868	1049	929	826	875	1095
	ii) other construction	727	757	769	799	897	964
11. Punjab	i) buildings	2480	3107	2610	2287	2635	3326
	ii) other construction	492	511	495	503	739	719
12. Rajasthan	i) buildings	2317	2891	2506	2117	2376	2992
	ii) other construction	542	554	585	658	852	745
13. Tamil Nadu	i) buildings	2914	3547	4077	2630	2897	3655
	ii) other construction	1384	1434	1485	1541	1767	1949
14. Uttar Pradesh	i) buildings	6242	7528	6431	5493	6332	7813
	ii) other construction	1657	1713	1778	1893	2197	2394
15. West Bengal	i) buildings	2074	2880	2523	2206	2539	3064
	ii) other construction	254	261	272	296	365	355
16. Union Territories	i) buildings	295	364	321	273	309	380
	ii) other construction	2	2	1	4	11	4
All India	i) buildings	40104	49543	43745	37160	41997	51782
	ii) other construction	15309	15860	15947	18105	23828	21792

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IARNIW/70/1.16

INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research

in  
National Income

ON THE RANKING OF STATES ACCORDING TO THE LEVELS OF DEVELOPMENT

By

V.V. Divatia

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

ON THE RANKING OF STATES ACCORDING TO THE  
LEVELS OF DEVELOPMENT

by

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1. Introduction

The question of relative position of the States in the ranking attempted on the basis of per capita State income (PCSI) has assumed considerable importance in recent times, and particularly in the context of special Central assistance to backward States. PCSI is one of the four determinants of Central assistance, the other three being (i) population, (ii) tax effort in relation to per capita income, and (iii) the requirements for continuing irrigation and power schemes. It is understood that States with PCSI below the all-India net domestic product (NDP) of Rs.424 per capita qualify for additional Central assistance on the basis of this factor. The assumption appears to be that PCSI does measure the economically advanced or backward position of a State. It is the intention of this paper to examine this assumption. This paper also examines whether extra Central assistance to backward States could be allocated to such States on the basis of their relative position rather than on the basis of their PCSI above or below a certain level (which, in this case, is all-India NDP). The rationale of the procedures used in ranking the States has been discussed in Section 4.

2. The Emerging Pattern

If one examines the data on density of population, per capita State income and proportion of non-agricultural income to total PCSI for different States (Table I), one is struck by the following pattern: (1) Some States with high density (compared to all-India) of population, have a low per capita State income, and this is particularly the case for States for which non-agricultural income accounts for about half or less of the total State income. Kerala, U.P. and Bihar fall in this category.

(2) For some States, although the density of population is not relatively high, the per capita State incomes are low and this is particularly the case where the proportion of non-agricultural income is also comparatively low (say, round about 40 per cent or below). Jammu & Kashmir, Madhya Pradesh, Rajasthan and Orissa belong to this category.

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(3) There are some States which have relatively high per capita State incomes, although the population density is high. This is particularly the case for States which show high proportion (say, about 55 per cent) of non-agricultural income. Tamil Nadu and West Bengal belong to this category.

(4) Yet another group consists of States which have low density of population but relatively high per capita State income. Gujarat, and Maharashtra could be assigned to this category.

It must be pointed out that Punjab (including Haryana) has a higher per capita State income in spite of a somewhat higher than all-India density of population and a lower proportion of non-agricultural income. In a way, therefore, this State occupies a somewhat exceptional position.

TABLE I

State-wise Density of Population and Index of average Per Capita Income and Percentage of Non-agricultural Income to Total State Income

State	Density of Population per sq.km. based on areas as on 1-1-1966	Average Index of per capita income	Percentage of non-agricultural income
Andhra Pradesh (AP)	131	103.65	41.38
Assam (A)	60	105.65	38.30
Bihar (B)	267	71.34	48.44
Gujarat (G)	110	124.37	53.88
Jammu & Kashmir (J&K)	26	81.22	42.20
Kerala (K)	435	91.72	50.59
Madhya Pradesh (MP)	73	87.34	40.52
Tamil Nadu (TN)	259	107.91	57.03
Maharashtra (M)	129	128.69	62.65
Mysore (MY)	123	100.30	46.09
Orissa (O)	113	82.08	39.52
Punjab & Haryana (P)	166	126.92	39.86
Rajasthan (R)	259	84.56	39.41
Uttar Pradesh (UP)	251	81.91	39.22
West Bengal (WB)	398	125.38	60.65
All-India	134	100.00	

(Figures in brackets are abbreviations used in later Tables)

The pattern could be described more clearly through a 2 x 2 table (Table II) if the aspect of proportion of non-agricultural income is for the present left out of consideration.

Table II

Density of Population	Per Capita Income	
	High	Low
High	TN, P, WB	B, K, UP
Low	AP, A, G, M, MY.	J&K, MP, O, R.

This classification is based on the definition that States with figures of density of population and per capita State income above the corresponding all-India figures of density and NDP, respectively, are placed in the high category (Table I gives the relevant figures).

One could infer from the above Table that Punjab (including Haryana), West Bengal and Tamil Nadu exhibit high PCSI in spite of high population density and, therefore, in spite of relatively larger number to support per every acre of land. This consideration should classify such States into economically advanced position. Similarly, at the other end of the spectrum, the States of Jammu & Kashmir, Madhya Pradesh, Orissa, and Rajasthan can be placed in the category of economically backward States since, in spite of less mouths to feed and support for every acre of land, the State income per person is low. While in the former set of States it is certainly not the lack of persons which come in the way of exploitation of natural resources of the States, in the latter set of States the extent of exploitation of whatever resources or enterprise exist is not sufficient to bring up the levels of PCSI of these States.

In the case of the remaining two sets of States (in the other two cells), no such clear-cut conclusions seem to follow. Thus, it is not clear, if the States of Andhra Pradesh, Assam, Gujarat, Maharashtra and Mysore exhibit high PCSI because of low population density or / higher levels of economic activity and whether Bihar, Kerala and Uttar Pradesh have low PCSI because of high population density to support or lower levels of economic activity. For fitting these States in the total ranking of all States, therefore, it is proposed to examine the structural aspect of State income, viz., the proportion of non-agricultural income to the total State income. This is done because generally one finds a higher proportion of non-agricultural incomes as the economic development advances. Considering the States falling in the high PCSI and low density cell of the 2 x 2 Table first the ordering of the five States in this cell according to the proportion of non-agricultural incomes is as follows: Maharashtra, Gujarat, Mysore, Andhra Pradesh and Assam. Similarly, ordering of the States belonging to the low PCSI and high density cell is Kerala, Bihar and Uttar Pradesh. This procedure is intended to give 'order preference' to high PCSI over low PCSI as between the two cells, and 'order preference' according to the structural parameter within each of the two cells.

Another ranking procedure considered here is to arrange the intermediate States according to the descending values of the structural parameter irrespective of the intermediate cell in which they fall. The reason to be advanced for this is our inability to decide whether high-income-low-density States should be considered as economically more advanced than the States with low-income-high-density.

These rankings, as will have been observed, depend for their classification of high and low density and high and low PCSI on the all-India figures. In order to make them independent of these all-India figures, the procedure could be to consider first 7 or 8 States as high and the second 8 or 7 as low ranking States, and then arrange them in the 2 x 2 Table. One could also consider a 3 x 3 Table, with the classification of States into high, medium and low categories. The first five States are considered as having high ranks, the next five, medium ranks, and the last five as having low ranks. This is done in Table III below:



TABLE III

PCSI	High	Medium	Low
Population density			
High	TN, WB	K	B, UP
Medium	P, M	AP, MY.	O
Low	G,	A, MP	R, J&K

Such a classification also separates out relatively advanced and relatively backward States. The first and the last diagonal cells show that West Bengal and Tamil Nadu rank as the two highest ranking States, and Rajasthan and Jammu & Kashmir as the two lowest ranking States. Applying the same procedure of giving precedence to higher PCIS, the arrangement of the intermediate States can be considered. As before, within each cell, structural parameter, viz., proportion of non-agricultural income is made the basis of ranking. Thus, after West Bengal and Tamil Nadu, Punjab, Maharashtra and Gujarat are to be ordered considering the values of their structural parameter. The ordering given to them is Maharashtra, Punjab and Gujarat. Next State is Kerala followed by Mysore, Andhra Pradesh, Madhya Pradesh, Assam, Bihar, Uttar Pradesh and Orissa.

### 3. Comparison of different Procedure

The ranking according to the four procedures is as follows (Table IV). ....6/-

TABLE IV

Ranking according to different methods

Rank	Method			
	I	II	III	IV
1	M	P	P	WB
2	P	WB	WB	TN
3	WB	TN	TN	M
4	G	H	M	P
5	TN	G	G	G
6	A	MY	K	K
7	AP	AP	B	MY
8	MY	A	MY	AP
9	K	K	AP	MP
10	MP	B	UP	A
11	R	UP	A	B
12	O	MP	MP	UP
13	UP	R	R	O
14	J&K	O	O	R
15	B	J&K	J&K	J&K

Method I : According to descending order of PSCI.

" II : According to (i) PCSI in diagonal cells of 2 x 2 Table, and (ii) proportion of non-agricultural income for States in the high income - low density cell, followed by States in low income - high density cell.

- Method III : According to (i) PCSI in diagonal cells 2 x 2 Table, and (ii) proportion of non-agricultural income for all intermediate States.
- " IV : According to (i) PCSI in the first and last diagonal cells in 3 x 3 Table, and (ii) proportion of non-agricultural income for States in other cells with descending income categories and descending classification of density within each of these income cells.

The ranking of States in the descending order of their level of economic development, when density of population and structural property of the State income are considered in the manner described above is somewhat different from the ranking based on the PCSI alone. Furthermore, it can be seen that the ranking of intermediate States is different in methods II and III. The top five and last three States will be ranked the same way since diagonal cells of 2 x 2 table are not altered. The ranking in method IV is, again, different from the rankings derived by the other three methods.

The four rankings considered together bring out two points very clearly; viz., that West Bengal, Maharashtra, Punjab, Gujarat and Tamil Nadu are among the top five States - although their inter-se ordering varies with the different procedures adopted. Secondly, procedures II, III and IV show that Orissa, Rajasthan and Jammu & Kashmir are among the most backward States, although their inter-se rankings may differ. Even in procedure I, they are among the four most backward States. It is to be noted that among methods II, III & IV, the first top five, the intermediate seven, and the last ranking three States form the same set of States, although the inter-se ranking in each set may differ. It is interesting to note that if the PCSI factor for intermediate States is not taken into consideration (as in method III) the States of Uttar Pradesh and Bihar move up in the ranking. This is because, in considering only the structural parameter, Uttar Pradesh and Bihar get higher place in ranking. Considering ranking only according to PCSI, Uttar Pradesh and Bihar on the other hand got very low rankings. This is because of the fact that part of the reason for low PCSI is due to high density of these States. In the light of these observations, method II or III appear preferable. The intermediate States rank somewhat differently and may perhaps obtain different inter-se rankings with different possible procedures not considered here. For instance, if one considered the group of low income - high density States to have precedence over the group of low density - high income States, and so on, intermediate rankings may be different. If all these

States, whatever may be the groups (except those of high density and high income, and low density and low income) were ranked according to the values of the structural parameter or a weighted combination of PCSI and the values of the structural parameter, different orderings would result. The point is that it is important to rank these intermediate States on some rational basis.

4. Rationale of the Adopted Procedure

It has been observed that States with high density and low PCSI are considered less advanced as compared to high PCSI-high density States. This reasoning is as follows: Although agriculture, is the principal occupation of the major part of the population, it adds very little to income with additions of people on the farm or takes away little if some persons are removed from agricultural occupations. This is particularly so in the case of States with already heavy concentration of population per acre of land, given the industrial pattern of the State. Thus, it is the concentration of population which brings down the PCSI, and if in spite of this fact, a State with high density has high PCSI, it deserves to be ranked high and higher than the high density-low income States. Similarly, if in spite of the low density, PCSI remains low for some States, they can be reasonably considered as economically backward. Stated differently, prosperity attracts population and results in lowering the PCSI, whereas backwardness shuns population concentrations resulting in somewhat higher PCSI.

This is a feature of the under-developed and mainly agrarian economy which needs more emphasis than it has received so far. Under the circumstances, and particularly in the context of an economy basically dependent on agriculture, the mere fact of per capita State income for ranking the States does not appear reasonable. The PCSI needs to be considered in conjunction with the density of population.

While this procedure does separate out the advanced from the backward States, the intermediate States need to be ranked on some additional basis to work with. Here though there could be difference of opinion, it seems reasonable to consider the States in terms of the decreasing PCSI classification, i.e., high PCSI first, with medium or low densities, medium PCSI next with high, medium or low densities, and low PCSI with high, medium or low densities. These different cells are considered one after the other on the reasoning that States with high PCSI and medium density should rank higher than States with high PCSI and low density, the reasons being more or less the same as for separating out top and the bottom order State. But whether

medium PCSI with high density should get precedence over high PCSI with medium or low density is still open to question. Similar question could also be raised for the procedure adopted here in the case of intermediate States. As stated earlier, PCSI in their case (cell by cell) has been given precedence over any other rules of ranking.

Within each such intermediate cell, (i.e., all except for the top and the bottom diagonal cells), the additional consideration brought into play is that of the value of the structural parameter, viz., proportion of non-agricultural income to the total State income. A higher proportion points up to a higher level of development. And accordingly, within each intermediate cell of the 2 x 2 or 3 x 3 Tables, the States are ranked according to the descending order of this proportion.

It would appear from the above reasoning, that so long as agriculture is the main plank of the economy and supports a large chunk of under-employed or non-contributing population, the considerations of density of population will need to be taken into account for arranging the States according to ascending or descending order of their development levels. Furthermore, their structural weakness or strength has to be taken into consideration at least for the States which cannot be distinctly classified as advanced or backward, through the use of proportion of non-agricultural income to total income of a State.

It might be asked that when density-PCSI manifold is evolved, why is it that an index obtained by the product of density and PCSI cannot be used straightway to rank the States? This index would be equivalent to State income per unit of area. Apart from the fact that the density of population figures pertain to 1961 Census, and State income figures are more recent, the reason is that one cannot entirely go by such an index. It may perhaps be useful to consider a figure of, say, agricultural income per acre or per acre of cultivable area, but when the whole aggregate of State income is being considered and when industrial and tertiary products are not necessarily related to productivity of land, one cannot consider a composite figure of State income per unit of area. However, in view of the dependence of large part of State income on land, a two way classification of density and PCSI would appear reasonable.

## 5. Data base

As already observed, the source for the figures of density of population is the Census of Population, 1961. As for the PCSI figures, these are based on the State income figures for the years 1962-63, 1963-64 and 1964-65 alongside the population projections of the CSO for these years. The State income figures and hence also the PCSI figures are at current prices, or if one so likes, at local current prices (to bring out the fact that prices relate to the year as well as to the respective States), but these figures are expressed in terms of all-India per capita NDP = 100 and then these indices are averaged out over the three years to get the average index of PCSI for each State. In this way, the effect of variations of prices over the years is sought to be eliminated to the extent possible. Three years' figures are used to eliminate the fluctuations in per capita incomes, mainly due to climatic vagaries. The source for the data on PCSI is also the CSO's estimates of PCSI for each State. These estimates are supposed to have been worked out on the basis of methods employed for the so called comparable estimates of State income. There are several views as to how comparable estimates should be computed; or for that matter, whether there can at all be comparable estimates when data base of different States is at different levels of development and the methodology is so patently dependent on the availability of data. However, for the purpose of this paper, it is assumed that the available figures of PCSI do represent dimensionally the relative levels of economic development.

## 6. Concluding remarks

The exercise carried out in this paper shows that while the really advanced States and really less developed States can be separated out by the technique of two way classification in 2 x 2 or 3 x 3 manifold, it is a little difficult to consider the ranking of the intermediate States. The techniques further show that it may perhaps be possible to speak of top four or five States, intermediate five or six States and the States in the lowest ordering rather than give specific ranks. This may also serve the purpose of deciding on the issue of backward States. The reason for suggesting such groupings instead of ranking is that on considerations of three or four procedures adopted in this exercise, more or less the same set of States fall in these three groups; although their inter--so ranking within each group may vary with the procedures adopted.

Another point which also seems to emerge is that ranking on the basis of PCSI figures only does not appear to be appropriate for reasons stated in Section 6. In the type of under-developed and mainly agrarian economy as ours, this one single figure of PCSI appears patently inappropriate.

In so far as population is attracted to fertile lands forming high density areas, and it shuns less fertile underdeveloped or undeveloped areas, making for low density-low income areas, the solution seems to lie in increasing the productivity of land as much as possible in both the fertile as well as undeveloped areas. It would appear that a faster growth rate in the productivity of land which has so far remained relatively under-developed but which can be developed through modern techniques of farming, animal husbandry, etc. should offer a much greater scope for reduction of regional inequalities of incomes and better distribution of population. Concentrating efforts only on fertile lands for further increases in productivity to the neglect of other areas may, on the other hand, lead to increases in regional inequalities, further concentrations of population and available migratory movements of persons in working age groups.

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IARND/70/2.2

INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

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in

National Income

ROLE OF PRICES IN THE COMPUTATION OF INCOME FROM AGRICULTURE INDUSTRY

By

A. Kananohan Rao

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.



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ROLE OF PRICES IN THE COMPUTATION OF INCOME FROM  
AGRICULTURE INDUSTRY

by

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There are three customary levels of prices, viz., producers prices, wholesale prices and retail prices. Producers' prices are lower than the wholesale prices which in turn are lower than the retail prices. In the computation of the gross values of Agriculture produce, Wholesale prices in respect of a majority of the crops and retail prices in respect of few commodities are adopted. But the producers level prices viz., Farm harvest prices should be adopted to get the real value of Agriculture produce. An attempt is made in this paper to analyse the extent by which the gross values of Agriculture produce is inflated on account of the adoption of the wholesale prices instead of the Farm harvest prices in the computation of the income from Agriculture Industry. The analysis relate to the base level year 1960-'61.

2. The Wholesale prices collected refer to the rate at which a relatively large transactions of purchases in respect of the marketed produce, usually for a further sale is effected. This price relates to the model price i.e., the price at which most of the transactions take place during the period of marketing on a particular day at the selected centre. It is the price at which the transaction takes place irrespective of the terms of the contract and includes different incidentals such as a charges of weighment, wholesalers commission, Charity, cost of container and if it is not in the normal practice includes tax. Thus, this price is more than the Farm harvest prices.

3. There is distinction between the wholesale markets at which the produce is sold. Wholesale markets may mean the markets where the traders engage in whole transaction with the traders themselves. It may also mean a market where wholesale transactions are effected between the producers and producers, and between the producers and retail traders or between the producers and consumers themselves. In practice it is very difficult to find such clear cut markets operating at any point of time. Though it may not be possible to make such distinctions between the markets of one type or other for theoretical purposes, there is the problem of location of the markets whose prices we are going to use. Sometimes we may find price differences between the shops located at the same town or village. Further the centres once selected for

the collection the wholesale prices are continued without any reference to the transactions done during the year for which the gross values of agriculture produce are compiled by us. In view of this the wholesale prices collected and used for the computation of the income from Agriculture sometimes, may not be the actual wholesale prices and as such the prices do not reflect the correct prices.

4. Even while using the wholesale prices we will be over-estimating the gross value of the agriculture produce to the extent that the entire production is not marketed. While evaluating the value of the agriculture produce using the wholesale prices, the entire production is taken into consideration instead of taking the marketed produce only, deducting the produce required for human and domestic consumption by the producer and for seed requirements etc. But while calculating the gross values, the entire production is taken as marketed in the whole sale markets which is not at all correct. No doubt, the crop wise estimates relating to the quantity of various commodities marketed are not available. But this data can easily be collected through some ad-hoc surveys.

5. During the 15th round of National Sample Survey conducted during the year 1959-'60, certain estimates relating to the disposal of major cereals were prepared. The Andhra Pradesh state Statistical Bureau also participated in this survey during the year 1959-'60 and as per the data collected during this round it is estimated that about 87.88% of the produce of major cereals viz., Rice, Wheat, Jowar, Bajra, Maize, Small-billet and Pagi mainly or wholly consumed at home while the remaining 12.12% of the production is mainly or wholly grown for the purpose of marketing. Out of this marketed produce, 42.39% is sold at home, 32.22% is marketed in the village, 20.03% is estimated to be marketed outside the village and remaining 5.36% at other places. As such while evaluating the value of these crops, gross value in respect of the quantities intended for consumption and that marketed within the villages should be based on the farm harvest prices and that sold outside the village should be based on the whole sale prices.

6. Separate estimates of consumption and quantities marketed in the village and outside the villages were also given in respect of these crop. The following table (1)

furnishes the quantities consumed and sold and their respective gross values.

TABLE I.

Sl. No.	Crop	Produce consumed and sold in the village (Tons)	Farm harvest prices in P. per quintal.	Value of the produce Col.4 & Col.3 (P. in crores)	Produce marketed outside the village (tons)	Whole sale prices in P. per quintal	Value of the produce col.6 col.7 (P. crores)
1	2	3	4	5	6	7	8
1.	Rice	34,43,097	58.10	200.04	159,599	63.68	1.01
2.	Jowar	13,18,573	34.28	45.20	16,286	34.49	0.56
3.	Wheat	3840	53.22	0.20	-	-	-
4.	Bajra	29,16,29	34.38	10.03	761	35.16	0.03
5.	Maize	15,24,02	32.32	4.93	-	-	-
6.	• Ragi	28,52,21	34.54	9.85	29	38.13	0 (Negligible)
7.	Korra	17,59,35	31.33	5.51	2,065	34.67	0.07
8.	Varagu	11,28,56	28.18	3.18	1,324	34.35	0.05
9.	Sarai	2,77,15	26.02	0.72	325	34.89	0.01
				279.66			1.73

7. From the above table it will be seen that the value of these 9 commodities amounts to P.281.39 crores while it amounts to P.313.49 crores if the entire production is taken as marketed in the wholesale markets as detailed

below in table II.

TABLE II.

Crop	Production (in tons)	Wholesale prices quintal (Rs.)	Value (Rs. in crores)
1	2	3	4
1. Rice	36,02,696	63.68	229.42
2. Jowar	13,34,859	34.49	46.03
3. Wheat	3,840	53.99	0.21
4. Bajra	2,92,390	35.16	10.28
5. Raize	1,52,402	36.77	5.60
6. Ragi	2,85,250	38.13	10.38
7. Korra	1,78,000	34.67	6.17
8. Varagu	1,14,180	34.35	3.92
9. Sarai	28,040	34.89	0.98
	<b>Total</b>		<b>313.49</b>

8. It may thus be seen that the value of these nine commodities is inflated by about Rs.32 crores for having taken the entire production as marketed in the wholesale markets.

9. The farm harvest prices i.e. the producers' level prices, refer to the average wholesale price at which the commodity is disposed off by the producer to the trader at the village site during the peak marketing period in the harvest season. Further these price data are collected from a number of representative villages which are selected on a purposive basis during the specific

peak marketing period of 6 to 8 weeks of the both Kharif and Rabi seasons. The Revenue Inspector of the concerned Firka collects these prices and their work is supervised by the Tahsildar at the Taluk level and the District Statistical Officers at the district level and these prices to the extent they are collected are reliable. (As such the value evaluated using these prices gives the correct value of produce).

10. At present farm harvest prices are not collected in respect of all the crops and as such it will not be possible to estimate the extent by which the value of agriculture produce is inflated on account of the adoption of the whole sale prices instead of farm harvest prices. However, it may be seen from the following table that the gross values of certain commodities for which both farm harvest prices and wholesale prices are available, that the gross value is inflated by about Rs.56 crores.

Gross values of certain commodities

TABLE III

Sl. No.	Crop	Production (in Tons)	Farm harvest price per quintal.	Wholesale prices quintal.	Gross value P. crores	
					As per Farm harvest prices	As per whole sale prices
1	2	3	4	5	6	7
1.	Rice	36.02	58.10	63.68	209.28	229.41
2.	Jowar	13.35	34.28	34.49	45.76	46.04
3.	Bazra	2.92	34.38	35.16	10.04	10.28
4.	Bagi	2.85	34.54	38.13	9.84	10.88
5.	Borra	1.78	31.33	34.67	5.58	6.16
6.	Varagu	1.14	28.38	31.35	3.21	3.92
7.	Sarai	0.28	26.02	34.89	0.73	0.98
8.	Laize	1.52	32.32	36.77	4.91	5.60
9.	Wheat	0.38	53.22	53.99	0.20	0.20
10.	Pengalgran	0.24	40.25	46.69	0.97	1.12

TABLE - III (contd.)

1	2	3	4	5	6	7
11.	Redgram	0.62	34.89	40.66	2.16	2.52
12.	Blackgram	0.32	41.89	48.99	1.34	1.57
13.	Greengram	0.67	42.96	46.81	2.88	3.15
14.	Horsegram	0.75	36.47	37.90	2.74	2.84
15.	Cane Jaggary	8.00	32.08	39.26	25.66	34.47
16.	Groundnut	6.83	57.16	67.58	39.04	46.18
17.	Castor	0.56	59.50	69.20	3.33	3.90
18.	Gingelly	0.34	98.14	117.95	3.34	3.95
19.	Linseed	0.035	67.43	87.97	23.60	30.88
20.	Chillies	0.82	151.47	174.50	12.42	14.37
21.	Onions	1.22	16.88	17.09	2.06	2.09
22.	Tobacco	1.11	205.47	250.17	22.81	27.81
Total					431.90	488.32

11. From table No. III it may be observed that the gross value of agriculture produce in respect of 22 commodities amounted to Rs. 431.50 crores on the basis of the farm harvest prices as against Rs. 488.32 crores on the basis of the wholesale prices. The gross value of these 22 crops is thus inflated by 13% over the real value on account of the adoption of the wholesale prices.

12. It is therefore desirable to use the farm harvest prices for evaluating the correct value of the agriculture produce. As it will not be difficult to collect these price data in respect of all the crops in view of the availability of field agency at various levels, it is better to extend the coverage to all the crops.

PRELIMINARY & CONFIDENTIAL

IARNIW/70/2.3

INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research

in

National Income

DEFLATION OF NATIONAL ACCOUNTS - AN EXERCISE FOR INDIA

By

Uma Datta Roy Choudhury

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

Deflation of National Accounts: an  
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Estimation of national income is now an established practice in India. However, the annual official series is still limited to the estimates of national product by industrial origin and the current and capital accounts of the public and the rest of the world sectors. Thus necessary data are not yet available to enable the construction of a fully articulated system of national accounts. The Central Statistical Organisation (CSO) in the recent past have independently attempted estimation of capital formation and savings<sup>1</sup> which can be said to be strictly comparable with the national income estimates. Though provisional estimates of capital formation<sup>2</sup> along similar lines had been attempted in the past, the present are the first ever estimates of savings prepared by the C.S.O. All previous estimates of savings attempted from time to time have been by independent research bodies<sup>3</sup> and, therefore, cannot be considered to be comparable with the official national income estimates.

2. Given these new estimates of capital formation and savings, it is possible to prepare the national accounts for the country in its more simplified form<sup>4</sup> once the estimates of private consumption expenditure are available. To keep the accounts fully balanced, one could derive the levels of private consumption expenditure as residuals in the Domestic Product Account. Alternatively, one could use independent estimates of private consumption expenditure while presenting the accounts. However, in this case, the accounts are not likely to be fully balanced and items of "statistical discrepancy" are necessary to be introduced to balance the final totals within the accounts. In India, because of the availability of independent estimates of house-hold consumption expenditure on the basis of the Surveys undertaken by the National Sample Survey<sup>5</sup> (NSS), one could think in terms of using independent estimates of private consumption expenditure while constructing the national accounts.

3. In the past, several attempts have been made by individual research workers to construct national accounts by either of the two methods mentioned above. For example, the attempts by Narang<sup>6</sup> and Pillai<sup>7</sup> were by the method of residuals while that by the present author<sup>8</sup> was by the use of independent estimates of capital formation, savings and private consumption expenditure. These past attempts at presentation of national accounts have all been with the use of either the "conventional"<sup>9</sup> or the "proposed revised"<sup>10</sup> series of national income. The official series of national income has, however, been revised<sup>11</sup> in the recent past and the present series is substantially different from the "conventional" series. Besides, for the revised series there is the additional advantage of having comparable estimates of capital formation and savings brought out by the C.S.O.

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One of the greatest usefulness of the system of national accounts is that it ~~is~~ presenting a mutually consistent picture of the various aggregates in the national income statistics. To examine the extent to which this consistency is maintained in the present revised series of national income and the related aggregates, an attempt has been made here to construct the national accounts with the revised series of estimates both at current and constant prices.

4. In the simplified system of national accounts ~~is~~ suggested by the National Income Committee<sup>12</sup>, the primary accounts are the Domestic Product Account, Private Appropriation Account, Government (Administration) Appropriation Account, Consolidated Resting Account and the Accounts for the Rest of the World. Of these, the Appropriation Account for the Government sector and the Accounts for the Rest of the World are published annually along with official series of national income. Further, consolidated Resting Account is indirectly presented in both the papers of capital formation and savings in the process of deriving each of the aggregates from the other. The other two Accounts viz., the Domestic Product Account and the Private Appropriation Account, ~~are~~ therefore, the only ones which are not available. From the point of view of consistency also, these two are the most important ones. These two Accounts are, therefore, presented next for the period 1960-61 to 1964-65 using the estimates of capital formation and savings as prepared by the C.S.O. and estimates of private consumer expenditure as derived from the NSS data. The presentation of the other Accounts would have meant mere reproduction of the details from the published official source and would not have, added to the available stock of data on the subject. The Accounts for the year 1965-66 have not been presented as the estimates of almost all the aggregates including national income are provisional and the results of NSS for the corresponding year are as yet not available.

5. The 'Revenue' entries in the Domestic Product Account and the 'Expenditure' entries in the Private Appropriation Account give an idea of the levels by which the related aggregates on the two sides of the Accounts differ both for the economy as a whole and for the private sector. On an average the margin of discrepancy at the aggregate level is around 5 to 7 p.c. and this is sufficiently encouraging considering the fact that the estimates are from entirely independent sources. To present a clearer picture of the level of difference between the two independent estimates of net national product and national expenditure, the details of Expenditure on Net National Product are presented next both in terms of actuals as also percentage distribution thus indicating the proportion of discrepancy.

-: 5 :-

TABLE (1): Domestic Product and Private Appropriation accounts  
for the Indian Union, 1960-61 to 1964-65.

(Figures in Crores of rupees)

	DOMESTIC PRODUCT ACCOUNT.				
	1960-61.	1961-62.	1962-63.	1963-64.	1964-65.
<u>EXPENDITURE.</u>					
1. Indirect taxes.					
1.1 taxes.	1,040	1,190	1,408	1,714	1,931
1.2 miscellaneous fees.	61	71	84	94	109
1.3 Total.	1,101	1,261	1,492	1,808	2,040
2. Depreciation Provision					
2.1 private sector.	620	680	771	822	909
2.2 Govt. administration *	64	60	73	74	84
2.3 Govt. enterprises **	52	71	86	98	125
2.4 Total	736	811	930	994	1,118
3. Domestic Product accruing to:					
3.1 private sector	13,190	13,936	14,749	16,884	19,917
3.2 Government	190	225	250	347	312
3.3 Total	13,380	14,161	14,999	17,231	20,229
4. TOTAL.	16,576	16,233	17,421	20,033	23,387
<u>REVENUE</u>					
5. Current expenditure					
5.1 Consumers	12,217	12,771	13,368	13,973	16,543 <sup>n</sup>
5.2 Govt. admn.	1,086	1,206	1,458	1,876	2,005
5.3 Total	13,303	13,977	14,826	15,849	18,548
6. Gross domestic capital formation					
6.1 private sector	1,257	1,355	1,406	1,666	1,854
6.2 Govt. Admn.*	744	728	946	1,047	1,212
6.3 Govt. enterprises **	400	417	498	634	733
6.4 Total	2,401	2,500	2,850	3,347	3,799
7. Net exports of commodities and services	-411	-285	-353	-363	-492
8. Subsidies	92	110	143	148	147
9. Statistical discrepancy	1,191	-69	-45	1,052	1,385
10. TOTAL	16,576	16,233	17,421	20,033	23,387

\* Including departmental enterprises.

\*\* Non-departmental enterprises and statutory corporations.

TABLE (1): Contd.

-: 4 :-

(Figures in Crores of Rupees)

	PRIVATE APPROPRIATION ACCOUNT.				
	1960-61.	1961-62.	1962-63.	1963-64.	1964-65.
<u>EXPENDITURE</u>					
11. Consumer Expenditure	12,217	12,771	13,368	13,973	16,543
12. Direct taxes	420	467	574	707	763
13. Private saving	872	1,028	1,197	1,302	1,856
14. Statistical discrepancy	-138	-130	-166	1,141	997
15. Total	13,371	14,136	14,973	17,123	20,159
<u>REVENUE</u>					
16. Income from domestic product	13,190	13,936	14,749	16,884	19,917
17. National debt interest.	59	72	106	116	123
18. Net earned income from abroad	-72	-98	-108	-112	-149
19. Transfer payments	166	191	192	201	226
20. Net donations from abroad	28	35	34	34	40
21. Total	13,371	14,136	14,973	17,123	20,159

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Table (2) EXPENDITURE ON NET NATIONAL PRODUCT,  
1960-61 to 1965-66.

(at current prices)

Particulars.	1960- 61.	1961- 62.	1962- 63.	1963- 64.	1964- 65.	1965- 66.
<u>1. Private consumer expenditure</u>						
	(Rs. crores)					
1.1 Rural *	9141	9973	9876	10283	12411	-
1.2 Urban	3076	3223	3492	3690	4132	-
1.3 Total	12217	12771	13368	13973	16543	16942**
<u>2. Govt. current expenditure.</u>						
2.1 Compensation of employees.	723	812	908	1048	1193	1338
2.2 Net purchase of commodities & services.	363	394	550	828	812	957
2.3 Total	1086	1206	1458	1876	2005	2295
<u>3. Net capital formation</u>						
3.1 Public	1028	1015	1285	1509	1739	2034
3.2 Private	637	674	635	844	942	1022
3.3 Total	1665	1689	1920	2353	2681	3056
4. Export of goods & services.	784	802	835	985	1015	954
5. <u>Less</u> import of goods & services.	-1195	-1086	-1188	-1348	-1506	-1437
6. Net factor <sup>income</sup> / from abroad.	- 72	- 98	-108	- 112	- 149	-167
7. Less indirect taxes net of subsidies.	-948	-1080	-1265	-1566	-1784	-2086
8. Statistical discrepancy.	-229	- 141	- 129	958	1275	1029
9. Net national product = National Income.	13308	14063	14891	17119	20080	20586

\*Including imputed rent.

\*\*Estimated as a residual after assuming 5 p.c. statistical discrepancy.

Table(2): contd.....

-: 6 :-

(Percentage Distribution)

Particulars.	1960- 61.	1961- 62.	1962- 63.	1963- 64.	1964- 65.	1965- 66.
<u>1. Private consumer expenditure</u>						
1.1 Rural*	6868	6739	6632	60.07	61.61	-
1.2 Urban	2312	2342	2345	2155	2058	-
1.3 Total	9180	9081	8977	8162	8239	8230 **
<u>2. Govt. current expenditure.</u>						
2.1 Compensation of employees.	543	577	610	642	594	650
2.2 Net purchase of commodities & services.	273	280	369	484	404	465
2.3 Total	816	857	979	1096	998	1115
<u>3. Net capital formation.</u>						
3.1 public	772	722	863	881	766	982
3.2 private	479	481	426	493	469	496
3.3 total	1251	1203	1289	1374	1335	1484
4. Export of goods & services.	589	570	561	575	505	463
5. Less import of goods & services.	-898	-773	-798	-787	-750	-698
6. Net factor income from abroad.	-754	-079	-073	-065	-074	-081
7. Less indirect taxes net of subsidies.	-712	-768	-849	-915	-888	-1013
8. Statistical discrepancy.	-172	-100	-086	560	635	500
9. Net national product = National income.	10000	10000	10000	10000	10000	10000

\* Including imputed rent.

\*\* Estimated as a residual after assuming 5 p.c. statistical discrepancy.

The estimates for the year 1965-66 are also included here to give an idea of the possible level of consumer expenditure in a bad crop year. Though provisional, the estimates for all the aggregates - except consumer expenditure - are available for the year 1965-66.<sup>13</sup> Assuming a statistical discrepancy of the order of 5 p.c.\*, the consumer expenditure for the year 1965-66 has been obtained as a residual.

6. The structural changes in the economy over the period of six years beginning 1960-61 is brought out clearly in the table. This has mainly been in the form of distribution of national product between current and capital expenditures besides the steady growth of the public sector. Thus for example, both the current and capital expenditures in the public sector have been increasing steadily since 1960-61. Public capital formation formed as much as 10 p.c. of total expenditure on net national product in 1965-66 against a little over 7.5 p.c. in 1960-61 and only 2.7 p.c. in 1953-54.<sup>14</sup> Similarly government current expenditure increased from 8.2 p.c. in 1960-61 to 11.2 p.c. in 1965-66 though the increase in this case has been more for purchase of commodities and services than for compensation ~~xxx~~ of employees. This increasing role of the public sector has - as expected - been at the cost of private consumer expenditure which has formed a somewhat smaller proportion of total in the more recent years as compared to 1960-61. It may, however, be mentioned in this connection that there has been no fall in the absolute level of either the total (as presented in Table 2) or the per capita consumer expenditure over the period. The trend in per capita income and expenditure can be seen from the following:-

Table 3: Per capita consumer expenditure and income  
1960-61 to 1965-66.

Year	Consumer expenditure			Income
	Rural	Urban	Total	
1960-61	263.3	354.4	281.5	306.7
1961-62	266.8	370.8	289.9	316.7
1962-63	270.9	383.2	293.4	326.8
1963-64	275.6	395.5	299.5	367.0
1964-65	324.6	432.3	346.2	420.2
1965-66	...	...	346.1 <sup>@</sup>	420.5

<sup>@</sup> estimated

7. Going into the details of the actual estimates it is seen that the level of statistical discrepancy has increased substantially over the short period to which the present study is limited. From the point of view of the estimates, the two main sources which might lead to such discrepancies are private consumer expenditure and capital

\* for consistency with the estimates for the earlier years.

formation. If, because of the entirely independent nature of the data on consumer expenditure, one assumes that this, to some extent, is the main source of discrepancy - the results would then suggest that the consumer expenditure estimates are marginally overestimated over the first three years of the study viz. 1960-61 to 1962-63 and underestimated, comparatively to a greater extent, for the later years. This is also suggested by the fact that the levels of capital formation in the more recent years are unlikely to have been more than what is indicated by the results.

8. The analysis so far has been limited to the series at current prices. No long period trend study is complete with current price series only. Even over short periods the various components of national income aggregate are likely to be affected differently as a result of non-uniform changes in prices of various items. In the recent past, in India there has been fluctuations in prices with no uniform pattern between prices of various items and for fruitful economic analysis it is essential that the structural changes are studied at constant prices just as at current prices.

9. The components of national product and expenditure which can be identified with quantities of goods and services and the corresponding unit prices, can generally be estimated both at current and constant prices without much difficulty. Such series for national product at 1960-61 prices are available for India from official sources as also capital formation. The problem however, becomes complicated when one intends to deflate the complete set of national accounts. This is so because a large number of items appearing in the national accounts are not identifiable with commodity flows and cannot, therefore, be expressed in terms of volumes easily. This would, for example, be true for savings or transfer items like direct taxes and interest. In view of this it is almost impossible to obtain unique deflated values of such items and arrive at a balanced system of national accounts in real terms.

10. However, even if no unique set of accounts at constant prices can be prepared, it would be worth undertaking such an exercise if the application of such a system for policy purposes demands it. For a country like India, the application of national accounts for either national budgeting or national planning is still limited and it may not be worthwhile to attempt deflation of the complete system  
contd.../-

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\*\* Capital formation data are based on the same source material as national income which is not true of consumer expenditure data based on survey results.

-: 9 :-

of national accounts particularly when any such exercise would involve subjective judgment for items with no unique set of prices applicable to them.

11. For a study of the structural changes therefore, it might be worthwhile to attempt deflating only the basic balanced relations in the accounts which are of primary interest. In its most simplified form (excluding transfers) these can be stated as:-

- (1) Consumption + Capital Formation + Exports - Imports = Domestic Product.
- (2) Domestic Product + Net factor income from abroad = Consumption + Savings.
- (3) Savings = Capital Formation + Net external investment.
- (4) Net external investment = Exports - Imports + Net factor income from abroad.

In the above set of relations, equation (1) can be uniquely deflated while savings will have a unique value at constant prices guided by the deflated value of net external investment. Net external investment, in its turn, is implicitly deflated in equation (4) on the deflation of net factor income from abroad if the identity is sought to be maintained as in the case of current price series. If on the other hand, net external investment is deflated independently by the use of relevant price series, it is most unlikely that relation (4) would still be satisfied without the introduction of the item of 'trading gain/loss' which is the difference between the deflated value of net external investment and the net balance as available from (Export - Import + Net factor income from abroad). To preserve the articulation of the system of relations, it will then be necessary to introduce this item of trading gain/loss in relation (2) also.

12. The table (2) at constant prices would correspond to relation (1) above and give a broad picture of the balanced national accounts at constant prices in its simplest form. This, however, would not be sufficient to present the whole system of national accounts or even all the four relations suggested above. Given, the deflated values in relation (1), the other three relations can be reduced to two with the problem of deflation referring particularly to relation (4) and real value of savings being derived from the definitional identity. The deflation of net external investment in relation (4) is linked with the determination of the relevant prices for the same. Several suggestions have been put forward in this regard from time to time and the most common among these is the use of the same set of prices as for 'net factor income from abroad'. For the official series of real national income, 'net factor income from abroad' has been deflated by the import price index

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obviously because of negative balance of trade. One would therefore be justified in using 'import price index' for deflating 'net external investment', the only alternatives being the use of (a) implicit price index of national income or (b) investment cost index. For the present exercise the deflation has been attempted by the application of the import price index only.

13. The results at constant prices are presented next, first for table (2) and then for relations (3) and (4). As an introduction to the series at constant prices, it would be useful to mention the price deflators used for each of the items in table (2) as also the alternatives attempted. Constant price estimates for items 3, 6 and 9 in table (2) viz., net capital formation, net factor income from abroad and net national product are available from official sources. For deflation of consumption expenditure, the most appropriate set of prices would be retail prices for major consumer items in rural and urban areas. Since no such series are readily available, the rural series have been deflated by the working class consumer price index while the urban series has been deflated by the corresponding index for non-manual urban labour. Alternatively, the total private current expenditure has been deflated by the average of the above two indices for working class and urban non-manual labour. Unit value index for export & import as also for overall terms of trade are published by the Reserve Bank of India. Here too, alternative deflated values have been worked out using export & import unit value indices in one case and the overall indices for balance of trade in the other. In the case of government current expenditure, the two components of compensation of employees and net purchase of commodities and services have been deflated separately. Contribution of public administration to national product comprise wages and salaries only and are available both at current and constant prices. The implicit price index obtained from these two series has been used for estimating compensation of employees at 1960-61 prices. The value of purchase of commodities & services has been deflated by the wholesale price index as the purchase on government account is generally not likely to be from retail markets. The only other item in the table requiring deflation is 'indirect taxes net of subsidies'. Since these taxes and subsidies are mostly relevant to urban consumer items or rural consumer items of urban nature, this aggregate has been deflated by the consumer price index for urban non-manual employees. Having thus obtained the estimates in real terms for all the items in table (2), 'statistical discrepancy' has as usual been introduced to give an idea of the gap in constant prices between aggregate expenditures and national product.

14. Table (4) presented below gives the details of expenditure on net national product at constant prices - using the deflated values of consumer expenditure separately for rural and urban areas and also of exports and imports

contd...../-

TABLE (4): - Expenditure on Net National Product, 1960-61 to 1965-66  
(at 1960-61 prices)

(Figures in Crores of Rupees)

I T E M S.	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
<u>1. Private Consumer expenditure.</u>						
1.1 Rural *	9,141	9,403	9,422	9,296	9,586	
1.2 Urban	3,076	3,166	3,233	3,265	3,332	
1.3 Total	12,217	12,569	12,655	12,561	12,918	12,475
<u>2. Govt. current expenditure.</u>						
2.1 Compensation of employees	723	805	897	1,013	1,114	1,186
2.2 Net purchase of commodities & services	363	393	537	764	664	724
2.3 Total	1,086	1,198	1,434	1,777	1,778	1,910
3. Net capital formation	1,665	1,624	1,794	2,120	2,286	2,442
4. Export of goods & services	784	809	887	1,032	1,043	928
5. <u>Less</u> import of goods & services	-1,195	-1,064	-1,213	-1,334	-1,461	-1,326
6. Net factor income from abroad	-72	-96	-110	-111	-145	-154
7. <u>Less</u> indirect taxes net of subsidies	-948	-1,055	-1,182	-1,402	-1,407	-1,536
8. Statistical discrepancy	-229	-190	-198	246	933	305
9. Net national product = National income	13,308	13,795	14,067	14,889	15,945	15,045

\* Including imputed rent.

TABLE (4):- Cont.

-: 12 :-

ITEMS	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
<u>PERCENTAGE DISTRIBUTION</u>						
<u>Private Consumer expenditure</u>						
1.1 Rural *	68.68	68.16	66.98	62.44	60.12	
1.2 Urban	23.12	22.95	22.98	21.93	20.90	
1.3 Total	91.80	91.11	89.96	84.37	81.02	82.92
<u>Govt. current expenditure</u>						
2.1 Compensation of employees	5.43	5.84	6.38	6.80	6.99	7.88
2.2 Net purchase of commodities & services	2.73	2.85	3.32	5.13	4.16	4.81
2.3 Total	8.16	8.69	10.20	11.93	11.15	12.69
<u>Net capital formation</u>	12.51	11.77	12.75	14.24	14.34	16.23
<u>Export of goods &amp; services</u>	5.89	5.86	6.30	6.93	6.54	6.17
<u>Less import of goods &amp; services</u>	-8.98	-7.71	-8.62	-8.96	-9.16	-8.81
<u>Net factor income from abroad</u>	-0.54	-0.70	-0.78	-0.75	-0.91	-1.02
<u>Less indirect taxes net of subsidies</u>	-7.12	-7.65	-8.40	-9.42	-8.82	-10.21
<u>Statistical discrepancy</u>	-1.72	-1.37	-1.41	1.65	5.84	2.03
<u>Net national product = National Income</u>	100.00	100.00	100.00	100.00	100.00	100.00

\* Including imputed rent.

TABLE (5):- Alternative estimate of Expenditure on Net National Product at constant prices of 1960-61.

(Figures in Crores of Rupees)

I T E M S	1961-62	1962-63	1963-64	1964-65	1965-66
<u>I. Separate deflation for rural, urban C.E. and Exports &amp; Imports.</u>					
1. <u>Private consumer expenditure.</u>					
1.1 Rural	9,403	9,422	9,296	9,586	
1.2 Urban	3,166	3,233	3,265	3,332	
1.3 Total	12,569	12,655	12,561	12,918	12,476
2. Exports of goods and services.	809	887	1,032	1,043	928
3. <u>Less Imports of goods &amp; services</u>	-1,064	-1,213	-1,334	-1,461	-1,326
4. Net balance of trade (2-3)	-255	-326	-302	-418	-398
5. Statistical discrepancy	-190	-198	246	933	306
6. Net national product = National income.	13,795	14,067	14,889	15,945	15,045
<u>II. Overall deflation for C.E. and Net balance of trade.</u>					
7. Private consumer expenditure.	12,476	12,565	12,494	13,052	12,470
8. Net balance of trade	-295	-359	-321	-523	-519
9. Statistical discrepancy	- 56	- 75	332	904	417
10. Net national product = National income	13,795	14,067	14,887	15,945	15,045

Notes: (1) Unlisted values of other items in Table(4) not appearing above remain unaltered.

(2) Alternative I above is same as Table (4).

TABLE (5):- Cont.

-: 14 :-

I T E M S	1961-62	1962-63	1963-64	1964-65	1965-66
<u>PERCENTAGE DISTRIBUTION</u>					
<u>I. Separate deflation for Rural, Urban C.E. and Exports &amp; Imports.</u>					
1. <u>Private consumer expenditure</u>					
1.1 Rural	68.16	66.98	62.44	60.12	
1.2 Urban	22.95	22.98	21.93	20.90	
1.3 Total	91.11	89.96	84.37	81.02	82.92
2. Exports of goods & services	5.86	6.30	6.93	6.54	6.17
3. <u>Less</u> Imports of goods & services	-7.71	-8.62	-8.96	-9.16	-8.81
4. Net balance of trade (2-3)	-1.85	-2.32	-2.03	-2.62	-2.64
5. Statistical discrepancy	-3.13	-1.41	1.65	5.85	2.03
<hr/>					
6. Net national product = National income.	100.00	100.00	100.00	100.00	100.00
<hr/>					
<u>II. Overall deflation for C.E. and Net balance of trade.</u>					
7. Private consumer expenditure	90.43	89.32	83.92	81.86	82.92
8. Net balance of trade	-2.14	-2.55	-2.16	-3.28	-3.45
9. Statistical discrepancy	-0.40	-0.54	2.24	5.66	2.78
<hr/>					
10. Net national product = National income	100.00	100.00	100.00	100.00	100.00

NOTES:- (1) The deflated values of other items in Table (4) not appearing above remain unaltered.  
(2) Alternative I above is same as TABLE (4).

individually. The alternative estimates obtained from overall deflation of consumer expenditure and balance of trade are presented separately in a summary in table (5) to give an idea of the effect of using alternative deflation methods.

15. The results at constant prices are as good as those at current prices, if not better judged from the levels of statistical discrepancy. Thus, the percentage difference between total national expenditure and national product at factor cost is not more than 2 p.c. in any of the years except in 1964-65. The use of the two different methods of deflation do not change the results very much though in the case of the use of overall deflators the gap narrows down marginally. This is so perhaps because both the series are based on deflation methods of overall nature. It is likely that the difference would have been significant if the results presented were compared with constant price series obtained by the detailed method of evaluation of quantities falling within each of the aggregates in each year by the relevant prices in the base year.

16. Going into the details of structural shifts and the differential effects of prices on the aggregates, not much changes are discernible between the current and constant price series. The differences occur in case of both net capital formation and government current expenditure and their share in the total do increase. Thus real net capital-formation forms as much as 16.23 p.c. of total in 1965-66 against 14.84 p.c. in current prices. Similarly, government compensation of employees also show a slightly increasing trend in share. These increases are counteracted by the rise in the proportion of imports on goods and services as also net factor income from abroad in the total leaving the share of private consumer expenditure practically unchanged. Slight increase in the share of exports is also noticed. All this would suggest that the movement of prices for individual groups of items forming each of the aggregates was different though the variations between them might not have been much. Thus for example, capital cost index and the price indices of balance of trade are not likely to have increased as much as the overall implicit price index of net national product. This is also true of government current expenditure. The consumer priceindex, on the other hand, appear to have moved very close to the overall implicit national income index of prices. To give an idea of the trends in individual price indices, these are presented next in a summary form in table (6).

Contd...../-

Table(6): Trends of prices, 1960-61 to 1965-66

(Indices with 1960-61=100)

Year	Implicit national income	Whole-sale	Consumer		Investment cost.	Implicit govt. wage.	Balance of trade		
			Rural work-ing class	Urban non-manual labour			Exports of goods & ser-vices.	Imports of goods & ser-vices.	Terms of trade.
1960-61	100.00	100.00	100.00	100.00	100.00	100.00	100.0	100.00	100.00
1961-62	101.94	100.16	100.80	104.00	103.70	100.25	99.09	102.08	96.52
1962-63	105.86	102.40	104.80	108.00	106.74	101.21	96.36	97.92	98.26
1963-64	114.93	108.33	110.40	113.00	111.18	103.46	95.45	101.04	93.91
1964-65	125.93	122.26	129.60	124.00	116.90	107.10	97.27	103.12	93.91
1965-66	136.83	132.19	139.60	132.00	124.37	112.86	102.73	108.33	93.64

Note: Price indices with differing base periods have been reworked with 1960-61 = 100 to present a comparable overall picture of changes.

17. Obviously, the changes in prices have been substantially different between items and such differential behaviour suggest that the changes in structural pattern between current and constant price series should have been much more marked than what has been presented in Tables (4) & (5). The present apparent stability is due to the fact that the price movement of private consumer expenditure which forms as much as 90% of net national product, was almost parallel to that of national income over the period. Another reason for such stability might be the use of overall price indices for deflation of different aggregates rather than use of detailed prices in the base year similar to the official series of national income in real terms.

18. Coming next to relations (3) and (4), the following picture emerges when the effect of prices is eliminated.

Table (7): Savings at 1960-61 prices.

Items	(Rs. crores)					
	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
1. Net domestic capital formation.	1665.0	1624.0	1794.0	2120.0	2286.0	2442.0
2. Less net capital inflow.	-482.5	-373.2	-470.8	-452.3	-592.5	-542.8
3. Net savings.	1182.5	1250.8	1323.2	1667.7	1693.5	1899.2

...../-

Table (8): External transactions at 1960-61 prices.

Items.	(Rs. crores)					
	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
1. Exports on goods & services.	784.40	808.96	866.65	1031.96	1043.18	928.16
2. Less Imports on goods & services.	1194.90	1064.26	1213.03	1333.63	1460.72	1326.04
3. Net factor income from abroad.	-72.00	-96.00	-110.00	-111.00	-145.00	-154.00
4. Trading gain(+) or loss(-)	-	-21.94	-14.41	-39.63	-29.97	9.09
5. Net internal investment.	-482.50	-373.24	-470.79	-452.30	-592.51	-542.79

The above two tables would suggest that there has not been much change either in terms of levels or proportions between constant and current price series in external transactions. The series of savings at constant prices are uniquely derived given the series of net external investment. Thus the tables (7) and (8) jointly with table (4) give a simplified set of national accounts at constant prices. It would not be unjustified in suggesting that the accounts are articulated and uniquely determined and also balanced with the introduction of items of 'statistical discrepancy' and 'trading gain'. It may be mentioned here that the derivation of relation (2) in real terms would also require the introduction of 'trading gain' appearing in relation (4) to achieve full articulation of the system of national accounts.

19. Before concluding the study it might be interesting to present the estimates of real per capita consumer expenditure corresponding to the current price estimates in Table (3) and compare the same with the corresponding income series.

Table (9): Per capita private consumer expenditure and income at 1960-61 prices

Year	(Rs. per annum)			Income
	Consumer expenditure			
	Rural	Urban	Total	
1960-61	263.32	354.47	281.55	306.7
1961-62	264.70	356.53	283.07	310.7
1962-63	258.46	354.77	277.72	308.8
1963-64	249.11	350.02	269.29	319.2
1964-65	250.75	348.67	270.33	333.6
1965-66	-	-	270.00	307.3

...../-



The trend in income is thus more or less maintained in the per capita consumer expenditure series except for the last two years. Of these, the 1965-66 estimates are not based on NSS results and therefore, cannot be taken too seriously. The marginal rise in per capita expenditure in 1964-65 which evidently is very much lower than that in income partly suggests a possible underestimation in Survey results and also partly follows from comparatively higher level of investment.

20. The present study, though not very extensive is sufficiently encouraging to suggest a possible line of investigation which has not been explored very much so far. The study of alternative deflation methods for each of the aggregates with as much of details as possible and the results of the same in the form of structural shifts would help in studying the economy and its behaviour much more thoroughly. Analysis along similar lines might ultimately lead to more practical application of the results of such studies for policy purposes than has been possible so far. It is of course true that for a satisfactory and comprehensive understanding of the effect of prices on each of the items appearing in the national accounts it would be necessary to go much more deeply into the problem of deflation as also determine the set of prices relevant for each of the items. The problem of balancing of national accounts in real terms would be another important factor requiring serious attention though it is true that no complete balancing is possible unless some of the items are derived as residuals from definitional identities.

- 19 -  
NOTES

1. C.S.O. : 'Capital formation in India, 1960-61 to 1965-66'  
C.S.O. : 'Saving in India, 1960-61 to 1965-66'.
2. C.S.O. : 'Estimates of Gross capital formation in India, 1948-49 to 1960-61', (Mimeographed).
3. Reserve Bank of India: 'Estimates of Savings and Investment in the Indian Economy, 1950-51 to 1962-63',  
India: Reserve Bank of India Bulletin, March 1965.  
  
National Council of Applied Economic Research: Savings in India, a Monograph, 1961.  
Urban Income & Saving, 1962.  
Income, Investment & Saving: All India Rural Household Survey, Vol.II, 1965.
4. As for example, suggested in the First Report of the National Income Committee(Ministry of Finance, 1951).
5. The results available in the N.S.S. Reports: 'Tables with Notes on Consumer Expenditure'.
6. K.L.Narang: 'National Accounts of the Indian Union, 1948-49 to 1958-59'(Mimeographed, presented at the Third Indian Conference on Research in National Income).
7. K.N.C.Pillai: 'National Accounts of India: 1958-59 and 1959-60' (The Economic Weekly, December 1, 1960).
8. Uma Datta Roy Choudhury: 'Construction of National Accounts for the Indian Union; an example (The Economic Weekly, September 4, 1965).
9. As detailed in 'Final Report of the National Income Committee', (Ministry of Finance, 1954), and extended subsequently in the form of annual publication on 'Estimate of National Income' brought out by the C.S.O., the last issue in the series having been published in 1966.
10. C.S.O. : 'National Income Statistics - Proposals for a revised series of National Income Estimates for 1956-56 to 1959-60' (May, 1961).
11. As detailed in 'Brochure on Revised Series of National Product for 1960-61 to 1964-65' published by the C.S.O. in 1967 and extended subsequently in the annual issues of 'Estimates of National Product' (Revised Series).
12. First Report of the National Income Committee (Govt. of India, 1951).
13. Estimates of National Product (Revised Series) 1960-61 to 1967-68(March, 1969).
14. As shown in Table 6 of 'Construction of National Accounts for the Indian Union; an example' by the author(The Economic Weekly, Sept.4, 1965) - the proportions in the two series of estimates are more or less comparable though not the actual levels.

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research

in

National Income

SHORT TERM ECONOMIC FORECASTING - A REVIEW OF INCOME STATISTICS IN MYSOR

By

S.M. Khot, I.B. Nanjappa and M. Mahadevaiah

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

SHORT-TERM ECONOMIC FORECASTING-  
REVIEW OF INCOME STATISTICS IN MYSORE

by

Dr. S. M. Khot\*, Shri M. B. Nanjappa,\*\* Shri L. Mahadevaiah

1. INTRODUCTION

National income statistics have been widely used the world over as one of the most dependable basis for various kinds of economic forecasts. Government policy makers, businessmen, planners and socio-political leaders use them for their own ends. Salesmen and manufacturers as well as government officials not only plan their future course of action, but also justify present trends of their activity on the basis of these national income statistics.

This wide-spread use of national income data may be explained by the fact that these statistics provide, at once, not only such broad national aggregates as gross production income and expenditure, savings and investment, but their sub-totals, broken down into various sectors such as government, business, household, etc. There are available, for instance, in the national income data of the U.S., as many as 42 well-defined components which make up the national aggregates.

The popularity of these data is due not only to these various breakdowns of the national income aggregates, but also to the frequency with which these data are made available.

For instance, in the USA the income data in respect of all the 42 components are made available on quarterly basis and the data in respect of 16 components are made available on monthly basis.

The variety of components of the national income aggregates and the short-term frequency of their availability

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The opinions expressed in this papers are of the authors only.

U.S. Department of Commerce "Survey of current Business" (July 1962) Table A, P. 14.

contd.....p/2

availability therefore, are two important features of the national income statistics. It is these features which are particularly important from the point of view of short-term economic forecasts.

What is a short-term forecast? For that matter, what is a forecast? Forecasting has been assigned the task of attempting "to find the most probable course of events" or, at best, "a range of probabilities". It is claimed that this objective is better achieved by a short-term forecast. By a short-term economic forecast, we mean a forecast for the period less than one year. Forecasts for the period longer than one year may be termed as long-term forecasts. A study of several hundred forecasts made by economists associated with industrial firms, banks and other financial corporations, business publications, government agencies and universities, has found that forecasts for "one to three quarters are typically better than all other types of forecasts". The study further states that "the accuracy diminishes steadily as the forecast span increases. Forecasts for four quarters or more ahead are generally not superior!"@

In other words, forecasts, when made for shorter periods are likely to be more accurate and to reveal the most probable course of events. For the purpose of such forecasts, therefore national income statistics need to be constantly improved in terms of the varieties of their components and especially in terms of their availability at short-term intervals.

With this in view, this paper attempts to examine the income statistics of Mysore State and suggests a method of making some of the statistics available at intervals of less than one year and thereby increasing the usability of the statistics for the purpose of short-term economic forecasts.

## II. INCOME STATISTICS FOR SHORT-TERM

Various economic activities of the State which contribute to the state income are classified into two major groups, namely: (1) commodity producing sectors and (2) service sectors. Under commodity producing sectors, (i) agriculture and animal husbandry (ii) forestry (iii) fisheries, (iv) mining and quarrying (v) large-scale manufacturing and (vi) small-scale manufacturing are included. In table 1 of the contribution

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@ Victor Zornowhitz: An appraisal of short-term Economic Forecasts, National Bureau of Economic Research, New York, 1967. PP 5-7.

from each sector to the state income for two years is indicated from which it is clear that production sectors contribute as much as 75 per cent of the total income.

In this paper we have excluded the two industrial sectors - large-scale and small-scale - from the production sectors group for the reason that material for the estimation of income from these will not be available within a reasonable time-lag. Thus the production sectors excluding these two sectors contribute as much as 61 per cent of the total income of the State. Agriculture alone contributes nearly 59 per cent of the total income. Thus the trends of state income are largely dependent upon the fluctuations in agricultural income.

#### Agricultural Sector.

It is seen from Table 2 in the appendix that out of 57 crops contributing to state income 15 major crops contribute as much as 84 per cent of total agricultural income. In other words, these 15 crops account for nearly 51 per cent of state income. A method of estimation of agricultural income, therefore can be found on the basis of these crops. For this reason we have selected these 15 crops for our study.

In order to arrive at reliable advance estimates of production of these crops, the relationship between rainfall and production and that between area and production were examined. It was found that while the relationship between rainfall and production in respect of these crops did not indicate positive results, there has been a positive correlation between area under these crops and their production as shown below:

1. Correlation coefficient of area and production of food crops. .. 0.7
2. Correlation coefficient of area and production of non-food crops. .. 0.4
3. Correlation coefficient of area and production of all crops. .. 0.5

This means that area figures, if available well in advance, would facilitate estimation of income from agricultural sector with some degree of accuracy.

Keeping the above relationship in mind and the need for short-term data, the various crop forecasts

were examined. Crop forecasts are being issued in respect of 43 crops, and second forecasts are issued by about the end of December for most of the crops. A study was made of the relationship between area and production as reported in the second forecasts and, area and production as reported in the final forecasts. Results were interesting. It was observed that nearly 75 to 99 per cent of the area and production as reported in the final forecasts is covered by the earlier forecasts. The details of the study are indicated in table 3 of the appendix. The summary table given below shows the percentage of area and production accounted for in the second forecast in respect of a few major crops.

Crop	Area	Production
Rice	87.7	85.2
Jowar	88.6	87.8
Ragi	90.0	82.2
Groundnut	95.0	87.2
Sugarcane	102.0	95.8
Cotton	81.8	75.6

Although the above study was based on the data relating to only two years, the pattern may not be much different even if the data for more years is examined. Using this data it is possible that the forecast of income can be made for shorter periods such as half-year.

With a view to apportion the crop production into two half-yearly periods, the calendar of crop forecasts was examined and it was seen that the second forecasts for most of the crops are issued by December. The details of calendar are shown in table 4 of the appendix. Crops for which second crop forecasts are issued by December are included in the first half-yearly estimates during a particular crop year and the rest in the second half-yearly estimates. The perennial crops like coffee, coconut and arecanut for which only annual estimates are available are also included under the first half-yearly estimates. This is done on the assumption that there will not be much variation in the current year's production of these crops as compared to the previous year. The details of crops included in the two half-yearly estimates are indicated in table 5 of the appendix.

#### Other commodity production sectors.

Making forecasts of income estimates in other commodity producing sectors does not present serious problems. The income accruing from animal husbandry is

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estimated by working out the intercensal population of livestock and by imputing the value of livestock products. It is therefore quite easy to work out estimates of income from this sector in advance and allocate them to the two half-yearly periods. In so doing, the seasonal variations in the production of livestock products like milk, etc., will be ignored. But it is assumed that the estimates will not be damaged.

The income accruing from forestry sector is now being worked out from the annual State budget figures as the data on production of various forest products is not available. Since the budget figures will be available somewhere in March or April, the estimates of income from this sector will be included in the second half-yearly period. This will not vitiate the estimate, as the contribution of this sector is only one per cent of the total income of the State.

The apportionment of income from mining and quarrying also does not present serious difficulties because the value added by this sector is available for each month in the monthly bulletin of Indian Bureau of Mines. Though the value added relates only to the major minerals, it is adequate for purpose of estimates since it accounts for about 90 per cent of the total sectoral income. Besides, the value added by minor minerals is available only after a long lag of time. Hence, the value of production of minerals from April to September is included in the first half-yearly estimates and the data for the rest of the months is included in the second half-yearly estimates.

### III. CONCLUDING REMARKS

Based on the method described above, half-yearly estimates of income of the production sectors have been worked out and presented in the Table No.6. The merit of the method lies in the fact that it makes available income estimates immediately at the end of a period without any time-lag and provides a reasonably good base for a short-term economic forecast.



: 6 :

T A B L E I

Relative share of sectors and of sectoral components  
in the total State income of Mysore, (1960-61 and  
1964-65).

(Figures in Percentage)

Sectoral Components	1960-61	1964-65
<u>(A) Production Sectors.</u>		
1. Agriculture and Animal Husbandry.	59.06	58.52
2. Forestry	1.08	0.95
3. Fishery	0.59	0.44
4. Mining and Quarrying	1.03	0.60
5. Large-Scale manufacturing.	5.66	8.56
6. Small-scale manufacturing	6.61	7.06
Sub-total:-	<u>74.05</u>	<u>76.13</u>
<u>(B) Service Sectors.</u>		
1. Communication.	0.29	0.39
2. Railways	1.38	1.39
3. Banking and Insurance	0.79	1.06
4. Commerce and Transport	9.82	8.43
5. Professional and Liberal Arts.	4.14	3.56
6. Domestic service	0.32	0.62
7. Public Administration.	3.68	3.60
8. House property	3.53	4.83
Sub-total:-	<u>23.95</u>	<u>22.88</u>
GRAND TOTAL:	100.00	100.00

contd....p/7.

: 7 :

T A B L E 2

Relative share of 15 selected crops in the total value of agricultural production in Mysore. 1960-61, 1965-66 and 1967-68.

Crop.	Relative share.		
	1960-61	1965-66	1967-68
1. Rice	19.9	28.0	32.4
2. Wheat	1.0	1.4	1.4
3. Jowar.	9.9	18.4	15.0
4. Bajra.	1.1	1.2	1.3
5. Ragi	7.5	7.0	6.4
6. Small Millets.	0.9	1.1	0.7
7. Gram	0.6	0.8	1.3
8. Tur	0.7	1.2	1.3
9. Horsegram	1.3	1.4	1.2
10. Groundnut.	7.5	8.4	7.1
11. Coconut.	4.2	3.0	3.5
12. Sugarcane	4.2	5.2	5.8
13. Cotton	10.1	3.1	2.7
14. Arecanut.	3.5	3.7	6.0
15. Coffee.	2.4	3.8	2.5
Total	74.8	89.7	88.3 Avera 84.3

contd.....p/8.

: 8 :

T A B L E 3.

Area and production as per second and final forecasts of 12 selected crops in Mysore State 1967-68 and 1968-69.

Area in '000' hectares.  
Production in '000' M.tonne

Crop	1967-68.						1968-69					
	Area.			Production.			Area.			Production.		
	II F.	F.F.	Col. 7	II F.	F.F.	Col. 11	II F.	F.F.	Col. 12	II F.	F.F.	Col. 11
1	2	3	4	5	6	7	8	9	10	11	12	13
Rice	1007	1135	88.7%	1610	1797	89.6%	951	1099	86.5%	1485	1839	80.7%
Wheat	308	298	103.4%	79	79	100.0	309	310	99.7	81	124	65.3
Jowar	2214	2793	79.3	1081	1436	75.3	2998	3059	98.0	1381	1530	90.3
Bajra*	326	414	78.7	98	102	97.1	738	513	143.8	190	160	118.8
Ragi*	765	875	87.3	420	568	70.0	680	733	92.8	395	418	94.5
Small millets	389	447	87.0	99	90	110.0	343	339	101.2	101	95	106.3
Gram	147	149	98.6	58	67	86.6	199	208	95.7	79	87	90.8
Tur*	209	254	82.3	129	82	157.3	222	249	91.6	151	91	165.9
Other	85	102	83.3	14	17	82.3	96	95	101.0	18	15	112.5
Pulses*												
Groundnut.	773	778	99.3	465	503	92.4	769	808	95.2	312	321	81.9
Sugar-cane.	85	79	107.6	7236	7586	95.3	92	95	96.8	8815	9145	96.4
Cotton	819	920	89.0	115	149	77.2	878	1037	84.0	308	416	74.1

\* Figures relates to first forecast.

T A B L E 4

THE CALENDER OF CRCP FORECASTS

Crop	Date on which the forecasts are issued		
	First FC.	II FC.	Final FC
1. Rice	15/10	15/12	15/2
2. Wheat	15/1	15/3	25/5
3. Jowar	31/10	31/1	31/3
4. Bajra	31/10	-	28/2
5. Ragi	31/10	-	28/2
6. Small millets	5/11	5/2	20/5
7. Gram	15/1	15/3	15/5
8. Tur	15/9	-	15/5
9. Other Rabi Pulse	15/1	-	15/5
10. Groundnut	15/8	15/10	10/2
11. Sugarcane	21/6	21/10	15/5
12. Cotton	10/8	10/10	5/5
13. Coconut	-	-	5/9
14. Arecanut.	-	-	5/9
15. Coffee	-	-	15/9

contd....r 10

TABLE 5

Details of sectors and crop included under  
two six-monthly forecasts of State income.

	<u>Dec. forecast.</u>	<u>July forecast</u>
A. Agriculture.	Rice.	Wheat
	Bajra	Jowar
	Ragi	Small millets
	Tur.	Gram
	Groundnut	Other pulses
	Sugarcane	
	Cotton	
	Coconut.	
	Arecanut	
	Coffee	
B. Animal Husbandry	$\frac{1}{2}$ of the annual Value.	$\frac{1}{2}$ of the annual Value.
C. Forestry.	-	Previous year's Value.
D. Fisheries	Previous year's Value	-
E. Mining and quarrying.	Value for the months from April to September.	Value for the months from October to December and January to March.

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IARW/70/3.2

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INFLATION AND THE FOURTH PLAN

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Basil G. Kavalsky

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## INFLATION AND THE FOURTH PLAN

by

Basil G. Kavalsky

(International Bank For Reconstruction and Development)

In the critical internal resource situation which India is currently facing it is difficult to see how the Planners can avoid considerable recourse to deficit financing through net credit to the Government if a significant increase in public investment is to take place. It is rare however to find a serious acknowledgement in Indian government circles of this proposition and perhaps the unwillingness to face the possibility accounts for the apparent lack of serious examination of this method of raising resources. The sharp price rises of the past two years have lent credence to the view that increasing net credit to the government is a last resort measure - a cushion perhaps when revenues fail to come up to the estimates. It does not seem to be regarded however as a serious policy alternative.

There are a number of important questions which the Planners need to put. These relate to such problems as the level of aggregate demand required to efficiently, rather than fully, utilise existing capacity; the quantum of additional investment resources required; whether obtaining these resources through transfers from households and private sector corporations will seriously damage investment incentives; and the distributional effects of additional taxation as compared with those of money supply expansion; the impact of money supply expansion on prices; the effect of rising prices on tax revenues on the one hand and current expenditures on the other etc. The answers to these questions have to be tied together to form the macro-economic part of the Plan. It may be a lot easier and more practical to ask simply, How much money do we need and how the hell do we get it? But the chances of a serious mistake are far greater.

It would take a large staff to handle all these questions but by narrowing the scope of the enquiry it is possible to derive useful answers to some, which at least limit the range of possible answers to the others. I propose here to focus specifically on problems of expansion of the money supply and price inflation. To do this it will be necessary to assume away some of the most important problems. Thus it is assumed that there is a particular level of investment which will lead to the desired growth rate, however this is financed. Secondly, it is assumed that price inflation affects government tax revenues and current and capital expenditures equally and by the same percentage as the rate of inflation.

### A. Measuring Inflation

The most frequently used indicator of price changes in India is the Index of Wholesale Prices. Wage negotiations however have as their basis the Working Class Consumer Price Index. Over the period since 1965/66 the two indices have kept closely in step with one another, although there is a lag as would be expected between wholesale and retail price changes especially when the wholesale price index is rising very rapidly. This can be seen from P.1 and P.2 in Table 1 below. Neither the wholesale price index nor the consumer price index are comprehensive. A third price

index can be calculated, consisting of the changes in the ratio of national income at current prices to national income at constant prices over the period. This index would better reflect the prices of services which are under-represented in both the other indices. The average annual rate of growth for this index was only .5 per cent as compared to 7 per cent for the other two indices. This is shown as P3 in Table I.

TABLE I  
COMPARATIVE PRICE TRENDS

	P 1 Wholesale Price Index 1/	P 2 Consumer Price Index 1/	P 3 National Income 'implicit' Price Index 2/
1955/56	100	100	100
1956/57	114	111	108
1957/58	117	117	110
1958/59	122	123	114
1959/60	127	128	115
1960/61	135	129	117
1961/62	135	132	119
1962/63	138	137	122
1963/64	146	143	130
1964/65	165	164	143
1965/66	179	176	146
1966/67	207	199	162
1967/68	230	222	na.

1/ The actual base year is 1952/53

2/ Ratio of national income at current prices to national income at constant (1948/49) prices.

If one substitutes for the 'conventional' series of national income at constant (1948, 49) prices, the 'revised' series of national income at constant (1960, 61) prices, the results are strikingly different. Thus the latter series shows an even faster growth rate over the period than the Index of Wholesale Prices.



TABLE II  
COMPARATIVE PRICE TRENDS

	P 1 Index of Wholesale Prices (1952/53 base)	P 3 National Income 'implicit' price Index (1948/49 prices)	P 4 National Income 'implicit' price Index (1960/61 price)
1960/61	100	100	100
1961/62	100	102	102
1962/63	102	104	106
1963/64	108	111	116
1964/65	122	122	126
1965/66	132	125	136
1966/67	153	139	154

The revisions which have taken place between the two national income series consist not only of the change in the constant price base year, but also in the series for current prices. If current prices in this case had been obtained simply by 'blowing up' the constant price series by the index of wholesale prices then a comparison between the two series is not very useful. Even so, the non-coverage of a large number of items in the wholesale price index might have led to a different result being obtained. With regard to P3 which uses 1948/49 prices, it is difficult to have much confidence in figures which were adjusted since that time on the basis of yearly changes. Since the 1960/61 figure was arrived at through a fairly comprehensive analysis of existing production it would seem reasonable to give the more recent figure the benefit of the doubt, and since this figure bears a close relationship to the Index of Wholesale Prices, I propose to make the assumption that the Index of Wholesale Prices for which a long series exists, represents an adequate approximation of the rate of inflation in the Indian economy.

#### Money Supply, G.N.P. and Prices

Analysing the relationship between money supply, output and prices will not answer the questions which fundamentally interest us about how the rate of expansion of money supply and prices influence the growth of G.N.P. It is not entirely without point, however, to derive the mechanical ex-post impact of expanding the money supply on prices, while assuming output to be exogenously determined. This is so especially in a case when certain constraints exist which limit the range of possibilities. It would be useful for example to be able to answer such a question as 'assume that we want prices at the end of five years to be within 10 per cent of

their present level what is the relationship between money supply and output which would have to prevail over that period', or again 'assuming that a given growth in GNP is not possible without an additional Rs. 1000 crores of expansionary deficit financing by the government, what is the level of prices which we might expect at the end of a five-year period'. In the succeeding section an attempt will be made to answer these questions. As a preliminary, however, an analysis of past experience is required.

The indices for Money Supply, GNP, the ratio of Money Supply to GNP, and Prices are shown in Table III below:

TABLE III  
INDICES FOR MONEY, OUTPUT AND PRICES 4/

	M	Y	M/Y	P
	Money Supply Index	Index of GNP at constant (60/1) prices	Index of ratio of Money Supply to GNP	Index of Wholesale Prices
1955/56	100	100	100	100
1956/57	106	105	101	114
1957/58	109	105	104	117
1958/59	114	113	101	122
1959/60	123	114	108	127
1960/61	129	122	106	135
1961/62	137	127	108	135
1962/63	149	131	114	138
1963/64	169	138	123	146
1964/65	184	148	125	155
1965/66	204	141	145	179
1966/67	224	144	155	207
1967/68	241	157	154	230

4/ Figures rounded.

In measuring the rate of inflation we are basically interested in how prices are determined. Varying the normal quantity theory equation we would have prices equal to money supply over output multiplied by the

velocity of circulation. For the moment we can assume velocity to be a constant and concentrate on the relationship between prices, and the ratio of money supply to output. In the Indian situation we would expect the relationship to be a lagged one. In a year stretching from April to the following March, most of the agricultural output becomes available between November and March and thus largely influences the following year's prices. In addition since the slack season stretching from end-April to end-October usually sees a fall or levelling of the money supply, and the rise is concentrated in the busy season (end-October to end-April), and the increased money supply will have its major impact on price levels the following year. This is evident from Table IV below:

TABLE IV  
CHANGES IN THE RATIO OF MONEY SUPPLY  
TO GNP, AND IN THE PRICE INDEX <sup>5/</sup>

	M/Y* <u>Annual percentage change in index</u>	P* <u>Annual percentage change in index</u>
1956/57	.8	11.4
1957/58	3.2	3.0
1958/59	- 2.7	4.0
1959/60	6.2	3.7
1960/61	- 1.5	6.7
1961/62	1.7	no change
1962/63	6.0	2.2
1963/64	7.7	6.0
1964/65	1.5	12.9
1965/66	16.0	8.0
1966/67	7.4	16.0
1967/68	- 1.1	11.0

<sup>5/</sup> Figures rounded to one decimal place.

Clearly the relationship is between the changes in the ratio of money supply to GNP in the first year to the changes in prices in the following year. A rise in ratio is always followed by a more than proportionate rise in prices. Since the price index never fell and the

ratio generally changed by fairly small amounts this might be thought to constitute a spurious correlation. When a linear regression is done on the series the confidence limits do indeed appear to be rather large. Thus for example for an increase in the ratio of money supply to GNP of 5 per cent, we can be 95 per cent confident that the increase in prices during the year will fall in the rather substantial range of 2.2 per cent to 12.7 per cent. Seventy-five per cent confidence would limit the range to between 4.5 per cent and 10 per cent. There are, however, a large number of factors which would inevitably lead us to expect that the correlation would not be a very close one. Firstly, there are year to year changes in the velocity of circulation which are related to the distribution of money incomes; secondly, there is the problem that the fiscal year is an arbitrary cut-off period, possibly the correlation would be improved by including April which is part of the busy season, with the figures for the preceding year; thirdly, there are lags in price changes which may well alter over time.

Despite the limitations of the regression curve I propose to use it for working out price changes in response to changes in the ratio of money supply to GNP. The excuse for doing so is that since we are not using the formula for the prediction of a particular year's price level, but for the changes over a five-year period, the variation around the curve will tend to cancel out since as many observations will be above as below. Thus for the eleven-year period the highest deviation for any five-year average within the sequence from the values which would be predicted by the formula was 2.10 equal to an average difference of .42 per cent per year over the period. While this may change in the future, the formula would seem to be a fairly good working hypothesis for future relationships. The linear equation is the following,

$$\Delta P_2 = 2.18 + 1.05 \Delta \frac{MS_1}{Y_1}$$

where  $\Delta P_2$  is the change in prices in year two, and  $\Delta \frac{MS_1}{Y_1}$

is the change in the ratio of Money Supply to GNP in year one. The expected and actual values of Prices for each observation of the ratio is given below

TABLE V  
COMPARISON OF ACTUAL AND CALCULATED CHANGES IN  
PRICES IN RELATION TO CHANGES IN MONEY SUPPLY AND GNP

<u>M/Y*</u>	<u>P</u>	<u>P*2</u>	
<u>Annual Percentage</u> <u>Change in Index</u> <u>in One Year</u>	<u>Change in price Index</u> <u>in Year Two Calculat-</u> <u>ed from Equation</u>	<u>Actual Change in</u> <u>Prices in Year</u> <u>Two</u>	<u>/the</u>
.8	3.02	3.0	
3.2	5.55	4.0	
- 2.7	- .66	3.7	
- 6.2	8.71	6.7	
- 1.5	.60	0.0	
1.7	3.97	2.2	
6.0	8.49	6.0	
7.7	10.28	13.0	
1.5	3.76	8.0	
16.0	19.02	16.0	
7.4	9.97	10.0	

One additional problem which arises is why the equation doesn't take the form which would be derived from the quantity theory. Even when there is no change in the ratio of money supply to GNP there is still a 2 per cent price rise. It may well be that the formula indicates only a systematic upward bias in the price index, a possibility discussed earlier. A rather more worrying thought is that it might also reflect a certain degree of over-estimation of the national income statistics. Another possibility is a secular change in the velocity of circulation, though this would have to be a secular increase which goes against the view that as the subsistence sector is monetised velocity falls. In the absence of the kind of information which would answer these questions, it has to be assumed that the factors which have operated in the past to produce this result will continue to do so in the future.

Financing the Plan

In looking at the consequences of different levels of monetary expansion for plan financing there are various heroic assumptions which will have to be made. At first these might seem to invalidate the analysis, but given the limited scope of the conclusions and the fact that they are only required to be right over a five-year period the

exercise would seem worthwhile. The first assumption is that a five per cent growth rate in GNP is attained, both in the base year 1968/69 and during the five years of the Plan period, i.e. at the end of 1973/74 GNP will be 34 per cent higher than the end 1967/68 level. The other assumptions will be discussed in the course of the succeeding analysis.

Since we are especially interested in government financing we must look at the components of the money supply. So far it has been assumed not only that growth of GNP is exogenously determined but increases in the money supply also. Money supply has been assumed to be a policy variable determined by some august gentlemen with strong views on next year's desirable price levels. In fact money supply is not independent but is related to the price levels of the preceding year etc. Whether one could ever arrive at such a relationship empirically however is extremely doubtful. Firstly, components other than net bank credit to either government or private sector are completely unpredictable and arbitrary; fortunately they are a decreasing proportion of total monetary expansion though still far from negligible. Net Bank credit to the government is partly a policy decision but partly also determined by price levels. Net Bank credit to the private sector is determined by such factors as the supply of agricultural and other commodities, the price level and marginally by policy decisions. The behaviour of the three major categories is shown in Table VI below.

TABLE VI  
ANALYSIS OF VARIATIONS IN THE MONEY SUPPLY

	<u>Money Supply</u>	<u>Net Bank Credit to Government</u>	<u>Net Bank Credit to Private Sector</u>	<u>Others</u>
1956/57	+ 125	+ 310	+ 100	- 285
1957/58	+ 72	+ 502	- 152	- 278
1958/59	+ 113	+ 333	- 138	- 82
1959/60	+ 195	+ 264	- 70	+ 1
1960/61	+ 199	- 17	+ 253	- 37
1961/62	+ 177	+ 203	+ 37	- 63
1962/63	+ 264	+ 202	+ 172	- 110
1963/64	+ 442	+ 242	+ 217	- 17
1964/65	+ 328	+ 207	+ 117	+ 4
1965/66	+ 449	+ 467	+ 100	- 118
1966/67	+ 424	+ 218	+ 206	-
1967/68	+ 401	+ 226	+ 191	- 16

What are the most reasonable assumptions to make about the categories of monetary expansion in which we are not interested i.e. net bank credit to the private sector and the residual category in which net foreign exchange assets is the most important. Commencing with the latter, in the past the effect has been almost invariably to reduce the overall monetary expansion. This was partially because of an outflow of reserves. The most reasonable assumption would seem to be that given the low level of reserves of the past few years, the overall trend towards a lesser decline in the residual category will continue. For the past five years the decline has been about Rs. 150 crores. A small decline from Rs. 30 crores a year to Rs. 25 crores a year on average may occur. As far as net credit to the private sector is concerned one could correlate it, probably with little success, to prices, GNP, agricultural or industrial output etc. Again the choice of a five-year period must be the last line of defence for simply plotting a trend for the growth of net credit to the private sector. The equation for the trend line is

$$C = - 58.3 + 19.7 x$$

where  $C$  is net credit to the private sector and  $x$  is the number of years. Thus for each year net credit would increase by 19.7 over a base year figure of Rs. 180 crores (slightly lower than the actual for 1967/68 of Rs. 190 crores).

The following four case studies utilise these assumptions.

CASE I: MAINTAINING THE PRESENT RATE OF MONETARY EXPANSION (10 per cent)

			Annual		1973/4 over 1967/8			1973/4 over 1968/9	
% Increase in Money Supply					10		77		61
% Increase in GNP					5		34		27
% Change in Ratio MS/GNP					4.75		32		26
% Change in Prices					7.20		43 <u>6/</u>		42
	1967/8	1968/9	1969/70	1970/1	1971/2	1972/3	1973/4	Total Excl. 67/8	Total Plan Period Only
Increase in Money Supply	(401)	535	588	648	712	784	862	4130	3595
Residual items	(-16)	-25	-25	-25	-25	-25	-25	-150	-125
Net Bank Credit to Private Sector	(191)	200	220	240	260	280	300	1500	1300
Net Bank Credit to Government	(226)	360	393	433	477	529	587	2779	2419
Net Bank Credit to Government in 1968/9 rupees	-	369	367	378	389	403	418	2315	1955
1967/8 Credit to Government in 1968/9 rupees	-	226	242	259	278	298	319	1622	1396

6/ Rise in prices of 1 per cent in 1968/69.

Although in money terms, maintaining the present level of monetary expansion would yield an additional Rs. 1280 crores of additional net bank credit (i.e. plan period total of Rs. 2419 crores less Rs. 1130 crores which could be obtained by maintaining the Rs. 226 crores throughout the period); in fact the gain in real terms using 1968/69 rupees would only be Rs. 560 crores of additional investment, since prices will rise by 42 per cent over the plan period.



CASE II: EQUILISING THE GROWTH RATE AND THE RATE OF MONETARY EXPANSION

			Annual	1973/4 over 1967/8		1973/4 over 1968/9			
% Increase in Money Supply			5	40	<u>7/</u>		28		
% Increase in GNP			5	34			27		
% Change in Ratio M/GNP			-	5			-		
% Change in Prices			2	16	<u>7/</u>		15 <u>7/</u>		
	<u>1967/8</u>	<u>1968/9</u>	<u>1969/70</u>	<u>1970/1</u>	<u>1971/2</u>	<u>1972/3</u>	<u>1973/4</u>	<u>Total excl. 67/8</u>	<u>Total Plan Period only</u>
Increase in Money Supply	(401)	535	294	309	325	341	358	2162	1627
Residual items	(-16)	-25	-25	-25	-25	-25	-25	-150	-125
Net Bank Credit to Private Sector	(191)	200	220	240	260	280	300	1500	1300
Net Bank Credit to Government	(226)	360	99	94	90	86	83	812	452
Net Bank Credit to Government in 1968/9 rupees	-	360	93	86	81	76	72	768	408
1967/68 Credit to Government in 1968/69 rupees	-	226	242	247	252	257	262	1486	1260

7/ 1967/68 increase in money supply 10 per cent; 1967/8 increase in prices 1 per cent; 1968/9 increase in prices 7 per cent.

The effect of maintaining both the rate of increase of the money supply and the rate of growth of GNP at 5 per cent per annum would be a rise in prices of 15 per cent over the plan period and a need to find an additional Rs. 850 crores of resources during the plan period to maintain the real value of the current level of investment financed by net credit to the government.

CASE III: MAINTAINING NET BANK CREDIT TO GOVERNMENT AT Rs. 300 CRORES AT CURRENT PRICES

			<u>Annual</u>	<u>1973/4 over 1967/8</u>			<u>1973/4 over 1968/9</u>		
% Increase in Money Supply			7.8 <u>8/</u>			60 <u>7/</u>		45	
% Increase in GNP			5			34		27	
% Change in Ratio MS/GNP			2.5 <u>8/</u>			18		13	
% Change in Prices			5.2 <u>8/</u>			30		29	
	<u>1967/8</u>	<u>1968/9</u>	<u>1969/70</u>	<u>1970/1</u>	<u>1971/2</u>	<u>1972/3</u>	<u>1973/4</u>	<u>Total excl. 67/8</u>	<u>Total Plan Period only</u>
Increase in Money Supply	(401)	535	495	515	535	555	575	3210	2675
Residual items	(-16)	-25	-25	-25	-25	-25	-25	-150	-125
Net Bank Credit to Private Sector	(191)	200	220	240	260	280	300	1500	1300
Net Bank Credit to Government	(226)	360	300	300	300	300	300	1860	1500
Net Bank Credit to Government in 1968/9 rupees	-	360	281	267	254	244	234	1640	1280
1967/68 Credit to Government in 1968/9 rupees	-	226	242	255	268	280	292	1563	1337

8/ Annual average.

Maintaining net bank credit to the government at a constant level of about Rs. 300 crores during each year of the Plan period would mean roughly the same level of existing resources - slightly less than the 1967/8 level over the Plan period, but slightly more when 1968/9 is included. There would still however be a 30 per cent increase in prices over the period.

CASE IV: MAINTAINING THE PRESENT PRICE LEVEL

	<u>Annual</u>	<u>1973/4 over 1967/8</u>		<u>1973/4 over 1968/9</u>	
% Increase in Money Supply	1.75	19	8		
% Increase in GNP	5	34	27		
% Change in Ratio MS/GNP	-3.4	-12	-15.5		
% Change in Prices	-	-	-		

	<u>1967/8</u>	<u>1968/9</u>	<u>1969/70</u>	<u>1970/1</u>	<u>1971/2</u>	<u>1972/3</u>	<u>1973/4</u>	<u>Total excl. 67/8</u>	<u>Total Plan Period only</u>
Increase in Money Supply	(401)	535	107	107	107	75	84	1015	480
Residual items	(-16)	-25	-25	-25	-25	-25	-25	-150	-125
Net Bank Credit to Private Sector and Government	(417)	560	132	132	132	100	109	1165	605
Net Bank Credit to Private Sector and Government in 1968/9 rupees		560	123	125	127	88	109	1132	572
1967/68 Credit to Private Sector and Government in 1968/9 rupees	-	417	446	438	431	424	417	2576	2156

The cost of maintaining the existing price level is a very heavy one. It implies a rise of only 8 per cent during the Plan period and a need to find an additional nearly Rs. 1600 crores in real terms to maintain the current levels of credit to private and public sectors. Assuming that all the credit went to the private sector it would still suffer a reduction of about Rs. 400 crores as against the current level over the Plan period, and about Rs. 700 crores as against its estimated needs during that period. The public sector would have to find an additional Rs. 1170 crores over the Plan period if there is to be no fall in real investment.

Conclusion

The implications of the cases analysed above for policy are un-  
evitable in the extreme. Even if the Indian government decides that none  
of the additional resources required for the Plan will be raised through  
deficit financing (Case III) there will still be a rise in prices of 29  
per cent during the Plan period. If it was desired to stabilise the  
price level or the ratio of money supply to GNP, a very considerable  
additional resource effort would be required.

The choice of a suitable 'mix' of monetary expansion, price increa-  
ses and resource generation will depend on variables which are outside the  
scope of the present analysis. Assuming that a particular rate of  
investment is required to attain a 5 per cent growth rate the first  
decision is what percentage of the investment must be undertaken by each  
sector. The next question is where the resources for this will come  
from. If drawing away resources from the private sector by the public  
sector will mean that the private sector portion of the investment targets  
will not be attained then policy has to be adjusted accordingly. If the  
maximum draft on the private sector exceeds the public sector's needs then  
it might be feasible to, say, adopt Case II which would yield a relatively  
stable price level. In the case of the maximum draft being rather less  
than required something like Case I might have to be chosen, or  
alternatively the economy might just have to settle for a lower growth  
rate.

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SHORT-TERM ECONOMIC FORECASTING IN THE  
CONTEXT OF THE NATIONAL INCOME ACCOUNTING

By

P.V. Ramaraju

HYLER/BAL

16th - 19th January 1970

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The views expressed in the papers are those of the authors  
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which they belong.

SHORT-TERM ECONOMIC FORECASTING IN THE CONTEXT OF  
THE NATIONAL INCOME ACCOUNTING

by

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The purpose of this paper is to describe a technique for forecasting the gross national product for a year or so ahead and to appraise the many problems associated with this operation. The approach to be followed here will be the so-called "sectoral analysis" procedure, in which the various components of the gross national product are separately evaluated and then combined to form a total. In a sense, Gross National Product is a sprawling aggregate that sums up the output of the economy. More precisely, it is a part of the conceptual apparatus that demonstrates the process by which goods and services are produced, and incomes generated. Income and output are merely different ways of looking at the same basic process and these concepts are linked up together in a framework called the "National Income and Product" accounts.

2. Short-term economic forecasting method can be adopted for estimating Government expenditures, capital investment, construction, business prospects and Foreign Trade and the Balance of Payments. Gross national product, which is most widely used and publicised of these related concepts, measures the market value of the final goods and services produced by the nation. In other words, it comprises of the total expenditures of consumers, business and government, as well as net export balance with foreigners.

3. Government expenditures are often taken as an exogeneous or pre-determined factor in preparing an aggregate economic forecast. The forecasts of capital investment are a basic part of the forecasts of the gross national product and thus a reliable forecast of capital expenditures helps to provide a reliable forecast of the general economy. Factors affecting the success of construction forecasting differ somewhat from those influencing the success or failure of other types of forecasting. In developing short-term forecasting pattern of business prospects, total inventory change is derived by summing up the changes calculated from a detailed break-down for manufacturing, trade, and other industries. Changes in inventory investment are probably the most volatile of all the segments of gross national product. Forecasting of the Foreign Trade and the Balance of Payments require analytical study of the past data and successful methods involve only a modest amount of mathematics.

4. The significant things to bear in mind in attempting this hazardous undertaking are the following assumptions of importance in making forecasting to be more feasible for a year ahead:-

- i) No major war or heating up of inter-national tensions will occur;
- ii) Relationship between Government and the business community will not be sharply altered;
- iii) Crippling strikes will, by and large, be averted;

- iv) Social-cultural patterns will not produce inordinate strains;
- v) Taxes will not be raised or lowered in any significant fashion.

5. The present study is in particular reference to the short-term forecasting of the Gross domestic product for all-India and the State of Andhra Pradesh in particular for a period of 3 years, 1967-68 - 1969-70 based on the past estimates of the years 1960-61 - 1966-67 on the methodology followed for the 'Revised Series' by the Central Statistical Organisation and the Bureau of Economics and Statistics, Andhra Pradesh.

#### Methodology

6. The gross domestic product at factor cost by Industry of Origin for all-India and Andhra Pradesh State at current prices is considered to develop a suitable mathematical formulae by each industry of origin to enable for the estimation of the gross domestic product for the years 1967-68 - 1969-70. The second degree equation is considered as a best fit for each of the Industries both for all-India and Andhra Pradesh. The following formulae have been worked out for the estimation of income for the years 1967-68 - 1969-70 based on the data available for the years 1960-61 - 1966-67 (Revised Series).

##### I. All-India

- 1. Agriculture:  $y = 6376.00 + 139.3690x + 104.2758 x^2$ ;
- 2. Forestry:  $y = 348.7132 + 17.4405x + 0.7976 x^2$ ;
- 3. Fishing:  $y = 95.7143 - 9.0545x + 2.4405 x^2$ ;
- 4. Mining & Quarrying  $y = 128.5714 + 19.7619x + 0.1190 x^2$ ;
- 5. Large-scale manufacturing:  $y = 995.5714 + 168.7381x + 3.0952 x^2$ ;
- 6. Small-scale manufacturing:  $y = 683.1428 + 110.5476x - 2.0238 x^2$ ;
- 7. Construction:  $y = 577.5714 + 40.5714x + 5.5000 x^2$ ;
- 8. Electricity, gas & water supply:  $y = 76.2857 + 6.7738x + 1.9381 x^2$ ;
- 9. Transport and communication:  $y = 626.2857 + 68.4762x + 2.8333 x^2$ ;
- 10. Trade, storage, hotels and restaurants:  $y = 1280.1428 + 16.5714x + 26.5714 x^2$ ;
- 11. Banking and Insurance:  $y = 126.2857 + 31.4643x + 0.3929 x^2$ ;

12. Real Estate and Ownership of buildings:  $y = 523.4286 + 54.8453x + 0.0595 x^2$ ;
13. Public administration and defence:  $y = 470.4286 + 53.7381x + 5.5238 x^2$ ;
14. Other Services:  $y = 912.7143 + 2.8452x + 13.0595 x^2$ ;

II. Andhra Pradesh

1. Agriculture:  $y = 518.7143 + 71.4048x + 1.7619 x^2$ ;
2. Animal Husbandry:  $y = 152.1429 + 1.8333x + 2.0476 x^2$ ;
3. Fisheries:  $y = 10.1429 + 1.0356x + 0.0356 x^2$ ;
4. Forestry:  $y = 5.2857 - 1.2381x + 0.2143 x^2$ ;
5. Mining & Quarrying:  $y = 6.7143 + 1.0952x + 0.0238 x^2$ ;
6. Large-scale manufacturing (factory establishment):  $y = 23.5714 + 7.4524x - 0.1905 x^2$ ;
7. Small Enterprises:  $y = 35.5714 + 10.0238x - 0.2143 x^2$ ;
8. Transport:
  - A. Posts & Telegraphs:  $y = 3.7143 + 0.0833x + 0.0833 x^2$ ;
  - B. Railways:  $y = 19.1429 + 2.4405x + 0.0190 x^2$ ;
  - C. Other transport:  $y = 7.5714 + 0.5952x + 0.0238 x^2$ ;
9. Trade:  $y = 78.7143 + 7.3333x + 0.1905 x^2$ ;
10. Banking & Insurance:  $y = 7.2857 + 0.6429x + 0.1429 x^2$ ;
11. Government services:  $y = 78.7143 + 4.2262x + 0.2262 x^2$ ;
12. Other services:  $y = 62.4286 + 4.5714x$ ;
13. House property:  $y = 40.1429 + 0.2500x + 0.3929 x^2$ ;

Notation: x = year to which estimate relates with 1960-61 as 1 and 1969-70 = 10.

y = Income (in crores) from industry of origin considered.



Estimates

7. The forecasting estimates for the years 1967-68 - 1969-70 have been worked out for each industry using the above formulae developed for each industry of origin for the all-India and Andhra Pradesh based on the data for the years 1960-61 - 1966-67 the period of coverage is being of 7 years duration. The period under study has been restricted to 7 years only, 1960-61 - 1966-67, due to lack of the previous years estimates, as the methodology adopted for the estimation of income by industry of origin prior to the year 1960-61 is different from those adopted since the year 1960-61 onwards and as such the estimates for the years earlier to 1960-61, say 1950-51 were not utilised. The estimates adopted here is based on the methodology for the 'Revised series' for all-India and State estimates prepared by the Central Statistical Organisation and the Bureau of Economics and Statistics, Andhra Pradesh respectively. The estimates prepared by the Central Statistical Organisation for the years upto 1959-60 are the 'Conventional Estimates (and those prepared from the year 1960-61 onwards are known as the "Revised Series".

/to  
1959-60

8. It is interesting to note from Table III that the estimates prepared by the Central Statistical Organisation for the year 1967-68 closely agree with the corresponding estimates based on the forecasting method, the difference is practically negligible. It may be evident that by the method of forecasting, the estimates are compiled for each Industry of Origin separately and then added up together to arrive at the gross domestic product. It may be of great significance to observe that the estimates based on the Forecasting method hold good for at least 2 years to come, i.e., 1968-69 and 1969-70 and in no way inferior to the quick estimates. It may be relevant here to recall that the quick estimates prepared by the Central Statistical Organisation and State Statistical Bureaus are usually released one year later after the close of the year under question. No doubt, that the quick estimates are broadly arrived at basing on Forecast estimates in case of agriculture and indices of production in the case of manufacturing, etc., consequently the usefulness of the quick estimates do not fully serve the requirements of the official and non-official institutions well in time in the context of the developing economy.

9. In view of the consistency in the share of income for all-India by major industry groups, vide Table I that the short-term forecasting method obviously proves a very useful tool for the estimation for the future years to come in advance. Contrary to this, due to change of share of income by the major industry groups for a state like Andhra Pradesh from year to year, and due to adverse seasonal conditions prevailed in the years 1965-66, 1968-69 and 1969-70, it needs a very careful study to adopt forecasting for the future years to estimate the income under agriculture and allied industries.

10. It is, however, desirable to study the past data for a longer period instead of a short duration data like the years 1960-61 - 1966-67 alone. In view of lack of the estimates for a series of years based on the same methodology for the years 1950-51 - 1959-60 no attempt is made to examine in detail the trends inherent in the behaviour of the

estimates. Nevertheless, it can be relied upon the short-term economic forecasting feasible for 2 years period to come for the purposes of analysing the various components into which investment is greatly needed for an increase in income. It is not necessarily the agriculture group alone mainly responsible for larger increase in income but other industries too which need more investment as envisaged by the Planning Commission.

Investments during the Third and Fourth Plans

Sector	Third plan.	Fourth plan.	Percentage increase.
1	2	3	4
Agriculture and Allied Activities:	2110	3439	+ 163.0
Mining & Manufacturing	4057	8916	+ 219.8
Others	4233	8995	+ 212.5
	10400	21350	+ 205.3

11. The forecasting estimates agree very closely with the provisional estimates prepared by the Central Statistical Organisation for the year 1967-68 for each industry of origin for all-India except in the case of large-scale manufacturing as seen in Table No.V. In the case of agriculture, the Central Statistical Organisation's estimate form 49.9% to the gross domestic product as against 48.8% by the forecasting method for the year 1967-68. Yet, the agriculture industry form 49.4% and 50.0% respectively to the gross domestic product for the years 1968-69 and 1969-70 and confirm the consistency of the forecasting method. By and large, the main industry groups form approximately the same proportion to the gross domestic product for all these three years 1967-68 - 1969-70. In other words, the second degree fit used for the forecasting may be considered appropriate.

12. As regards Andhra Pradesh State as seen from Tables V and VI, the forecasting estimates agree very closely for each of industry of origin. Their proportions to the gross domestic product form the same for each industry from year to year in their contribution to the total income. It can be justified that the contribution to the gross domestic product from agriculture group steadily increases from 59.6% to 69.0%, while the contribution from mining and industry group decreases from 8.5% in 1960-61 to 8.1% in 1969-70 though not much appreciable as compared to the other groups. Nevertheless, it is significantly important that more quantum of investment is made towards Irrigation and Power and Industry Sectors in the State.

Limitations of the study

13. Short-term economic forecasting method is quite useful for the estimation of the forecasting atleast for 2 years to come. Estimates

should be compiled for each industry of origin separately and then added together for arriving at the gross domestic product but not through any short-cut methods. Seasonal trends should be eliminated from these estimates before utilising them to get the gross domestic product. It is necessary to analyse in detail the segments forming Government expenditure, inventory investment, capital investment, construction, business prospects and Foreign Trade and Balance of Payments.

Table I

Comparative Statement showing the Gross Domestic Product at Factor cost by Industry of Origin for Andhra Pradesh & All-India. At Current Prices. (Rs. in crores)

Year	Agriculture		Mining, Manufac- turing, & small Enterprises.		Commerce, Trans- port & Communi- tions.		Other Services		T o t a l	
	All- India	Andhra Pradesh	All- India	Andhra Pradesh	All- India	Andhra Pradesh	All- India	Andhra Pradesh	All-India	Andhra Pradesh
2	3	4	5	6	7	8	9	10	11	12
1960-61	7010	768	2870	86	2027	126	2209	193	14116	1173
1961-62	7257	866	3135	97	2197	140	2383	199	14972	1302
1962-63	7413	903	3500	118	2403	155	2613	212	15929	1388
1963-64	8591	1069	4031	133	2694	168	2909	230	18225	1602
1964-65	10471	1228	4474	147	3155	183	3247	244	21347	1802
1965-66	10128	1192	4847	159	3410	196	3581	256	21966	1803
1966-67	12061	1436	5285	171	3957	218	3954	275	25257	2100
1967-68	15307	1535	5591	190	4415	236	4329	293	29642	2254
1968-69	16958	1676	6283	201	5054	254	4859	313	33154	2444
1969-70	19148	1826	6792	213	5697	273	5365	334	37002	2646

Table II

Comparative Statement showing the Percentage Distribution of Gross Domestic Product at Factor Cost by Industry of Origin for Andhra Pradesh & All-India. At Current Prices.

S.No.	Year	Agriculture		Mining, Manufac- turing & Small Enterprises		Commerce, Trans- port & Communi- tion		Other Services		T o t a l	
		All- India	Andhra Pradesh	All- India	Andhra Pradesh	All- India	Andhra Pradesh	All- India	Andhra Pradesh	All- India	Andhra Pradesh
1	2	3	4	5	6	7	8	9	10	11	12
1.	1960-61	49.7	59.61	20.3	8.49	14.4	12.60	15.6	19.30	100.00	100.00
2.	1961-62	48.5	60.64	20.9	8.59	14.7	12.66	15.9	18.11	100.00	100.00
3.	1962-63	46.5	59.16	22.0	9.81	15.1	13.08	16.4	17.95	100.00	100.00
4.	1963-64	47.1	61.11	22.1	9.57	14.8	12.47	16.0	16.85	100.00	100.00
5.	1964-65	49.0	62.64	21.0	9.43	14.8	11.95	15.2	15.98	100.00	100.00
6.	1965-66	46.1	60.68	22.1	10.08	15.5	12.70	16.3	16.54	100.00	100.00
7.	1966-67	47.7	63.38	20.9	9.29	15.7	12.07	15.7	15.26	100.00	100.00
8.	1967-68	51.6	68.10	18.9	8.43	14.9	10.47	14.6	13.00	100.00	100.00
9.	1968-69	51.1	68.58	19.1	8.22	15.2	10.39	14.6	12.81	100.00	100.00
10.	1969-70	51.8	69.01	18.3	8.05	15.4	10.32	14.5	12.62	100.00	100.00

TABLE III.

Gross Domestic Product at Factor Cost by Industry of Origin - All India - (At current prices)

Industry	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	(In Rupees Crores)			
								(b)		(b)	(b)
								1967-68	Fore- cast	1968-69	1969-70
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9 a)	(9 b)	(10)	(11)
1. Agriculture	6752	6965	7114	8240	10093	9706	11596	14801	14454	16366	18487
2. Forestry and logging	176	200	203	250	263	290	320	348	349	380	412
3. Fishing	82	92	91	101	115	132	145	158	179	212	249
Sub-total	7010	7257	7410	8591	10471	10128	12061	15307	14982	16958	19148
4. Mining & quarrying	153	158	191	221	221	253	273	206	294	318	333
5. Large-scale manufacturing	1189	1320	1502	1740	1947	2103	2325	2367	2544	2765	2992
6. Small-scale manufacturing	805	886	967	1110	1213	1256	1357	1493	1438	1514	1586
7. Construction	637	674	723	822	933	1047	1109	1172	1250	1388	1533
8. Electricity, gas & water supply	86	97	110	131	160	188	221	253	258	298	343
Sub-total	2870	3135	3503	4031	4474	4847	5285	5591	5784	6283	6792
9. Transport and communication	693	773	872	946	1034	1125	1255	1320	1355	1472	1594
10. Trade, storage, hotels and restaurants	1334	1424	1531	1748	2121	2255	2702	3095	3113	3582	4103
Sub-total	2027	2197	2403	2694	3155	3410	3957	4415	4468	5054	5697
11. Banking & Insurance	161	186	228	253	292	340	360	404	403	441	480
12. Real estate and ownership of buildings	589	621	673	760	807	850	908	960	966	1021	1074
13. Public Administration & defence	538	593	668	770	890	942					

TABLE III (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9 a)	(9 b)	(10)	(11)
14. Other services	921	983	1044	1118	1258	1399	1574	1760	1771	1996	2247
Sub-total	2209	2383	2613	2909	3247	3581	3954	4329	4394	4859	5365
15. Gross domestic product	14116	14972	15929	18225	21347	21966	25257	29642	29628	33154	37002

(b): Estimated by Forecasting method.

Source: Figures recorded against columns (2) to (9a) are from the estimates of National Product (revised series) 1960-61 to 1967-68 issued by the Central Statistical Organisation.





T A B L E - V

Gross Domestic Product at Factor Cost by Industry of Origin for Andhra Pradesh State -  
1960-61 - 1969-70

(in crores)

Industry	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<u>AGRICULTURE</u>										
A. Agriculture	587	687	706	860	983	910	1144	1203	1304	1409
B. Animal Husbandry	162	158	173	187	217	250	256	298	334	375
C. Fisheries	11	13	14	13	16	20	18	21	22	24
D. Forestry	8	8	10	9	12	12	18	13	16	18
SUB-TOTAL:	768	866	903	1069	1228	1192	1436	1535	1676	1826
<u>MINING, MANUFACTURING &amp; SMALL ENTERPRISES</u>										
A. Mining & Quarrying	8	9	10	11	13	15	15	17	18	20
B. Factory Establishment	32	38	41	50	56	67	63	71	75	79
C. Small Enterprises	46	50	67	72	78	77	93	102	108	114
SUB-TOTAL:	86	97	118	133	147	159	171	190	201	213
<u>COMMERCE, TRANSPORT &amp; COMMUNICATIONS</u>										
A. Posts & Telegraphs	3	3	5	6	7	7	8	10	11	13
B. Railways	22	23	27	30	31	34	37	40	43	45
C. Other Transport	8	9	10	10	11	12	13	14	15	16
D. Trade, Hotels, Restaurants & Storage	85	96	102	112	120	127	141	150	160	171
E. Banking & Insurance	8	9	11	12	14	16	19	22	25	28
SUB-TOTAL:	126	140	155	168	183	196	218	236	254	273
<u>OTHER SERVICES</u>										
A. Government Services	86	84	92	101	107	113	118	127	135	144
B. Other Services	66	73	76	81	86	87	96	99	104	108
C. House Properties	41	42	44	48	51	56	61	67	74	82
SUB-TOTAL:	193	199	212	230	244	256	275	293	313	334
GROSS DOMESTIC PRODUCT:	1173	1302	1388	1602	1802	1803	2100	2254	2444	2646

Source: Figures recorded in columns (2) to (8) are from the Working sheets of the State Income Estimates, 1960-61 to 1966-67 prepared by the Bureau of Economics and Statistics, Andhra Pradesh.

TABLE No. VI

Gross Domestic Product at Factor Cost by Industry of Origin for Andhra Pradesh:  
Percentage Distribution

Industry	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<b>AGRICULTURE:</b>										
A. Agriculture	46.48	49.32	47.02	49.85	50.78	46.73	50.50	53.37	53.36	53.25
B. Animal Husbandry	11.41	9.54	10.27	9.77	10.14	12.06	11.06	13.22	13.66	14.17
C. Fisheries	0.97	1.04	1.06	0.86	0.94	1.11	0.87	0.93	0.90	0.91
D. Forestry	0.75	0.74	0.81	0.63	0.78	0.78	0.95	0.58	0.66	0.68
SUB-TOTAL:	59.61	60.64	59.16	61.11	62.64	60.68	63.38	68.10	68.58	69.01
<b>MINING, MANUFACTURING &amp; SMALL ENTERPRISES:</b>										
A. Mining & Quarrying	0.62	0.62	0.68	0.65	0.65	0.74	0.65	0.75	0.74	0.76
B. Factory Establishment	3.25	3.47	3.50	3.68	3.69	4.36	3.48	3.15	3.07	2.99
C. Small Enterprises	4.62	4.50	5.63	5.24	5.09	4.98	5.16	4.53	4.42	4.31
SUB-TOTAL:	8.49	8.59	9.81	9.57	9.43	10.08	9.29	8.43	8.22	8.05
<b>COMMERCE, TRANSPORT &amp; COMMUNICATIONS:</b>										
A. Posts & Telegraphs	0.29	0.27	0.39	0.41	0.45	0.43	0.42	0.44	0.45	0.49
B. Railways	2.15	2.06	2.33	2.23	2.03	2.21	2.04	1.77	1.76	1.70
C. Other Transport	0.84	0.82	0.83	0.77	0.73	0.76	0.73	0.63	0.61	0.60
D. Trade, hotels, restaurants & storage	8.56	8.72	8.60	8.17	7.83	8.25	7.83	6.65	6.55	6.46
E. Banking & Insurance	0.76	0.79	0.93	0.89	0.91	1.05	1.05	0.98	1.02	1.06
SUB-TOTAL:	12.60	12.66	13.08	12.47	11.95	12.70	12.07	10.47	10.39	10.32
<b>OTHER SERVICES:</b>										
A. Govt. Services	8.63	7.60	7.76	7.43	6.98	7.29	6.56	5.63	5.52	5.44
B. Other Services	6.58	6.66	6.46	5.92	5.64	5.63	5.33	4.39	4.26	4.08
C. House Properties	4.09	3.85	3.73	3.50	3.36	3.62	3.37	2.98	3.03	3.10
SUB-TOTAL:	19.30	18.11	17.95	16.85	15.98	16.54	15.26	13.00	12.81	12.62
<b>TOTAL:</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research  
in  
National Income

SOME NOTES ON SHORT-TERM FORECASTING OF INVESTMENT TRENDS IN INDIA

By

Narottam Shah

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors  
and not necessarily of the Organisations or Institutions to  
which they belong.

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SHORT-TERM FORECASTING OF  
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By Narottam Shah

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### Introductory Remarks

1. In terms of the theme set for this Conference, one is expected to deal with forecasting, i.e. estimating the likely trends in future. Such forecasting is, needless to say, very important. But equally important, under Indian conditions, is the need to fill the gap in the data for the recent past. Thus, the latest available CSO estimates of capital formation (not yet released to the public) go only upto 1965-66. Obviously, then, for preparing forecasts for the period ahead as well as for current policy purposes, it is necessary to prepare some rough estimates for the recent three or four years before we go on to prepare projections for the next three or four years. The problems of 'forecasting' the trends in the recent years call for separate treatment and hence have not been dealt with in this paper.

2. In most forecasting exercises, it is usual to start with the relevant time series data for the recent period and carry these forward on the basis of some assumptions. Despite the impressive sophistication of some of the mathematical tools used for this purpose, the results obtained are too conjectural to be of any use either to academicians or to policy makers. The results are likely to be all the more conjectural when the recent data used are two to five years old. In view of these considerations, the need for exploring some alternative approach to the problems of forecasting investment trends is obvious.

3. We, therefore, propose a different approach, which can yield far more reliable and detailed (i.e. sectoral) estimates. This approach is made possible by the fact that the actual investment activity is usually preceded by a perceptible and more or less firm investment decision and some other preparatory activity, which can serve as reliable leading indicators of the investment activity which follows subsequently. The usual time-lag is one to four years. From this

follows an implication which is of great importance for forecasting of investment trends, viz. the indicators of investment activity and other preparatory activity can be used to forecast the likely investment trends over the next one to four years.

4. As will be shown below, such indicators are available even now. That the forecasting potential of these available indicators is not being utilised seems, therefore, unfortunate. Of course, there are some gaps in the indicators. But even within the limitations of the various official agencies collecting these data at present, the task of filling these gaps does not seem to be particularly difficult.

#### Public Sector

5. To turn to our subject, we shall begin with the public sector. Here, one has to begin with the Five Year Plan documents which, it should be emphasised, provide only a notional frame of reference. Further, even, as a notional frame of reference, these documents are useful only for a year, or at the most for two years, after their publication. Thereafter, the Five Year Plan documents lose touch with reality to such an extent that their usefulness for any forecasting exercise is extremely limited.

6. A more useful document would be the "Material and Financial Balances" relating to the current or the next Five Year Plan -- if, of course, one has access to these "Balances", which, more often than not, are unavailable to the general public. While we do not know the latest position in this regard, at least until recently balances for investment goods were not prepared. If the Perspective Planning Division starts preparing detailed balances for investment goods and if the full document on "Material and Financial Balances" is released to the public, we would have extremely valuable material for forecasting exercises.

7. Needless to add, the efficiency of plan formulation and implementation in India can be enormously improved if the "Balances" are revised and issued every year along with the Annual Plans. Such annual "Balances" would enormously improve the quality and reliability of all exercises about forecasting of investment trends.

8. As is well-known, in India a Five Year Plan document is not an operational document. It is essentially a statement of tasks and intentions. However, we have Annual Plan documents which approximate closely to operational documents. But not quite -- and for two reasons. Firstly, sometimes the Annual Plan for a State as indicated by the Planning Commission in its Annual Plan document is somewhat different from the State Annual Plan adopted by the State Government concerned. Secondly, although investment is the crux of our plans, the hard information on the details of the proposed investment is woefully scanty in the Annual Plan documents as indeed it is even in the Five Year Plan documents.

9. Operational plan documents par excellence in India are, of course, the budget documents of the Union Government and State Governments\*. Since the Government sector accounts for about half of the total gross fixed assets formation in the Indian economy, the importance of these documents for the investment forecasting exercise should be obvious. They provide a reasonably good basis for a firm forecast of investment activity in the government sector over the period of the next one year. However, one faces two problems here: (i) An analysis of these voluminous documents is likely to take several months, and by the time the results are made available to the public, about six months out of the one year covered by the budget documents may be over. (ii) The States do not publish economic and functional classifications of their respective budgets. This makes the

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\* All references to State Governments in this paper should be taken to cover the Union Territories and Local Authorities also.

task of analysing their budget documents extremely difficult. Further, the prevailing system of classification does not provide for sufficient details of the investment expenditures. This lacuna should be filled and all the States should start issuing economic and functional classifications of their budgets within a month after the presentation of their respective budgets. If this is done, the task of the forecasters will be rendered easier by half.

10. After the budget, there is a near-blackout of information for a whole year until the next budget. To tackle this problem, the system of reporting on the progress of investment activity applicable at present only to the private sector entrepreneurs holding industrial licences (see paragraph 16 below and the appendix at the end of this paper) should be extended to all government investment activity.

#### Private Sector: Large Scale Industry

11. Here a series of very useful leading indicators are available. Of course, there are many gaps in the available data because of various exemptions granted under the existing rules and regulations. It would, therefore, be useful in a number of ways if the Government introduces the necessary amendments in the prevailing rules and regulations to call for certain types of requisite information even from the exempted units.

12. An investment intention arises in this sector whenever an entrepreneur (an individual or an organisation) decides to start a new unit or expand an old one. For obvious reasons, it is impossible under Indian conditions to collect any reliable information about this starting point of investment activity. Fortunately, we can do without this information.

13. Once an investment scheme is formulated in sufficient detail and leads to a firm investment decision, the first important step is to apply for an industrial licence.



If the application is rejected, the matter ends there. But if a licence is issued, the way is cleared for undertaking the intended investment activity. Sometimes, due to some unforeseen difficulties, an entrepreneur may not be able to implement the scheme, and as a result, the licence may be surrendered by the entrepreneur or revoked by the Government. Not infrequently, as shown by Dr. R.K. Hazari, some entrepreneurs may decide, for ulterior motives, not to implement the scheme. In most cases, however, the schemes are implemented. Hence, the data on industrial licences provide an excellent starting point for preparing fairly reliable projections of likely investment trends in this sector.

14. A couple of comments about the interval between the issuance of a licence and the actual investment activity are in order here. First, there is some interval between the issuance of a licence and the beginning of the physical investment activity, i.e. construction and erection. Secondly, the physical investment activity is usually spread over a period of more than one year. Taken together, the interval between the issuance of a licence and the termination of investment activity is usually two to four years. Isolated cases of intervals of six to eight years are not unknown, however. This non-uniformity of the total interval and the non-uniformity of the exact phasing of the total interval create insuperable problems when we try to aggregate the data on a yearly basis to derive some projections

15. Data on industrial licences are provided in the Weekly Bulletin of Industrial Licences, Import Licences and Export Licences, published by the Ministry of Foreign Trade and Supply. The time-lag in the publication of this Bulletin is remarkably short - just about a fortnight or so, on an average. However, there are some serious gaps in the data published in this Bulletin. Apart from the industrial licence number and the name of the entrepreneur, the published data indicate only the names of the items to be manufactured and their quantities. It

would be of great assistance for preparation of projections of investment trends as well as many other types of economic analysis, if the authority concerned were to include the following items also in the published data:

- (i) Expected investment in
  - (a) imported equipment,
  - (b) indigenous equipment,
  - (c) land,
  - (d) construction,
- (ii) Expected employment,
- (iii) Location of plant,
- (iv) Expected value of full capacity output at prevailing prices of each item to be produced.

Most of this information is usually furnished by the entrepreneurs along with the application for industrial licence. It would not be difficult to ask the entrepreneurs to furnish information on a couple of additional points.

16. Under the Industries (Development and Regulation) Act, the licencees are expected to submit specific information in Form G, once every six months, until the licensed capacity is fully installed. This most valuable source of information on current and prospective trends in the investment activity in this sector is practically lost to the world -- so much so that few statisticians or economists are even aware of its existence. This is partly because there is no system to ensure that the G Form returns are regularly filed by the licencees and mainly because, when these returns are received in the Ministry of Industrial Development, they are just filed and nothing is done at present to process the data that they contain. It is to be hoped that hereafter something will be done urgently about this matter by the authorities concerned. In an appendix to this paper, we suggest an expanded version of this form which can usefully replace the present pro-forma of the G. Form.

17. In the absence of access to the G.form data, all that an outside research worker can do is to fall back upon two other sources of detailed information on the various individual large scale industrial projects on hand in the private sector. These two sources are: (i) Prospectuses and (ii) Annual account issued by the public limited companies.

18. Prospectuses are issued by old or newly formed companies when they desire to raise capital required for financing the investment activity on hand. The fact of issuance of a prospectus is of great significance for investment forecasting. For, it signifies a firm and irrevocable investment decision: the same cannot be said about the taking out of an industrial licence. Usually these prospectuses give detailed information, in financial terms, about the volume of investment activity on hand, as well as the (total) period over which the investment activity is expected to be spread.

19. Old or new, once a public limited company is formed, it is legally bound to **issue** its annual reports on a regular basis, in accordance with the Companies Act. An annual report comprises the annual accounts and the report of the board of directors. Although ~~it has~~<sup>there is</sup> no legal obligation, usually there is also the speech of the chairman of the board of directors at the annual general meeting of the shareholders. Finally, there is the not-much-publicised record of proceedings of the annual general meeting of the shareholders. Much useful material about the prospective investment by the company is found in this material which also provides fairly comprehensive information about the medium-term (i.e. say, the next **three** to five years) investment plans of the company. It is unfortunate that much of this information is in non-statistical terms, and hence does not lend itself to aggregation. However, an experienced analyst can form a reasonably dependable impression as to whether the tempo of investment in this sector is rising or falling.

20. All the sources discussed so far in this section provide the required information on a unit-wise basis, with a good deal of useful supplementary detail. However, there are three other sources of information which do not give as much detail, but which, nevertheless, are worth using both for preparing independent estimates and as checks on estimates derived from other sources. The sources we have in mind are:

- (i) Sanctions for capital issues, other than bonus issues.
- (ii) Fresh capital raised from the capital market.
- (iii) Loans and other assistance sanctioned and disbursed by various financial institutions.

21. Generally, securing a sanction for issuing capital (other than bonus) is the second step which follows the taking out of an industrial licence. It indicates an almost firm decision to undertake investment activity. The other things are not always equal; but in so far as these can be assumed to be equal, rise <sup>or</sup> and fall in the volume of capital issues sanctioned during the recent months can be taken as a leading indicator presaging rise or fall in the investment activity in the coming period. The time-lag between the ~~a~~ sanction for a capital issue and the actual issue of capital is one to two years. Then, there is a further time-lag of one to two years between the raising of capital and the actual investment activity. Hence, the capital issues sanction data help us identify the investment activities likely to be taken up two to four years later. While making inter-temporal comparison of these data, full account should be taken, inter alia, of the implications of the changing rules about exemptions from the Capital Issues ~~Act~~. *Control*.

22. As indicated in the preceding paragraph, getting a sanction for the capital issue implies "an almost firm investment decision". This decision becomes firm and irrevocable when the entrepreneur goes to the market and raises capital.

From this the importance of the data on capital raised in the market becomes obvious. Nevertheless, an important limitation of these data should be noted: Capital raised from the market represents only a part of the total finance mobilised for the investment activity on hand; further, the proportionate share of this source in the total capital finance keeps on changing. Hence, it is rather hazardous to use this data alone as a quantitative leading indicator of the trends in the investment activity in the coming months or years.

23. During the 1960's, special financial institutions have emerged as a major source of finance for industrial investment in the private sector. In view of this, the data on assistance sanctioned by these institutions can also be useful for our purpose. From an examination of the past trends, it appears that the actual disbursement follows about a year or so after the sanction of the assistance and the **relevant** investment activity follows within a few months of the disbursement. Given these lags, the predictive value of the data on sanctions (and, to a limited extent, even the data on disbursement) becomes obvious. A considerable part of the forecasting potential of these data is, at present, lost merely because most of the data are published with a considerable time-lag. This problem can be solved if all the institutions arrange to publish the relevant data on a monthly basis. The data in respect of the Industrial Finance Corporation and the State Financial Corporations are published regularly in the Reserve Bank of India Bulletin. It should not be difficult to publish similar data in respect of all other financial institutions also on a monthly basis.

24. Since almost every new investment activity is started with some assistance or other from one financial institution or another, or at least a bank, and since the borrowing entrepreneur has to furnish all the details of the proposed investment activity to the lending institution, it

should be possible for a central government agency like the Ministry of Finance to collect and analyse all these data to **develop** a full picture of the likely investment trends in the coming year or two. Even at the cost of some repetition, we would like to draw attention to the fact that the establishment of a set-up in the Ministry of Finance for this type of investment trend analysis does not call for collection of new data right from scratch. All that is required is a centralised pooling and analysis of the valuable material which is being collected even now in various institutions in the course of **their** usual business.

25. Data on the position of the order books of the firms manufacturing machinery and transport equipment can be one more useful source of data required for investment forecasting. In fact, these data are widely used for this purpose in the western countries. In India, however, no machinery exists at present to collect, process and publish such data. The difficulties of undertaking this task under Indian conditions **are** obvious. We would, however, like to point out a favourable feature of the task in India: viz. the fact that the number of units from which these data would have to be collected is rather small and therefore manageable. In fact, about a hundred larger units seem to account for about three-fourths of the total output of machinery and transport equipment in India. Even among these, most of the more important units are in the public sector. In view of this favourable feature, the task of collecting data on the position of the order books may not be nearly so difficult as it appears at first sight. It is, therefore, a task which some government agency would do well to take up, say on a quarterly basis.

#### Private Sector: Construction Activity

26. Construction activity is known to account for a large chunk of private sector investment activity in India.

Unfortunately, no data, which can be **used** for forecasting future investment trends in private construction activity, are available at present.

27. The **nearest** one can go, at present, is to use the data on sales of cement to private sector consumers (other than manufacturers of hune pipes, tiles, etc.) to ~~make~~ an extremely rough projection of the current level of investment in modern construction activity, i.e. where the use of cement is involved. Most probably, at least for many years to come, it may not be possible to go beyond such extremely crude forecasts covering the limited period of only a few months **ahead**.

28. To go beyond that, official **agencies** at the Central and State level would have to organise collection of data on municipal permission for starting construction of buildings. In their primary form, these data are already available with the municipal authorities. Now, two more steps are needed. First, aggregation and regular despatch of these data by the municipalities and secondly, their further aggregation at the State and Central levels. These data on building starts can be **usefully** aggregated only in terms of the carpet area of the buildings proposed to be constructed with some disaggregation by the types of construction. However, to convert these data (in terms of carpet area by different types of construction) into money value terms, we would need reliable data on the construction cost in each State (or even different regions of a State) for each type of **construction**. Special surveys for collecting these data may be conducted by either the National Building Organisation or the Reserve Bank of India. But here one has to face a familiar difficulty. What is desired is a forecasting of future trends; but the usual delay in the publication of the results of surveys by these agencies is so great that the future becomes past by the time the results of the

construction cost surveys become available. In view of this difficulty, it may be expedient to start with some benchmark data and to supplement these data by a regular index number series for construction cost for each type and each region, making provision for a revision of the weighting diagram of the index number series once every two or three years. With such an index number series, it would be possible to have a continuous time series data on construction cost, which would be useful for many other purposes also. With the help of the data on sanctions for starting of construction of buildings, bench mark surveys of construction cost and the index numbers of construction cost, it would be possible to forecast the trends in investment in building activity (in municipal area only) in the private sector.

29. Here, we shall consider private sector investment, other than land improvement, in agriculture, in so far as such investment is financed mainly by government owned agencies and co-operative societies. A possible source of information for forecasting such investment by the farmers is the data on loans sanctioned for such purposes by the various agencies.

Concluding Remarks:

30. Beyond the areas discussed in this paper so far, lie other areas of investment activity, for which it may not be possible to prepare forecasts for quite some time to come. Some of the major areas of this type are:

- ( i) Unauthorised construction in municipal areas.
- ( ii) All construction outside the municipal towns and cities i.e. rural private sector building activity.
- (iii) Land improvement activity by farmers.
- ( iv) Investment by branches of foreign companies.



Of these, perhaps, not much can be done in respect of forecasting investment trends in (i), (ii) and (iii). As for (iv), perhaps the Reserve Bank may be able to induce them to provide some regular reports on their future investment programmes.

31. One last comment. It is obvious that in its entirety the task is enormous and can be tackled in a satisfactory manner only by a government agency or a group of government agencies working in close co-operation. From the preceding discussion, it would be obvious that while the gaps are many, the full potential of the available data still remains to be exploited. Full exploitation by official or non-official agencies would be considerably facilitated, if the data available with the various official agencies <sup>are</sup> ~~is~~-fully released to the general public with the least possible time-lag.

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SUGGESTED PRO-FORMA FOR G. FORM  
QUARTERLY REPORT ON THE PROGRESS MADE IN THE INVESTMENT ACTIVITY  
OF INDUSTRIAL UNDERTAKINGS

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- (i) The quarterly reports should be submitted in the following cases, where the additional gross fixed capital formation exceeds Rs.5 lakhs.
- (a) New units
  - (b) Substantial expansion
  - (c) Manufacture of new articles
  - (d) Change of location
- (ii) This form is to be used for reporting the progress during and upto the end of the quarters ending March, June, September and December.
- 

- 1.0 Name and address of the undertaking:
- 2.0 Number and date of Registration Certificate/Licence/Permission issued to the undertaking:
- 3.0 Industry code number for each group of products and by-products:
- |  |     |
|--|-----|
|  | i   |
|  | ii  |
|  | iii |
|  | iv  |
- 

Contd....

4.0 Financing of Capital Requirement for Gross Fixed Capital Formation

	As envisaged in the application or original scheme	As envisaged now		
		Total	Of which	
			Raised till the end of preceding quarter	Balance to be raised
	1	2	3	4
4.1 Internal capital including owned funds, bonus shares depreciation provision and other provisions and retained profits				
4.2 External capital				
4.21 From Indian capital market				
4.22 Financial institutions (other than 'a')				
4.23 Banks				
4.24 Foreign collaborators				
4.25 Others				
Total 4.1 + 4.2				

Contd....

5.0 Programme of investment activity:

Activity	Original date	Actual date	Likely date if Col. No. 3 does not apply
1	2	3	4
5.1 Finishing all the official procedures to enable starting erection/installation			
5.2 Arrangements for the minimum finance required for starting erection/installation			
5.3 Possession of land			
5.4 Completion of major part of drawing board work			
5.5 Placing of orders for capital equipment			
5.51 Indigenous			
5.511 Major part			
5.512 All			
5.52 Imported			
5.521 Major part			
5.522 All			
5.6 Arrival of capital equipment at site			
5.61 Indigenous			
5.611 Major part			
5.612 All			
5.62 Imported			
5.621 Major part			
5.622 All			
5.7 Completion of erection			
5.8 Commissioning*			

\* Information may be given by major equipment or divisions.

Contd...

6.0 Progress of investment activity:

(in Rs.lakhs)

Particulars	Cost	Cost of capital		Cost	Total
	of land acqui- sition and develop- ment	Indig- enous	Impor- ted	of con- stru- ction; fac- tory and build- ings	Cols. (4+5)
	1	2	3	4	5
6.1 Total as envisaged in the application.					6
6.2 Total as finally revised till the end of the quarter under report.					
6.3 Orders placed till the end of the quarter under report.					
6.4 Installations till the end of					
6.41 Preceding quarter					
6.42 Quarter under report					
6.5 Balance to be implemented till the final commissioning of the project.					
6.6 Tentative programme of implementation as visualised for the next four quarters following the quarter under report:					
6.61 Quarter ending .....					
6.62 Quarter ending .....					
6.63 Quarter ending .....					
6.64 Quarter ending .....					
6.7 Programme of implementation for the subsequent two years:					
6.71 Year ending .....					
6.72 Year ending .....					
7.0 Itemwise annual installed capacity per shift on commissioning.		<u>Product</u>	<u>Quantity</u>	<u>Value</u>	

6.0 Progress of investment activity:

(in Rs.lakhs)

Particulars	Cost	Cost of capital		Cost	Total
	of land acqui- sition and develop- ment	Indig- enous	Impor- ted	of con- struc- tion; fac- tory and build- ings	Cols. (4+5)
	1	2	3	4	5
6.1 Total as envisaged in the application.					6
6.2 Total as finally revised till the end of the quarter under report.					
6.3 Orders placed till the end of the quarter under report.					
6.4 Installations till the end of					
6.41 Preceding quarter					
6.42 Quarter under report					
6.5 Balance to be implemented till the final commissioning of the project.					
6.6 Tentative programme of implementation as visualised for the next four quarters following the quarter under report:					
6.61 Quarter ending .....					
6.62 Quarter ending .....					
6.63 Quarter ending .....					
6.64 Quarter ending .....					
6.7 Programme of implementation for the subsequent two years:					
6.71 Year ending .....					
6.72 Year ending .....					
7.0 Itemwise annual installed capacity per shift on commissioning.		<u>Product</u>	<u>Quantity</u>	<u>Value</u>	

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research

in

National Income

SHORT-TERM FORECASTING OF NATIONAL INCOME OF  
UNDERDEVELOPED COUNTRIES (WITH SPECIAL REFERENCE  
TO INDIA)

By

A.G. Majumdar

HYDERABAD

16th - 19th JANUARY 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

SHORT - TERM FORECASTING OF NATIONAL INCOME OF UNDER-DEVELOPED COUNTRIES (WITH SPECIAL REFERENCE TO INDIA)

by

A.G. MAJUMDAR

(Economic and Scientific Research Foundation)

By short term economic forecasting it is generally meant estimation of one or more economic variables for one quarter, half or one year ahead. In advanced countries like the U.S.A. attempts are regularly made to estimate many economic variables and especially the GNP in advance. For example, Members of the Research Seminar in Quantitative Economics at the University of Michigan each year prepare an econometric forecast of the values of many economic variables by using some thirty six stochastic equations <sup>1/</sup>. For short - term forecasting of GNP, however, so many equations may not be necessary. Irwin Friend and Robert C. Jones in their paper 'Short-run Forecasting Models Incorporating Anticipatory Data'<sup>2/</sup> observed that for short-term forecasting of GNP, a simple small-scale model is likely to do at least as well as the more complex multi-equational and multivariates models. They further argued that "there seemed to be little evidence that otherwise important niceties, such as production functions, demand-for-labour equations, labour market adjustment equations, interest rate and price equations, disaggregated consumption function, or perhaps even distributive share and financial variables, added significantly to the short-term prediction of gross national product"<sup>3/</sup>. In India, no attempt has yet been made to forecast scientifically, even one economic variable like the National income on a short-term basis. In this connection one can think of CSO's quick estimates of national income for a period prepared and published six months after the end of the period, as nearest to short-term forecasting of national income.

For U.S.A., Irwin Friend and Robert C. Jones <sup>4/</sup> found that specific quarterly, semi-annual and annual models consisting of four relatively simple structural equations (demand for consumption, housing, plant and equipment and inventories) and one identity, seemed to give both good fits for the period 1951 to 1960 and relatively good 'ex-post' forecasts for 1961-62. The actual model of Friend and Jones is as follows: -

$$\begin{aligned}
 \Delta C &= 3.61 + .43 \Delta \tilde{Y} + .07 \Delta C_{-1} && \dots \dots (1) \\
 \Delta H &= .46 + 1.67 \Delta HS_{1/4} - .10 \Delta PE^e && \dots \dots (2) \\
 \Delta PE &= .10 + .99 \Delta PE^e + .10(\Delta \tilde{Y} - \Delta Y_1) && \dots \dots (3) \\
 \Delta I &= .11 - 1.04 I_1 + .18 \Delta \tilde{Y} + .42 \Delta PE^e && \dots \dots (4) \\
 \Delta Y &= 33.02 + 3.92 \Delta G^1 + 6.80 \Delta PE^e && \dots \dots (I) \\
 &+ .30 \Delta Y_1 - 2.35 \Delta C_{-1} - 3.43 \Delta HS_{1/4} && \dots \dots (5) \\
 &- 5.37 I_{-1} - .99 \Delta O_{-1} &&
 \end{aligned}$$

where  $\Delta C$ ,  $\Delta H$ ,  $\Delta PE$ ,  $\Delta I$ ,  $\Delta G^1$  and  $\Delta Y$  represent changes respectively in consumption, residential construction, plant and equipment expenditures, inventory investment, government expenditures plus net exports



and gross national product, all seasonally adjusted at annual rates in billions of 1954 dollars;  $\Delta Q_1$  represents the difference between unfilled orders at the beginning of years  $t$  and  $t-1$ ;  $\Delta PE^e$  refers to the first differences in anticipated plant and equipment expenditure for the year  $t$ ;  $\Delta HS_{1/4}$  is the change in housing starts between the last two quarters of the previous year; and  $\Delta Y$  indicates that computed values (from a reduced form have been used instead of actual values)

Short-term forecasting of GDP/NNP/GNP of underdeveloped countries

For short-term forecasting of the GNP (or national income or GDP) of an underdeveloped country like India, it is not possible to use the Friend - Jones Model since reliable time series data on such items as total investment, residential construction, plant and equipment expenditure, inventory investment are generally not available. Even if these data were available, it is doubtful whether Friend - Jones or Friend - Taubman <sup>5/</sup> models can be used in an economy like ours where fifty per cent of national income is generated in a sector which depends more on nature than on any type of expenditure, Government or Private. An attempt has, therefore, been made in this paper to construct a simple single equation model by which one can estimate the national income of India (or any other underdeveloped economy) for a year before the end of the year. For this purpose, we have examined the national income statistics of eight underdeveloped countries viz. Brazil, Chile, Guatemala, India, Mexico, Morocco, Pakistan and Taiwan spread over all continents of the world except Europe and Oceania. It is found that for the above countries (1) data on indices of agricultural and industrial production are available and (2) agriculture and industry together account for more than fifty per cent of the respective GNP, GDP or NNP. We, therefore, fitted the following model:

$$\log_{10} Y = b_0 + b_1 \log_{10} A + b_2 \log_{10} I \dots (II)$$

Where Y = GNP, GDP or NNP of any country

A = Its index of agricultural production.

& I = Its index of industrial production

to the respective data of eight countries. The fitted equation together with the value of the square of the multiple correlation coefficient

and the period covered for the eight countries are shown in Table 1.

Table 1  
Values of  $R^2$  and Regression Coefficients for  
Different Countries

Countries	Period Covered	Square of multiple correlation coefficient <sup>2</sup>	Equations
1.	2.	3.	4.
Brazil	1955 to 1963	0.9773	$\log_{10} Y = 1.03 + 0.126 \log_{10}^A + 0.469 \log_{10}^I$
Chile	1955 to 1964	0.9138	$\log_{10} Y = 0.663 + 1.45 \log_{10}^A + 0.00206 \log_{10}^I$
Guatemala	"	0.9833	$\log_{10} Y = 1.28 + 0.293 \log_{10}^A + 0.554 \log_{10}^I$
India	1960-61 to 1967-68	0.9954	$\log_{10} Y = 2.37 + 0.452 \log_{10}^A + 0.390 \log_{10}^I$
Mexico	1955 to 1964	0.9989	$\log_{10} Y = 0.0418 + 0.280 \log_{10}^A + 0.591 \log_{10}^I$
Morocco	"	0.9377	$\log_{10} Y = -0.503 + 0.350 \log_{10}^A + 0.352 \log_{10}^I$
Pakistan	"	0.9948	$\log_{10} Y = 0.225 + 0.403 \log_{10}^A + 0.224 \log_{10}^I$
Taiwan	"	0.9968	$\log_{10} Y = 2.99 + 0.105 \log_{10}^A + 0.584 \log_{10}^I$

(The data on Y, A and I for different countries are given in Appendix Tables I to VIII).

It may be seen from the above table that in all the eight cases the fit was very good, the value of  $R^2$  being always higher than 0.90. In as many as four countries,  $R^2$  is higher than 0.99 and in two countries it is more than 0.97. Only in two cases, the value of  $R^2$  is less than 0.95

Estimate of National Income of India for 1969-70

With the help of the equation

$$\log_{10} Y = 2.37 + 0.452 \log_{10} A + 0.396 \log_{10} I \dots (III)$$

where Y = National income of India at 1960-61 prices

A = Its index of agricultural production

and I = Its index of Industrial production

It is now possible to estimate the national income of India at 1960-61 prices for 1968-69 and 1969-70. But, before doing it so, let us now see how the estimated (i.e. 'expected' values obtained through the model) values of national income of India differ from the corresponding observed (i.e. official estimates) values during the period 1960-61 to 1967-68. These are shown in table 2.

Table 2

Estimated and observed values of NNP of India

years	(1960-61 to 1967-68)		
	NNP at 1960-61 Prices (Thousand million rupees)		Percentage difference
	Observed <sup>+</sup> (O)	Estimated*(E)	$\frac{(E-O)}{O} \times 100$
1.	2.	3.	4.
1960-61	133.08	132.70	- 0.3
1961-62	137.95	138.56	+ 0.4
1962-63	140.67	141.26	+ 0.4
1963-64	148.89	147.40	- 1.0
1964-65	159.45	159.44	0.0
1965-66	150.45	151.14	+ 0.5
1966-67	151.73	151.36	- 0.3
1967-68	165.25	165.51	+ 0.2

+ Official estimates

\* 'Expected' values obtained through the 'Model'

It may be noticed from column (4) of table-2 that excepting in one year (1963-64), the maximum difference between the two sets of estimates is only 0.5 per cent.

To estimate the national income of India for 1968-69 at 1960-61 prices, we put  $A = 158.7$  and  $I = 160.9$  in equation (III) and obtain the value of  $Y$  as Rs.16800 crores. This compares favourably with ten corresponding official 'quick' estimates of national income of Rs.16830 crores - the difference being only 0.2 per cent.

For the estimation of national income for 1969-70, it would be first necessary to estimate  $A$  and  $I$  for 1969-70. In our model, we have used the calendar year (i.e. January to December) figures for  $I$  and agricultural year (i.e. July to June) figures for  $A$ . With the help of the first six month's data on index of industrial production, we can fix the value of  $I$  for 1969-70 at 173.8. So far as agricultural production is concerned, it is too early to give a firm estimate for 1969-70. However, since the monsoon this year was more/less normal, the experts of Ministry of Food and Agriculture feel that the production of food grains in the current year would cross 100 million tonnes. Or, in other words, the production of food grains in the current year will be at least 6 per cent more than that of 1968-69. Since the growth of production of crops other than foodgrains is likely to be much less than that of foodgrains for obvious reasons we can reasonably assume that total agricultural production in 1969-70 will be 5 per cent higher than that of the previous year. In that case, the value of  $A$  will be 166.6. Putting  $A = 166.6$  and  $I = 173.8$  in equation (III), we obtain  $Y = 177.00$ . Or, in other words, our estimate of national income of India for 1969-70 at 1960-61 prices is Rs.17700 crores which is higher than the corresponding figure of 1968-69 by 5.4 per cent.

#### Source and adjustment of data

GNP/GDP/NNP - Time series data on GNP/GDP etc. at constant prices (either at factor cost or at market price) in respect of Brazil, Chile, Guatemala, Mexico, Morocco, Pakistan and Taiwan have been collected from the 'Year Book of National Accounts' (1965) issued by United Nations. For all the above countries except Brazil the data refer to the period 1955 to 1964. In case of Brazil, however, the data were collected for the period 1955 to 1963 since the estimate for 1964 was not available. The data on estimates of net national product (at factor cost) of India for the period 1960-61 to 1967-68 at 1960-61 prices have been taken from the publication 'Estimates of National Income (revised series), 1960-61 to 1967-68' issued by the Central Statistical Organisation, Government of India.

#### Index of Agricultural Production

The data on index of agricultural production (base: 1952-53 to 1956-57 = 100) for all the above countries except India have been taken from 1961 and 1966 editions of U.N. Statistical Year Book. These index Nos. were constructed by FAO. The period covered is 1955-56 to 1964-65. In case of India, the data on index of agricultural production for the period 1960-61 to 1967-68 (base: 1949-50 = 100) have been taken from the journal 'Agricultural Situation in India' (Annual Number, 1968) issued by the Directorate of Economics and Statistics, Ministry of Food and Agriculture, Government of India.

Index of Industrial Production

U.N. Statistical Year Books, 1961 and 1966 are the major sources of information for all the countries except India. Data on index of industrial production of India (base: 1960 = 100) are taken from Monthly Statistics of the production of Selected Industries of India.

For countries other than India, details are given below.

Brazil - The index covers mining, manufacturing, electricity and gas. For the period 1958 to 1962, data on index of industrial production (with 1958 = 100) have been directly taken from the U.N. Statistical Year Book, 1966. For 1963 the data have been taken from the 1968 issue of the U.N. Statistical Year Book after arithmetically shifting the base from 1963 = 100 to 1958 = 100. Similarly, for the period 1954 to 1957, data were collected from 1961 issue of the U.N. Statistical Year Book, after shifting the base arithmetically from 1953 = 100 to 1958 = 100.

Chile - As the combined index of industrial production is not available, we had to combine index of manufacturing and index of mining. Data on indices of manufacturing and mining have been taken from 1966 and 1961 issues of the U.N. Statistical Year Book. The Statistics for the period 1958 to 1964 (with 1958 = 100) are available in the 1966 issue of the Year Book while those for the period 1954 to 1957 (with 1953 = 100) are available in the 1961 edition of the Year Book. For combining the indices of manufacturing and mining, we have used the weights (viz. each sector's contribution to GDP of Chile in 1958) as given in the publication 'Growth of World Industry (1953-65): National tables' issued by the United Nations.

Guatemala - The index covers manufacturing, electricity and gas. Data for the period 1958 to 1964 (with 1958 = 100) have been directly taken from the 1966 edition of the U.N. Statistical Year Book. For the period 1954 to 1957, statistics of index of industrial production have been collected from the 1961 issue of the U.N. Statistical Year Book after arithmetically shifting the base from 1953 = 100 to 1958 = 100.

Mexico - The index of industrial production covers mining, manufacturing, electricity and gas. The data for the period 1958 to 1964 have been directly taken from the 1966 issue of the U.N. Statistical Year Book while those relating to the period 1954 to 1957 have been collected from the 1961 edition of the U.N. Statistical Year Book after shifting the base from 1953 to 1958.

- Morocco - The index covers mining, manufacturing, electricity and gas. The data relating to the period 1958 to 1964 (1958 = 100) have been directly taken from the U.N. Statistical Year Book (1966) whereas those for the period 1954 to 1957 have been collected from U.N. Statistical Year Book (1961) after shifting the base arithmetically from 1953 to 1958.
- Pakistan - The index of industrial production excludes electricity and gas. It includes only mining and manufacturing. The data for the period 1958 to 1964 (1958 = 100) have been directly taken from U.N. Statistical Year Book (1966) while those relating to the period 1954 to 1959 have been collected from 1961 issue of the same publication after shifting the base from 1953 to 1958.
- Taiwan - The index includes mining, manufacturing, electricity and gas. The data relating to the period 1958 to 1964 with the base 1958 = 100 have been directly taken from U.N. Statistical Year Book (1966) while those for the period 1954 to 1957 have been collected from the 1961 edition of the same publication after shifting the base from 1953 to 1958.

Appendix Table 1

Brazil - Time Series Data on G.D.P. and indices of Agricultural and Industrial Productions.

Years	Index of GDP at market prices of 1949 (1949 = 100) (Y)	Index of Agricultural production (1952-53 to 1956-57 = 100) (A)	Index of Industrial Production (1958 = 100) (I)
1.	2.	3.	4.
1955	138.4	106	65
1956	141.0	106	75
1957	150.7	115	84
1958	160.7	124	100
1959	172.5	130	109
1960	184.0	137	126
1961	197.4	147	140
1962	208.0	146	149
1963	211.3	143	149

Appendix Table 2

Chile - Time Series Data on N.D.P. and indices of Agricultural and Industrial Production

Years	Net Domestic Product at factor cost of 1961 (million escudos) (Y)	Index of Agricultural Production (1952-53 to 1966-57 = 100) (A)	Index of Industrial Production (1958 = 100) (I)
1.	2.	3.	4.
1955	3607	102	94
1956	3798	101	100
1957	4208	109	98
1958	4237	106	100
1959	4345	109	114
1960	4250	114	112
1961	4561	114	119
1962	4904	121	131
1963	5040	125	138
1964	5152	124	146

Appendix Table 3.

Guatemala - Time Series Data on G.D.P. and Indices of Agricultural and Industrial Production.

(1955 to 1964)			
Years	GDP at market prices of 1958 (million quetzales)	Index of Agricultural Production (1952-53 to 1956-57 = 100)	Index of Industrial Production (1958 = 100)
	(Y)	(A)	(I)
1.	2.	3.	4.
1955	809.1	103	76
1956	882.7	108	82
1957	932.5	114	91
1958	970.9	118	100
1959	1018.1	123	106
1960	1047.9	133	106
1961	1088.1	141	112
1962	1115.6	163	111
1963	1256.0	171	126
1964	1330.1	173	133

Appendix Table 4.

India - Time Series Data on NNP and Indices of Agricultural and Industrial Production.

(1960-61 to 1967-68)			
Years	NNP (national income) at 1960-61 prices (thousand million rupees)	Index of Agricultural Production (1949-50 = 100)	Index of Industrial Production (1960 = 100)
	(Y)	(A)	(I)
1.	2.	3.	4.
1960-61	133.08	142.2	100.0
1961-62	137.95	142.8	109.2
1962-63	140.67	139.6	119.7
1963-64	148.89	143.1	129.7
1964-65	159.45	158.5	140.9
1965-66	150.45	132.7	150.9
1966-67	151.73	132.0	152.4
1967-68	165.25	161.8	151.4



Appendix Table 5

Mexico - Time Series Data on GDP and Indices of Agricultural and Industrial Productions

Years	(1955 to 1964)		
	GDP at market prices of 1950 (thousands and million Pesos)	Index of Agricultural Production (1952-53 to 1956-57 = 100)	Index of Industrial Production (1958 = 100)
	(Y)	(A)	(I)
1.	2.	3.	4.
1955	55.3	111	81
1956	59.0	113	88
1957	63.4	128	95
1958	66.9	138	100
1959	68.9	135	109
1960	74.3	145	117
1961	76.9	151	122
1962	80.7	160	129
1963	85.9	165	140
1964	94.6	181	158

Appendix Table 6

Morocco - Time Series Data on G.D.P. and Indices of Agricultural and Industrial Productions

Years	(1955 to 1964)		
	GDP at Market prices of 1960 (thousand million dirhams)	Index of Agricultural Production (1952-53 to 1956-57 = 100)	Index of Industrial Production (1958 = 100)
	(Y)	(A)	(I)
1.	2.	3.	4.
1955	7.99	95	94
1956	7.85	101	96
1957	7.21	81	96
1958	8.13	107	100
1959	7.89	100	101
1960	8.20	108	111
1961	7.93	84	115
1962	8.90	116	120
1963	9.30	120	123
1964	9.37	119	130

Appendix Table 7

Pakistan - Time Series Data on GDP and Indices of Agricultural and Industrial Productions.

Years	NDP at factor cost of 1959 (thousand million rupees)	Index of Agricul- tural Production (1952-53 to 1956- 57 = 100)	Index of Industrial Production (1958 = 100)
	(Y)	(A)	(I)
1.	2.	3.	4.
1955	27.9	98	75
1956	29.5	102	85
1957	29.7	101	89
1958	30.1	100	100
1959	31.5	106	112
1960	33.0	113	132
1961	34.8	115	154
1962	36.0	115	177
1963	38.9	130	201
1964	40.5	129	224

Appendix Table 8

Taiwan - Time Series Data on Expenditure on G.N.P. and indices of Agricultural and Industrial Production.

Years	Expenditure on GNP at market prices of 1952 (million N <sup>o</sup> dollars)	Index of Agricul- tural Production (1952-53 to 1956- 57 = 100)	Index of Industrial Production (1958 = 100)
	(Y)	(A)	(I)
1.	2.	3.	4.
1955	20314	101	80
1956	21129	109	84
1957	22596	115	95
1958	24074	100	100
1959	25864	118	113
1960	27876	130	129
1961	30111	132	144
1962	32021	138	163
1963	34143	137	179
1964	38650	156	226

Notes and References

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Irwin Friend and Robert C. Jones, "Short-Run Forecasting Models Incorporating Anticipatory Data", Models of income Determination, Studies in Income and Wealth (Vol. 28) published by the National Bureau of Economic Research (Princeton, 1964).

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference On Research

in

National Income

NATIONAL ACCOUNTS IN INDIAN ECONOMY: 1950-51 to 1966-67

By

P. Nagrathna

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

NATIONAL ACCOUNTS OF THE INDIAN  
ECONOMY : 1950-51 to 1966-67.

BY

Smt. P. NAGATHINA  
(RESERVE BANK OF INDIA)

The object of the paper is to present the National Accounts of the Indian Economy from 1950-51 to 1966-67. The accounts presented in this study are: (i) Domestic Product Account, (ii) Private Appropriation Account, (iii) Government Appropriation Account, (iv) Consolidated Resting Account and (v) Rest of the World Account. The accounts are presented on the basis of estimates of savings and capital formation prepared by National Council of Applied Economic Research (NCAER) and Reserve Bank of India (RBI). The NCAER has presented two estimates of savings one by direct approach and the other by indirect approach. Also the estimates of private consumer expenditure are presented in this study. National income studies have a much more general interest and usefulness of information on the structure of the constituent transactions, and the mutual inter-dependence of these transactions are provided.

Essential constituents

The social accounting framework which is essentially a tool of economic analysis and which constitutes the empirical correlates describes the complex economic relationship between different sectors of economy and different forms of economic activity forces attention on a net work of economic transactions with a view to visualising the working of the economic system as a whole. Such a system of statistical classification of economic activity exhibits the flow of funds through financial channels.

Utility

In the organisation of economic and financial statistics and also in economic analysis and formulation it is of immense importance. It is also extremely helpful in the planning of financial resources.

Earlier attempts

The National Income Committee which presented its first report in April 1951 examined the possibility of presenting the information in the form of social accounts. They found that they could not compile a complete set of such accounts at that time as the statistics relating to provision for depreciation, capital formation and savings

in the private sector or consumer current expenditure were not available. They gave a simple frame work of accounts suitable to our country. Wherever reliable numerical values could not be assigned, certain symbols were used to represent such values. They also proceeded with the hopes that these gaps would be filled at one time possibly at an early date.

In the publication "Papers on National Income and Allied Topics" an attempt was made by Late Shri B.L. Barpujari to prepare National Accounts of India for the period 1951-52 to 1955-56.

The lacunae in statistics is filled up by the formulation of direct and indirect estimates of savings, investment and depreciation by HCAER and estimates of savings and investment by Reserve Bank of India. These estimates no doubt differ from one another and there is a lot of controversy in reconciling these figures, still, wherever it is possible and necessary these figures are made use of.

The following three sets of accounts are presented corresponding to three sets of estimates of savings and investments for a series of years. They are:

1. Domestic Product Account,
2. Private Appropriation Account,
3. Government Appropriation Account,
4. Consolidated Resting Account, and
5. Rest of the World Account.

#### Domestic Product Account

All transactions relating to the domestic production in a summary form are brought together by the Domestic Product Account. The economic activity relating to consumption is reflected by the Private and Government Appropriation Accounts. The capital transactions of the country is reflected by the Consolidated Resting Account and it also explains how domestic capital expenditure is financed. The economic relationship of the country within the rest of the world by means of various transactions with other countries is reflected by the Rest of the World Account.

The following are the three sets of estimates:

- i) Corresponding to NCAER (Direct estimates)
- ii) Corresponding to NCAER (Indirect estimates)
- iii) Corresponding to RBI (Estimates)

Sources of data

All the figures are taken from the publication "Estimates of National Income, 1948-49 to 1959-60" published by the Central Statistical Organisation except for the figures of savings and investments and depreciation in case of NCAER estimates. As the figures relating to "Net Lending in India" as is published in the White Paper which has been referred to above differ with those used by NCAER under the heading "Net Foreign Investment of India" and by RBI under the heading "Net Capital Inflow" necessary adjustments are made in the following tables:

- i) Domestic Product Account and
- ii) Rest of the World Account.

The rows corresponding to depreciation in the tables (i) Domestic Product Account and (ii) Consolidated Resting Account have been left blank since the figures of the same have not been published by the Reserve Bank of India. The necessity of depreciation figures for balancing the expenditure and revenue side has been obviated by making use of net investment figures in these two tables.

Consumer expenditure on commodities and services in Private Appropriation Account and Government Appropriation Account have been worked out as residual figures.

As regards the validity of estimates there is a lot of controversy over the NCAER and RBI estimates of savings and investment. Also attempts are being made to work out independent estimates of capital formation by the Central Statistical Organisation.

The three sets of estimates of savings and investment used in the paper are appended below:

(Rs.abja,

Year	Estimate of net savings			Estimate of net investment		
	NCAER		RBI	NCAER		RBI
	Direct	Indirect		Direct	Indirect	
1	2	3	4	5	6	7
1948-49	-	3.2	-	-	5.7	-
1949-50	4.4	6.0	-	4.9	6.5	-
1950-51	6.3	6.2	6.4	6.1	6.0	6.1
1951-52	5.2	5.1	5.0	7.3	7.1	6.9
1952-53	6.4	6.9	5.9	6.2	6.7	5.5
1953-54	6.2	7.2	6.0	5.9	6.9	5.8
1954-55	7.3	8.4	6.8	7.5	8.6	7.1
1955-56	10.3	11.3	9.1	10.3	11.4	9.5
1956-57	9.3	10.5	9.9	12.4	13.6	13.5
1957-58	10.7	12.1	8.2	15.0	16.4	12.7
1958-59	-	-	9.7	-	-	13.4

By making use of these estimates, the three sets of National Accounts have been presented in appended tables for the period 1948-49 - 1958-59.

#### Consumer expenditure

In this paper three estimates are calculated for consumer expenditure which is worked out as residual figures. Private consumer expenditure figures are also presented by making use of data presented in the different rounds



of National Sample Survey and a table on the same is attached. Estimate of consumer expenditure for the year 1949-50 was worked out on the commodity flow approach by I/s. S.S. Dhar, I.G. Banbur, K.L.C. Pillai and V.S. Puri and published in the "Papers on National Income and Allied Topics". Subsequently, Central Statistical Organisation worked out similar estimates, following again commodity approach for the year 1956-57. Table giving comparative figures is also attached.

Trends in private consumer expenditure

The estimates of private consumer expenditure at current prices were converted into constant prices (1952-53) and with the help of this data the trend in these figures can be worked out. Per capita consumer expenditure figures with the indices worked out with 1952-53 as base were derived from figures at 1952-53 prices. From the figures presented in the table below the change in the level of private consumer expenditure can be noticed.

Trends in Private Consumer  
Per Capita Expenditure

1952-53=100.

Year	NCAER		RBI	NSS
	Direct	Indirect		
1948-49	-	91.2	-	-
1949-50	91.5	90.2	-	-
1950-51	88.3	88.8	87.2	-
1951-52	86.7	87.4	86.4	91.0
1952-53	100.0	100.0	100.0	100.0
1953-54	101.0	100.4	100.6	84.6
1954-55	95.9	95.0	95.7	76.8
1955-56	100.6	100.0	101.0	86.3
1956-57	100.6	99.9	99.2	78.4
1957-58	94.8	94.0	96.3	82.2
1958-59	-	-	99.4	-

N.B.: The views expressed in this paper are entirely those of the author and not of the institution to which she belongs. Also most of the figures adopted for the National Income tables have been taken from "Estimates of National Income" issued by Central Statistical Organisation. The figures from 1950-51 to 1959-60 have been adopted from the above publication with the period 1948-49 - 1962-63 and for the other years the figures are from the same publication with the period 1960-61 - 1967-68. No linking of these two series has been attempted as the figures are mostly comparable.

(Rs. Abia)

	1950-	1951-	1952-	1953-	1954-	1955-	1956-	1957-	1958-	1959-
	51	52	53	54	55	56	57	58	59	60
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
<u>Expenditure</u>										
<u>Domestic Product Account</u>										
1. Domestic product accruing to										
1.1 Private Sector	94.8	99.1	97.7	104.3	95.5	99.1	112.1	113.1	125.3	129.8
1.2 Government Sector	0.7	0.8	0.6	0.5	0.6	0.7	0.9	0.9	0.9	1.0
Total	95.5	99.9	98.3	104.8	96.1	99.8	113.0	114.0	126.2	130.8
2. Provision for depreciation										
3. Indirect taxes										
3.1 Taxes	4.3	5.3	4.6	4.7	5.2	5.6	6.5	7.9	8.2	9.1
3.2 Miscellaneous fees	1.1	1.0	1.0	1.1	1.1	1.4	1.5	1.5	1.8	2.0
Total	5.4	6.3	5.6	5.8	6.3	7.0	8.0	9.4	10.0	11.1
4. Grand Total	100.9	106.2	103.9	110.6	102.4	106.8	121.0	123.4	136.2	141.9
<u>Revenue</u>										
5. Current expenditure on commodities and services										
5.1 Consumers	88.2	94.9	91.9	98.4	88.9	90.7	103.5	105.6	116.0	119.3
5.2 Government Sector	6.1	6.2	6.3	6.6	7.1	7.7	8.3	9.8	10.5	13.2
Total	94.3	101.1	98.2	105.0	96.0	98.4	111.8	115.4	126.5	132.5
6. Net domestic capital formation										
6.1 Private Sector	6.1	6.9	5.5	5.8	7.1	9.5	13.5	12.7	13.4	9.4
6.2 Government Sector										
Total										
Net export of commodities and services	0.2	-1.9	0.1	-0.1	-0.4	-0.7	-4.1	-5.0	-3.8	-2.3
Subsidies	0.4	0.4	0.4	0.2	0.1	0.2	0.3	0.5	0.5	0.6
Total	101.0	106.5	104.1	110.9	102.8	107.3	121.5	123.6	136.6	140.2
(corresponding adjustments made wherever required by RBI.)	-0.1	-0.3	-0.2	-0.3	-0.4	-0.5	-0.5	-0.2	-0.4	1.7
Total	100.9	106.2	103.9	110.6	102.4	106.8	121.0	123.4	136.2	141.9

National Accounts of the Indian Union (Contd)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<u>Expenditure</u>											
			<u>Private Appropriation Account</u>								
10. Consumer expenditures	88.2	94.9	91.9	98.4	88.9	90.7	103.5	105.6	116.0	119.3	
11. Direct taxes	2.3	2.4	2.5	2.4	2.4	2.6	2.9	3.2	3.4	3.7	
12. Private Savings	5.5	3.1	5.0	5.3	6.0	8.4	8.6	7.1	8.7	8.8	
13. Total	96.0	100.4	99.4	106.1	97.3	101.7	115.0	115.9	128.1	131.8	
<u>Revenue</u>											
14. Income from domestic product	94.8	99.1	97.7	104.3	95.5	99.1	112.1	113.1	125.3	128.8	
15. National debt interest	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	1.0	
16. Earned income from abroad	-0.2	-0.2	-0.1	0.0	0.0	0.0	0.1	-0.1	-0.2	-0.3	
17. Transfer payments	0.6	0.6	0.7	0.8	0.9	1.3	1.4	1.5	1.6	1.9	
18. Net donation from abroad	0.4	0.5	0.6	0.6	0.5	0.8	0.9	0.8	0.7	0.4	
19. Total	96.0	100.4	99.3	106.1	97.3	101.7	115.0	115.9	128.1	131.8	

Government Appropriation Account

<u>Expenditure</u>										
20. Government expenditure on commodities and services	6.1	6.2	6.3	6.6	7.1	7.7	8.3	9.8	10.5	13.2
21. Subsidies	0.4	0.4	0.4	0.2	0.1	0.2	0.3	0.5	0.5	0.6
22. Transfer payments	0.6	0.6	0.7	0.8	0.9	1.3	1.4	1.5	1.6	1.9
23. Government Savings	0.9	1.9	0.9	0.7	0.8	0.7	1.3	1.1	1.0	1.1
24. Total	8.0	9.1	8.3	8.3	8.9	9.9	11.3	12.9	13.6	13.8
<u>Revenue</u>										
25. Indirect taxes										
25.1 Taxes	4.3	5.3	4.6	4.7	5.2	5.6	6.5	7.9	8.2	9.1
25.2 Miscellaneous fees	1.1	1.0	1.0	1.1	1.1	1.4	1.5	1.5	1.8	2.0
Total	5.4	6.3	5.6	5.8	6.3	7.0	8.0	9.4	10.0	11.1
26. Direct taxes	2.3	2.4	2.5	2.4	2.4	2.6	2.9	3.2	3.4	3.7
27. Income from domestic product	0.7	0.8	0.6	0.5	0.6	0.7	0.9	0.9	0.9	1.0
28. Less National debt interest	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.5	-0.6	-0.7	-1.0
29. Total	8.0	9.1	8.3	8.3	8.9	9.9	11.3	12.9	13.6	13.8



(Figures in abjas)

Domestic Product Account	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67
<u>Expenditure</u>							
1. Domestic product accruing to							
a) Private sector	131.90	139.36	147.49	168.84	199.17	204.07	235.20
b) Government sector	1.90	2.25	2.50	3.47	3.12	3.46	3.82
Total:	133.80	141.61	149.99	172.31	202.29	207.53	239.02
2. Provision for depreciation	7.36	8.11	9.30	9.94	11.18	12.13	13.55
3. Indirect taxes							
a) Taxes	8.02	9.40	11.21	13.91	15.92	19.09	21.72
b) Miscellaneous fees	2.38	2.50	2.87	3.23	3.39	3.63	3.98
Total:	10.40	11.90	14.08	17.14	19.31	22.72	25.70
Grand Total:	151.56	161.62	173.37	199.39	232.78	242.38	278.27
<u>Revenue</u>							
1. Current expenditure on commodities and services							
a) Consumers	134.05	143.07	152.50	174.69	206.68	215.14	246.79
b) Government sector	2.23	2.61	3.15	3.97	3.72	4.36	4.74
Total:	136.28	145.68	155.65	178.66	210.46	219.50	251.53
2. Gross domestic capital formation							
a) Private sector	4.41	4.55	5.57	6.54	7.33	7.82	7.79
b) Government sector	2.78	3.00	3.45	3.90	4.37	4.79	5.00
Total:	7.19	7.55	9.02	10.44	11.70	12.61	12.79
3. Net export of commodities and services	7.84	8.02	8.35	9.85	10.15	9.54	13.22
4. Subsidies	0.25	0.37	0.35	0.44	0.53	0.73	0.73
5. Grand Total:	151.56	161.62	173.37	199.39	232.78	242.38	278.27

Private Appropriation Account

(figures in abjas)

Expenditure	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67
1. Consumer expenditure	120.62	126.66	132.99	151.67	179.77	183.73	212.72
2. Direct taxes	4.20	4.67	5.74	7.07	7.63	7.76	8.03
3. Private savings	7.23	8.12	9.08	10.48	11.93	13.38	15.17
4. Grand total	132.05	139.45	147.81	169.22	199.33	204.87	235.92
<u>Revenue</u>							
1. Income from domestic product	131.90	139.36	147.49	168.84	199.17	204.07	235.20
2. National debt interest	0.59	0.72	1.06	1.16	1.25	1.75	2.40
3. Earned income from abroad	- 0.72	- 0.98	- 1.08	- 1.12	- 1.49	- 1.67	- 2.55
4. Net donations from abroad	0.28	0.35	0.34	0.34	0.40	0.72	0.87
5. Grand total	132.05	139.45	147.81	169.22	199.33	204.87	235.92

GOVERNMENT APPROPRIATION ACCOUNT

(Figures in abjas)

	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67
<u>Expenditure</u>							
1. Government expenditure on commodities and services	10.31	11.40	13.79	17.88	19.04	22.16	25.01
2. Subsidies	0.92	1.10	1.43	1.48	1.47	1.86	2.34
3. Transfer payments	1.66	1.91	1.92	2.01	2.26	2.66	3.29
4. Government Savings	3.02	3.69	4.12	5.15	6.04	5.51	4.51
5. Grand Total	15.91	18.10	21.26	26.52	28.81	32.19	35.15
<u>Revenue</u>							
1. Indirect Taxes							
(a) Taxes	8.02	9.40	11.21	13.91	15.92	19.09	21.72
(b) Miscellaneous fees	2.38	2.50	2.87	3.23	3.39	3.63	3.98
Total	10.40	11.90	14.08	17.14	19.31	22.72	25.70
2. Direct Taxes	4.20	4.67	5.74	7.07	7.63	7.76	8.03
3. Income from domestic product	1.90	2.25	2.50	3.47	3.12	3.46	3.82
4. Less National Debt interest	0.59	0.72	1.06	1.16	1.25	1.75	2.40
5. Grand Total	15.91	18.10	21.26	26.52	28.81	32.19	35.15

\*A\*



Consolidated Resting Account

(Figures in abjas)

	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67*
<u>Expenditure</u>							
1. Gross domestic capital formation							
(a) Private Sector	4.41	4.55	5.57	6.54	7.33	7.82	7.79
(b) Government Sector	2.78	3.00	3.45	3.90	4.37	4.79	5.00
Total	7.19	7.55	9.02	10.44	11.70	12.61	12.79
2. Net lendings from abroad	0.30	0.40	0.30	0.30	0.40	0.70	0.90
3. Grand Total	7.49	7.95	9.32	10.74	12.10	13.31	13.69
<u>Revenue</u>							
1. Provision for depreciation	0.64	0.60	0.73	0.74	0.84	0.83	1.06
2. Savings							
(a) Private Sector	3.83	3.66	4.47	4.85	5.22	6.97	8.12
(b) Government Sector	3.02	3.69	4.12	5.15	6.04	5.51	4.51
Total (Savings)	6.85	7.35	8.59	10.00	11.26	12.48	12.63
3. Grand Total	7.49	7.95	9.32	10.74	12.10	13.31	13.69

\* Provisional

Rest of the World Account

(Figures in abjas)

	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67
<u>Expenditure</u>							
1. Net donations to India	0.28	0.35	0.34	0.34	0.40	0.72	0.87
2. Net lendings to India	0.90	0.87	1.17	1.31	1.94	1.66	1.31
3. Total	1.18	1.22	1.51	1.65	2.34	2.38	2.18
<u>Revenue</u>							
4. Net export of commodities and services to India	1.90	2.20	2.59	2.77	3.83	4.05	4.73
5. Net earned income from abroad	-0.72	-0.98	-1.08	-1.12	-1.49	-1.67	-2.55
6. Total	1.18	1.22	1.51	1.65	2.34	2.38	2.18

Private Consumer Expenditure

		1948-	1949-	1950-	1951-	1952-	1953-	1954-	1955-	1956-	1957-	1958-
		49	50	51	52	53	54	55	56	57	58	59
	1	2	3	4	5	6	7	8	9	10	11	12
A. Worked out as residual figures from												
(i) NCAER (direct estimates)	(a) Rs. abja		85.1	88.8	94.8	91.4	98.3	88.3	89.9	104.5	103.4	
	(b) Rs. abja		79.5	78.0	77.9	91.4	94.0	90.9	97.2	99.2	95.4	
	(c) Rs.		225.9	218.1	214.2	247.0	249.5	236.8	248.4	248.5	234.2	
	(d)		91.5	88.3	86.7	100.0	101.0	95.9	100.6	100.6	94.8	
(ii) NCAER (indirect estimates)	(a) Rs. abja	81.3	83.5	88.8	95.0	90.9	97.3	87.4	88.9	103.2	102.0	
	(b) Rs. abja	77.7	78.0	78.0	78.1	90.9	93.0	89.6	96.1	98.0	94.1	
	(c) Rs.	224.2	221.7	218.1	214.8	245.7	246.8	233.4	245.6	245.5	231.0	
	(d)	91.2	90.2	88.8	87.4	100.0	100.4	95.0	100.0	99.9	94.0	
(iii) RBI estimates	(a) Rs. abja			88.2	94.9	91.9	98.4	88.9	90.7	103.5	105.6	116.0
	(b) Rs. abja			77.4	78.0	91.9	94.1	91.2	98.1	98.3	97.4	102.7
	(c) Rs.			216.5	214.5	248.4	249.8	237.6	250.9	246.3	239.1	247.0
	(d)			87.2	86.4	100.0	100.6	95.7	101.0	99.2	96.3	99.4
B. (iv) N.S.S. data	(a) Rs. abja				109.1	100.2	90.3	77.9	84.6	89.2	98.3	
	(b) Rs. abja				89.6	100.2	86.3	79.9	91.5	84.7	90.7	
	(c) Rs.				246.4	270.8	229.1	208.1	233.8	212.2	222.7	
	(d)				91.0	100.0	84.6	76.8	86.3	78.4	82.2	
C. (v) Estimates based on commodity flow approach	(a) Rs. abja		87.4							106.0		
	(b) Rs. abja		81.6							100.7		
	(c) Rs.		231.9							252.3		
	(d)											

(a) at current prices

(b) at 1952-53 prices

(c) per capita consumer expenditure at 1952-53 prices for one year

(d) indices of per capita consumer expenditure with 1952-53 as base

Private Consumption Expenditure in India

(Figures in abjas)

	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67
1) Net domestic product at market prices = net domestic expenditure at Market Prices	133.80	141.61	149.99	172.31	202.29	207.53	239.02
2) Add : Indirect taxes	10.40	11.90	14.08	17.14	19.31	22.72	25.70
3) Less : Subsidies	0.92	1.10	1.43	1.48	1.47	1.86	2.34
4) Net domestic product at factor cost	143.28	152.41	162.64	187.97	220.13	228.39	262.38
5) Less : General Government expendi- ture at market prices	2.78	3.00	3.45	3.90	4.37	4.79	5.00
6) Less : Net domestic capital forma- tion	6.55	6.95	8.29	9.70	10.86	11.78	11.73
7) Add : Net Imports of goods and services	7.84	8.02	8.35	9.85	10.15	9.54	13.22
8) Private consumption expenditure	141.79	150.48	159.25	184.22	215.05	221.36	258.87

Private Consumer Expenditure Based on N.S.S. Data

Rounds	Year	Per capita consumer expenditure for 30 days (Rs.)		Percentage of population in rural/urban areas		Per capita combined consumer expenditure for 30 days (Rs.)	Per capita annual consumer expenditure (Rs.)	Population estimates I (millions)	Population estimates II (millions)	Total consumer expenditure estimate I (Rs. crores)	Total consumer expenditure estimate II (Rs. crore)
		Rural	Urban	Rural	Urban						
3rd Rd.	1951-52@	23.09	31.72	82.62	17.38	24.59	300.00	36392	36361	10918	10908
4th Rd.	1952-53	21.57	28.79	82.57	17.43	22.83	270.71	36858	37001	9979	10017
5th Rd.		19.81	28.86								
6th Rd.	1953-54@	19.97	27.40	82.52	17.48	19.70	239.68	37331	37677	8947	9030
7th Rd.		17.24	23.88								
8th Rd.	1954-55	14.96	24.69	82.47	17.53	16.67	202.82	37812	38387	7669	7786
9th Rd.	1955-56	15.20	23.69	82.42	17.58	17.73	216.31	38300	39133	8285	8465
10th Rd.		17.61	25.24								
11th Rd.	1956-57	16.97	24.98	82.37	17.63	18.38	223.62	38796	39913	8676	8925
13th Rd.	1957-58	18.57	25.70	82.32	17.68	19.83	241.27	39301	40729	9482	9827

Note: 1. @ Figures for 3rd and 6th rounds which were based on a week as a reference period have been adjusted in order to conform them to 30 days as a reference period on the basis of the average ratio for 4th and 5th rounds between 30 days and a week as a reference period.

2. The per capita consumer expenditure for rural and urban area have been combined by using 1951 and 1961 census percentages.
3. Rounds (4 & 5), (6 & 7) and (9 & 10) have been combined with months as weights.
4. Population estimates I pertain to the estimates used for the white paper "Estimates of National Income 1948-49 to 1959-60." and population estimates II are those which are based on all-India census figures 1941, 1951 and 1961 and are provisional.
5. Consumer expenditures are accordingly based on the respective population estimates.

National Saving (Net) at Current Prices : Direct Estimates

	(Rs. Lakhs)				
	<u>1960-61</u>	<u>1961-62</u>	<u>1962-63</u>	<u>1963-64</u>	<u>1964-65*</u>
1. Individuals	1058,25	971,60	1117,03	1083,53	1125,77
2. Corporate	122,14	122,06	134,64	124,35	127,36
3. Government	227,99	239,20	55,23*	70,00*	75,00
4. Domestic Saving	1408,38	1332,86	1306,90	1277,88	1328,13

\* Preliminary

National Saving (Net) at Current Prices Indirect Estimate

	(Rs. Lakhs)				
	<u>1960-61</u>	<u>1961-62</u>	<u>1962-63</u>	<u>1963-64</u>	<u>1964-65*</u>
1. Domestic Investment	1970,90	1912,50	2155,39	2089,45	2195,02
2. Individuals	550,54	563,54	622,00	625,30	629,23
3. Corporate	453,85	386,70	383,65	284,15	290,79
4. Government	966,51	962,26	1149,74*	1180,00*	1275,00
5. Net Foreign Investment	-497,05	-381,30	-453,55	-467,50	-626,10
6. Domestic Saving (1 + 5)	1473,85	1531,20	1701,84	1621,95	1568,92
7. Corporate	122,14	122,06	134,64	124,35	127,36
8. Government	227,99	239,20	55,23*	70,00*	75,00
Individuals $\sqrt{6-(7+8)}$	1123,72	1169,94	1511,97	1427,60	1366,56

\* Preliminary.

National Saving (Net) at 1948-49 Prices : Direct Estimate

	(Rs. Lakhs)				
	<u>1960-61</u>	<u>1961-62</u>	<u>1962-63</u>	<u>1963-64</u>	<u>1964-65*</u>
1. Individuals	952,43	855,01	971,82	877,66	844,33
2. Corporate	109,93	107,41	117,14	100,72	95,52
3. Government	205,19	210,50	48,05*	56,70	56,25
4. Domestic Saving	1267,55	1172,92	1137,01	1035,08	996,10

\* Preliminary

National Saving (Net) at 1948-49 Prices Indirect Estimate

	(Rs. Lakhs)				
	<u>1960-61</u>	<u>1961-62</u>	<u>1962-63</u>	<u>1963-64</u>	<u>1964-65*</u>
1. Domestic Investment	1773,82	1683,01	1875,19	1592,45	1646,27
2. Individuals	495,49	495,92	541,14	505,49	471,93
3. Corporate	408,47	340,30	333,78	230,16	218,09
4. Government	869,86	846,79	1000,27*	955,80*	956,25
5. Net Foreign Investment	-447,35	-335,54	-394,59	-378,68	-469,58
6. Domestic Saving (1 + 5)	1326,47	1347,47	1480,60	1213,77	1176,69
7. Corporate	109,93	107,41	117,14	100,72	95,52
8. Government	205,19	210,50	48,05*	56,70	56,25
9. Individuals $\underline{[6-(7+8)]}$	1011,35	1029,56	1315,41	1156,35	1024,92

\* Preliminary.

Individuals' Saving (Net) at Current Prices.

		(Rs. lakhs)				
		<u>1960-61</u>	<u>1961-62</u>	<u>1962-63</u>	<u>1963-64</u>	<u>1964-65 *</u>
1.0	Financial	507,71	408,06	495,03	458,23	496,54
1.1	Currency	135,23	96,30	170,09	216,71	158,66
1.2	Net bank deposits	182,32	-21,97	59,51	51,43	86,45
1.3	Life Insurance	56,91	70,41	66,26	82,63	78,21
1.4	Provident Funds	108,95	108,99	123,70	138,46	156,64
1.5	Pension funds	2,55	2,72	..	..	..
1.6	Net claims on Government Sector	-24,42	31,95	37,51	40,44	31,05
1.7	Corporate and Co-operative Securities	46,17	119,66	37,96	-77,46	-14,47
2.0	Non-Financial	550,54	563,54	622,00	625,30	629,23
2.1	Farm Investment	117,13	121,46	123,84	121,57	108,04
2.2	Construction	309,50	312,66	321,72	321,57	311,29
2.2.1	Rural	186,81	190,27	195,38	195,23	184,95
2.2.2	Urban	122,69	122,39	126,34	126,34	126,34
2.3	Others	123,91	129,42	176,44	182,16	209,90
3.0	Individuals' Saving	1058,25	971,60	1117,03	1082,53	1125,77

\* Preliminary.



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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research  
in  
National Income

INDIA'S ECONOMIC GROWTH: 1950-51 to 1965-66

By

Parneshwar Prasad

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong. of

## INDIA'S ECONOMIC GROWTH: 1950-51 TO 1965-66

by Parmeshwar Prasad

(Directorate of Statistics & Evaluation, Govt. of Bihar)

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### Concept of economic growth:-

Economic growth means sustained increase in out-put per head, for it is only by this that community's living standard can rise over the long period. Out-put growth is not sufficient to be looked in absolute terms, for this could be obtained by disproportionate use of factor in-puts with diminishing returns prevailing such that out-put per head might actually fall.

There are three main dynamic factors which must be given attention though they can not be separated from their social back-grounds. Firstly, the division of labour, Secondly accumulation of capital and lastly the technical change. These are inter dependent and are factors of the single organic process of development.

It is doubtful whether in past so profound a change has ever occurred within such a narrow span of time. The aspect of economic growth is the regulation of the relative properties in which things are produced and arising there from the proportion in which the economic resources are distributed between the various branches of Productions.

In economic growth the ~~unscientific~~ measure is the national income per capita. Economic growth implies an increase in this variable. But what is income and what should be included in it? The data collected may be misleading because money income increases more than the real output of goods and services. This under estimation is acute particularly in the agricultural sector.

It may be admitted that the national income data contain many ambiguities requiring caution in their use. And that developing country must not devote their statistical resources solely to the production of the total income data neglecting sector output, Population census, census of manufacturing and other important statistics.

Economic development through time involves an increase in the capital and labour ratios and permits capital deepening. Capital is the most important variable in bringing about a rapid economic growth and thus economic growth may be termed as sustained change in the output of economic community's.

### Object of India's efforts towards Economic growth:-

Good and fair life must be the objective of any economic development programme. Peace is an essential pre-requisite. War with modern weapon must not be the aim, liberated humanity must be the aim. India is covered up by the wide spread and appalling poverty, the result of a traditional society and a static economy in the past, Petrified to some extent by the

colonial rule. In traditional India at every stage a new conflict and challenge arises.

The immediate problem is to combat the curse of poverty, especially in rural India. Thus it is essential to advance social and economic aspect. The aim is to build up a technologically mature society and a social order. It is also to offer equal opportunity to all the citizens by basic, social and economic changes. It is also the replacement of the old traditional order by a dynamic society by application of modern science and Technologies. And hence a Rapidly expanding and Technologically Progressive economy with a social order based on justice with equal opportunity to every man has been aimed at.

India's social structure presents numerous inherent conflicts and barriers to economic advance with traditional society structure and caste system rigidity. India's economic growth was almost stagnant. The real income per head was very low. There was poverty, backwardness technically and under development alround, the tendency for output per head still worse, aggregate output  $\angle$  at a low level and static equilibrium is yet another sign of economic growth.

Keeping in view the above factors, India's objective towards economic growth may be summarised in the following lines:-

Firstly, the rapid economic growth, secondly Expansion of employment potentialities, thirdly reduction of the big gap between the haves and have nots. Fourthly, prevention of concentration of the economic power in few hands and finally creation of the values and attitudes a free and equal societies

The objective is to overcome the failure to utilise the existing potential of an economic within a given technical possibilities. This is because of social and institutional obstacles, and characters of economic performances in comparison with other countries. The objective is also the efforts to explain how factors like population, natural resources, organisation of labour and technological know-how combine to produce economic progress.

Achievement of objective through planned efforts: National

#### National Income

The rise in national income was 3.4 p.c. during five year ending 1955-56 and 4 per cent during five year ending 1960-61. It was 4.2 p.c. for last four years ending 1964-65. The last year 1965-66 was a very abnormal year due to unprecedented drought and external aggression. Taken in aggregate terms, India's national Income increased by about 69 p.c. i.e. from Rs. 98 crores to Rs. 16,630 crores (at 1960-61 prices) between 1950-51 to 1964-65. But since 1950-51 India's population has risen by nearly at 2.5 P.C. per annum and reduction in death rate due to nation wide health services. And hence per capita income in real terms increased by 28 p.c. i.e. at annual average rate of above 1.8 p.c. Hence it was much below the target.

Agriculture:- The progress in Agriculture has undoubtedly been tardy. The growth rate has been 3 p.c. compound in 14 years ending 1964-65. The absolute increase in production during the fourteen years above have been large. The index of Agriculture production has gone up from 100 in 1949-50 to 158 in 1964-65. By any standard of comparison this is substantial increase. Area under major and medium irrigation went up by 13.8 million acres and under minor irrigation 31.6 million acres.

Industry:-

The increase in power, transport and industry has been more impressive. Installed electric power capacity has increased from 2.3 million K.W. in 1950-51 to 10.2 K.W. in 1965-66. Electrified town and villages has gone up to 52,300 from 3700. The freight carrying capacity of the railways has gone upto 205 million tons from 93 million tons. Surfaced roads increased from 1,56,000 K.W. to 2,84,00 and shipping from 3.9 lakh GRT to 5.4 lakh GRT. The index of industrial production has gone up from a level of 74 in 1951 (related to 100 in 1956) to 182 in 1965 i.e. an increase of 146 p.c. over the whole period. Since 1956-57 there has been special feature in growth with increase in capacity of steel, Aluminium, engineering chemicals, fertilizers and ~~petroleum~~ products. Apart from this large investment has been made in heavy industries.

Public Sector:- In a country aiming at a socialistic society, the public sector has progressively to occupy the commanding heights in the economy keeping in view this the share of public sector rose up to 35 p.c. in 1965-66 as compared to only 15 p.c. in 1950-51. In spite of delays and disappointments it has succeeded in developing a number of new industrial complexes which are offering new opportunities for the private sector as well.

Social Services:-

The number of schools rose to 505 in 1965-66 from 231 in 1950-51. Hospital beds from 113 to 240. Primary health centres to 4800 from 2800 in 1960-61 and family planning centres from 1649 in 1960-61 to 11,474 in 1965-66. Expenditure on scholarship has increased from Rs 2.75 crores in 1950-51 to Rs 35 crores in 65-66. People are now more educated and much more healthy - Malaria has been eradicated (of course on paper) and life span has increased to average 50 year from the average of 32 years.

Along with the increase in tax revenue of the central and state Government this expenditure on development plan outlay from Rs 1960 crores in first plan to Rs 8630 crores in 3rd plan is a symbol of wider responsibilities that the government have under taken for economic and social betterment of the people.

Growth of national Income (in Rs. hundred crores)

	<u>1950-51</u>	<u>1955-56</u>	<u>1960-61</u>	<u>1964-65</u>
At 1948-49 prices	88.5	104.8	127.5	150.5

(ii)

Agricultural production in 1950= 100

	<u>1950-51</u>	<u>1955-56</u>	<u>1960-61</u>	<u>1964-65</u>
Food	90.5	115.3	135.6	149
all commodities	95.6	116.8	139.7	157

Industrial Production (1956 = 100)

	<u>1951</u>	<u>1955</u>	<u>1960</u>	<u>1965(Jan-Oct.)</u>
	73.5	91.9	130.1	184

General Index 100

Money Supply with the Public (Crores of Rupees)

	<u>1950-51</u>	<u>1955-56</u>	<u>1960-61</u>	<u>1966 Jan.</u>
	1406	1571	2098	2948
Deposits	609	645	770	1389

(v)

Public Debts Centre

(crores)

	<u>1950-51</u>	<u>1955-56</u>	<u>1965-66</u>
Internal	2022	2328	5073
External	32	113	2763

(vi)

Balance of Payments

(Crores of Rs.)

	<u>1950-51</u>	<u>1955-56</u>	<u>1960-61</u>	<u>1964-65</u>
A	4	113	475	593.3

The First Five Year Plan:

The population taken at 341 million in the year 1948-49. The percapita income was Rs 255 i.e. Rs 8710 crores in total. The industry-wise breakups are:-

	(Rs.crores)
(i) Services	1360
(ii) Mining, manufacturing & Hand trades	1500
(iii) Commerce, Transport and communication	1700
(iv) Agriculture	4150
	<hr/>
	Rs 8710
	<hr/>

This means that nearly 48% was contributed by agriculture alone. But the productivity per person in agriculture has been the lowest.

The Colombo plan came into effect of-course officially on July 1, 1961. The first Plan was started with an outlay to the tune of Rs 2069 crores for the period 1951-52 to 55-56. An important mistake was done at this level by giving a smaller plan.

In that First Plan expenditure to the tune of Rs 69% was to be made on agriculture, irrigation and power, transport and communication - which was a landmark for a more intensified industrial development at a later stage. And hence Industrial Development during that period was left on private sector exactly in accordance with the schumpeterian system.

India received number of loans and aid for this plan. There was also deficit financing and utilization of sterling reserves. The loan and aids were meant either for financing food deficits or for building up the future capacity in agriculture and means of communication and transport. It means that the loans and assistance received were not utilised for immediate turnover. The food we eat-up produced nothing and rest we invested in non-productive aspects.

During first plan there was increased import of goods both for economic development as well as essential consumption. And it was U.S. wheat loan and drawings from the I.B.R.D. and both these made it possible for the country to finance the deficit in the balance of payments. The assistance agreed under Colombo Plan did not affect balance of payment in 1951-52 since it was mostly received after March, 1952. The export promotion aim failed in 1952-53 due to Korean war in spite of assistance received a deficit of Rs. 46 crores was left.

In 1953-54 there was considerable fall in the level of trade. The imports value also declined more than that of exports. The exports receipts went up to 7.6% by 1955-56 with still deficit of Rs 8,800 lakhs (approximately).

Excluding the official donations deficit during first plan was Rs 123 crores - much below estimation. Before planning began, it was in regard to sterling area that there was the largest improvement in the India's balance of payment in 1950. This was all due to devaluation of pound sterling and Indian rupee in terms of dollars. Deficit turned into surplus in 1949 with the hard currencies areas. This was all due to Korean war and stock piling of goods as well as rise in prices of Indian exports. The value of our exports and imports have been the highest in this period due to well established trade relations with the sterling area.

I can conclude herewith rise in the national income to the tune of Rs 1890 crores over 1950-51 figure i.e., a rise in per capita Rs. 22 or say 17.5% rise in national income i.e. 6.5% above estimated. The food grain production was also above estimates to about 3 million tonnes. The country made considerable progress, though stress and strains were faced.

But these stresses and strains were land mark of further progress of deep routed poverty stricken society and stagnant economy. Failures and errors must be avoided. Step into 2nd five year plan must be laid with Inspiring and continuous endeavour to reach the desired aim.

#### THE SECOND FIVE YEAR PLAN

The Second Five Year Plan was started with an outlay of Rs. 4,800 crores. To start with it was considered that priority should be shifted from agriculture as it was considered that agriculture production has been now channelised and will prosper. With this view in mind the planner gave stress on building up of productive assets and out layed the expenditure to about 80% of total outlay on it. And hence the target of percentage increase of agriculture production was almost insignificant. This was the greatest mistake done by planners at that time. As the favourable conditions which co-operated First plan may not perhaps do the same in second plan. I hope perhaps planners consulted the astrologists about country's future and made the plan. The second plan laid also great stress on increasing the targets of physical production in the case of mineral and large scale industry. It was also a mistake since in a country where population at base was already very large and was on an increase the comparative neglect of agricultural production was bound to lead to difficult years. The greater stress on large scale industry in second plan was bound to give rise in





However so far progress is concerned the rate of growth in key industries has been more 15% per annum. The increase in the production has been substantial in industries like machine tools, electric transformers, Aluminium, automobiles, sugar, jute, cement and Petroleum etc. A number of projects delayed earlier were nearing completion to start production early in fourth plan. Area under major irrigation has gone up by 5.5 million acres and under minor irrigation by 13.1 million acres. Generating capacity for power has increased from 5.6 m.k.w. to 10.2 m.k.w. village and towns electrified from 24,200 to 52,300. Surfaced roads from 235 thousand k.m. to 284 thousand k.m. and freight carried by shipping and railway were 8.6 lakh G.R.T. to 15.4 lakh G.R.T. and 156 million tons to 205 million tons respectively. And thus the problem faced in early years were over to a large extent.

In social service sectors the numbers of schools increased from 4 lakh to 5 lakh and family planning centres from 1,649 to 11,474. The food grain production increased from 79.4 to 89 million tones in 1964-65 which certainly give good reasons for believing that conditions have been created which should yield substantially better results in future. In industrial field a considerable amount of production capacity which has already been created, is lying idle because of shortage of imported components.

In spite of all the short falls and disappointments of 3rd plan, the country is poised for a faster growth during the years to come. However the 3rd plan has three distinctive notions. Firstly, notion of self-Governing economy. The incorporation of this idea in the plan was a result of the visible influence of contemporary thinking on stages of economic growth. However the plan does not precisely define the notion of self-governing economy. Secondly it makes an effort to concretise the implication of perspective planning and describes in detail the implication of long range development. It visualised the doubling of national income in 25 years and per capita in 30 years. The third aspect is the introduction of the concepts of regional balanced development.

The working of 3rd plan was somewhat distorted by the operation of an exogenous factor the sudden rise in defence expenditure.

#### GENERAL REVIEW FROM 1950-51 to 1965-66

India initiated her first plan in the year 1951. With a total outlay of 2069 crores. It is interesting to note the size of Rs 2069 crores, expressing only the measures of Governmental efforts in planning and the magnitude of its own outlay. It did not include the investment and outlay in the private sector. The plan, however, did mention the financial requirements of the private sectors, but was very

-3-

sketchy about to Rs. 1 thousand crores. But actually private sector investments proved much higher at about Rs. 1800 crores. Thus the 2nd plan outlay of Rs 7,700 crores (actual) included Rs. 3,100 crores in private sectors investment alone. The 3rd plan of Rs. 11,800 crores included Rs 4,300 crores in private sectors. The first plan in effect was of the order of Rs. 3,700 crores.

The first plan aimed at capital formation nearly about Rs. 2,500 crores in five years which was only Rs. 2,069 crores at end of 5 years. But such discrepancies are no more than a minor blemish at the initial stages. In fact the first plan was a veritable mine of information that gives all possible details, elaborate programmes and comprehensive coverage to all basic facts and attempted projection for the future which later came to be known as long range development planning or perspective planning. The first plan exceeded the envisaged growth rate of 11% and the actual was 18% rise in national income. Increase in food production was spectacular industrial production by 25% and all points the economy showed signs of recovery, stability and buoyancy. With prices down by 8% the first plan was a golden era that brought the glimmer of hope for downing prosperity.

The second plan started with some fan fare and based its calculation on the then existing level of national income which had risen to Rs. 10,800 crores from Rs. 9,000 crores. The capital formation was aimed at 11% i.e. 3% more to first plan. The size of 2nd plan was more than 100% greater than that of first plan. The volume of foreign aid was much greater i.e. Rs. 1200 crores where as Rs. 180 crores was in first plan. This gave a big gap in balance of payment position and the mounting need for foreign aid to finance development gave a rude awakening to the reality of progress. And hence there was sharp criticism as receiving foreign aid was equated to mortgaging prosperity and bartering away freedom. Political non-alignment was being compromised for the sake of economic alignment. To start with three steel projects at one time, got the unhesitating verdict of an economic blunder. And hence the 2nd plan threw the economy into a vortex of veritable mess and confusion. The rising prices tended to make confusion worse confounded. The rise in prices was 33%. Deficit financing was to the tune of Rs. 1000 crores. This brought about the new paradoxical situation of increased pressure of money demand against the limited supply of available goods caused by more money accompanied with shortfall in production of goods, consumers goods and capital goods. Inflation emerged a class of people with more money entering into new kinds of trade and made more money. Conspicuous consumption also began to make itself felt. The controls of production and prices of some commodities make possible transaction through black market thus making unaccounted money in some pockets. And hence a second plan completely reversed the first plan trend to falling production and rising prices with foreign exchange ~~control~~. The other effects

effects have been change in the fiscal policy with every budget, there was further deficit financing, further taxation and further rise in prices. The economy was in a quandry and seemed entirely to have lost its track.

Big size plan, inept handling of agriculture, food shortage, large industrial projects, price rise, foreign exchange crisis, high deficit financing and penal rate of taxation are all marks of big change in second plan. The concept of socialism in planning, very sharply produced a short of schism in the economy. The respective role of public and private sector became undecided. The result was conflict that sapped vitality and curbed dynamism in growth. The sharp shift in the economic policy combined with social ideals brought the economy to its new phase.

In spite of many sharp turns in second plan, the economy recorded some progress. The rise in national income was 20% , 5% below the targets. From the fourth year of plan both agricultural and industry recorded substantial progress. The three plants were set up, coal and power production increased, - food reached the new peak at 81 Million tones.

/steel

In the usual fashion the third plan seeks to attend economic progress at the rate of 5% per annum. It is surprising how in the midst of that incircling confusion, nothing was particularly done to correct the imbalance, but on the contrary a programme was drawn up for an annual percent cumulative growth. The plan looked no more than wishful thinking. The annual 5% growth rate target was only three percent in the first 3 years and rose to 8% in the 4 year but was not maintained so in final year 1965-66. The bad harvest at about 78 million / tonnes in the final year was due to famine in recent time. The third plan stepped up the rate of savings to 14% of the National Income per annum. This raises the crucial issue in planning which question, does planning mean more savings meaning thereto essentially more taxes, more Governmental expenditure but eventually lower increase in National Income and slower progress. Broadly speaking, though sufficient precautions were taken to consolidate gains and to go slow. The third Plan ended more disastrously than the second. The progress has been slower than ever before, and the price rise worst ever. The balance of payment crisis continue mounting to forcing devaluation later on.

/tonnes

The agriculture failed only due to bad planning. Merely providing better seed without irrigation or irrigation without fertiliser is a really not agriculture planning. The fertiliser consumption in India is pitiable and is not even 2% of what is used in Japan per acre. And yet the plan end at 5% substained and continuous growth in agriculture. Failure in Industries has been equally glaring. The target of 11% rise in production was only up to 6.5%. Of course it is true that performance in cases like mineral and power was satisfactory, but overall performance was much shorter than planned. The most important reason was lack of raw materials and creation of production capacity without being able to

to utilise it and hence 30 to 50 % idle capacity was visible. This lack of raw materials was only due to foreign exchange crisis, combined with labour trouble, Transport, Power shortage and industrial disputes.

As a result of failure both in agriculture and Industries the rise in National Income was just 2.5% in 1961-62, just keeping pace with population. It was just 2% in 62-63 rising to 7.8% in 1964-65. There was actual decline in per capita income from 1962-63. Since did not catch up the growth of population. And hence the Third Plan ended as a complete defeat to planning, and furnishes and eloquent testimony to our failing growthmanship.

General Conclusion:

Fifteen years of Planning has come to an end. The progress has been almost negligible. But this should not be taken as an example for future planning in India. This was all because of high Prices, Inflationary pressure, devaluation and inflation alongwith recessions. Of course the end of Third Plan was very dismal, frustrating and it appeared as if planning apparatus has failed in India. But this cannot be a guide line for future. We must not give up plan, but rather adopt bigger plan or say voluminous plan by which bold steps may be taken up for growth. Because a big plan will have the compensatory advantage of producing some big results like increasing employment potential providing social services, and exploring new investment of opportunities.

Broadly speaking, in India, the biggest single handicap is the absence of a collective will to progress. The mass mind has no awareness of what is happening, or efforts being made to make things happen around him. Economic development lacks the touch of a mass enthusiasm. Identification of the peoples will to the common cause has now here been in evidence. As a result the Planning in India gives the impression of being a superimposition of efforts by an outside agency on the people. It is Government's own plan and development seem to be of the least concern of these for whom it is intended. The gap between the plan and the people cannot be deplored too much, and with increasing imbalances in efforts and results, it is still widening. Neither the people nor the Government is wholly responsible for this. The thing is that the Indian mind is not quite responsive to material prosperity. It requires efforts to break the shackles of tradition and come to the new age of innovation, machines and modernisation. The transition is yet to come and perhaps it may take a long time too.

Obviously our plan have gone wrong somewhere. So many imbalances could not have arisen had planning been fully streamlined. We took agricultural prosperity for granted and launched a big industrialisation programme. The strategy proved a costly blunder. Agricultural shortage persists and expansion of big projects accompanied by restriction on consumer goods has brought about price rise and

and exchange crisis/ologically, to advance forward without taking guard of the rear is unsound. The danger of getting trapped is there, and that is precisely what has happened to the economy.

The suggestion is to redress the grievances may be firstly is to strengthening the Agricultural base with top most priority. Secondly industrialisation programme need not and cannot be halted. But there can and must be some rephasing. Incomplete projects shall have to be completed and some agriculture based industries like fertilisers, agricultural tools can be given priority. Thirdly export industries have to be given new account to build up new potential for foreign debt repayment. Fourthly, Governmental expenditure on non-essential items have to be considerably cut down to keep money supply within limits and allow output to catch up with the existing excesses. There is need of long-term population planning. The present dichotomy between public and private sector is misleading and plainly harmful. The economy has to function as a whole. The vigorous perusal of social justice is an essential parameter, and provision of a national minimum income to the maximum number of the poor section is an objective that has to be taken as a more meaningful aspect of progress and development. Finally, planning shall have to be viewed progressively in its wider dimension since it is evolving a new destiny. Planning, like any other human problem is a renewal of efforts in the unending pursuit for the ideal. It is the problem of bridging the gap between what we are and what we want to be. India is dedicated to that task of bringing imperfect realities nearer to the perfect. The task is difficult but we have promises to keep. India has a 'Trust with destiny' to threat for herself the world she chooses to live in.

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IARNW/70/1.

INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research  
in  
National Income

INDIA'S ECONOMIC GROWTH: 1950-51 to 1965-66

By

J.L. Narayana Murty

HYDELABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

# INDIA'S ECONOMIC GROWTH: 1950-51 to 1965-

by

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A total outlay of Rs.15,262 crores was incurred on plan schemes in the public sector during the fifteen year period 1951-52 to 1965-66 exceeding the aggregate financial target by about six per cent. The first plan started with a modest outlay of Rs.1,960 crores which was almost doubled in each of the subsequent plans culminating in an outlay of Rs.8,630 crores in the third plan period. The rate of performance also showed a consistent improvement from about 95% of the provision in the first plan period to 97% in the second plan period and 115% in the third plan period. However, this trend in the financial achievements was not reflected in the growth of the economy. The economic crisis towards the end of the third plan which climaxed in a substantial devaluation of the rupee and the postponement of the fourth plan caused widespread concern about the economic health of the nation. This paper represents an attempt to critically examine our achievements and failures with a view to draw lessons for the future. The later part of the exercise appears to be more important as a mere post-mortem can only be of academic interest.

## RATE OF GROWTH

In the first plan period, the rate of growth in the real national income exceeded the modest expectation of 2.1%. The growth rate fell short of the target of 5% in the second plan period. The third plan aimed at a rate of more than 5% but the actual achievement was even less than that of the first plan. From less than 1% in the pre-plan era, there was a substantial improvement in the rate of growth to 3.5% during the first plan period. Thereafter, it rose only slightly to 4% in the second plan and provided an anti-climax by declining to 2.9% in the third plan period. On the other hand, investment in the economy progressively increased from about 5% of national income in 1950-51 to 7%, 11% and 14% in the three successive plan periods. Indian experience thus confirms the view that there is no direct simple relationship between investment and rate of growth. It is because what is crucial for growth is not mere addition to capacity but income creation through utilisation of capacity. Building up the potential is different from realising a higher level of out-put. It is the failure of the agricultural sector, which accounts for nearly half of the national income, that has been mainly responsible for depressing the growth rate in the third plan period. The non-agricultural sector maintained a consistent increase in its growth rate from plan to plan and acquitted itself in a creditable manner achieving an average rate of over 6% but the agricultural sector recorded a net decline of 0.4% bringing down the rate of growth to 2.9%.

Immediately after the third plan there has been a deplorable tendency to treat 1965-66 as an exceptional year and to confine the analysis to the period ending 1964-65. There is little justification for it has amply demonstrated by events of subsequent years. These events emphasise the need for preparedness on our part to the confronted by a succession of bad years also

instead of expecting always to be visited by good or average years. It is also necessary that we should have our targets in the form of quinquennial averages so that over-fulfilment in any single year may not lead to complacency.

There is in fact no need to be very apologetic about the performance of our agriculture in the third plan. Lack of stability is characteristic of agriculture throughout the world. Even in Soviet Russia average out-put of cereals in the quinquennium 1946-50 was lower than the level attained as early as 1924-28. The out-put doubled during 1956-60 but about 80% of the rise was attributed to substantial increase in acreage brought about by reclamation of virgin lands. A glimpse of the instability which still persisted can be had from the performance of the subsequent years: 107.5 million tons in 1963, 152.1 million tons in 1964 and 127.5 million tons in 1965. The fall was attributed to extremely unfavourable weather conditions in 1963 and partly in 1965.

What is, however, peculiar to India is the predominance of agriculture in its economy and what is more alarming is the virtual stagnation in the structural pattern of the economy during all these 15 years of planned development. Consequently, India's growth rate has also become more of a gamble with monsoon rather than a response to systematic efforts through scientific planning. While in Japan the proportion of population dependent on agriculture declined from 50% to 38% between 1947 and 1955, there was practically no change in the Indian situation during the first decade of development, the magnitude of dependence being 72% in 1951 and 70% in 1961. Again, the share of agriculture in the national income showed a substantial fall in several countries: between 1950 and 1959, the share of agriculture went down from 34.1% to 22.1% in Soviet Russia, from 65.7% to 43.6% in China and from 36.7% to 27.2% in Yugoslavia. And the share was already less than 20% in most of the advanced countries. In India, on the other hand, the share of agriculture showed a marginal increase from 43.1% in the first plan period to 48.8% in the second plan and 49.7% in the third plan period (figures are quinquennial averages). Moreover, the labour to income ratio of agriculture in India which is 7 : 5 (70% of people earning 50% of national income) cannot be considered unfavourable since the corresponding ratio obtaining in several advanced countries is only 2 : 1. It thus appears that non-agricultural occupations are not sufficiently attractive under Indian conditions.

#### DISTORTION OF INCOME DISTRIBUTION

Abnormal price fluctuations have also been playing havoc with the economy distorting the pattern of income distribution. Parallel estimates of the respective shares of different sectors of national income at current prices and constant prices represent a striking contrast. As already pointed out earlier there has been a marginal increase in the share of agriculture in the current national income but this has occurred despite a fall in its contribution to the real national product. As regards the manufacturing sector its share of current income also improved though its real contribution remained more or less constant. It is, however, the other sectors including the



fixed income groups that have been squeezed. The extent of the squeeze in their purchasing power is revealed by the fact that their share of the current income dwindled to 30% while their real contribution is estimated to have gone up to 40% of the national product.

PERCENTAGE SHARE OF DIFFERENT SECTORS IN NATIONAL INCOME

	Agriculture		Manufacturing		Others	
	Current prices	1948-49 prices	Current prices	1948-49 prices	Current prices	1948-49 prices
I Plan period	48.1	48.7	17.6	16.7	34.3	34.6
II Plan period	48.8	46.8	18.3	16.6	32.9	37.6
III Plan period	49.7	42.6	20.7	17.2	29.6	40.3

Note: Figures are quinquennial averages.

It all reinforces the view that in general the Indian agriculturist has been benefited by the upsurge in prices. The benefit might have been disproportionately high for those large and medium farmers possessing capacity to withhold stocks and wait for a favourable turn in the price, while only a part of the benefit might have percolated to the lower strata of cultivators and agricultural labourers. Again diverse interests like the big monopolist, the small trader and the salaried classes are lumped together under "others". The monopolist must have been among the first to be benefited. The small trader also would have made modest gains. But the fixed income groups have been the worst hit the real magnitude of which is reflected not by the above figures, but by the fact that the cost of living index shot up 67% between 1950-51 and 1965-66. All these emphasise the need for a penetrating analysis of such distortions by sub-sectors of economic classes and for different strata in each class for which purpose existing data regarding income distribution are not very helpful.

NEED FOR ENSURING STABILITY IN PRICES

Since agriculture has been the pace setter of our economy leading the growth rate by the nose, it is all the more necessary that we should pay adequate attention to what is humanly possible to stabilise the situation. The price policy should be such that an increase in out-put is followed by an increase in income and a decrease in out-put is followed by a decrease in income. It is only in such conditions that there will be strong incentives to increase real out-put. Though we have been pre-occupied with high prices for over a decade, we should not forget the depressing spectacle of 1954-55 when agricultural income and even aggregate national income, fell considerably despite substantial increases in real out-put.

The country is now passing through a green revolution and a high level of agricultural production is being maintained despite flood, drought, cyclone and other calamities. A good year

is long overdue and even a succession of bumper harvests cannot be ruled out. Should there be a crash in prices it becomes necessary to procure grain on a massive scale directly from the farmer at economic prices. Otherwise, once the farmer feels let down it will not be easy to persuade him again to go in for costly inputs and intensive practices, and such a reaction can have disastrous consequences for the economy. But, to put it mildly, the existing institutional arrangements for dealing with the farmer direct are utterly inadequate. And dealing through middle men offers no relief at all. In this connection measures like collection of land revenue and irrigation rates in kind at fairly reasonable prices can have a salutary effect in that the ryot in the normal course gets accustomed to sell his produce directly to the state. This, coupled with a standing offer to lift any quantity at any time at the economic price can have a great stabilising effect on price level. Wage payments by Government in kind to those engaged in works programmes can provide an outlet for disposal of the procured stocks.

Stability in prices is also a must for providing incentives to work, save and invest. Without such stability existing inequalities in income and wealth get further aggravated to the detriment of the fixed income groups.

#### CAPITAL OUTPUT RATIO AND ECONOMIC GROWTH

The capital output ratio denotes the amount of capital required for securing a unit increase in income. This ratio was estimated at 2.1 for the First Plan, 3 for the Second Plan and 2.3 for the third plan. Because of the lower capital output ratio and higher level of investment in the third plan there ought to have been a higher rate of growth in the third plan than in the second. This did not however, materialise which again emphasises the fact that under Indian conditions is not possible to find a simple and direct relationship between capital out-put ratio and economic growth. This is because though economic logic would have us expect a higher return from agriculture as opposed to industry, there is a possibility of total loss in agriculture while the industrial investment may yield at least a steady though modest return. Again, if the industry is agro-based and is starved of agricultural raw materials, then even the fate of such industrial investments would not be materially different from those in agriculture. Capital out-put ratio cannot, therefore, form the sole criterion for determining the choice of priorities to the exclusion of other considerations such as the need to have necessary diversification in order to have proper balance and stability in the economy.

#### POPULATION AND ECONOMIC GROWTH

Per capita income rose by only 15% in 15 years though real national income increased by 57%. This was due to a sizeable increase of about 35% in the Population. Consequently the already lower rate of growth in the national income became even more insignificant in terms of its impact on the common man while the national income at least maintained a consistent and

steady increase except for one year (1965-66), the same thing cannot be said of per capita income. Real per capita income showed a consistent increase only during the First Plan period. In five out of the remaining ten years viz., 1957-58, 1959-60, 1960-61, 1962-63 and 1965-66, real-per capita income actually recorded a decline. This was because the rate of population growth was stated to have increased in the later years of the plan, often overtaking the rate of growth of the economy which was subjected to more frequent vagaries of the monsoon. Thus a high rate of increase in population appears to have been an inhibiting factor in our development.

That is, however, only one side of the picture. Very often, population is also regarded as a positive factor in economic growth. While avoidable consumption has to be necessarily curtailed, consumption by itself is not undesirable. It can, on the other hand, accelerate economic growth. The economic scene appears to be favourable for a widening of the rural market for consumer goods and services which can absorb the surplus purchasing power, provide additional employment and lead to greater diversification of the economy. Consumer industries are also less capital intensive which is another advantage. It appears necessary to reorient our attitudes towards consumption which in the past appear to have overstressed the negative role of consumption in relation to economic growth.

Professor Colin Clark is in fact credited with the view that population rise should not pose any problem and that it should, on the other hand, be a growth factor. It is necessary that each country should employ to better advantage those resources in which it has a surplus. India has abundance of manpower, a modest extent of reclaimable land and acute scarcity of capital. While harping on the lack of adequate capital, we do not appear to have made reasonable use of our resources of labour and land. This is evident from the fact that the backlog of unemployment in the country had increased from about 2 million at the beginning of the first plan to about 10 million by the end of the third plan.

It is not as if there was no additional employment. It is stated that employment has been provided to about 31.5 million persons during the three plan periods. But the labour force is believed to have increased by 38 million persons leading to a net addition of 6.5 millions to the ranks of unemployed in the country. Additional facilities that were created with a view to overcoming shortages of technical personnel finally lead to man-power surpluses and the country was faced with over 15,000 unemployed engineers by the end of the third plan which subsequently has gone up to 45,000. Thus our attempts to tackle the problem of unemployment were inadequate and provided no match to the requirements of the situation. Even the estimates of employment made by the planning commission are wide off the mark and are open to questioning and challenge. For instance the claim of the Planning Commission that non-agricultural jobs were provided to a majority of

the new entrants into the labour force in rural areas appears to be unwarranted. If it were so, there would have been a perceptible improvement in the occupational pattern but the census figures tell a different story.

ESTIMATES OF ADDITIONAL EMPLOYMENT

(figures in millions)

Particulars	Increase in labour force	Increase in Employment in		
		Agricultural Sector.	Non-agricultural	Total
1951 - 1961 Census	N.A.	29	17	46
-10- Planning Commission Estimates	21	5	12	17

There is thus considerable divergence between these two sets of data regarding the magnitude as well as occupational pattern of the newly employed persons.

EMPLOYMENT AND ECONOMIC SECURITY

Often countries are required to maintain large armies for ensuring national security. Similarly it is necessary to fight unemployment also on a war footing by raising armies of unemployed persons, if necessary, to ensure economic security. The labour so mobilised may be charged with earth work and construction, formation of roads, sinking of wells, execution of minor irrigation works, reclamation of land etc. The persons so engaged may be paid on the basis of work done which is a better alternative to distribution of doles to all unemployed as the latter puts a premium on idleness. The immense scope for additional employment on land as well as the intricate nature of the problems that confront the agricultural sector require to be explored, and understood in depth. The existing conflict between private interest and public interest has to be resolved in a bold and constructive manner through suitable incentives. For instance, it is common knowledge that intensive cultivation raises not only the physical yield but also the costs so that often the net additional return to the cultivator is not appreciable. From the social point of view, additional output (which saves valuable foreign exchange) and additional

employment (which increases national income) are highly desirable. But the farmer may not be prepared for the additional inputs since his net income remains virtually uncharged. Similar reasons, as also lack of finance, appear to be responsible for abandoning cultivation and keeping large areas as fallows for recouping the fertility of the soil. There is an extent of about 20 million hectares under fallows and another 20 million hectares of cultivable waste which together represent an extent equal to about one-third of the total net cultivated area of the country. Reclamation of this huge area as also adoption of intensive methods of cultivation and multiple cropping over a larger extent of the land which is at present cultivated can result in a large volume of additional employment.

Payment of wages in kind in the form of foodgrains and other consumer goods may also be desirable since it offers a ready market for goods production of which is encouraged and also serves as an outlet for the disposal of stocks procured by Government. A special consumer currency may be issued to the employment recruits which can be cashed only against such commodities.

#### ROLE OF INDUSTRY

The allotment for industry was only about 5% in the First plan period but it was stepped up considerably to about 25% in the Second Plan and 23% in the Third Plan. Bulk of this investment was devoted to heavy industries and this stress on heavy industry came in for criticism from some quarters. But a look at the steel and power capacities which are the measuring rods of industrial supremacy in the modern world would show the enormous leeway we still have to make up even after attaining a four-fold increase under both of these since 1950-51. Though India is six times Japan in area and nearly five times its population, our production of steel has been one-seventh and our power capacity one-fourth of that of Japan even in 1965.

## STEEL AND POWER CAPACITIES OF INDUSTRIAL POWERS

Country	Area Million Sq. miles	Population Million	Out-put of crude steel million tons	Power Capacit Million K.W.
U.S.A.	3,027	192	119	240
U.S.S.R.	8,600	228	91	104
Japan	183	97	41	38
U.K.	95	54	27	45
India	1,179	472	6	10

(Note: Population and power data relate to 1964.  
Figures regarding steel output are for 1965)

Japan without any iron ore reserves of its own has become the world's third leading manufacturer of steel, while with iron ore reserves of about three-fourths of those of U.S.A. we now produce less steel than what Japan produced in 1937 and Russia in 1932. In the matter of power capacity also, we reached the level obtaining in Soviet Union and Japan in 1937 by 1965-66 though our hydro-electric power potential ranks next to U.S.A. Heavy industry not only played a key role in the economic development of U.S.S.R. and Japan. It was because of their heavy industry that Russia could survive against the German onslaught while Japan could dominate the eastern hemisphere during the Second World War. So from the point of view of development as well as defence a strong industrial base is a must. India was involved in hostilities with unfriendly neighbours in 1962 and again in 1965. Specially in 1965 the country had to depend on its own resources following suspension of all foreign assistance. The development of our heavy industry stood us in good stead at a crucial testing time for the country. Therefore, the need for expanding consumer industry should not result in neglect of heavy industry. In fact our emergence as a major exporter of mineral ores should be a matter of concern. Moreover, we should get rid of our extreme dependence on imported fertilisers at the earliest opportunity by developing our capacities. It is, therefore, necessary to aim at a balanced and all round development of our industrial sector.

### STRESS ON PRODUCTIVITY

The secret of Japan's phenomenal rise as an economic giant appears to lie in its stress on productivity. Japanese man-hour productivity doubled between 1953 and 1961 while man-hour earnings rose only by 60%, thereby leading to a fall of about 20% in labour costs. On the other hand, in U.K. and U.S.A. rise in earnings out-stripped the rise in productivity resulting in higher costs. Therefore, the Japanese example is more relevant to our country.

Japan has been experiencing the highest rate of growth for over a decade. During 1950-64, gross domestic product increased at the rate of 10.8% per annum. In 1964, Japanese gross domestic fixed capital formation was 34% of the G.N.P. and together with stocks, investment was 39%. This rate of investment was considerably higher than 27% in W.Germany, 25% in U.S.S.R. and 18% in U.S.A. Internal resources of enterprises like retained profits and depreciation account for about one-half of the total investment in Japan. Bulk of the remaining funds come as loans from financial institutions in which people deposit their savings. These personal savings form about one-third of the total volume of savings.

It is thus clear that massive investment is indispensable for rapid economic growth; more so in a country with a high rate of population growth. Since the public sector accounts for about 35% of the net reproducible tangible wealth of our country, it is the public sector enterprises which should provide the bulk of the funds out of their surplus earnings. Since investment is made out of borrowed capital the minimum that is expected of an enterprise is that it should yield at least a net return to cover payment of interest and instalment. Every investment should create its own means of repayment which alone can lead to self-generating growth. It is in this connection that recurring losses in some of our public sector units should cause serious concern.

The management of state enterprises under a democratic set-up is a novel experiment with few parallels. But then we perhaps may have to innovate and cover new ground. To-day there is urgent need for such innovation in techniques of managing public enterprises. There should be a direct and fluctuating relationship between the reward for management and the performance of the enterprise. Introduction of an enterprising allowance that is attractive enough and which rises faster than profits and falls steeper than losses, deserves consideration. Bureaucrats should yield place to specially selected executives whose security of service cannot be automatically ensured independently of the performance of the enterprise.

In the light of the closure of certain mills towards the close of the third plan leading to industrial unemployment, it

is also pertinent to consider whether, and how far, rigidities in the wage structure should be allowed even to the extent of curtailing employment. The desirability of tagging on the wage structure to the profitability and performance of an enterprise assumes great relevance. If profits are followed by a certain automatic increase in wages, then the workers may not be unwilling to accept a cut in their wages in the wake of losses, especially to avoid closure and unemployment. Such arrangements should form part of an industrial truce agreement and perhaps a fifty: fifty weightage may be given to cost of living index and profitability as a compromise between risk-bearing and profit sharing on the part of the worker.

#### FUTURE APPROACH TO DEVELOPMENT

Our future approach to development should be essentially employment oriented-employment of not only the manpower resources, but also of land and capital through optimum utilisation of our potentialities and existing capacities. Top most priority should be given for attaining self-sufficiency in agricultural inputs as well as out-puts which is an essential precondition for self-sustaining growth. Stock-piling of agricultural surpluses of food as well as raw materials in order to shake off dependence on foreign aid during lean years should be part of our new strategy. There should also be very great stress on productivity, profitability and stability. Attitudes and Organisational arrangements should be evolved which encourage initiative and effort, and the will to work, save and invest. And suitable incentives and deterrents should be provided to secure compliance with these objectives.

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A STUDY OF GROWTH OF NATIONAL INCOME OF INDIA

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(Bihar State Electricity Board, Patna).

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Along with a approach to study the over all growth in economy, viz., a study of the rate of investment, i.e. of the regenerating force in the economy, relative stability of prices, increase in the total outturn and productivity per factor of production, etc., a study of growth of national income would be more appropriate. Such a study would be helpful in reviewing the extent of short-fall or advance in achievements against the targets. It will also justify conditions to probe into the factors responsible for not achieving the targets to the extent proposed and to reformulate the guide-lines that will accelerate economic growth on more systematic and sound lines.

In the present paper, an attempt has been made to study the growth of national income of India with the help of data released by the Central Statistical Organisation, Govt. of India in the "Estimates of National Products". Recognising the reliability of fit for long term projection and also observing the apparent upward concave shape of the curve drawn by plotting the values of net national output at factor cost over years for the period 1948-49 to 1967-68, the logistic curve of growth,

$$Y = \frac{K}{1 + be^{-at}} \dots\dots(1)$$

Where Y is the value of growth character studied at a point of time t, and a, b and K are parameters to be estimated from the observed data (t<sub>i</sub>, Y<sub>i</sub>) for i=1,2,...,20, has been fitted to the data.

But on estimation of the parameter k by the method propounded by Sir R.A. Fisher in 1950, it is found that k is giving a negative value. This result stands on the way of proceeding with the logistic fit any further.

On the other hand, a close scrutiny of the behavior of curve drawn by plotting national income data over years on arithmetic scale, reveals that the curve is taking a shape of increasing exponential form. It is also observed that when the log values of national income are plotted over years the curve reflects almost a straight line trend. These curves have been shown in Figure I.

Recognising these two important behaviours of national income data, the exponential curve of growth,

$$Y = ab^x \dots \dots \dots (ii)$$

where Y is the value of growth character (national income) studied at a point of time x, and a and b are parameters to be estimated from the observed data (xi, Yi) for i = 1, 2, \dots, 20, has been fitted to the data.

Estimation of a and b

taking log of (ii), we have,

$$\log Y = \log a + x \log b \dots \dots \dots (iii)$$

$$\log b = .0147466$$

$$\text{Therefore } b = 1.03454$$

Now the compound growth rate of national income  
 $(Y) = (b-1) \times 100 = 3.45\%$

$$\text{Total sum of squares of } \log Y = .1463079$$

$$\text{Sum of Squares due to regression} = .1446120$$

Analysis of Variance Table

Sources of variation	Degree of freedom	Sum of Squares	Mean sum of squares	F
Due to regression	1	.1446120	.1446120	1535
Due to error	18	.0016959	.0000942	
<b>Total</b>	<b>19</b>	<b>.1463079</b>		

The value of F is highly significant when compared to 5% value of F(4.414) on 1 and 18 degrees of freedom. It is also interesting to note that the above exponential equation explains 98.84% of the total variation in log Y. This further assures the reliability of the exponential function adopted in this paper.

$$\text{Standard error of growth rate} = 100 \times \log_e 10 \times b^x \times (\log b) = .0896\%$$

$$\text{where } \log b = .003763$$

Finally, from the equation arrived at after substituting the values of log a and log b in equation (iii), the values of national income of India for the years 1948-49 to 1967-68 have been estimated and shown along with their corresponding observed values and residuals (log Y - log Ye) in Table I.

- 3 -

TABLE - 1

National Income of India at 1948-49 Prices

(Rs. in abja)

Year	Y	Ye	(logY-logYe)
1948-49	86.50	83.57	+.0149767
1949-50	88.20	86.45	+.0086826
1950-51	88.50	89.44	-.0045893
1951-52	91.00	92.53	-.0072378
1952-53	94.60	95.73	-.0051347
1953-54	100.30	99.03	+.0055285
1954-55	102.80	102.45	+.0014741
1955-56	104.80	105.99	-.0049043
1956-57	110.00	109.65	+.0013805
1957-58	108.90	113.44	-.0177309
1958-59	116.50	117.36	-.0031795
1959-60	118.60	121.41	-.0101673
1960-61	127.30	125.60	+.0058298
1961-62	130.60	129.94	+.0021980
1962-63	133.00	134.43	-.0046402
1963-64	139.50	139.07	+.0013358
1964-65	149.80	143.88	+.0175268
1965-66	146.40	148.84	-.0071905
1966-67	150.50	153.99	-.0099417
1967-68	165.20	159.30	+.0157852

Note:- (i) Y relates to the national income (at 1948-49 prices) of India.

(ii) Ye relates to the estimated values of

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On examination of the residuals, i.e., the difference between the log of observed and estimated value of national income, it is noticed that they vary from  $-.0177309$  to  $+.0175268$ . The standard error of estimate of national income on years, i.e.,  $se(\log Y)$  which explains how closely the estimated values of national income agree with the values actually observed, works out to  $.009707$ . From this it is obvious that even with the small number of observations, 14 out of 20 residuals representing 70 percent lie within the range of  $\pm se(\log Y)$  and all the 20 residuals representing cent percent lie within the range of  $\pm 1.96 se(\log Y)$  which is close to the expected proportion of the normal distribution.

Equipped with the above degree of goodness of fit and also recognising the usefulness of reliable estimate of national income in formulation of Five Years Plans, an attempt has been made to project the country's national income at the beginning and the end of the Plan periods right up to the Sixth Plan on the basis of the estimating equation. The results are given below:-

Year	National Income (P. in abja)	95% of Fiducial limit of the estimated value of National Income (R. in abja)
1	2	3
1969-70	170.50	163.03 to 177.97
1973-74	195.30	186.75 to 203.85
1974-75	202.05	193.19 to 210.91
1978-79	231.44	221.31 to 241.57
1979-80	239.43	228.94 to 249.92
1983-84	274.27	262.26 to 286.28

While comparing the projections of national income of India made by the Planning Commission, Govt. of India as released in the draft Fourth Five Year Plan, 1969-74 with that of the estimates arrived at in this paper (details given in Table it is noticed that the Planning Commission's estimates are liberal. It is also evident that in some cases there is a wide gulf in the Commission's planned and adjusted project of national income, and some of the projections are miles apart when compared with the actual values of national income already attained by now.

TABLE - II

Long Term Projections of National Income of India

(P. in abja)

Year	1st Plan		2nd Plan		3rd Plan	
	Planned	Adjusted	Planned	Adjusted	Planned	Adjusted
1950-51	90.00	96.50	-	-	-	-
1955-56	99.00	105.90	108.00	114.10	-	-
1960-61	112.00	119.80	134.80	144.90	145.00	132.70
1965-66	133.00	142.30	172.60	184.00	190.00	174.80
1967-68	-	-	-	-	-	-
1970-71	170.00	181.90	216.80	233.70	250.00	235.40
1973-74	-	-	-	-	-	-
1975-76	230.00	246.10	272.70	296.00	330.34	315.00
1980-81	-	332.70	-	376.00	-	421.50

Year	4th Plan		Projections based on Exponential fit	Value of National Income attained
	Planned	Adjusted		
1950-51	-	-	89.44	88.50
1955-56	-	-	105.99	104.80
1960-61	-	-	125.60	127.30
1965-66	-	-	148.84	146.40
1967-68	279.30	165.60	159.30	165.20
1970-71	-	-	176.39	--
1973-74	381.00	225.70	195.30	--
1975-76	-	-	209.02	--
1980-81	579.00	342.20	247.70	--

-- Not available.

....6/-

On the other hand, there is a very close correspondence between the past twenty actual values of national income and the estimates arrived at in this paper. From the error analysis it is also evident that these estimated values of national income are having greater accuracy and reliability and high probability of occurrence.

The formulation of a suitable growth model for projection of national income with greater degree of accuracy for the distant future is really a very difficult job, especially in the planned economy as of ours, because the natural law of economic growth is not allowed to operate freely. Over and above, one has to assure from the very beginning that the projections based on growth model will remain valid only if the conditions prevalent in the past on which the model is built up, also exist in the future for which the fit has been extended. However, the projections of national income arrived at on the basis of exponential equation fitted to the twenty years actual data with a reasonable degree of error involved in them, can safely be used by the planners & planning experts as likely values of national income which can be attained in future provided there is no serious disorder in the economy.

Recognising the importance of such growth studies and projections of national income accruing from various sectors of our economy, sectorwise growth rates and probable estimates of income at the beginning and the end of the Fourth, Fifth and the Sixth Plans along with 95% fiducial limits of these estimates have been worked out, which are summarised below:-

National Income Originating from Agriculture, Animal Husbandry and Ancillary Activities:-

The behaviour of curves drawn by plotting the observed values of national income accruing from agriculture, animal husbandry and ancillary activities ( $Y_i$ ), log values of  $Y_i$  and expected values of national income ( $Y_{ie}$ ) (obtained by fitting the exponential,  $Y = ab^x$ ) over years, have been shown in Figure II.

Growth rate of $Y_i$ .....	2.24%
Standard error of estimate of growth rate.....	0.18%

.....7/-

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Analysis of Variance Table

Sources of variation	Degree of freedom	Sum of squares	Mean sum of squares	F
Due to regression	1	.0613018	.0613018	157.35
Due to error	18	.0070129	.0003896	
<b>Total</b>	<b>19</b>	<b>.0683147</b>		

The value of F(157.35) is highly significant when compared to 5% value of F on 1 and 18 degrees of freedom. From the Analysis of Variance Table, it is also evident that the regression sum of squares explains 89.73% of the total variation in log Y<sub>1</sub>. This shows the reliability of fit attained by the exponential equation,

$$\text{Log } Y_1 = (1.6235614) + (.0096013)X \dots \text{ (iv)}$$

The expected values of national income accruing from agriculture, animal husbandry and ancillary activities (Y<sub>1e</sub>) have been derived from the above exponential equation and shown along with their corresponding observed values (Y<sub>1</sub>) and residuals (log Y<sub>1</sub> - log Y<sub>1e</sub>) in Table I.I. From the analysis of residuals, it is evident that 15 out of 20 residuals representing 75% lie within the range of  $\pm se \log(Y_1)$  and 18 out of 20 residuals representing 90% lie within the range of  $\pm 1.96 se(\log Y_1)$  which is close to the expected proportion of normal distribution.

Finally, the projections of national income accruing from agriculture animal husbandry and ancillary activities (Y<sub>1e</sub>) have been made on the basis of the estimating equation (iv), the estimates along with their 95% fiducial limits as under:-

Year	Y <sub>1e</sub> (P. in abja)	95% Fiducial limits of Y <sub>1e</sub> (P. in abja)	
1969-70	68.20	62.12	to 74.28
1973-74	74.51	67.87	to 81.15
1974-75	76.17	69.39	to 82.95
1978-79	83.22	75.81	to 90.63
1979-80	85.08	77.49	to 92.67
1983-84	92.94	84.87	to 101.21

...8/-



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TABLE - III

National Income (Accruing from Agriculture, Animal Husbandry and Ancillary Activities) of India at 1948-49 Prices.

(Rs. in abn)

Year	$Y_1$	$Y_{1e}$	$\text{Log} Y_1 - \text{log} Y_{1e}$
1948-49	42.50	42.87	-.0037738
1949-50	43.60	43.83	-.0022775
1950-51	43.40	44.81	-.0138756
1951-52	44.40	45.81	-.0135836
1952-53	46.00	46.83	-.0078101
1953-54	49.80	47.88	+.0170601
1954-55	50.30	48.95	+.0117975
1955-56	50.20	50.05	+.0013319
1956-57	52.20	51.17	+.0086974
1957-58	50.10	52.31	-.0187367
1958-59	55.60	53.48	+.0168991
1959-60	55.10	54.67	+.0033746
1960-61	59.00	55.90	+.0234737
1961-62	59.10	57.15	+.0146079
1962-63	57.90	58.42	-.0039023
1963-64	59.60	59.73	-.0009359
1964-65	64.90	61.06	+.0264612
1965-66	57.10	62.43	-.0387487
1966-67	57.80	63.82	-.0430583
1967-68	68.80	65.25	+.0230010

National Income Originating from Mining, Manufacturing and Small Enterprises:-

The behaviour of curves drawn by plotting the observed values of national income accruing from mining, manufacturing and small enterprises (Y2), log values of Y2 and expected values of national income (Y2E) (obtained by fitting the exponential,  $Y=ab^x$ ) over years, have been shown in Figure III.

Growth rate of Y2 = 3.73%

Standard error of estimate of growth rate = .12%

Analysis of Variance Table

Sources of variation	Degree of freedom	Sum of squares	Mean sum of squares	F
Due to regression	1	.1681660	.1681660	1044.51
Due to error	18	.0028984	.0001610	
Total	19	.1710644		

The value of F(1044.51) is highly significant in comparison to 5% value of F on 1 and 18 degrees of freedom (4.414). From the Analysis of Variance Table, it is also evident that the regression sum of squares explains 98.31% of the total variation in log Y2. This shows the reliability of fit attained by the exponential equation,

$$\log Y2 = (1.1232961) + (.0159045) \times \dots (V)$$

The expected values of national income originating from mining, manufacturing and small enterprises (Y2e) have been derived from the above exponential equation and shown along with their corresponding observed values (Y2) and residuals (log Y2 - Log Y2e), in Table IV.

From the analysis of residuals, it is evident that 15 out of 20 residuals, representing 75% lie within the range of  $\pm se$  (log Y2) and 19 out of 20 residuals representing 95% lie within the range of  $\pm 1.96 se$  (log Y2) which is close to the expected proportion of normal distribution.

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Finally, the projections of national income accruing from mining, manufacturing and small enterprises (Y2e) have been made on the basis of estimating equation (V), the estimates alongwith their 95% fiducial limits are as under:-

...11'-

TABLE-IV

National Income (Originating from Mining Manufacturing & Small Enterprises) of India at 1948-49 Prices.

(Rs. in lakhs)

Year	Y2	Y2e	logY2-logY2e
1948-49	14.80	13.78	+.0310160
1949-50	14.60	14.29	+.0092478
1950-51	14.80	14.83	-.0007479
1951-52	15.20	15.38	-.0050705
1952-53	15.80	15.95	-.0041615
1953-54	16.50	16.55	-.0012392
1954-55	17.00	17.16	-.0041787
1955-56	17.60	17.80	-.0050194
1956-57	18.40	18.47	-.0016188
1957-58	18.60	19.16	-.0128282
1958-59	18.80	19.87	-.0240878
1959-60	19.70	20.61	-.0196839
1960-61	21.10	21.38	-.0057721
1961-62	22.00	22.18	-.0035364
1962-63	23.00	23.01	-.0001358
1963-64	24.30	23.87	+.0078382
1964-65	25.40	24.76	+.0111011
1965-66	26.80	25.68	+.0185577
1966-67	27.40	26.64	+.122690
1967-68	27.50	27.63	-.0020534

Note:- (i) Y2 relates to the national income (accruing from mining manufacturing and small enterprises) of India.  
(ii) Y2e relates to the estimated values of Y2.

Year	Y2e (₦. in abja)	95% of Fiducial limits of Y2e (₦. in abja)
1969-70	29.73	28.02 to 31.44
1973-74	34.42	32.46 to 36.38
1974-75	35.70	33.66 to 37.74
1978-79	41.34	38.97 to 43.71
1979-80	42.88	40.43 to 45.33
1983-84	49.64	52.48 to 46.80

National Income Accruing from Commerce, Transport and Communications

The behaviour of curves drawn by plotting the observed values of national income accruing from commerce, transport and communications (Y3), log values of Y3 and expected values of national income (Y3e) (obtained by fitting the exponential,  $Y=ab^X$ ).. Over years, have been shown in figure IV.

Growth rate of Y3 = 3.86%

Standard error of estimate of growth rate = .09%

Analysis of Variance Table

Sources of variation	Degree of freedom	Sum of squares	Mean sum of squares	F
Due to regression	1	.1799822	.1799822	2010.97
Due to error	18	.0016101	.0000895	
Total	19	.1815923		

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The value of  $F(2010.97)$  is highly significant in comparison to 5% value of  $F$  on 1 and 18 degrees of freedom (4.414). From the analysis of Variance Table, it is also evident that the sum of squares due to regression explains 89.11% of the total variation in  $\log Y_3$ . This shows the reliability of fit attained by the exponential equation,

$$\log Y_3 = (1.1715400) + (.0164528)X \dots (vi)$$

The expected values of national income accruing from commerce, transport and communication ( $Y_{3e}$ ) have been derived from the above exponential equation and shown along with their corresponding observed values ( $Y_3$ ) and residuals  $\log Y_3 - \log Y_{3e}$  in Table V.

From the analysis of residuals, it is evident that 14 out of 20 residuals representing 70% lie within the range of  $\pm se (\log Y_3)$  and all the 20 residuals representing cent percent lie within the range of  $\pm 1.96 se (\log Y_3)$  which is close to the expected proportion of normal distribution. ...14/-

TABLE - V

National Income (Accruing from Commerce, Transport & Communications) of India at 1948-49.

(P. in abja)

Year	Y3	Y3e	Logy3-Logy3e
1948-49	16.00	15.42	+ .0161272
1949-50	16.40	16.01	+ .0103982
1950-51	16.60	16.63	- .0007903
1951-52	17.30	17.27	+ .0006949
1952-53	17.90	17.94	- .0009510
1953-54	18.30	18.63	- .0078057
1954-55	19.10	19.35	- .0056762
1955-56	19.70	20.10	- .0086962
1956-57	20.80	20.87	- .0015519
1957-58	21.10	21.68	- .0117855
1958-59	21.90	22.52	- .0120767
1959-60	22.70	23.39	- .0129477
1960-61	24.50	24.29	+ .0037397
1961-62	25.50	25.23	+ .0046610
1962-63	26.40	26.20	+ .0032719
1963-64	27.80	27.81	+ .0092600
1964-65	29.40	28.26	+ .0171097
1965-66	29.50	29.36	+ .0021316
1966-67	30.10	30.49	- .0055767
1967-68	31.70	31.67	+ .0004633

Note: (i) Y3 relates to the national income (accruing from Commerce, Transport and Communications) of India.

(ii) Y3e relates to the estimated values of Y3.

Finally, the projections of national income accruing from commerce, transport and communications (Y3e) have been made from the estimating equation (VI), the estimates alongwith their 95% fiducial limits are as under:

Year	Y33 (P. in abja)	95% Fiducial limits of Y3e(P. in abja)
1969-70	34.16	32.69 to 35.63
1973-74	39.75	38.04 to 41.46
1974-75	41.28	39.52 to 43.04
1978-79	48.04	45.98 to 50.10
1979-80	49.89	47.75 to 52.03
1983-84	58.06	55.57 to 60.55

National income accruing from Other Services

The behaviour of curves drawn by plotting the observed values of national income accruing from other services (Y4), log values of Y4 and the expected values of national income (Y4e) (obtained by fitting the exponential,  $Y = ab^x$ ) over years, have been shown in Figure V.

Growth rate of Y4.....6.01%

Standard error of  
estimate of growth..... 0.22%  
rate

On comparison of the growth rate of national income accruing from other services and its standard error of estimate with the similar growth rates and standard errors of national income accruing from other sectors of our economy, it is evident that the growth rate and standard error of the former is almost double than the latter except the rate and standard error of national income accruing from agriculture, animal husbandry and ancillary activities. This is a healthy indication of change in the structure of national income, and if it continues to remain so then it will tilt the weight in favour of tertiary sector instead of the present weightage in favour of agriculture sector. Only then, our country will be in a position to move from the era of economic backwardness to the era of economic prosperity like Japan, France, West Germany, U.K., U.S.A. and many other advanced countries of the world.



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Analysis of Variance Table

Sources of variation	Degree of freedom	Sum of squares	Mean sum of squares	F
Due to regression	1	.4276934	.4276934	755.78
Due to error	18	.0101862	.0005659	
<b>Total</b>	<b>19</b>	<b>.4378796</b>		

The value of F(755.78) is highly significant in comparison to 5% value of F on 1 & 18 degrees of freedom (4.414). From the Analysis of Variance Table, it is also evident that the sum of squares due to regression explains 97.67% of the total variation in log Y4. This shows the reliability of fit attained by the exponential equation.

$$\text{Log } Y4 = (1.0540390) + (.0253607)X \dots \text{VII}$$

The expected values of national income accruing from other services (Y4e) have been derived from the above exponential equation and shown alongwith their corresponding observed values (Y4) and residuals log Y4-log Y4e in Table VI.

From the residual analysis it is evident that 14 out of 20 residuals representing 70% lie within the range of  $\pm se(\log Y4)$  and 19 out of 20 residuals representing 95% lie within the range of  $\pm 1.96se(\log Y4)$  which is close to the expected proportion of the normal distribution.

Finally, the projections of national income accruing from other services have been made on the basis of estimating equation (VII), the estimates alongwith their 95% fiducial limits are as under:-

Year	Y4e (P. in abja)	95% Fiducial limits of Y4e (P. in abja)
1969-70	40.92	36.53 to 45.21
1973-74	51.69	46.14 to 57.24
1974-75	54.80	48.92 to 60.68
1978-79	69.22	61.79 to 76.65
1979-80	73.38	65.50 to 81.26
1983-84	92.69	82.73 to 102.65

From the analysis of a fairly large values of standard error of estimates of  $Y_4$  and their consequent wider 95% financial limits, it is evident that the further improvement on these projections can be had by fitting a second or higher degree log polynomial.

...18/-

-: : 78 : :-  
TABLE - IV

National Income (Accruing from other Services)  
of India at 1948-49 Prices.

(P. in abja)

Year	Y4	Y4e	LogY4-LogY4e
1948-49	13.40	12.01	+.0477051
1949-50	13.80	12.73	+.0351187
1950-51	13.90	13.49	+.0128937
1951-52	14.30	14.30	-.0001458
1952-53	15.00	15.17	-.0047512
1953-54	15.70	16.08	-.0103035
1954-55	16.40	17.04	-.0167201
1955-56	17.30	18.07	-.188785
1956-57	18.20	19.16	-.0222139
1957-58	19.20	20.31	-.0243448
1958-59	20.40	21.53	-.0233765
1959-60	21.40	22.82	-.0279536
1960-61	23.20	24.20	-.0182401
1961-62	24.70	25.65	-.163918
1962-63	26.60	27.19	-.0095679
1963-64	28.70	28.83	-.0019283
1964-65	31.20	30.56	+.0089837
1965-66	34.20	32.40	+.0234945
1966-67	37.10	34.35	-.0334816
1967-68	39.30	36.41	-.0331396

Note:- (i) Y4 relates to the national income (accruing from other services) of India.

(ii) Y4e relates to the estimated values of Y4.

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Acknowledgement:- The author is thankful to Sri L. S. Thakur, I.A.S., Chairman, Bihar State Electricity Board for encouragement and Dr. I. Narayan, M.A.(Cal.), Ph.D.(Aberdeen) for guidance.

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NATIONAL INCOME OF INDIA  
AT 1948-49 PRICES

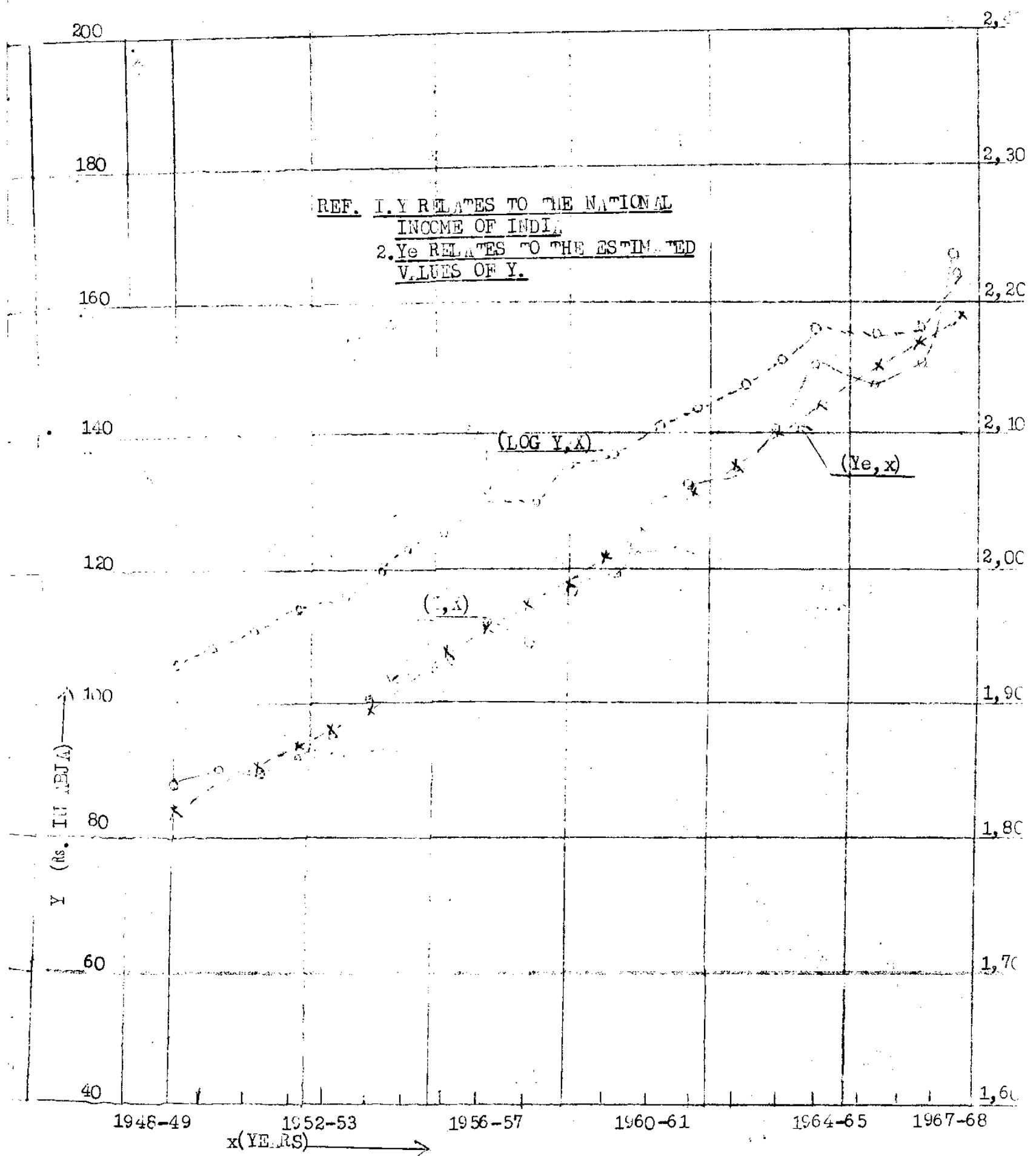


FIGURE I.

NATIONAL INCOME ACCRUING FROM AGRICULTURE  
ANIMAL HUSBANDRY & ANCILLARY ACTIVITIES OF  
INDIA AT 1948-49 PRICES.

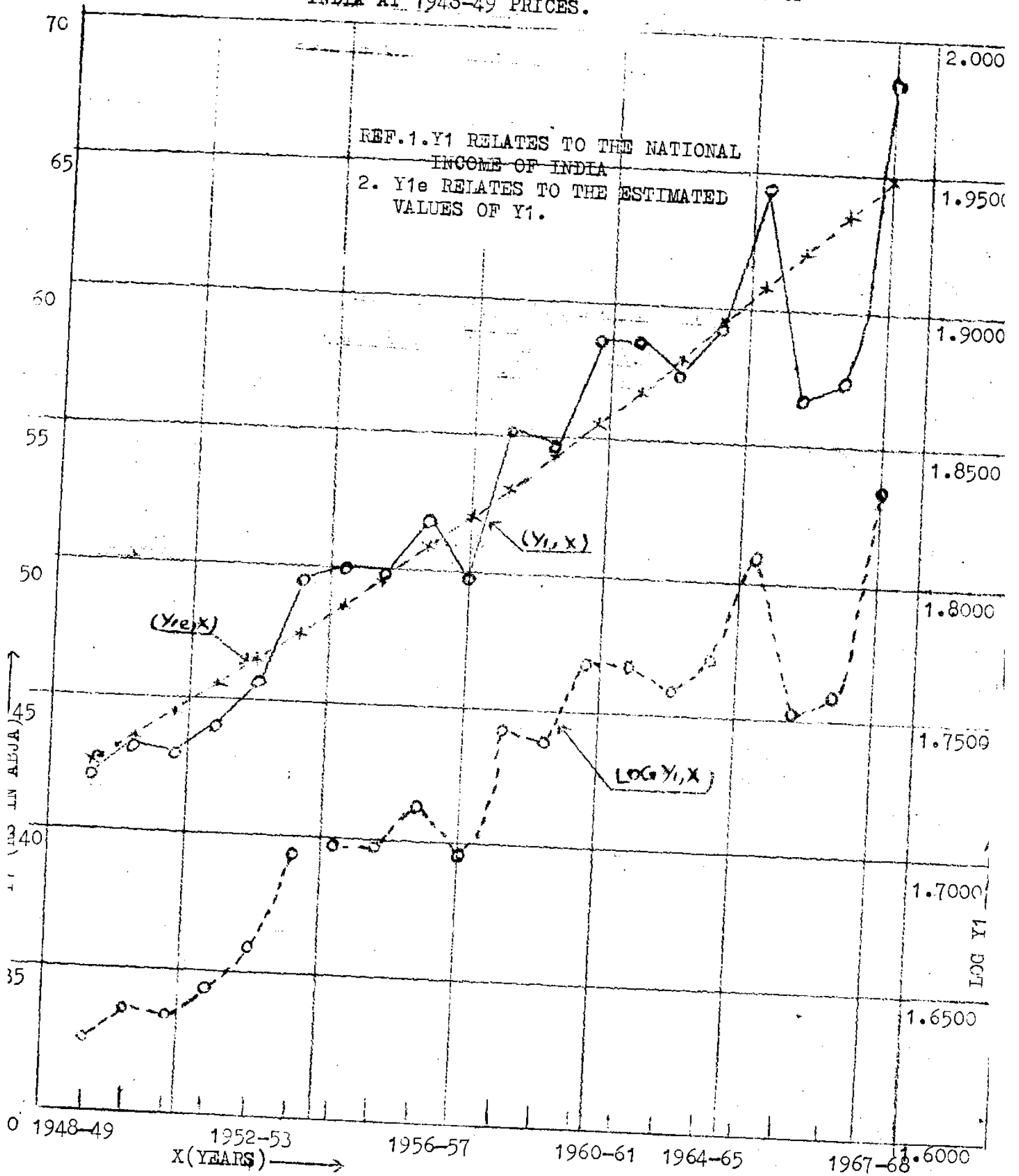


FIGURE - II

NATIONAL INCOME (ORIGINATING FROM MINING  
MANUFACTURING & SMALL ENTERPRISES) OF INDIA  
AT 1948-49 PRICES.

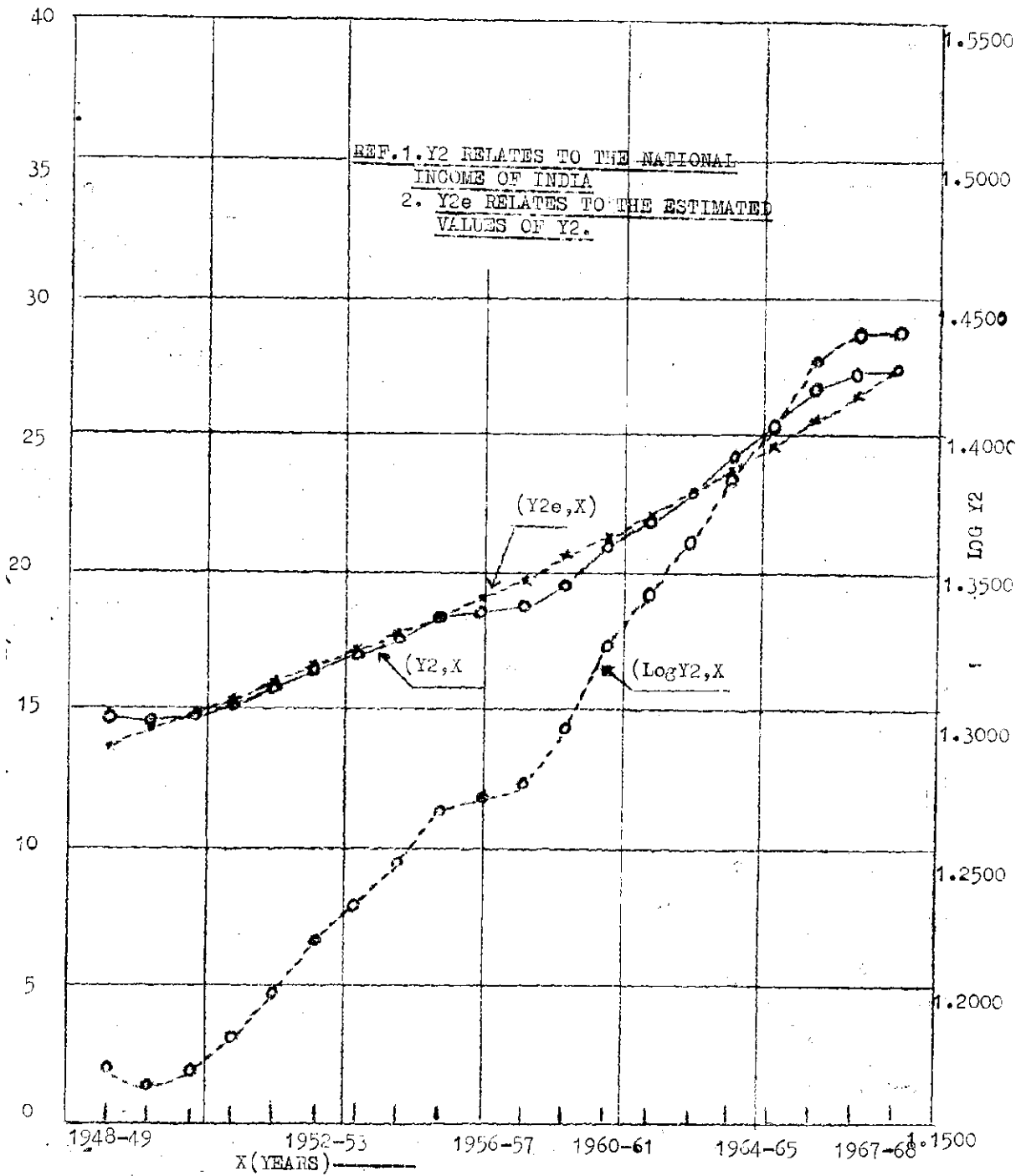


FIGURE - III

NATIONAL INCOME (ACCRUING FROM COMMERCE  
TRANSPORT & COMMUNICATIONS) OF INDIA AT  
1948-49.

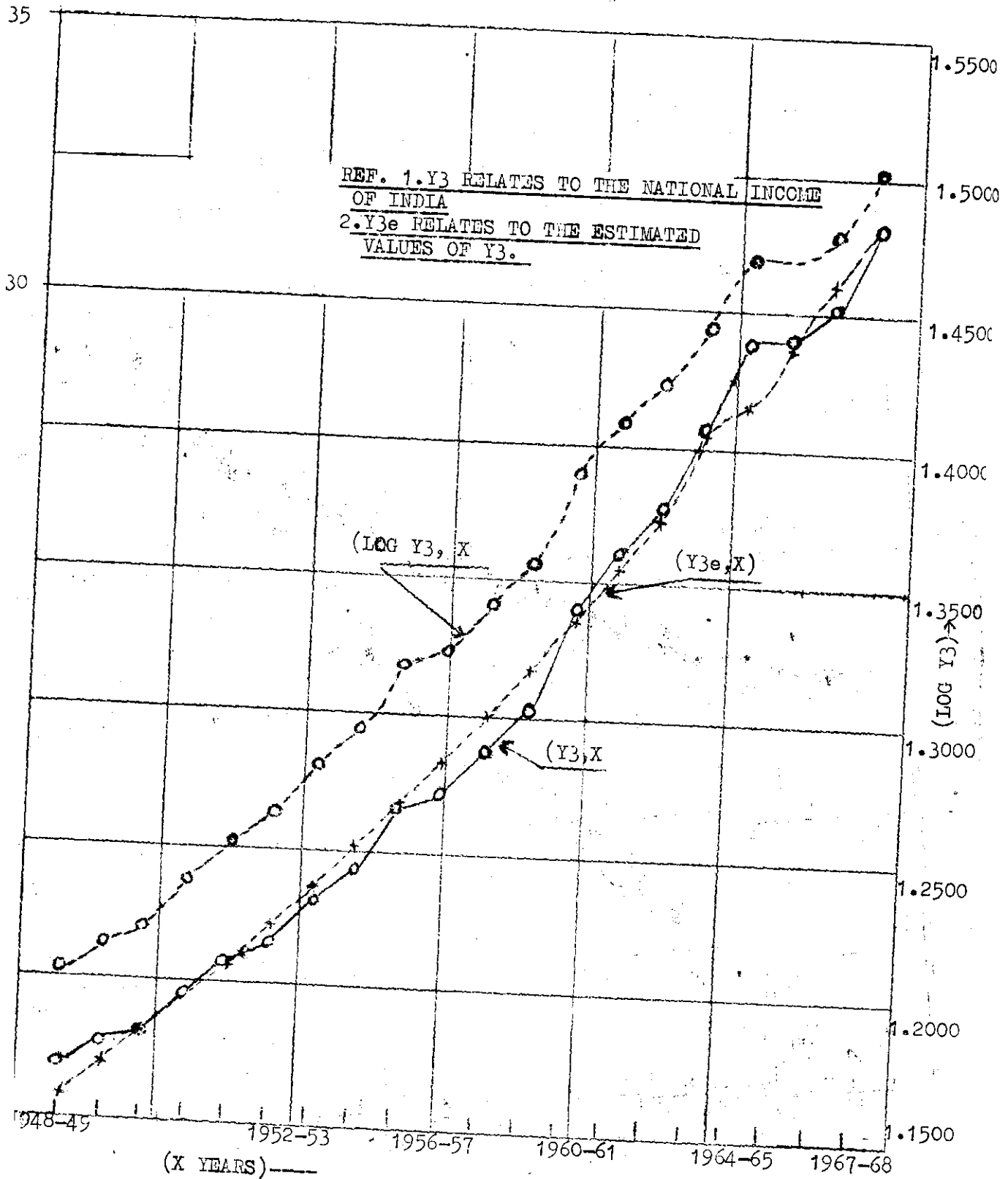


FIGURE - IV



NATIONAL INCOME (ACCRUING FROM OTHER SERVICES) OF INDIA AT 1948-49 PRICES)

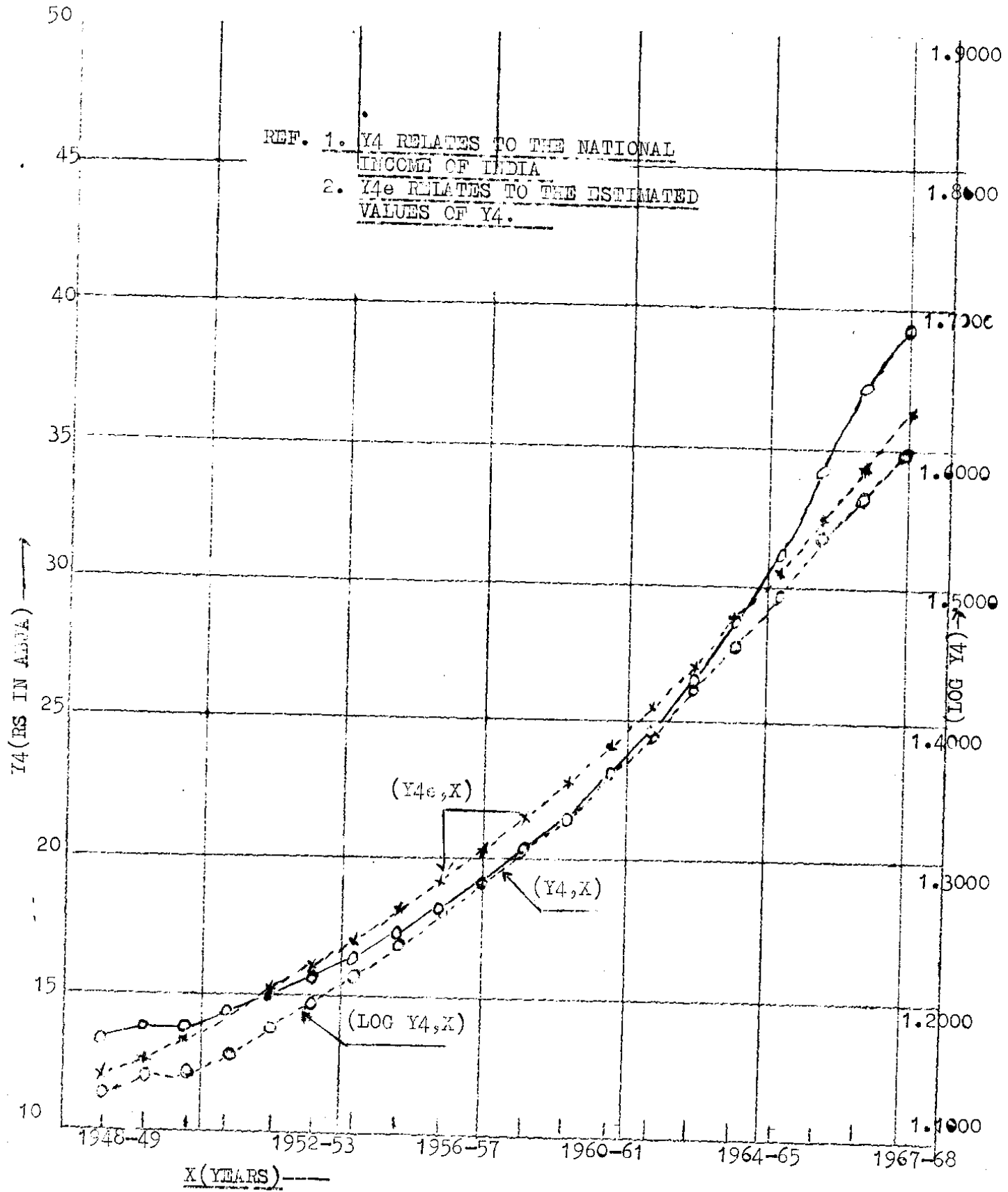


FIGURE - V

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Seventh Indian Conference on Research  
in  
National Income

INDIA'S ECONOMIC PROGRESS, 1951-66

By  
J. Guha Thakurta

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

# INDIA'S ECONOMIC PROGRESS, 1951-66

by

J. Guha Thakurta  
(Indian Chamber of Commerce, Calcutta)

## Introduction

India's rate of economic progress in the 15 years of planned economy from 1951-52 to 1965-66 was neither even nor uniform. In the First Five-Year Plan period (1951-52 to 1955-56), India advanced at the rate of 3.5% per annum. This rate rose to 4% per annum in the Second Plan period (1956-57 to 1960-61); but in the Third Plan period (1961-62 to 1965-66) a declining trend was visible in the economic advancement of India, specially in 1965-66. The result was that the rate of growth of the economy dwindled to 2.6% per annum. The average rate of growth of the Indian economy during the fifteen years (1951-66) was, therefore, pegged to 3.4% per annum against about 5% envisaged by the planners.

India's economy being agriculture-based depends mostly on the agricultural situation for her economic advancement or retardation. The rate of economic progress of the country mostly followed the pattern of that in agricultural production during the period under study. It has been found that the correlation coefficient between the Index of National Income at 1960-61 prices (1960-61 = 100) and the Index of Agriculture Production (1960-61 = 100) for the 15 years 1951-52 to 1965-66 is over 0.9. The average annual increase in agricultural production in the first plan was 4.2%, in the second plan 4.3% but in the third plan there was a decrease of 1.0% per annum and the overall rate for the 15 years was 2.5%. Even today India's agriculture depends mostly on monsoon, because about 20% of the cropped area are irrigated.

This low rate of growth has been experienced, in spite of an additional investment of more than Rs.20,000 crores in the 15 years; the public sector accounting for about Rs.11,500 crores and the private sector about Rs.9,000 crores.

This moderate rate of growth of the Indian economy was again largely nullified by the phenomenal rate of increase in population specially during the Third Five Year Plan period. In the Third Five-Year Plan the annual rate of growth of population rose to 2.5% from 1.5% in the first Five-Year Plan and 2.1% in the Second Five-Year Plan. The average rate of increase for the 15 years was as high as 2% per annum. The result was that whereas national income at 1960-61 prices improved from Rs.9252 crores in 1950-51 to Rs.15,045 crores in 1965-66, the per capita national income rose from Rs.259 to only Rs.307 in the same period.

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Agriculture: The Main Crop

About one-half of the economy is accounted for by agriculture. (See Tables VIA & VIB). The contribution of agriculture and allied activities to the national economy at 1948-49 or 1960-61 prices was a little less during the Third Five-Year Plan period. (See tables VIII A and VIII B). More than two thirds of the population eke out their livelihood from this source. Even our major industries e.g. suger, jute manufactures and cotton textiles are agriculture-based. It is no wonder, therefore, that the national income of India at constant prices follow the same pattern as that of agricultural production. It has been found on a detailed study of the relationship between the index of national income at 1960-61 prices (1960-61 = 100) and the index of agricultural production (1960-61 = 100) during the period 1951-52 to 1965-66 that they follow almost the same trend. After eliminating the trend from both the series by the method of 3-year moving average, the correlation coefficient between the two series has been worked out as 0.91. The method of moving average has been arrived at by having a three-year average for each successive period and placing the first average figure against the second year under study, that is, the average of the three years 1950-51, 1951-52 and 1952-53 has been shown against 1951-52. It is also seen that the estimated figures for the index of national income on the basis of the equation  $y = 0.39x + 61$ , where y denotes the ratio of the index of national income to moving average and x the ratio of the index of agricultural production to moving average, compare very closely to the actual figures of the index of national income (See tables IVA and XIV).

The behaviour of agricultural production, indicated by the index of industrial production (1949-50 = 100), was completely erratic. During the First Five-Year Plan agricultural production increased by 2% in 1951-52 over 1950-51, by 5% in 1952-53 over 1951-52 and 11.6 in 1953-54 over 1952-53. But in 1954-55 it started declining and in 1955-56 it was lower by 0.2% as compared with 1954-55. In 1957-58 agricultural production was again lower by 6.8% as compared with 1956-57 but in 1958-59 it rose sharply by 15.2% over 1957-58. The average annual rates of increase were, however, maintained at a little over 4% during both the first and the second five-year plan periods. But in the third plan period, agricultural production received such a setback, specially in 1962-63 when it was lower by 3.6% as compared with 1961-62 and also in 1965-66 when it was again lower by 16.3% as compared with 1964-65 that the average annual rate of decline for the five-year period was 1%. The average rate of improvement of agricultural production in the 15 years was, therefore, only 2.5% (See table III).

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As a result of the depression in agricultural production in the third plan period 25 million metric tons of foodgrains, 3.9 million bales of cotton and 1.5 million bales of jute were imported. Even after importing large quantities of foodgrains, rationing of cereals was resorted to in all important cities towards the end of the third plan, thereby causing hardship to millions of people. The per capita availability of cereals in 1965-66 was only 12.5 ozs. when 10.3 million tons of cereals were imported. The net availability was highest in 1964-65 when the cereals consumed per person was 14.56 ozs. per day. In 1950-51 the corresponding figure was 11.76 ozs.

The agricultural sector is a slow moving one with sudden spurts here and there. But the resultant effect is that it moves forward very slowly and the rate of growth during the 15 years 1951-66 was only 2.5% per annum. Not only the sector does move slowly but the level of agricultural output is also very low. This is why the per capita availability of foodgrains after considerable imports remained always below the desired optimum level. The erratic behaviour and slow movement of the agricultural sector is primarily due to the non-availability of adequate water in time. Even today a little over 4/5ths of the country's cropped area depends exclusively on rainfall, most of it are concentrated in a few months of the year. After more than 15 years of planning, the country has got irrigation facilities for only 20% of its cropped area.

The reason why the country which is predominantly agricultural cannot feed her population properly even in peace time is that the yields per hectare for the crops are one of the lowest in the world. Recent statistics indicate that the yield per hectare of rice (paddy) for India was only 1280 kgs against 4667 kgs for Italy, 5087 kgs for Japan, 4847 kgs for the U.S.A. and 4115 kgs for the UAR. India's yield per hectare of wheat was 878 kgs against West Germany's 3266 kgs, France's 2824 kgs, Italy's 2201 kgs and Yugoslavia's 2525 kgs and the USA's 1768 kgs.

#### Large Scale Manufacturing Industry: Meagre Contribution

Large scale manufacturing industry constituted about 6% in 1951-52 rising to about 10% in 1965-66 (see tables VIA, VIB and VIIIA). The impact on the national economy of this sector cannot, therefore, be much felt. On an examination of table IVA, it is found that there is very

little correlation between the index of industrial production (1961 = 100) and the index of national income at 1960-61 prices (1960-61 = 100). The industrial production, as indicated by the index of industrial production (1960 = 100), showed a continuous rise, whereas the index of net national output indicated both increases and decreases in the 15-year period.

The highest increase recorded in the index of industrial production was in 1959-60, when it reached the figure of 11.5% over 1958-59. The increase in industrial production was maximum during the second five-year plan when the average figure arrived at was 7.4% against 6.4% in the first five-year plan period. In the first plan period, however, the increase in industrial production in 1953-54 was as high as 10.7% as against 1952-53. At the beginning of the third plan the increase in industrial production was more or less uniform at about 9% but towards the fall of the third plan this rate was declining and dwindled to 1% in 1965-66. The annual average increase was, therefore, pegged to 6.9%.

At the end of 1965 the total productive capital of the large scale manufacturing industry was about Rs.7,700 crores. The net output originating therefrom was of the order of Rs.2,000 crores. The low level of net output of the large scale manufacturing industry was mainly due to low productivity in industry. Statistics in the early 60's show that the output per person engaged in manufacturing industry was incredibly low as compared with that of other industrialised countries.

Considering that the major industries are agro-based, the performance of the large scale industrial sector in the 15-year period was commendable. Industrial production increased by 17% over the period or by 6.9% per annum. (See tables II and III).

#### Small Scale Manufacturing: Diminishing Sector

The small scale manufacturing industrial sector has been gradually becoming smaller. Its contribution to the economy of the country dropped from about 10% in 1950-51 to a little over 6% in 1965-66. The income generated from this sector was about Rs.1,200 crores at current prices and Rs.1,000 crores at 1960-61 prices in 1965-66. In 1950-51, the income originating from this sector was about Rs.900 crores at current prices. (See tables VA, VB, VIA, VIB, VIIA and VIIIA).

### Tertiary Sector \* Impact Unimpressive

The tertiary sector that is, trade, commerce, transport, banking, Government and other services accounted for about a third of the country's economy from 1950-51 to 1965-66. The percentage share of this sector at current prices declined slightly from 32.8% in 1950-51 to 31.2% in 1965-66 but at constant prices this share remained unchanged at a little over 34% in the same period. (See table Nos. VIA, VIB and VIIIA). The impact of this sector to foster a change on the national economy was, therefore, not very effective.

The index of services at 1960-61 prices (1960-61 = 100) has been calculated by me on the basis of the data given in the White Paper on national income for the 16 years from 1950-51 to 1965-66. This index shows that there was a continuous rise throughout and the increase during this period was by 107% or 5% per annum. This sector being composed of mostly fixed income groups did not grow at a fast pace. But at the same time it had no retardation also.

During the first plan period, the maximum increase recorded was in 1952-53 when the income from different services rose by 4.5% over 1951-52. The average annual growth of this sector was 3.9% in the first plan period against 5.2% in the second plan period and 5.8% in the third plan period. When the rates of increase in the net outputs in the other sectors declined the growth of this sector gained momentum. In 1960-61, the last year of the Second Plan period, the index showed an increase by 8.1% over 1959-60 and in 1963-64 the mid-year of the third plan period by 7.7%. It is interesting to note that this sector fared much better during the third plan period, whereas the other sectors of the economy were lagging behind. The correlation coefficient between the index of services at 1960-61 = prices (1960-61=100) and the index of national income at 1960-61 prices (1960-61 = 100) cannot therefore be very significant. (See tables IVA and IVB)

### Prices - Inflationary Trend

Wholesale prices, as indicated by the index of wholesale prices (1952-53 = 100), advanced by 48% in the 16-year period from 1950-51 to 1965-66 or at an annual rate of 2.9%. But this overall average gives an incorrect picture of the situation. Actually during the first five year plan prices receded by 3.4% per annum. The maximum

decline during this period was 15.3% in 1952-53 as compared with 1951-52. From the start of the second plan prices started rising. In the first year of the second plan, that is 1956-57, wholesale prices rose by 13.8% over 1955-56. The average increase per year during the second plan period was 6.3%. Prices were below level in the first plan period, but in the second plan period these rose by over 6% per annum. During the third plan period wholesale prices rose further still and the increase was recorded at 12.9% in 1964-65 over 1963-64. The advance in the wholesale prices from 1961-62 to 1965-66 was 5.8% per annum. Towards the end of the Second Plan period and during the Third Plan period inflationary tendencies were noticeable.

The two main factors were mainly responsible for this inflationary condition in the Indian economy, namely less agricultural and industrial production and more notes in circulation, specially in the third plan period. The fall in both agricultural and industrial production during the period has already been discussed. Notes in circulation increased from Rs.1239 crores in 1950-51 to Rs.1424 crores in 1955-56 and further advanced to Rs.1942 crores in 1960-61. After 1960-61 notes in circulation were increasing at a faster rate and reached the figure of Rs.2823 crores in 1965-66. (See tables II and III).

#### Population: Phenomenal Increase

In the first five-year plan the growth of population was more or less normal. The average rate of increase per annum was 1.5%. But in the second five-year plan the rate of growth was about 2% per annum over the entire period. During the third plan this rate gained further momentum and reached the figure of 3.2% in 1965-66 over 1964-65 resulting in an average rate of 2.5% per annum. There was practically population explosion towards the end of the third plan and at the end of the third plan the country had to bear the burden of a little less than 500 million persons. (Tables II and III).

#### Government's Share in National Income:

The total revenue collected by the Central and State Governments amounted to Rs.911 crores in 1951-52 or 9.1% of the national income at current prices. This revenue increased continuously throughout and reached the figure of Rs.4170 crores in 1965-66, the ratio being 20.3% of the national income.



### Tax Revenue:

The tax revenue, however, constituted a major portion of the total revenue. In 1951-52 the total tax revenue of the Central and State Governments amounted to Rs.739 crores rising to Rs.2,902 crores in 1965-66. The ratio of tax revenue to national income, therefore, increased from 7.4% in 1951-52 to 14.1% in 1965-66. The foregoing analysis clearly indicates that the expansion of the Government's sector has taken place at a much faster rate than that of the other sectors. (See tables IX and X).

### Foreign Trade: Exports Dwindling, Imports Receding

The total exports increased from Rs.610 crores in 1950-51 to Rs.806 crores in 1965-66 or by about Rs.200 crores in the course of 16 years. But if we relate these exports to national income, it is found that the ratio dropped from 7.4% in 1951-52 to 3.9% in 1965-66. In the first plan period the ratio of exports to national income was more than 6%, declining to about 5% in the second plan period. The ratio dwindled to about 4% towards the end of the third plan showing thereby that India's exports were not keeping pace with production.

The total imports rose much faster from Rs.623 crores in 1950-51 to Rs.1409 crores in 1965-66 but when related to national income the ratio of imports to national income dropped from about 10% in 1951-52 to about 7% in 1965-66. This is also a clear indication that the imports are not maintained at a level commensurate with that of national income. This has become necessary because imports have been always higher than exports and the adverse balance of trade was as high as Rs.603 crores in 1965-66 against only Rs.22 crores in 1950-51. This big trade gap was mainly due to a colossal increase in the imports of cereals and cereal preparations from Rs.77.5 crores in 1950-51 to Rs.322 crores in 1965-66. (See table XI).

### Economic Growth: Slow Progress

National income at current prices rose from Rs.9,330 crores in 1950-51 to Rs.20,586 crores in 1965-66 or by Rs. 11,256 crores. The increase, therefore, in this period was by 121% or about 6% per annum. In the first plan the average rise in national income at current prices was only by 1.1% but the rate of increase was accelerated from the beginning of the second plan period. The average rate recorded during this was, therefore, much higher at 7.3% per annum. In the third plan period there was

a further spurt and in 1964-65 national income rose by 17.3%, the peak figure, over 1963-64 and the average for the five years was 9.3%.

The rates of increases in national income at current prices were more artificial than real, because the fluctuations in prices were sharp during the 15 years of planning. If the effect of changes in prices is eliminated from the national income figures, the resultant figures became Rs.9252 crores in 1950-51 and Rs.15045 crores in 1965-66 at 1960-61 prices. This means that the improvement in national income at constant prices was of the order of Rs.5,800 crores or by 63%. The average annual increase during this period worked out to 3.4%.

In the first plan period the highest increase recorded in national income was by 6.1% in 1953-54 over 1952-53 giving an annual average rate of 3.5%. In the second plan period the highest increase of 7.4% was recorded in 1960-61 over 1959-60 and the average for the five years was 4%. In the third plan period the maximum rise of 7.1% in national income was shown in 1964-65 over 1963-64 but in 1965-66 national income at 1960-61 prices fell by 5.6% and the average for the five years was as low as 2.6%.

After eliminating the effect of growth of population, the resulting per capita national income at current prices amounted to Rs.266.5 in 1950-51 rising to Rs.420.5 in 1965-66. In the course of 15-16 years, the improvement in per capita national income was only by Rs.154 or 58%. The average annual increase during this period was about 3%. If we further eliminate the effect of changes in prices, the per capita national income at 1960-61 prices became Rs.258.9 in 1950-51. This rose to Rs.307.3 in 1965-66 which means an increase by Rs.48.4 or 18.7% in the course of 15-16 years. The average annual increase was less than 1%.

From the foregoing analysis it is clear that the economic progress of the country was very slow which was made slower still by sharp fluctuations in prices. Over and above this phenomenon the rate of population growth started gaining momentum from the commencement of the second five year plan and at the end of the third plan it reached a colossal figure of more than 3%, thereby almost nullifying the progress made by the country in various directions (See tables I,II,III,IVA and IVB).

Savings: Low Level

Capital formation which is the basis of economic progress of a country is very low in India, because its main constituent, personal savings are meagre. In India millions of people live on the subsistence level and with sharp increases in living costs in recent years the situation has deteriorated further still. The All-India consumer price index for working class (1949=100) advanced by 36% in 1965-66 over 1960-61. It is no wonder, therefore, that the level of savings in India never reached the optimum level in order to move the Leviathan forward. In 1950-51 the ratio of savings to national income at current prices was 5.7% falling to 4.2% in 1952-53. It rose to about 10% in 1955-56 which position was more or less maintained up to 1962-63 except in 1957-58 and 1958-59. The ratio of 10% was maintained up to 1964-65 but afterwards the percentage of savings to national income fell below 8.

International Comparison

National Income: From the available data India's position in respect of national income at current prices was eighth in 1965-66, the period before devaluation of the rupee. Below is given the names of the countries with their national product in order of ranking:

	1966 (Billion US \$)
1) U.S.A.	621.0
2) U.S.S.R.	230.0*
3) Germany, West	90.6
4) U.K.	83.1
5) Japan	78.2
6) France	76.2
7) Italy	49.1
8) India	44.2 @

\*Approximate  
@ For 1965-66

The above figures indicate the satisfactory position

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of India. But if we consider the vastness of the country and her colossal population, India's position becomes very discouraging.

#### Per Capita National Income

The per capita national income of India was only \$ 91 in 1965-66 against the U.S.A's \$ 3153, West Germany's \$ 1518, the U.K.'s \$ 1517, France's \$ 1542, Italy's \$ 944 and Japan's \$ 791 in 1966. In respect of per capita national income India is at the level of Niger, Madagascar, Zanzibar, Togo and other underdeveloped countries of Africa and Asia.

#### Rate of Growth:

The economic progress of a developing country like India was very low - much lower than other countries placed in this position. Between 1950 and 1960 this rate was not very low but afterwards it declined to a very low level. In the first period it was 3.7% per annum and between 1960 and 1966 this dropped to 2.9%. In 1953-60 Japan's economic development was at the rate of 9% per annum and in 1960-66 it rose still further to 9.8% per annum. In the same periods the rates for the Republic of Korea was 4.8% and 7.5% respectively, West Malaysia's 4.1% and 6.4% respectively and Thailand's 6.4% and 7% respectively. For the U. S. S. R. the rate of growth declined from 10.2% in 1950-60 to 6.5% in 1960-65 as also for Yugoslavia from 8.6% in 1953-60 to 7.7 in 1960-66.

#### Conclusion

##### Why slow progress ?

The foregoing analysis has shown that India's rate of economic growth which was already low declined further during the third plan period. It has also been seen that the level of income per person has been incredibly low. For this economic plight, two factors are responsible: 1) predominance of the slow moving and uncertain agricultural sector of the economy and 2) low level of savings.

In highly developed countries the agricultural sector has gradually narrowed and in recent years this sector's contribution to the national economy has become insignificant. This varies between 3% and 13%. In 1966,

agriculture constituted only 3% of the economy in the U.S.A. and the U.K., 4% in West Germany, 7% in France and Canada, 12% in Japan and 13% in Italy.

In most developing countries this trend has also been visible. As for instance, in the Republic of Korea the agricultural sector shrank from 49% in 1953 to 39% in 1966, in Malaysia from 38% in 1960 to 28% in 1965 and in Thailand from 43% in 1953 to 33% in 1966.

In India, on the other hand, this sector has remained unchanged accounting for about 50% of the economy from 1950-51 to 1965-66. In a bumper crop year this sector's contribution goes up still higher. Even today about four-fifths of India's population depend on their livelihood on agriculture directly or indirectly. In such a situation is it to be expected that a country with an area of 3,268,090 sq. kilometers and a population of about 500 million will move forward at a rate faster than in the past?

The paramount necessity today is therefore the rapid industrialisation of India, because the pace of progress of manufacturing industry is much faster than other sectors of the economy. As for instance the average annual rate of growth of manufacturing industry was 11% in West Malaysia, 10.2% in Thailand and 8.9% in the U.S.S.R. in 1960-65, as also 6.3% in India, 12.8% in the Republic of Korea and 6.6% in the U.S.A. in 1960-66. The average annual rate of growth in the U.S.A. was 5.0% in 1960-66.

Another important factor which is responsible for the slow rate of progress of India is meagre domestic savings at 8-10% of National Income per year. For moving a leviathan like India forward much more domestic savings are essential for higher investments in different sectors of the economy. Even in smaller countries capital formation constituted a much higher proportion of the G.N.P. In Japan it formed 31%, in the Republic of Korea 20% and in Thailand 22% in 1966 and in Malaysia 17% in 1965.

For raising the rate of domestic savings, it is necessary either to lower the living costs or to increase the level of personal income so that the surplus can become higher. This, however, envisages the adoption of improved methods of agriculture, application of more chemical manures, use of more water other than available from rain and sowing of high-yielding varieties of seeds. For industry, better results will not be available only by its expansion, but also by the application of modern techniques, better utilisation of man-power and higher managerial efficiency.

In the context of better and higher production in agriculture and industry, it should never be forgotten that family planning should be the back-bone of all planning. Otherwise, the forward march of both agricultural and industrial sectors of the economy will be almost halted, resulting in the continuance of the low standard of living of the millions of people.

This is evident from the fact that even with bumper food crops at about 100 million metric tons in 1967-68 and 1968-69 rations of foodgrains and sugar is being maintained in big cities and towns.

The motto should therefore, be "Industrialise" or Perish as also "Family Planning".

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APPENDIX

Table I

National Income and Per Capita Income at Current and Constant Prices.

Year	National Income at Current Prices (Rs. crores)	Per Capita Income at Current Prices (Rs.)	National Income at 1960-61 Prices (Rs. crores)	Per Capita Income at 1960-61 Prices (Rs.)
1950-51	9,530	266.5	9,252	258.9
51-52	9,970	274.2	9,513	261.8
52-53	9,820	265.4	9,889	267.5
53-54	10,480	278.1	10,485	278.4
54-55	9,610	250.3	10,747	280.1
55-56	9,980	255.0	10,956	280.1
56-57	11,310	283.4	11,500	288.3
57-58	11,390	279.6	11,384	289.1
58-59	12,600	303.0	12,179	293.1
59-60	12,950	304.7	12,398	291.8
60-61	13,308	306.7	13,308	306.7
61-62	14,063	316.7	13,795	310.7
62-63	14,891	326.8	14,067	308.8
63-64	17,119	367.0	14,889	319.2
64-65	20,080	420.2	15,945	333.6
65-66	20,586	420.5	15,045	307.3

Note: The figures for National Income and Per Capita Income prior to 1960-61 have been linked with those after 1960-61 to obtain the relevant figures before 1960-61 at 1960-61 prices.



TABLE--II

Indices of National Income, Agricultural Production,  
Industrial Production and Wholesale Prices at Population.

Year	Index of National Income at current prices (1960-61= 100)	Population (Million)	Index of Agricultural production (Year ending June 1950= 100)	Index of Industrial Production (1960= 100)	Index of Wholesale Prices (1952-53 = 100)
1950-51	67.4	358.3	95.6	56.1	118.8
51-52	70.5	360.2	97.5	58.1	118.0
52-53	69.4	366.3	102.4	59.7	100.0
53-54	74.1	372.8	114.3	63.8	104.6
54-55	68.0	379.6	117.0	70.6	97.5
55-56	70.6	386.6	116.8	76.6	92.5
56-57	80.0	394.2	124.3	80.0	105.3
57-58	80.6	402.2	115.9	82.6	108.4
58-59	89.1	410.7	133.5	89.7	112.9
59-60	91.6	419.6	130.3	100.0	117.1
60-61	100.0	429.0	142.2	109.2	124.9
61-62	105.7	439.0	144.8	119.7	125.1
62-63	111.9	449.6	139.6	129.7	127.9
63-64	128.6	460.5	143.1	140.9	135.3
64-65	150.9	471.6	158.5	150.9	152.7
65-66	154.7	486.8	132.7	152.4	165.1

Note: Figures of industrial production relate to calendar years, i.e.; 1950-51 = 1951, 1951-52 = 1952 and so on.

TABLE III

Percentage Variation in the Indices of National Income, Agricultural Production, Industrial Production and Wholesale Prices & Population.

Year	Index of National Income at current prices	Population	Index of Agricultural production	Index of Industrial Production	Index of Wholesale Prices
1950-51	-	-	-	-	-
51-52	+4.6	+0.5	+2.0	+3.0	+5.5
52-53	-1.6	+1.7	+5.0	+2.8	-15.3
53-54	+6.8	+1.8	+11.6	+6.9	+4.6
54-55	-8.2	+1.8	+2.4	+10.7	-6.8
55-56	+3.8	+1.8	-0.2	+8.8	-5.1
AVERAGE (5 years)	+1.1	+1.5	+4.2	+6.4	-3.4
56-57	+13.3	+2.0	+6.4	+4.2	+13.8
57-58	+0.8	+2.0	-6.8	+3.3	+2.9
58-59	+10.5	+2.1	+15.2	+8.6	+4.2
59-60	+2.8	+2.2	-2.4	+11.5	+3.7
60-61	+9.2	+2.2	+9.1	+9.2	+6.7
AVERAGE (5 years)	+7.3	+2.1	+4.3	+7.4	+6.3
61-62	+5.7	+2.3	+1.8	+9.6	+0.2
62-63	+5.9	+2.4	-3.6	+8.4	+2.2
63-64	+14.9	+2.4	+2.5	+8.6	+5.8
64-65	+17.3	+2.4	+10.8	+7.1	+12.9
65-66	+2.5	+3.2	-16.3	+1.0	+8.1
AVERAGE (5 years)	+9.3	+2.5	-1.0	+6.9	+5.8
AVERAGE (15 years)	+5.9	+2.0	+2.5	+6.9	+2.9

TABLE - IVA

Indices of National Income, Income from Trade Commerce and other Services at 1960-61 Prices, Agricultural Production and Industrial Production.

Year	Index of National Income at 1960-61 Prices	Percentage increase ( ) or decrease (-) in each year over previous year	Index of Services at 1960-61 prices (*)	Percentage increase ( ) or decrease (-) in each year over previous year	Index of Agricultural production	Index of Industrial Production (1961 = 100)
	(1960-61=100)		(1960-61=100)			
1950-51	69.5	-	64.0	-	67.2	51.6
51-52	71.5	2.9	66.0	3.1	68.6	53.2
52-53	74.3	3.9	69.0	4.5	72.0	53.8
53-54	78.8	6.1	71.3	3.3	80.4	58.4
54-55	80.7	2.4	74.4	4.3	82.3	64.7
55-66	82.3	2.0	77.6	4.3	82.1	70.3
Average (5 years)		3.5		3.9		
56-57	86.4	5.0	81.8	5.4	87.4	73.3
57-58	85.5	-1.0	84.5	3.3	88.5	75.6
58-59	91.5	7.0	88.7	5.0	93.9	82.1
59-60	93.1	1.7	92.5	4.3	91.6	91.6
60-61	100.0	7.4	100.0	8.1	100.0	100.0
Average (5 years)		4.0		5.2		
61-62	103.7	3.7	106.3	6.3	101.8	109.6
62-63	105.7	1.9	113.1	6.4	98.2	118.8
63-64	111.9	5.9	121.7	7.7	100.6	129.0
64-65	119.8	7.1	128.6	5.7	114.6	138.2
65-66	113.1	5.6	132.5	3.0	93.3	139.6
Average (5 years)		3.4		5.0		

(\*) Calculated by ge.

Note: The figures for services prior to 1960-61 have been linked with those after 1960-61 to arrive at the corresponding figures previous to 1960-61 at 1960-61 prices.

TABLE IVB

Indices of National Income and of Commerce, Transport,  
Communication and other Services at 1948-49 Prices.

(Conventional Estimate)

Year	National Income (Rs. crores)	Services (Rs. crores)	Index of National Income (1960-61=100)	Index of Services (1960-61 = 100)
1950-51	8,850	3,050	69.5	64.0
51-52	9,100	3,160	71.5	66.3
52-53	9,460	3,290	74.3	69.0
53-54	10,030	3,400	78.8	71.3
54-55	10,280	3,550	80.8	74.5
55-56	10,480	3,700	82.3	77.6
56-57	11,000	3,900	86.4	81.8
57-58	10,890	4,030	85.5	84.5
58-59	11,650	4,230	91.5	88.7
59-60	11,860	4,410	93.2	92.5
60-61	12,730	4,770	100.0	100.0
61-62	13,060	5,020	102.6	105.3
62-63	13,300	5,300	104.5	111.2
63-64	13,950	5,650	109.6	118.5
64-65	14,980	6,060	117.7	127.1
65-66	14,640	6,370	115.0	133.6

## National Income by Industrial Origin at Current Prices

In Rs. crores

Year	Agriculture & allied activities	Mining	Factory establishments	Small enterprises	Communication	Railways	Organised banking & insurance	Other commerce & transport	Professions & liberal arts	Govt. services	Domestic services	House property	Net Domestic product at factory cost.
1950-51	4,890	70	550	910	40	180	70	1,400	470	430	130	410	9,550
51-52	5,020	90	640	950	40	210	80	1,460	500	450	140	410	9,990
52-53	4,810	90	640	970	40	200	70	1,470	520	460	130	430	9,830
53-54	5,310	100	690	980	40	200	80	1,480	530	490	140	440	10,480
54-55	4,350	90	750	960	40	220	80	1,470	540	520	140	450	9,610
55-56	4,520	100	780	970	50	250	90	1,490	560	570	140	460	9,980
56-57	5,520	120	900	980	50	280	110	1,520	580	610	150	480	11,300
57-58	5,280	140	980	1,000	50	320	120	1,580	620	660	160	490	11,400
58-59	6,240	140	1,000	1,030	60	330	130	1,630	660	730	170	500	12,620
59-60	6,210	140	1,110	1,080	60	330	140	1,710	700	790	180	520	12,970
	Agriculture & allied activities	Mining & Quarrying	Large-scale Manufacturing	Small-scale Manufacturing	Construction	Electricity, Gas & water supply	Railways	Communication	Other transport	Trade, Storage, Hotels, etc.	Banking & Insurance	Real estate & ownership of dwellings	
1960-61	6,822	144	1,071	785	620	68	252	63	267	1,301	153	386	
61-62	7,053	149	1,176	864	653	77	281	72	302	1,389	403	403	
62-63	7,198	178	1,298	942	701	87	313	80	343	1,494	224	447	
63-64	8,360	204	1,518	1,082	792	109	353	91	362	1,706	240	528	
64-65	10,213	204	1,686	1,182	894	127	360	100	417	2,069	288	563	
65-66	9,846	234	1,822	1,225	1,003	150	400	113	445	2,229	335	585	

contd. ....

TABLE -VA (contd.)

-2-

National Income by Industrial Origin at Current Prices (contd.)

<u>Year</u>	<u>Public adminis- tration &amp; Defence</u>	<u>Other Services</u>	<u>Net Domestic Product</u>
1960-61	538	905	13,380
61-62	593	966	14,161
62-63	668	1,026	14,999
63-64	778	1,099	17,231
64-65	890	1,236	20,229
65-66	992	1,374	20,753

National Income by Industrial Origin at Current Prices  
(Conventional Estimate)

In Rs. crores

Year	Agriculture & allied activities	Mining	Factory establishments	Small enterprises	Communica- tion	Rail- ways	Organi- sed Ban- king & Insura- nce	Other Commer- ce & trans- port	Profe- ssions & Libe- ral arts	Govern- ment services	Domestic services	House proper- ty	Net Domestic product at factor cost
1950-51	4,890	70	550	910	40	180	70	1,400	470	430	130	410	9,550
51-52	5,020	90	640	950	40	210	80	1,460	500	450	140	410	9,990
52-53	4,810	90	640	970	40	200	70	1,470	520	460	130	430	9,830
53-54	5,310	100	690	980	40	200	80	1,480	530	490	140	440	10,480
54-55	4,350	90	750	960	40	220	80	1,470	540	520	140	450	9,610
55-56	4,520	100	780	970	50	250	90	1,420	560	570	140	460	9,980
56-57	5,520	120	900	980	50	280	110	1,520	580	610	150	480	11,300
57-58	5,280	140	980	1,000	50	320	120	1,580	620	660	160	490	11,400
58-59	6,240	140	1,000	1,030	60	330	130	1,630	660	730	170	500	12,620
59-60	6,210	140	1,110	1,080	60	330	140	1,710	700	790	180	520	12,970
60-61	6,890	160	1,320	1,120	60	360	160	1,770	740	900	190	530	14,200
61-62	6,940	170	1,540	1,170	60	380	190	1,840	790	1,000	210	550	14,840
62-63	6,990	190	1,680	1,210	80	460	210	1,900	840	1,130	220	560	15,470
63-64	8,160	230	1,850	1,250	90	510	240	1,970	900	1,280	230	580	17,290
64-65	10,360	250	2,100	1,370	110	530	300	2,150	1,010	1,460	260	600	20,500
65-66	9,360	280	2,340	1,530	120	560	380	2,380	1,150	1,690	300	620	20,710

National Income by Industrial Origin at Current Prices

Percentage Distribution

Year	Agriculture & allied activities	Mining	Factory establishments	Small enterprises	Communications	Railways	Organised banking & insurance	Other commerce & transport	Professions & liberal arts	Govt. services	Domestic services	House property	Net Domestic product at factor cost
1950-51	51.3	0.7	5.8	9.6	0.4	1.9	0.7	14.7	4.9	4.5	1.4	4.3	100.2
51-52	50.4	0.9	6.4	9.6	0.4	2.1	0.8	14.6	5.0	4.5	1.4	4.1	100.2
52-53	49.0	0.9	6.5	9.9	0.4	2.0	0.7	15.0	5.3	4.7	1.3	4.4	100.1
53-54	50.7	1.0	6.6	9.3	0.4	1.9	0.8	14.1	5.0	4.7	1.3	4.2	100.0
54-55	45.3	0.9	7.8	10.0	0.4	2.3	0.8	15.3	5.6	5.4	1.5	4.7	100.0
55-56	45.3	1.0	7.8	9.7	0.5	2.5	0.9	15.0	5.6	5.7	1.4	4.6	100.9
56-57	48.8	1.1	7.9	8.7	0.4	2.5	1.0	13.4	5.1	5.4	1.3	4.3	99.9
57-58	46.4	1.2	8.6	8.8	0.4	2.8	1.1	13.9	5.4	5.8	1.4	4.3	100.1
58-59	49.5	1.1	7.9	8.2	0.5	2.6	1.0	13.0	5.2	5.8	1.4	4.0	100.2
59-60	48.0	1.1	8.6	8.3	0.5	2.5	1.1	13.2	5.4	6.1	1.4	4.0	100.2

	Agriculture & allied activities	Mining & Quarrying	Large-scale manufacturing	Small-scale manufacturing	Construction	Electricity, gas & water supply	Railways	Communication	Other transport	Trade, storage, hotels, etc.	Banking & Insurance etc.	Real Estate & ownership of dwellings	Public Administration & defence	Other service	Net Domestic Product
1960-61	51.0	1.1	8.0	5.9	4.6	0.5	1.9	0.5	2.0	9.7	1.2	2.9	4.0	6.7	100.0
61-62	49.8	1.1	8.3	6.1	4.6	0.5	2.0	0.5	2.1	9.8	1.3	2.9	4.2	6.8	100.0
62-63	48.0	1.2	8.6	6.3	4.7	0.6	2.1	0.5	2.3	10.0	1.5	3.0	4.4	6.8	100.0
63-64	48.5	1.2	8.8	6.3	4.6	0.6	2.1	0.5	2.1	9.9	1.4	3.1	4.5	6.4	100.0
64-65	50.0	1.0	8.3	5.9	4.4	0.6	1.8	0.5	2.1	10.2	1.4	2.8	4.4	6.1	100.0
65-66	47.5	1.1	8.8	5.9	4.8	0.7	1.9	0.5	2.2	10.8	1.6	2.8	4.8	6.6	100.0



National Income by Industrial Origin at Current Prices  
(Conventional Estimates)

Percentage Distribution

Year	Agriculture & allied activities	Mining	Factory establishments	Small enterprises	Communication	Railways	Organised Banking & Insurance	Other commerce & transport	Professions & Liberal Arts	Government services	Domestic Services	House property	Net Domestic Product at factor cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1950-51	51.3	0.7	5.8	9.6	0.4	1.9	0.7	14.7	4.9	4.5	1.4	4.3	100.2
51-52	50.4	0.9	6.4	9.6	0.4	2.1	0.8	14.6	5.0	4.5	1.4	4.1	100.2
52-53	49.0	0.7	6.5	9.9	0.4	2.0	0.7	15.0	5.3	4.7	1.3	4.4	100.1
53-54	50.7	1.0	6.6	9.3	0.4	1.9	0.8	14.1	5.0	4.7	1.3	4.2	100.0
54-55	45.3	0.9	7.8	10.0	0.4	2.3	0.8	15.3	5.6	5.4	1.5	4.7	100.0
55-56	45.3	1.0	7.8	9.7	0.5	2.5	0.9	15.0	5.6	5.7	1.4	4.6	100.0
56-57	48.8	1.1	7.9	8.7	0.4	2.5	1.0	13.4	5.1	5.4	1.3	4.3	99.9
57-58	46.4	1.2	8.6	8.8	0.4	2.8	1.1	13.9	5.4	5.8	1.4	4.3	100.1
58-59	49.5	1.1	7.9	8.2	0.5	2.6	1.0	13.0	5.2	5.8	1.4	4.0	100.2
59-60	48.0	1.1	8.6	8.3	0.5	2.5	1.1	13.2	5.4	6.1	1.4	4.0	100.2
60-61	48.7	1.1	9.3	7.9	0.5	2.5	1.1	12.5	5.2	6.4	1.4	3.7	100.3
61-62	47.0	1.2	10.4	7.9	0.5	2.6	1.3	12.4	5.3	6.8	1.4	3.7	100.5
62-63	45.4	1.3	10.9	7.9	0.5	3.0	1.3	12.4	5.5	7.3	1.4	3.7	100.6
63-64	47.4	1.3	10.8	7.3	0.5	3.0	1.4	11.5	5.2	7.4	1.4	3.3	100.5
64-65	50.8	1.2	10.3	6.7	0.5	2.6	1.5	10.6	4.9	7.2	1.3	2.9	100.5
65-66	45.5	1.4	11.4	7.4	0.6	2.7	1.8	11.6	5.6	8.2	1.4	3.0	100.6

National Income by Industrial Origin at Constant Prices

In Rs. crores

Year	Agriculture & allied activities	Mining, Manufacturing & Small Enterprises		Commerce, Transport & Communication			Other services*	Net Domestic Product at factor cost							
		<u>At 1948-49 Prices</u>													
1950-51	4,340			1,480			1,660	1,390						8,870	
51-52	4,440			1,520			1,730	1,430						9,120	
52-53	4,600			1,580			1,790	1,500						9,470	
53-54	4,980			1,650			1,830	1,570						10,030	
54-55	5,030			1,700			1,910	1,640						10,280	
55-56	5,020			1,760			1,970	1,730						10,480	
56-57	5,250			1,840			2,080	1,820						10,990	
57-58	5,010			1,860			2,110	1,920						10,900	
58-59	5,560			1,880			2,190	2,040						11,670	
59-60	5,500			1,970			2,270	2,140						11,880	
	Agriculture & allied activities	Mining	Large-scale manufacturing	Small-scale manufacturing	Construction	Electricity, gas & water supply	Railways	Communication	Other transport	Trade storage, hotels, etc.	Banking & Insurance	Real Estate & ship of dwellings	Public Administration & defence	Other Services	Net Domestic product
		<u>At 1960-61 Prices</u>													
1960-61	6,822	144	1,071	785	620	68	252	63	267	1,301	158	386	538	905	13,380
61-62	6,891	152	1,178	849	627	79	270	69	288	1,387	179	395	588	939	13,891
62-63	6,704	172	1,291	886	661	88	287	76	310	1,457	192	412	660	981	14,177
63-64	6,898	189	1,421	949	727	107	311	85	328	1,572	206	437	752	1,018	15,000
64-65	7,519	180	1,543	1,007	745	118	314	88	351	1,679	210	443	831	1,062	16,090
65-66	6,421	204	1,567	989	760	131	340	96	362	1,680	214	450	879	1,106	15,199

\*Includes professions &amp; liberal arts, Government services, domestic services and house property.

TABLE-VIIB

National Income by Industrial Origin at 1948-49 Prices  
(Conventional Estimate)

((In Rs. crores))

Year	Agriculture & allied activities	Mining, manufacturing & small enterprises	Commerce, transport & communication	Other services*	Net Domestic product at factor cost
1950-51	4,340	1,480	1,660	1,390	8,870
51-52	4,440	1,520	1,730	1,430	9,120
52-53	4,600	1,580	1,790	1,500	9,470
53-54	4,980	1,650	1,830	1,570	10,030
54-55	5,030	1,700	1,910	1,640	10,280
55-56	5,020	1,760	1,970	1,730	10,480
56-57	5,250	1,840	2,080	1,820	10,990
57-58	5,010	1,860	2,110	1,920	10,900
58-59	5,560	1,880	2,190	2,040	11,670
59-60	5,500	1,970	2,270	2,140	11,880
60-61	5,900	2,110	2,450	2,320	12,780
61-62	5,910	2,200	2,550	2,470	13,130
62-63	5,790	2,300	2,640	2,650	13,390
63-64	5,980	2,430	2,780	2,870	14,040
64-65	6,490	2,540	2,940	3,120	15,090
65-66	5,710	2,680	2,950	3,420	14,760

\*Includes professions & liberal arts, Government services, domestic services and house property.



TABLE-VIIB

National Income by Industrial Origin at 1948-49 Prices

(Conventional Estimate)

Percentage Distribution

Year	Agriculture & allied activities	Mining, manu- facturing & small enter- prises	Commerce, transport & communica- tion	Other Services	Net Domestic product at factor cost.
1950-51	49.0	16.7	18.8	15.7	100.2
51-52	48.8	16.7	19.0	15.7	100.2
52-53	48.6	16.7	18.9	15.9	100.1
53-54	49.7	16.4	18.2	15.7	100.0
54-55	48.9	16.5	18.6	16.0	100.0
55-56	47.9	16.8	18.8	16.5	100.0
56-57	47.7	16.7	18.9	16.6	99.9
57-58	46.0	17.1	19.4	17.6	100.1
58-59	47.7	16.2	18.8	17.5	100.2
59-60	46.4	16.6	19.2	18.1	100.3
60-61	46.4	16.6	19.2	18.2	100.4
61-62	45.3	16.8	19.5	18.9	100.5
62-63	43.5	17.3	19.9	20.0	100.7
63-64	42.7	17.4	19.9	20.6	100.6
64-65	43.3	17.0	19.6	20.8	100.7
65-66	39.0	18.3	20.1	23.4	100.8

TABLE IX

Ratio of Tax Revenue of the Centre and States to  
National Income

Year	National Income at Current Prices (Rs. crores)	Tax Revenue (Rs. crores)	Ratio of Tax Revenue to National Income (%)
1951-52	9,970	738.7	7.4
52-53	9,820	677.8	6.9
53-54	10,480	672.5	6.4
54-55	9,610	720.4	7.5
55-56	9,980	767.6	7.7
56-57	11,310	889.5	7.9
57-58	11,390	1,045.0	9.2
58-59	12,600	1,089.3	8.6
59-60	12,950	1,216.4	9.4
60-61	13,308	1,351.9	10.2
61-62	14,063	1,538.0	10.9
62-63	14,891	1,855.0	12.5
63-64	17,119	2,313.4	13.5
64-65	20,080	2,585.2	12.9
65-66	20,586	2,902.4	14.1

TABLE X

Ratio of Total Revenue of the Centre and States to  
National Income

Year	National Income at Current Prices (Rs. crores)	Total Revenue (Rs. crores)	Ratio of total Revenue to National Income (%)
1951-52	9,970	911	9.1
52-53	9,820	855	8.7
53-54	10,480	870	8.3
54-55	9,610	956	9.9
55-56	9,980	1,035	10.4
56-57	11,310	1,161	10.3
57-58	11,390	1,385	12.2
58-59	12,600	1,483	11.8
59-60	12,950	1,686	13.0
60-61	13,308	1,889	14.2
61-62	14,063	2,111	15.0
62-63	14,891	2,712	18.2
63-64	17,119	3,336	19.5
64-65	20,080	3,716	18.5
65-66	20,586	4,170	20.3

TABLE XI

Ratio of Exports and Imports to National Income at Current Prices.

Year	National Income (Rs. crores)	Exports* (Rs. crores)	Ratio of Exports to National Income (%)	Imports (Rs. crores)	Ratio of Imports to National Income (%)
1950-51	9,530	601.35	6.3	623.36	6.5
51-52	9,970	732.95	7.4	979.34	9.8
52-53	9,820	577.31	5.9	701.83	7.1
53-54	10,480	530.63	5.1	610.24	5.8
54-55	9,610	592.51	6.2	656.42	6.8
55-56	9,980	608.91	6.1	774.35	7.8
56-57	11,310	619.62	5.5	902.91	8.0
57-58	11,390	635.14	5.6	1,036.40	9.1
58-59	12,600	572.64	4.5	903.64	7.2
59-60	12,950	639.65	4.9	961.45	7.4
60-61	13,308	642.07	4.8	1,121.62	8.4
61-62	14,063	660.58	4.7	1,091.63	7.8
62-63	14,891	685.32	4.6	1,131.48	7.6
63-64	17,119	793.24	4.6	1,222.85	7.1
64-65	20,080	816.30	4.1	1,349.03	6.7
65-66	20,586	805.64	3.9	1,408.52	6.8

\*Including Re-Exports.



TABLE XII

National Income and Savings at Current Prices.

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Year	<u>National Income</u> (Rs. crores)	<u>Savings</u> (Rs. crores)	<u>Ratio of Savings to National Income</u> %
1950-51	9,530	541.9	5.7
51-52	9,970	529.4	5.3
52-53	9,820	408.3	4.2
53-54	10,480	565.0	5.4
54-55	9,610	764.2	8.0
55-56	9,980	970.5	9.7
56-57	11,310	1,076.4	9.5
57-58	11,390	797.8	7.0
58-59	12,600	931.4	7.4
59-60	12,950	1,102.0	8.5
60-61	13,308	1,371.9	10.3
61-62	14,063	1,373.8	9.8
62-63	14,891	1,498.4	10.1
63-64	17,119		
64-65	20,080		
65-66	20,586		



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TABLE XIV

Year	Index of National Income at 1960-61 prices (1960-61 = 100)		Ratio of Index to moving average (y)	Index of Agricultural production (1960-61 = 100)		Ratio of Index to moving average (x)	Estimated Index of National Income at 1960-61 prices (1960-61 = 100)
	Index	Three-year moving average		Index	Three year moving average		
50-51	69.5			67.2			
51-52	71.5	71.8	99.6	68.6	69.3	99.0	71.5
52-53	74.3	74.9	99.2	72.0	73.7	97.7	74.2
53-54	78.8	77.9	101.2	80.4	78.2	102.8	78.8
54-55	80.7	80.6	100.1	82.3	81.6	100.9	80.9
55-56	82.3	83.1	99.0	82.1	83.9	97.9	82.4
56-57	86.4	84.7	102.0	87.4	86.0	101.6	85.2
57-58	85.5	87.8	97.4	88.5	89.9	98.4	97.3
58-59	91.5	90.0	101.7	93.9	91.3	102.8	91.0
59-60	93.1	94.9	98.1	91.6	95.2	96.2	93.5
60-61	100.0	98.9	101.1	100.0	97.8	102.2	99.8
61-62	103.7	103.1	100.6	101.8	100.0	101.8	103.8
62-63	105.7	107.1	98.7	98.2	100.2	98.0	106.2
63-64	111.9	112.5	99.5	100.6	104.5	96.3	110.9
64-65	119.8	114.9	104.3	114.6	102.8	111.5	120.1
65-66	113.1	115.6	97.8	93.3	100.3	93.0	112.5

The regression equation is  $y = 0.39x + 61$ , based on the method of least square.

$\bar{y} = 100.0$      $\bar{x} = 100.0$   
 $s_y = 1.78$ ,     $s_x = 4.1$ , where 's' signifies standard deviation.

$r = 0.91$ , where 'r' signifies coefficient of correlation.

PRELIMINARY & CONFIDENTIAL

I.R.N.I.W/70/4.8

INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research  
in  
National Income

MEASUREMENT OF PRODUCTION AND PRICES  
IN  
LARGE-SCALE MANUFACTURING SECTOR : 1960-65

BY

L. N. RASTOGI

HYDERABAD

16th - 19th January 1970

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MEASUREMENT OF PRODUCTION AND PRICES  
IN  
LARGE-SCALE MANUFACTURING SECTOR: 1960-65

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. N. RASTOGI

Introduction

Large-scale manufacturing sector is of central importance to the rate of economic growth. It is this sector on which depend all other sectors of the economy, either directly or indirectly, for their requirements of inputs and capital goods. Recognising the importance of this sector huge investment and effort are being injected into it, through the Five Year Plans. In this context, it becomes essential to have an intimate knowledge of the developmental movement of large-scale manufacturing sector in the past. Measurement of production and prices would provide an insight into the behaviour of this sector.

Scope of the large-scale manufacturing sector

2. For purpose of the present study, the scope of the large-scale manufacturing sector has been restricted to the definition adopted by the Central Statistical Organisation (CSO) in their document entitled "Brochure on Revised Series of National Product for 1960-61 to 1964-65", wherein this sector has been defined to cover all manufacturing and processing establishments (called factories) which are registered under the Indian Factories Act, 1948. Establishments registered under the Indian Factories Act, but not engaged in manufacturing activity such as those providing water and sanitary services, recreation services, personal services and generation, transmission and distribution of electricity are excluded from the scope of this sector. Railway workshops, mints and other manufacturing establishments, however, form part of the large-scale manufacturing sector.

Different concepts for production measurement

3. Production can be measured by following different concepts. The following main concepts can be distinguished with advantage:

(i) Total value of gross output: The first concept of production is the sum of the gross output of each industrial establishment. It would measure total gross flows within and from each industry, including sales to other establishments in the industry and sales to other industries and sectors of the domestic economy and outside, goods bought to be resold without further processing and work done for others.

....2.

(ii) Value of goods and services flowing from the manufacturing sector to other sectors:

This concept may be defined as equivalent to concept (i) minus current flows within the manufacturing sector but includes current inputs of material and service from other sectors of the economy.

(iii) Gross domestic product originating in the manufacturing sector:

The third concept excludes current inputs of materials and services from other sectors of the economy as well as intra-sector flows; it is the gross product originating in the domestic manufacturing sector. The term 'gross' refers to the fact that it does not exclude capital consumption.

(iv) Net domestic product originating in the manufacturing sector:

The fourth concept is net product i.e. gross product originating net of capital consumption.

Objective of the present study

4. Each of the above concepts can be related to both current and constant prices. The objective of the present study is to measure production in constant prices by following the first concept viz. value of gross output. For this purpose, an index of industrial production-production defined according to gross output concept-has been compiled and the same has been used for making comparisons with the official index of industrial production prepared on the basis of the net product concept for working out estimates of gross output in constant prices and for deriving implicit prices of outputs and inputs in the large-scale manufacturing sector.

Official index of industrial production

5. The current series of index of industrial production comprises 3 major components - mining, manufacturing and electricity generation, transmission and distribution. The year 1960 forms both, the comparison base and the weight base. The index is compiled from the series of gross production in physical terms for 325 items whose data are available on monthly basis and 124 additional items whose data are available on annual basis. Weights have been allotted to different items at 3 digit level of industrial classification according to the Annual Survey of Industries (ASI) 1960, covering both the census and the sample sectors, with necessary adjustments for non-response in the census sector. The distribution of weights to the different items within the 3 digit groups

has been made on the basis of value added figures of individual items or on the basis of value of gross output where the former are not available, according to ASI data as far as possible. Within a group or sub-group, distribution of weights is uniformity on either of the above basis viz. value added or gross output. In mathematical notation the index may be written:

$$I_v = \frac{\sum V_{oi} \frac{Q_i}{Q_{oi}}}{\sum V_{oi}}$$

where  $V_{oi}$  is the net value added in the base year and  $Q_i$ , the production in physical terms. The index may thus be regarded as extending the base year net domestic product with the help of physical production. The use of the index in this sense, however, involves the following implicit assumptions:

- (i) the items forming the basis for compilation of the index are representative of the respective industry groups,
- (ii) production series in respect of these items are also representative of production trends in the industry groups, and
- (iii) net value added per unit of production (in physical terms) as well as the composition of industry groups remain constant overtime.

The efficiency of the index is, therefore, directly linked with the validity of these assumptions. It is, however, not intended here to go into the merits and demerits of the above assumptions.

#### Gross output index

6. Gross output index for the purpose of the present study has been compiled on annual basis for the manufacturing sector alone. The weight base and the comparison base of this index is also the year 1960 and the same production series with all supplementary adjustments, which go into the computation of the 'value added index' described in the previous section, have been used. Weights have been allotted to industry groups at 3 digit level, according to value of gross output from ASI-1960 including both the sample sector and the census sector; gross output defined as the aggregate value of products and by-products manufactured for sale, work done for customers and sale value of goods sold in the same condition as purchased and adjusted for the difference in the stocks of semi-finished goods at the beginning and at the end of the year. Census sector figures of output have been adjusted for non-response. The distribution of weights, to different items within a three digit

group has been done on the basis of the value of gross output in the census sector of the ASI. Every care has been taken to make the gross output index comparable with the value added index in coverage, scope and computational details. In mathematical form the gross output index may be written:

$$I_g = \frac{\sum \frac{G_{0i} P_{0i}}{G_{0i}}}{\sum G_{0i}}$$

where  $G_{0i}$  is the gross output in the base year. The index, therefore, represents the movement of value of gross output in constant prices.

Comparison of gross output weights and value added weight

7. Table 1 presents the comparison of the weights at the 2 digit level of classification while details for 3 digit classification have been relegated to appendix I.

Table 1: Value Added And Gross Output weights: 1960

Industry Code	Description	Value added weight	Gross output weight	Percentage gain in weight (4):(3)
1	2	3	4	5
20-21	Food mfg. industries	14.23	24.78	74.1
22	Beverage & tobacco industries	2.61	3.20	22.6
23	Textiles	31.88	27.47(-)	13.8
24	Footwear, other wearing apparel & made-up textile goods	0.25	0.25	0.0
25	Wood & cork industries	0.94	0.86(-)	8.5
26	Furniture & fixtures	0.46	0.35(-)	26.1
27	Paper & paper products	1.90	1.77(-)	6.8
29	Leather & leather products	0.50	1.20	140.0
30	Rubber products	2.61	2.01(-)	23.0
31	Chemicals & chemical products	8.55	7.26(-)	15.1
32	Products of petroleum & coal	1.71	1.35(-)	21.1
33	Non-metallic mineral products	4.54	3.45(-)	24.0
34	Basic metal industries	8.69	8.90	2.4
35	Metal products	2.96	2.78(-)	6.1
36	Machinery except electrical	3.98	3.17(-)	20.4
37	Electrical machinery	3.59	2.95(-)	17.8
38	Transport equipment	9.15	6.99(-)	23.6
39	Misc. manufacturing industries	1.45	1.27(-)	12.4
Total:		100.00	100.00	-

The above table brings out clearly the marked difference in the relative importance of industries when measured respectively in terms of gross output and value added.



Leather and leather products industry and food manufacturing industry show tremendous gains in the process, the gain being 140 per cent and 74 per cent respectively. This gain has been mostly at the cost of furniture and fixture industry, rubber products industry, products of petroleum and coal, non-metallic mineral products and transport equipment industries. The reason for the shift in importance does not lie very far. The inter-industry variations in the ratio of value added to gross output in the base year have been responsible for the shift. Table 2 gives the ratio of value added to gross output at 2 digit level of industrial classification.

Table 2: Value Added-Gross Output Ratios: 1960

Industry Code	Description	Value added (Rs. lakhs)	Gross Output (Rs.lakhs)	Ratio (3)/(4)
(1)	(2)	(3)	(4)	(5)
20-21	Food mfg industries	13482	94391	14.3
22	Beverage & tobacco industries	2789	12938	21.6
23	Textiles	30576	104231	29.3
24	Footwear, other wearing apparel & made up textile goods	261	1045	25.0
25	wood & cork industries	910	3180	28.6
26	Furniture & fixtures	440	1278	34.4
27	Paper & paper products	1815	6688	27.1
28	Leather & leather products	479	4583	10.5
29	Rubber products	2464	7628	32.3
31	Chemicals & chemical products	8213	27559	29.8
32	Products of petroleum & coal	1912	5941	32.2
33	Non-metallic mineral products	4318	13077	33.0
34	Basic metal industries	8189	33075	24.8
35	Metal products	2764	10470	26.4
36	Machinery except electrical	3773	12098	31.2
37	Electrical machinery	3386	11036	30.7
38	Transport equipment	9675	28808	33.6
39	Misc.manufacturing industries	1313	4707	27.9
2-3	Manufacturing Industries	96759	382733	25.3

8. All the industries, excepting food manufacturing, beverages and tobacco, leather and leather products and basic metal industries, have value added-gross output ratio above the average. It is, however, interesting to note that the ratio of value added to gross output is the highest in the case of furniture and fixture industry. This is not peculiar to the base year but is persistently so throughout the period, 1960-65. Further analysis shows that ratio of labour cost to gross output or value added is the highest in this industry. Although manufacture of furniture is far less capital intensive as compared to heavy engineering industries or chemical industries yet higher labour cost more than compensate and

push the value added-gross output ratio to gain the highest position. Reclassification of industries into market groupings would be more revealing. Table 3 presents ratios of value added to gross output by consumer goods industries, intermediate goods industries and capital goods industries. Admittedly, the market classification attempted here is very crude in character. The details available from the ASI, more particularly from the sample sector which furnishes data only by 3 digit industry groups, do not permit finer market classification. Moreover, the annual series of the official index of industrial production is published only at two digit level of industrial classification. Any finer market classification, therefore, would make the comparison of the two sets of indices difficult. This factor has also weighed heavily in favour of adopting market groupings only at two digit level of industrial classification.

Table 3: Value added - Gross out Ratios in Market Groupings: 1960.

Market grouping	Value added (Rs. lakhs)	Gross output (Rs. lakhs)	Ratio (2)÷(3)
1	2	3	4
1. Consumer goods industries	48861	218590	22.4
2. Intermediate goods industries*	28300	101731	27.8
3. Capital goods industries	19598	62412	31.4

\* Excluding 'printing and publishing' as this industry group is not covered in the index of industrial production.

9. The results are in accordance with the normal expectation and common belief. It is too well known that the capital intensity generally increases from consumer goods industries to capital goods industries through intermediate goods industries. Capital in this country is costlier than labour and this fact pushes up the ratio of value added to gross output in capital intensive industries.

1. Correspondence between the industrial classification and the market classification adopted in this study is as under

- (a) Consumer goods industries = food manufacturing; beverage and tobacco; textiles; footwear, other wearing apparel and made-up textile goods; furniture and fixtures; and misc. manufacturing industries.
- (b) Intermediate goods industries = wood and cork products; paper and paper products; printing and publishing; leather and leather products; rubber products; chemical and chemical products; products of petroleum and coal; non-metallic mineral products; and basic metal industries.
- (c) Capital goods industries = metal products; machinery except electrical; electrical machinery; and transport equipment industries.

Gross output index

10. The indices of gross output computed in the manner as explained in the earlier sections are presented in table 4. This table also contains the official index of industrial production:

Table 4: INDUSTRIAL PRODUCTION: 1951-65  
(Base: 1960 = 100)

1961	Value added index					Gross output index				
	1962	1963	1964	1965	1965	1961	1962	1963	1964	1965
1	2	3	4	5	(6)	(7)	(8)	(9)	(10)	(11)
108.6	110.3	109.3	117.4	123.9	20-21 mfg. industries	105.4	111.0	115.1	124.1	124.2
107.0	111.7	109.2	126.1	147.6	22 Beverage & tobacco industries	105.7	111.4	108.9	125.6	146.9
103.8	106.4	110.5	116.1	115.4	23 Textiles	102.2	105.6	109.8	115.7	115.3
126.7	106.4	107.9	69.7	74.3	24 Footwear, other wearing apparel & made-up textile goods	123.	107.4	109.3	72.2	75.7
96.2	108.6	148.7	204.5	235.2	25 Food & cork industries	94.0	107.8	149.2	185.3	238.0
129.2	142.2	153.2	123.3	158.1	26 Furniture & fixture	129.2	142.2	153.2	123.3	150.1
105.2	109.5	130.4	135.8	146.8	27 Paper & paper products	107.0	111.4	132.3	137.2	150.5
105.2	109.5	130.4	135.8	146.8	28 Printing & publishing **	107.0	111.4	132.3	137.2	150.5
100.9	110.6	126.0	121.7	122.7	29 Leather & leather products	111.5	110.3	126.4	121.8	122.8
112.9	121.8	135.5	143.0	159.4	30 Rubber products	113.0	121.6	135.2	141.9	158.1
115.9	121.4	135.7	146.6	159.8	31 Chemicals & chemical products	117.5	123.5	140.7	151.0	163.4
105.7	113.8	131.6	146.7	154.6	32 Products of petroleum & coal	105.9	113.7	131.3	146.7	156.5
106.9	116.3	130.4	138.6	150.2	33 Non-metallic mineral products	105.6	114.8	128.6	137.1	148.9
118.7	143.1	171.7	174.4	180.0	34 Basic metal industries	105.2	132.1	160.4	164.7	170.3
122.3	122.4	132.6	138.9	135.3	35 Metal products	120.7	118.0	125.1	133.4	136.7
126.9	162.5	206.9	260.4	289.9	36 Machinery except electrical	129.5	169.4	230.7	312.5	342.2
114.5	133.3	156.2	179.4	215.8	37 Electrical machinery	113.9	134.2	153.8	181.2	220.2
120.5	148.1	144.2	182.8	197.2	38 Transport equipment	110.2	154.1	152.2	179.8	192.1
105.6	121.4	126.8	140.7	151.1	39 Misc. manufacturing industries	107.5	121.4	127.1	143.9	150.4
110.8	120.5	130.1	143.1	151.2	2-3 Manufacturing industries C	100.3	118.8	120.1	141.2	148.0
105.7	108.5	110.9	118.3	120.6	1 Consumer goods industries	104.7	109.2	112.7	120.4	121.8
112.0	125.2	145.2	154.0	164.9	2 Intermediate goods industries	110.2	122.7	143.9	151.7	162.8
121.0	144.4	157.3	191.3	210.0	3 Capital goods industries	121.1	147.1	163.4	198.4	217.6

\* Index for furniture and fixtures is based on the production figures of steel furniture.

\*\* Printing & publishing industry is not covered in the index. The index for paper and paper products has been used for working out the estimates in constant prices.

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11. The two series of indices reveal very interesting results. On the basis of the movement of indices industry groups can broadly be classified into two categories, namely, (i) where the gross output index shows faster movement than the value added index; and (ii) where this trend is in the opposite direction. A number of factors contribute to the phenomenon. For example, shift in the product composition of an industry group resulting in higher value added/gross output ratio (both measured in constant prices) would give higher growth rate in terms of value added. On the other hand, increase in the number of stages of production within the industry would result in increase in intra-industry flows of goods and services and consequently in higher growth rate when measured in accordance with the gross output concept. Similarly, import substitution and increasing dependence on sources outside the industry group for its requirements of components, semi-finished goods and industrial services would affect the growth rates measured according to the two concepts of production. However, even in developing economy the overall effect of these factors would be slow and therefore, for short-run comparisons and forecasting such factors may be assumed to be inoperative. In other words, the major factor responsible for the differences in the two series of indices lies in the variations of the base year ratios of value added to gross output of the component industry sub-groups, which result in redistribution of weights.

12. Table 4 indicates that the growth in terms of gross output has been particularly spectacular in machinery manufacturing industry group. It is partly due to redistribution of weights in favour of fast growing industries like agricultural machinery, prime movers, and construction and mining machinery. Slow growth rate in the case of basic metal industries is the result of the shift in weight against the fast moving iron and steel industry and in favour of comparatively slow moving non-ferrous metals industry. In transport equipment industry group growth rate in terms of gross output has been adversely affected by the loss of weight of the rapidly expanding rail-road equipment industry and the gain in weight by motor vehicles and bicycles industries which have moved rather slowly during the period under review.

#### Gross output, input and value added in constant prices

13. The estimates of the value of gross output in constant prices have been prepared by carrying forward the base year gross output at two digit level of industrial classification to other years with the help of the gross output index. Similarly, constant price estimates of net value added have been worked out on the basis of the value added index, while constant rupee value of inputs has been derived as a residue by subtracting value added from gross output. These estimates for the period 1961-65 are presented in tables 5 and 6. The estimates of gross output, input and value added in current prices are, however, given in appendix 2.

output

Table 5: Gross Output in 1960 Prices: 1961-65

(Rs. lakhs)

Industry code	Description	1961	1962	1963	1964	1965
1	2	3	4	5	6	7
20-21	Food mfg. industries	100432	105529	108614	117139	117234
22	Beverage & tobacco industries	13005	14413	14206	16250	19006
23	Textiles	105524	110068	114446	120595	120178
24	Footwear, other wearing apparel & made-up textile goods	1325	1122	1142	754	791
25	Wood & cork industries	3015	3428	4745	5893	7568
26	Furniture & fixtures	1651	1817	1958	1576	2021
27	Paper & paper products	7156	7450	8048	9176	10065
28	Printing & publishing*	8487	8815	10469	10857	11909
29	Leather & leather products	4606	5055	5564	5582	5628
30	Rubber products	8620	9276	10313	10824	12060
31	Chemicals & chemical products	32382	34035	38776	41614	45031
32	Products of petroleum & coal	2297	6755	7301	8715	929
33	Non-metallic mineral products	15940	15012	16817	17929	19459
34	Basic metal industries	36118	43692	53052	54475	56327
35	Metal products	12637	12355	13098	13967	14312
36	Machinery except electrical	15667	20494	27910	37800	41399
37	Electrical machinery	12570	14810	16973	19997	24301
38	Transport equipment	34051	44393	43846	51797	55240
39	Misc. manufacturing industries	5060	5714	5983	6773	7079
20-39	Manufacturing industries	424323	464233	504591	551719	579006
1.	Consumer goods industries	228797	238663	246379	263087	266309
2.	Intermediate goods industries	120601	133518	156385	165065	177345
3.	Capital goods industries	74925	92052	101827	123567	135352

\* Base year figures have been projected with the help of the index for paper and paper products industry group.

Table 6: Input and Value added in 1960 Prices: 1961-65

Industry code	Value of inputs					Value added				
	1961	1962	1963	1964	1965	1961	1962	1963	1964	1965
1	2	3	4	5	6	7	8	9	10	11
20-21	85791	90658	93908	101041	100530	14641	14871	14736	16098	16704
22	10821	11298	11160	12733	14389	2984	3115	3046	3517	4117
23	74786	77535	80660	85096	84893	31738	32533	33786	35499	35285
24	994	844	860	572	597	331	278	282	182	194
25	2140	2440	3392	4032	5428	875	988	1353	1861	2140
26	1083	1191	1284	1033	1325	568	620	674	543	696
27	5247	5463	6481	6711	7401	1909	1987	2367	2465	2664
28	5072	5281	6261	6475	7172	3395	3534	4208	4382	4737
29	4123	4525	4960	4999	5040	483	530	604	583	588
30	5888	6275	6974	7300	8132	2782	3001	3339	3524	3928
31	22863	24064	27831	29574	31907	9519	9971	11145	12040	13124
32	4276	4579	5285	5910	6342	2021	2176	2516	2805	2956
33	9324	9990	11186	11944	13973	4616	5022	5631	5985	6488
34	25598	31974	39091	40193	4587	9720	11718	14081	14282	14740
35	9257	8972	9433	10128	10572	3380	3383	3665	3839	3740
36	10879	14363	20104	27981	30461	4788	6131	7806	9825	10938
37	2693	10298	11684	13923	16994	3877	4514	5289	6074	7307
38	2227	3004	24895	34111	28267	1652	14324	18951	17688	19078
39	3673	4120	4318	4926	5095	1387	1594	1665	1847	1984
2-3	313651	343932	374467	408682	427599	110672	120301	130124	143037	151407
Con.	177148	185646	192190	205401	207329	51649	53017	54189	57686	58980
Intr.	85281	94591	111161	117138	125982	35320	38927	45224	47927	51363
Cap.	51222	63695	71116	86143	94288	23703	28357	30711	37424	41064

(Rs. in lakh)

Con = Consumer goods industries; Intr. = Intermediate goods industries; Cap = Capital goods

14. It is gratifying to note that during the period under review the share of capital goods in total production has shown considerable increase. While their contribution was only 16.0 per cent in 1960 (19.6% in terms of value added), it has gone up to 23.4 per cent (27.1% in 1965. Similarly, intermediate goods have also registered an increase in their contribution to total production. Obviously, all this increase has been at the cost of consumer goods whose share has fallen down from 56.0 per cent (48.9% of value added) in 1960 to only 46.0 per cent (39.0%) in 1965.

Implicit prices of output, input and value added

15. The implicit price indicators of output, input and value added can be derived as ratios, having the current price estimates in the numerator and constant price estimates in the denominator. Undoubtedly, such indicators can be worked out at two digit level of industrial classification. However, it is apprehended that the items and the production series used for computation of the gross output index and the value added index may not be good representatives of the respective industry groups in all the cases. For example, 'umbrella ribs' can hardly be considered adequate to represent the production trends in the wearing apparel and made-up textile goods industry group. Likewise, 'box cameras' would constitute only a poor representative of the photographic and optical goods industry group. In the case of machinery manufacturing group, only value series of production is available. Although current price values have been deflated before use in the computation of the indices, but the deflators are based on the whole-sale price index.

However, due to differences in the contents of whole-sale prices and the producers' ex-factory prices of output and also due to typical weighting diagram of the whole-sale price index, the deflators and the consequent index of industrial production would be very crude in character. Further, the production series forming the basis of index compilation relate not to the entire factory sector but only to a part thereof. Since prices are very sensitive, the implicit indicators have been derived at the aggregate level viz. market grouping level. These indicators are reproduced in table 7. It may also be added that the weighting diagram both in the gross output index and the value added index being based on the ASI data, the implicit prices of output are producers' ex-factory prices and the value added is at producers' factor cost prices. The implicit prices of inputs (including depreciation) would, therefore, be purchasers' prices.

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Table 7: Index of Implicit Prices: 1961-65  
(Base, 1960 = 100)

S.No.	Market grouping	1961	1962	1963	1964	1965
1	2	3	4	5	6	7
A. Index of output prices						
1.	Consumer goods industries	108.0	111.4	116.3	124.9	129.8
2.	Intermediate goods industries	105.8	112.2	113.5	122.8	128.8
3.	Capital goods industries	99.0	92.1	104.6	99.3	110.3
4.	2-3 Manufacturing industries	105.9	107.8	113.1	118.6	124.9
B. Index of input prices						
1.	Consumer goods industries	108.5	112.4	117.9	128.1	131.8
2.	Intermediate goods industries	106.5	115.9	116.2	126.4	133.2
3.	Capital goods industries	102.9	92.5	103.5	99.2	111.2
4.	2-3 Manufacturing industries	107.0	109.7	114.7	121.8	127.7
C. Index of 'Value added' cost						
1.	Consumer goods industries	106.2	107.8	110.8	113.8	122.5
2.	Intermediate goods industries	104.3	103.1	107.0	114.0	118.2
3.	Capital goods industries	93.2	91.0	107.2	99.6	108.2
4.	2-3 Manufacturing industries	102.8	102.3	108.6	110.2	117.2

15. The prices of outputs in the case of both the consumer goods industries and the intermediate goods industries have been rising continuously through-out the period under review. The same trend is observed for the large-scale manufacturing sector as a whole. As against this, the output prices of capital goods have initially shown a tendency to decline, except for the year 1963 when there was a nominal rise of 4.6 per cent.

In the year 1965 the prices of capital goods rose by 10.3 per cent but the rise is very moderate as compared to either the intermediate goods prices or the consumer goods prices, the latter showing as large an increase as 30 per cent over the level of 1960.



( 1a )

APPENDIX I

Weighting Diagram at Three Digit of Industrial  
Classification: 1960.

Industry Code	Description	value-added weight	Gross output weight
206	Flour milling and grinding	1.75	6.15
208	Bakery products	0.28	0.26
209	Sugar factories and refineries	4.22	5.22
210	Cocoa, chocolate and sugar confectionery	0.07	0.09
211-219	Misc. food preparations	7.91	13.06
223	Breweries and mfr. of malt	0.08	0.05
227	Cigarette manufacturing	2.53	3.15
232-235	Textiles, Cotton, woollen and jute	30.37	25.02
239	Manufacturing of textiles, n.e.c.	1.51	2.45
241	Footwear, except rubber footwear	0.06	0.07
243	Wearing apparel	0.19	0.18
251-259	Wood and cork products	0.94	0.86
260	Furniture and fixture	0.46	0.34
270	Paper and paper products	1.90	1.77
291	Tanneries and leather finishing plants	0.48	1.18
299	Leather products n.e.c.	0.02	0.02
300	Rubber products	2.61	2.01
311-312	Basic industrial chemicals, incl. fertilizers	3.13	2.67
313	Vegetable and animal oils and fats	0.05	0.16
314	Paints, varnishes and lacquers	0.38	0.37
315-319	Fine chemicals, toilet preparations, soaps, materials and misc. chemicals	4.99	4.06
321	Petroleum refineries	1.58	1.24
329	Misc. products of petroleum and coal	0.13	0.11
331	Structural clay products	0.91	0.51
332	Glass and glass products	0.67	0.46
333	Pottery, China and earthenware	0.28	0.16
334	Cement	1.38	1.41
339	Non-metallic mineral products, n.e.c.	1.30	0.91
341	Iron and steel basic industries	7.34	7.25
342-349	Non-ferrous metal industries	1.35	1.65

....2.

( 1A )

1	2	3	4
350	Metal products	2.96	2.78
360	Machinery except electrical	3.98	3.17
370	Electrical machinery	3.59	2.95
381	Ship building and repairing	1.00	0.56
382	Rail-road equipment	4.12	2.44
383	Motor vehicles	2.96	3.12
385-6	Motor cycles and bicycles	0.73	0.66
388	Mfr. of air-craft	0.29	0.17
389	Mfr. of transport equipment, n.c.c.	0.05	0.04
391	Professional, scientific, measuring and controlling instruments	0.24	0.13
392	Photographic and optical goods	0.06	0.04
393	Watches and clocks	0.02	0.01
394	Jewellery and related articles	0.02	0.15
399	Industries, n.c.c.	0.93	0.94
	Total:	100.00	100.00

APPENDIX II

GROSS OUTPUT, INPUT AND VALUE ADDED: 1960-65 (AT CURRENT PRICES)

(Rs. lakhs)

Industry code	Description	1960	1961	1962	1963	1964	1965	
1	2	3	4	5	6	7	8	
0-21	Food mfg. industries	0	94391	108235	115530	117542	138894	151214
		I	80909	92197	100483	103098	122747	132616
		V	13482	16038	15047	14444	16147	18598
2	Beverage & tobacco Industries	0	12938	14252	14555	16440	18709	12131
		I	10149	11089	11346	12359	14733	6972
		V	2789	3163	3209	3481	3976	5159
3	Textiles	0	104231	116993	125415	139354	157601	167571
		I	73655	83657	89295	101326	115917	123492
		V	30576	33336	36120	38628	41684	44073
4	Footwear, other wearing apparel & made-up textile goods.	0	1045	1245	1774	2311	2404	2473
		I	784	971	1401	1846	1866	1894
		V	261	274	373	465	538	579
5	Wood & cork industries	0	3180	4203	3508	4081	5334	5517
		I	2270	2869	2635	3092	4196	4149
		V	910	1334	873	989	1138	1368
6	Furniture & Fixture	0	1278	1389	1718	1917	2158	2662
		I	838	912	1121	1270	1424	1787
		V	440	477	597	647	734	875

.....2.

1	2		3	4	5	6	7	8
27	Paper & paper products	O	6688	7559	8364	10146	11156	12610
		I	4873	5562	6040	7349	8097	9282
		V	1815	1997	2324	2799	3059	3328
28	Printing & publishing	O	7913	8209	9045	10376	10527	12394
		I	4686	4748	5397	6369	6381	7546
		V	3227	3461	3648	4007	4146	4848
29	Leather & leather products	O	4583	4321	3576	3451	4344	5121
		I	4104	3813	3090	3026	4301	4535
		V	479	508	486	425	543	586
30	Rubber products	O	7628	8504	10094	11161	11835	13366
		I	5164	5566	6389	7632	8769	10113
		V	2464	2938	3205	3479	3066	3773
31	Chemicals & chemical products	O	27559	34068	39706	45566	53095	65107
		I	19346	24421	28453	32355	39001	48351
		V	8213	9847	11253	12707	14094	16756
32	Products of petroleum & Coal	O	5941	6708	7393	9345	9823	10702
		I	4029	4612	5641	7086	7864	8842
		V	1912	2096	1752	2259	1959	1860
33	Non-metallic mineral products	O	13077	15096	17323	19633	21532	24825
		I	8759	10357	11664	13585	15223	17346
		V	4318	4739	5659	6048	6303	7479

....3.

1	2	3	4	5	6	7	8	
34	Basic metal industries	O	33075	38947	50745	63791	74514	78306
		I	24886	29039	39820	48103	54190	57599
		V	8189	9908	10925	15688	20324	20707
35	Metal products	O	10470	12264	15874	18761	19228	25023
		I	7706	9118	12016	13845	14458	18610
		V	2764	3146	3858	4916	4770	6413
36	Machinery except electrical	O	12098	14710	17556	22452	28138	35264
		I	8325	9707	11683	15154	18694	24193
		V	3773	15003	5873	7298	9444	11071
37	Electrical machinery	O	11036	12624	15259	19018	23202	30023
		I	7650	8676	10785	13283	16612	21361
		V	3386	3948	4274	5735	6590	8662
38	Transport equipment	O	28808	35173	36060	46312	52174	59012
		I	19133	25185	24265	31331	35689	40727
		V	9675	9988	11795	14981	16485	18285
39	Misc. manufacturing industries	O	4707	4950	6874	8471	8957	9574
		I	3394	3390	5069	6098	6366	6595
		V	1313	1560	1805	2373	2591	2979
2-3	Manufacturing Industries	O	390646	449448	500369	570730	654175	723415
		I	290660	335687	377293	429361	496584	546016
	Total:	V	99986	113761	123076	141369	157591	177399

....4.

1	2	3	4	5	6	7	8
1. Consumer goods industries	O	218790	247062	265866	286635	320723	345625
	I	169729	192214	208715	226597	263053	273362
	V	48861	54848	57151	60038	65670	72263
2. Intermediate goods industries	O	109644	127615	149754	177552	202710	228468
	I	78117	90787	109629	129151	148078	167763
	V	31527	36828	40125	48401	54632	60705
3. Capital goods industries	O	2412	71771	84749	106543	122742	149322
	I	42814	52686	58949	73613	85453	104891
	V	19598	22085	25800	32930	37289	44431

O - Output;  
 I - Input;  
 V - Value added

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INDIAN ASSOCIATION FOR RESEARCH IN NATIONAL INCOME & WEALTH

Seventh Indian Conference on Research

in

National Income

CAPITAL FORMATION IN INDIA : 1950-51 to 1965-66

By

R.N. LAL

Assisted by D.K. Makvana and Gobind Chand

HYDERABAD

16th - 19th January 1970

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The views expressed in the papers are those of the authors and not necessarily of the Organisations or Institutions to which they belong.

## CAPITAL FORMATION IN INDIA : 1950-51 to 1965-66

By

R.N. LAL

Assisted by D.K. Makvana and Gobind Chand

1. The paper aims at presenting the estimates of Capital formation in India for the years 1950-51 to 1965-66 as also various capital formation proportions. Gross estimates for the years 1960-61 to 1965-66 in respect of all the three components of Capital Formation namely, construction, machinery and equipment and change in stocks have been taken from the paper 'Estimates of Capital Formation in India 1960-61 to 1965-66' prepared by the Central Statistical Organisation (CSO), hereafter termed as 'the CSO paper'. The estimates for other years have been prepared for this paper following the methodology suggested in the CSO paper. Data for earlier years i.e., for the years 1950-51 to 1959-60 are however, not available on comparative basis for all the items. The sources of data as well as the degree of information obtained have varied. A note detailing the methods of estimation adopted for the year not covered by the CSO has therefore been added to this paper in the form of an appendix<sup>1</sup>.

2. This paper contains five sections. Section I gives the estimates of gross as well as net domestic capital formation in India with a break up of the gross estimates into construction, machinery and equipment and change in stocks. Section II brings out the share of public sector in Capital Formation in India with special emphasis on the role of the Central Government in this regard. Section III deals with financing of capital formation. Capital formation and saving proportions to the rates of growth in domestic and material product have been worked out in section IV. Section V is devoted to the presentation of Capital-output ratios.

### I. ESTIMATES OF DOMESTIC CAPITAL FORMATION

3. Gross or net domestic Capital Formation (DCF) includes (i) Capital formation in construction (excluding military installations), (ii) Capital formation in machinery and equipment (excluding durable goods in the hands of households and war equipment) and (iii) change in stocks (exclusive of change in stocks of war materials).

4. The estimates of gross capital formation in construction for the years 1950-51 to 1959-60 comparable to CSO estimates for the years 1960-61 to 1965-66 are available in the paper 'Growth of construction Industry in India - 1950-51 to 1964-65' prepared by R.N. Lal, S.P. Joshi, D.K. Makvana and B.L. Joshi<sup>2</sup>. The estimates of gross value of Capital

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1. See appendix 2.

2. The paper was read in the Sixth Indian Conference on research in National Income held in May 1968 at Bangalore. The concept and the methodology of estimating total value of construction adopted in the CSO paper as well as in this paper are the same. Both the papers have followed the concepts and the methodology indicated in the Brochure on Revised Series of National Product for the years 1960-61 to 1964-65 issued by the CSO. The detailed version of the Brochure was presented by the CSO in a seminar on Revised Series of national product held at Udaipur in April, 1969.



formation in construction for the years 1950-51 to 1965-66 at current and 1960-61 prices thus obtained are presented in appendix 1.1

5. A detailed table giving the estimates of machinery and equipment at current and 1960-61 prices is given in appendix 1.2. As stated above the estimates for the years 1960-61 to 1965-66 have been taken from the CSO paper and the estimates for the remaining years have been worked out for this paper.

6. The estimates of change in stocks for the years untraversed by the CSO paper have been framed for this paper for agricultural commodities other than foodgrains, foodgrains, livestock, mining, manufacturing, electricity, commerce and public administration on the lines indicated in the CSO paper. The estimates related to all these items at current and 1960-61 prices for all the years under study appear in appendix 1.3. The estimates of the aggregate value of change in stocks worked out for this paper, however, differ from the CSO estimates in one respect. Change in stocks unaccounted as given in the CSO paper accounts for the difference between the estimates of saving and capital formation worked out by the CSO and is intended to cover errors and omissions also. As comparable estimates of saving are not available for the remaining years of this study, the estimates of change in stocks unaccounted could not be worked out for the remaining years.

7. The estimates of depreciation for the years 1960-61 to 1965-66 are available in the annual paper on Estimates of National Product brought out by the CSO. Official estimates of depreciation for earlier years are not available. However, the estimates for the remaining years at current and 1948-49 prices have been worked out by R.N. Lal and D.K. Makvana<sup>3</sup>. The estimates at current prices are given in their paper have been accepted for this paper as such and the estimates at 1948-49 prices have been converted into 1960-61 prices on the basis of price trend implicit in depreciation as given in their paper.

8. The estimates of gross domestic capital formation (GDCE) for the years 1960-61 to 1965-66 at current prices are given in table 1.

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3. See the paper "Indian Economic Growth - 1948-49 to 1964-65, Dimensions and Determinants" read in the Sixth Indian Conference on Research in National Income held in May 1968 at Bangalore.

TABLE 1. DOMESTIC CAPITAL FORMATION  
(at current prices)

years	gross					(in crores)	
	construction	machinery and equipment	fixed assets (2+3)	change in stocks	total (4+5)	depreciation	net
1.	2.	3.	4.	5.	6.	7.	8.
1950-51	600	256	856	96	952	277	675
1951-52	549	330	879	143	1022	315	707
1952-53	545	280	825	-21	804	336	468
1953-54	564	282	846	36	882	369	513
1954-55	646	316	962	40	1002	386	616
1955-56	766	445	1211	194	1405	444	961
1956-57	966	561	1527	224	1751	473	1278
1957-58	902	624	1526	234	1660	555	1105
1958-59	981	542	1523	195	1718	633	1085
1959-60	1082	606	1688	202	1890	668	1222
1960-61	1318	752	2070	331	2401	736	1665
1961-62	1456	918	2374	126	2500	811	1689
1962-63	1569	1080	2649	201	2850	930	1920
1963-64	1766	1329	3095	252	3347	994	2353
1964-65	1987	1569	3556	243	3799	1118	2681
1965-66	2220	1778	3998	271	4269	1213	3056

9. Estimates of Capital formation at 1960-61 prices have been provided in the CSO paper. For the remaining years, the estimates at current prices as given above have been converted into 1960-61 prices by making use of appropriate deflators for construction, machinery and equipment and change in stocks indicated in the CSO paper. In case of construction, however, the deflators have been prepared for (i) general pucca construction, (ii) urban and rural housing (iii) pucca wells and (iv) wages for rural skilled workers. In the CSO paper different deflators have been used for urban housing and rural housing. For this paper a combined index for urban and rural housing has been prepared. The weights allotted to different inputs of construction for the combined index have been determined on the basis of weights given in the CSO paper for the inputs in respect of urban and rural housing and the relative share of the value of urban and rural housing in the aggregate value of urban and rural housing taken together. The estimates of gross and net domestic Capital formation at 1960-61

prices are given in Table 2.

TABLE 2. DOMESTIC CAPITAL FORMATION  
(at 1960-61 prices)

(Rs. crores)							
years	GROSS				Total	deprecia-	net
	construc-	machinery	fixed	change			
	tion	and equi-	assets	in		tion	
		ment		stocks			
1.	2.	3.	4.	5.	6.	7.	8.
1950-51	785	355	1140	103	1243	358	885
1951-52	689	408	1097	148	1245	389	856
1952-53	678	313	991	-31	960	407	553
1953-54	718	322	1040	38	1078	455	623
1954-55	820	365	1185	51	1236	475	761
1955-56	961	511	1472	249	1721	534	1187
1956-57	1137	635	1772	260	2032	548	1484
1957-58	998	686	1684	157	1841	612	1229
1958-59	1054	583	1637	201	1838	678	1160
1959-60	1130	637	1767	210	1877	696	1181
1960-61	1318	752	2070	331	2401	736	1665
1961-62	1385	898	2283	125	2408	784	1624
1962-63	1454	1025	2479	200	2679	885	1794
1963-64	1597	1198	2795	239	3034	914	2120
1964-65	1711	1371	3082	189	3271	985	2286
1965-66	1773	1465	3238	212	3450	1008	2442

## II. CAPITAL FORMATION IN THE PUBLIC SECTOR

10. A developing country, determined to accelerate the pace of development has in the initial stages of growth, to depend a great deal on autonomous investment. Reliance on induced investment can, at best, be only marginal. The Government of such a country, therefore, has to assume a far greater responsibility of speeding up the rate of Capital formation by taking recourse to autonomous investment. It is in this regard that the study of the contribution of the public sector to the total volume of Capital formation in the country assumes importance and becomes interesting. Capital formation in the public sector consists of Capital formation in (i) government administrative departments (GAD), (ii) departmental commercial undertakings (DCU) and (iii) non-departmental commercial undertakings (NDCU). The first two would constitute the government sector and all the three together would constitute the public sector. Data for government sector in regard to Capital formation in each component are available in the budget documents of the Central and State governments and local bodies. Similar data for N.D.C.U.s are available in the annual accounts of the undertakings. The estimates of gross Capital formation in each of the three segments of the public sector in respect of each component of Capital formation are presented in appendix 1.4. Details

regarding the estimates presented and the method of estimation are given in appendix 2. The aggregate value of Capital formation in GAD, DCUs & NDCUs are presented in table 3 given below. Table 3 also gives the proportions of the value of Capital formation in the public sector to the aggregate value of Capital formation in India.

TABLE 3: CAPITAL FORMATION IN THE PUBLIC SECTOR  
(at current prices)

year	gross				depre- ciation	net capital : NCF in the formation : public sector as (NCF) in the : a percentage of public sector: NDCE	
	GAD	DCU	NDCU	total (2+3+4)		7.	8.
1.	2.	3.	4.	5.	6.	7.	8.
1950-51	71	142	10	223	32	191	28.3
1951-52	73	199	17	289	42	247	34.9
1952-53	80	183	54	317	45	272	58.1
1953-54	97	198	39	334	43	291	56.7
1954-55	118	250	38	406	51	355	57.6
1955-56	175	330	43	548	53	495	51.5
1956-57	182	410	67	659	56	603	47.2
1957-58	183	447	322	952	87	865	78.3
1958-59	191	407	264	862	117	745	68.7
1959-60	225	350	420	995	95	900	73.6
1960-61	335	410	339	1144	116	1028	61.7
1961-62	274	455	416	1145	131	1014	60.0
1962-63	348	597	499	1444	159	1285	66.9
1963-64	348	699	634	1681	172	1509	64.1
1964-65	447	765	733	1945	209	1739	64.9
1965-66	453	810	988	2251	214	2037	66.7

11. Capital formation out of the budgetary resources of the Central Government plays a very large part in Capital formation in India. Central Government contributes to Capital Formation directly as well as indirectly by giving financial assistance to the rest of the economy. The rest of the economy includes (i) States and Union Territories (ii) NDCU (iii) local authorities and (iv) others. Financial assistance to others, in fact goes to finance Capital formation in the private sector while the rest of the assistance is utilised for financing Capital formation in the public sector. This assistance is given in the form of grants, investment in shares and loans and advances. Table 4 given below gives the estimates of gross capital formation in the public and private sectors out of the budgetary resources of the Central Government at current prices and also the contribution to the aggregate value of Capital formation in the public sector as also in the economy as a whole. The data pertaining to the Central Government expenditure on Capital formation and financial assistance have been taken from the Economic Classification of the Central Government Budget issued by the Ministry of Finance.

TABLE 4: CAPITAL FORMATION OUT OF THE BUDGETARY RESOURCES OF THE CENTRAL GOVERNMENT (at current prices)

(Rs. crores)					
Year	: gross : capital : formation : by Central : Govt.	: financial assistance : to the rest : of the public : sector	: to : others	: Total : (2+3+4)	: percentage contri : tion to the gross : domestic capital : formation in India
1.	2.	3.	4.	5.	6.
1950-51	80	47	2	129	13.6
1951-52	105	90	8	203	19.9
1952-53	68	108	8	184	22.9
1953-54	86	150	10	246	27.9
1954-55	200	266	22	488	48.7
1955-56	152	302	29	483	34.4
1956-57	248	272	25	545	31.1
1957-58	328	436	39	803	48.4
1958-59	325	542	28	895	52.1
1959-60	237	542	20	799	42.3
1960-61	307	536	18	861	35.9
1961-62	343	596	23	962	38.5
1962-63	432	719	26	1177	41.3
1963-64	552	952	21	1525	45.6
1964-65	598	1046	39	1683	44.3
1965-66	520	1250	36	1806	42.3

### III. FINANCING OF CAPITAL FORMATION

12. Gross or net domestic Capital formation is financed by gross or net saving (including retained earnings of the branches and subsidiaries of foreign companies), current account deficit on balance payments and non-cash inflow. Current account deficit on balance payment measures the difference between Capital inflow comprising imports and invisibles (debits) excluding official donations and Capital outflow consisting of exports and invisibles (credits). E and Omissions are completely neglected for estimating net inflow Capital. Estimates pertaining to imports, exports, invisibles, no cash inflow etc. are published in Reserve Bank of India bulletins. These estimates are available at current prices. The estimates at current prices have been converted into 1960-61 prices with the help of price trends implicit in imports. Table 5 gives the estimates saving (including retained earnings of the branches and subsidiaries of foreign companies) and net Capital-inflow (excluding retained

earnings of the branches and subsidiaries of foreign companies) at current and 1960-61 prices.

TABLE 5. ESTIMATES OF SAVING AND NET CAPITAL INFLOW

years	at current prices					at 1960-61 prices			
	NDCF	current account deficit on balance of payments	non-cash inflow	net capital inflow+ (3+4)	saving*	NDCF	net capital inflow+	saving	
1.	2.	3.	4.	5.	6.	7.	8.	9.	
1950-51	675	-37	16	-21	696	885	-23	908	
1951-52	707	166	16	182	525	856	168	688	
1952-53	468	-50	16	-34	502	553	-32	585	
1953-54	513	-29	16	-13	526	623	-13	636	
1954-55	616	17	6	23	593	761	24	737	
1955-56	961	46	6	52	909	1187	55	1132	
1956-57	1278	350	9	359	919	1484	365	1119	
1957-58	1105	464	11	475	630	1229	456	773	
1958-59	1085	362	12	374	711	1160	365	795	
1959-60	1222	224	7	231	991	1181	243	938	
1960-61	1665	438	43	481	1184	1665	481	1184	
1961-62	1689	329	16	345	1344	1624	339	1285	
1962-63	1920	414	26	440	1480	1794	459	1335	
1963-64	2353	433	17	450	1903	2120	454	1666	
1964-65	2681	580	20	600	2081	2286	594	1692	
1965-66	3056	557	13	570	2486	2442	548	1894	

+ excludes retained earnings of the branches and subsidiaries of foreign companies.

\* Includes retained earnings of the branches and subsidiaries of foreign companies.

#### IV. CAPITAL FORMATION PROPORTIONS

13. Capital formation proportion refers to the rates of Capital formation to the aggregate national product total. Higher the rates of Capital formation, higher the rates of growth of national product that can be generated. Thus it is a pointer to the growing productive capacity of the country. Again, national Capital formation (DCF adjusted for net Capital-inflow) proportion represents the fraction of national product that is saved. Variations in the same shed light, to an extent, on the willingness and the effort of the nation to save as also on the relation between the rates of growth obtained in national product and the saving proportions. It might be stated however, that these proportions speak little in regard to factors and mechanism that determine the connection between the ratio of growth in national product and saving fraction.

14. Table 6 given below summarises the evidence on the proportions of GDCF gross fixed domestic capital formation (GDCF), saving and Capital consumption (CC) to GDP at current prices. The estimates of GDP are based on Revised Series of National Product brought out by the C.O. The figures of GDP are available at 1960-61 prices only. The estimates for the years 1960-61 to 1965-66 are given in the latest annual paper on estimates of national product published by the C.S.O. Estimates for the years 1950-51 to 1959-60 are taken from the paper 'Some Aspects of Economic Growth in India' by Dr. S.G. Tiwari read in the Sixth Indian Conference on Research in National Income. The estimates at 1960-61 are converted into current prices on the basis of price deflator implicit in conventional series. Estimates thus obtained have been made at market prices by making adjustment for indirect taxes net of subsidies.

TABLE 6: CAPITAL FORMATION PROPORTIONS  
(at current prices)

Years	GDCF as per centage of GDP at market prices	GDCF as per centage of GDP at market prices	Saving* as per centage of GDP at market prices	CC as per centage of GDP at market prices	GDP at market prices
1.	2.	3.	4.	5.	6.
1950-51	9.9	8.9	7.3	2.9	9592
1951-52	10.1	8.7	5.2	3.1	10111
1952-53	8.1	8.3	5.1	3.4	9881
1953-54	8.4	8.0	5.0	3.5	10551
1954-55	10.2	9.8	6.0	3.9	9824
1955-56	13.5	11.7	8.8	4.3	10383
1956-57	14.9	13.0	7.8	4.0	11784
1957-58	13.8	12.7	5.2	4.6	12040
1958-59	12.8	11.4	5.3	4.7	13369
1959-60	13.6	12.2	7.2	4.8	13854
1960-61	15.9	13.7	7.9	4.9	15064
1961-62	15.6	14.8	8.4	5.1	16052
1962-63	16.6	15.4	8.6	5.4	17194
1963-64	16.9	15.6	9.6	5.0	19791
1964-65	16.4	15.4	9.0	4.8	23131
1965-66	17.7	16.6	10.3	5.0	24052

\* inclusive of the retained earnings of the branches and subsidiaries of foreign companies.

15. Capital formation proportions at 1960-61 prices are presented in Table 7. The proportions have been worked out in regard to GDCF, GF DCF Saving and CC to GDP at factor cost. The estimates of GDP at factor cost for the years 1960-61 to 1965-66 have been taken from the annual paper on national product issued by the C.O and estimates for the remaining years have been taken from Dr. Tiwari's paper referred to above.

TABLE 7. CAPITAL FORMATION PROPORTIONS  
(at 1960-61 prices)

years	:GDCF as per- : GFDCF as per- : saving as per-: CC as per- : tage at GDP at : centage of : centage of GDP: tage of GDP : factor cost : GDP at factor : at factor cost: at factor : : cost : : cost.	1.	2.	3.	4.	5.
1950-51		12.9	11.8	9.4	3.7	
1951-52		12.6	11.1	7.0	4.0	
1952-53		9.4	9.7	5.7	4.0	
1953-54		10.0	9.6	5.9	4.2	
1954-55		11.1	10.7	6.6	4.3	
1955-56		15.0	12.8	9.8	4.6	
1956-57		16.8	14.6	9.2	4.5	
1957-58		15.3	14.0	6.4	5.1	
1958-59		14.2	12.6	6.1	5.2	
1959-60		14.2	13.4	6.3	5.3	
1960-61		17.0	14.7	8.4	5.2	
1961-62		16.4	15.6	8.8	5.3	
1962-63		17.8	16.5	8.9	5.9	
1963-64		19.1	17.6	10.5	5.7	
1964-65		19.2	18.0	9.9	5.8	
1965-66		21.3	20.0	11.7	6.2	

16. A statement giving the Capital formation proportions at current prices in some of the important developed and developing countries of the world appears in appendix 1.5. In all, the relevant estimates of sixteen countries have been presented in the statement. The countries are divided into two groups. Group 1 includes six countries namely; Canada, Italy, Japan, United Kingdom, United States and West Germany. These are economically developed countries. Group 2 consists of ten countries, such as Burma, Ceylone, Chile, India, Iran, Iraq, Malaysia, Pakistan, Thailand and Turkey. These are developing countries. The proportions are based on cumulated totals of capital formation and GDP for the years indicated against them in the statement. The data for working out proportions for all the countries excepting India have been taken from the Year Book of National Accounts Statistics issued by the United Nations. Proportions for India are based on the estimates given in this paper.



## V. CAPITAL OUTPUT RATIO

17. Capital output ratio refers to a functional relationship between capital and output. Higher the rates of Capital formation, it is expected that higher would be the rates of growth in national product. It is admitted, however, that production depends on a number of factors like irreproducible-natural-resources (land) supply of labour, capital investment in training, education and health, change in over-all social structure, changes in production technology, quality of managerial and organisational skill, change in relative prices, changing reliance on foreign markets, utilisation of productive capacity etc. But in a poor country where Capital (re-producible tangible assets) is the greatest limiting factor, other factors are more or less dependant on Capital formation and hence the importance of Capital formation as a major determinant of economic growth. Capital-output ratio therefore permits us to discern pattern in the relation between capital and levels of output which provide valuable assistance in the formulation of economic policies.

18. For preparing Capital-output ratio, it is appropriate to take into account only domestic capital and domestic output in the numerator and denominator respectively. Capital invested abroad is functionally related to output originating abroad. Again, average output-ratio for a developing country is a hazardous venture mainly because reliable estimates of Capital Stock in a continuous series are not available. However, as a tool for economic planning and projection the behaviour of incremental capital output ratio indicating relationship between Capital formation and addition to output is sufficiently strong.

19. Various Capital output ratios worked out for this paper are based on GDCF and gross output. The estimates of net Capital formation and net output have not been used for the purpose for two reasons. First depreciation estimates as made available by CSO and as presented in this paper (for the period CSO estimates are not available) do not strictly represent replacement expenditure. The estimates are based to a large extent on depreciation provision and hence they are likely to be on the higher side. Net Capital-output ratio, would therefore be unduly lowered. In developed economy where accumulation is very large net Capital-output ratio would not be much different than the gross ratio irrespective of the method of measurement of depreciation. Secondly, on net estimates the denominator would include not merely the output resulting from the net investment but also the addition to productive Capacity resulting from replacement of old assets by technically superior assets and productive capacity is not kept in tact by replacement as would be technically warranted but increases because of technical change caused by superior assets.

Even if the estimates are closed to replacement expenditure in case of capital as output ratio based

20. A comparison of GDCF at current prices with changes in GDP as a measure of incremental Capital-output ratio would hardly be of any interest to the planners in the study of economic growth. It would be misleading for the fact that changing prices would not affect GDCF and GDP to the same extent. Moreover changes in product at current prices would reflect price changes in the whole of output and not only in the additions to output whereas capital formation at current prices would reflect price changes only in the additions to Capital Stock. The ratio of Capital formation proportion at current prices to the rates of increa

of product at constant prices provides a measure of incremental Capital-output ratio which is of much interest to the planners for it would indicate the percentage of national product at current prices that need to be diverted into Capital formation to produce the given percentage rise in real national product. The ratio of the Capital Formation proportion at constant prices to the annual rate of growth of product at constant prices would, however, represent the true incremental Capital-output ratio.

21. Table 8 as given below gives incremental Capital output ratios representing (i) the ratios of GDCF proportion at current prices to the percentage rise in GDP at 1960-61 prices and (ii) the ratios of GDCF proportion at 1960-61 prices to the percentage rise in GDP at 1960-61 prices. The ratios are based on three years moving average.

TABLE 8. INCREMENTAL CAPITAL-OUTPUT RATIO  
(based on three years moving average)

Years	1. proportion of GDCF to GDP at current prices(%)	2. rise per year in GDP at 1960-61 prices(%)	3. ratio of GDCF to rise per year in GDP at 1960-61 prices : (2/3)	4. proportion of GDCF to rise per year in GDP at current prices	5. ratio of GDCF to rise per year in GDP at 1960-61 prices : (5/3)	6.
1950-51	-	-	-	-	-	-
1951-52	9.4	-	-	11.6	-	-
1952-53	8.9	4.0	2.2	10.6	2.6	-
1953-54	8.9	4.1	2.2	10.2	2.5	-
1954-55	10.7	4.1	2.6	12.1	3.0	-
1955-56	13.0	3.9	3.3	12.4	3.7	-
1956-57	14.1	2.7	5.2	15.7	5.8	-
1957-58	13.8	4.1	3.4	15.4	3.8	-
1958-59	13.4	3.0	4.5	14.5	4.8	-
1959-60	14.2	5.5	2.6	15.2	2.8	-
1960-61	15.1	4.2	3.6	15.9	3.8	-
1961-62	16.0	4.4	3.6	17.1	3.9	-
1962-63	16.4	4.1	4.0	17.8	4.3	-
1963-64	16.6	5.3	3.1	18.7	3.5	-
1964-65	17.0	2.4	7.1	19.8	8.2	-

Note:- GDP and GDCF (at current prices) relate to market prices and GDP at 1960-61 prices relate to factor cost.

22. Incremental Capital-output ratios have been worked out for each Five Year Plan and presented in Table 9. Ratio for each plan period has been worked out in two different ways. First method is based on the sum of investment during the incremental years and the incremental product between the terminal years at 1960-61 prices. For the purpose of comparison estimates at current prices are also given. In the second case the average of the annual ratios as given in table 8 has been worked out. Both these methods have their limitations. In case of the former the ratio would be influenced a great deal by the character of the figures of terminal years and in the latter case the ratio would be affected unduly by the character of the figures of individual years. But for a short series this is the best that can be done. No allowance for lag of additions to GDP behind additions to GDCF has been made.

TABLE 9: INCREMENTAL CAPITAL OUTPUT RATIO FOR EACH FIVE YEAR PLAN

Plan period	Capital-output ratio : based on Capital formation during the incremental years and incremental GDP between the terminal years at 1960-61 prices	Capital-output ratio : based on the average of the annual Capital-output ratios (GDCF at current prices)	Capital-output ratio : based on the average of the annual Capital-output ratios (GDCF and GDP both at 1960-61 prices) +
	(1)	(2)	(3)
First Five Year Plan	3.3	6.5	2.6
Second Five Year Plan	3.8	2.0	3.9
Third Five Year Plan	7.1	1.9	4.4
1952-53 to 1959-60	3.7	3.0	3.2
1960-61 to 1964-65	3.6	1.6	4.3
1952-53 to 1964-65	3.6	2.0	3.6

+ Based on three years moving average.

#### LIMITATIONS OF THE STUDY

23. The estimates presented in this paper inherit all those limitations from which the estimates of the CSO paper for the years 1960-61 to 1965-66 suffer. But beyond that the estimates for other years worked out for this paper might not be considered as strong as the estimates of CSO are. The reason is that the availability of information is still less for other years.

24. The estimates of Capital formation built up by the CSO have drawn very heavily upon the information contained in the reports of the Annual Survey of Industries. These reports are neither available for the years earlier to 1959 nor later to 1965.

25. In preparing the estimates a number of proportions have been used in the CSO paper which are based on limited information for instance, on the basis of the RBI results for one year in regard to the survey of building construction in Calcutta, Bombay and Madras, the value of five basic materials used in construction namely, cement, iron and steel, bricks and tiles, timber and round wood and furniture and fixtures have been assumed to form 65 per cent of the total value of materials used in construction; the proportion of factor payments to the total value of construction under commodity-flow has been assumed to be 33 per cent; proportion of the value of site to the total value of wealth has been taken to be 5 per cent. These as well as other proportions in respect of trade and transport charges to the ex-factory value of building materials and machinery and equipment have been used for all other years in the absence of other evidence.

26. The proportion of various types of partly capital goods treated as capital goods as given in the CSO paper have been taken to hold good for all other years. The proportions of the value of construction in rural and urban housing falling outside the commodity flow approach available for one year have been used for all other years. In the absence of any other information in regard to the value of output in small scale industries, the proportion between gross value added and output revealed for the year 1958-59 in NSS Report No.94 has been accepted for all the years.

27. A number of other deficiencies can be located in the paper which arise mainly from the inadequacy of the data. The estimates therefore may not stand a rigorous scrutiny and test in their details. Still the estimates must be built up, they must be presented because such exercises continue to land us in various islands of statistical gaps which must be filled up.

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(i)

## Appendix 1.1

## GROSS CAPITAL FORMATION IN CONSTRUCTION 1950-51 to 1965-66

years	at current prices					GDCF in construction							
	construction covered by commodity-flow method	construction not covered by commodity-flow method	total value of construction	Value repairs and maintenance for defence	gross capital formation in construction	at current prices	public sector	private sector	total	at 1960-61 prices	public sector	private sector	total
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1950-51	541	179	720	120	600	176	424	600	235	550	785		
1951-52	509	171	680	131	549	206	343	549	264	425	689		
1952-53	528	167	695	150	545	238	307	545	302	376	678		
1953-54	541	173	714	150	564	267	297	564	344	374	718		
1954-55	636	173	809	163	646	309	337	646	395	425	820		
1955-56	747	188	935	169	766	414	352	766	528	433	961		
1956-57	931	227	1158	192	966	446	520	966	522	615	1137		
1957-58	892	213	1105	203	902	545	357	902	597	401	998		
1958-59	958	245	1203	222	981	530	451	981	564	490	1054		
1959-60	1081	239	1320	238	1082	654	428	1082	679	451	1130		
1960-61	1294	275	1569	251	1318	678	640	1318	678	640	1318		
1961-62	1428	308	1736	280	1456	754	702	1456	717	668	1385		
1962-63	1592	297	1889	320	1569	915	654	1569	846	608	1454		
1963-64	1844	304	2148	382	1766	1148	618	1766	1035	562	1597		
1964-65	2040	358	2398	411	1987	1250	737	1987	1076	635	1711		
1965-66	2297	376	2673	453	2220	1409	811	2220	1124	609	1733		

## GROSS CAPITAL FORMATION IN MACHINERY AND EQUIPMENT

(Rs. Crores)

years	at current prices						GDCF in machinery and equipment								
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
	ex-factory:	domestic	trade	change	total	expo-	GDCF:	at current	prices	at 1960-61	prices				
	value of	imports	produc-	and	in	(4+5+6)	rts	in	public:	priv:	te:	total:	public:	private:	total
	domestic	plus	tion plus	trans-	live-			M&E	sector:	sector:			sector:	sector:	
	production	import	imports	port	stock			(7-							
	including	duties	(2+3)	char-	treated:			8)							
	excise	less re-		ges	as										
	duty	exports:			M&E+										

1950-51	56	131	187	69	1	257	1	256	N.A.	N.A.	256	N.A.	N.A.	355
1951-52	80	161	241	90	1	332	2	330	N.A.	N.A.	330	N.A.	N.A.	408
1952-53	74	137	211	78	1	290	2	288	64	216	280	72	241	313
1953-54	76	129	205	78	1	284	2	282	67	215	282	76	246	322
1954-55	93	138	231	86	1	318	2	316	95	221	316	110	255	365
1955-56	130	196	326	120	1	447	2	445	121	324	445	139	372	511
1956-57	171	243	414	148	1	563	2	561	169	392	561	191	444	635
1957-58	197	262	459	166	2	627	3	624	289	335	624	318	368	686
1958-59	197	203	400	142	2	544	2	542	229	313	542	247	336	583
1959-60	222	225	447	161	2	610	4	606	323	283	606	339	298	637
1960-61	293	260	553	201	2	756	4	752	379	373	752	379	373	752
1961-62	382	297	679	245	-	924	6	918	351	567	918	343	555	898
1962-63	459	357	816	268	1	1085	5	1080	396	684	1080	376	649	1025
1963-64	608	394	1002	335	1	1337	8	1329	414	915	1329	373	825	1198
1964-65	749	430	1179	404	1	1583	14	1569	570	999	1569	498	873	1371
1965-66	853	478	1331	455	-	1786	8	1778	673	1105	1778	554	911	1465

machinery and equipment.

Appendix 1.3  
CHANGE IN STOCKS

(Rs. crores)

Years	at current prices												at 1960-
	agricul- tural either than foodgrains	food- grains	live- stock	min- ing	manu- factur- ing	elec- tri- city	comm- erce	public adminis- tration (exclud- ing food- grains)	unaccoun- ted	total	public	private	- total
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1950-51	7	30	12	1	3	5	69	-29	-	96	N.A.	N.A.	103
1951-52	2	31	14	1	68	1	57	-31	-	143	N.A.	N.A.	148
1952-53	10	13	13	-	-11	2	-73	25	-	-21	15	-36	-31
1953-54	-14	40	15	1	-10	3	11	-10	-	36	-	35	38
1954-55	-8	-20	15	-	2	3	22	26	-	40	2	38	51
1955-56	12	-23	16	-	20	6	142	21	-	194	13	181	249
1956-57	-2	36	29	-2	28	36	76	-37	-	224	44	180	260
1957-58	6	-29	34	1	80	-18	46	14	-	134	118	16	157
1958-59	7	139	38	-1	80	25	-69	-24	-	195	103	92	201
1959-60	-7	72	41	-	30	3	81	-18	-	202	18	184	210
1960-61	-17	13	46	5	202	2	67	66	-53	331	87	244	331
1961-62	-3	-17	10	-2	269	15	38	-8	-176	126	40	85	125
1962-63	-3	-14	11	-	204	83	-9	4	-75	201	133	62	200
1963-64	7	-82	12	1	145	47	110	31	-19	252	119	133	239
1964-65	-7	59	16	-2	292	27	60	-66	-136	243	125	118	189
1965-66	1	-59	10	-	357	9	15	-36	-26	271	169	102	212

(iv)

Appendix 1.4  
**GROSS CAPITAL FORMATION IN THE PUBLIC SECTOR**  
 ( at current prices )

years	GAD			DCU			NDCU			Total			(Rs. crores)
	fixed : assets	change : in	total	fixed : assets	change : in	total	fixed : assets	change : in	total	fixed : assets	change : in	total	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	
1950-51	N.A.	N.A.	71	N.A.	142	7	7	3	10	N.A.	N.A.	223	
1951-52	N.A.	N.A.	73	N.A.	199	12	12	5	17	N.A.	N.A.	289	
1962-53	78	2	80	181	183	43	43	11	54	202	15	317	
1953-54	96	+ 1	97	207	198	31	31	8	39	334	-	334	
1954-55	119	- 1	118	252	250	33	33	5	38	404	2	406	
1955-56	175	-	175	323	330	37	37	6	43	535	13	548	
1956-57	181	1	182	381	410	53	53	14	67	615	44	659	
1957-58	182	1	183	396	447	256	256	66	322	834	118	952	
1958-59	190	1	191	390	407	179	179	85	264	759	103	862	
1959-60	223	2	225	363	350	391	391	29	420	977	18	995	
1960-61	278	57	335	442	410	337	337	62	399	1057	87	1144	
1961-62	300	-26	274	455	455	350	350	66	416	1105	40	1145	
1962-63	345	3	348	557	597	409	409	90	499	1311	133	1444	
1963-64	390	-42	348	654	699	518	518	116	634	1562	119	1681	
1964-65	437	10	447	733	765	650	650	83	733	1820	125	1945	
1965-66	478	-25	453	782	810	822	822	166	988	2082	169	2251	



(v)

## Appendix 1.5

C.P.I. T.L FORMATION PROPORTIONS IN SOME COUNTRIES OF THE WORLD  
(at current prices)

country	Period covered	(per cent)									
		GDP	GDP	GDP	to GDP	to GDP	M&E	Const-	to	ME	Change in
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	
<b>Group 1.</b>											
1. Canada	1960-61 to 1965-	23.2	22.2	1.0	14.5	7.7	65.2	34.8	4.4		
	-do- 66	26.8	25.4	1.4	13.0	12.4	51.2	48.8	5.2		
2. Germany (West)	-do-	23.2	22.0	1.3	12.9	9.1	58.6	41.4	5.3		
3. Italy	-do-	36.1	32.7	3.4	N.A.	N.A.	N.A.	N.A.	9.5		
4. Japan	-do-	18.3	17.1	1.2	8.6	8.5	50.7	49.3	6.8		
5. United Kingdom	-do-	17.6	16.8	0.8	10.8	6.0	64.4	35.6	4.7		
6. United States	-do-										
<b>Group 2.</b>											
7. Burma	1960-61 to 1964-65	17.9	15.8	2.1	10.4+	5.4+	65.7+	34.3+	11.9		
8. Ceylone	1960-61 to 1965-66	13.8	14.3	-0.5	9.7	4.6	67.6	32.4	-4.0		
9. Chile	-do-	12.8	12.6	0.3	5.5	7.1	44.0	56.0	2.0		
10. India	-do-	16.6	15.4	1.2	8.9	6.5	58.1	41.9	7.4		
11. Iran	-do-	15.0	15.0	-	10.3*	4.7*	71.1*	28.9*	-		
12. Iraq	1960-61 to 1964-65	13.9	12.8	1.1	N.A.	N.A.	N.A.	N.A.	7.7		
13. Malaysia	-do-	17.2	16.0	1.2	10.8	5.2	62.6	37.4	7.3		
14. Pakistan	1962-63 to 1964-65	16.2	15.7	0.5	8.3	7.4	53.0	47.0	5.3		
15. Thailand	1960-61 to 1965-66	20.1	19.3	0.8	9.9	9.4	50.9	49.1	3.9		
16. Turkey	-do-	14.8	14.0	-	9.1	4.9	64.8	35.2	-		

Note:- The proportions are based on cumulated totals.

+ Relate to the period 1960-61 to 1963-64  
\* Relate to the period 1960-61 to 1964-65.

(1)

Appendix 2

METHODOLOGY AND SOURCES OF DATA

Machinery and Equipment (1950-51 to 1959-60)

1. ASI data in regard to the domestic production of machinery and equipment for the years earlier to 1959 are not available. The ASI report (census) for the year 1959, however, is very brief and does not contain itemwise details of production. With a view to move the estimates of production of machinery and equipment for the years 1950-51 to 1959-60, the following procedure has been adopted. First, the estimated value as worked out for the ASI Census and sample sectors for the year 1960-61 has been broken into three groups, namely (i) electrical machinery (ii) transport equipment and (iii) other machinery and equipment. The estimate for each group has been moved backward upto 1951-52 on the basis of index of industrial production available in Monthly Statistics of Production of Selected Industries (MSPSI) published by the CSO. Separate indices for these three groups, are, however, not available for the year 1950-51. Therefore, the combined total of the three groups for the year 1951-52 has been taken back to 1950-51 with the help of index of production in general and electrical engineering. The total value of domestic production for large scale manufacturing (aggregate of ASI census and Sample Sectors for these three groups), thus worked out, were at 1960-61 prices. Current price estimates have been framed by using index number of whole sale prices for the group machinery and transport equipment as available in the Economic Advisor's Index Numbers of Whole Sale Prices. Methodology in regard to production in small scale manufacturing is the same as given in the CSO paper.

Change in Stocks (1950-51 to 1959-60)

2. Methodology adopted and sources of data for agriculture other than foodgrains, foodgrains, electricity, commerce and Government administrative departments are the same as used for the CSO paper. Departure has been effected in case of manufacturing, livestock and mining. As regards large scale manufacturing in the absence of ASI data for the years 1950-51 to 1959-60, information has been gathered from scattered sources. The value of change in stocks for NDCUs (manufacturing) has been taken from the paper 'Estimates of Capital Formation in the Public and Private Corporate Sector' by J. Kumar, Ajit Singh and O.P. Rajpal. For manufacturing companies in the private sector reliance has been placed on RBI studies in regard to finances of joint stock companies published in RBI Bulletins. As RBI data are not available for the year 1949-50, the value of change in stocks for the year 1950-51 has been assumed to be zero. The methodology for change in stocks in the small scale manufacturing is the same as indicated in the CSO paper. However, comparable data on product from small scale manufacturing for the years 1950-51 to 1959-60 are not available. The estimates for these years as available in the annual paper on national income published by the CSO contain an element of product from household construction and that has been removed for working out the estimates of change in stocks for this paper.

(ii)

3. The value of livestock has been worked out by interpolating and extra-polating the livestock census results on the basis of geometric growth rates for each type of animal in each state and the changes worked out. The price of each type of animal for each state has been used to work out the value of change in livestock at 1960-61 prices. The estimates at 1960-61 prices have been converted into current price estimates with the help of a combined index of the prices of agricultural commodities and milk with equal weight.

4. The estimates for change in stocks in mining have been worked out in respect of coal and iron ore only. The total value of change in stocks of other minerals is, however, negligible.

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