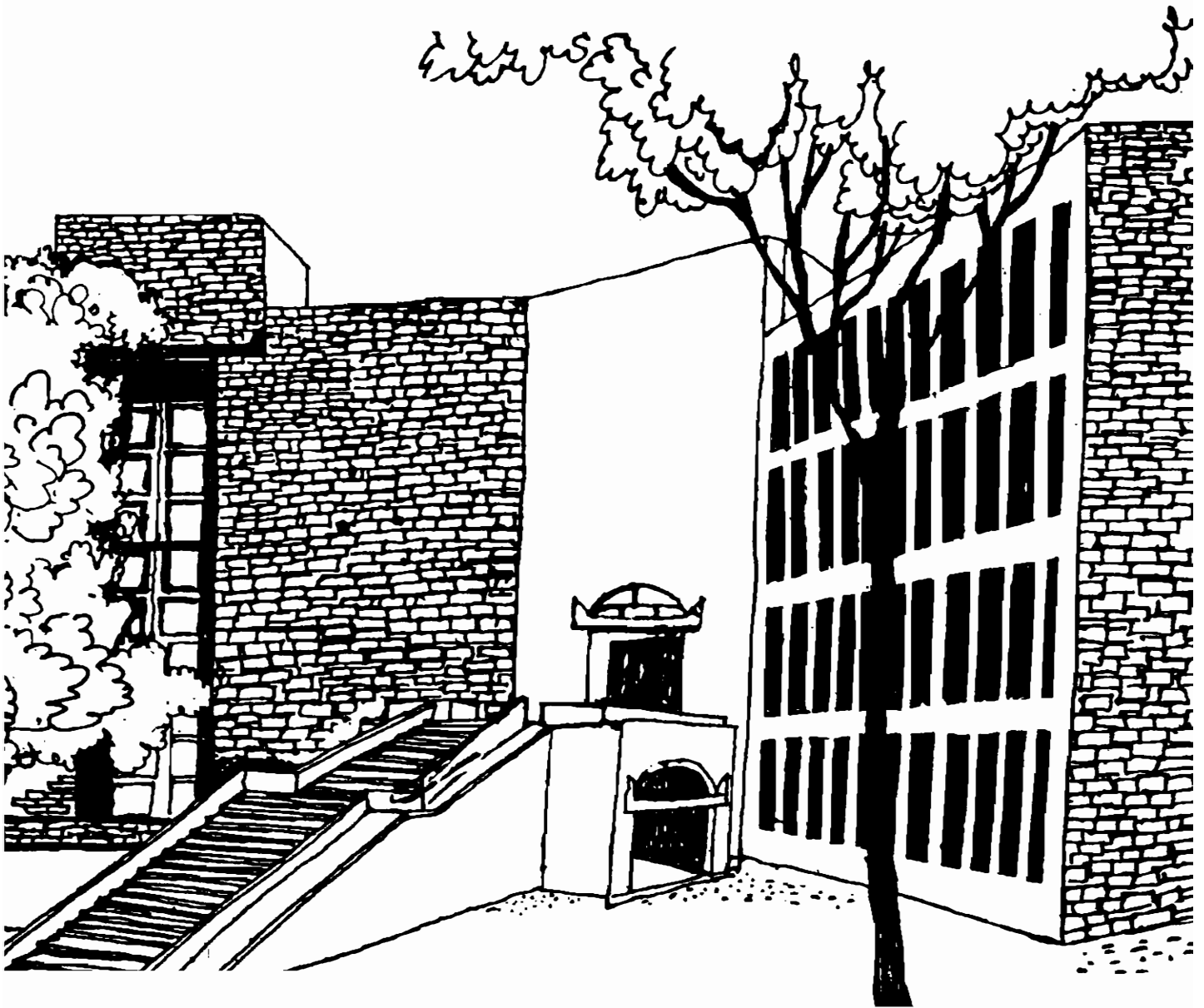




# Working Paper



**IMPLICATIONS OF THE SECTORAL TARGETS  
OF INDIA'S EIGHTH FIVE YEAR PLAN**

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**Implications of the Sectoral Targets of India's  
Eighth Five Year Plan**

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**Abstract**

The paper examines critically the implications of the sectoral targets of income and employment growth coupled with the investment allocations as envisaged in India's Eighth Five Year Plan. The implications are worked out on the labour income per unit of investment, required economic rate of return on project investments and the rate of total factor productivity growth by sectors. As was the case with the Seventh Five Year Plan, the 8th Plan also appears to lack consistency.

## Implications of the Sectoral Targets of India's Eighth Five Year Plan

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### 1. Introduction:

Unlike the 7th Plan document, the 8th Plan document is much less transparent in terms of methodology, assumptions made and critical estimation of aggregates used. It makes the task of examining critically the plan targets more difficult. On the one hand, it is supposed to be only an indicative plan, but on the other hand, it is based on 60 sector Input-Output consistency model. [See, Planning Commission, 1992, p.67]. The details of the model are not available so far. Although the growth of employment and income and cumulative investment by 7 major sectors over 1992-97 are given in the Plan, the initial structure of employment, income and stock of capital among those sectors is not given in the plan. Since official estimates of the stock of capital were not available in published form when the 7th Plan was prepared, it did not report the estimates of initial capital stock either at the aggregate level or at sectoral level. However, the 7th Plan did report the sectoral break-up of the initial estimates of both income and employment by sectors along with the growth rates targetted over the plan period. Since the 8th Plan does not report all these details about the targets at sectoral/ aggregate level, it arouses some suspicion.

In the present paper, an attempt is made to derive implications of the sectoral targets of the plan on the economic

rate of return and labour income generation required to be achieved on projects/schemes to be undertaken during the plan period. In the next section, we briefly discuss the sectoral targets given in the plan. The third section describes the methodology and the minimum information required to derive the implications of the plan targets on the economic rate of return and labour income generation by sectors. In the fourth and final section, results of our exercise are discussed.

## 2. Sectoral Targets:

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The plan provides sectoral targets of employment and income (GDP at factor cost) and cumulative investment at 1991-92 constant prices. [See, Planning Commission, 1992, pp.55 & 56]. It is assumed that the growth of income at 1991-92 prices over the plan period would be the same when measured at market prices as the one measured at factor cost. [Ibid.; p.43]. Since the investments are always at market prices, the income growth estimates at market prices would be more relevant. The plan does not provide such estimates nor does it mention explicitly anywhere whether the sectoral growth targets would be different at market prices from the ones at factor cost. The implicit assumption of the equality of growth rates of income at market prices with the one at factor cost at aggregate level is discernible from the table on macro aggregates for the 8th Plan in its chapter 3. This is one of the few places where the initial and terminal values of the macro aggregates are given in

the plan. Unfortunately, the GDP estimates for the year 1991-92 do not tally with the quick estimates produced by the CSO (1993). The plan document does not give sectoral break-up of the estimates of GDP it is using. We may, therefore, use the latest available estimates of GDP prepared by CSO (1993) for the year 1991-92. Table 1 below provides the sectoral targets of the 8th Plan.

It can be seen from the table that the plan provides for positive growth of labour productivity in all sectors except construction in which zero growth is targetted. Maximum growth of labour productivity is targetted in the electricity, gas & water supply (3.9%) and manufacturing (3.6%) sectors. With the target growth of aggregate income at 5.6% p.a. and employment at 2.6%, the labour productivity growth on an average is targetted at 3% p.a. In all sectors other than manufacturing and electricity, gas & water supply, the growth of labour productivity would be less than the average of 3% p.a.

Moreover, it should also be noted that the total of cumulative income expected to be generated over the Plan period 1992-97 implies an aggregate growth of total GDP to be 5.4% p.a. and not 5.6% p.a. as targetted in the plan. This happens because we are using the CSO's (1993) quick estimates for the initial year 1991-92 whereas the 8th Plan is based on some forecast estimates not reported explicitly in the plan. Thus, the implication of the sectoral growth with more recent and realistic estimates of income across sectors is to reduce the overall

growth of income though marginally. However, investment target remaining the same, it implies lower investment rate from 23.2% to 22.3%. If the target of saving rate is achieved, this would imply a much lower dependence on the foreign savings. Alternatively, either the effort to raise the domestic savings may not be required to the extent envisaged in the plan or the sectoral investment targets may be revised. In any case, minor revisions in the plan target regarding savings and investments have become necessary. However, in order to derive the implications of the plan targets on the rates of return, we may assume the absolute investment targets to remain unchanged.

### 3. Methodology:

Let us assume an aggregate production function of income (Y) in capital (K), labour (L) and time (t):  $Y = f(K, L, t)$ . Taking first differential with respect to K on both sides, we have

$$(1) \quad dY/dK = f_L (dL/dK) + f_K + f_t (dt/dK).$$

Where  $f_L$ ,  $f_K$  and  $f_t$  are partial derivatives of Y with respect to L, K and t respectively. Now  $dY/dK$  is the incremental output-capital ratio which is the reciprocal of the ICOR. The 8th Plan assumes an ICOR of 4.1. The first term on the right-hand side of equation (1) can be interpreted as the incremental labour income per unit of investment during the plan period. Although no explicit targets are mentioned on this important parameter in the plan, we can derive its estimate if we have some idea about the relative share of labour. This is because it can be shown that



$$(2) \quad f_L (dL/dK) = R_L (GL/s)$$

Where  $R_L$  is relative share of labour;  $GL$  is the annual growth rate of employment and  $s$  is the average investment rate over the plan period obtained as a ratio of total investment to the total cumulative income over the plan period. The same framework and equations can be used to generate sectoral estimates.

The sectoral ICORs which are not given in the plan, can be generated by

$$(3) \quad ICOR = s/GY$$

Where  $GY$  is the annual growth of income. From the sectoral ICOR, we can obtain the estimates of the sectoral  $dY/dK$  as the reciprocal.

The second term on the right-hand side of equation (1) above, viz.  $f_K$  is the marginal product of capital. The third and the last term in the equation (1) can be interpreted as the technology return per unit of investment. At the micro level where we consider individual projects, these two terms together provide an estimate of the **economic rate of return (ERR)** on the project investment. Thus, the required ERR to achieve the plan targets can be obtained as

$$(4) \quad ERR = (dY/dK) - R_L (GL/s).$$

Moreover, if we have an estimate for the marginal product of capital ( $f_K$ ), it is possible to obtain the implied estimate of the "residual" or the rate of technical progress or the rate of **Total Factor Productivity Growth (TFPG)** in the system. This is because

$$(5) \quad \text{ERR} - f_k = f_t (dt/dK) = r/s$$

$$\text{i.e. } r = s (\text{ERR} - f_k)$$

Where  $r$  is the rate of TFPG.

The TFPG estimates can be derived on the basis of the classical theorem that the marginal product of capital in the economy is given by the long-run rate of growth of income. This theorem is based on the assumptions that (i) all profits are saved and all wages are consumed; and (ii) average capital-output ratio remains constant over time. In practice, these assumptions may not hold. If we consider more realistic situations, the marginal product of capital is likely to be higher and hence the TFPG would be lower than the ones based on these assumption. Moreover, since capital on margin is fully mobile, we may assume the same marginal product across the sectors.

Thus, the minimum required information to derive the rate of return implications of the plan targets is on the relative factor shares in each of the sector of the economy. Unfortunately, these estimates are not officially available. CSO used to publish the estimates on functional distribution of income by sectors along with the national accounts statistics. However, after 1987, CSO has stopped providing even these estimates. Since the factor shares are relatively more stable and have a reasonably narrow range of plausible values, we can use a single decimal value of relative share of labour approximated from the 1984-85 CSO estimates of the income shares by sectors. These estimates are provided along with other results in Table 2 here.

#### 4. Results and Implications:

From Table 2, it can be seen that productivity of investment ( $dY/dK$ ) varies considerably across sectors from as high as 46.37% in construction to as low as 6.61% in electricity, gas & water supply. What is surprising is that the ICOR in agriculture is taken to be distinctly higher than in manufacturing sector. The labour income per unit of investment and the economic rate of return (ERR) required to achieve the plan targets are also considerably different in different sectors. The target of labour income as a proportion of total investment works out to about 8% for the economy as a whole during the 8th Plan period. It works out only to 1.65% in the electricity, gas & water supply sector whereas in construction and other sectors it works out to be considerably higher than the national average. In terms of the ERR, the national average implied by the plan targets is 16%. The manufacturing and other sectors require distinctly higher ERR whereas electricity, gas & water supply, transport & communication, construction and mining & quarrying sectors need a substantially lower ERR than the national average.

Given the extent of the variation in the required ERR across the sectors, it is important for the government to ensure through appropriate policy measures that the investment target in every sector is met if the plan has to succeed. If the private capital is supposed to get a return of 18.2% in the manufacturing sector, 16.8% in other sectors and 15.5% in agriculture, it is going to be very difficult to attract it to sectors like electricity, gas,

& water supply or transport & communication or construction or mining & quarrying where the returns are only 5%, 8.6%, 9.3% and 10.8% respectively. These are precisely the sectors where privatization and foreign investments are being encouraged. Without any substantial inducements offered for attracting the private capital in these sectors, the sectoral targets of investments in the plan appear to be only a wishful thinking. Indicative planning certainly does not mean such a wishful thinking. If, however, these targets are to be taken seriously, incentives in the form of heavy annual subsidies of about 11% on electricity, gas & water supply projects, 7.4% on transport & communication projects, 6.7% on construction projects and 5.2% on mining & quarrying projects have to be provided in real terms. Similarly, disincentives to the tune of 2.2% p.a. on the manufacturing projects have to be provided over the plan period. The plan documents do not contain such strong and clear measures. Although the budget for the year 1993-94 provides a tax holiday for 5 years and other concessions to the private enterprises to attract them in these sectors, it is doubtful whether they would be sufficient.

Finally, we may examine the implications of the 8th Plan targets on the rate of total factor productivity growth (TFPG) in different sectors. For the economy as a whole, the 8th Plan visualizes a TFPG of 2.4% out of 5.4% growth in real GDP. Such a high contribution of TFPG, moreover, is to be achieved only through the manufacturing and mining sectors in the economy. The

rest of the sectors are not expected to experience TFPG in excess of the national average. Although this in itself is a surprising element, the most astonishing implication of the exercise of setting the targets in the 8th Plan is the negative TFPG or "residual" in the electricity, gas & water supply sector. Something has seriously gone wrong with the calculation of targets in the 8th Plan in general and the one in the electricity, gas & water supply in particular. If it is not so, it implies that the Planning Commission has no concrete steps nor any intension to improve efficiency of the public enterprises in this critical sector of the economy. Considering that only 10% of total investment in electricity, gas & water supply sector is envisaged to come from the private sector (see Table 1), the 8th Plan targets imply the government's commitment to encourage inefficiency and wastage of resources by inflating the public sector in such priority sectors! Since concept of economic planning involves inter alia optimization, it is difficult to accept a negative TFPG target for a sector in the plan. As was the case with the 7th Plan (see, Dholakia, 1988), the 8th Plan also does not appear to meet the consistency requirement when viewed from the angles of return on investment and the total factor productivity growth.

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**Table 1: Sectoral Targets of India's 8th Five Year Plan**

Sectors	Annual Growth Rates (in Per cent)		Investment at 1991-92 Prices (in Rs.Crores)		GDP in 1991-92 at Current Prices (in Rs. Crores)	
	Employment	GDP at 1991-92 Prices	Total	Private	At Factor Cost	At Market Prices
1	2	3	4	5	6	7
1) Agriculture	1.6	3.1	148800	96800	174337	196089
2) Mining & Quarrying	6.8	8.0	39600	11100	11363	12781
3) Manufacturing	3.7	7.3	188400	141300	96247	108256
4) Construction	4.7	4.7	20540	17240	31331	35240
5) Electricity, Gas & Water Supply	3.9	7.8	102120	-10120	12206	13729
6) Transport & Communication	3.9	6.6	113910	39710	41185	46324
7) Other Sectors	4.2	6.0	184630	120730	175219	197081
<b>TOTAL</b>	<b>2.6</b>	<b>5.6</b>	<b>798000</b>	<b>437000</b>	<b>541888</b>	<b>609500</b>

Source: (1) Planning Commission (1992) p.55-56.

(2) CSO (1993). [Col.7 is derived by assuming the same structure as in Col.6].

**Table 2: Implications of the Sectoral Targets of 8th Plan**

Sectors	Ratio of Investment to Cumulative GDP	ICOR	Relative Share of Labour	Incremental Capital Productivity (in %)	Incremental Labour Income per unit of Investment (in %)	Economic Rate of Return (in %)	Rate of Total Factor Productivity Growth (in %)
1	2	3	4	5	6	7	8
1) Agriculture	0.13836	4.46	0.6	22.41	6.94	15.47	1.4
2) Mining & Quarrying	0.48901	6.11	0.4	16.36	5.56	10.80	2.6
3) Manufacturing	0.28035	3.84	0.6	26.04	7.87	18.17	3.6
4) Construction	0.10135	2.16	0.8	46.37	37.10	9.27	0.4
5) Electricity, Gas and Water Supply	1.18086	15.14	0.5	6.61	1.85	4.95	(-10.5)
6) Transport & Communication	0.40433	8.13	0.8	16.32	7.72	8.6	1.3
7) Other Sectors	0.15678	2.61	0.8	38.27	21.43	16.84	1.8
<b>TOTAL</b>	<b>0.22309</b>	<b>4.13</b>	<b>0.7</b>	<b>24.21</b>	<b>8.16</b>	<b>16.05</b>	<b>2.4</b>

Source: (1) Table 1 and Section 3 in the text.

(2) Col.4 is approximated based on a study on sectoral factor shares carried out by Prof.B.H.Dholakia at IIM, Ahmedabad. The basic sources used here are: CSO (1987) and Dholakia & Dholakia (1991).



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