CHAPTER VII

SUMMARY AND POLICY IMPLICATIONS

1. Summary

The present work is devoted to a close examination of the relationship between government effort through its annual expenditure plans and the welfare of the populance. In order to inbuild the distributional impacts of government effort, we have considered a modified concept of welfare, the improvement in which necessarily indicates improvement in the conditions of poor. Unlike many other studies in this field, we have not followed any straight forward allocation of government annual expenditure, to get an idea of direct benefits of such expenditures to various classes of population. In fact, in such studies the indirect benefits are simply ignored and hence their findings could hardly be of relevance for underdeveloped countries, where spread effects and increasing returns to government effort are often expected to play important role.

These characteristics of the LDC's are of crucial importance, since they represent a hope for the existing potential to be exploited for rapid future development. Our method on the other hand, considers the performance in terms of final output indicators, which measure the consumption of

items of social priorities like basic literacy, health, nutrition and other necessities. Thus, our approach has the advantage of considering the indirect effects of government efforts as well.

A simplistic model, based on the standard 2x2x2 general equilibrium model is constructed, in which the basic welfare is functionally related to government efforts and other socio-cultural, geographical factors. As a corollary, change in basic welfare is functionally related to the change in government efforts, which represents flow of government expenditures over time. It is also shown, that the slope of such a function could be considered as the second order direct partial derivative of basic welfare with respect to the government efforts. Thus, the sign of slope of the functional relationship between change in basic welfare and government expenditures reflects nature of the returns to government effort.

This framework can be extended to include various categories of government expenditures on the one hand and different categories of indicators for social consumption on the other hand.

As an illustration of the practical application of the model developed in Chapters I to III of the present work, we have taken the case of India over the period 1960-61 to

1980-81. Since the purpose is only illustrative, we have considered fifteen major states in India for which most of the required data are readily available, as far as indicators of basic welfare are concerned.

For the government expenditures we have considered only the expenditures by the state economies on their revenue accounts which form not only the major component of the change in total government effort but also considered reasonably satisfactory proxy for government effort by different scholars working in the field. The revenue account expenditures by the state governments are readily available on consistent and comparable basis, whereas data on other components of government expenditures in the state economies are either not available at all or not available in desired details to make them usable in such an exercise. The illustrative exercise of empirically fitting the model is carried out in Chapters IV to VI.

Depending on the nature of the available data, the model in its most detailed form is fitted for the period 1971-81, on observations of fifteen states of India, in Chapter IV. On the whole, the model seems to be performing satisfactorily. In order to increase the degrees of freedom, sometimes, certain expenditure categories need to be clubbed together, for estimating a combined impact. An illustrative

exercise of this type is also carried out, for the expenditure categories of industries and minerals, water, power and development and transport and communications.

If, on account of either availability of data or the purpose and objective of deciding the broad strategies, only broad expenditure categories like expenditure on human capital and expenditure on physical capital have to be considered, the model needs to be adopted to only such requirements. This is illustrated with the help of Indian data in Chapter V. Our model also performs well for such broad expenditure categories. This increases its usefulness for application even in those countries where accounts and statistical data collection may also be in infancy stage.

The impacts or the nature of the returns to government efforts may change significantly over a period of time. In such a dynamic setting, it is important to see how the impact parameters undergo a change over time. Such an exercise is illustrated with the help of Indian data over the two decades of 1961-71 and 1971-81. It is found that impact parameters are not stable over time. Policy makers have, therefore, to be extremely cautious, while deciding strategies for the future. An illustration for five broad categories of social consumption goods and eight categories of expenditures with changing structure of relationships

over two decades in India is attempted in Chapter VI of the present study.

The model fits very well and does provide useful insights into the basic questions regarding the distribution and welfare implications of government expenditure in India.

In the next section, we briefly discuss the basic policy questions, which the planners have to consider to devise appropriate strategies in terms of allocation of government expenditures among different sectors. We also discuss how and to what extent the results obtained from our model become useful for policy purposes. As usual, we would indicate as an illustration, the usefulness of our specific empirical findings for their policy implications in India in Section 3.

2. Policy Implications Of The Theoretical Model

In order to discuss the policy implications of our model in greater detail, we need to first spell out clearly the options before the policy makers within our framework. Holding all other factors totally exogenous to our model constant, we get the following simple production function in the basic welfare level (X) and government efforts in different directions (G_1 and G_2) :

$$X = f.(G_1, G_2)$$

At any given point of time on the above function, the values would exactly correspond. In other words, if we consider Diagram-7.1, on the G_2O G_1 plane, the situation at any given point of time would be represented by a point like A. G_1 and G_2 represent cumulative government effort in directions 1 and 2. Since the point A is lying within the positive quadrant of G_2 O G_1 plane, it must necessarily lie on some isoquant like X_o.

The planner would face a target to achieve a higher level of basic welfare like X_1 over a given period of time.*1 The basic question is, how to achieve X_1 with the help of G_1 and G_2. That G_1 and/or G_2 have to be increased is well recognised. Various options to achieve X_1 if we are on initial point like A, are given by different combinations of increases in G_1 and G_2 from their respective initial values of G_1 and G_2 at A. Usually cumulative government effort from its existing level would not absolutely decline over a period of time, given the way we have defined the term. Thus the range of choice is given by the arc DBC where AC is a vertical line and AD is a horizontal line through the point A

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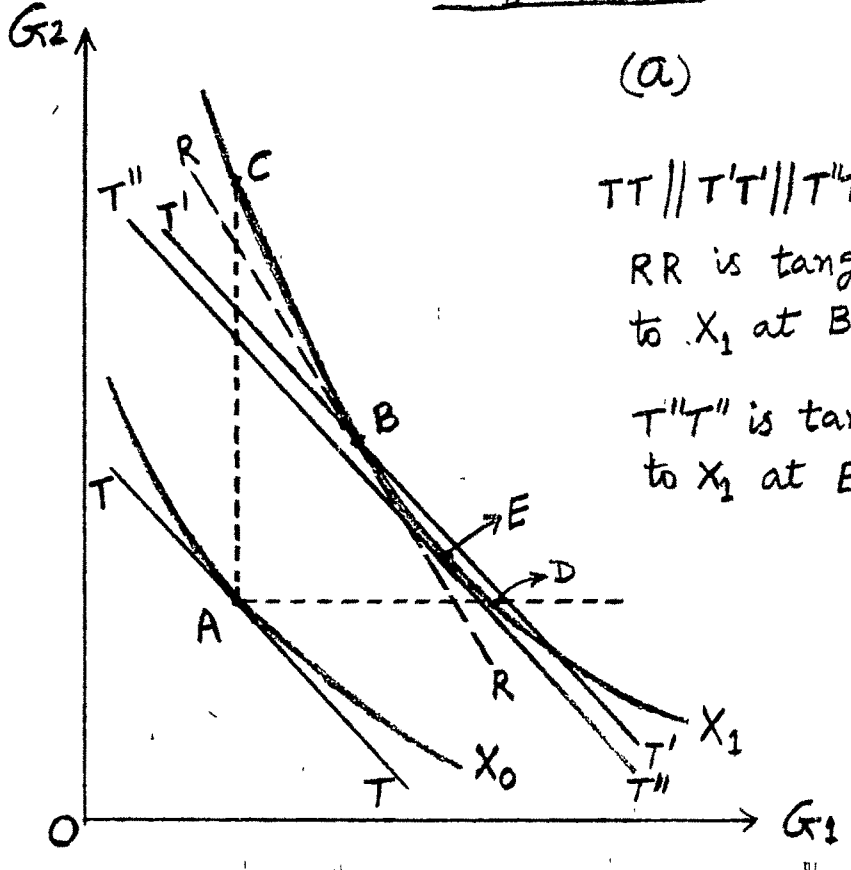
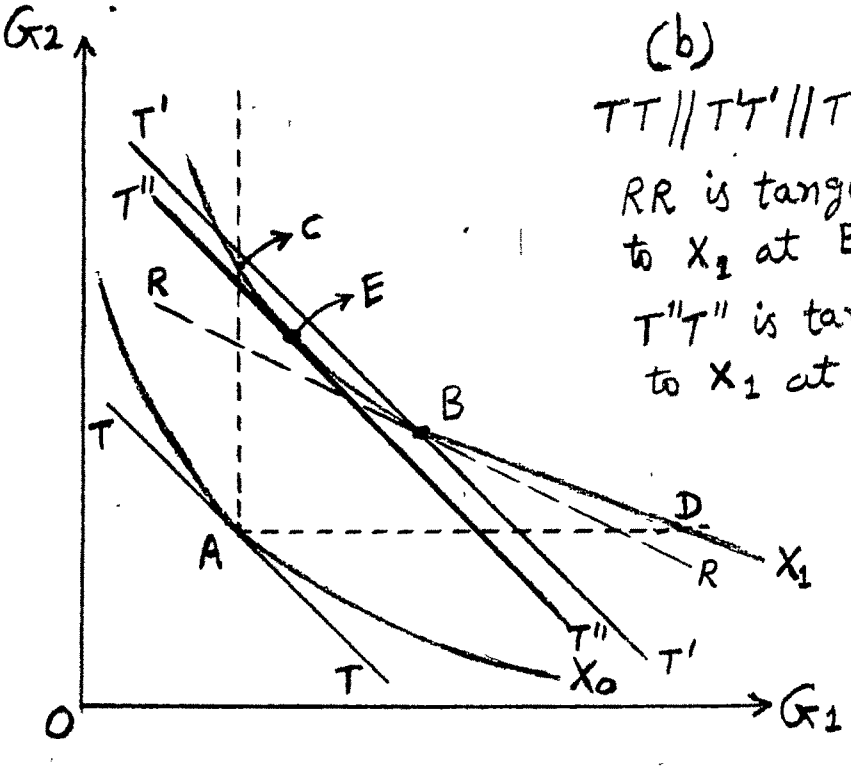
*1 In order to simplify the exposition, we assume for the time being that the new target of X_1 is such that it can be achieved by keeping the total rate of annual per capita real government expenditure the same as before.

Diagram 7·1


G2
(a)
TT || T'T' || T"T".
RR is tangent to X1 at B.
T"T" is tangent to X1 at E.
R
C
T"
T'
B
T
E
D
A
R
X1
X0
T'
T"
T
O
G1


G2
(b)
TT || T'T' || T"T".
RR is tangent to X1 at B.
T"T" is tangent to X1 at E.
T'
T"
C
R
E
B
T
D
A
R
X1
T"
T'
T
X0
O
G1

intersecting the new iso-quant X_1*2 in point C and point D respectively.

The whole issue about choosing different expenditures could then be considered with a specific reference to the point B which is taken to represent the continuation of past trends. Thus, it is assumed that the present rate of annual government expenditures in the two directions given by G_1 and G_2 are remaining the same at point B. Any point on the arc BD would represent higher annual government expenditure in the direction 1 and lower annual expenditure in the direction 2 as compared to the present level. Similarly any point on the arc BC would represent higher expenditure in the direction 2 and lower expenditure in the direction 1 as compared to the present level.*3

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*2 The new iso-quant at X_1 may or may not belong to the same production function as X_0. Since X_1 is a target to be achieved over a period of time, it is possible to envisage changes in 'other factors' held constant while drawing X_0. If these changes have taken place in a systematically predictable way as we have attempted in our model, the argument in the text regarding the choice open for the policy maker would not undergo any significant change.

*3 It should be noted here that point B representing the same rate of annual per capita real government expenditures in the two directions as before would be on the isoquant X_1 so long as we are assuming that the target of X_1 is achievable with the total government expenditure in real per capita terms remaining the same as before. If X_1 requires higher expenditure rate, point B would lie below the isoquant X_1.

Having put the question of choice in this framework we need to consider the criterion for making a choice. Since planning is by definition an activity involving optimisation, it would not be unjustified to assume that the planner would like to avoid all the excess costs which are unintentional in nature. The concept of excess cost may be thought of as closely akin to the one of excess burden of taxation. The excess cost on the society or the economic system are avoided, if the basic relative marginal costs of government efforts are left unaltered by the planned action to achieve the targeted basic welfare level (X_1). This would also imply minimisation of social costs at base period shadow prices to achieve the required level of basic welfare.

Considering the initial point A, we can obtain the social costs of the government efforts G_1 and G_2 in the two directions by drawing a tangent to the iso-quant X_o at point A. The slope of this tangent as is wellknown is represented by the ratio of the marginal products of G_1 and G_2 viz., r_1 and r_2, respectively. The shadow prices of accumulated government efforts in the two directions - G_1 and G_2 are then considered to be given by the same ratio between r_1 and r_2 in relative terms.

In the absence of any explicit target about such relative social costs, the planner may aim to maintain the given

parity between the social marginal costs undisturbed while planning to achieve the target X_1 for basic welfare. Therefore, the criterion of maintaining the marginal rate of substitution between the accumulated government efforts G_1 and G_2, existing at point A, also at new point on the arc DBC, requires us to examine the behaviour of the marginal products of accumulated government efforts G_1 and G_2 over time.

In order to make a policy choice, the planner should be in a position to assess the ratio of marginal products of G_1 and G_2 at point B on a new iso-quant X_1. It is important to note that the planner is not interested in the absolute estimate of the ratio r_1/r_2 at the point B nor at the point A . For the choice under consideration we need to know only the behaviour of this ratio between points A and B. Thus, for instance as shown in Diagram 7.1(a), if the ratio r_1/r_2 at B is greater than the one at A, given the convexity of the iso-quants, it is obvious that the point where the ratio r_1/r_2 remains constant would lie on the arc BD, implying higher expenditure in direction 1 and lower expenditure in direction 2 than before. We can similarly infer from Diagram 7.1(b) that the planner should increase expenditure in direction 2 and reduce the expenditure in direction 1, if the ratio r_1/r_2 at B is less than the one at A.

The crucial question to be investigated in making a policy choice in our framework thus boils down to examining the behaviour of the ratio r_1/r_2, representing the ratios of marginal products of accumulated government efforts in directions 1 and 2. Our model presented in Chapter I to III finally gives the nature of returns to government efforts as the slope of the estimated equations between $\dot{X}$ and $\dot{G}_i$.*4 In other words, our results basically show the second order direct partial derivatives of basic welfare level (X) with respect to government effort in the given direction (G_i).

Assuming that cross-partial derivatives are not of substantial size, our findings about returns to government efforts in different directions can provide at least approximate answers to the direction of the ratio of marginal products of government efforts (r_1/r_2). Thus, if the returns are increasing in direction 1 and if the returns are either diminishing or constant in direction 2, the ratio of marginal products - r_1/r_2 will have a tendency to increase. In such a case it is most likely that the ratio r_1/r_2 would be higher at B than at A so that the planner is best advised

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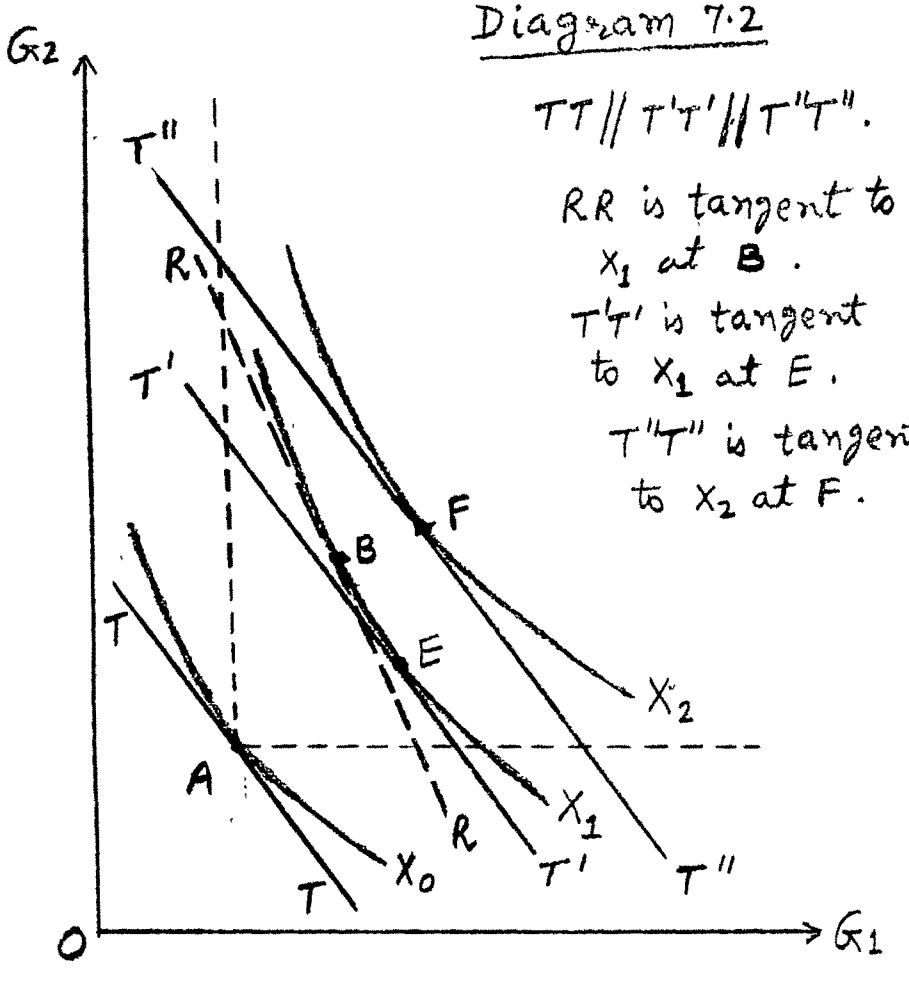
*4 It should be recalled that our equations are in terms of the disparity reduction Rates and Average Annual Rates of real per capita Government Expenditures in different directions. As noted earlier, point B in Diagram 1 denotes the same rate of annual expenditures in different directions as before.

to go in for higher expenditure in direction 1 and lower expenditure in direction 2 than before. Such a policy under the circumstances is likely to leave the ratio of shadow prices of accumulated government efforts in the two directions more or less unaffected so as to ensure achievement of the targeted basic welfare level X_1 at minimum social cost calculated at the base period shadow prices.

When we consider a case where total rate of annual per capita real expenditure by government increases over time, the reference point B indicating the same level of expenditure as before would lie below the iso-quant for the achievable target X_2. Diagram 7.2 represents such a case. Several real life situations are most likely to resemble this case. The discussion of Diagram-7.1(a) totally applies to the point B in Diagram 7.2 as well. However, the achievable welfare level (X_1) at point B is lower than the target X_2.

The implication of this particular condition is to reduce the sharpness of the conclusions regarding the nature of returns to government efforts and the direction of government expenditure. To illustrate the difference it would make in such a case, let us consider a situation where at point B, the ratio of the marginal products - r_1/r_2 is higher than at point A. In earlier case, this would imply increasing the rate of expenditure in direction 1 and reducing the rate of

Diagram 7·2



$TT /\!/ T'T' /\!/ T''T''$.

RR is tangent to X_1 at B.
$T'T'$ is tangent to X_1 at E.
$T''T''$ is tangent to X_2 at F.

expenditure in direction 2. If, however, we consider the latter case when the total rate of government expenditure is higher than before, although it is necessary that rate of expenditure in direction 1 should increase, it is not necessary that the rate of expenditure in direction 2 should decrease. This happens because even if we move from point B to point E on the isoquant X_1 to ensure the same ratio - r_1/r_2 as at point A, it is quite conceivable that a point like F on the higher isoquant X_2 representing the target level of basic welfare may represent the same ratio - r_1/r_2. At point F, then, we cannot rule out constancy or even increase in the rate of government expenditure in direction 2 as compared to point B. On the other hand, point F would invariably represent a higher rate of expenditure in direction 1 as compared to point B.

The message from this discussion is clear. If the ratio of marginal products of the government effort in any two directions is increasing, the rate of government expenditure in the direction of the numerator should increase. Whether the rate of expenditure in the direction of the denominator should increase, decrease or remain the same depends on the extent of increase in the total rate of government expenditure. Table 7.1 summarizes different situations under which the ratio - r_1/r_2 would increase, decrease or remain constant.

Table 7.1 : Likely Behaviour of the Marginal Rate of substitution (r_1/r_2) of G_1 for G_2 under different Returns to G_1 and G_2

Returns to G_2	Returns to G_1		
	Increasing	Constant	Diminishing
Increasing	Uncertain*	Fall	Fall
Constant	Rise	Constant	Fall
Diminishing	Rise	Rise	Uncertain*

* The behaviour can be predicted by considering the magnitude of the impact coefficients.

3. Policy Implications of the Empirical Findings

In the previous section we have already discussed implications of the potential results our model can provide for any economy. As we have noted there, the expenditure needs to be increased in the direction in which the marginal rate of substitution tends to increase. From Table 7.1 it also becomes clear that this can happen only when there are either increasing returns or constant returns to accumulated government effort in the given direction with diminishing returns in the other direction. Whether government expenditure in the direction where diminishing returns are obtained should be curtailed or not depends on whether total expenditure

on per capita real basis is constant or increasing in the system.

As an illustration we summarise here the broad policy implications following from our empirical exercise in the case of India for the period 1961-to 1981.Since we have also considered the question of changing nature of the impact parameters over a period of time due to operation of various exogenous variables, we can summarise our findings about returns to government efforts in different directions as given in Table 7.2.

As is evident from Table 7.2 (columns 6 and 11) in terms of the composite welfare index for the economy as a whole, government efforts in primary education not only has increasing returns but also has reinforcing positive effects on the same over time in India. It therefore, represents a clear case for being taken up more extensively by allocating a higher expenditure in per capita real terms.

Out of the remaining direction of government efforts, except agriculture, all are yielding constant returns with no significant change in their impacts over time, in terms of CWI. Efforts in agriculture in the past had increasing returns, but its impact over time is significantly diminishing.

Table 7.2 : Returns to Government Efforts in Different Directions in India, 1961-81.

Direction of efforts	Nature of Basic Returns					Nature of changes over Time				
	MLR	FLR	HI	GESC	CWI	MLR	FLR	HI	GESC	CWI
1	2	3	4	5	6	7	8	9	10	11
1. GPE	IRG	IRG	IRG	CRG	IRG	Zero	Zero	Zero	Zero	Zero
2. GOE	CRG	CRG	CRG	CRG	CRG	Zero	Zero	Zero	Zero	Zero
3. GMHF	CRG	CRG	CRG	CRG	CRG	Zero	Zero	Zero	Zero	Zero
4. GOSCS	CRG	CRG	CRG	CRG	CRG	Zero	Zero	Zero	Zero	Zero
5. GIM	CRG	CRG	CRG	-	(CRG)	Zero	Zero	Zero	-	(Zero)
6. GWPD	CRG	CRG	CRG	-	(CRG)	Zero	Zero	Zero	-	(Zero)
7. GTC	DRG	DRG	CRG	-	(CRG)	+ve	+ve	-ve	-	(Zero)
8. GOECS	(CRG)	(CRG)	(CRG)	CRG	CRG	(Zero	(Zero)	(Zero)	Zero	Zero
9. GAG	CRG	CRG	IRG	CRG	IRG	Zero	Zero	-ve	Zero	-ve
10. GHK	IRG	IRG	IRG	CRG	IRG	Zero	Zero	Zero	+ve	Zero
11. GPK	CRG	CRG	IRG	CRG	CRG	Zero	-ve	-ve	-ve	-ve

Note : (i) IRG = Increasing Returns to Government efforts;
DRG = Diminishing Returns to Government efforts
CRG = Constant Returns to Government efforts

(ii) Results in parantheses indicate non-preferred regressions; and '-' denotes insignificant fit.

Source : Table 5.5; Table 6.10 and Table 6.11.

In terms of total basic welfare, the government effort on human capital in general had increasing returns in the past, with no significant change in the impact over time; whereas, efforts on physical capital in general had constant returns with significant declining impact over time. These results therefore, suggest that per capita real expenditures on human capital should be increased if our aim is to minimise social costs of achieving a given basic welfare target during a given period of time. If the total government expenditure in real per capita terms is not increasing, such a policy would necessarily imply reduction in the expenditure on physical capital. However, if the total real per capita government expenditure is increasing it is not necessary to reduce expenditure on physical capital. For the directions where constant returns are obtained without any significant change in the impact over time, the per capita real expenditure could be left unaltered.

We have so far discussed the policy implications of our empirical findings with respect to the total basic welfare, which is measured by composite welfare index in our case. However, it is possible to discuss in the similar way the policy implications, if any of the components of the basic welfare is considered crucial. Even if one does not agree with our composite welfare index on account of either weights or the contents, it is still possible to use the

results at a more disaggregated level by looking at the component indices and drawing the policy implications in the same way as described above.

Another use of the component indices could be when, for a particular economy, the objectives and priorities are considerably different as compared to the national or global priorities. In the case of Gujarat for instance, health is more important a priority than anything else and hence the policy considerations should be based on findings for the returns to government efforts in different directions in terms of health index. Similarly, in some other economy, male literacy and female literacy may be a more urgent need and therefore, policy should be guided by considering findings for these indexes. In short, if different categorical priorities exist in different economies, they should be appropriately considered for taking policy decisions based on findings of a detailed application of a broad model like ours.

It is worth noting at this stage that our empirical exercise was merely illustrative and the policy implications discussed here should also serve to demonstrate the practicability and usefulness of our approach.

Finally, we need to discuss our findings regarding the impact of the level of development index on the rate of

improvement in basic welfare and the autonomous rate of change in basic welfare in the system. The latter was basically negative and significant, implying thereby that the system had a basic tendency for deteriorating conditions of the poor, if left to itself. The government effort in the past was basically countering such inherent tendencies of the system. According to our findings on changes in impacts over time, there seems to have developed strong positive influences on autonomous rate of improvement in basic welfare in India. Thus, in future we have a reason to expect such working of the basic forces which would tend to improve the conditions of the poor. The government effort would only be required to reinforce these tendencies.

As regards the impact of the level of general economic development which we measured through the level of per capita income in the base period, our findings corroborate the celebrated hypothesis of inverted U shape of inequality relation with respect to level of economic development. Thus for instance, we get a statistically significant positive relationship between the level of economic development and rate of improvement in the basic welfare for the initial period. This only implies that economically more developed states were the ones with higher rates of improvement in basic welfare and economically less developed states were the ones with lower rates of improvement in basic welfare,

on an average. This in turn implies increasing level of inequalities in terms of basic welfare with respect to economic development to begin with. Over a period of time however, the change in the relationship is of statistically significant negative direction.

When we combine statistically the level with the change, we find that in more recent period the null-hypothesis of no linear relationship holds good between level of development and the rate of improvement in the basic welfare. This finding implies that a systematically increasing tendency for inequalities in basic welfare with respect to level of economic development is arrested. This in turn implies that we might have reached the turning point of the inverted U curve of the inequality. If the trend continues in the same direction as in the recent past, we should find the inequalities in basic welfare declining in the near future. This finding, moreover, is quite consistent with our earlier finding about basic tendencies influencing the autonomous rate of improvement in basic welfare.

All these together presents an optimistic picture for the potential, existing to be exploited by serious minded government effort to reduce disparities and achieve higher levels of basic welfare in the economy.

The negative influence on returns to government efforts in agriculture of late, is a matter of serious concern. In all such cases a more serious and searching probes are necessary to immediately combat inefficiencies, mismanagement and relative technological retrogression.