Chapter VI

Growth and Social Indicators : Some Concluding observations

The debate on the relationship between the growth of per capita GDP and social indicators has important implications for the public policy of a country. It is true that the higher the average income of a country, the more likely it is that it will have a higher life expectancy, lower infant mortality rate, higher rate of literacy and a higher value of human development index (HDI). To the extent that growth in per capita income is an instrument in raising levels of achievements in literacy and life expectancy, there is less of a need for public provisioning of social services by means of spending on health and education., If, however, only a weak link exists between growth in per capita income and achievements in social indicators the development policies can not be centred on the growth of levels of income. There would then be a need of public provision of social services.

The case of Sri Lanka is often used as an example in this context. This issue has been the centre of debate in the 1980's. Sen (1981) and Isenman (1980) have concluded that it is the public action which made Sri Lanka an exceptional country in achieving such a high standard of living even with low per capita income. Bhalla and Glewwe (1986) and Bhalla (1988) have argued that Sen's and Isenman's conclusions are flawed because they did not take into account the initial conditions of the country. Again, they have argued that it is not the levels but the changes in social indicators which should be taken into account. Using an alternative methodology Bhalla and Glewwe (1986) concluded that Sri Lankan improvements (i.e. changes) in the standard of living is not exceptional.

Using Sri Lankan time series data Anand and Kanbur (1991) found a negative correlation between IMR and both social spending and income growth but social spending had a stronger impact . These finding are justified as Child Vaccination campaigns can reduce IMR more quickly than can income growth. Kakwani (1993) presented axioms that measures of social indicators should satisfy. His residual analysis suggested that Sri Lankan achievements in the standard of living between 1970-1990 in relation to its per capita income to be exceptional.

Kakwani also challenged the Bhalla and Glewwe thesis which was found to have theoretical flaws and the conclusions to be inconsistent. Anand and Ravallion (1993) presented further evidence that both social spending and growth matter for social indicators. Their analysis showed a significant income effect, but this effect seemed to be small relative to the effects of public health spending. Aturpane et al (1994) studied this issue as a comparison between Pakistan and Sri Lanka and concluded that income growth, while important, is not the primary determinant of improvement in social indicators.

Isenman (1980) fitted the following model using the data from 59 countries :

log (life expectancy) = 3.2+0.13 log (GDP per capita).

The model implies that a 1% increase in per capita GDP will increase the life expectancy at birth by 0.13 percent.

We have used the same model for 15 States of India in 1991 and our model gives.

log (life expectancy) = 2.77)+0.15 log (net SDP per capita)

(6.05)* (2.99)*

$R^2 = 0.39$.

Our model implies that a 1% increase in per capita SDP will increase the life expectancy at birth by 0.15 percent and in our model the t Statistics are significant at 5% level of significance. The Correlation Coefficient between the two variables are observed to be 0.62. However, net SDP per capita alone can explain only 0.39 percent variation of the variables. Lest there be error of omitted variables we introduce another variable in the same model as :

log (LE) = 2.78 + .14 log (net SDP per capita) + .018 log (expenditure on health per capita)

(5.82)*, (2.13)* (.02)

$R^2 = 0.392$.

The introduction of new variable does not have significant impact as explanatory variable as R^2 remains almost the same. Hence we introduce another new variable in our model as :

log (LE) = 3.32 + 0.10 log (net SDP per capita) - 0.001 log (expenditure on health per capita)

(3.74)* 1.24) -.01

- 0.04 log (population below poverty line)

(-.75)

$R^2 = 0.42$.

With the introduction of the new variable R^2 increases to .42. In our exercise the value of Correlation Coefficient between LE and expenditure on health per capital is 0.42 and the value of Correlation Coefficient between LE and population below poverty line is -0.58 as against the value 0.62 between LE and per capita net SDP. So far as the value of Correlation Coefficient is concerned, the association between income and LE is the strongest and that of expenditure on health and LE is the weakest.

We carry on the same exercise for literacy rate of 15 States of India in 1991 and other variables as follows :

log (Literacy rate) = 0.73+0.37 log (net SDP, per capita)

(.52) 2.40)*

$R^2 = 0.29$.

This model implies that one percent increase in per capita net SDP will increase the literacy rate (LR) by 0.37 percent. In this model per capita net SDP can explain only 29% variation in literacy rate. The second model gives :

log (Literacy rate) = 0.54 - 0.09 log (net SDP per capita) + 0.92 log (expenditure on education on per capita) (.52) (-.53) (3.46)*

$R^2 = 0.63$.

With the introduction of expenditure on health (public action) in the same model, the sign of the coefficient of income per capita becomes negative. The expenditure on educations by government has a significant role on the literacy rate. Again this model can explain 63% of the variation in literacy rate by the two factors of the model. The third model gives:

log (LR) = - 2.20 + 0.02 log (net SDP per capita)+1.16 log (expenditure on health per capita)

(-1.11) (0.11) (4.03)*

+ .20 log (population below poverty line)

(1.67)

$R^2 = 0.70$.

Here again the coefficient of income has a very negligible and insignificant effect on the literacy rate and the strongest and significant effect is shown by per capita expenditure on health. The model gives $R^2 = .70$.

The value of Coefficient of Correlation between LR and income is .54, between LR and per capita expenditure on health is .79 and between LR and population below poverty line is -.44. Hence the degree of association between LR and per capita expenditure on health is the strongest and the negatives association between LR and population below poverty line is the weakest.

Anand and Ravallion (1993) introduced the following model to measure the proportionate reduction in shortfall of LE from 80 years against the log of mean national income across 22 Countries: - log (80 - LE) = - 6.15 + 0.45 log (GNP per capita)

(2.07) (4.00)

$R^2 = 0.45$.

From this model they concluded that there is significant partial Correlation between life expectancy and average income. The model also implies that income variations tend to explain not much more than half the differences in life expectancy as $R^2 = .45$. So the association between income and LE is far from perfect.

We have also used the same model and obtained the following result

- log (80 - LE) = - 6.94 + 0.46 log (per capita net SDP)

(- 3.83)* (2.28)*

$R^2 = 0.27$.

Our results confirm that variation in income tend to explain only one-fourth the difference in LE. Other conclusions of the previous model are also confirmed in this model.

On adding poverty index and public health spending per person in the above regression, the significant positive relationship between life expectancy and average income vanishes entirely. This is given by the following equation

- log (80 - LE) = - 1.08 - 0.28 log (GNP per person) - 0.21 log (proportion of population
(2.34) (1.34) (2.36)
consuming less than PPP$ 1 per day in 1985) + .30 log (public health spending per person)
(3.02)

$R^2 = 0.71$.

With the addition of these two variables, the Coefficient of log (GNP per person) reverses sign

though it ceases to be significantly different from zero.

Our data on the States of India obtained the following equation:

- log (80 - LE) = - 3.98 + 0.17 log (SDP per head) + 0.74 log (public spending on health per
(-1.17) (0.52) (0.21) capita)

- 0.22 log (proportion of population below poverty line)

(-1.05)

$R^2 = 0.35$.

In our model the significant positive relation between LE and per capita net SDP has reduced sharply, though it has still a positive sign for the Coefficient on log (net SDP per capita). The Coefficient of log (public spending on health per capita) in our model has a much higher positive value than that of the model of Anand and Ravallion (1993). The negative values of the Coefficient of people below poverty line are almost the same for Indian states and 22 Countries of the earlier study.

From the above results we can conclude, as Anand and Ravallion (1993) did , that it is not true that per capita income is less important in expanding life expectancy; rather it is clear that the importance of income lies in the way that its benefits are distributed between people and the extent to which growth in income supports public health services.

On regressing a suitable nonlinear transformation of literacy to measure the proportionate reduction in shortfall of the literacy rate from 100 against the log GNP per person across 22 countries Anand and Revellion obtained the following result

- log (100 - Literacy) = - 10.21+ 0.95 log (GNP) per person)

(3.56) (4.55)

$R^2 = 0.51$.

In this model income variations tend to explain half of the differences in literacy rate with R^2 of 0.51.

Using the same regression our exercise gives

- log (100 - LR) = - 6.86 + 0.36 log (per capita net SDP)

(-2.24)* (1.05)

$R^2 = 0.07$

Adding the poverty index and public spending on education per person, Anand Revellion

obtained the regression:

- log (100 - LR) = - 9.5 + 1.12 log (GNP per person) - 0.27 log (proportion of population
(1.86) (2.56) (1.24) consuming less than
PPP$ per day in 1985 + 0.33 log (public spending on education per person)
(1.02)

$R^2 = 0.56$.

They explained that the lack of any significant correlation between literacy and public spending on education reflects the fact that a large share of public spending on education goes to secondary and tertiary levels of schooling in poor countries and literacy impact should be largely confined to spending on primary level schooling. The lack of any significant Correlation with poverty reflects the fact that most people in developing countries, particularly poor people, attend publicly provided free primary schools.

However our results from the regression equation gives

-log (100 - LR) = - 9.81 - 0.58 log (net SDP per capita) + 2.28 log (expenditure education
(-2.09) (-1.36) (3.36)* per head) + 0.19 In (population
below poverty line) (+ 0.65)

$R^2 = 0.55$.

Adding the extra two variables in our equation the sign of the coefficient on log (net SDP per capita) becomes negative by. The public expenditure on health per capita has a significant positive role in the literacy rate of Indian States. It should be noted that the Coefficient of log (population below poverty line) gives a positive value against the expected negative value. This also confirms the Anand and Revellion explanation that poor people attend publicly provided free primary schools. Again in India different steps have been taken to increase the literacy rate of the poor people like mid-day meal free provision of text books, and similar measures.

From the above analysis and results it is not evident that econimic growth does not expand social indicators like life expectancy and literacy rate. It is indicated that their connections are seriously contingent upon and depends on how the fruits of economic growth are shared, in particular what the poor get and how far additional resources are used to support public services. In other words, our results also support the recent views of the relationship between income and social indicators; that growth, while important, is not the only explanation for improvement in social indicators.