

## Income Distribution and Development : Some Stylized Facts

MONTEK S. AHLUWALIA\*

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In recent years, the relationship between income distribution and the process of development has come under increasing scrutiny. Much of the debate has focused on the hypothesis, originally advanced by Simon Kuznets, that the secular behavior of inequality follows an inverted U-shaped pattern with inequality first increasing and then decreasing with development. This hypothesis has become so much a part of the conventional wisdom on this subject that it has generated considerable skepticism about the welfare implications of the development process. Indeed, on some interpretations, developing countries face the grim prospect not just of increasing relative inequality, but also of declining absolute incomes for the lower income groups.

The object of this paper is to reexamine the empirical basis for this hypothesis, using a recent compilation of cross-country data.<sup>1</sup> We have used multiple regression to estimate cross-country relationships between inequality, as reflected in the income shares of various percentile groups, and selected explanatory variables reflecting different aspects of the development process. Needless to say, associational relationships of this type do not establish causality. They are better described as “stylized facts,” which can be observed, but which then need to be explained by an appropriate theory.

### I. Short and Long Term Relationships

As a first step, it is useful to distinguish between two types of relationships that might obtain between income distribution and development; there may be a long-term or secular relationship between the degree of inequality and the level of development, and there may be a short-term relationship between inequality and the rate of growth. Both types have been discussed in the literature, but the importance of distinguishing between them has not been adequately recognized.

Kuznets' hypothesis clearly referred to a secular relationship generated by long-term changes in economic structure. It was, after all, based on an observed trend in this century towards a reduction in inequality in some of the now developed countries, which Kuznets contrasted with the “more probable” trend of widening inequality in the early stages of their industrialization. In contrast with this type of long-term relationship, some of the recent debate has focused on much more short-term phenomena. Thus it has been suggested that high growth rates in some less developed countries (*LDC*), observed over comparatively short periods, e.g., Brazil between 1960 and 1970, have led to a marked increase in income inequality. While such an outcome can be explained simply in terms of Kuznets' hypothesis—a higher rate of growth raises the level of development, which in turn affects inequality—it is noteworthy that the debate on this issue has a somewhat different flavor. There is a distinct suspicion that there are short-term forces operating independently of the long-term phenomenon which generate higher inequality as a consequence of faster growth. For example, if growth is concentrated in particular regions or sectors (as is very likely to be the case), then lags in labor mobility may create factor market disequilibria which generate significant income differentials. It is easily seen that such differentials need to be distinguished from income differentials reflecting long-term structural factors such as the scarcity of labor skills. They are superimposed on the structurally determined income differentials and may be seen (and are often defended) as necessary lubricants to overcome some of the frictional resistance to the pursuit of high growth rates.

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<sup>1</sup> Income distribution data for 62 countries (including 14 developed countries and 6 Socialist countries) were taken from a recent compilation of available data (see Shail Jain). Data on explanatory variables for years corresponding to the observations on income distribution are taken from the World Bank's data files.

We can test for each of these relationships by appropriate choice of explanatory variables in our regression equations. The secular relationship can be tested by including per capita GNP (in various transformations) as an explanatory variable and the short-term relationship can be tested by including the rate of growth of GDP over the past ten years as an additional explanatory variable. The relevant findings of our cross section analysis can be summarized as follows. See equations (1a), (2a), (3a) and (4a) in Table 1.

(1) There is substantial confirmation of a statistically significant relationship between the income shares of various percentile groups and the logarithm of per capita GNP. Furthermore, the relationship is clearly not monotonic since a significant relationship is identified only when the per capita GNP variable is entered in quadratic form. This formulation generates the familiar U-shaped pattern: the income share of the lower income groups (alternatively defined as the lowest 60 percent and the lowest 40 percent) first declines and then rises with increasing per capita GNP, while the share of the upper income group (top 20 percent) describes the opposite pattern. Similar results have been reported by Irma Adelman and Cynthia Morris and Hollis Chenery and M. Syrquin.

(2) By contrast, there is no evidence of an independent short-term relationship between the level of inequality and the rate of growth of GDP over the recent past. The coefficient on this variable was insignificant in all the equations estimated in experimenting with alternative functional forms and different combinations of other explanatory variables.

The lack of a significant relationship between inequality and the rate of growth is potentially important in defining the nature of the relationship between distribution and development. It suggests that while there may be a secular time path for inequality which developing countries must traverse and which contains a phase of increasing inequality, there is at least no evidence that faster growing countries show higher inequality at the same level of development than slower growing countries. If this is true, policymakers are perhaps best advised to think of the rate of growth as determining essentially the speed of transition through the different phases of development and inequality: higher growth rates accelerate the transition without necessarily generating greater inequality than can be structurally expected in each phase.

We hasten to add that our cross-section results provide only weak evidence for this point of view. For example, we cannot deny that particular types of growth processes may have markedly adverse effects on inequality. The cross-section evidence only establishes that fast growers do not systematically display any such pattern i.e., if there are countries in which this is true, there are others whose experience is of the opposite variety. Recognizing this diversity of experience is perhaps the most important lesson to be learned from the data. At the very least, it shifts the focus of debate away from a naive (and quite possibly dangerous) suspicion of high growth rates as such towards an examination of the particular nature of growth in different countries and the implications of different types of growth for inequality. Inquiries along these lines must figure high on any agenda of research on income distribution, but until their results persuade us to the contrary, the verdict on growth rates need not be unequivocally pessimistic.

## II. The Secular Relationship

We now turn to a more detailed examination of the long-term or secular relationship identified above. The observed U-shaped relationship between inequality and per capita CAT obviously reflects the net effect on inequality of a number of structural changes occurring with development. The nature of these changes has been extensively discussed in the literature, albeit only in general terms.<sup>2</sup> One of the mechanisms generating an increase in relative inequality in the early stages of development is the shift of population from the low income, slow growing, traditional sectors to the high income, faster growing, modern sectors of the economy. The difference in mean incomes between sectors suffices for such a

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<sup>2</sup> Systematic historical studies of their impact in particular countries have yet to be conducted—the lack of time series data being a major limitation

process to produce a phase of increasing inequality, and this tendency is further reinforced if the modern sectors are also characterized by greater within-sector inequality. There are other factors which operate to reverse the process of increasing inequality in the later stages of development. For one thing, as the modern sector expands, it absorbs larger proportions of the labor force into high income employment, thus reducing the pressure of population in the traditional sectors and thereby narrowing intersector income differentials. Equally important, there are long-term forces which operate to reduce inequality within the modern sector. The cumulative impact of an expanded education system and a long established modern sector is to create a highly trained labor force with a more equal dispersion of skills which generates both an increase in the share of wage income as well as greater equality in its distribution. This tendency is further strengthened by improvement in labor organization.

We have attempted to quantify the impact of some of these mechanisms by including in our regression equations selected explanatory variables which reflect these structural changes. In general, we find that explanatory variables reflecting expansion in education, diminution of demographic pressures, and changes in the structure of production in favor of the modern sector are significantly related to the observed cross country patterns in inequality. The inclusion of these variables, in addition to the quadratic in per capita *GNP*, substantially improves the percentage of variation explained by the regression equations. See Table 1, equations (1b), (2b), (3b) and (4b). Our findings can be summarized as follows:

(1) Improvements in the quality of human resources have long been thought to be a major force for reduction in inequality. (See especially, Adelman and Morris). Measuring improvements in this dimension obviously poses formidable conceptual and empirical problems. At the very least, we need data on the skill structure of the labor force, but even this is not available for most of the countries in our sample. We have therefore experimented with the literacy rate and various definitions of the school enrollment rates as explanatory variables roughly reflecting the quality of human resources. As shown in Table 1, improvements in literacy have a beneficial impact on the income share of the lowest 40 percent while the secondary school enrollment rate has a beneficial impact on the income share of the middle 40 percent, probably reflecting the exclusion of the lower income groups from access to schooling. It is important to note that in each case, the increase in income share occurs at the expense of a reduction in income share of the top 20 percent—an unambiguous improvement from a welfare point of view. We note in passing that in the case of the middle income groups the inclusion of education as an explanatory variable has the effect of making the per capita *GNP* variables insignificant.

(2) There are strong a priori reasons for supposing that demographic pressures have an important impact on income inequality. High growth rates of population are likely to generate greater inequality by perpetuating the phenomenon of “surplus labor,” in the sense that a large proportion of the work force remains locked into low income employment in the traditional *or informal sectors of the economy*. The cross-section results provide substantial support for this point of view. The rate of growth of population is highly significant as an explanatory variable in all our equations, and as we would expect, it has an adverse effect on the income shares of the lower and middle groups while raising the income share of the top 20 percent.

(3) We find some support for Kuznets’ original suggestion that changes in the structure of production provide a mechanism through which development affects inequality. The process Kuznets had in mind has two aspects — declining relative importance of agricultural production in total output, and a shift in population from the low income agricultural sector to the high income modern sector. We have modeled each aspect separately by using two explanatory variables, the share of agriculture in total *GDP* and the share of urban population in the total population. We find that each variable is significantly related to the pattern of inequality but their effects on the income shares of different groups are not identical. The share of agriculture in *GDP* is not significantly related to the income shares of the lowest groups, but it is positively related to the income shares of the middle groups and negatively related to the income shares of the top 20 percent [equations (2b) and (1b)]. By contrast, the share of the urban population in the total has no effect on the income share of the middle group, but it is positively associated with the income shares of the lowest

groups and negatively with the income share of the top 20 percent [equations (3b), (4b) and (lb)].

**TABLE 1— CROSS-COUNTRY REGRESSIONS EXPLAINING INCOME SHARES**  
(Values in Parentheses are T Ratios)<sup>a</sup>

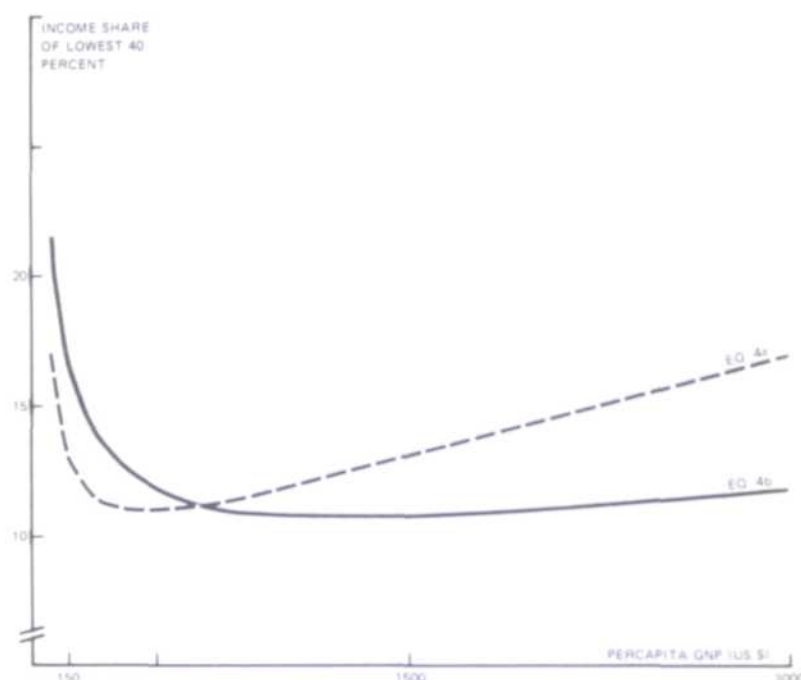
Explanatory Variables	Dependent Variable: Percentage Income Shares							
	Top 20 percent		Middle 40 percent		Lowest 60 percent		Lowest 40 percent	
	Eq.(1a)	Eq.(1b)	Eq.(2a)	Eq.(2b)	Eq.(3a)	Eq.(3b)	Eq.(4a)	Eq.(4b)
1. Constant	-65.27 (2.28)	-9.07 (0.27)	89.47 (4.68)	31.15 (1.34)	128.60 (5.95)	110.20 (4.14)	75.77 (5.47)	77.93 (4.11)
2. <i>log per capita GNP</i>	96.94 (4.47)	50.35 (2.13)	-48.21 (3.33)	-3.07 (0.19)	-81.39 (4.98)	-62.66 (3.40)	-48.70 (4.65)	-47.28 (3.60)
3. <i>log per capita GNP</i> <sup>2</sup>	-18.86 (4.85)	-8.16 (1.98)	9.76 (3.76)	0.52 (0.19)	15.48 (5.28)	10.14 (3.16)	9.09 (4.84)	7.65 (3.35)
4. Growth rate of <i>GDP</i>	-0.22 (0.48)	-0.11 (0.32)	0.13 (0.44)	0.001 (0.01)	0.19 (0.54)	0.18 (0.63)	0.08 (0.37)	0.11 (0.55)
5. Literacy rate		-0.09 (2.21)		.03 (1.16)		0.09 (2.87)		0.06 (2.56)
6. Secondary school enrollment		-0.14 (2.48)		0.12 (3.02)		0.07 (1.6)		0.02 (0.74)
7. Growth rate of population		3.59 (4.29)		-2.40 (4.20)		-2.54 (3.89)		-1.19 (2.56)
8. Share of agriculture in <i>GDP</i>		-0.25 (2.23)		0.21 (2.70)		0.13 (0.43)		0.04 (0.65)
9. Share of urban population		-0.10 (1.68)		0.04 (1.00)		0.08 (1.82)		0.06 (1.79)
10. Dummy for socialist countries	-20.27 (6.72)	-9.41 (3.27)	8.14 (4.04)	0.85 (0.40)	17.76 (7.80)	10.24 (4.56)	12.13 (8.32)	8.57 (5.35)
$\bar{R}^2$	.58	.76	.46	.68	.60	.76	.59	.69
<i>F</i>	21.6	22.3	14.1	15.5	24.16	22.4		16.21
<i>SEE</i>	6.4	4.6	4.3	3.2	4.9	3.6	3.11	2.0
Estimated turning point of quadratic (per capita <i>GNP</i> in US\$)	372	1217	94	-	425	1230	477	1231

<sup>a</sup> For our sample, a T value of 1.68 indicates significance at the 10 percent level for a two-tailed test.

This suggests an interesting asymmetry in the distributional impact of structural change. As the share of agriculture in *GDP* declines with development, there is a relative shift of income away from the middle and towards the upper groups. Alongside this process, however,

development also generates a shift of population to the modern or urban sectors, and this process, appears to favor the lowest income groups at the expense of the rich. This asymmetry between the impact on the middle and lower groups is not entirely implausible. At some risk of stretching our evidence too far, we can speculate that the decline in relative importance of agriculture is likely to have its strongest impact on small and middle sized landholding cultivators who may dominate the middle income groups, while the parallel process of increasing urbanization favors the low income population because it reflects increased employment in urban areas and a reduced pressure of population in the rural areas.

(4) Finally, we find that socialist countries display markedly greater equality than others as shown by the positive and significant coefficients on the dummy variables in equations (3a), (3b), (4a) and (4b).



**Figure 1 Estimated Relationship Between Income Shares and Per Capita GNP**

These findings provide some clues to the casual mechanisms that lie behind the conventionally described U-shaped behavior of inequality. They are no more than clues because the essential complexity of a dynamic process cannot be adequately captured in a single equation. It is however interesting to examine how the explicit inclusion of these structural variables affects the relationship between income shares and per capita GNP. We find that while the coefficients on both terms in the quadratic remain significant for the upper and lower groups, the exact shape of the relationship is substantially altered. Figure 1 traces the conventional U-shaped relationship between income shares for the lowest 40 percent as estimated from equation (4a), and compares it with the relationship implied by equation (4b) in which the effects of the structural change variables are netted out.<sup>3</sup> The two curves differ substantially in that the ascending phase for income shares is almost completely flattened out in equation (4b) while the descending phase is more or less unchanged.

This suggests that the familiar U-shaped relationship captured in (4a) reflects the operation of two quite distinct forces. The improvement in income distribution which characterizes the “later phases” of development can be attributed to the operation of identifiable structural changes which favor equality, viz.: the cumulative impact of

<sup>3</sup> The estimated values are computed from the equations by holding the dummy variable for Socialist countries at zero and holding all explanatory-variables other than per capita GSP constant at their mean value for the sample.

improvements in the human resource base, a reduction in the rate of growth of population, and a growing capacity on the part of the modern sector to absorb population from the low income traditional sectors. These variables however do not explain the observed deterioration in inequality in the early stages of development. This descending phase of the U-curve remains a "stylized fact" for which we need some special explanation. We can only conclude that there are structural mechanisms, which are not captured by the variables used in our analysis, which appear to produce a worsening of relative inequality in the early stages of development.

### **III. Relative Inequality and Absolute Impoverishment**

This prospect of declining income shares of the lower income groups raises obvious questions about the welfare aspects of development. In pursuing these questions, we should distinguish between two alternative views of the underlying process. The pessimistic view holds that this pattern reflects a process of absolute impoverishment of lower income groups in developing countries. (See for example Adelman and Morris.) Such an outcome cannot be ruled out a priori. It may result from an erosion of traditional economic structure—against the impact of an aggressively expanding modern sector, competing against traditional sectors both for markets and resources. The resulting disruption of the preexisting economic system could lead to absolute impoverishment for some groups. There is, however, another view of the process that is somewhat less pessimistic. On this view, the worsening in relative inequality occurs not because there is a decline in the absolute incomes for the lower income groups but because rates of growth of income are lower than for upper income groups. Thus if development occurs through opportunities for economic expansion becoming available initially to upper income groups, and if these groups have relatively weak income linkages with lower income groups, we would expect development to be accompanied by an increase in relative inequality, although no absolute impoverishment need occur. The essential distinction between these two views lies in whether we assume that the disruption of low income traditional economic activities is an essential precondition for growth of the modern sector, or whether the problem is primarily one of insufficient linkage. In the latter case the problem appears somehow more tractable since we are no longer dealing with an inherent contradiction in the development process.

Cross-section analysis cannot take us very far in choosing between two such opposite views of the development process; the choice raises issues which are central to our understanding of the nature of development and these issues call for much fuller theoretical and empirical investigation. But, in keeping with our stated objective, we can at least document the stylized facts of cross-country experience. A crude measure of the average absolute income level in each percentile group can be obtained by multiplying the ratio of income shares to population shares of the group by per capita GNP of the economy (data on per capita personal income, which is the correct variable to use, are not available). Using equations (3a), (3b), (4a) and (4b) to estimate income shares of the lowest 40 percent and lowest 60 percent at different levels of per capita GNP, we can obtain estimates of absolute income levels in these groups at different levels of development. None of these estimates shows any decline in the absolute average income of the poor as per capita GNP rises. Alternatively, we have used the actual income share data to estimate the average absolute income of the lowest 40 percent and the lowest 60 percent. This estimate of average absolute incomes of the poor was then used as a dependent variable (in logarithmic form) in cross-country regression equations. Testing for a quadratic relationship with the logarithm of per capita GNP for the economy as a whole, we find that the negative term in the quadratic is not significant. This suggests that while there is substantial support for the hypothesis that relative inequality increases in the early stages of development, the cross-country evidence does not support the stronger hypothesis that there is also an actual decline in the absolute income level of the poorer groups in this phase.

We should be careful not to read too much into this finding. Clearly, the percentile groups are very large and the observed behavior of average incomes for such groups may hide significant declines in the absolute incomes of particular socio-economic groups which may be offset by above-average growth in income for other groups. Besides, the relationships discussed above are at best descriptions of "average" cross-country behavior; leaving

ample room for inter-country differences. Nevertheless, it is important to record that the stronger hypothesis of declining absolute incomes for large sections of the population is not so unequivocally established by cross-country data as to be uncritically accepted as one of the "stylized facts" about development.

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