This paper, based on recent data for 44 developing countries, examines income distribution and its relationship to various economic and non-economic forces.

Development Research Center
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TABLE OF CONTENTS

I. INTRODUCTION ................................................. 1
II. THE DEPENDENT VARIABLES .............................. 2
III. THE INDEPENDENT VARIABLES ......................... 4
IV. STATISTICAL METHOD ....................................... 8
V. THE SHARE OF INCOME ACCRUIING TO THE
   (a) Lowest 20 per cent of the Population ..... 12
   (b) Lowest 60 per cent of the Population ..... 13
   (c) Middle Income Groups ......................... 15
   (d) Upper 5 per cent of the Population ....... 15
   (e) Upper 20 per cent of the Population ...... 18
VI. SUMMARY AND CONCLUSIONS ............................. 18
VII. APPENDIX A
    Definition of the Dualism Indicator ............. 23
AN ANATOMY OF INCOME DISTRIBUTION PATTERNS IN DEVELOPING NATIONS -
A SUMMARY OF FINDINGS *

Irma Adelman and Cynthia Taft Morris

The distribution of income among the individuals and households of a nation is central to its economic welfare. An understanding of the interactions between the inequalities of income distribution and various aspects of economic and social modernization is therefore essential for the formulation of appropriate development policy. This study is an empirical investigation into the sources of intercountry variation in various facets of income distribution in 44 underdeveloped nations, which span the range from predominantly subsistence economies to those rapidly approaching a developed state; Japan and Israel are also included.

Most of the theoretical discussion on income distribution refers to the manner in which functional shares are determined, i.e., shares accruing to the factors of production—land, labor, capital, and entrepreneurship. The establishment of functional shares, and the quantities of these factors possessed by individuals, then ipso facto determine the distribution of personal incomes. But many qualifications must be introduced in the application of such a theory, especially in developing countries. Differences in individual wages are often the result of non-market considerations—norms set by the previous, colonial power or a politically powerful traditional elite, and influenced by semiarbitrary scales for government employees,

the social philosophy of the government, minimum wage laws, the degree of (often premature) unionization, and the role of expatriates. The extent of concentration of income in underdeveloped nations should therefore depend not only on various aspects of the structure of the economy, its factor endowments, institutions, and linkages with the rest of the world, but also on the political complexion of the government, the country's colonial heritage, the structure of political power and pressure mechanisms, and the recentness of independence. Various indices of economic, political and social forces which could on a priori grounds be expected to exert an impact upon the distribution of income were therefore introduced into the analysis as independent variables.

The Dependent Variables

Data on income distribution are notoriously unreliable, even in developed countries. The raw data are usually derived from information supplied by the income recipients themselves; its accuracy is therefore a function of the recall of the respondent, of his perception of the use to which the information will be put, of his veracity about a sensitive subject, etc. Three types of sources were used to construct the income distribution tables in this study: budget or income-expenditure studies which sample different strata of the population; income information compiled from national censuses; and tax returns. This last source may be somewhat more reliable, but was available in very few countries. In some cases, the results of budget studies referring to particular segments of the population (e.g., only urban, or only wage earners) were used
in conjunction with data from the national accounts statistics and from other sources to construct the overall picture of income distribution. In some cases, the basic information was exceedingly coarse; a finer breakdown into class intervals was achieved by fitting the distributions to similar empirical or theoretical distributions. Whenever the lowest end of the lowest income class was not given, the minimum income was estimated by fitting a Pareto curve to the data. Whenever the average income in the upper class interval was not given, it was estimated by selecting a value which would equate the average per capita (or per household) income estimated from the income distribution to the corresponding value estimated from the national accounts.

There were other sources of incompatibility in the basic data. Some of the information, for example, referred to households, some to individuals, and some to active population. Information on households was preferred because of theoretical considerations. It should be noted, however, that for a given country the distribution based on active population indicates less concentration than the distribution based on households; the latter, in turn, shows less concentration than data for individuals. Since the percentage adjustment differs with the nature of the distribution, no adjustment on this score was attempted. Also, our data refer to various years in the late fifties and through the sixties; income distributions do not change very rapidly, however. What is more serious is that the extent of detail differs substantially among countries, varying from 28 class intervals for Zambia to 5 class intervals for some African and Latin American nations; the more detail provided, the greater is the estimate of concentration.
The basic data for the study are summarized in Table 1.* Six different dependent variables were constructed from the data:

1. The income share of the poorest 20 percent of the population.
2. The proportion of the total product accruing to the lowest 60 percent of the population.
3. The ratio of income of the middle 40-60 percent quintile (i.e., the households 10 percent below and 10 percent above the median income households).
4. The share of total output accruing to the wealthiest 5 percent of the population.
5. The percentage of national income accruing to the upper 20 percent of the population.
6. The concentration (Gini) coefficient. This index is a measure of the extent of departure of the actual income distribution from a uniform income distribution, and represents the best single index of overall concentration. However, income distributions with very different properties can have the same concentration ratio. **

The Independent Variables

A wide range of independent variables, chosen as having some possible relationship with the aspects of income distribution described above, were tested in the analysis. They include 18 economic indicators, five socio-cultural indicators, and eight political indicators. For the most part,

* For the list of sources for the data, together with the estimates of country income distributions used to obtain figures in this table, readers should consult the original document.

** Since results of analysis with the Gini coefficient added little to those using measures (1) to (5), such results are not described in this excerpt.
Table 1: Income Distribution Estimates
Percentage Shares in Total National Income
Going to Population Groups of Different
Income Levels in 44 Countries

<table>
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<tr>
<th>Country</th>
<th>Poorest 20%</th>
<th>Poorest 60%</th>
<th>Middle 40-60%</th>
<th>Highest 5%</th>
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**Averages**

|       | 5.6 | 26  | 12  | 30  | 56  |
indicators refer to conditions in the early 1960s. Of this array of 31 variables, the following 12 (not listed in order of importance) proved to be the most significant in explaining one or more of the breakdowns in income distribution:


2. **Abundance of natural resources.** This grouping of countries was based upon information regarding the quantity and variety of fuel and other mineral resources, together with data on the amount of agricultural land available per capita.

3. **Extent of dualism (about 1960).** This index stratifies countries by the presence and extent of socio-economic and technical dualism. At one pole are the largely agrarian societies having subsistence farming with extremely small exchange sectors. At the other pole are countries with concentrated development of a limited modern sector (especially in petroleum), often by foreign capital, contrasting with backward, traditional agriculture. Intermediate are societies where a widely developed modern sector is superimposed upon a predominantly agrarian society, and countries in which the growth of an indigenous small-farm-cash-crop sector using modern techniques has evolved at the expense of a traditional subsistence sector.

4. **Level of modernization of techniques of agriculture (about 1961).** This indicator is a composite based upon the extent of use of mechanical power, fertilizer, and other modern techniques in agriculture, and the relative weight of traditional and of modern agriculture.

5. **Character of agricultural organization (about 1960).** This index combines indices of land-tenure patterns and the size and viability of farming units. Various types of agrarian structure are viewed as located along a scale, one end of which is represented by communally owned agricultural lands on which the marketing of crops is only of incidental importance, and the other end of which is depicted by commercial agriculture in which owner-operated farms are sufficiently large to be economical viable. Intermediate on the scale are tenant-operated subsistence farms and large owner-absentee commercial farms or plantations.

6. **Rate of improvement in human resources (1961).** This indicator is a weighted average of secondary and higher level school enrollment ratios as a percentage of the relevant age group. We call this index the rate of improvement in human resources since it measures the rate of additions to the stock of education rather than the total stock of education.

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*Detailed descriptions of country classification schemes and sources of data are given in I. Adelman and C. Taft Morris, Society, Politics, and Economic Development - A Quantitative Approach (Johns Hopkins Press, 1967). To indicate how these classifications are constructed the classification scheme for dualism is appended in Appendix A.*
7. **Potential for economic development.** Seventy-four underdeveloped countries are grouped into three categories according to their performance during the period 1950/51 to 1963/64 in raising rates of growth of per capita GNP and improvements in seven areas of economic institutions and activities (described in an earlier work by the same authors).

8. **Importance of the indigenous middle class (about 1960).** This classification is based upon the relative size and political importance of indigenous people in middle class occupations in less developed countries, including entrepreneurs, and managerial, technical, administrative, commercial and banking employees.

9. **Extent of social mobility (about 1960).** This classification is based upon a composite measure of several aspects of social mobility, including the extent of racial or cultural barriers to mobility, the extent of educational opportunity, and access to membership in the middle class.

10. **Degree of cultural and ethnic homogeneity (about 1960).** Countries are ranked into groups differentiated by the proportion of the population which speaks the dominant language; distinctions within categories are based upon the extent of ethnic and religious heterogeneity.

11. **Extent of political participation (1957-1962).** This variable is an aggregate of three elements: the extent to which the major socio-economic and cultural-ethnic groups have their interests represented in national political decisions; the extent of choice among political channels for national representation; and the extent of actual participation in national political processes.

12. **Extent of direct government economic activity (about 1960).** This classification is based upon the share of government investment in total net investment.

In addition, the following variables were found to have significant relationships with one or more aspects of income distribution, but in each case less significant than one of the 12 variables just enumerated. They were: degree of improvement in agriculture since 1950; level of modernization in industry; increase in industrialization since 1950; structure of foreign trade (primary vs. processed exports); effectiveness
of financial institutions; level of socio-economic development (index with 24 components); percentage of literacy; political strength of the traditional elite; strength of the labor movement; political strength of the military; and the degree of commitment of the leadership to promoting economic development.

Finally, of the 31 variables chosen as having on a priori grounds some possible relevance to income distribution, the following were found not to yield significant relationships in this analysis: proportion of the population in traditional subsistence agriculture; size and pattern of development (population size combined with industrial orientation); adequacy of physical overhead capital; effectiveness of the tax system; population numbers; urbanization (percentage of population in centers over 20,000); colonial experience (whether British, French, or other); and number of years of self-government.

Statistical Method

The technique used here divides the original sample into a series of subgroups constructed so as to make the difference among subgroups (and, hence, the similarity within subgroups) as great as possible. The initial sample (44 countries arrayed according to income distribution—e.g., the share of the lowest 20 percent) is tested against each of the independent variables (e.g., per capita GNP), with the latter divided into two mutually exclusive groups (e.g., countries with GNP above X, and countries with GNP below X). Mean values for the dependent variable in both groups (e.g., average shares of the lowest 20 percent of population in the high per
capita GNP countries, and a similar average for the low GNP countries) and the variances of these means from the overall mean of the group are compared for each split (i.e., for each possible \( X \) value of per capita GNP used to split the group in two). For every independent variable, that partition is selected which maximizes the fraction of total variance in the dependent variable explained (i.e., maximizes the sum of the squared deviations of the group means from the overall mean). That variable is chosen for which the best split accounts for the greatest portion of overall variance in the dependent variable. After the initial split, the two groups of countries are then further subdivided, using the same method. This subdivision is continued, using the best variable for splitting of groups in each case, until subgroups of 10 or less are reached—or until a subgroup of more than 10 cannot be split by using any variable to produce a statistically significant result (at least 10 per cent of the variance by an \( F \) test).

The above technique is very well suited to the study of systematic interactions among a dependent variable, on the one hand, and a set of independent variables on the other, when the best principles for stratifying the original data into subsamples is not known \textit{a priori} and when there is reason to believe that the phenomenon to be analyzed affects different parts of the data differently.

In the charts below, showing the results of this analysis for the five measures of income distribution, the splitting of groups and subgroups is presented in pictorial form. The box on the left shows the original group
of 44 countries and its average value for the dependent variable (on Figure 1: \( N = 44 \), and \( \bar{y} = 5.6 \) per cent which is the average of the shares in income of the poorest 20 per cent of the population in each country).

Lines branch out to the right to two boxes, in which the same \( N \) (number of countries) and \( \bar{y} \) (average share of the poorest 20 per cent) values for each group of countries appear, along with a statement of characteristics that differentiate the two groups. Next to the point where the two lines move apart is the name of the variable used to make the split, and the proportion of variance accounted for by the split (on Figure 1: the first variable used is "Dualism", accounting for 35 per cent of the variance). As these groups of countries are split into subgroups, more lines and boxes appear with the same notations, moving to the right on the chart. In the upper left corner, the percentage of variance accounted for by the entire analysis (coefficient of multiple determination, \( R^2 \) adjusted for degrees of freedom) is shown. Names of countries are given for the box that represents the smallest subgroup in which they appear.
Figure 1: The Share of Income of the Poorest 20% of the Population

Variance accounted for jointly: .56

Group 3
\( \bar{y} = 5.6\% \) limited dualism; low development
N = 10

Group 2
\( \bar{y} = 4.8\% \) sharp and moderate dualism
N = 34

Group 5
\( \bar{y} = 5.2\% \) moderate and high productivity
N = 29

Group 6
\( \bar{y} = 4.6\% \) commercial agriculture
N = 24

Group 7
\( \bar{y} = 7\% \) small farms
N = 5

Group 8
\( \bar{y} = 6.8\% \) high mobility
N = 4

Group 9
\( \bar{y} = 6.8\% \) high mobility
N = 4

Group 4.
\( \bar{y} = 2.2\% \) low productivity
N = 5

Group 7:
Ecuador, India, Morocco, Pakistan, Tanzania

Group 8:
Brazil, Ceylon, Chile, Colombia, Costa Rica, El Salvador, Jamaica, Lebanon, Mexico, Panama, Peru, Philippines, Rhodesia, South Africa, Sudan, Taiwan, Trinidad, Tunisia, Venezuela, Zambia

Group 3: Bolivia, Burma, Chad, Dahomey, Ivory Coast, Kenya, Malagasy, Niger, Nigeria, Surinam

Group 4: Gabon, Iraq, Libya, Senegal, Sierra Leone

Group 5:
Agricultural Productivity (.26)

Group 6:
Agricultural Organisation (.21)

Group 7:
Social Mobility (.36)

Group 9:
Agricultural Organisation (.21)

Group 9:
Agricultural Productivity (.26)
We will now discuss the forces affecting the distribution of income at the lowest end of the income scale. The average share of GNP accruing to the poorest 20 per cent in the countries in our sample is 5.6 per cent, or about one-fourth of what it would receive had income been distributed completely uniformly throughout the population.

The important characteristics which distinguish among countries with respect to the share of income accruing to the poorest 20 per cent of households (see Figure 1) are the extent of dualism and various aspects of foreign trade and agricultural policy. The relationship between the share of income at the lowest 20 per cent and economic development varies with the level of development. Economic development is associated with increases in the share of the bottom 20 per cent only after relatively high levels of socio-economic development have been attained. At the early stages of the development process, economic development works to the relative disadvantage of the lowest income groups.

The countries of group 3, in which the highest share of national income appears (8.6 per cent), are characterized by low or moderate degrees of dualism, by the pursuit of agriculturally oriented foreign trade policies, and (except for Kenya) by agriculturally oriented developed patterns. They are also relatively low in the extent of their socio-economic development and in the extent of their development potential. The countries of group 4, in which the very smallest portion of national income (2 per cent) accrues to the lowest 20 per cent, are likewise rather undeveloped.
However, they are characterized by sharp dualism, and have economies centered on the foreign-financed and foreign-managed exploitation of natural resources.

Between these extremes there are two types of countries in which a relatively large share of national income (around 7 per cent) is channeled to the lowest 20 per cent of their respective populations: 1) countries with small owner-operated farms devoted mostly to subsistence agriculture and of only moderate agricultural productivity (Group 7); and 2) the best developed countries (Group 9) which have high social mobility; they are ethnically and culturally homogeneous and have highly productive, modern, commercial agricultural sectors. In the majority of countries some 4 - 5 per cent of national income goes to the lowest 20 per cent of households. These countries have at least moderate (but not extremely high) development potential. They are for the most part not sharply dualistic; exceptions are Peru, Zambia, Sudan and Tunisia. Most have at least 10 per cent of their indigenous active male population in middle class occupations; they have no more than 50 per cent of their populations in subsistence agriculture, at least moderate agricultural productivities, and important commercial farming.

The Share of Income Accruing to the Lowest 60 Per Cent of the Population

The allocation of income to the poorest 60 per cent of the population (see Figure 2) is related to both the extent of dualism and the level of modernization. The share of the national product accruing to the poorer 60 per cent of households is high under two distinctly different sets of circumstances:
Figure 2: Analysis of Share of Income of the Poorest 60% of the Population

Variance accounted for jointly: .74

Group 7
\( \bar{y} = 36\% 
\) low development potential
\( N = 6 \)

Group 9
\( \bar{y} = 30\% 
\) high school enrollment
\( N = 11 \)

Group 3
\( \bar{y} = 28\% 
\) low and moderate dualism
\( N = 31 \)

Group 6
\( \bar{y} = 26\% 
\) moderate and high development potential
\( N = 25 \)

Human Resources (.40)

Group 8
\( \bar{y} = 23\% 
\) low school enrollment
\( N = 14 \)

Group 2
\( \bar{y} = 20\% 
\) sharp dualism
\( N = 13 \)

Development Potential (.34)

Group 5
\( \bar{y} = 24\% 
\) low GNP per capita
\( N = 7 \)

Group 4
\( \bar{y} = 17\% 
\) medium GNP per capita
\( N = 6 \)

Group 7: Malagasy, Morocco, Sierra Leone, Sudan, Tanzania, Tunisia, Zambia
Group 4: Gabon, Iraq, Libya, Peru, Senegal, South Africa
Group 7: Burma, Chad, Dahomey, Ecuador, Niger, Surinam
Group 8: Bolivia, Brazil, Ceylon, Colombia, El Salvador, Ivory Coast, Jamaica, Kenya, Lebanon, Mexico, Nigeria, Pakistan, Rhodesia, Trinidad
Group 9: Argentina, Chile, Costa Rica, Greece, India, Israel, Japan, Panama, Philippines, Venezuela, Taiwan
reasonably pervasive underdevelopment (Group 7) and very substantial development (Group 9). Under both of these circumstances, the share of the lowest 60 percent is, on the average, between 30 and 40 percent. The bottom 60 percent of households gets the smallest share (20 percent) when a sharply dualistic development process has just been initiated. In all other instances, the share of national income of the lowest 60 percent is, on the average, about 25 percent. This is the case in moderately dualistic, moderately developed countries, as well as in sharply dualistic more poorly developed countries.

The Share of Income of the Middle Income Groups

Social and economic development are uniformly to the advantage of the middle income groups (see Figure 3). They appropriate the highest share of GNP in countries which are well developed, both economically (Group 7, with 16 percent of national income going to the middle quintile), and socially (Group 11, with 13.5 percent of national income accruing to the middle income groups). Given the level of socio-economic development, natural resource abundance is associated with a lower share for the middle income groups and a higher share to the top income groups. Greater political participation is correlated with higher shares for the middle-income households, even when the indigenous middle class accounts for less than 10 percent of active males.

The Share of Income Accruing to the Upper 5 Percent

Two variables emerge as important in distinguishing reliably among countries with respect to the income share accruing to the upper 5 percent of families (see Figure 4): abundance of natural resources and the role of government in economic activity. The share of income accruing to the top 5 percent is larger in resource-rich countries and in countries in which private enterprise predominates. Except for Group 5, the natural-resource-rich, human-resource-poor group in which the share of national product accruing to the top 5 percent is the highest, all the final groups combine wide variations
Figure 3: Analysis of the Share of Income of the Middle Income Groups (40-60%)

Variance accounted for jointly: .88

Group 3
\[ \bar{y} = 13.6\% \]
large indigenous middle class
N = 23

Natural Resources (.42)

Group 5
\[ \bar{y} = 9.6\% \]
small indigenous middle class
N = 21

Natural Resources (.40)

Group 4
\[ \bar{y} = 9.3\% \]
good resources
N = 15

Political Participation (.49)

Group 6
\[ \bar{y} = 11.7\% \]
good resources
N = 15

Human Resources (.60)

Group 7
\[ \bar{y} = 15.6\% \]
sparse resources
N = 7

Group 8
\[ \bar{y} = 8.2\% \]
low participation
N = 8

Group 9
\[ \bar{y} = 10.6\% \]
moderate participation
N = 7

Group 10
\[ \bar{y} = 9.7\% \]
moderate enrollment
N = 7

Group 11
\[ \bar{y} = 13.5\% \]
high school enrollment
N = 8

Group 2
\[ \bar{y} = 12\% \]
sparse resources
N = 5

Group 7: Ceylon, India, Israel, Lebanon, Pakistan, Surinam, Taiwan
Group 8: Gabon, Iraq, Kenya, Malagasy, Morocco, Rhodesia, Sierra-Leone, South Africa
Group 9: Bolivia, Burma, Ivory Coast, Nigeria, Senegal, Tanzania, Zambia
Group 10: Brazil, Colombia, Jamaica, Tunisia, Mexico, Peru, Trinidad
Group 11: Argentina, Chile, Costa Rica, Greece, Japan, Panama, Philippines, Venezuela
Figure 4: Analysis of the Share of Income of the Wealthiest 5% of the Population

Variance accounted for jointly: .65

Group 3
\[ \bar{y} = 34\% \]
abundant natural resources
\[ N = 26 \]

Natural Resources (.27)

Group 2
\[ \bar{y} = 23\% \]
mixed natural resources
\[ N = 18 \]

Group 4
\[ \bar{y} = 31\% \]
moderate and high school enrollment
\[ N = 19 \]

Group 9
\[ \bar{y} = 29\% \]
moderate natural resources
\[ N = 26 \]

Human Resources (.26)

Group 4
\[ \bar{y} = 42\% \]
low school enrollment
\[ N = 7 \]

Cultural and Ethnic Homogeneity (.26)

Group 11
\[ \bar{y} = 34\% \]
private enterprise
\[ N = 7 \]

Group 6
\[ \bar{y} = 41\% \]
heterogeneous
\[ N = 9 \]

Group 8
\[ \bar{y} = 18\% \]
mixed economies
\[ N = 9 \]

Government Economic Activity (.49)

Group 5
\[ \bar{y} = 42\% \]
Survive school enrollment
\[ N = 7 \]

Group 7
\[ \bar{y} = 41\% \]
heterogeneous
\[ N = 3 \]

Group 10
\[ \bar{y} = 26\% \]
mixed economies
\[ N = 9 \]

Government Economic Activity

Group 8: Ceylon, Chad, India, Israel, Japan, Niger, Pakistan, Sudan, Taiwan

Group 9: Dahomey, El Salvador, Ivory Coast, Jamaica, Kenya, Lebanon, Philippines, Senegal, Surinam

Group 5: Gabon, Malagasy, Nigeria, Rhodesia, Sierra Leone, Tanzania, Zambia

Group 7: Bolivia, Peru, South Africa

Group 10: Argentina, Burma, Chile, Costa Rica, Ecuador, Mexico, Morocco, Tunisia, Venezuela

Group 11: Brazil, Colombia, Greece, Iraq, Libya, Panama, Trinidad
in levels of social and economic development. The countries in Group 7 have racial problems related to ethnic majorities of very poor people.

The Share of Income Accruing to the Upper 20 Percent of the Population

The factors which explain intercountry differences in the share of the upper 20 percent are quite similar to those which account for the share of the upper 5 percent: the extent of socio-economic dualism, the share of nationalized enterprise, the abundance of natural resources, and policies with respect to human resource development. (See Figure 5.)

The countries in which over 60 percent of income accrues to the top 20 percent fall into one of two categories. They are either sharply dualistic (Group 3), or have neither strongly socialist governments nor generalized access to education (Group 9). The countries at the other extreme, with 50 percent or less of the total product in the hands of the wealthy, have "socialist" governments and not too abundant natural resources (Group 6). In the other intermediate groups of countries, the share of the upper 20 percent is approximately 55 percent. There is less variance among groups in the average share of income accruing to the wealthiest 20 percent than in the shares of the top 5 percent.

Summary and Conclusion

The most important variables affecting income distribution are ecological, socio-economic and political. Among socio-economic indicators, the rate of improvement of human resources is the variable most frequently associated with differences in patterns of income distribution. This variable is statistically significant in 10 of the 28 splits and is the primary differentiator in five. The rate of improvement of human resources is essentially an index of the equality of access to middle level and university education, and therefore reflects the extent of political commitment to equalizing economic and social opportunities throughout the society: when access is limited, education is solely an elitist
Figure 5: Analysis of the Share of Income of the Wealthiest 20% of the Population

Variance accounted for jointly: .68

Group 3: Gabon, Iraq, Libya, Morocco, Peru, Senegal, Sierra Leone, Sudan, Tanzania, Tunisia, Zambia

Group 6: Burma, Ceylon, Chad, Ecuador, Israel, Japan, Niger, Pakistan, Taiwan

Group 7: Argentina, Bolivia, Rhodesia, Venezuela

Group 9: Brazil, Colombia, Dahomey, El Salvador, Ivory Coast, Jamaica, Kenya, Lebanon, Malagasy, Mexico, Nigeria, Trinidad

Group 8: Chile, Costa Rica, Greece, India, Panama, Philippines, South Africa, Surinam

Group 1: Group 3
- $\bar{y} = 66\%$
- sharply dualistic
- N = 11

Group 2:
- $\bar{y} = 53\%$
- low and moderate dualism
- N = 33

Group 4:
- $\bar{y} = 49\%$
- much nationalized industry
- N = 4

Group 5:
- $\bar{y} = 56\%$
- predominantly private enterprise
- N = 20

Group 6:
- $\bar{y} = 60\%$
- low and moderate school enrollment
- N = 12

Group 7:
- $\bar{y} = 52\%$
- high enrollment
- N = 8

Group 8:
- $\bar{y} = 56\%$
- plentiful resources
- N = 4

Group 9:
- $\bar{y} = 46\%$
- moderate resources
- N = 9
activity. In the analysis, higher school-enrollment ratios are uniformly associated with less concentration in income distribution and with larger shares accruing to the lower and middle income strata.

The variable to appear next most frequently in the analysis is the abundance of natural resources. This indicator is statistically significant in a third of the splits, and it appears as primary differentiator in 5 of 28. At all levels of social and economic development, wealth in natural resources is associated with a shift in the allocation of income towards the wealthiest 20 percent and 5 percent and against the middle income groups, thereby increasing the concentration of income and wealth. Among the least developed countries, most of which are in sub-Saharan Africa, there is, of course, an association between the extent of dualism and the abundance of natural resources; this association is the result of colonial settlement and exploitation patterns which these countries have not yet been able to overcome.

The more developed, natural-resource-poor countries have had to rely on human resource development as a substitute for natural resource endowments. These countries have not experienced as extensive "colonial" exploitation of their resources and are, therefore, not as dualistic in their structure. As a result, the countries with only moderate natural resource endowments, whether developed to a greater or a lesser extent, tend to have more equal income distribution patterns.

The extent of direct government economic activity is the next most important variable to differentiate among countries in their patterns of income distribution. It appears in 9 out of 28 splits and is a primary variable in 4 of the splits. The larger the government's share in total
investment, the smaller is the share of income of the wealthiest 5 and 20 percent and the larger is the share of the middle income groups. It is interesting to note that this variable has been found not to have a systematic relationship with levels of economic development or with rates of change in per capita GNP; but it does exert a significant impact upon income distribution.

The extent of dualism appears as the first variable to differentiate among countries in four out of the six analyses. Higher dualism increases the concentration of income by lowering the shares of the least privileged 20 percent and 60 percent, by decreasing the share of income of the middle class, and by increasing the share of the wealthiest 20 percent. Furthermore the analysis indicates that, once a sharply dualistic development pattern has been initiated, further economic growth actually reduces the share of the lowest 60 percent. When the dualistic development pattern is primarily foreign-managed and financed, higher GNP tends to lower the share of the middle income households as well. In the absence of government intervention, dualistic growth therefore increases the concentration of income. The extent of cleavage in technology and life styles thus exerts a profound effect upon income distribution, not only in itself, but also by influencing the way in which further development affects the distribution of income.

The extent of potential for economic development is statistically significant in nine of the splits, but appears as a primary variable only twice. Faster growth, when accompanied by improvements in economic institutions, tends to redistribute income away from the two extremes of the income distribution towards the families in the 60-95 percent income brackets. The more dynamic the economy, and the more malleable its institutions,
the larger is the share of the middle income groups. However, more rapid economic growth also increases the proportion of income accruing to the upper 20 percent, even though it decreases the share of income of the upper 5 percent. The effect of economic growth on the share of the lowest 20 percent is not very systematic, but there is an indication that better growth performance tends to lower the share of the poorest households. The overall effect may or may not be an increase in the concentration of income: in two splits, a higher concentration coefficient is associated with higher development potential; in one split, it is associated with lower development potential.

More widespread opportunities for political participation increase the degree of equality of income distribution. This variable was statistically significant in 6 of 28 splits, though it appeared as a primary differentiator only once.
APPENDIX A

Definition of Dualism Indicator

One of the most striking characteristics of the socioeconomic structure of many developing nations is that, side by side with a dominant traditional sector in which conventional techniques and communal self-sufficiency prevail, there exists a rapidly growing exchange sector. Technology in the exchange sector tends to be modern where expansion has been largely the result of foreign investment in extractive, plantation, or estate activities; it tends to be traditional where expansion has taken place through shifts of indigenous producers into the small-scale cultivation of cash crops. Partly as a consequence of the limited interaction between the two sectors, varying degrees of dualism affect many facets of life in these countries. In defining dualism some authors emphasize the marked contrast in social organization and cultural style between the traditional subsistence and exchange sectors. Others underline the presence of technological dualism as an outcome of the growth along sharply differing production functions of modern exchange sectors and traditional sectors. Still others have taken the more eclectic view of dualism as typically involving a wide range of economic and social dichotomies.

It is to be expected that the presence and extent of socioeconomic and technical dualism might have a marked effect on the path of economic growth. Arthur Lewis, among the best-known of those economists who have incorporated the fact of dualism into a model of growth, underlines the importance to the expansion of a modern capitalist sector of surplus labor obtainable from subsistence agriculture in which the marginal product tends toward zero. More recently, Fei and Ranis have viewed growth under economic dualism as the key analytically important stage of development as countries proceed from essentially stagnant agrarian economies toward economic maturity.

In classifying countries with respect to the extent of dualism, we have attempted to rank them on a scale, one pole of which is the largely agrarian society having an extremely small exchange sector and the other pole of which is the incipient stage of economic maturity in which continuous interaction between modern and nonmodern elements in the economic system is a pervasive phenomenon. Intermediate points along...
the scale are defined by two types of dualistic growth: one type in which a foreign-financed and -directed, technically advanced sector is superimposed upon a predominantly agrarian society; the other in which the growth of an indigenous small-scale cash-crop sector using conventional techniques evolves at the expense of a traditional subsistence sector.\textsuperscript{22} The former type is ranked as more highly dualistic than the latter since it involves a more marked cleavage and contrast between the nonmonetized traditional sector and the market sector with respect to socioeconomic structure and technology. In this type of dualistic economy the overwhelming preponderance of the economy often remains relatively untouched by the rise of the market sector. The second type of dualistic economy in which an important market sector consists largely of indigenous cash-crop production and related activities is ranked as further removed from an unchanging traditional agrarian society since it tends to alter patterns of activity and incentives within traditional indigenous communal societies more rapidly. The lowest category in the indicator of the extent of dualism includes those overwhelmingly agricultural economies that are not dualistic because the extent of their modern exchange sectors is negligible.

The precise criteria used in classifying countries with respect to the extent of dualism as of about 1960 and the individual classifications are presented below.

A. Countries characterized by some significant modernization of methods of production in almost all sectors of the economy and in which there is no clear-cut sectoral or geographic cleavage between the modern and nonmodern segments of the economy; that is, traditional and modern production methods exist side by side in almost all sectors of the economy: Argentina, Chile, Greece, Israel, Jamaica, Japan (+), Lebanon, South Africa (-), Taiwan, Trinidad.

B. Countries characterized by a moderately definite sectoral or geographic cleavage between (1) an important industrial and/or mining and/or agricultural exchange sector in which modern technology may or may not prevail and (2) a predominantly nonmonetized sector in which traditional hand and animal production methods prevail. Countries in this category differ from those in category C in two respects: (1) a single, geographically distinct, traditional nonmonetized sector is not overwhelmingly predominant; if such a sector exists, it tends to be less important than the exchange sector; (2) these countries have only moderately contrasting socioeconomic organization and styles of life between the exchange sector and the traditional nonmonetized sector. Included in this category and classified B- are a number of countries in which the exchange sector consists of important, large, modern, expatriate or government activities and significant indigenous small-scale commercial enterprises, in which there is also a fairly large and distinct nonmonetized traditional sector: Brazil, Ceylon, Columbia, Costa Rica, Ecuador, El Salvador, India, Ivory Coast (-), Kenya (-), Mexico, Nigeria (-), Pakistan, Panama.

\textsuperscript{22} For a useful characterization of these two types of dualistic economic growth see United Nations, Department of Economic Affairs, Structure and Growth of Selected African Economies (New York, 1958), pp. 1-5.
Philippines, Rhodesia, Surinam (-), Venezuela.

C. Countries in which there is a sharp and pervasive sectoral or geographic cleavage between an important exchange sector and an important traditional nonmonetized sector. These countries are characterized by (1) a sharp contrast between levels of technology, types of economic organization, and social styles of life in the exchange sector and the traditional sector and (2) by the predominance of a traditional nonmonetized sector in which strong traditional patterns of social organization remain relatively untouched by the activities of the exchange sector in spite of significant intermittent labor flows into the exchange sector: Bolivia, Burma, Gabon (+), Iraq (+), Libya (+), Morocco (+), Peru (+), Senegal (-), Sierra Leone (-), Sudan (+), Tanzania (-), Tunisia (+), Zambia (+).

D. Countries not characterized by significant dualism by reason of the extremely limited development of their exchange sector combined with the overwhelming predominance of the nonmonetized traditional sector: Chad (-), Dahomey (-), Malagasy, Niger (-).
An Anatomy of Income Distribution Patterns in Developing Nations --

A Summary of Findings

This paper, based on recent data for 44 developing countries, examines income distribution and its relationship to various economic and non-economic forces.

Development Research Center
Prepared by: Irma Adelman and Cynthia Taft Morris
TABLE OF CONTENTS

I. INTRODUCTION .................................................. 1

II. THE DEPENDENT VARIABLES .................................. 2

III. THE INDEPENDENT VARIABLES .......................... 4

IV. STATISTICAL METHOD ........................................ 8

V. THE SHARE OF INCOME ACCRUING TO THE
   (a) Lowest 20 per cent of the Population ...... 12
   (b) Lowest 60 per cent of the Population ...... 13
   (c) Middle Income Groups ....................... 15
   (d) Upper 5 per cent of the Population ....... 15
   (e) Upper 20 per cent of the Population ...... 18

VI. SUMMARY AND CONCLUSIONS ............................. 18

VII. APPENDIX A
    Definition of the Dualism Indicator ............ 23
The distribution of income among the individuals and households of a nation is central to its economic welfare. An understanding of the interactions between the inequalities of income distribution and various aspects of economic and social modernization is therefore essential for the formulation of appropriate development policy. This study is an empirical investigation into the sources of intercountry variation in various facets of income distribution in 44 underdeveloped nations, which span the range from predominantly subsistence economies to those rapidly approaching a developed state; Japan and Israel are also included.

Most of the theoretical discussion on income distribution refers to the manner in which functional shares are determined, i.e., shares accruing to the factors of production—land, labor, capital, and entrepreneurship. The establishment of functional shares, and the quantities of these factors possessed by individuals, then ipso facto determine the distribution of personal incomes. But many qualifications must be introduced in the application of such a theory, especially in developing countries. Differences in individual wages are often the result of non-market considerations—norms set by the previous colonial power or a politically powerful traditional elite, and influenced by semiarbitrary scales for government employees,

the social philosophy of the government, minimum wage laws, the degree of (often premature) unionization, and the role of expatriates. The extent of concentration of income in underdeveloped nations should therefore depend not only on various aspects of the structure of the economy, its factor endowments, institutions, and linkages with the rest of the world, but also on the political complexion of the government, the country's colonial heritage, the structure of political power and pressure mechanisms, and the recentness of independence. Various indices of economic, political and social forces which could on a priori grounds be expected to exert an impact upon the distribution of income were therefore introduced into the analysis as independent variables.

The Dependent Variables

Data on income distribution are notoriously unreliable, even in developed countries. The raw data are usually derived from information supplied by the income recipients themselves; its accuracy is therefore a function of the recall of the respondent, of his perception of the use to which the information will be put, of his veracity about a sensitive subject, etc. Three types of sources were used to construct the income distribution tables in this study: budget or income-expenditure studies which sample different strata of the population; income information compiled from national censuses; and tax returns. This last source may be somewhat more reliable, but was available in very few countries. In some cases, the results of budget studies referring to particular segments of the population (e.g., only urban, or only wage earners) were used
in conjunction with data from the national accounts statistics and from other sources to construct the overall picture of income distribution. In some cases, the basic information was exceedingly coarse; a finer breakdown into class intervals was achieved by fitting the distributions to similar empirical or theoretical distributions. Whenever the lowest end of the lowest income class was not given, the minimum income was estimated by fitting a Pareto curve to the data. Whenever the average income in the upper class interval was not given, it was estimated by selecting a value which would equate the average per capita (or per household) income estimated from the income distribution to the corresponding value estimated from the national accounts.

There were other sources of incompatibility in the basic data. Some of the information, for example, referred to households, some to individuals, and some to active population. Information on households was preferred because of theoretical considerations. It should be noted, however, that for a given country the distribution based on active population indicates less concentration than the distribution based on households; the latter, in turn, shows less concentration than data for individuals. Since the percentage adjustment differs with the nature of the distribution, no adjustment on this score was attempted. Also, our data refer to various years in the late fifties and through the sixties; income distributions do not change very rapidly, however. What is more serious is that the extent of detail differs substantially among countries, varying from 26 class intervals for Zambia to 5 class intervals for some African and Latin American nations; the more detail provided, the greater is the estimate of concentration.
The basic data for the study are summarized in Table 1.* Six different dependent variables were constructed from the data:

1. The income share of the poorest 20 percent of the population.
2. The proportion of the total product accruing to the lowest 60 percent of the population.
3. The ratio of income of the middle 40-60 percent quintile (i.e., the households 10 percent below and 10 percent above the median income households).
4. The share of total output accruing to the wealthiest 5 percent of the population.
5. The percentage of national income accruing to the upper 20 percent of the population.
6. The concentration (GINI) coefficient. This index is a measure of the extent of departure of the actual income distribution from a uniform income distribution, and represents the best single index of overall concentration. However, income distributions with very different properties can have the same concentration ratio. **

The Independent Variables

A wide range of independent variables, chosen as having some possible relationship with the aspects of income distribution described above, were tested in the analysis. They include 18 economic indicators, five socio-cultural indicators, and eight political indicators. For the most part,

* For the list of sources for the data, together with the estimates of country income distributions used to obtain figures in this table, readers should consult the original document.

** Since results of analysis with the GINI coefficient added little to those using measures (1) to (5), such results are not described in this excerpt.
Table 1: Income Distribution Estimates

Percentage Shares in Total National Income
Going to Population Groups of Different Income Levels in 44 Countries

<table>
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<th>Poorest 60%</th>
<th>Middle 40-60%</th>
<th>Highest 5%</th>
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Averages       | 5.6         | 26          | 12           | 30         | 56          |
indicators refer to conditions in the early 1960s. Of this array of 31 variables, the following 12 (not listed in order of importance) proved to be the most significant in explaining one or more of the breakdowns in income distribution:


2. **Abundance of natural resources.** This grouping of countries was based upon information regarding the quantity and variety of fuel and other mineral resources, together with data on the amount of agricultural land available per capita.

3. **Extent of dualism (about 1960).** This index stratifies countries by the presence and extent of socio-economic and technical dualism. At one pole are the largely agrarian societies having subsistence farming with extremely small exchange sectors. At the other pole are countries with concentrated development of a limited modern sector (especially in petroleum), often by foreign capital, contrasting with backward, traditional agriculture. Intermediate are societies where a widely developed modern sector is superimposed upon a predominantly agrarian society, and countries in which the growth of an indigenous small-farm cash-crop sector using modern techniques has evolved at the expense of a traditional subsistence sector.

4. **Level of modernization of techniques of agriculture (about 1961).** This indicator is a composite based upon the extent of use of mechanical power, fertilizer, and other modern techniques in agriculture, and the relative weight of traditional and of modern agriculture.

5. **Character of agricultural organization (about 1960).** This index combines indices of land tenure patterns and the size and viability of farming units. Various types of agrarian structure are viewed as located along a scale, one end of which is represented by communally owned agricultural lands on which the marketing of crops is only of incidental importance, and the other end of which is depicted by commercial agriculture in which owner operated farms are sufficiently large to be economically viable. Intermediate on the scale are tenant-operated subsistence farms and large owner-absentee commercial farms or plantations.

6. **Rate of improvement in human resources (1961).** This indicator is a weighted average of secondary and higher level school enrollment ratios as a percentage of the relevant age group. We call this index the rate of improvement in human resources since it measures the rate of additions to the stock of education rather than the total stock of education.

*Detailed descriptions of country classification schemes and sources of data are given in I. Adelman and C. Taft Morris, *Society, Politics, and Economic Development - A Quantitative Approach* (Johns Hopkins Press, 1967). To indicate how these classifications are constructed the classification scheme for dualism is appended in Appendix A.*
7. Potential for economic development. Seventy-four underdeveloped countries are grouped into three categories according to their performance during the period 1950/51 to 1963/64 in raising rates of growth of per capita GNP and improvements in seven areas of economic institutions and activities (described in an earlier work by the same authors).

8. Importance of the indigenous middle class (about 1960). This classification is based upon the relative size and political importance of indigenous people in middle class occupations in less developed countries, including entrepreneurs, and managerial, technical, administrative, commercial and banking employees.

9. Extent of social mobility (about 1960). This classification is based upon a composite measure of several aspects of social mobility, including the extent of racial or cultural barriers to mobility, the extent of educational opportunity, and access to membership in the middle class.

10. Degree of cultural and ethnic homogeneity (about 1960). Countries are ranked into groups differentiated by the proportion of the population which speaks the dominant language; distinctions within categories are based upon the extent of ethnic and religious heterogeneity.

11. Extent of political participation (1957-1962). This variable is an aggregate of three elements: the extent to which the major socio-economic and cultural-ethnic groups have their interests represented in national political decisions; the extent of choice among political channels for national representation; and the extent of actual participation in national political processes.

12. Extent of direct government economic activity (about 1960). This classification is based upon the share of government investment in total net investment.

In addition, the following variables were found to have significant relationships with one or more aspects of income distribution, but in each case less significant than one of the 12 variables just enumerated. They were: degree of improvement in agriculture since 1950; level of modernization in industry; increase in industrialization since 1950; structure of foreign trade (primary vs. processed exports); effectiveness
of financial institutions; level of socio-economic development (index with 24 components); percentage of literacy; political strength of the traditional elite; strength of the labor movement; political strength of the military; and the degree of commitment of the leadership to promoting economic development.

Finally, of the 31 variables chosen as having on a priori grounds some possible relevance to income distribution, the following were found not to yield significant relationships in this analysis: proportion of the population in traditional subsistence agriculture; size and pattern of development (population size combined with industrial orientation); adequacy of physical overhead capital; effectiveness of the tax system; population numbers; urbanization (percentage of population in centers over 20,000); colonial experience (whether British, French, or other); and number of years of self-government.

**Statistical Method**

The technique used here divides the original sample into a series of subgroups constructed so as to make the difference among subgroups (and, hence, the similarity within subgroups) as great as possible. The initial sample (44 countries arrayed according to income distribution—e.g., the share of the lowest 20 per cent) is tested against each of the independent variables (e.g., per capita GNP) with the latter divided into two mutually exclusive groups (e.g., countries with GNP above X, and countries with GNP below X). Mean values for the dependent variable in both groups (e.g., average shares of the lowest 20 per cent of population in the high per
capita GNP countries, and a similar average for the low GNP countries) and the variances of these means from the overall mean of the group are compared for each split (i.e., for each possible X value of per capita GNP used to split the group in two). For every independent variable, that partition is selected which maximizes the fraction of total variance in the dependent variable explained (i.e., maximizes the sum of the squared deviations of the group means from the overall mean). That variable is chosen for which the best split accounts for the greatest portion of overall variance in the dependent variable. After the initial split, the two groups of countries are then further subdivided, using the same method. This subdivision is continued, using the best variable for splitting of groups in each case, until subgroups of 10 or less are reached—or until a subgroup of more than 10 cannot be split by using any variable to produce a statistically significant result (at least 10 per cent of the variance by an F test).

The above technique is very well suited to the study of systematic interactions among a dependent variable, on the one hand, and a set of independent variables on the other, when the best principles for stratifying the original data into subsamples is not known a priori and when there is reason to believe that the phenomenon to be analyzed affects different parts of the data differently.

In the charts below, showing the results of this analysis for the five measures of income distribution, the splitting of groups and subgroups is presented in pictorial form. The box on the left shows the original group
of 44 countries and its average value for the dependent variable (on Figure 1: \( N_{44} \), and \( \bar{y} = 5.6 \) per cent which is the average of the shares in income of the poorest 20 per cent of the population in each country). Lines branch out to the right to two boxes, in which the same \( N \) (number of countries) and \( \bar{y} \) (average share of the poorest 20 per cent) values for each group of countries appear, along with a statement of characteristics that differentiate the two groups. Next to the point where the two lines move apart is the name of the variable used to make the split, and the proportion of variance accounted for by the split (on Figure 1: the first variable used is "Dualism", accounting for 35 per cent of the variance). As these groups of countries are split into subgroups, more lines and boxes appear with the same notations, moving to the right on the chart. In the upper left corner, the percentage of variance accounted for by the entire analysis (coefficient of multiple determination, \( R^2 \) adjusted for degrees of freedom) is shown. Names of countries are given for the box that represents the smallest subgroup in which they appear.
Variance accounted for jointly: .54

Group 3
\( \bar{y} = 8.6\% \)
limited dualism; low development
\( N = 10 \)

Group 2
\( \bar{y} = 5.6\% \)
Dualism (.35)
\( N = 44 \)

Group 5
\( \bar{y} = 5.2\% \)
moderate and high productivity
\( N = 29 \)

Group 4
\( \bar{y} = 2.2\% \)
low productivity
\( N = 5 \)

Group 7
\( \bar{y} = 7\% \)
small farms
\( N = 5 \)

Group 8
\( \bar{y} = 4.2\% \)
marginal dualism
\( N = \) unspecified

Group 9
\( \bar{y} = 6.8\% \)
high mobility
\( N = \) unspecified

Group 10
Agricultural Organization (.21)

Group 6
\( \bar{y} = 4.6\% \)
commercial agriculture
\( N = 24 \)

Social Mobility (.25)

Group 3: Bolivia, Burma, Chad, Dahomey, Ivory Coast, Kenya, Malagasy, Niger, Nigeria, Surinam
Group 4: Gabon, Iraq, Libya, Senegal, Sierra Leone
Group 7: Ecuador, India, Morocco, Pakistan, Tanzania
Group 9: Argentina, Greece, Israel, Japan
Group 8: Brazil, Ceylon, Chile, Colombia, Costa Rica, El Salvador, Jamaica, Lebanon, Mexico, Panama, Peru, Philippines, Rhodesia, South Africa, Sudan, Taiwan, Trinidad, Tunisia, Venezuela, Zambia
The Share of Income Accruing to the Lowest 20 Per Cent of the Population

We will now discuss the forces affecting the distribution of income at the lowest end of the income scale. The average share of GNP accruing to the poorest 20 per cent in the countries in our sample is 5.6 per cent, or about one-fourth of what it would receive had income been distributed completely uniformly throughout the population.

The important characteristics which distinguish among countries with respect to the share of income accruing to the poorest 20 per cent of households (see Figure 1) are the extent of dualism and various aspects of foreign trade and agricultural policy. The relationship between the share of income at the lowest 20 per cent and economic development varies with the level of development. Economic development is associated with increases in the share of the bottom 20 per cent only after relatively high levels of socio-economic development have been attained. At the early stages of the development process, economic development works to the relative disadvantage of the lowest income groups.

The countries of group 3, in which the highest share of national income appears (8.6 per cent), are characterized by low or moderate degrees of dualism, by the pursuit of agriculturally oriented foreign trade policies, and (except for Kenya) by agriculturally oriented developed patterns. They are also relatively low in the extent of their socio-economic development and in the extent of their development potential. The countries of group 4, in which the very smallest portion of national income (2 per cent) accrues to the lowest 20 per cent, are likewise rather undeveloped.
However, they are characterized by sharp dualism, and have economies centered on the foreign-financed and foreign-managed exploitation of natural resources.

Between these extremes there are two types of countries in which a relatively large share of national income (around 7 per cent) is channeled to the lowest 20 per cent of their respective populations: 1) countries with small owner-operated farms devoted mostly to subsistence agriculture and of only moderate agricultural productivity (Group 7); and 2) the best developed countries (Group 9) which have high social mobility; they are ethnically and culturally homogeneous and have highly productive, modern, commercial agricultural sectors. In the majority of countries some 4 - 5 per cent of national income goes to the lowest 20 per cent of households. These countries have at least moderate (but not extremely high) development potential. They are for the most part not sharply dualistic; exceptions are Peru, Zambia, Sudan and Tunisia. Most have at least 10 per cent of their indigenous active male population in middle class occupations; they have no more than 50 per cent of their populations in subsistence agriculture, at least moderate agricultural productivities, and important commercial farming.

The Share of Income Accruing to the Lowest 60 Per Cent of the Population

The allocation of income to the poorest 60 per cent of the population (see Figure 2) is related to both the extent of dualism and the level of modernization. The share of the national product accruing to the poorer 60 per cent of households is high under two distinctly different sets of circumstances:
Figure 2: Analysis of Share of Income of the Poorest 60% of the Population

Variance accounted for jointly: .74

Group 3
\( \bar{y} = 28\% \)
low and moderate
dualism
N = 31

Development Potential (.34)

Group 4
\( \bar{y} = 24\% \)
low GNP per
capita
N = 7

Group 5
\( \bar{y} = 26\% \)
moderate and high
development poten-
tial
N = 25

Group 6
Human Resources (.40)

Group 7
\( \bar{y} = 36\% \)
low development
potential
N = 6

Group 8
\( \bar{y} = 23\% \)
low school en-
rollment
N = 14

Group 9
\( \bar{y} = 30\% \)
high school en-
rollment
N = 11

Dualism (.26)

Group 2
\( \bar{y} = 26\% \)
sharp dualism
N = 44

Group 5: Malagasy, Morocco, Sierra Leone, Sudan,
Tanzania, Tunisia, Zambia
Group 4: Gabon, Iraq, Libya, Peru, Senegal, South Africa
Group 7: Burma, Chad, Dahomey, Ecuador, Niger, Surinam
Group 8: Bolivia, Brazil, Ceylon, Colombia, El Salvador,
Ivory Coast, Jamaica, Kenya, Lebanon, Mexico,
Nigeria, Pakistan, Rhodesia, Trinidad
Group 9: Argentina, Chile, Costa Rica, Greece, India,
Israel, Japan, Panama, Philippines, Venezuela, Taiwan
reasonably pervasive underdevelopment (Group 7) and very substantial development (Group 9). Under both of these circumstances, the share of the lowest 60 percent is, on the average, between 30 and 40 percent. The bottom 60 percent of households gets the smallest share (20 percent) when a sharply dualistic development process has just been initiated. In all other instances, the share of national income of the lowest 60 percent is, on the average, about 25 percent. This is the case in moderately dualistic, moderately developed countries, as well as in sharply dualistic more poorly developed countries.

The Share of Income of the Middle Income Groups

Social and economic development are uniformly to the advantage of the middle income groups (see Figure 3). They appropriate the highest share of GNP in countries which are well developed, both economically (Group 7, with 16 percent of national income going to the middle quintile), and socially (Group 11, with 13.5 percent of national income accruing to the middle income groups). Given the level of socio-economic development, natural resource abundance is associated with a lower share for the middle income groups and a higher share to the top income groups. Greater political participation is correlated with higher shares for the middle-income households, even when the indigenous middle class accounts for less than 10 percent of active males.

The Share of Income Accruing to the Upper 5 percent

Two variables emerge as important in distinguishing reliably among countries with respect to the income share accruing to the upper 5 percent of families (see Figure 4): abundance of natural resources and the role of government in economic activity. The share of income accruing to the top 5 percent is larger in resource-rich countries and in countries in which private enterprise predominates. Except for Group 5, the natural-resource-rich, human-resource-poor group in which the share of national product accruing to the top 5 percent is the highest, all the final groups combine wide variations
Figure 3: Analysis of the Share of Income of the Middle Income Groups (40-60%)

Variance accounted for jointly: .88

Group 3
\[ \bar{y} = 13.6\% \]
large indigenous middle class
\[ N = 23 \]

Natural Resources (.42)

Group 6
\[ \bar{y} = 11.7\% \]
good resources
\[ N = 15 \]

Human Resources (.60)

Group 7
\[ \bar{y} = 15.6\% \]
sparse resources
\[ N = 7 \]

Group 11
\[ \bar{y} = 13.5\% \]
high school enrollment
\[ N = 8 \]

Group 8
\[ \bar{y} = 10.6\% \]
mixed political participation
\[ N = 7 \]

Group 10
\[ \bar{y} = 9.7\% \]
moderate enrollment
\[ N = 7 \]

Group 9
\[ \bar{y} = 9.3\% \]
good resources
\[ N = 15 \]

Political Participation (.49)

Group 4
\[ \bar{y} = 9.3\% \]
sparse resources
\[ N = 5 \]

Group 5
\[ \bar{y} = 12\% \]
small indigenous middle class
\[ N = 21 \]

Middle Class (.26)

Group 2
\[ \bar{y} = 9.6\% \]
small indigenous middle class
\[ N = 21 \]

Group 1
\[ \bar{y} = 12\% \]
N = 44

Group 7: Chad, Dahomey, El Salvador, Niger, Sudan
Group 7: Ceylon, India, Israel, Lebanon, Pakistan, Surinam, Taiwan
Group 8: Gabon, Iraq, Kenya, Malagasy, Morocco, Rhodesia, Sierra-Leone, South Africa
Group 9: Bolivia, Burma, Ivory Coast, Nigeria, Senegal Tanzania, Zambia
Group 10: Brazil, Colombia, Jamaica, Tunisia, Mexico, Peru, Trinidad
Group 11: Argentina, Chile, Costa Rica, Greece, Japan, Panama, Philippines, Venezuela
Figure 4: Analysis of the Share of Income of the Wealthiest 5% of the Population

Variance accounted for jointly: .65

Group 3
\( \bar{y} = 34\% \)
abundant natural resources
N = 26

Group 4
\( \bar{y} = 31\% \)
moderate and high school enrollment
N = 19

Group 5
\( \bar{y} = 28\% \)
predominantly private enterprise
N = 18

Group 6
\( \bar{y} = 29\% \)
homogeneous
N = 19

Group 7
\( \bar{y} = 41\% \)
heterogeneous
N = 7

Group 8
\( \bar{y} = 34\% \)
private enterprise
N = 7

Group 9
\( \bar{y} = 26\% \)
mixed economies
N = 9

Group 10
\( \bar{y} = 18\% \)
mixed economies
N = 9

Group 11
\( \bar{y} = 18\% \)
mixed economies
N = 9

Group 8: Ceylon, Chad, India, Israel, Japan, Niger, Pakistan, Sudan, Taiwan
Group 9: Dahomey, El Salvador, Ivory Coast, Jamaica, Kenya, Lebanon, Philippines, Senegal, Surinam
Group 5: Gabon, Malagasy, Nigeria, Rhodesia, Sierra Leone, Tanzania, Zambia
Group 7: Bolivia, Peru, South Africa
Group 10: Argentina, Burma, Chile, Costa Rica, Ecuador, Mexico, Morocco, Tunisia, Venezuela
Group 11: Brazil, Colombia, Greece, Iraq, Libya, Panama, Trinidad
in levels of social and economic development. The countries in Group 7 have racial problems related to ethnic majorities of very poor people.

The Share of Income Accruing to the Upper 20 Percent of the Population

The factors which explain intercountry differences in the share of the upper 20 percent are quite similar to those which account for the share of the upper 5 percent: the extent of socio-economic dualism, the share of nationalized enterprise, the abundance of natural resources, and policies with respect to human resource development. (See Figure 5.)

The countries in which over 60 percent of income accrues to the top 20 percent fall into one of two categories. They are either sharply dualistic (Group 3), or have neither strongly socialist governments nor generalized access to education (Group 9). The countries at the other extreme, with 50 percent or less of the total product in the hands of the wealthy, have "socialist" governments and not too abundant natural resources (Group 6). In the other intermediate groups of countries, the share of the upper 20 percent is approximately 55 percent. There is less variance among groups in the average share of income accruing to the wealthiest 20 percent than in the shares of the top 5 percent.

Summary and Conclusion

The most important variables affecting income distribution are ecological, socio-economic and political. Among socio-economic indicators, the rate of improvement of human resources is the variable most frequently associated with differences in patterns of income distribution. This variable is statistically significant in 10 of the 28 splits and is the primary differentiator in five. The rate of improvement of human resources is essentially an index of the equality of access to middle level and university education, and therefore reflects the extent of political commitment to equalizing economic and social opportunities throughout the society: when access is limited, education is solely an elitist
Figure 5: Analysis of the Share of Income of the Wealthiest 20% of the Population

Variance accounted for jointly: .68

Group 3
- \( \bar{y} = 66\% \)
- sharply dualistic
- \( N = 11 \)
- \( N = 44 \)
- Dualism (.29)

Group 4
- \( \bar{y} = 49\% \)
- much nationalized industry
- \( N = 13 \)

Group 5
- \( \bar{y} = 56\% \)
- predominantly private enterprise
- \( N = 20 \)
- Natural Resources (.44)

Group 6
- \( \bar{y} = 52\% \)
- high enrollment
- \( N = 8 \)

Group 7
- \( \bar{y} = 56\% \)
- plentiful resources
- \( N = 4 \)

Group 8
- \( \bar{y} = 56\% \)
- low and moderate school enrollment
- \( N = 12 \)

Group 9
- \( \bar{y} = 60\% \)
- Human Resources (.35)

Group 2
- \( \bar{y} = 53\% \)
- low and moderate dualism
- \( N = 33 \)

Group 3:
- Gabon, Iraq, Libya, Morocco, Peru, Senegal, Sierra Leone, Sudan, Tanzania, Tunisia, Zambia

Group 6:
- Burma, Ceylon, Chad, Ecuador, Israel, Japan, Niger, Pakistan, Taiwan

Group 7:
- Argentina, Bolivia, Rhodesia, Venezuela

Group 9:
- Brazil, Colombia, Dahomey, El Salvador, Ivory Coast, Jamaica, Kenya, Lebanon, Malagasy, Mexico, Nigeria, Trinidad

Group 8:
- Chile, Costa Rica, Greece, India, Panama, Philippines, South Africa, Surinam

Note: The diagram shows the distribution of countries into groups based on income and economic activity, with shaded boxes indicating groups and unshaded boxes indicating subgroups.
activity. In the analysis, higher school-enrollment ratios are uniformly associated with less concentration in income distribution and with larger shares accruing to the lower and middle income strata.

The variable to appear next most frequently in the analysis is the abundance of natural resources. This indicator is statistically significant in a third of the splits, and it appears as primary differentiator in 5 of 28. At all levels of social and economic development, wealth in natural resources is associated with a shift in the allocation of income towards the wealthiest 20 percent and 5 percent and against the middle income groups, thereby increasing the concentration of income and wealth. Among the least developed countries, most of which are in sub-Saharan Africa, there is, of course, an association between the extent of dualism and the abundance of natural resources; this association is the result of colonial settlement and exploitation patterns which these countries have not yet been able to overcome.

The more developed, natural-resource-poor countries have had to rely on human resource development as a substitute for natural resource endowments. These countries have not experienced as extensive "colonial" exploitation of their resources and are, therefore, not as dualistic in their structure. As a result, the countries with only moderate natural resource endowments, whether developed to a greater or a lesser extent, tend to have more equal income distribution patterns.

The extent of direct government economic activity is the next most important variable to differentiate among countries in their patterns of income distribution. It appears in 9 out of 28 splits and is a primary variable in 4 of the splits. The larger the government's share in total
investment, the smaller is the share of income of the wealthiest 5 and 20 percent and the larger is the share of the middle income groups. It is interesting to note that this variable has been found not to have a systematic relationship with levels of economic development or with rates of change in per capita GNP; but it does exert a significant impact upon income distribution.

The extent of dualism appears as the first variable to differentiate among countries in four out of the six analyses. Higher dualism increases the concentration of income by lowering the shares of the least privileged 20 percent and 60 percent, by decreasing the share of income of the middle class, and by increasing the share of the wealthiest 20 percent. Furthermore the analysis indicates that, once a sharply dualistic development pattern has been initiated, further economic growth actually reduces the share of the lowest 60 percent. When the dualistic development pattern is primarily foreign-managed and financed, higher GNP tends to lower the share of the middle income households as well. In the absence of government intervention, dualistic growth therefore increases the concentration of income. The extent of cleavage in technology and life styles thus exerts a profound effect upon income distribution, not only in itself, but also by influencing the way in which further development affects the distribution of income.

The extent of potential for economic development is statistically significant in nine of the splits, but appears as a primary variable only twice. Faster growth, when accompanied by improvements in economic institutions, tends to redistribute income away from the two extremes of the income distribution towards the families in the 60-95 percent income brackets. The more dynamic the economy, and the more malleable its institutions,
the larger is the share of the middle income groups. However, more rapid economic growth also increases the proportion of income accruing to the upper 20 percent, even though it decreases the share of income of the upper 5 percent. The effect of economic growth on the share of the lowest 20 percent is not very systematic, but there is an indication that better growth performance tends to lower the share of the poorest households. The overall effect may or may not be an increase in the concentration of income: in two splits, a higher concentration coefficient is associated with higher development potential; in one split, it is associated with lower development potential.

More widespread opportunities for political participation increase the degree of equality of income distribution. This variable was statistically significant in 6 of 28 splits, though it appeared as a primary differentiator only once.
APPENDIX A

Definition of Dualism Indicator

One of the most striking characteristics of the socioeconomic structure of many developing nations is that, side by side with a dominant traditional sector in which conventional techniques and communal self-sufficiency prevail, there exists a rapidly growing exchange sector. Technology in the exchange sector tends to be modern where expansion has been largely the result of foreign investment in extractive, plantation, or estate activities; it tends to be traditional where expansion has taken place through shifts of indigenous producers into the small-scale cultivation of cash crops. Partly as a consequence of the limited interaction between the two sectors, varying degrees of dualism affect many facets of life in these countries. In defining dualism some authors emphasize the marked contrast in social organization and cultural style between the traditional subsistence and exchange sectors. Others underline the presence of technological dualism as an outcome of the growth along sharply differing production functions of modern exchange sectors and traditional sectors. Still others have taken the more eclectic view of dualism as typically involving a wide range of economic and social dichotomies.

It is to be expected that the presence and extent of socioeconomic and technical dualism might have a marked effect on the path of economic growth. Arthur Lewis, among the best-known of those economists who have incorporated the fact of dualism into a model of growth, underlines the importance to the expansion of a modern capitalist sector of surplus labor obtainable from subsistence agriculture in which the marginal product tends toward zero. More recently, Fei and Ranis have viewed growth under economic dualism as the key analytically important stage of development as countries proceed from essentially stagnant agrarian economies toward economic maturity.

In classifying countries with respect to the extent of dualism, we have attempted to rank them on a scale, one pole of which is the largely agrarian society having an extremely small exchange sector and the other pole of which is the incipient stage of economic maturity in which continuous interaction between modern and nonmodern elements in the economic system is a pervasive phenomenon. Intermediate points along
the scale are defined by two types of dualistic growth: one type in which a foreign-financed and directed, technically advanced sector is superimposed upon a predominantly agrarian society; the other in which the growth of an indigenous small-scale cash-crop sector using conventional techniques evolves at the expense of a traditional subsistence sector. The former type is ranked as more highly dualistic than the latter since it involves a more marked cleavage and contrast between the nonmonetized traditional sector and the market sector with respect to socioeconomic structure and technology. In this type of dualistic economy the overwhelming preponderance of the economy often remains relatively untouched by the rise of the market sector. The second type of dualistic economy in which an important market sector consists largely of indigenous cash-crop production and related activities is ranked as further removed from an unchanging traditional agrarian society since it tends to alter patterns of activity and incentives within traditional indigenous communal societies more rapidly. The lowest category in the indicator of the extent of dualism includes those overwhelmingly agricultural economies that are not dualistic because the extent of their modern exchange sectors is negligible.

The precise criteria used in classifying countries with respect to the extent of dualism as of about 1960 and the individual classifications are presented below.

A. Countries characterized by some significant modernization of methods of production in almost all sectors of the economy and in which there is no clear-cut sectoral or geographic cleavage between the modern and nonmodern segments of the economy; that is, traditional and modern production methods exist side by side in almost all sectors of the economy: Argentina, Chile, Greece, Israel, Jamaica, Japan (+), Lebanon, South Africa (-), Taiwan, Trinidad.

B. Countries characterized by a moderately definite sectoral or geographic cleavage between (1) an important industrial and/or mining and/or agricultural exchange sector in which modern technology may or may not prevail and (2) a predominantly nonmonetized sector in which traditional hand and animal production methods prevail. Countries in this category differ from those in category C in two respects: (1) a single, geographically distinct, traditional nonmonetized sector is not overwhelmingly predominant; if such a sector exists, it tends to be less important than the exchange sector; (2) these countries have only moderately contrasting socioeconomic organization and styles of life between the exchange sector and the traditional nonmonetized sector. Included in this category and classified B- are a number of countries in which the exchange sector consists of important, large, modern, expatriate or government activities and significant indigenous small-scale commercial enterprises, in which there is also a fairly geographically distinct nonmonetized additional sector: Brazil, Ceylon, Columbia, Costa Rica, Ecuador, El Salvador, India, Ivory Coast (-), Kenya (-), Mexico, Nigeria (-), Pakistan, Panama.
C. Countries in which there is a sharp and pervasive sectoral or geographic cleavage between an important exchange sector and an important traditional nonmonetized sector. These countries are characterized by (1) a sharp contrast between levels of technology, types of economic organization, and social styles of life in the exchange sector and the traditional sector and (2) by the predominance of a traditional nonmonetized sector in which strong traditional patterns of social organization remain relatively untouched by the activities of the exchange sector in spite of significant intermittent labor flows into the exchange sector: Bolivia, Burma, Gabon (+), Iraq (+), Libya (+), Morocco (+), Peru (+), Senegal (-), Sierra Leone (-), Sudan (+), Tanzania (-), Tunisia (+), Zambia (+).

D. Countries not characterized by significant dualism by reason of the extremely limited development of their exchange sector combined with the overwhelming predominance of the nonmonetized traditional sector: Chad (-), Dahomey (-), Malagasy (-), Niger (-).