THE SIZE DISTRIBUTION OF INCOME: AN INTERNATIONAL COMPARISON

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This paper collects and extends the available data on size distribution of income by country, and then uses these data to develop an hypothesis about the relation of stage and mode of development to the distribution of income. In particular, the author attributes the increase in income inequality which often occurs in the early stages of economic development to the uneven spread of capitalist modes of production, which leads to a dualism which separates the capitalist sector from the rest of the economy. The author goes on to discuss the role of this dualism in increasing the inequalities existing in the society. Finally, the author contrasts the income distributions found in socialist countries with those of capitalist ones, and concludes that it is not economic growth *per se*, but rather the capitalist mode of production, which creates income inequalities in developing countries.

I. INTRODUCTION

Although the study of inequalities and development has had a long theoretical history beginning with Ricardo and the Classical economists, it was not until Pareto's work at the beginning of this century that quantitative analysis of the distribution of income by *size* (rather than by *function*) was carried out. His early comparison of several countries and time periods led Pareto to conclude that income inequalities were relatively insensitive to changes across space, time, and economic system.[1] Today, the applicability of the Pareto function to a variety of economic phenomena is without question, although little faith is placed in the constancy of its single parameter, α, for studies of income distribution.[2] Great variations in income size distributions, both within countries over time and across countries at a similar point in time, have been found in more recent studies. Whether or not a significant relationship exists between economic development and the size distribution of income is still a matter of debate, however, with the empirical work showing conflicting results.[3] Unfortunately, all of these studies

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[1]V. Pareto, *Cours d'économie Politique* (Nouvelle Edition: Genève, Librairie Droz, 1964).

[2]For two critical studies of the constancy of Pareto's α, see C. Gini, "On the Measurement of Concentration with Especial Reference to Income and Wealth," Cowles Commission, 1936, and D. Yntema, "Measures of the Inequality in the Pesonal Distribution of Wealth or Income," *Journal of the American Statistical Association*, vol. 28, 1933 p. 395.

[3]International comparisons generally supporting an inverse relationship between development and inequalities include S. Kuznets, "Quantitative Aspects of the Economic Growth of Nations: Distribution of Income by Size," *Economic Development and Cultural Change*, January, 1963; S. Swamy, "Structural Changes and the Distribution of Income by Size: The Case of India," *Review of Income and Wealth*, June 1967, pp. 155–174; I. Kravis, *The Structure of Income* (Philadelphia:

have technical drawbacks either because of the definition of income used (e.g., many dealt only with earnings) or the range of countries included. Two more recent studies by Kravis and Paukert synthesize the earlier cross-country work, adding to the data base where possible.[4] Both are primarily descriptive, however, and do not provide a theory of the development process as it impacts on inequalities. Two additional studies by Adelman-Morris and Lydall (referenced in footnote 3) using more limited inequality data attempt an explanation of the relationship by investigating inequalities in power, education and resource abundance. Our analysis has been influenced by these studies in particular as well as others. We have also extended the data base on size distributions of income provided in Paukert (the most comprehensive to date). Our data are presented in Section II below.

Knowledge of the relationship between economic development and income inequalities is only a first step, however, in understanding the evolutionary process of capitalist growth and expansion. Neoclassical growth theory has little to say about the nature of capitalist development, the transformation of society's economic, social and political structure, the reorganization of production, consumption, and distribution, and the ebb and flow of traditional and capitalist sectors and classes; in short, the factors determining inequalities. The upshot of the class struggle in most underdeveloped countries has been the uneven spread of capitalist modes of production, resulting in a sharp dualism. The political strength of the traditional classes and the slow growth in the relative size of the capitalist sector (for reasons detailed later), have perpetuated this dualism and created egregious inequalities in income, lifestyles, and power. The role of economic and educational dualism in exacerbating inequalities is documented in sections III and IV. Finally, in section V a comparison of inequalities in socialist and capitalist countries is presented which suggests that development in its early stages is not

University of Pennsylvania Press, 1962), p. 253; M. J. Oshima, "The International Comparison of the Size Distribution of Family Income with Special Reference to Asia," *Review of Economics and Statistics*, November, 1962, pp. 439–445; H. Lydall, *The Structure of Earnings* (Oxford, Clarendon Press, 1968), p. 216; and B. Chiswick, "Earnings Inequality and Economic Development," *Quarterly Journal of Economics*, February, 1971 p. 35. Similar international studies which have found little or no evidence for such an inverse relationship include I. Adelman and C. Morris, "Who Benefits from Economic Development?" unpublished mimeograph, January, 1972; P. D. Ojha and V. V. Bhatt, "Income Distribution: A Case Study of India," *American Economic Review*, September, 1964, pp. 711–721; and R. Weiskoff, "Income Distribution and Economic Growth: An International Comparison," unpublished Ph.D. thesis (Cambridge, Mass.: Harvard University, 1969). Within-country studies by S. Kuznets, *Shares of Upper Income Groups in Income and Saving* (Princeton, NBER, 1963), L. Soltow, "Long-Run Changes in British Income Inequality," *Economic History Review*, April, 1968, and L. Soltow, "Evidence of Income Inequality in the United States," *Journal of Economic History*, June, 1969, have also supported a long-run inverse relationship, but conflicting studies by G. Kolko, *Wealth and Power in America* (New York, Praeger, 1969), T. P. Schultz, "Secular Trends and Cyclical Behavior of Income Distribution in the United States: 1944–1965," in Soltow (ed.), *Six Papers on the Size Distribution of Wealth and Income* (New York, NBER, 1969), and B. Chiswick and J. Mincer, "Time Series Changes in Personal Income Inequality in the United States Since 1939, with Projections to 1985," *Journal of Political Economy*, May/June, 1972, pp. 34–73, pose serious questions regarding the length and causes of the decline.

[4] I. Kravis, "A World of Unequal Incomes," *The Annals of the American Academy of Political and Social Science: Income Inequalities*, September, 1973, pp. 61–80; F. Paukert, "Income Distribution at Different Levels of Development: A Survey of Evidence," *International Labor Review*, August–September, 1973 pp. 97–125.

inexorably disequalizing, lending support to the argument that what is really disequalizing is the capitalist mode of production which relies to a large degree of hierarchical, pyramidal relations of production. Under an alternative mode, economic growth can be achieved without sacrificing economic justice.

II. Income Inequalities and the Level of Development

Do income inequalities narrow over the course of development in capitalist economies? Considerable theoretical discussion has revolved around this question, but lack of sufficient information has precluded a definitive answer. The difficulties in making income comparisons across countries are well known. Even more difficult have been comparisons of incomes by *size* because of the different ways in which countries define income and the recipient unit, the time frame of analysis, and the quality of the data collection procedures. One solution to the problem has been to select for analysis only those countries which are believed to be similar along these dimensions, but the result is such a small sample of relatively homogeneous countries as to be relatively uninformative. A second solution, and the one employed here, is to purge inequality statististics of systematic biases in such variables as type of recipient unit and income. This was accomplished by first regressing the Gini ratios for each of the countries in our sample on a set of variables describing sample characteristics as well as underlying causal variables such as *per capita* income. The resulting structural equation was then used to adjust the actual ratios for significant biases. The details of this technique and the variables used in the adjustment process are given in the Appendix.

Table 1 provides a ranking of 67 countries by their "adjusted" Gini ratios along with the share of income[5] going to the top five and bottom twenty per cent of households where available. Considerable effort was made to use data for the most recent year. The ranking given in Table 1 should not be interpreted too strictly for obvious reasons. The quality of the data is too variable to assert, for example, that the United States is more equal than West Germany or even the Netherlands. Errors of 10 to 20 percent are probably common—particularly for the underdeveloped countries. The adjustment process has eliminated some but probably not all of the systematic bias in the figures. Cursory comparisons with other studies still show only a fair match for some countries, suggesting that significant unexplained sources of variation remain.[6] These variations, however, were not found to be related to inequalities in a systematic way.

It is difficult to tell from the simple ranking of countries in Table 1 whether or not the three measures of inequality are related to the level of development. To facilitate comparisons, all countries were first ranked by their *per capita* incomes,

[5]For most countries income is defined as annual total family income earned and unearned. While the income definition was different in many cases, no systematic bias was discovered using our adjustment technique. For deviations from the standard definition, see the Appendix.

[6]F. Paukert's data are the most comprehensive to date. A country-by-country match showed a few dramatic differences such as India, South Africa, Peru, Tanzania, and El Salvador but the zero-order correlation between Paukert's Gini coefficients and our data for 52 comparable countries was 0.81. This is quite good given the different data sources and adjustments made to the data by each author.

TABLE 1

VARIATIONS IN THE SIZE DISTRIBUTION OF INCOME ACROSS COUNTRIES

Country	Year	Gini Coefficient	Share of Income Going to	
			Top 5%	Bottom 20%
1. East Germany	1964	0.239	—	—
2. Czechoslovakia	1958	0.246	—	—
3. Poland	1965	0.260	—	9.2
4. Hungary	1962	0.270	12.3	9.1
5. Surinam	1962	0.290	15.4	10.7
6. Niger	1960	0.292	23.0	12.0
7. Chad	1958	0.296	23.0	12.0
8. Israel	1957	0.316	11.2	6.8
9. Burma	1958	0.318	28.2	10.0
10. Ecuador	1968	0.320	21.5	6.3
11. Yugoslavia	1963	0.324	15.2	7.9
12. New Zealand	1958	0.357	—	—
13. Canada	1965	0.360	—	4.5
14. Norway	1963	0.360	15.4	8.0
15. Dahomey	1959	0.376	32.0	6.1
16. Italy	1948	0.379	—	6.9
17. Pakistan	1964	0.381	20.0	5.0
18. Denmark	1963	0.390	16.9	5.6
19. Sudan	1969	0.393	17.1	8.0
20. Ivory Coast	1959	0.396	29.0	4.9
21. Venezuela	1962	0.397	23.2	4.4
22. Sweden	1963	0.400	17.6	5.1
23. England	1964	0.400	19.2	4.7
24. Japan	1962	0.409	14.7	9.6
25. Tanzania	1964	0.412	42.9	9.6
26. United States	1965	0.414	15.8	3.5
27. Australia	1962	0.416	16.7	6.3
28. Taiwan	1961	0.417	24.1	4.5
29. Congo	1958	0.419	36.0	5.0
30. Argentina	1961	0.423	29.4	7.0
31. West Germany	1962	0.423	—	—
32. El Salvador	1963	0.424	33.0	5.5
33. Egypt	1958	0.429	22.8	5.6
34. Zambia	1959	0.432	37.5	6.3
35. Greece	1962	0.439	—	6.4
36. Netherlands	1962	0.440	23.6	4.0
37. Puerto Rico	1963	0.441	22.0	5.4
38. Chile	1968	0.446	22.6	5.4
39. Barbados	1952	0.456	—	3.6
40. Malagasy	1960	0.460	37.0	7.0
41. Rhodesia, S.	1945	0.460	60.0	4.0
42. Bolivia	1968	0.462	35.7	4.0
43. Philippines	1961	0.463	29.0	7.0
44. Nigeria	1959	0.468	38.4	7.0
45. Finland	1962	0.470	21.0	2.4
46. Guatemala	1948	0.476	—	—
47. India	1962	0.482	—	—
48. Morocco	1955	0.486	20.6	7.1
49. Trinidad	1965	0.487	26.6	3.6
50. Kenya	1961	0.488	22.2	7.0
51. Ceylon	1963	0.490	—	3.8
52. Panama	1969	0.490	34.1	4.9
53. Brazil	1958	0.491	38.4	3.5
54. Lebanon	1960	0.511	34.0	3.0

TABLE 1—*continued*

Country	Year	Gini Coefficient	Share of Income Going to	
			Top 5%	Bottom 20%
55. Tunisia	1965	0.516	22.4	5.0
56. South Africa	1959	0.517	39.4	4.9
57. Peru	1963	0.520	—	4.0
58. France	1962	0.520	25.0	1.9
59. Costa Rica	1969	0.520	35.0	6.0
60. Senegal	1959	0.524	36.0	3.0
61. Sierra Leone	1968	0.524	33.8	3.8
62. Jamaica	1958	0.528	31.2	2.2
63. Mexico	1963	0.530	28.8	3.5
64. Iraq	1956	0.568	34.0	2.0
65. Thailand	1962	0.583	29.6	—
66. Gabon	1960	0.584	47.0	3.3
67. Colombia	1964	0.584	40.4	2.2

Sources for Table 1:

Argentina, Mexico, Puerto Rico: R. Weisskoff, *et. al.*, pp. 110, 132 and 154.

Canada: Dominion Bureau of Statistics, *Income Distribution in Canada*, 1965.

Ceylon: Central Bank of Ceylon, *Survey of Ceylon's Consumer Finances, 1963*, Colombo, 1964, Table 42.

Australia: Commonwealth Bureau of Census and Statistics, *Commonwealth Taxation Assessments*, 1962–63, Canberra, 1964, pp. 4–5.

Greece: Jean Crockett, *Consumer Expenditures and Income in Greece*, Monograph 17, Athens, 1967, p. 88.

Italy: United Nations, *National Income and its Distribution in Underdeveloped Countries*, Statistical Papers, Series E, 1951, pp. 26, 29.

India: S. Swamy, "Structural Changes and the Distribution of Income by Size: The Case of India," *Review of Income and Wealth*, June, 1967, p. 168.

New Zealand, Guatemala: B. M. Russett, *World Handbook of Political and Social Indicators*, 1969.

Pakistan: A. Bergan, "Personal Income Distribution and Personal Savings in Pakistan, 1963/64," *Pakistan Development Review*, Summer, 1967, pp. 160–212.

Peru: E. Brady, *The Distribution of Total Personal Income in Peru*, 1963, University of Iowa, 1968, pp. 7–10.

Philippines: Bureau of the Census and Statistics, "Family Income and Expenditures, April, 1962," *The Philippine Statistical Survey of Households*, Bulletin 14, Match, 1964.

Sweden, Norway, Netherlands, France, Finland, Denmark, W. Germany, E. Germany, Czechoslovakia, England, Hungary, Poland, Yugoslavia: U.N. Economic Commission for Europe, *Economic Survey of Europe in 1965, Part II, Incomes in Post-war Europe: A Study of Policies, Growth, and Distribution*, Geneva, 1967.

Bolivia, Burma, Brazil, Chad, Colombia, Costa Rica, Dahomey, Ecuador, El Salvador, Iraq, Israel, Ivory Coast, Jamaica, Kenya, Lebanon, Libya, Malagasy, Morocco, Niger, Nigeria, Panama, S. Rhodesia, Sierra Leone, Sudan, Surinam, Taiwan, Tanzania, Tunisia, Venezuela, Zambia: I. Adelman and C. Morris, "Who Benefits from Economic Development," unpublished manuscript, January, 1972.

Egypt: National Bank of Egypt, "Family Budget Study in United Arab Republic," *Economic Bulletin*, Vol. XX, No. 1967, p. 251.

United States: U.S. Bureau of the Census, *Current Population Survey: Consumer Income*, Series P-60, 1966.

Barbados: Ohja and Bhatt, "Pattern of Income Distribution in an Underdeveloped Economy: A Case Study of India," *American Economic Review*, September, 1964, pp. 714–715.

Senegal, Congo, Gabon: C. Morrison, *La Repartition Des Revenues Dans Les Pays du Tiers-Monde*, Paris, 1968.

Trinidad: Central Statistical Office, Income: *Earnings of Individuals by Sex*, Continuous Survey of Population, No. 6, 1965.

then grouped by income class and average Gini ratios and percentile shares calculated for each group. The results are given in Table 2. Summarizing the overall trends in non-socialist countries, income inequalities were found to be least in the most backward economies, due primarily to the relatively high share (9.1 percent) of income going to the bottom 20 percent. With development apparently comes a rapid increase in the Gini concentration ratio with inequalities peaking at levels of per capita product between $200 and $400. From this level, inequalities appear to narrow, but never again reaching the levels of the most backward African countries. Differences in the share going to the top 5 percent follow a pattern similar to the Gini ratio, rising during the early phase of development and falling noticeably thereafter. There are reasons to believe, however, that this trend is biased downwards with respect to *per capita* product because of changes in the industrial structure, non-reporting to avoid steeply progressive income taxes in developed countries, and the growing importance of capital gains and other forms of income not normally included in the definition of income. While trends in the top 5 percent would appear to be equalizing across poor and rich countries, the same is not true for the share going to the poorest 20 percent of households. Although the most advanced countries are more equal than all but the poorest countries, they also exhibit the lowest share of income (4.4

TABLE 2

GINI CONCENTRATION RATIOS AND PERCENTILE SHARES BY COUNTRIES GROUPED BY *Per Capita* PRODUCT

Groups of Countries by *Per Capita* Product (number of countries)	Mean *Per Capita* Product (U.S. $)	Average Gini Ratio	Average Income Share going to	
			Top 5% (%)	Bottom 20% (%)
Capitalist Countries:				
1. Group one (7)	53	0.367	31.7	9.1
2. Group two (13)	118	0.472	30.1	5.2
3. Group three (14)	197	0.475	34.1	4.9
4. Group four (10)	408	0.457	27.2	5.3
5. Group five (6)	715	0.428	22.1	5.2
6. Group six (12)	1950	0.412	20.0	4.4
Average (62)	586	0.438	27.9	5.4
7. Socialist Countries (5)	795	0.267	13.8	8.7

Countries by Group:

Group One: Burma, Chad, Congo, Dahomey, Malagasy, Niger, Tanzania.

Group Two: Ceylon, Egypt, Guatemala, India, Kenya, Morocco, Nigeria, Pakistan, Philippines, S. Rhodesia, Sierra Leone, Taiwan, Thailand.

Group Three: Barbados, Bolivia, Brazil, Colombia, Ecuador, El Salvador, Gabon, Italy, Iraq, Ivory Coast, Peru, Senegal, Tunisia, Zambia.

Group Four: Argentina, Chile, Greece, Jamaica, Lebanon, Mexico, Panama, South Africa, Sudan, Surinam.

Group Five: Costa Rica, Israel, Japan, Puerto Rico, Trinidad, Venezuela.

Group Six: Australia, Canada, Denmark, Finland, France, W. Germany, Netherlands, New Zealand, Norway, Sweden, United Kingdom, United States.

Socialist Countries: East Germany, Czechoslovakia, Hungary, Poland, Yugoslavia.

percent) going to the bottom 20 percent. The decline in the lowest quintile share is unexpected, given the expanding role of the public sector with development, stabilizing aggregate demand, thereby minimizing unemployment, and effecting income transfers and various subsidies.[7] This no doubt reflects the fact that a significant portion of these benefits generally do not accrue to the poorest segment of society.[8]

To determine the statistical significance of the relationship between *per capita* income (YPC) and the three measures of inequality, *viz.*, the Gini ratio (GR) and the shares going to the top five (T5) and bottom 20 (B20) percent, each was regressed on YPC for the entire sample of 67 countries. The results are given in Table 3.

TABLE 3

REGRESSIONS OF INEQUALITIES ON *Per Capita* INCOME*

Dependent Variable	Intercept	YPC ($000)	R^2	Number of Countries
(1) GR	0.445	0.025	0.05	67
	(33.5)	(−1.8)	(3.2)	
(2) T5	0.31	−0.064	0.22	54
	(20.4)	(−3.8)	(14.3)	
(3) B20	0.06	−0.009	0.07	59
	(15.6)	(−2.1)	(4.2)	

*t statistics or F-ratio (for the R^2) in parentheses.
Note: R^2 is adjusted for degrees of freedom.

Equations (1) and (2) support the tentative conclusion drawn from Table 2 that inequalities are narrower in countries with greater *per capita* incomes. Offsetting this to some extent is the declining share going to the bottom 20 percent.[9] Equations (2) and (3) together suggest that the growth in the economic position of the middle class comes at the relative expense of *both* the upper and lower income groups. This is consistent with what is known about changes in percentile shares in the developed countries.[10]

While a significant relationship between YPC and GR apparently exists, the declining share going to the poor with economic growth renders the influence of YPC on inequalities marginal to say the least. A $1,000 increase in YPC reduces inequalities by only 0.025 percentage points. A country with a *per capita* income

[7]Government transfers, in fact, are included in income for most of the developed countries.

[8]For an analysis of the negative trends in minimum wages, public assistance, and total welfare payments relative to average personal income in the United States, see R. Edwards, "Who Fares Well in the Welfare State?" in Edwards, Reich, and Weisskopf (eds.), *The Capitalist System* (Engelwood Cliffs, Prentice-Hall, 1972), pp. 244–251.

[9]For an earlier study which found an increase in the share going to lower income groups with development, see S. Kuznets, "Economic Growth and Income Inequality," *American Economic Review*, March, 1955, p. 18.

[10]See, for example, H. Miller, *Income Distribution in the United States* (Washington: U.S. Government Printing Office, 1968). No study that we are aware of shows a fundamental redistribution of income to the bottom of the income distribution.

of $100 would require approximately 120 years to reduce its Gini ratio by 0.025 percentage points if the only change were a constant growth in YPC of 2 percent annually. Clearly, the impact of economic growth on the forces underlying the distribution of income must be small, indeed, within the general institutional framework of capitalism.

III. Income Inequalities and the Uneven Nature of Capitalist Development

It is conceivable that the small, estimated impact of YPC on inequalities may be simply accounted for by Kuznets' hypothesis that the early phase of growth is characterized by increasing inequalities,[11] suggesting a non-linear, U-shaped relationship between GR and YPC. Tests for such a relationship using a squared YPC term, however, were unsuccessful.[12] The fact that YPC was not related to the size distribution of income in a non-linear fashion is not unexpected, for it is not the *level* of development so much as its *unevenness* that is relevant to movements in the size distribution of income. Much of Kuznets' theoretical and empirical analysis focused on agriculture (A) and non-A and intra- and inter-sectoral differences in income over the course of development. His argument can be summarized, algebraically, using a decomposition formula provided by Swamy:[13]

$$C = \frac{\{W_1 C_1^2 + W_2 C_2^2 \lambda^2 + W_1 W_2 (\lambda - 1)^2\}^{1/2}}{W_1 + W_2 \lambda} \tag{4}$$

where C = coefficient of variation of total income; W_1 and W_2 = proportions of households in the A and non-A sectors, respectively; C_1 and C_2 = coefficients of variation in each sector, and λ = per household income in sector 2 relative to that in sector 1. Kuznets' explanation depends upon the relative inequalities within the non-A sector (C_2) and λ, the inter-sectoral difference in average incomes. If C_2 and λ are large enough in poor countries, they can offset a greater population weight, W_1, being placed on the more equal A sector. Kuznets' data did, in fact, suggest that both C_2 and λ are greater in the more backward countries.[14]

This approach has merit in that it focuses on one of the crucial aspects of capitalist development; that is, its inherent unevenness. But it is not at all clear that sectors should be defined in terms of the kind of output produced. What really sets the two sectors apart is not the different outputs each produces, but rather, the mode of production. For it is the mode and associated social relations of production which determine the extent of inter-sectoral competition, inequality, and class struggle. All currently underdeveloped countries exhibit large, backward, agriculture and handicraft sectors relying almost exclusively on land and

[11] S. Kuznets, "Quantitative Aspects of the Economic Growth of Nations: Distribution of Income by Size," *op. cit.*, p. 67. In contrast, L. Soltow, in his studies of the trend in inequalities in England and the United States, found no evidence that the trend narrowed or widened during the early stages of industrialization (see L. Soltow, *op. cit.*, p. 19 and p. 282).

[12] Paukert's grouped data appear to support a U-shaped relationship, but variances within groups at different income levels, very low Gini ratios for India at one end of the distribution and the U.S. at the other, and the exclusion of all socialist countries in the middle overstate the case.

[13] S. Swamy, *op. cit.*, p. 155.

[14] S. Kuznets, *op. cit.*, Table 14.

labor inputs. In most cases, however, the model must be modified to include a small, modern, capitalist sector where labor works for wages and salaries and capitalists appropriate any economic surplus. The social relations of production concomitant with the introduction of large-scale capital are clearly different from those in the traditional (agriculture and handicraft) sectors.

Because the difference between the traditional and capitalist sectors is so important in what follows, it is worthwhile making the distinction as clear as possible. Again, the type of output each sector produces is not the deciding factor, for capitalist plantation agriculture is quite prevalent in underdeveloped countries today, producing alongside traditional peasant plots.[15] Neither is the deciding factor the more "roundabout" methods of production. It is conceivable that capitalist relations of production could exist with labor-intensive productive techniques as well. What is unique about the modern, capitalist sector both in developed and underdeveloped countries is "the way in which the means of production [are] owned and . . . the social relations between men result[ing] from their connections with the process of production."[16] Capitalism implies the concentration of ownership of the means of production in a few hands with the result that most of the labor force works for wages, selling labor-time as a commodity. Excess profits and a sharp skewness in the distribution of income are natural outcomes. Competition between the capitalist and traditional sectors takes place on several fronts, but the primary issue almost always concerns the supply of labor. The struggling capitalist sector in backward countries is usually blessed with an unlimited supply of labor. This is partly due to its relatively small size in comparison to the larger agricultural sector, partly to the legacy of colonialism which resulted in a halving of the death rate without a similar effect on the birth rate.[17] A highly elastic supply of labor is crucial to the existence of the capitalist class, as it permits them to enjoy most of the fruits of technological change and market expansion. Further, the use of modern, capital-intensive techniques results in the emergence of a sharp dualism personified by dramatic differences in productivity and average income between the capitalist and traditional sectors.

Inequalities within the capitalist sector depend upon its relative size. With the spread of the capitalist mode of production, increasing quantities of labor are absorbed into the modern sector. The cost of attracting labor after a point begins to rise as economically redundant labor is syphoned off from the traditional sector, raising the average product of labor. Second, it is probable that some technology transfer will take place between the two sectors so that λ, too, will fall in spite of the capitalist's desire to keep productivity in the traditional sector as low as

[15]Malaysia and El Salvador, for example, have over 55 percent of their labor force employed for wages and salaries, yet a considerably greater percentage are employed in agriculture. For a quantitative analysis of differences between alternative definitions of economic "sectors" in underdeveloped countries, see S. Bowles, "Class Power and Mass Education": unpublished mimeograph, Harvard University, 1970.

[16]M. Dobb, *Studies in the Development of Capitalism* (New York: International Publishers, 1963), p. 7. On this point, also see S. Marglin, "What Do Bosses Do?: The Origins and Functions of Hierarchy in Capitalist Production," *The Journal of Radical Political Economy*, 1974.

[17]S. Kuznets, *Modern Economic Growth: Rate, Structure, and Spread.* (New Haven, Yale University Press, 1966), p. 440.

possible to assure a plentiful supply of cheap labor. For these reasons, in economies where capitalist modes of production predominate, C_2, λ, and C, too, should be lower.

An empirical test of the model involves replacing *per capita* income in the equality equations with a measure of the relative size of the capitalist sector. For this, the share of the labor force working for wages and salaries (SHAWE) is proposed, which conforms to the definition of the capitalist sector found in the literature.[18] While SHAWE is highly correlated with YPC (i.e., the zero-order correlation was 0.71), there still is reason to believe that it is a better predictor of inequalities. Our results are presented in Table 4. Equation (5) including a squared SHAWE term provides a test of the uneven impact of capitalist development. Unlike YPC, SHAWE does exhibit a very pronounced non-linear relationship, with inequalities widening during the initial growth of the capitalist sector and narrowing again after the sector reaches a certain size. Differentiating equation (5) with respect to SHAWE and setting the result equal to zero, we find that inequalities begin to narrow after the capitalist sector employs roughly 40 percent of the labor force.

To further explore the uneven impact of capitalist expansion on inequalities, we divided the sample of 54 countries with available data into two groups depending upon whether or not SHAWE was greater or less than 40 percent. Equation (6) applies to 19 countries whose capitalist sector employed not more than 40 percent of the labor force. A simple linear relationship was tried first, but it failed to capture the strong reciprocal relationship between SHAWE and GR at very early stages of capitalist development. The small, negative coefficient for the reciprocal of SHAWE in equation (6) suggests that inequalities rise very rapidly at first with the expansion of the capitalist sector so that by the time SHAWE = 10

TABLE 4

REGRESSIONS OF GINI RATIO ON THE RELATIVE SIZE OF THE CAPITALIST SECTOR AND THE LEVEL OF RESOURCE DEVELOPMENT

	Dependent Variable	Intercept	SHAWE	SHAWE^2	1/SHAWE	*RD*	R^2	Number of Countries
(5)	GR	0.404	0.36	−0.0043			0.13	54
		(14.1)	(2.3)	(−2.6)			(3.7)	
(6)	GR (SHAWE <40%)	0.502			−0.005		0.41	19
		(23.3)			(−3.5)		(12.0)	
(7)	GR (SHAWE >40%)	0.563	−0.19				0.12	35
			(−2.2)				(4.6)	
(8)	GR	0.375	0.28	−0.0038		0.001	0.21	54
		(12.8)	(1.9)	(−2.3)		(2.3)	(4.4)	

Note: R^2 is adjusted for degrees of freedom.

[18]P. Baran, *On the Political Economy of Growth* (New York, Monthly Review Press, 1962); S. Bowles, "Class Power and Mass Education . . .," *op cit.*

percent, GR = 0.45, an average somewhat above that found in the developed countries.[19] Equation (7) completes the relationship for 35 countries where SHAWE is greater than 40 percent. After peaking at SHAWE = 0.40, inequalities consistently narrow at a rate of 0.019 points for every 10 percent increase in SHAWE, reaching a minimum GR = 0.373 at SHAWE = 100 percent.

While these results clearly support the nexus between uneven capitalist development and the size distribution of income, SHAWE by itself does not completely capture the essence of the dual economic structure in underdeveloped countries. Although most third world countries are economically poor and technologically backward, many are actually quite rich in natural resources, the abundance of which attracted the capitalist countries and led to the establishment of colonial elites in positions of economic and political power. While most of the colonies today have their independence, the vestiges of colonialism remain in the form of indigenous elites carrying on the colonial tradition. Foreign corporations now legally extract what formerly required a strong coercive military presence. Hence, in poor countries with capitalist sectors of similar size, those with greater resource bases should be more unequal, reflecting a narrow based growth process founded on natural resource exploitation. Adelman and Morris calculated an index of resource development (RD) in their study of inequalities within underdeveloped countries.[20] It is included in the analysis along with SHAWE as a measure of another facet of the unevenness of capitalist development. The result, presented in equation (8), indicates that the extent of resource exploitation, holding constant the relative size of the capitalist sector, is positively related to inequalities in a significant way. That resource-rich countries at the same level of development are more unequal suggests that the mere abundance of physical resources does not guarantee a better standard of living for all segments of society. In general, it is only the top 5 percent which benefit the most from exploitation.[21]

IV. Educational Dualism

The incomplete spread of the capitalist sector to a few industries and the exploitive use of natural resources have been found to have a disequalizing impact on the size distribution of income in underdeveloped countries. At the heart of the process, we believe, is the class conflict between the traditional, land-owning elite and the emerging bourgeoisie over the direction and pace of economic development. Because the state can play a crucial role in protecting and/or extending the interests of each class, control over its activities is of paramount importance. In particular, the state is responsible for the spread of education. Education is an excellent means of accomplishing the ends of the capitalist class. Schools perform

[19]This rapid disequalizing influence no doubt explains Soltow's inability to document any significant widening of inequalities during the Industrial Revolution (see footnote 3). By that time the capitalist sector was already relatively large, placing his analysis in the range where inequalities are fairly stable or beginning to decline.

[20]I. Adelman and C. Morris, *Society, Politics, and Economic Development* (Baltimore, John Hopkins Press, 1967). The authors refer to their index as the level of resource *abundance* but it would be more correct, given their reliance upon published *output* data, to think of it as a measure of resource *development.*

[21]Adelman and Morris, "Who Benefits . . . ," *op. cit.*

the dual purpose of transmitting new ideologies based on universalistic and rationalistic principles characteristic of capitalist institutions while at the same time instructing the potential factory (or plantation) worker in such things as punctuality, discipline, personal motivation, and respect for authority outside the kinship group. The traditional elite, in stark contrast, are opposed to the spread of literacy and other skills which increase the mobility of labor, undermine traditional authority, and dissolve feudal ties of the peasant to the land. For these reasons, we would expect to find a general albeit limited, spread of mass education concomitant with the expansion of the capitalist sector.[22] If this is true what impact should it have on the size distribution of income?

An answer to this question can be had by employing a human capital approach used by Chiswick (see footnote 3), who argues that the log-variance of earnings should be a positive function of (a) the level of schooling, $\bar{S}$, (b) inequalities in schooling, Var (S), (c) the average return to schooling, $\bar{r}$, and (d) inequalities in rates-of-return, Var (r). Holding Var (S), $\bar{r}$, and Var (r) constant, an increase in the average level of schooling in the labor force, $\bar{S}$, would increase inequalities, the amount depending upon inequalities in rates-of-return, i.e., $\bar{S}$ and Var (r) should affect GR in a multiplicative fashion.

Very little data exist at all on Var (r), and what are available do not show any particular trend across countries.[23] If, for purposes of simplification, we assume along with Chiswick[24] that Var (r) is uncorrelated with the level of development and the spread of capitalist institutions, then differences in earnings inequalities become a function of differences in S and the *product* of the average return to schooling and inequalities in schooling, $\bar{r}$ Var (S). In order to measure the importance of these two crucial schooling parameters on inequalities, Chiswick's analysis was extended through the use of data on average rates-of-return provided by Psacharopoulos.[25] Also, the definition of income was broadened to total, not just earned income.[26] Finally SHAWE was substituted for YPC on the presumption that it is a more relevant measure of the uneven, dynamic properties of capitalist growth. The result is given in equation (9), Table V.[27] Increases in $\bar{r}$, Var (S), or both are shown to be significantly disequalizing, holding the spread of the capitalist sector constant.

[22]S. Bowles, "Class Power and Mass Education . . . ," *op. cit.*, has shown that whether or not the spread of mass education is in the capitalists' interests depends upon the elasticity of substitution between skilled labor and capital. If it is inelastic, then the spread of capital-intensive techniques will lower the relative return to capital and the capitalists' share in national income.

[23]See G. Psacharopoulos, *Returns to Education: An International Comparison* (San Francisco, Jossey/Bass/Elsvier, Inc., 1973) and M. Carnoy, "Rates of Return to Schooling in Latin America," *Journal of Human Resources*, Summer, 1967. Most of the data presented are on rates-of-return by education level, but this only adjusts for Var (r) due to Var (S). Psacharopoulos also collected data on returns to males and females and to various subjects of higher education, but found no discernible trends across countries.

[24]B. Chiswick, *op. cit.*, p. 30.

[25]Psacharopoulos, *op.cit.*, Table 5.2, p. 85.

[26]Chiswick's analysis, strictly interpreted, only applies to earned income. To the extent that earned and unearned income are correlated, the model is easily extended to include all income. To the extent that that are not, the inclusion of SHAWE in the analysis helps explain additional inequalities resulting from large unearned incomes.

[27]Unfortunately, data on Var (S) and $\bar{r}$ were mutually available for only ten countries. These countries, on the other hand, run the full range of the level of development so no particular bias is thought to exist.

TABLE 5

REGRESSIONS OF THE GINI RATIO ON THE RELATIVE SIZE OF THE CAPITALIST SECTOR, LEVEL OF RESOURCE DEVELOPMENT, AND SCHOOLING INEQUALITIES

Dependent Variable		Intercept	SHAWE	SHAWE^2	$\bar{r}$ Var (S)	S	$1/S$	PTE	R^2	Number of Countries
(9)	GR	0.434	−0.11		0.0017				0.82	10
		(11.4)	(−2.3)		(4.4)				(16.4)	
(10)	$\bar{r}$	0.179				−0.0005			0.10	24
		(6.4)				(−1.6)			(2.4)	
(11)	Var(S)	1.62					190		0.12	22
		(0.4)					(1.6)		(2.4)	
(12)	S	11.5	1.0					−0.36	0.50	58
		(1.0)	(5.8)					(−2.2)	(27.2)	

Although the level of schooling apparently does not affect inequalities directly (its sign in equation (9) was positive, but insignificant), it should have indirect effects through $\bar{r}$ and Var (S). First, the rate-of-return to education should vary inversely with the level of schooling in the labor force, holding the demand for educated labor constant. With the spread of capitalist modes of production, however, the demand should also shift out, thereby raising the return again, leaving the relationship undetermined. While an inverse relationship between $\bar{r}$ and S was found, see equation (10), efforts to explain differences in $\bar{r}$ across countries using SHAWE as well proved unsuccessful.[28] As for Var (S), inequalities in schooling in less developed economies today are, in most instances, part of the colonial legacy. Expatriates established capitalist enclaves in commercial and extractive industries and, by controlling the state, set up an educational system designed to educate their offspring and a select group of the indigenous population. Biases toward an elitist type of education still persist in many countries today even with independence.[29] In the developed countries, more effective minimum schooling laws and larger schooling subsidies for lower grades might be expected to narrow inequalities in schooling.[30] Equation (11) does support a reciprocal relationship between schooling levels and schooling inequalities although the level of development as measured by the size of the capitalist sector (or YPC for that matter) proved insignificant. From this it is tentatively concluded that education in developed countries is more equally distributed than elsewhere, and, because of its plentiful supply relative to demand, receives a lower economic return, *ceteris paribus.*

[28]Still, some evidence exists indicating that relative wage rates (a proxy for rates-of-return) of skilled and unskilled workers are related at least to the commodity composition of output (see S. Bowles, "Class Power and Mass Education . . .," *op. cit.*).

[29]This is borne out by the perpetual discrepancy between private and social returns to schooling, with greater relative subsidization of higher education in underdeveloped countries (see Psacharopoulos, *op. cit.*, Table 4.4, p. 67).

[30]B. Chiswick, "Minimum Schooling Legislation and the Cross-Sectional Distribution of Income," *Economic Journal*, September, 1969, pp. 495–507; B. Chiswick, "The Average Level of Schooling and the Intra-Regional Inequality of Income," *American Economic Review*, June, 1968, pp. 495–508; and H. Lydall, *op cit.*, pp. 209–214.

All that is left to document is the connection between the level of schooling in the labor force and the spread of capitalist modes of production. In countries with politically dominant traditional elites, the level of schooling is hypothesized to be less than in those where modern, growth-oriented capitalist groups are in control of the state. As a measure of the power of the traditional elite (PTE), an index constructed by Adelman and Morris ranking countries according to the political strength of traditional-oriented elites is used.[31] Equation (12) confirms our hypothesis. SHAWE and PTE are both very significant and have the expected signs. Together, these two variables explain 50 percent of the variance in schooling levels across countries. The consistent performance of these variables in explaining various dimensions of the spread of education in this and other studies[32] lends credence to the argument that traditional, landholding elites retard the spread of schooling and stand politically and culturally opposed to capitalist interests in this area.

Recapitulating, in underdeveloped countries the persistence of two forms of dualism, economic and educational, are found to be both interrelated and mutually responsible for the present egregious inequalities in income and power. The more advanced capitalist countries do not exhibit such a sharp dualism in either respect, and inequalities appear to be somewhat narrower. Still, even with the attenuation of both forms of dualism, the basic institutional structure of capitalism greatly restricts the effectiveness of any equalizing forces associated with development in general.

V. The Socialist Income Revolution

Are the large income inequalities found in most countries inevitable, or might another economic system with a different set of social relations of production and distribution permit more equality and economic opportunity? In this final section, a comparison of size distribution statistics in capitalist and socialist countries is carried out in order to answer this important question. To be sure the task is complicated by differences in definitions of income and recipient unit. The treatment of in-kind income is particularly important given its relative importance in total household income in socialist countries.[33] Unfortunately, no comprehensive data on the distribution of free government goods and services exist. Still, it seems reasonable to assume that a proper accounting of in-kind income in capitalist and socialist economies would not make the latter appear any less unequal relative to the former.

Inequality statistics for a limited number of socialist countries have already been presented above in Table 1. If we accept the Gini ratios of the five socialist

[31] Adelman and Morris, *Society, Politics, and Economic Development, op. cit.*, p. 72.

[32] S. Bowles, "Class Power and Mass Education . . . ," *op. cit.*, Tables 5–6.

[33] In Hungary and Czechoslovakia, for example, in-kind transfers of social services (e.g., health care, education) amount to 12 and 18 percent of personal consumption, respectively (J. Michal, "Size-Distribution of Earnings and Household Incomes in Small Socialist Countries," *Review of Income and Wealth*, December, 1973, p. 408). Social benefits may add as much as 35 percent to take-home wages in the more advanced Soviet Union (J. Chapman, "Wage Variation in Soviet Industry," Rand No. RM-6076, February, 1970, p. 113).

economies as relatively accurate,[34] then a comparison of simple averages (see Table 2) leads to an inescapable conclusion: Socialism, as carried out in Eastern Europe, has resulted in a true "income revolution." Inequalities (measured by the Gini ratio) within the socialist countries are 39 percent less (0.438–0.267/0.438) than for the 62 non-socialist countries in the sample. Even when compared to the 12 advanced capitalist economies in Group 6, the reduction is still on the order of 35 percent (0.412–0.267/0.412). The "equality gap" is so large, so significant, that no adjustment for income definition, recipient unit, etc., suggests itself, which could explain away all of the gap. Therefore, it would appear that socialism, as practiced in Eastern Europe, has accomplished one of its primary revolutionary goals, *viz.*, the significant narrowing of income inequalities.

That socialist countries are more egalitarian in the distribution of claims to goods and services is not unexpected. One would expect the relative insignificance of property income, which is everywhere more unequally distributed than earnings in capitalist economies, to have an equalizing influence. Yet, more and more evidence is beginning to show that inequalities in *earned* income are also less in socialist countries.[35] Not only has the revolutionary expropriation of property eliminated one of the principal, immediate sources of inequalities but, in addition, has obviously altered the manner in which real effort is differentially rewarded.

This effect can be more clearly shown by separating out the effects of industrial and technical change concomitant with economic development. One could argue, for example, that socialist countries are more equal because they have carried capitalist techniques and modes of production to the ultimate; that everyone, in agriculture or industry, works for wages and salaries.[36] As a test, equation (8) was rerun with a dummy variable for economic system (COM) added. The result is shown in equation (8′). Even holding SHAWE and RD constant, the importance of economic system is still apparent. The coefficient for COM is negative and highly significant, its size relative to the mean of non-socialist countries almost exactly that found in the simple averages of Table 2, implying a 40 percent reduction in inequalities.

$$(8') \quad GR = \underset{(12.8)}{0.376} + \underset{(1.9)}{0.0028}\,SHAWE - \underset{(-2.4)}{0.00037}\,SHAWE^2 \qquad R^2 = 0.42$$

$$F = 9.4$$

$$+ \underset{(2.3)}{0.001}\,RD - \underset{(-5.2)}{0.18}\,COM \qquad \text{Number of Countries} = 59$$

[34]While the Gini ratios for East Germany, Czechoslovakia, and Poland are based on worker-and-employee households only, studies based on a more comprehensive set of recipient units essentially confirm the representativeness of these data. There is good reason to believe that the Gini ratios for Hungary and Yugoslavia are accurate and that the other three socialist countries in our sample are more equal than either of these countries. (See F. Pryor, "Economic System and the Size Distribution of Income and Wealth," Working Paper No. 1, International Development Research Center; UNESCO, Economic Commission for Europe, *Economic Survey of Europe in 1965 Part II*, Geneva, 1967.)

[35]H. Lydall, *op. cit.*, p. 153; J. Michal, *op. cit.*, p. 412; F. Pryor, *op. cit.*

[36]Actually, such was not the case in Eastern Europe in 1965, as SHAWE was only 42.3 percent in Yugoslavia, ranging to a high of 80 percent in Czechoslovakia. Besides, previous results deny such an interpretation. Equation (7) indicated that even if the capitalist countries extended wage-and-salary employment to the entire labor force, the Gini ratio would fall to only 0.37, still considerably above the average of socialist countries.

These results suggest that the hierarchical, pyramidal structure of capitalist production personified by SHAWE does not necessarily imply a grossly unequal distribution of income and/or earnings. Socialist modes of production in denying a role for the capitalist *qua* capitalist, have evidently resulted in a much more equal income distribution in spite of an increasing capital-intensity of production and diminishing reliance upon agriculture. What has been different about socialist adaptations of hierarchy to production is the elimination of extraordinary economic returns realized by capitalists, with the economic surplus usually returning to the state. The manifest equity in such a treatment of the surplus has undoubtedly been instrumental in permitting the narrowing of wage differentials as well without retarding economic growth.

APPENDIX

Income Inequalities across Countries: Problems in Measurement

The major drawback to the study of income inequalities across countries has to do with the data that are available, their quantity, quality, and comparability. In this appendix, these problems are discussed along with the data sources used.

Recipient Unit

Probably the single most important source of variability across countries involves the definition of the recipient unit. Because income data are collected from censuses, sample budget surveys, wage surveys, tax returns, consumption studies, and individual collection efforts, the number of people in the recipient unit varies depending upon whether or not the distribution is among households or individuals. This study has concentrated on the household as the basic recipient unit as it is more closely tied to welfare and the measurement of inequalities in standards-of-living. Not all inequality studies used the household as the unit, however.

Scope

Inequality data are collected from a wide variety of sources so that uniformity of scope can never be perfect. For the purposes of comparing income inequalities across countries, one particular source of incomparability must be addressed and that is the complete exclusion of rural households which make up to 60–90 percent of the population in poor countries. The bias of such an omission is ambiguous, however. Referring to equation (4) above, if $C_1 < C_2$ and $\lambda > 1$, which is most likely the case, then C may be greater than, equal to, or less than C_2 depending upon the relative size of C_1, W_1, and λ. Without knowing C_1, it is clearly impossible to determine exactly the direction of the bias, even if W_1 and λ are known. Data provided by Swamy[1] and Kuznets[2] on inter- and intra-sectoral inequalities in selected countries lead us to believe that for countries where we have had to rely on urban income distributions alone, our estimate of total inequalities is probably biased downwards—particularly for countries with sectors

[1]S. Swamy, *op. cit.*, p. 167.
[2]S. Kuznets, "Quantitative Aspects of the Economic Growth of Nations . . .," *op. cit.*, p. 50.

about equal in size. As shown below, however, this bias was not statistically significant once other relevant factors were held constant.

Income Definition

The lack of uniformity in defining income also raises difficult questions of comparability. In reviewing the data, three sources of disparity were found. First, a few studies included only *earned* income, often the result of an industrial wage survey, although an adjustment was made by the source, making some of these countries more comparable. As a rule earned income is more equally distributed than total family income, given the considerable inequalities in unearned income. Second, a few countries measure income on an after-tax basis, including government transfers, which would result in a more equal distribution assuming some progressivity in the tax structure. Third, several countries did not include, or only partially included, in-kind income. For the developed countries, the reliance on tax returns also results in an underestimate of in-kind income although it is probably too small to be significant anyway, at least for cross-country comparisons.[3] The exclusion of in-kind income for less developed countries, on the other hand, is more serious as it is a much more important source of income in a peasant, barter economy. Omission of in-kind income will definitely result in an overestimate of the fall in inequalities with development.

Time Frame

Ideally, all countries would report household income on an annual (or even better, two or three years') basis. While most studies did give yearly income, some asked for only monthly income while one, Barbados, collected data on a weekly basis. Seasonality of employment can have a definite impact on the size distribution of monthly income so that it does make some difference when the survey takes place. Both Cuba and Libya had to be dropped from the study because the resulting Gini ratios calculated on these monthly data seemed unrepresentative (i.e., Cuba = 0.305, Libya = 0.748).

Grouping Technique

Raw size distribution data usually are presented either by (a) income categories, or (b) percentage groupings of recipient units. The majority of countries used in our analysis had a size distribution by *quintiles* (or could be so aggregated), but others did not. Generally, the detailed breakdown by cells did not appear to vary systematically with the level of development and therefore created only random error. In a few countries where it would have been arbitrary to group households by a manageable number of percentile groups, an alternative technique, attributable to Aitchison and Brown,[4] was used to calculate the Gini coefficient.

[3]For an estimate of the distributional impact of in-kind income, see G. Kolko, *op. cit.*, and W. I. Gillespie, "Effect of Public Expenditures on the Distribution of Income," in R. Musgave (ed.), *Essays in Fiscal Federalism* (Washington, Brookings, 1965).

[4]J. Aitchison and J. A. C. Brown, *The Lognormal Distribution* (Cambridge, University Press, 1957).

Adjustment Procedure

Altogether, eleven potential sources of artificial variation in the size distributions of income across countries were identified and coded. Instead of working with them in this condition or reducing the sample to uninteresting proportions, an effort to purge as much of the error as possible was made. Unadjusted[5] Gini coefficients, calculated from the raw data, were regressed on three variables found to be statistically correlated with inequalities, *viz.*, *per capita* income (YPC), economic system (COM), and the development of natural resources (RD), and each of the eleven undesirable sources of variation. Only two of the descriptive indicators turned out to be significant, i.e., *t*-statistics greater than one (see equation A.1).

$$\text{(A.1)} \quad \begin{array}{l} GR = 0.395 + 0.0014RD - 0.0004YPC - 1.8COM \qquad R^2 = 0.49 \\ \qquad\quad (15.8)\ (3.2) \qquad\quad (2.9) \qquad\quad (5.0) \qquad\quad F = 8.2 \\ \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad N = 59 \\ \qquad + 0.056NU - 0.041LU \\ \qquad\quad (1.5) \qquad (1.2) \end{array}$$

They were the number of people in the recipient unit (NU) and the Aitchison–Brown technique (LU). According to the signs of these variables, distributions among single individuals (NU = 1) overstate inequalities while the use of the Aitchison–Brown technique results in an underestimate. The Gini coefficient was then adjusted according to equation (A.2):

$$\text{(A.2)} \qquad \overline{GR} = GR - 0.056NU + 0.041LU$$

where $\overline{GR}$ = the adjusted Gini coefficient. It is this coefficient which appears in Table 1 above.

[5]The data are not always unadjusted as various authors have made attempts to make them more comparable. Where this was the case, the most comparable data were used.