POLICY RESEARCH WORKING PAPER 1246

Determinants of Cross-Country Income Inequality

An "Augmented" Kuznets' Hypothesis

Branko Milanovic

An alternative hypothesis to explain why income inequality differs among countries. Inequality in richer societies decreases not only because of economic factors but also because societies choose less inequality as they grow richer.

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Summary findings

Why does income inequality differ among countries? Using a sample of 80 countries from the 1980s, Milanovic shows that two types of factors explain variations in income inequality.

The first are factors that are, in the short term, independent of economic policies and are included in the standard formulation of the Kuznets' curve: the level of per capita income and the country's regional heterogeneity. From the viewpoint of economic policy, these are "given" factors, resulting in a "given inequality."

The second group of factors are the *social-choice factors* reflected in the size of social transfers and of state sector employment, both of which reduce inequality. For this sample, the reduction amounts to about a quarter of "given" inequality.

The importance of social-choice factors rises as the level of income rises. The divergence between actual inequality and the inequality predicted by the standard Kuznets' curve therefore systematically widens as a society develops.

The discrepancy is systematic, Milanovic contends. Inequality in richer societies decreases not only because of economic factors but also because societies *choose* less inequality as they grow richer.

This paper — a product of the Transition Economies Division, Policy Research Department — is part of a larger effort in the department to study determinants of income distribution and poverty. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Rebecca Martin, room N11-043, extension 39065 (62 pages). January 1994.

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DETERMINANTS OF CROSS-COUNTRY INCOME INEQUALITY: AN "AUGMENTED" KUZNETS' HYPOTHESIS

Branko Milanovic [1]

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1. Introduction

This paper presents an alternative hypothesis why income inequality differs between the countries. The only currently existing hypothesis was formulated by Kuznets (1955). Kuznets' hypothesis is briefly reviewed in Section 2. It provides an indispensable background to our "augmented" Kuznets' hypothesis which is formulated in Section 3. The empirical assessment of our hypothesis is presented in Section 4. The hypothesis is tested on a cross-sectional sample of 80 countries including all OECD countries, all European (former) socialist countries, and 50 African, Asian, and Latin American countries. The data are from the 1980s. Section 5 spells out the main conclusions and implications of our hypothesis.

2. The Background: the Kuznets' Relationship

When it comes to factors that explain differences in size income distribution between the countries, there exists only one broad hypothesis, proposed almost 40 years ago by Simon Kuznets (1955). It became famous as the Kuznets' inverted U curve. The hypothesis states that at very low levels of income, income inequality must also be low, as practically everybody lives at, or close to, subsistence level. There is no room for increased inequality because with the small size of overall output increased inequality would push many people below the subsistence level. As the process of growth begins, income inequality increases. People migrate from the traditional agricultural sector where incomes are low to the modern industrial sector where both the (expected) wage is higher and wage differentiation is greater. Kuznets' model is thus also consistent with the Lewis-type pattern of growth. At the early stage of development, both physical and human capital are scarce and unequally distributed (that is, heavily concentrated among the few), and owners of human and physical capital are able to command high returns. As the two types of capital accumulate and become more diffused among the population, the rate of return on the physical capital declines while wage differentials between skilled and unskilled labor diminish. Income distribution becomes more equal. The process was summarized as follows by Kuznets (1966, p. 217): "It seems plausible to assume that in the process of growth,

the earlier periods are characterized by a balance of counteracting forces that may have widened the inequality in the size distribution of total income for a while because of the rapid growth of the non-A [non-agricultural] sector and wider inequality within it. It is even more plausible to argue that the recent narrowing in income inequality observed in the developed countries was due to a combination of the narrowing inter-sectoral inequalities in product per worker, the decline in the share of property incomes in total incomes of households, and the institutional changes that reflect decisions concerning social security and full employment."

Kuznets' empirical relationship has been extensively studied in both the cross-country and inter-temporal contexts. It remains the subject of controversy.[2] The controversy has centered on: (1) the very existence of the relationship (it was argued that the Kuznets relationship critically depends on Latin American countries which are at an intermediate stage of development, and for reasons peculiar to them, exhibit high inequality),[3] (2) its validity for different countries and regions,[4] and (3) its validity for different epochs. Kaelble and Thomas (1991, p.32) have recently thus summarized the empirical results of the Kuznets hypothesis: "Income levels explain only a small part of the variance of the inequality measures. This suggests that national characteristics (whether in terms of economic structure, political institutions, socio-cultural heritage, or whatever) play an important part in determining exactly what level of inequality is to be found at any particular level of modernization." No comprehensive alternative hypothesis regarding determinants of income inequality has so far been suggested, however.

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[2]Reviews of theory and evidence on the Kuznets curve are extremely numerous. A particularly useful subset would include Lindert and Williamson (1985), Kaelble and Thomas (1991), Williamson (1991a), Polak and Williamson (1991), Paukert (1973), and Lecaillon et al. (1984). Williamson (1991) provides a useful summary of the country studies and tries to determine if there is historical evidence for the Kuznets curve in Great Britain; Dumke (1991), Soderberg (1991), and Thomas (1991) in the same volume do the same thing respectively for Germany, Sweden, and Australia. Ram (1991) applies the Kuznets hypothesis to the states of the US.

[3]See, for example, recent criticism by Atkinson and Micklewright (1992, p.35).

[4]For the denial of its validity in Asia, see Oshima (1991, p.121); for the absence of the Kuznets curve in Japan, see Lindert and Williamson (1985, p.354).

It is worth pointing out, in light of the alternative hypothesis proposed here, that the Kuznets' hypothesis puts at center stage the role of economic factors, that is, of the supply of, and demand for, various factors of production.[5] The forces of economic development determine the shape of income distribution. Societies do not choose the income distribution that they would like to have. The process is led by inexorable economic forces, and deviations from the income distribution that a country must have at a certain level of development are small and non-systematic.

3. A New Hypothesis

Here, I propose an "augmented" Kuznets' hypothesis. I argue that size income distribution is determined (1) by factors that are in the short-run, from the point of view of policy makers or society as a whole, "given", and (2) by social (or public policy) choice. The "givens" are (1) the level of income and (2) the regional heterogeneity of a country. Neither of these factors can be influenced strongly in the short-run. The level of development (level of income) is obviously a variable that changes slowly; so is, and for the same reasons, the inherited regional inequality. No amount of government redistribution will transform, in a few years, Sicily into Lombardy, nor, in the former Soviet Union, Kyrghzystan into Estonia. The public policy factors are (1) the percentage of workers employed in the state and the para-statal sector, and (2) the extent of government transfers, measured as a share of a country's GDP. These two factors are the products of political decisions, both current and past (e.g. a country might have a large state sector because of a strong past influence of socialist parties). In the empirical section that follows, I will address two key questions: (1) Are social choice factors statistically significant "explanators" of cross-country income inequality? and (2) If so, how large is their influence?

The "given" factors are not new. They have already been included in the numerous studies of cross-country income inequality. This applies not only to income as in the strong variant of the Kuznets hypothesis where income alone determines income inequality, but also to regional

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[5]I use the qualifier "at center stage" because Kuznets' was indeed aware, as the earlier quotation makes clear, of the role of institutional factors in income distribution.

heterogeneity. The point was made in earlier studies that the heterogeneity of the country will have an impact on income inequality. The total population (Pryor, 1973, pp. 83ff.) or the geographical size of a country were used as control variables, assuming that larger or more populous countries will tend to be more heterogeneous. These assumptions are dubious. For example, in the former Yugoslavia, equal in size to the state of Oregon and in population to California, the ratio of per capita income between the richest and the poorest republic was almost 8:1, whereas in the much larger United States the ratio between the richest and the poorest state in 1980 was only 2:1. More exact indicators than geographic size would need to be used to reflect a country's heterogeneity. In the empirical part of the paper, I use, for each country, the ratio in average income between its richest and its poorest territorial unit (state, republic, province, *länder* in the case of federal states; prefectures, counties, etc. in the case of unitary states).[6]

The heterogeneity of the country, however, requires special attention. If we consider regional difference as a datum, in the sense that it reflects long-standing and slow-changing features of different regions that are not significantly influenced in the short-run by social policy, the inclusion of regional heterogeneity as an explanatory variable is appropriate. Thus, if we take the former Soviet Union or Brazil as examples, it could be argued that, everything else being the same (income, social transfers, state-sector employment etc.), these countries could be expected to have a more unequal income distribution than some others, such as France or Sweden, owing to historically different regional income levels. One would also expect that this year's social policy (or that of the last several years) would have almost no effect on the ratio of *average* incomes between (say) Russia and Tajikistan, and Sao Paolo and Rondonia. If nothing else changes except that a country splits up, as happened with the Soviet Union, size income inequality within each of the new countries will decrease precisely because regional differences will be less. The inclusion of a variable that captures regional heterogeneity is then

[6]Clearly, this is not a perfect measure either. Heterogeneity will increase the smaller the size of the units. There also the usual problems associated with the use of extreme values only. However, as can be observed in the Annex, the variable seems to reflect relatively well the heterogeneity of the countries.

legitimate.

However, if one believes that regional inequality is also influenced by the variables which we hold to determine personal income distribution, then the model may be misspecified. Regional inequality may, in effect, be the dependent variable, explained by the same factors as personal income inequality. If the first hypothesis is true (regional differences are "given"), then the correlation between regional inequality and other explanatory variables must be low, and significantly lower than the correlation between the other explanatory variables and size income inequality. In the empirical section, I shall therefore always present two versions of each equation: with and without the regional heterogeneity variable.

What is new in our "augmented" Kuznets hypothesis is the role of social choice. Our hypothesis says that -- once the "given" elements are accounted for -- there is still sizeable discretion regarding income inequality. Income distribution is viewed also as the product of *social choices* mediated through elections, lobbying of various social groups, societal preferences or historical developments. Thus, some countries may have a greater proportion of state-sector workers because socialist or Communist parties were historically stronger; or the population may have a high preference for eradicating poverty and redistributing income through transfers; or the middle classes which decisively determine the size of transfers in developed democracies may have had experience of downward mobility and may regard transfers as an insurance proposition (lest they become poor) as argued by Lindert (1989 and 1991). In any case, variables such as the size of the state sector and the size of transfers will be determined through the interaction of social forces, or put more broadly, by the political economy of the country.

Consider now the influence of the two "social choice" elements in more detail. The large size of the state sector will tend to reduce inequality because of a more compressed wage distribution existing in the state compared to the private sector. More bureaucratic structures, in which earnings are largely determined by seniority and academic credentials, are believed to reward those at the top relatively less and to pay relatively more to those at the bottom. This is confirmed by empirical studies. Bishop, Formby, and Thistle (1991, p.430) find that wage distribution in the U.S. government sector is consistently more egalitarian than in manufacturing,

services or agriculture (all of which are entirely private). Meron (1991) obtains the same result for France. Blank (1993, pp. 29-30) writes: "Public sector workers [in the U.S. and the UK] face more compressed wage distribution than do private sector workers. For almost every occupation in every year in both countries, both the 10th percentile and the 90th percentile of wages in the public sector are closer to the mean public sector wages than are 10th percentile and 90th percentile of wages in the private sector." Further confirmation of the levelling tendencies present in state-owned enterprises is provided by socialist countries, where the majority of workers (outside agriculture) were or are employed in the state sector. Wage distribution in socialism, adjusted for the heterogeneity of the country, tends to be more equal than in capitalism. Thus Phelps-Brown (1988, p.303) writes that lower inequality in Soviet-type economies "arises mainly from a slower rise of income above the median, that is, broadly: the more skilled manual occupations and still more the higher clerical, the professional and administrative, are paid less than in the West relatively to the bulk of manual workers."[7]

There is yet another reason why a high level of state involvement in the organization of an economy may lead to lower inequality. The point was made by Hirschman (1973, p.558) "[i]f decision-making is perceived to be largely decentralized, individual advances are attributed to chance, or possibly merit (or demerit). When decision making is known to be centralized, such advances will be attributed to favoritism....[Centralized systems] will strain to be more egalitarian not just because they want to, but also because they have to: centralization of decision making largely deprives them of tolerance for inequality that is available to more decentralized systems".

I am not aware of previous attempts to link explicitly, at the economy-wide level, the share

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[7]See also Phelps-Brown (1977, p.286) and Lydall (1968). Atkinson and Micklewright (1992, pp.81ff.) show that Czechoslovakia, Hungary and Poland have consistently lower earnings inequality than the UK. The USSR and the UK have about the same level of inequality of earnings; the former is, however, regionally much more heterogeneous. Comparisons are, of course, strewn with many problems. State sector wages in socialism are almost always on net basis, wages in capitalism are gross. This imparts an upward bias to income inequality in market economies. The opposite bias, however, has to do with the absence of unemployment in socialist countries. This means that even those with low productivity, often unemployed in market economies, will be wage earners in socialist economies.

of the state-sector employment to size income inequality. Some indirect attempts were made -- for example, through the introduction of the dummy variable for socialist countries. In some studies (e.g. Kaelble and Thomas, 1991, or Ahluwalia, 1976) the socialist dummy variable was found to be significant (lowering inequality) while in others its effect was negligible (Dye and Ziegler, 1988). Here, however, I propose to use a continuous variable that spans almost the entire theoretical spectrum from 100 percent of state employment (USSR and Czechoslovakia before the change of the regime) and almost 0 percent (e.g., 3 percent for Madagascar and Senegal).

The extent of government transfers will also tend to reduce inequality. The relationship, however, is not unambiguous, because the reduction in inequality achieved by a given amount of government transfers will vary. The reduction of inequality will depend on the extent to which transfers are focused on the poor. If most transfers are captured by those who pay taxes out of which the transfers are financed, the reduction in inequality may be small (the theory of the middle class capture of benefits argued by Le Grand, 1982 and Sawyer, 1982). However, on balance, the larger the transfers are, the greater will be the reduction in inequality, even if the relationship may be concave, that is, additional increases in transfers may lower inequality by less and less.

4. Testing the New Hypothesis

The Data

The sample consists of 22 OECD countries, 8 socialist European countries including the former Soviet Union, 16 African, 17 Asian, and 17 Latin American countries. For these 80 countries I have been able to collect the necessary information, compatible in both the definition of the variables and the time-period (mostly early to mid-1980s). These 80 countries account for 98.8 percent of world GDP and 90 percent of world population.[8] The list of the countries, the data, and their sources are given in Annex Tables 1-4.

In undertakings of this scope, the data represent a particular problem. It is therefore important to discuss them in some detail. Income distribution data are generally thought to be among the least reliable types of macroeconomic data. The problems that hinder comparability are numerous. The most frequently mentioned are the following: How representative are household surveys on the basis of which income inequality is estimated? What is the type of income (original, gross, or disposable)? Who are the recipients (households, families or individuals)? How are they ranked (by total household income or by household per capita income or by equivalent household income)? Therefore, in Annex Table 4, I have indicated exactly the type of income and recipient from which the Gini coefficients are calculated. A general requirement, satisfied for all the countries, was twofold: the data should be derived from household surveys and they should be nationally-representative.

For the OECD countries, I have relied heavily on the Luxembourg Income Study (LIS) where a special effort was made to generate consistent data across the countries. For most of the OECD countries, the Gini coefficients are calculated for disposable (after both transfers and personal taxes) per capita income. The recipients are individuals. This means that each individual in a household is assigned the same, household per capita, income. The same principle was applied to Eastern Europe and the former Soviet Union, where most of direct taxation is in the form of

[8]GDP figures exclude the Soviet Union and East Germany. Taiwan and Hong Kong are not included in either population or GDP figures.

payroll taxes. Most of East European data were directly calculated from the published household surveys. For the Latin American and Caribbean (LAC) countries, the majority of the data come from a single source (Psacharopoulos et al., 1992) which itself is based on household surveys of very similar design as those used for OECD countries and Eastern Europe (distribution of individuals by their per capita income). However, income is almost always gross (i.e. inclusive of transfers, but not of personal taxes) rather than disposable income: since personal taxation is minimal in LAC countries, the two measures do not differ by much. Full comparability was more difficult to ensure for Africa and Asia. The problem here is less the income concept -- gross and disposable income are practically the same -- but rather the reliability of the surveys. I have used published results which I have tried to render as consistent as possible, often by using the data from the same source (e.g., a single comparative paper). The problems, however, remain: it is mostly households, rather than individuals, that are treated as recipient units. This imparts an upward bias to the data. Finally, regarding the time-period: for all but 10 countries, the Gini coefficients are from the 1980s (including 1979). The reader can check how close the definitions and the time-periods are in Annex Table 4. I believe that the data represent the most consistent set of the Gini coefficients existing at present.

Among explanatory variables, social transfers as a percentage of GDP and GDP per capita in equivalent purchasing power are relatively easily available. OECD and ILO data are the source for cash and in-kind social expenditures for most of the countries; these data were complemented by various World Bank, IMF and individual countries' publications (see Annex Table 2). For practically all the countries, the data refer to the year 1985 or the 1980s average. The purchasing power equivalent GDP per capita in 1988 or 1985 is obtained for practically all the countries from Summers and Heston (1991). The exceptions are several East European countries that were not included in the Summers-Heston sample. Estimates for these countries are made by the World Bank.

Since both income concepts (disposable and gross income) used for the calculation of the Gini coefficient include transfers, size of transfers will, it is argued, directly influence both types of GINI. But, in addition, there may be also indirect effects of social transfers. As documented (see Danziger, Haveman and Plotnick 1981 for a review of the U.S. experience, or Atkinson 1987 and

Atkinson et al., 1984 for the UK experience) the existence of transfers leads to changes in behavior of firms and individuals and thus affects their pre-fisc income. For example, existence of unemployment insurance may reduce willingness to work and reduce person's labor income. If that person is poor and his overall income, equal to income from unemployment allowance, is less than would be his income from labor (in absence of unemplpoyment insurance), a perverse situation may appear where increased transfers -- existence of unemployment insurance -- lead to greater inequality. I cannot account for this effect. I must assume that the indirect effect is sufficiently small to be swamped by the direct effect of transfers on income distributuon.

The size of the state sector is more difficult to obtain. Again, for the OECD countries, the OECD publications are the best source (even if such publications are not as exhaustive and up-to-date as one would expect). East European countries generally provide, in their statistical yearbooks, very detailed data on the size of the state sector (and the cooperative sector). For the LAC countries, Psacharopoulos et al. (1992) has also been used extensively because household surveys provide information on the employer (state, private, own-account) of the interviewed individuals. For Africa and Asia, the main sources were countries' statistical yearbooks. In almost all cases, the denominator (state sector as percentage of what) was the labor force or the economically active population. Both include the officially unemployed and agricultural underemployment; both exclude students, housewives, etc. that is, people of working age who are not economically active outside their household.[9] Almost all of the data refer to the 1980s (see Annex Table 1).

The heterogeneity variable is not only the most problematic in analytical sense; it is so in an empirical sense as well. I have tried to use the ratio of household incomes (per capita or total household) between the richest and the poorest region as the preferred indicator. But even if such data existed for all the countries, changing administrative divisions alone would produce changes in the results. Clearly, the greater is the number of administrative units in a country, the larger is the ratio. I have therefore indicated, in Annex Table 3, the number of administrative units

[9]The distinction is, of course, somewhat artificial in the case of countries with agricultural underemployment.

which are being compared (e.g. 10 regions or 16 provinces or 24 departments). In addition, ratio in incomes was not always available. I have then had to resort to proxies like consumer expenditures, wage bills per region, or even, in some cases, per capita consumption of electricity (for five countries) or per capita ownership of consumer durables such as cars or TV sets (for six countries).

The explanatory variables are therefore the following: INCOME = the country's purchasing power 1988 GDP per capita (in thousands of 1988 international dollars); RATIO = the ratio of average incomes between the richest and the poorest region within a country; STATE = the percentage of all employed who work in the state sector (inclusive of government administration); and TRANS = the percentage share of cash and in-kind social transfers (pensions, maternity and family allowances, temporary sick pay, unemployment compensations, education, and health) in the country's GDP. The dependent variable is the Gini coefficient of disposable income (GINI) expressed for convenience in percentages: Gini coefficient of 30 (instead of 0.3).

Two further points need to be clarified. An apparent inconsistency may be detected between the inclusion of in-kind transfers like education and health in the TRANS variable, and concern with disposable income inequality (which *excludes* public in-kind transfers) in the GINI variable.[10] The rationale for this is that public expenditures on health and education are conducive to more equal distribution of human captal which, in turn, reduces the inequality of disposable income: for example, more widely spread public education is likely to reduce wage differences.

Second, the analysis is conducted in per capita terms rather than in terms of equivalent consumption units. There are several reasons for this. There are practical ones, because most of the income distribition data for non-OECD countries are expressed in per capita terms; also, even when income distribution is done in terms of equivalency units, the weights used in different studies are different. There are also more substantive reasons for using the per capita measure. If we require that GINI be reported in equivalent units should we not require the same for GDP?

[10]Disposable income includes money income *plus* in-kind consumption.

The most compelling reason is that the very idea of equivalency units is country-dependent (or rather price-structure) dependent. If rents, for example, are subsidized, then economies of scale are much less important than if they are not; if education is private, the cost of children is much higher (their weight may be higher than the weight of an adult) than if education is public and free. In consequence, the use of per capita terms has both practical and substantive adventages.

Empirical Analysis

The regression with the expected signs of the coefficients is given below. The income variable is quadratic, since we test for the existence of an inverted U-shaped relationship.

$$GINI = fct\ [INCOME,\ RATIO\ (+)\ ,STATE\ (-)\ ,TRANS\ (-)].$$

The expected negative sign of TRANS deserves a further comment. As has been ar , increased social transfers will tend to reduce the inequality of *disposable or gross* income. E m some recent studies (e.g., Alesina and Rodrik, 1992; Persson and Tabellini, 1992) whic concerned with determinants of social transfers, higher income inequality is shown to lead, u conditions of wide franchise, to high redistribution. It would hence appear that inequality and transfers are positively related. The example underscores the ambiguity with which the term "income inequality" is used. The positive relationship between income inequality and transfers makes sense only if one has in mind inequality of *market income* (before government redistribution).[11] It is then logical to assume that if market incomes are distributed unequally, people (i.e. the median voter) will vote for large redistribution because they will thereby gain. But both Alesina and Rodrik (1992) and Persson and Tabellini (1992) use measures of income inequality *after* government cash transfers. Consequently, the cross-country relationship between market income inequality and TRANS may be positive (because taxes are higher in more unequal countries), while the cross-country relationship between TRANS and disposable or gross income

[11]Market or original income is the income prior to any government redistribution (ideally, it should be even prior to payroll taxes deducted at source). Gross income is equal to market income plus all cash government transfers. Disposable income is equal to gross income minus all direct taxes.

inequality may be negative (because transfers paid out of taxes lower inequality). The two income inequalities -- pre- and post-government -- are in effect two entirely different variables.

Table 1 gives summary statistics for the five regions. The most important conclusions are the following. (1) In terms of income inequality, the five regions have distinctly different averages: inequality is highest in Africa (Gini of 52), closely followed by Latin America (49), then Asia (41), OECD countries (31), while the European socialist economies are the most equal (25). (2) Eastern Europe and the former Soviet Union have a much larger share of state sector employment than does any other region (90 percent); the African and Asian samples have the lowest share (11 to 12 percent of the labor force). (3) The size of social transfers is much greater in OECD and socialist countries than elsewhere. (4) Regional heterogeneity within countries is largest in Latin America, followed by Africa; OECD countries are the most homogeneous.

Table 1. Summary statistics for the five regions

Region	GINI	STATE	TRANS	RATIO	INCOME	Number
OECD	31.2	21.2	22.6	1.8	12501	22
E. Europe	24.8	90.0	17.2	2.5	6234	8
Africa	52.3	11.3	5.7	4.8	1778	16
Asia	41.0	12.6	6.8	3.3	4851	17
L.America	49.2	19.3	7.6	7.0	4156	17

Note: All the statistics are unweighted averages.

Definition of the variables:

Region: For the list of countries see Annex. Algeria, China, and Cuba, although socialist, are included in their respective regions.

GINI : Gini coefficient of disposable income (for OECD and socialist economies); Gini coefficient of gross income for Africa, Asia and Latin America. Gini coefficients are expressed in percent.

STATE: Share of state sector workers (general government and state-owned enterprises) in total labor force.

TRANS : Share of cash and in-kind social transfers in GDP, in percent.

RATIO : Ratio of per capita income between the richest and the poorest administrative unit (province, republic, state) within a country.

INCOME : Purchasing power GDP in international dollars for 1988.

Number: Number of countries included.

The relationship between RATIO and other explanatory variables is of particular importance because of the two possible interpretations of regional heterogeneity mentioned above. In order to include RATIO in our regressions we need to satisfy two conditions. First, the correlation between RATIO and GINI, while existent, should not be close to unity (as it would be if RATIO and GINI were practically the same variable); and second, the correlation coefficients between the other explanatory variables and RATIO should be small (ideally close to zero) and in any case smaller than the correlation between these explanatory variables and GINI. Table 2 shows the results. The correlation between RATIO and GINI is +0.54, which is the weakest of any explanatory variable and GINI. This argues that RATIO is not a proxy for GINI. The correlation between other explanatory variables and GINI is always two to three times stronger than the correlation between the same explanatory variable and RATIO, thus implying that RATIO is not determined by the same set of factors as GINI. RATIO can therefore be included in our regressions.

Table 2. Testing RATIO:
Zero-order correlation coefficients

	STATE	TRANS	INCOME	GINI
RATIO	-0.20	-0.39	-0.39	+0.54
GINI	-0.63	-0.73	-0.60	

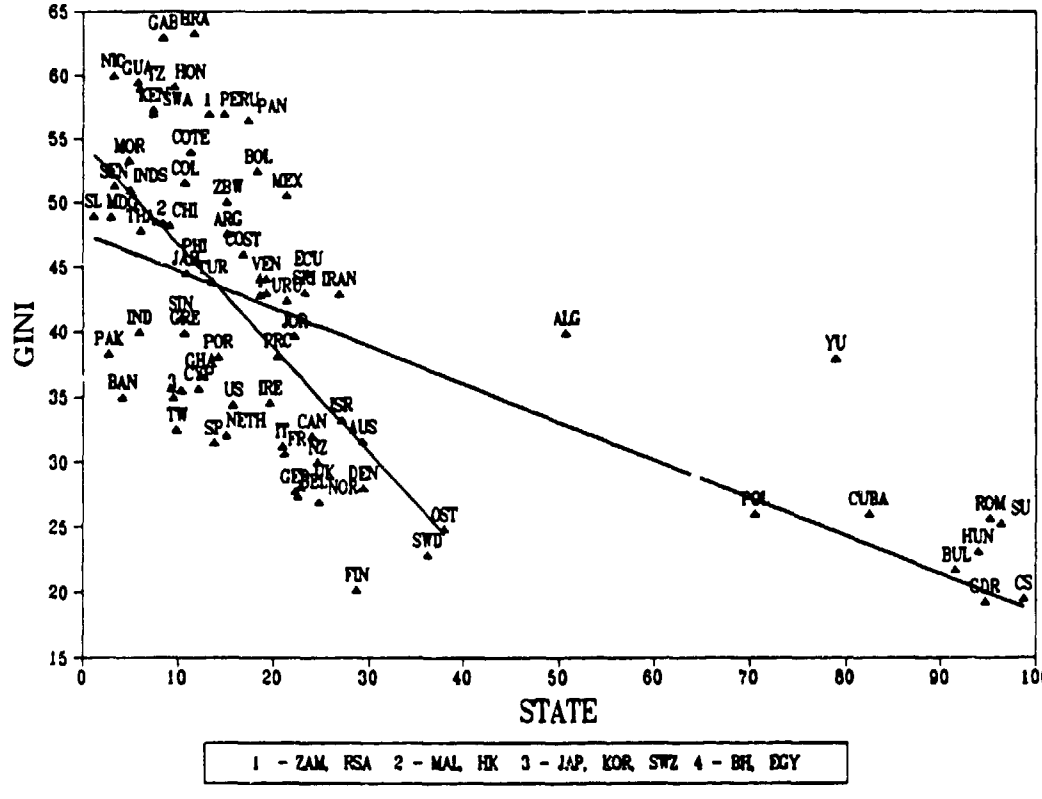
Figures 1a-1d display the relationship between GINI and the four explanatory variables.

We test first the "canonical" equation given above. This is equation (1.0) displayed also in Table 3. The observations in all the regressions are arranged in ascending order according to INCOME.

$$GINI = fct\ [STATE,\ TRANS,\ RATIO,\ LN(INCOME),\ LN(INCOME)^2].$$

All the coefficients have the predicted sign and are statistically significant at either 1 percent

Figure 2a. Relationship between GINI and STATE



Note: Steeper regression excludes socialist countries.

Figure 2b. Relationship between GINI and TRANS

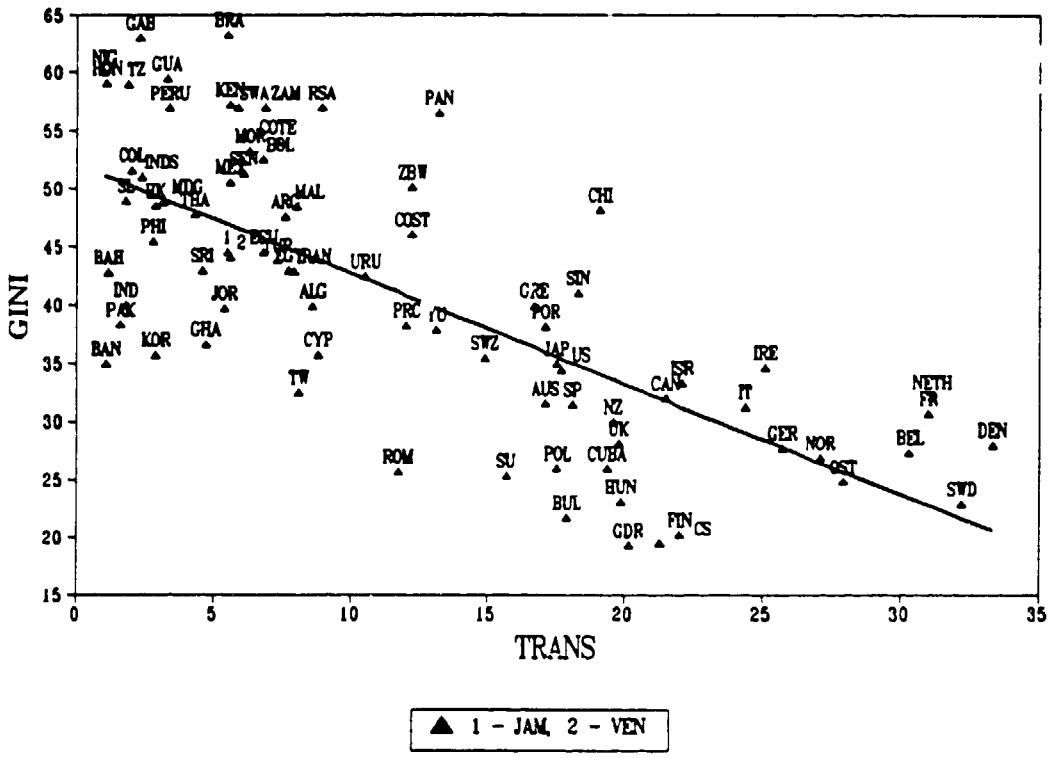


Figure 2c. Relationship between GINI and RATIO

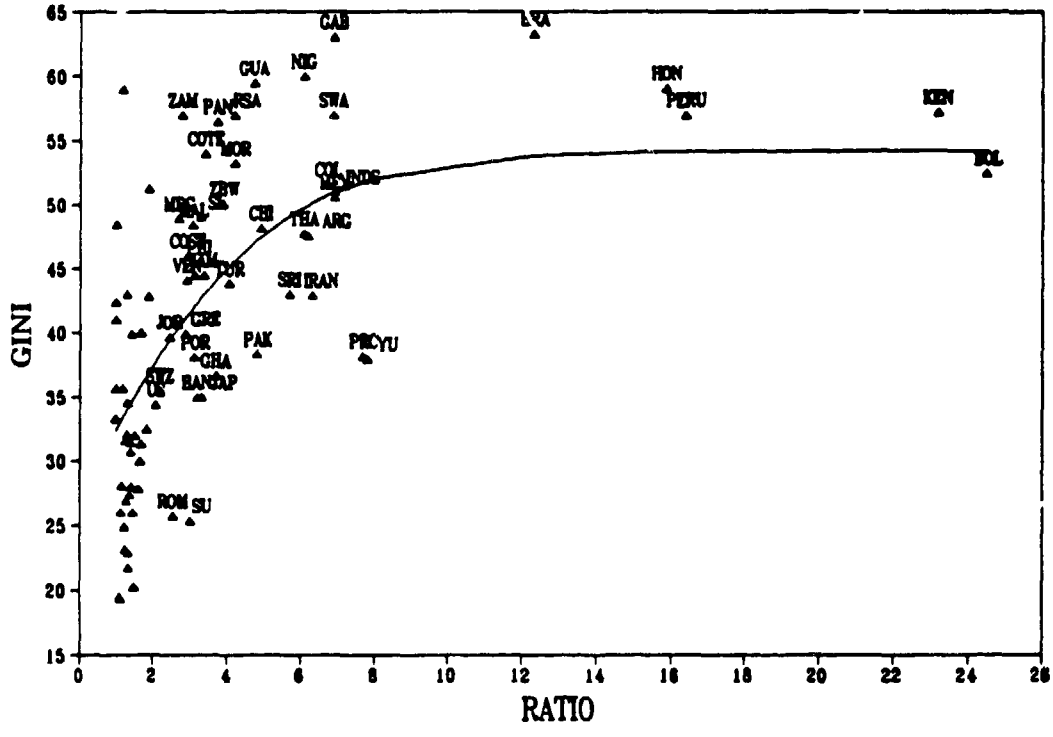
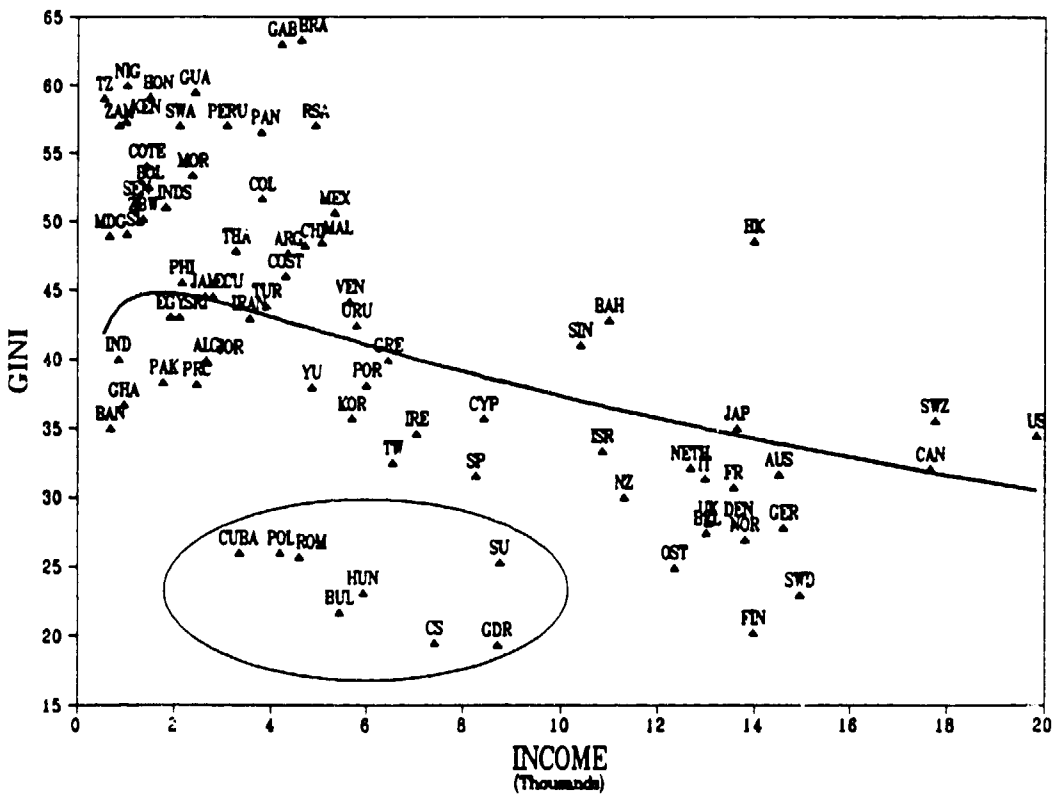


Figure 2d. Relationship between GINI and INCOME



Notes: Socialist countries shown in the circle.
Regression is: GINI = constant + B_0 ln(INCOME) + B_1 ln(INCOME)^2

(STATE, TRANS, RATIO) or 5 percent level (lnINCOME and squared lnINCOME).[12] The intercept is not statistically significantly different from zero. This means that, for a sufficiently low per capita income (at the limit for INCOME=0) and in the absence of state sector employment and transfers, the Gini coefficient would be close to zero: i.e., no inequality would exist. The coefficient of determination is 0.76. The interpretation of the results is as follows. Each ten percentage point increase in the share of state sector workers reduces inequality, on average, by 2.09 Gini points; each increase in social transfers by 10 GDP percentage points lowers inequality by 3.8 Gini points; each increase in country's heterogeneity by 1 (say, from 3 to 4) increases inequality by 0.65 Gini points. Finally, the relationship between income level and inequality is quadratic: at first, inequality rises with income and then declines. The turning point is reached for $2,100 per capita (at 1988 international prices) which is broadly the level of income of the Philippines, Swaziland, or Sri Lanka.[13]

There are two potential problems with equation (1.0). The first is that of heteroskedasticity. It was observed in the literature (see Lindert and Williamson 1985, p. 344; Lecaillon et al., 1984, p.40) that the dispersion of the Gini is greater at low than at high income levels. One can therefore expect some heteroskedasticity because standard errors would systematically decline with increase in income level. Indeed, this is exactly the case, as shown in Figure 2, where residuals from equation (1.0) are plotted against income levels. Regression (1) is the same as (1.0) except that I correct for heteroskedasticity by running OLS with Whites' heteroskedastic-consistent standard errors. This does not affect STATE, TRANS, or RATIO but does affect the two income

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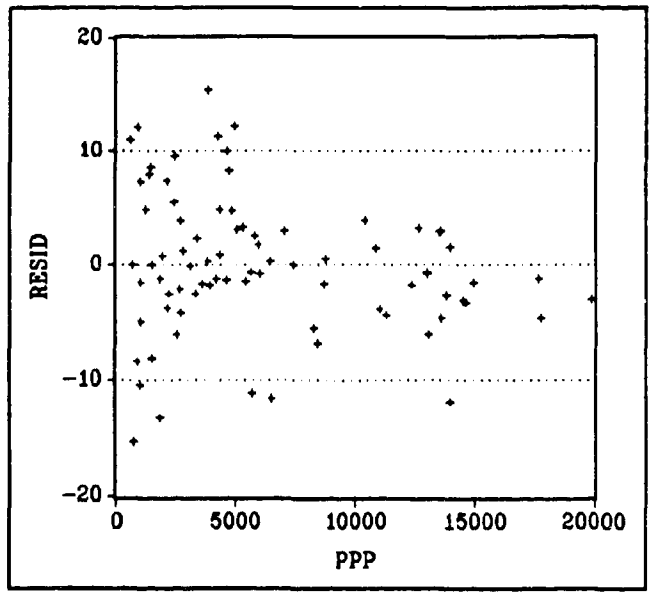
[12]I have experimented with a number of other formulations, some of them suggested recently by Anand and Kanbur (1993). The log-squared gives the best results. This was the original formulation used by Ahluwalia (1976).

[13]This is somewhat higher than the turning point shown in Figure 1d (about $1,800) where GINI is a function of INCOME alone. Ahluwalia (1976) finds the turning point at $468 per capita at 1970 prices and current exchange rates. On the basis of a somewhat smaller sample, Kaelble and Thomas (1991) find the turning points to range, depending on the measure of inequality used, between $322 and $489. Converting these values to 1988 prices and then applying the ratio between the purchasing power parity exchange rate and the current exchange rate from Summers and Heston (1991), we can express the turning points in 1988 purchasing power GDP per capita (as in our sample). Ahluwalia's value is then equivalent to $3 070, and Kaelble and Thomas's range turns out to be $2,175 and $3,176.

terms that become statistically significant only at a 10 percent level (instead of 2-3 percent level in regression 1.0). Since the same problem exists in all equations, all regressions will henceforth be run with the correction for heteroskedasticity.

The second problem is the role of RATIO. As indicated, we need to be sure that the model is correct even if RATIO is left out. Thus, regression (1A) is the same as (1) except for RATIO which is now deleted.[14] Omission of RATIO raises the coefficients and the significance of all the remaining variables. This produces an important effect on both income terms which now again become statistically significant at 2-3 percent level. The coefficients of STATE and TRANS remain stable. They rise in absolute amounts but by relatively little (e.g., STATE rises from -0.21 to -0.22). The intercept remains not significantly different from zero. R^2 decreases by very little, from 0.76 to 0.71. We can therefore conclude that the omission of RATIO does not affect the results except that it brings out the role of income more strongly.

Figure 2. Residuals from equation 1.0 as a function of INCOME



Are our results, and in particular the role of STATE, perhaps driven by the presence of

[14]This notational rule will be followed throughout: equation number followed by *A* denotes the same equation save for the elimination of RATIO.

socialist countries and their high share of state-sector employment? Regression (2) is the same as regression (1) except that all socialist countries (7 from Eastern Europe, the Soviet Union, Algeria, China, and Cuba) are dropped. The values of the coefficients change but slightly: the coefficient of STATE becomes, in absolute terms, greater, rising from -0.21 to -0.32 (see also Figure 1a where the regression line becomes steeper when socialist countries are omitted) and the coefficient of TRANS becomes smaller. Both income coefficients increase and their statistical significance rises. R^2 decreases from 0.76 to 0.7. Overall, the inclusion or exclusion of socialist countries makes little difference.

The steeper relationship between STATE and GINI when socialist countries are omitted requires an explanation. It implies that decreases in inequality recorded by socialist countries are small compared with the huge size of the state sector in their economies. Indeed, even from the summary Table 1, it can be seen that while the difference in GINI between East European countries and (say) OECD is only some 6 Gini points (or differently, inequality in OECD is about a quarter greater than in Eastern Europe) employment in the state sector is more than four times greater in Eastern Europe. Therefore, when socialist countries are dropped from the sample a given increase in state sector share produces larger decreases in GINI.

Regression (2A) is the same as (2) except for RATIO which is omitted. No major differences between the two regressions exist except (as before) that income terms are larger and statistically more significant.

Table 3. The Regressions:
80 countries; except equations (2) and (2A), 69 non-socialist countries only

Regr	Constant	STATE	TRANS	RATIO	INCOME	INCOME^2	DUMMY	EDUC	R^2 (F)	SE(DW)
1.0	-69.08 (0.22)	-0.209** (0.000)	-0.381** (0.003)	0.646** (0.000)	31.21* (0.028)	-2.036* (0.020)			0.76 (46.5)	5.947 (1.95)
1	-69.08 (0.37)	-0.209** (0.000)	-0.381** (0.000)	0.646** (0.000)	31.21 (0.092)	-2.036 (0.064)			0.76 (46.5)	5.947 (1.95)
1A	-97.08 (0.21)	-0.223** (0.000)	-0.416** (0.000)		39.80* (0.035)	-2.608* (0.002)			0.71 (46.4)	6.449 (1.99)
2	-84.72 (0.29)	-0.320** (0.001)	-0 297** (0.005)	0.652** (0.001)	3..35 (0.065)	-2.293* (0.043)			0.70 (28.8)	6.242 (1.94)
2A	-113.2 (0.16)	-0.288** (0.004)	-0.343** (0.002)		44.13* (0.024)	-2.888* (0.013)			0.64 (27.9)	6.779 (2.02)
3	-71.48 (0.36)	-0.182** (0.005)	-0.386** (0.000)	0.642** (0.001)	31.87 (0.086)	-2.084 (0.059)	-2.079 (0.650)		0.76 (38.4)	5.980 (1.94)
3A	-100.3 (0.20)	-0.185** (0.000)	-0.423** (0.000)		40.66* (0.032)	-2.671* (0.018)	-2.949 (0.413)		0.71 (36.9)	6.479 (1.98)
4	-48.99 (0.528)	-0.190** (0.000)	-0.292** (0.002)	0.672** (0.000)	24.60 (0.186)	-1.449 (0.191)		-1.247** (0.002)	0.78 (43.9)	5.680 (2.03)
4A	-79.71 (0.309)	-0.206** (0.000)	-0.336** (0.001)		34.06 (0.072)	-2.092 (0.064)		-1.144** (0.013)	0.73 (40.6)	6.259 (2.06)
5	-91.13 (0.165)	-0.230** (0.000)	-0.512** (0.000)	0.498** (0.001)	37.22* (0.020)	-2.376* (0.014)	-7.128** (0.000)		0.81 (52.1)	5.306 (1.82)
5A	-115.1 (0.076)	-0.244** (0.000)	-0.558** (0.000)		44.47** (0.005)	-2.849** (0.003)	-8.199** (0.000)		0.78 (53.8)	5.625 (1.93)

Notes to Table 3: Values in parenthesis are the complements of the level of confidence with which the null hypothesis is rejected. Two (one) asterisks indicate that coefficient is significantly different from zero at less than 1 (5) percent level. Variable INCOME is ln (purchasing power per capita GDP). Variable INCOME^2 is INCOME squared. In regressions (3) and (3A), DUMMY variable takes value 1 for socialist countries, zero for others; in regressions (5) and (5A), DUMMY variable takes value 1 for Asian countries, zero for others.

Another issue is whether our STATE variable really adds something to the common practice of using a dummy variable for socialist countries in income distribution studies. We argued above that STATE is more general because it covers the whole spectrum of values from 0 to 100, and thus differentiates also between various capitalist (or even socialist) countries. In regressions (3) and (3A) I introduce both STATE and a socialist dummy variable (otherwise the regressions are the same as 1 and 1A). The equation is therefore

$$GINI = fct\ [STATE,\ SOCIALIST\ DUMMY,\ TRANS,\ RATIO,\ LN(INCOME),\ LN(INCOME)^2].$$

The regression coefficients are practically unchanged. Only the coefficient of STATE decreases somewhat (from -0.21 to -0.18) but remains highly significant. We can safely reject the hypothesis that the dummy variable is statistically significant in the presence of STATE.

Is Asia Different?

From Figure 3a, which displays residuals from regression (1), it emerges that in the case of Asian countries the actual level of inequality is often smaller than the predicted. Out of five countries whose actual inequality is more than 10 Gini points less (about one-and-half standard deviations less) than the predicted inequality, four are Asian (Bangladesh, Pakistan, South Korea and Taiwan).[15] Also, out of 17 Asian countries (the dots in the Figures), in only four is the actual inequality higher than the predicted inequality. Differently, in African and Latin American economies inequality seems to deviate upward from the predicted values.

[15]The only other one is Ghana.

The Residuals...

Figure 3a: from equation (1)

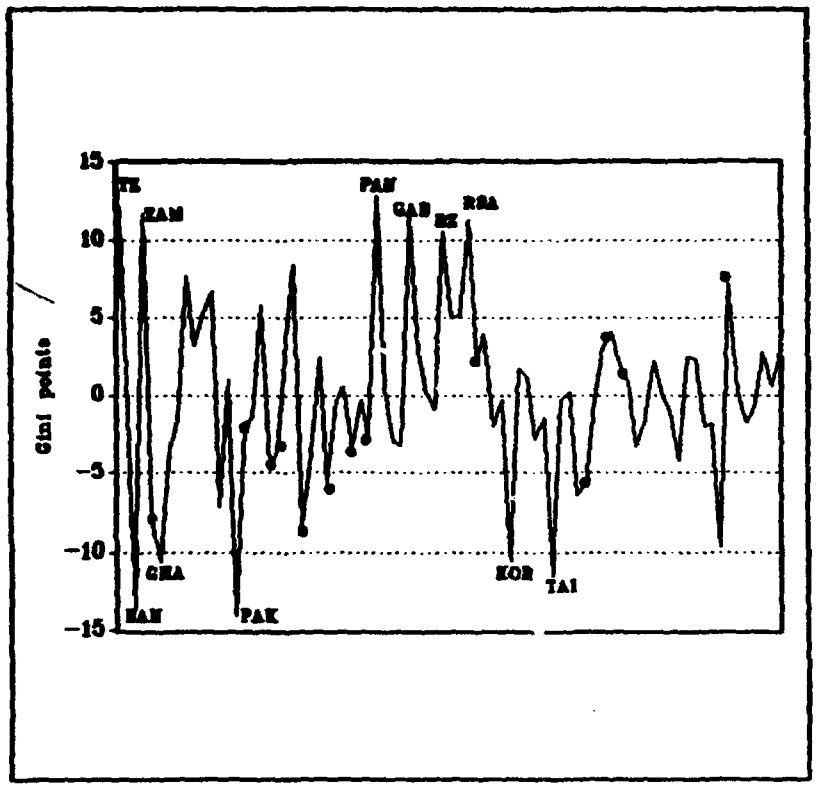
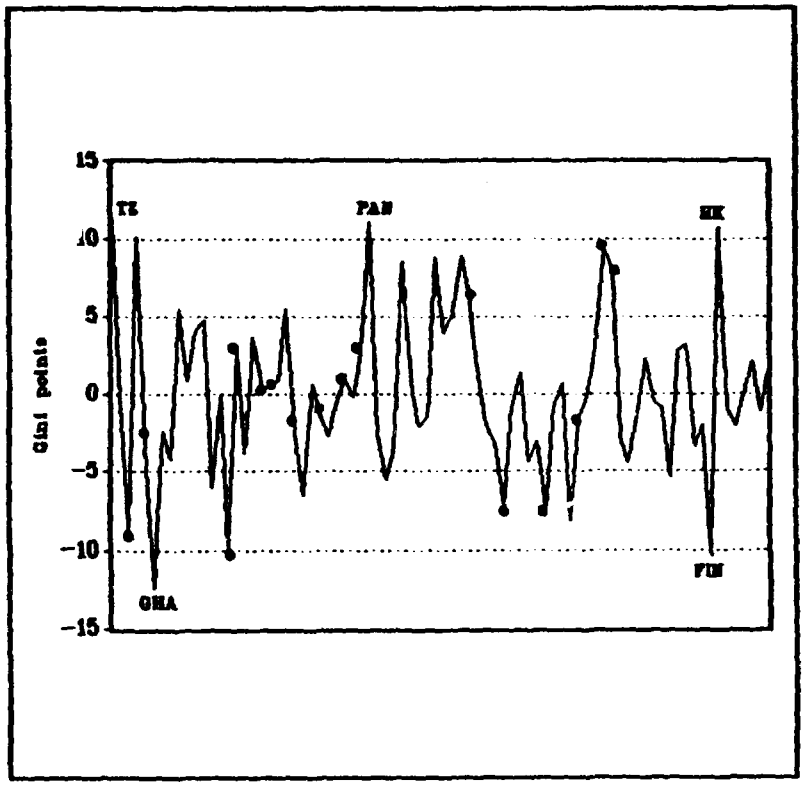


Figure 3b: from equation (5)



Several possible explanations for the contrast between Asia and other continents can be adduced. For example, more equal distribution of physical and human capital in Asian countries may result in lower market (pre-government involvement) inequality. Then, even if transfers are small, inequality in disposable income (i.e., after transfers and taxes) will be less than in the countries in which the underlying market distribution of income is skewed. Take, for example, Taiwan and Uruguay, both probably the most highly educated and among the most developed countries in their respective regions. The per capita GDPs of these countries are very close ($6,500 for Taiwan and $5,800 for Uruguay). Uruguay's share of state sector workers is twice as high as Taiwan's (21 vs. 10 percent), and social transfers are greater (10.5 percent of GDP vs. 8.1 percent). Yet Taiwan's Gini coefficient is 32 and Uruguay's is 42. But the average number of years of education completed by the population over 25 years of age, is 9.2 years for Taiwan and 7.8 years for Uruguay. The high premium placed on education in Taiwan is also reflected in the structure of social transfers: while total social transfers, in terms of GDP, are smaller in Taiwan, public education expenditures are three times as high: 4.6 percent of GDP in Taiwan and 1.5 percent in Uruguay. Another indicator of the high dispersal of assets in Taiwan is the proportion of stock-owning population, which at 27 percent is twice as large as in most West European countries and about the same as in the United States.

One possible explanation of the lower (than predicted) inequality in Asia may lie then in a more equal distribution of physical and human capital. The former is extremely difficult to approximate; the latter can be approximated by the spread and depth of education. I introduce the average number of school years completed by the population 25 years of age or older (EDUC).[16] The equation (4) is therefore

$$GINI = fct\ [STATE,\ TRANS,\ RATIO,\ LN(INCOME),\ LN(INCOME)^2,\ EDUC].$$

However, because of the strong collinearity between education and income, no new insight is obtained. These two variables can be used practically as substitutes. The introduction of education renders both INCOME terms statistically insignificant (see regression 4). Moreover, EDUC does not reduce the downward deviation of GINI observed in Asian countries (not shown

[16]The data come from the United Nations Development Program (1992).

here). The omission of RATIO (regression 4A), as in earlier regressions, increases all the coefficients and raises the statistical significance of both INCOME terms; however they still remain statistically insignificant at a 5 percent level. Education, therefore, does not provide an independent explanation (i.e., an explanation that is different from what is implied by income) for the lower inequality in Asia.[17]

We are left with the alternative of introducing a dummy variable for Asian countries (equations 5 and 5A in Table 3). The equation becomes

$$GINI = fct\ [STATE,\ TRANS,\ RATIO,\ LN(INCOME),\ LN(INCOME)^2,\ ASIA\ DUMMY].$$

This improves the fit and eliminates the systematic negative residuals for the Asian countries (Figure 3b). All the coefficients, including those of both INCOME terms, are statistically significant at less than 2 percent level. This is the first time that in the presence of RATIO both INCOME terms are statistically significant. The dummy variable has the expected negative sign and is highly significant: Asian countries have, all other elements being the same, an income inequality that is some 7.1 Gini points less than that of non-Asian countries.[18] This, of course, is not an entirely satisfactory conclusion because we are unable to explain what real factors lie behind the observed lower inequality in Asia.

What Explains the Differences in Inequality?

On the basis of these results we can find the causes for the difference in the levels of inequality between the five groups of countries. OECD countries are used as a yardstick and the difference in GINI between them and the other groups is explained by the differences in social choice variables (state sector employment and transfers), "given," variables (income levels and regional heterogeneity), and an "Asian element" variable. I use regression (5) for the calculations.

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[17]Different formulations using INCOME and EDUC were tried; none dispenses with the need for a dummy variable.

[18]As usual, the exclusion of RATIO in equation 5A does not affect our results.

The results are displayed in Table 4.

Table 4. Factors explaining the difference in inequality compared to OECD countries (in Gini points)

Due to:	Socialist	Africa	Asia	LAC
State sector	-15.8	+2.3	+2.0	+0.4
Size of transfers	+2.8	+8.7	+8.1	+7.7
The Asia dummy			-7.1	
Social choice	-13.0	+11.0	+3.0	+8.1
Regional inequality	-0.3	+1.5	+0.8	+2.6
Income level	+4.1	+5.8	+5.1	+5.5
"Given" factors	+4.4	+7.3	+5.9	+8.1
Unexplained	+2.2	+2.8	+0.9	+1.8
Actual difference	-6.4	+21.1	+9.8	+18.0

Note: Calculated from regression (5) in Table 3. Negative sign indicates that a given element reduces inequality in the region in comparison with inequality in OECD countries.

In the case of Latin America, Asia and Africa, the main causes of greater inequality, in comparison with OECD countries, are lower transfers (which explain between 7.7 and 8.7 additional Gini points) and lower income (which explains between 5.1 and 5.8 additional Gini points). These two elements alone would make inequality in Africa, Asia, and Latin America some 13 to 14 Gini points greater than in OECD. It is interesting to observe that despite other differences Africa and Latin America display very similar patterns in the explanation of inequality. Asia, however, is different because the Asia dummy variable lowers inequality from the levels predicted by the four general variables by about 7 Gini points. We also conclude that the existing lower state sector employment and greater regional heterogeneity do not alone produce much greater inequality in the three continents compared to the OECD countries. Because of lower state sector employment, the Gini coefficient in Africa and Asia would be greater by about 2 points, and by only 0.4 Gini points in Latin America. Greater regional heterogeneity similarly adds only between 2.6 and less than 1 Gini points (the latter in Asia) to inequality. These are all very small

differences.

In the case of Eastern Europe, by far the most important factor explaining lower inequality than in the OECD countries is the greater share of state sector workers: this lowers the Gini coefficient by 15.8 points on average. All other elements point to a greater inequality in Eastern Europe than in OECD but their impact is not sufficient to offset the impact of the large state sector. The debate about the lower income inequality in socialist economies (Ahluwalia 1976, Morrison 1984) can now be placed within a larger context of factors which explain income inequality in general. Socialist economies display lower inequality owing to the key feature of their system: the high share of state sector employment. This tendency is partly offset by capitalist countries' higher social transfers and higher income levels. Regional heterogeneity plays practically no role.

An important distinction to be made is between the effect of social choice and of "given" variables. If income level and regional heterogeneity were the same in Africa and Latin America as in OECD, inequality would still be greater on two these continents by 8.1 (Latin America) and 11 (Africa) Gini points. In consequence, social choice elements -- principally transfers -- seem the chief "explanators" of greater inequality in Africa and Latin America. The Asian situation is different because of the ambiguity of the "Asian variable": if it is a social choice variable, as it is logical to assume, then the difference between the importance of social choice elements in the OECD countries and in Asia is very small. However, while in the OECD countries social choice operates through high transfers and state-sector employment, in Asia, social choice takes the form of relatively equal asset endowments (presumably captured by the dummy variable). If this interpretation is correct, then Asian countries can afford to have low transfers since other factors (e.g., even distribution of assets) produce relatively equal distribution of original income (pre-government redistribution). Overall, the greater income inequality in Asia -- compared with that in OECD countries -- is explained primarily by the difference in income level.

In conclusion, how do we explain the higher inequality in less developed countries and the lower inequality in Eastern Europe, compared to OECD? For Africa and Latin America, inequality is higher because of lower social transfers and lower income; for Asia, inequality is

higher only because of lower income; and for Eastern Europe, inequality is lower because of the high share of the state sector.

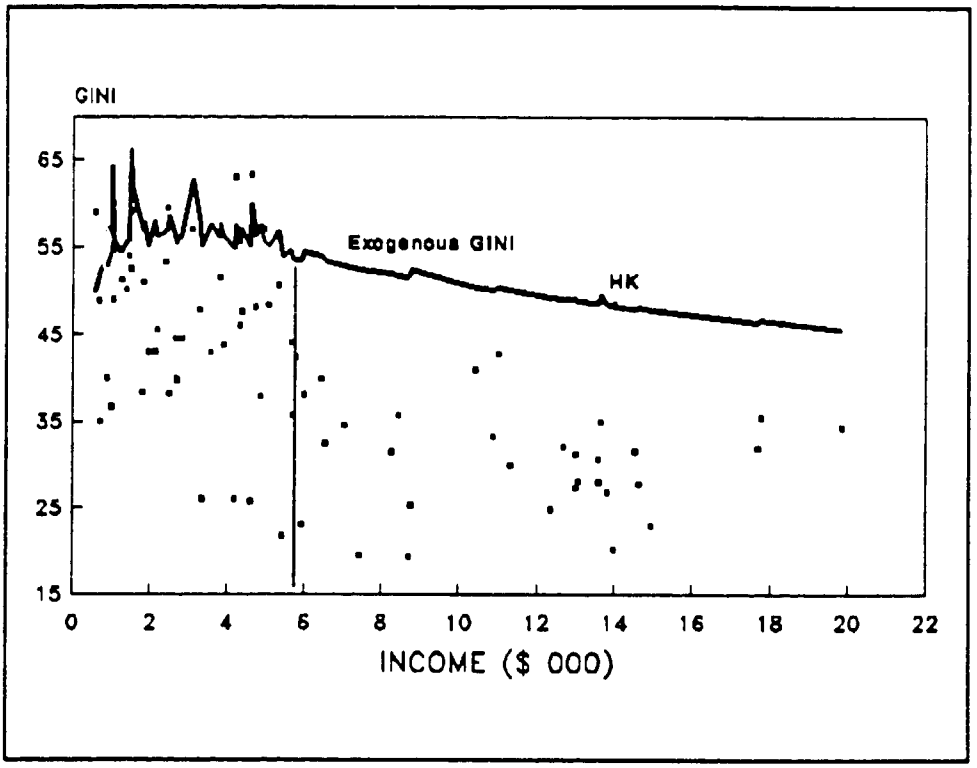
How Important Are Social Factors?

Our next question is: What is the importance of social factors compared with "given" factors? This is an important question because it is only after we empirically know the relative importance of social factors that we can make a judgment about the extent to which the standard Kuznets hypothesis needs to be modified. If social choice variables reduce income inequality by only a few Gini points, then the general validity of the standard Kuznets hypothesis cannot be seriously questioned. Societies can at the margin tamper with income distribution, but it is overwhelmingly determined by the factors that they cannot influence in the short-run, and in particular by their level of income. Differently, if social choice variables lower income inequality significantly, then the standard Kuznets' hypothesis needs to be substantially altered. This would mean that societies *can* affect income distribution: the economic determinism implicit in the standard formulation of the Kuznets' hypothesis is then seriously weakened.

The solid line in Figure 4 shows the calculated Gini coefficients that are solely the result of "given" factors: the line shows income inequality that would obtain if only income and regional heterogeneity determined inequality.[19] An upward and short bulge in inequality is followed by a prolonged and slow decrease in inequality as income levels rise. The Figure also shows that, if "givens" alone mattered, the differences in inequality between rich and poor countries would be relatively small. While the standard deviation of the actual GINI in our sample is 11.7, the standard deviation of the thus calculated GINI is only 4.1 (see Table 5).

[19]The calculation is made by using the coefficients from regression 5 for income and regional heterogeneity, and setting transfers and state sector employment=0.

Figure 4. "Given" GINI and the actual values of GINI



Note: Points represent the actual GINIs.

The distance between the solid line (the "given" Gini) in Figure 4 and the actual Gini points is due, save for the statistical discrepancy, to the role of social choice variables. The distance widens around $6,000 per capita. For all countries with higher incomes (except for Hong Kong), the divergence, and hence the role of social factors, is substantial. One can therefore propose two turning points of inequality: the first would occur at the level of approximately $2,100 where, as noted before, the standard Kuznets' curve linking income and GINI begins to turn downward. The second occurs at around $6,000 when social choice variables become significantly more important than before and reinforce the downward trend in inequality.

Table 5. The role of social choice variables

Level of income ($ PPP)	(1) "Given" GINI	(2) Actual GINI	Effect of social choice:(2)-(1)	Due to: STATE	Due to: TRANS
Less 1500	56.0	50.7	-5.3	-1.9	-2.3
1500-3000	56.8	46.0	-9.2	-3.7	-2.9
3000-4500	57.1	46.2	-10.9	-5.9	-4.5
4500-6000	55.4	41.2	-14.2	-8.6	-5.7
6000-10,000	52.6	29.8	-22.8	-10.2	-8.6
Over 10,000	48.8	31.4	-17.4	-5.8	-11.0
Total	53.9	40.7	-13.2	-5.5	-6.2
Standard deviation	4.1	11.7			

Notes:
"Given" GINI: Calculated from regression (5) by setting STATE and TRANS=0.
Effect of STATE and TRANS: Calculated from regression (5) by multiplying the corresponding coefficients with the actual values of STATE and TRANS. All of the difference in column (3) is not explained by STATE and TRANS. Some of it is explained by the Asia dummy and some is unexplained because of the discrepancy between the values predicted by the regression and the actual GINIs.
All values are unweighted averages.

The difference between the unweighted "given" Gini and the actual Gini in the whole sample amounts to 13.2 Gini points (Table 5). This is, therefore, the joint effect of social transfers and state sector employment: a reduction of the Gini coefficient from almost 54 to 41. How important is this effect? How big is it in practical terms? It is equivalent to transforming Bolivia or Cote d'Ivoire (both with actual Ginis of about 54) into Sri Lanka or Uruguay (Ginis of 41). The 13.2 Gini point reduction is almost evenly shared between the effect of state sector employment and social transfers: state employment reduces inequality, on average, by 5.5, and social transfers by 6.2, points.

The effect of the social choice variables is not independent of the level of income. At low levels of income, less than $1,500 at purchasing parity, the "given" and actual Gini differ by very

little: by about 5 Gini points with STATE and TRANS being of about the same importance in reducing inequality. Between $1,500 and $4,500, social choice variables reduce inequality by some 10 Gini points. The state sector now becomes more important than transfers. After $4,500, the importance of social choice variables further increases, reducing the "given" GINI by between 15 and 20 Gini points or, put differently, cutting the level of inequality by more than a third. The importance of STATE remains greater than that of TRANS reaching its peak for the countries with incomes between $6,000 and $10,000 where almost all socialist countries are located. Finally, for the richest countries, the reduction in inequality, equal to 17.4 Gini points, owes much more to transfers than to state sector employment.

Two conclusions can be drawn. First, variables which represent social choice have an important role in determining the degree of inequality. On average, social choice variables reduce the unweighted Gini coefficient in our sample by some 13 Gini points (i.e., by a quarter). Second, the importance of social choice variables increases with level of income. Social choice variables do not matter very much at low levels of income, but as income rises, society's preference for policies that reduce inequality seems to increase. Equality seems to be a superior good. The strong formulation of the Kuznets hypothesis is therefore less valid as income increases and non-economic factors -- compared with strictly economic factors -- become more important in shaping personal income distribution.

5. Conclusions and Implication of the Findings

We have set out to answer two questions. First, do social choice variables -- jointly with the purely economic variables included in the standard formulation of the Kuznets' hypothesis -- determine income inequality? The answer to this question is Yes. We have found that social choice variables (social transfers and state sector employment) uniformly, in all formulations of the regressions, show a statistically significant negative impact on inequality.

The second question is, how important is the effect of social choice variables? Here we have found that, for the sample of 80 countries in the 1980s, the social choice variables reduce inequality by some 13 Gini points. Actual inequality is, on average, only about three-quarters of what it would be if social variables were not operative. But this relation is not uniform with respect to income level. At a low level of income, the role of social choice variables is almost negligible. As income rises, their importance becomes greater. This finding cannot be interpreted by arguing that, at a low level of income, social choice has no role to play because there is nothing to redistribute as everyone is poor. This is patently not true because at low levels of income inequality is relatively high.[20] Thus, social choice variables could, a priori, play a significant role even at low income levels. Why they do not do so can only be conjectured now. My hypothesis is that society's preferences change in the process of development and that people, as average income rises, tend to place greater emphasis on equality. The preference for social equality is therefore income-elastic. But, whatever the cause for the increasing role of the social choice variables, the implication of our results is that the validity of the strong formulation of the Kuznets' hypothesis diminishes as society develops. The level of inequality that a society charts in its development diverges increasingly downward from the level predicted by the Kuznets' curve. The discrepancy is therefore systematic. This is so because inequality in richer societies does not decrease because of economic factors, but also because societies *choose* less inequality.

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[20]At some possibly mythical extremely low level of income everyone would be equally poor. But this is not true at the actual low levels of income which we observe in our sample.

We also find that Asian countries, once all these elements are taken into account, tend to have a lower than predicted inequality. The difference amounts to some 7 Gini points. Further research may be needed to find out just what accounts for the lower inequality. One hypothesis has been that the distribution of physical and human capital may be more equal in Asian countries -- for a given level of income -- than elsewhere. If this is the case, then government redistribution via transfers and taxes need not be as extensive in Asia as in other regions with more unequal personal distribution of assets. Equal distribution of assets, if confirmed, may be that missing "social choice" variable that not only explains lower inequality in Asia (compared to what "it should be") but provides a potential clue for high growth rates recorded by some Asian countries. Recent literature on the link between economic growth and political economy (e.g., Alesina and Rodrik 1991; Perotti, 1991 and 1992; Persson and Tabellini 1992) argues that the size of transfers is determined by the political process, in short, by the gain that the median voter expects from redistribution. Thus the population in countries in which assets are highly unequally distributed and in which, consequently, inequality in original income is high, will have an interest to vote for large social transfers. To the extent that transfers reduce the incentive to accumulate wealth and to work hard, either economic growth will be slow or democracy will be impossible to achieve. The dilemma, familiar from the 19th century Europe, was eloquently summarized by the Spanish statesman Canovas del Castillo: rebutting those who complained about electoral fraud, he wrote: "To have ' ' choose between the permanent falsification of universal suffrage and its abolition is not to have to choose between universal suffrage and preservation of property" (quoted in Ubieto et al., 1972, p. 731). But if a country's assets are relatively widely distributed and market-generated inequality is moderate, then large, particularly cash, transfers are not needed. Fast growth becomes compatible with democracy (as the median voter does not have an interest to vote for high taxes) and relatively equal distribution of income.

Our "augmented Kuznets" hypothesis can also be considered in a historical continuum. Pareto was the first economist who studied personal income distribution. On the basis of his empirical research, he was led to formulate the "iron rule of inequality."[21] Pareto held that, whatever the

[21]Pareto's law of income distribution appears for the first time in print in 1896. The sample contains seven countries or cities. The next year Pareto (1897) published his famous article in

social system, level of development, or type of elite in power, size income distribution had the same shape: only different people may be rich in one system (say, owners of capital) than in another system (for example, party bureaucrats or land-owners). After numerous disputes, Pareto's "iron law" was generally rejected. The most favorable conclusion that can be made is that the upper tail of income distribution (top 1 to 2 percent of recipients) tends to display features observed by Pareto and embodied in the density function bearing his name. The second general theory of income distribution was propounded by Kuznets (1955). The unmovable "iron law" of income distribution took the form of an economic "iron law," whereby size income distribution changes with development but does so in a predictable way and shaped by economic factors. The forces that determine the distribution of personal income, although knowable, are not alterable by human design (unless, of course, a society decides not to "develop"). This is so because the level of inequality is chiefly determined by economic factors: by the level of development and the attendant scarcity and the concentration among the individuals of various grades of skills, capital and land. The hypothesis advanced here mitigates the economic determinism implicit in the standard formulation of the Kuznets' hypothesis.[22] Size income distribution is determined also by *social choices.* Societies *can choose*, within limits imposed by the "objective" circumstances, whether they want to have a more or a less equal income distribution. And they tend to choose less inequality as they grow richer.

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which his original sample is extended by a further ten countries. See Creedy (1985, p.22).

[22]Kuznets himself was aware of the role of social factors. See the quotation above.

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Annex Table 1. State sector employment as percentage of labor force or economically active population

COUNTRY	STATE SECTOR EMPLOY.	YEAR a/	COMPONENTS state sector employment (all employed)	SOURCES
OECD				
Australia	29.3	1988	government + SOEs (all=labor force)	Australia statistical yearbook 1989 (p.171)
Austria	37.9	Avg75-80(G) Avg75-79(S)	idem	OECD Economic Studies, Spring 1985, No.4
Belgium	22.5	Avg75-80(G) Avg75-79(S)	idem	OECD Economic Studies, Spring 1985, No.4
Canada	24.1	Avg75-80(G) Avg75-79(S)	idem	OECD Economic Studies, Spring 1985, No.4
Denmark	19.4	Avg75-80(G) Avg75-79(S)	idem	OECD Economic Studies, Spring 1985, No.4
Finland	28.7	1989	public sector: productive + non-productive (all=labor force)	Finland statistical yearbook 1991 (p.361)
France	21.2	1984	government + SOEs + health, education and welfare (all=labor force)	France statistical yearbook 1988
W. Germany	22.3	Avg75-80(G) Avg75-79(S)	idem	OECD Economic Studies, Spring 1985, No.4
Greece	10.7	1986-87 except govt 1975	general govt + health and education, transport and telecom workers (all=econ. active popul.)	Greece statistical yearbook 1988; Rutkowska (1991)
Ireland	19.6	Avg75-80(G) Avg75-79(S)	idem	OECD Economic Studies, Spring 1985, No.4
Italy	20.9	Avg75-80(G) Avg75-79(S)	idem	OECD Economic Studies, Spring 1985, No.4
Japan	9.5	1986	SOEs + public health and education (all=labor force)	Japan statistical abstract 1991
Netherlands	15.0	1987	public sector: productive + non-productive (all=labor force)	Netherlands statistical yearbook 1988 (pp. 138, 140)
New Zealand	24.7	Avg75-80(G) Avg75-79(S)	idem	OECD Economic Studies Spring 1985, No.4
Norway	24.8	Avg75-80(G) Avg75-79(S)	idem	OECD Economic Studies Spring 1985, No.4
Portugal	14.2	1981	general govt + SOEs	OECD Economic Studies, Spring 1985, No.4; Portugal statistical yearbook 1982 (pp.41, 62)
Spain	13.7	1982	general govt	OECD Economic Studies, Spring 1985, No.4

COUNTRY	STATE SECTOR EMPLOY.	YEAR a/	COMPONENTS state sector employment (all employed)	SOURCES
Sweden	36.2	Avg75-80(G) Avg75-79(S)	idem	OECD Economic Studies, Spring 1985, No.4
Switzerland	10.4	1982	general govt (all=labor force)	OECD Economic Studies, Spring 1985, No.4
Turkey	13.6	1990	govt + SOEs (all=employed)	World Bank Turkey Data Base
United Kingdom	22.8	1989	general govt + SOEs (all=labor force)	UK Central Statistical Office, Social Trends No.21 (1991)
United States	15.8	1985	govt employment (all=labor force)	Esping-Andersen (1990; p.202)
Eastern Europe				
Bulgaria	91.5	1988	socialist sector (all=labor force)	World Bank Country Study, Bulgaria: Crisis and Transition to a Market Economy (1991, p.131).
Czechoslovakia	98.8	1989	state sector + cooperatives (all=labor force)	Czechoslovakia statistical yearbook 1990 (p.198)
Hungary	93.9	1988	state sector + cooperatives (all=labor force)	Hungary statistical yearbook 1988 (pp. 66-67)
Poland	70.4	1989	socialized sector (all=labor force)	Poland statistical yearbook 1990 (p.93)
Romania	95.2	1989	state sector + cooperatives (all=labor force)	World Bank Country Study, Romania: The Challenge of Transition (1991, p.2).
Former Yugoslavia	78.9	1989	socialized sector (all=labor force)	Yugoslavia statistical yearbook 1990
Former USSR	96.3	1888	state sector + cooperatives (all=labor force)	Soviet Union statistical yearbook 1988 (p.33)
E. Germany	94.7	1987	state sector + cooperatives (all=labor force)	East Germany statistical yearbook 1988 (p.112)

Idem indicates that the components are the same as in the entry under Australia, i.e. general government plus public sector.
SOEs = state-owned enterprises. These are public sector enterprises as defined in each country.

a/ Avg 75-80 (G) denotes the average goverment employment (G) in the period 1975-80; Avg 75-79 (S) denotes the average employment in state-owned enterprises or public sector (S) in the period 75-79.

Annex Table 1 (cont.)

COUNTRY	STATE SECTOR EMPLOY.	YEAR	COMPONENTS state sector employment (all employed)	SOURCES
Africa				
Algeria	50.8	87	public sector (all=econ.active pop.)	Algeria statistical yearbook 1990 (p.47) and FAO production yearbook 1987
Egypt	19.3	79	non-financial public ent.+ general govt.(all=econ.active pop.)	Heller & Tait (1983, p.40) and FAO production yearbook 1987
Gabon	8.4	89	govt + SOEs (all=labor force)	Gabon Direction Générale de l'Economie (1990, p.14), World Bank Social Indicators of Development 1991-92 and The World Factbook 1992, p.128
Ghana	12.4	85	govt + SOEs (all=labor force)	Ghana Quarterly Digest of Statistics, September 1989, p.48 and The World Factbook 1992, p.102
Cote d'Ivoire	11.3	86	public sector employees (all=econ.active pop.)	Calculated from Appleton, Collier & Horshell (1990, pp. 7 and 22) and Marcel (1992, p.94)
Kenya	7.5	80	non-financial public enterprises + general govt (all=econ. active pop.)	Heller & Tait (1983, p.40) and FAO production yearbook 1987
Madagascar	3.1	80	non-financial public enterprises + general govt (all=econ. active pop.)	Heller & Tait (1983, p.40) and FAO production yearbook 1987
Morocco	5.0	87	general govt (all=econ. active pop)	Morocco statistical yearbook 1989, pp. 23, 367
Nigeria	3.3	77-84	federal, state, local govt + SOEs (all=econ. active pop.)	Bienen & Diejomaoh (1981, p. 107), FAO production yearbook 1979; for SOEs=UNDP and World Bank, African Development Indicators, 1990, p.262
Senegal	3.4	76	non-financial public enterprises + general govt (all=econ. active pop.)	Heller & Tait (1983, p.40) and FAO production yearbooks
Sierra Leone	1.3	79	SOEs (all=econ.active pop.)	Milanovic (1989, p.17)
South Africa	13.2	85	SA transport + central govt + provincial and local authorities (all=econ. active pop.)	South Africa yearbook 1987-88 (p.752)
Swaziland	7.5	82	non-financial public enterprises + general govt (all=econ. active pop.)	Heller & Tait (1983, p. 40) and FAO production yearbooks
Tanzania	6.0	78	non-financial public enterprises + general govt (all=econ. active pop.)	Heller & Tait (1983, p. 40) and FAO production yearbooks
Zambia	13.2	80	non-financial public enterprises + general govt. (all=econ. active pop.)	Heller & Tait (1983, p. 40) and FAO production yearbooks
Zimbabwe	15.2	84	govt + SOEs (all=labor force)	Zimbabwe statistical yearbook 1987 (pp.50, 80)
Asia				
Bangladesh	4.2	83/84	govt + nationalized enterprises (all=econ. active pop.)	Bangladesh yearbook 1986 (pp. 210, 229, 234) and FAO production yearbook 1984
China	20.4	87	state + urban coop employees (all=econ. active pop.)	China yearbook 1988 (p.153) and FAO production yearbook 1988

COUNTRY	STATE SECTOR EMPLOY.	YEAR	COMPONENTS state sector employment (all employed)	SOURCES
Cyprus	12.2	90	public administration + public services (all=employed)	Cyprus economic and social indicators (1991, p.25)
Hongkong	7.9	90	civil service + public project employees (all=labor force incl. unemployed)	Hongkong annual digest 1991 (p.34) and Hongkong Semi-annual report (1991, p.67)
Israel	27.1	87	public and commercial services excl. public enterprises; (all=civilian labor force)	Israel statistical abstract 1988 (pp. 332, 340)
India	6.0	77	non-financial public enterprises + general govt. (all=econ. active pop.)	Heller & Tait (1983, p. 40) and FAO production yearbooks
Indonesia	5.1	90	civil service excl public enterprises; (all=age 10+)	Indonesia statistical yearbook 1991 (p. 61, 66)
Iran	26.9	86	public sector (govt+SOEs) (all=econ. active pop.)	Iran statistical yearbook 1989/90
Jordan	22.2	86	public sector (govt+SOEs) (all=domestic labor force)	Jordan statistical yearbook 1987, pp. 57, 69
Korea S.	9.3	81	non-financial public enterprises + general govt (all=econ. active pop.)	Heller & Tait (1983, p. 40) and FAO production yearbooks
Malaysia	8.4	85	govt. employed (all=labor force)	World Bank Malaysia report No. 8667-MA, p39; World Bank Malaysia report No. 10758-MA, p.30
Pakistan	2.8	74/75	SOEs (all=econ. active popul.)	Milanovic (1989, p.17)
Phillippines	11.8	79	non-financial public enterprises + general govt (all=econ. active pop.)	Heller & Tait (1983, p. 40) and FAO production yearbooks
Singapore	10.4	80	govt. + major public companies (all=econ. active pop.)	Singapore statistical yearbook 1988 (p. 64) and 1980-81 (p.45) and Pillai (1983, table VI)
Sri Lanka	23.3	80	non-financial public enterprises + general govt. (all=econ. active pop.)	Heller & Tait (1983, p. 40) and FAO production yearbooks
Taiwan	9.9	75	govt. employees (all=econ. active pop.)	Taiwan yearbook of labor statistics 1987 (p.33) and 1977 (p.18)
Thailand	6.2	88	govt. employees (all=econ. active pop.)	World Bank Thailand report No. 9627-TH, p.69
Latin America				
Argentina	15.2	81	non-financial public enterprises + general govt. (all=econ. active pop.)	Heller & Tait (1983, p. 40) and FAO production yearbooks
Bahamas	18.6	78	non-financial public enterprises + general govt. (all=employed)	Heller & Tait (1983, p.40) and ILO yearbook of labor statistics 1985
Bolivia	18.3	89	public sector (all=employed)	Psacharopoulos et al. (1992, annex 14)
Brazil	11.7	85	govt. + federal and provincial public enterprises (all=econ. active pop.)	Berg & Shirley (1987, p.21); Paul Singer (1989, p.21) and FAO production yearbook 1991 (p.26)
Chile	9.2	89	public sector (all=employed)	Psacharopoulos et al. (1992, annex 14)

COUNTRY	STATE SECTOR EMPLOY.	YEAR	COMPONENTS state sector employment (all employed)	SOURCES
Colombia	10.7	89	public sector (all=employed)	Psacharopoulos et al. (1992, annex 14)
Costa Rica	16.9	89	public sector (all=employed)	Psacharopoulos et al. (1992, annex 14)
Cuba	82.4	83	state sector incl. agriculture (all=employed)	Rudolph (1988, p. 299)
Ecuador	23.7	82	govt. + community services (all=labor force)	Hanratty (1991, p. 256)
Guatemala	5.8	81	non-financial public ent. + general govt (all=econ.active pop.)	Heller & Tait (1983, p.40) and FAO production yearbooks
Honduras	9.6	89	public sector (all=employed)	Psacharopoulos et al. (1992, annex 14)
Jamaica	11.0	91	government employees (all=labor force incl. self-employed)	Psacharopoulos et al. (1992, annex 14)
Mexico	21.4	85	public sector incl. public enterprises (all=employed incl. self-employed)	Glade (1990, p.41)
Panama	17.3	79	non-financial public enterprises + general govt (all=econ. active pop.)	Heller & Tait (1983, p.40) and FAO production yearbook 1979
Peru	14.8	89	public sector (all=employed)	Psacharopoulos et al. (1992, annex 14)
Uruguay	21.4	89	public sector (all=employed)	Psacharopoulos et al. (1992, annex 14)
Venezuela	19.3	89	public sector (all=employed)	Psacharopoulos et al. (1992, annex 14)

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Annex Table 2. Social transfers (cash and in-kind) as percentage of GDP

COUNTRY	SOCIAL TRANSFERS	YEAR	COMPONENTS	SOURCES
OECD				
Australia	17.1	av.1980s	Includes health + education + education + pensions + family allowances + sickness/maternity allowances + unemployment benefits + welfare, unless otherwise indicated	Rutkowska (1991)
Austria	27.9	av.1980s		Rutkowska (1991)
Belgium	30.3	av.1980s		Rutkowska (1991)
Canada	21.5	1988		OECD, Social Expenditures 1960-1990 (1985, Table 1, p.21)
Denmark	33.3	1988		OECD, Social Expenditures 1960-1990 (1985, Table 1, p.21)
Finland	22.0	av.1980s		Rutkowska (1991)
France	31.0	av.1980s		Rutkowska (1991)
W. Germany	25.7	av.1980s		Rutkowska (1991)
Greece	16.7	av.1980s		Rutkowska (1991)
Ireland	25.1	av.1980s		Rutkowska (1991)
Italy	24.4	av.1980s		Rutkowska (1991)
Japan	17.5	1981		OECD, Social Expenditures 1960-1990 (1985, Table 1, p.21)
Netherlands	31.1	av.1980s		Rutkowska (1991)
New Zealand	19.6	1981		OECD, Social Expenditures 1960-1990 (1985, Table 1, p.21)
Norway	27.1	1981		OECD, Social Expenditures 1960-1990 (1985, Table 1, p.21)
Protugal	17.1	av.1980s		Rutkowska (1991)
Spain	18.1	av.1980s		Rutkowska (1991)
Sweden	32.2	av.1980s		Rutkowska (1991)
Switzerland	14.9	1979		OECD, Social Expenditure 1960-1990 (1985, Table 1, p.21)
Turkey	7.3	av.1980s		Rutkowska (1991)
United Kingdom	19.8	av.1980s		Rutkowska (1991)
United States	17.7	av.1980s		Rutkowska (1991)
Eastern Europe				

COUNTRY	SOCIAL TRANSFERS	YEAR	COMPONENTS	SOURCES
Bulgaria	17.9	av.1980s		World Bank Country Study, Bulgaria: Crisis and Transition to a Market Economy, 1991, vol. 2 (Tables 6.6, 9.3 and Appendix Table 15). GDP from ibid, vol. 1, p.136.
Czechoslovakia	21.3	av.1980s		Rutkowska (1991)
Hungary	19.9	av.1980s		Rutkowska (1991)
Poland	17.5	av.1980s		Rutkowska (1991)
Romania	11.7	av.1980s	pensions, family allowances, sickness and maternity benefits, health and education.	World Bank Country Study, Romania: Human Resources and the Transition to Market Economy, 1992 (Tables 3.1, 5.21, 4.25).
Former Yugoslavia	17.1	av.1980s		Rutkowska (1991)
Former USSR	15.7	1985		Statistical Offices of Austria, Poland and the USSR (1989, pp.32-3)
E. Germany	20.2	1985	cash benefits, health and education	Statistical pocketbook for the GDR 1988 (pp. 25, 108)

Annex Table 2 (cont.)

COUNTRY	SOCIAL TRANSFERS	YEAR	COMPONENTS	SOURCE
Africa				
Algeria	8.6	86	health, pension, ind.injury, family and holiday allowances	Algeria statistical yearbook 1990 (p.113) and IMF International Financial Statistics 1991 (p.191)
Egypt	7.7	85	social insurance, family benefits, health, public assistance, education	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Gabon	2.3	85	idem; excl. education	ILO, The cost of social security 1984-86 (table 3)
Ghana	4.7	8'	social security, health, education	World Bank Ghana report No. 9475-GH, p.102
Cote d'Ivoire	7.3	85	idem; education (1984)	ILO, The cost of social security 1984-86 (table 3); education = World Bank World Resources 1992-93 (p.240)
Kenya	5.6	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Madagascar	3.2	85	idem	ILO, The cost of social security 1984-86 (table 3); and World Bank Madagascar report No. 9101-MAG
Morocco	6.3	86	education and health	Morrisson (1991, p. 1637)
Nigeria	1.02	85	idem; education (1975)	ILO, The cost of social security 1984-86 (table 3); education = Bienen & Diejomaoh (1981, p.463; IMF International Financial Statistics 1991 (p.570)

COUNTRY	SOCIAL TRANSFERS	YEAR	COMPONENTS	SOURCE
Senegal	6.1	85	idem; education (1984)	ILO, The cost of social security 1984-86 (table 3); education = World Bank World Resources 1992-93 (p.240)
Sierra Leone	1.8	85	social welfare, education, health	UN, National accounts statistics: Main Aggregates and Detailed Tables, 1990, pp.1666-67
South Africa	8.9	86	social security, education, health	Moll (1991, p.79)
Swaziland	5.9	85	idem; education (1987)	ILO, The cost of social security 1984-86 (table 3); education = L'etat du monde, edition 1991, Paris (p. 301).
Tanzania	1.9	85	idem; education (1986)	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1988
Zambia	6.9	85	idem; education (1986)	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1988
Zimbabwe	12.2	84-5	education, health and social welfare	Zimbabwe statistical yearbook 1987
Asia				
Bangladesh	1.1	85	idem; education (1986)	ILO, The cost of social security 1984-66; education = World Bank WDR 1988
China	12.0	88	cash social welfare, cash subsidies, education and health	China statistical yearbook 1992 (pp. 31, 223, 799, 807) and 1989 (p. 151)
Cyprus	8.8	86	idem; education (1989)	ILO, The cost of social security 1984-86 (table 3); education = Cyprus economic and social indicators (1991)
Hongkong	2.9	81	cash & non-cash social welfare (excl.pensions;), health, education	Chow (1985, p.73); Hongkong annual digest of statistics 1990 (pp. 111, 122)
Israel	22.1	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
India	1.8	85	idem	ILO, The cost of social security 1984-86 (table 3): education = World Bank WDR 1987
Indonesia	2.4	85	idem	ILO, The cost of social security 1984-86 (table 3): education = World Bank WDR 1987
Iran	7.9	85	health, social security, education	IMF Government Financial Statistics, yearbook 1991 (pp. 321-2)
Jordan	5.4	85-86	health, social security, education	Musallam (1990, pp. 132-33; also Annex A, Table 10A1); education = World Bank WDR 1987
Korea S.	2.9	91	social security, social assistance (budget), health and education	World Bank Korea Report No. 10733-KO (p.16)
Malaysia	8.0	85	idem; education (1982)	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1985
Pakistan	1.6	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Phillippines	2.8	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987

	SOCIAL TRANSFERS	YEAR	COMPONENTS	SOURCE
Singapore	18.3	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Sri Lanka	4.6	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Taiwan	8.1	85	social security, education, science, culture	Taiwan statistical databook 1992 (pp. 25, 157)
Thailand	4.3	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Latin America				
Argentina	7.6	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Bahamas	1.2	85	idem; excl. education	ILO, The cost of social security 1984-86 (table 3)
Bolivia	6.8	85	idem	ILO, The cost of social security 1984-86 (table 3)); education = World Bank WDR 1987
Brazil	5.5	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Chile	19.1	83	social security, education	C. Mesa-Lago (1991, p.19); education = World Bank WDR 1986
Colombia	2.0	85	idem; excl. education	ILO, The cost of social security 1984-86 (table 3)
Costa Rica	12.2	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Cuba	19.4	85	idem	ILO, The cost of social security 1984-86 (table 3); education = Cuba statistical yearbook 1988 (p.195)
Ecuador	6.8	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Guatemala	3.3	85	idem; education (1990)	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1992
Honduras	1.1	85	idem; excl. education	ILO, The cost of social security 1984-86 (table 3)
Jamaica	5.5	85	idem	ILO, The cost of social security 1984-86 (table 3); Boyd (1988, pp. 6, 118); IMF (1991, pp. 458-9)
Mexico	5.6	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Panama	13.2	85	idem; education (1986)	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1988
Peru	3.4	85	idem; education (1983)	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1986

COUNTRY	SOCIAL TRANSFERS	YEAR	COMPONENTS	SOURCE
Uruguay	10.45	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987
Venezuela	5.6	85	idem	ILO, The cost of social security 1984-86 (table 3); education = World Bank WDR 1987

Idem denotes the same components as in the entry under Egypt. The components are social insurance, family benefits, health care, social insurance schemes for public sector employees (if separate), public assistance and education expenditures. All items except education are obtained from ILO, The Cost of Social Security. Education expenditures are obtained separately most often from the *World Bank World Development Reports* (WDR). If education data do not refer to the same year as the rest of the data, *idem* is followed by *education (year)*.

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Annex Table 3. Within-country regional heterogeneity
(ratio of incomes between most developed and least developed region)

COUNTRY	RATIO IN INCOMES	YEAR	COMPONENTS	SOURCES
OECD				
Australia	1.24	1987	income of wage earners per capita (all states)	Australia statistical yearbook 1989 (p. 734)
Austria	1.22	1990	median gross income of employees and the self-employed (9 provinces)	Austria statistical yearbook 1991 (p. 144)
Belgium	1.38	1979	household income (11 regions)	van Weeren and van Praag (1984, pp. 239-270, Table 2)
Canada	1.53	1986	family income (all provinces)	Canada statistical yearbook 1990 (Table 5.62, pg.5-34)
Denmark	1.44	1979	household income (13 regions)	an Weeren and van Praag (1984, pp. 239-270, Table 2)
Finland	1.49	1986	individuals' income (all provinces)	Finland statistical yearbook 1991 (Table 276, p.303)
France	1.39	1979	household income (9 regions)	van Weeren and van Praag (1984, pp. 239-270, Table 2)
W. Germany	1.62	1979	household income (10 lander and West Berlin)	van Weeren and van Praag (1984, pp. 239-270, Table 2)
Greece	2.88	1981/89	domestic use of electrical energy per capita (10 regions)	Greece statistical yearbook 1988 (Table II:6, p.17 and Table XI:11, p.310)
Ireland	1.31	1981	vehicles per capita (by county)	Ireland statistical abstract, September 1986 (pp.27 and 327)
Italy	1.68	1979	household income ('0 regions)	van Weeren and van Praag (1984, pp. 239-270, Table 2)
Japan	3.32	1978	income per capita (all prefectures)	Japan statistical yearbook 1981-82 (Table 2, p.78)
Netherlands	1.31	1979	household income (11 provinces)	van Weeren and van Prang (1984, pp. 239-270, Table 2)
New Zealand	1.66	1980	average salary (by district)	New Zealand, Incomes & Income Tax 1979-80 (Table 21, p.32)
Norway	1.28	1980	cars per capita (by county)	Norway statistical abstract 1988 (Table 234, p.187)
Portugal	3.14	1986	wage bill per 1000 persons (by district and autonomous region)	Portugal statistical yearbook 1989 (Table 13.1.3, p.188)
Spain	1.39	1985	income per capita (all regions)	Spain statistical yearbook 1990 (Table 1.4, p.886 and Table 1.5, p.887)
Sweden	1.35	1988	income per capita (by county)	Sweden statistical yearbook 1991 (Table 225, p.213)
Switzerland	2.20	1988	income per capita (all cantons)	Switzerland statistical yearbook 1992 (Table 4.2)
Turkey	4.06	1986	GDP per capita (by region)	World Bank Turkey data base (Tables 1 and Table 2)
United Kingdom	1.16	1979	household income (10 regions)	van Weeren and van Praag (1984, pp. 239-270, Table 2)
United States	2.07	1988	income per capita (all states)	US statistical abstract 1990 (Table 706, p.437)
Eastern Europe				

COUNTRY	RATIO IN INCOMES	YEAR	COMPONENTS	SOURCES
Bulgaria	1.35	1988	tv per 1000 persons (all counties)	Bulgaria statistical yearbook 1989 (Table XI.w, p. 502)
Czechoslovakia	1.09	1988	income per capita (2 republics)	Czechoslovakia Federal Statistical Office (1990)
Hungary	1.24	1989	tv per 1000 persons (all counties)	Hungary statistical yearbook 1989-90 (Table 32.19, p.420)
Poland	1.47	1990	telephones per 1000 persons (all voivodships)	Poland statistical yearbook 1991 (Table III, pp. LVI-LVII)
Romania	2.56	1985	tv per capita by counties	Romania statistical yearbook 1986 (Table 11, p. 13 and Table 221, p.337)
Former Yugoslavia	7.83	1981/89	income per capita (8 republics or autonomous provinces)	Yugoslavia statistical yearbook 1991 (Table 203-5, p.445 and Table 205-2, p.476)
Former USSR	3.00	1980	income per capita (15 republics)	Braithwaite (1990, p.34)
E. Germany	1.14	1987	retail trade per capita (14 regions; excl. East Berlin)	E. Germany statistical yearbook 1988 (pp.1, and 65ff)

Annex Table 3 (cont.)

COUNTRY	RATIO	YEAR	VARIABLE (break-down by regions)	SOURCE
Africa				
Algeria	1.43	79/80	per capita expenditure (5 zones)	Algeria statistical yearbook 1990, No.14. p 289
Egypt	1.31	80	household income (2 regions)	Mohie-Eldin (1982, table 8.20)
Gabon	6.9	77	average income (urban vs. rural)	ILO (1983, p.23)
Ghana	3.72	70	living standards indicator (8 regions)	Boateng, Ewusi, Kanbur and McKay (1990, p.29)
Cote d'Ivoire	3.4	75	per capita rural income (all regions)	ILO (1982, p.47)
Kenya	23.2	76	per capita income (8 regions)	Bigsten (1978, p.408)
Madagascar	2.7	80	household income (12 regions excluding large cities)	Dorosh, Bernier, Sarris (1990, p.47)
Nigeria	6.1	77/78	per capita income (urban vs. rural)	Jamal (1981, p.18)
Morocco	4.2	88	ownership of cars per capita (7 areas)	Morocco statistical yearbook 1989, pp. 15, 219
Senegal	1.9	80	per capita rural income (all regions)	ILO (1982, p.47)
Sierra Leone	3.3	75/76	average income (urban vs. rural)	ILO (1983, p.23)
South Africa	4.2	79	per capita income (whites/blacks)	Devereux (1983, p.38)
Swaziland	6.9	74	average income (urban vs. rural)	ILO (1983, p.23)
Tanzania	1.2	78	average income (non-agricultural vs. farmers)	ILO (1982, p.49)

COUNTRY	RATIO	YEAR	VARIABLE (break-down by regions)	SOURCE
Zambia	2.8	76	average income (urban vs. rural)	ILO (1983, p.23)
Zimbabwe	3.9	83	taxable income per capita (4 regions)	Zimbabwe statistical yearbook 1987 (Table 2.12, 7.14)
Asia				
Bangladesh	3.19	79-80	per capita income (urban vs. rural)	Bangladesh Bureau of Statistics, Socio-economic indicators 1981, p.113)
China PRC	7.7	87	per capita income (3 metropolitan areas and 26 provinces)	China statistical yearbook 1988 (p.55)
Cyprus	1.0		regional difference non existant	
Hongkong	1.0		regional difference non-existant	
Israel	1.0		regional difference non-existant	
India	1.69	74	consumer expenditure per capita (24 states and territories)	India Department of Statistics (1978, pp.7-19, 70-83)
Indonesia	6.94	83	GDP per capita excluding oil-producing regions (23 regions)	Hill and Weidemann (1989, Table 1.1)
Iran	6.35	76	percentage of households with electricity (urban vs. rural)	UN compendium of social development indicators in ESCAP (Economic and Social Commission for Asia and the Pacific) 1989, p.69
Jordan	2.47	86	household income (10 regions)	Sha'ban (1990, p.67)
Korea S.	1.19	80	household income (urban vs. rural)	Sang-Mok Suh (1985, p.10)
Malaysia	3.06	80	per capita income (14 regions)	World Bank Malaysia report No. 8667-MA
Pakistan	4.83	80	percentage of households with electricity (urban vs. rural)	UN compendium of social development indicators in ESCAP, p. 70
Phillippines	3.26	71	average family income (10 regions)	Pernia (1977, p.78)
Singapore	1.0		regional diference non-existant	
Sri Lanka	5.74	81	percentage of households with electricity (urban vs. rural) HH	UN compendium of social development indicators in ESCAP, p. 71
Taiwan	1.85	88	household income (2 metropolitan areas and 21 counties)	Republic of China (Taiwan) statistical yearbook 1989 (pp.114-7)
Thailand	6.11	72	household income (5 rural regions and 5 urban regions)	Chiswick (1981, p.6)
Latin America				
Argentina	6.21	85	GDP per capita (22 regions)	World Bank county study, Argentina: Provincial Government Finances (1990, p.142)
Bahamas	1.9	90	household income (5 islands)	Bahamas statistical abstract 1992
Bolivia	24.5	89	tax payments per capita (9 regions)	Bolivia statistical yearbook 1989
Brazil	12.29	70	GNP per capita (26 states)	UN ECLA, Distribucion Regional del Producto Interno Bruto-Sectorial en los Paises de America Latina (1981, p.26)

COUNTRY	RATIO	YEAR	VARIABLE (break-down by regions)	SOURCE
Chile	4.92	76	GDP per capita (24 regions)	UN ECLA, Distribucion Regional del Producto Interno Bruto-Sectorial en los Paises de America Latina (1981, p.32)
Colombia	6.75	75	GDP per capita (24 departments)	UN ECLA, Distribucion Regional del Producto Interno Bruto-Sectorial en los Paises de America Latina (1981, p.30)
Costa Rica	2.95	73	percentage of urban population (7 regions)	Jantzi (1976, p.28)
Cuba	1.14	88	average wage (15 regions)	Cuba statistical yearbook 1988
Ecuador	3.12	85	GDP per capita (16 provinces)	UN ECLA, Distribucion Regional del Producto Interno Bruto-Sectorial en los Paises de America Latina (1981, p.33)
Guatemala	4.74	86/87	non-poor households as percentage of all households (8 regions)	Pinto et al. (1992, p.80)
Honduras	15.9	79	cars per capita (18 departments)	Honduras statistical yearbook 1979 (pp. 4, 131)
Jamaica	3.39	91	percentage of population in receipt of poor relief (13 regions)	Jamaica economic and social survey 1991 (pp. 15.3, 23.4)
Mexico	6.92	70	GDP per capita (32 states)	UN ECLA, Distribucion Regional del Producto Interno Bruto-Sectorial en los Paises de America Latina (1981, p.36)
Panama	3.76	68	GDP per capita (9 provinces)	UN ECLA, Distribucion Regional del Producto Interno Bruto-Sectorial en los Paises de America Latina (1981, p.37)
Peru	16.42	77	GDP per capita (23 departments)	UN ECLA, Distribucion Regional del Producto Interno Bruto-Sectorial en los Paises de America Latina (1981, p.39)
Uruguay	1.0		regional difference non-existant	
Venezuela	2.92	89	population with access to sewage (19 regions)	Venezuela statistical yearbook 1989 (pp.179, 648)

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Annex Table 4. The Gini coefficients

Country	Gini coefficient	Year	Components	Sources
OECD				
Australia	31.6	81-82	D(p/Y*p)	Bishop, Formby, Smith (1991, Tables 3 & 4). LIS data.
Austria	24.9	89	D(h/Y*p,e);workers households	Calculated from Austria Statistical Yearbook 1990 (p.161)
Belgium	27.4	83	D(h/Y*h)	Veleneduc (1987, p.97)
Canada	32.0	81	D(p/Y*p)	Bishop, Formby, Smith (1991, Tables 3 & 4). LIS data.
Denmark	28.0			Estimated from Tsakoglou (1992, p.27)
Finland	20.2	85	D(p/Yp*,e)	Ringen (1991)
France	30.7	81	D(p/Yp*,e)	Mitchell (1991, Table C3). LIS data.
W.Germany	27.8	81	D(p/Y*p)	Bishop, Formby, Smith (1991, Tables 3 & 4). LIS data.
Greece	39.9	86	D(h/Yh); taxable popul. only	Livada (1991, Table 1)
Ireland	34.6	87	D(h/Y*h)	Calculated from Ireland Central Statistical Office (1989).
Italy	31.3	90	D(h/Y*h)	Brandolini (1992, Table B12)
Japan	35.0	85	D(h/Yh)	Oshima (1991, Figures 1 & 2)
Netherlands	32.1	83	D(p/Y*p)	Bishop, Formby, Smith (1991, Tables 3 & 4). LIS data.
New Zealand	30.0	85-86	D(p/Y*p,e)	Saunders, Stott, Hobbes (1991, Table 5, p.75). LIS data.
Norway	26.9	79	D(p/Y*p)	Bishop, Formby, Smith (1991, Tables 3 & 4). LIS data.
Portugal	38.1	73-74	D(h/Yh)	Calculated from Portugal Instituto Nacional de Estatistica (1977, p.16).
Spain	31.5	88	D(h/Yh)	Calculated from Spain Instituto Nacional de Estatistica (1989, p.380).
Sweden	22.9	81	D(p/Y*p)	Bishop, Formby, Smith (1991, Tables 3 & 4). LIS data.
Switzerland	35.5	82	D(p/Y*p)	Bishop, Formby, Smith (1991, Tables 3 & 4). LIS data.
Turkey	43.8	87	D(h/Y*h)	Calculated from Turkey statistical yearbook 1990 (pp. 206-7) from household budget survey 1987.
United Kingdom	28.1	79	D(p/Y*p)	Bishop, Formby, Smith, (1991, Tables 3 & 4). LIS data.
United States	34.4	79	D(p/Y*p)	Bishop, Formby, Smith, (1991, Tables 3 & 4). LIS data.
Eastern Europe				

Country	Gini coefficient	Year	Components	Sources
Bulgaria	21.7	89	D(p/Y*p)	Calculated from household budget survey 1989.
Former Czechoslovakia	19.5	88	D(p/Y*p)	Calculated from Czechoslovakia Federal Statistical Office (1989); household budgets.
Hungary	23.1	89	D(p/Y*p)	Calculated from household survey 1988.
Poland	26.0	89	D(p/Y*p)	Calculated from Poland Central Statistical Office (1990); household budgets.
Romania	25.7	91	D(p/Y*p)	ose (1992, p.25)
Former Yugoslavia	37.9	89	D(p/Y*p)	Calculated from Yugoslavia Federal Statistical Office (1990); household budgets.
Former USSR	25.3	90	D(p/Y*p)	Calculated from household survey 1990.
E.Germany	19.3	89	D(p/Y*p,e)	Hauser, Mueller, Wagner (no date, p.9)
Africa				
Algeria	39.9	89		Ahmad (1992)
Egypt	43.0	74-75	D(h/Yh)	Hansen (1992, p.221)
Gabon	63.0	77	D(p/yp)	ILO (1992)
Ghana	36.7	88-89	D(p/Ep)	Chen, Datt, Ravallion (1993)
Cote d'Ivoire	54.0	85	D(p/Y*p,e)	Kozel (1990)
Kenya	57.3	81-83	D(h/Yh)	Chen, Datt, Ravallion (1993)
Madagascar	48.9	80	D(h/Yh)	Pryor (1990, p.26)
Morocco	53.3	80	D(p/Yp)	Bourguignon, Morrisson (1989, p.167)
Nigeria	60.0	73-74	D(h/Yh)	Jamal (1981)
Senegal	51.3	70	D(h/Yh)	Lecaillon, Paulkert, Morrisson, Germidis (1984)
Sierra Leone	49.0	75-76	D(p/yp)	ILO (1992)
South Africa	57.0	80		Devereux (1983, p.73)
Swaziland	57.0	74	D(p/yp)	ILO (1992)
Tanzania	59.0	88	D(h/Ep)	Luisa Ferreira (personal communication)
Zambia	57.0	72-73	D(h/yh)	Calculated from Fry (1979, p.92)
Zimbabwe	50.1	70	D(h/yh)	ILO (1992)

Country	Gini coefficient	Year	Components	Sources
Asia				
Bangladesh	35.0	83	D(h/Yh)	Oshima (1991)
China	38.2	88	D(p/Y*p)	Renwei (1992)
Cyprus	35.7	84-85	D(h/Yh)	Calculated from Christodoulou (1992, p.225)
Hong Kong	48.5	81	D(h/Yh)	Oshima (1991)
Israel	33.3	79	D(p/Y*p,e)	O'Higgins, Schmaus, Stephenson (1989)
India	40.0	75-76		Dowling (1984, p.15)
Indonesia	51.0	77	D(w/Yw)	Rao (1989, p.59)
Iran	42.9	84	D(h/Eh)	Behdad (1989, p.327)
Jordan	39.7	86	D(h/Yh)	Sha'ban (1990, p.67)
S. Korea	35.7	82	D(h/Yh)	Choo (1991, p.5)
Malaysia	48.4	89	D(p/Yp)	Chen, Datt, Ravallion (1993)
Pakistan	38.3	84	D(h/Yh)	Ahmad and Ludlow (1988, p.23)
Philippines	45.5	87	D(h/Yh)	Oshima (1991; Figures 1 & 2)
Singapore	41.0	87-88	D(h/Yh)	Rao (1990, p.147)
Sri Lanka	43.0	85	D(h/Yh)	Oshima (1991; Figures 1 & 2)
Taiwan	32.5	87	D(h/Yh)	Oshima (1991; Figures 1 & 2)
Thailand	47.8	88-89	D(h/Yh)	Bhongmakapat (1990, p.166)
Latin America				
Argentina	47.6	89	D(p/Yp)	Psacharopoulos et al. (1992, annex 3)
Bahamas	42.8	89	D(h/Eh); rural only	Calculated from the Commonwealth of the Bahamas (1992, p.102).
Bolivia	52.5	89	D(p/Yp)	Psacharopoulos et al. (1992, annex 3)
Brazil	63.3	89	D(p/Yp)	Psacharopoulos et al. (1992, annex 3)
Chile	48.2	87	D(p/Y*p)	Calculated from Haindl, Budinich, Irarrazaval (1989, pp. 47-9)
Colombia	51.6	87	D(h/Yh)	Altamir (1984, p. 266)
Costa Rica	46.0	89	D(p/Yp)	Psacharopoulos et al. (1992, annex 3)

Country	Gini coefficient	Year	Components	Sources
Cuba	26.0	78	D(p/Yp)	Rodrigues (1989, p.218)
Ecuador	44.5	87	D(p/w)	Psacharopoulos et al. (1992, annex 3)
Guatemala	59.5	89	D(p/Yp)	Psacharopoulos et al. (1992, annex 3)
Honduras	59.1	89	D(p/Yp)	Psacharopoulos et al. (1992, annex 3)
Jamaica	44.5	75	D(h/Yh)	Boyd (1988, p.100)
Mexico	50.6	84	D(p/Yp)	Psacharopoulos et al. (1992, annex 3)
Panama	56.5	89	D(p/Yp)	Psacharopoulos et al. (1992, annex 3)
Peru	57.0	81	D(h/Yh)	Berry (1989, p.200)
Uruguay	42.4	89	D(p/Yp)	Psacharopoulos et al. (1992, annex 3)
Venezuela	44.1	89	D(p/Yp)	Psacharopoulos et al. (1992, annex 3)

Definition of components. Distribution of (recipients/type of income per recipient) where recipents are p=persons or h=households, and income is Y=gross income, Y*=disposable income and e denotes equivalized income. Thus D(p/Yp) indicates that the Gini coefficient is calculated from the distribution of persons ranked by their per capita gross income; or D(h/Y*h) denotes distribution of households according to total household disposable income. For Indonesia, the recipients are only wage-earners and income is wage income (w) only; for Ecuador, income is approximated by labor income (w); for the Bahamas, Ghana, Tanzania and Iran, income is approximated by expenditures (E).

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Annex Table 5. Income data

Purchasing power parity (PPP) at international prices GDP per capita for 1988 (sometimes for 1987) are obtained from Summers and Heston (1991). The exceptions are the data for Bulgaria, Czechoslovakia, Romania, the Soviet Union, East Germany and Cuba which are obtained from Marer et al (1992). For all the countries except Cuba, the data refer to 1987. For Cuba, to 1988. Since these sources are widely available, the data are not reproduced here.

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