

**Income Inequality
in
East Europe**

B. Debroy

**GOKHALE INSTITUTE OF POLITICS AND ECONOMICS
PUNE 411004**

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FOREWORD

The eight socialist countries of Eastern Europe form an insubstantial part of the world's population and economy. Nor are their trade ties outside the socialist system strong. The most important aspect of a study of the economics of socialist countries would, therefore, be from a comparative point of view as to the relative merits and achievements of the socialist system of economic organisation compared to a capitalist or mixed economy.

A comparative study of all aspects of socialist economic systems would be of monumental proportions and would be beyond the resources of one scholar. Debroy has, therefore, selected a very specific aspect of the socialist system for study, namely the inequality in incomes. This is an appropriate beginning since the socialist system is recognized to be more egalitarian than other economic systems.

This particular study makes a comparison of income inequalities among the socialist countries of Eastern Europe. Comparison with other economic systems would have to come later. There are special problems in accounting for individual or family income in a socialist country since health, educational and welfare services are provided on the basis of individual needs and their value has to be imputed. In a socialist system these welfare services could form a substantial portion of individual benefits than in other systems. There are also problems about creating a data base for this comparative study. East European socialist countries have eight officially recognized languages belonging to three major linguistic groups. The economic data are to be gleaned from publications in these languages because they are not available from English publications.

There are methodological problems in carrying out an analysis of income distribution from secondary source data. For instance, the open-ended income categories have to be closed using Pareto or other assumed distributions.

Given these several limitations, Debroy has done a creditable job in carrying out the comparative analysis and has brought out a useful study on income inequality in East Europe. The literature citations are extensive and would prove useful especially for a reader not fully conversant with this field. It is hoped that Debroy would follow up this study with other aspects of East European economics and extend the comparison of the socialist system to other systems of economic organisation.

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K. Sivaswamy Srikantan
Offg. Director

August 11, 1986

PREFACE

The socialist countries of East Europe (Albania, Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, Romania and Yugoslavia) together accounted for about 3% of the world's population in 1980. Their combined share in the world's total production of coal, crude petroleum or crude steel was less than 1% in 1980. If one adds the contribution of the Soviet Union and that of the socialist countries of Asia, Africa and Latin America, these shares would go up somewhat. But what these figures do illustrate is that these eight socialist countries of East Europe do not form a sizeable section of the world's economy; no matter how one chooses to measure their share. The case for studying these socialist countries is however not couched in terms of their contribution to the world's economy. What is interesting about the socialist countries of East Europe is that, together with the Soviet Union and/or China, they represent in more senses than one a direct contrast to the Western economic systems or even to the economic systems of the third world. They are of an altogether different genre, certainly differing within themselves, but collectively representing what might be called the socialist economic system.

There are ways and ways of evaluating economic systems. One can be interested in absolute norms of evaluation, in which case one studies the values of various statistical indices which purport to reflect the overall functioning of the system. Or one might be interested in relative terms of comparison. In that case one might pose different questions in comparing across economic systems. One might use statistical indices like the gross national product or the per capita income or the production of selected commodities. And probably study the time profiles of these indices. Or one might ask what are even more fundamental questions. Does one economic system allocate resources more "efficiently" than another? The notion of "efficiency" must of course be suitably defined. How does the decision-making structure in one system compare with that in another? Is the distributive mechanism of one system "better" than that of another system, "better" being suitably defined. Is it "fairer", more "equitable"? Obviously the answers to these questions will depend to a certain extent on how the notions of "efficiency", "fairer", "better" or "equitable" are defined.

One of the most logical ways to evaluate a socialist system is in terms of the distributive mechanism, since traditionally, the appeal of a socialist system is in a fairer distributive system and not so much in a more efficient allocation of resources. In the initial periods of reconstruction, the socialist countries did seem to be remarkably equal. Free medical and welfare services were instituted. There were sweeping reforms in the fields of taxation and income. Educational facilities were increased

and were made more open. Employment was made more secure. There did seem to be a bias towards a more egalitarian distribution of income. The reforms in the educational system were especially important, since in the last resort, it is the level of education that determines to a large extent an individual's occupation and social status. During this period of socialist reconstruction, the entire philosophy seemed to be one of positive discrimination in favour of the working class. The possibility of an egalitarian promised land was partly belied in the future. The case of the Soviet Union can be taken to be symptomatic of what has been said to happen in the socialist countries of East Europe in the post reconstruction period. The increase in economic inequality in the Soviet Union in the Stalinist era is well documented. This trend was also true in general of the socialist countries of East Europe and has also been reasonably well documented. The inequalities that are endemic in these countries have been pointed out, mostly in a sociological context. In fact it has been argued that the distributive system in these countries is not so egalitarian as to demonstrate conclusively their superiority over mixed capitalist economies, at least as far as the distributive aspects are concerned. This is of course particularly true of the distribution of income, though not of the distribution of wealth or property. As a corollary, it has been argued that the essence of the distributive system under socialism is no different from that under capitalism. The convergence thesis argues that the socialist countries of East Europe seem to be heading towards a system of class stratification that is similar to that of the Western capitalist type.

It is of course possible to adopt the position that this stratification is not a characteristic of the socialist system *per se*, but is a survival of the capitalist past. It can also be argued that the stratification in the socialist system is phenotypical, it is not genotypical as in the case of the Western capitalist economies. Alternatively, it might be argued that the stratification in the socialist countries of East Europe and the Soviet Union are characteristic of state socialism or etatism. These existing socialist systems are thus departures from the model socialist state, the demerits of the system are explained away as aberrations from an ideal state of being. Justifications for the stratification have also been found in a functional theoretic framework.

The present study is not concerned with making comparisons with the Western economies or with the developing economies of the third world. It merely focuses on inequality within East Europe. Nor is it concerned with many of the broader aspects of the issue of inequality. The concern is not with the relational aspects of inequality, the study discusses the distributional aspects of inequality alone. And within the distributional aspects, the distribution of income alone has been singled out for examination. It was felt that not

enough work had been done on income inequality in East Europe, so that the present study might fill a gap in the literature. The obvious reason as to why not enough work had been done on income inequality in East Europe was the paucity of data that were available, as well as the lack of availability of data in English language sources. As the discussion in the text makes clear, the paucity of data has been a problem even in the case of the present study. Data, for the most part, have been collected from non-English language sources.

In completing any research work, major or minor, one accumulates debts. The study would not have been possible without access to the wealth of material on East Europe that is available in the library of Gokhale Institute of Politics and Economics. I am indebted to the staff of this library for considerable help in ferreting out material. A number of individuals have made comments on earlier drafts. Not all of the comments have been incorporated. Had I sought to incorporate all of these comments, there would have been no study that could have been published. I am particularly grateful to Professor K.K. Dasgupta and Professor B.G. Bapat, my colleagues at the Centre for the Study of East European Economies, Gokhale Institute of Politics and Economics. I am also grateful to Professor K.S. Srikantan for the interest he has shown in my work on income inequality in general, and East Europe in particular, over the last couple of years.

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August 1986

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Income Inequality in East Europe

This study examines certain aspects of income inequality in East Europe. Studies on income inequality in East Europe have been attempted earlier, such as, Kiuranov (1974), Michal (1973 and 1974), Wiles and Markowski (1971) and Debroy and Kulkarni (1984). Of these, the Kiuranov paper is devoted exclusively to Bulgaria, while the Wiles and Markowski study singles out Poland.¹ Debroy and Kulkarni also consider Poland alone. Michal's papers cover a number of socialist countries of East Europe. All of these studies basically concentrate on computing inequality coefficients for wage and salary and/or per capita income distributions.² As shall become apparent, our intention is to go a bit further. A second intention is to make use of the data for recent years, since the afore-mentioned studies, with the exception of the Debroy and Kulkarni one, only use data available up to the early 1970s.

SECTION 1

THE NATURE OF THE DATA

There are eight socialist countries in East Europe - Albania, Bulgaria, Czechoslovakia, the G.D.R., Hungary, Poland, Romania and Yugoslavia. In general, the data on distributions that are available for East Europe are of two types. In the first place, the frequency distribution of full time civilian wage and salary earners is given, for a selected month. The month varies from country to country. For instance, it is May in Czechoslovakia, and September in Hungary, Poland and Yugoslavia. Secondly, another frequency distribution tabulates households or individuals according to per capita annual cash after-transfers income. The data used for the present study are data of the above two categories, published in national statistical yearbooks. In a few cases, indicated accordingly, data from other sources are also used. No data were however available for Albania. And the data available for Yugoslavia were very unsatisfactory and fragmentary. Consequently, this study focuses on the other six socialist countries of East Europe, although Yugoslav data are also used on occasion. In principle, it would have been desirable to supplement data

culled from national statistical yearbooks with data obtained from various income surveys, but data obtained from income surveys were not in general available.

The nature of the data published does vary from country to country. Not all the countries publish data about per capita income distributions.

Bulgaria publishes two types of distributions. The first set of figures classifies households into different income brackets according to per capita annual incomes. Households are also classified into three social types — workers' households, employees' households and cooperative farmers' households. For each type of household, distribution figures according to per capita annual income are available. The second set of figures classifies workers and employees into different brackets according to monthly wages in mid-July. For separate branches, such as industry, construction, rural economy, forestry, transport, finance and credit, etc., distinct distribution figures are available. Annual income or earnings, from which the per capita figures are derived, are computed after taking into account social benefits (cash or kind), in addition to wages. To be more specific, apart from wages and bonuses, part of the social consumption fund is earmarked for social security and pension benefits. This includes family allowances and aid to the aged. In 1981 for example, the monthly allowance for children was 100 leva for a first child, 250 leva for a second, 500 leva for a third, and 100 leva for every additional child.³ Thus, apart from wages and bonuses, other components of total income (earnings) are payments from T.K.Z.S. (cooperative farms), pensions, family allowances, aids, stipends, receipts from the auxiliary economy and receipts from savings banks. But for worker and employee households, wages do constitute a sizeable percentage of total income in Bulgaria. For worker households, this percentage was 64.4 in 1965, 61.6 in 1970, 62.9 in 1975 and 64.7 in 1980. For employee households, this percentage was 71.9 in 1965, 70.5 in 1970, 69.6 in 1975 and 71.5 in 1980.⁴ For worker and employee households in Bulgaria, the distribution of wages does therefore give a reasonable idea of the distribution of total income. The distributions of per capita income that are given are pre-tax.

Czech statistics give frequency distributions of households according to per capita annual after-transfers income, including the money value of earnings in kind. Except for earnings from employment and earnings from agriculture, there are no other important sources of personal earnings in Czechoslovakia. Earnings from property are only in the nature of interests on bank deposits. Specifically, total earnings consist of earnings from employment, earnings from agriculture, earnings from social insurance, "other earnings" and the money value of earnings in kind.⁵ Direct taxes and contributions to national insurance and compulsory contributions to unified trade unions are not deducted.

But since taxes in Czechoslovakia are fairly low and not very progressive, the distribution of pre-tax earnings probably gives a fair enough picture of the distribution of earnings after taxes. Direct taxation in Czechoslovakia includes a wage tax on wages and salaries and an agricultural tax on the incomes of cooperatives and individual farmers. Despite the existence of social benefits, a large proportion of the earnings of households comprises of earnings from employment. Earnings from employment as a percentage of total money income were 67.7 in 1965, 66.7 in 1968, 65.9 in 1969, 65.4 in 1970 and 64.9 in 1971.⁶ Kociánová (1978) reported that about two-thirds of people's needs in Czechoslovakia are met from personal earnings. Hirše (1981) gives the results of a survey carried out in 1976. According to this survey, labour income (wages paid by state enterprises and organizations and incomes from cooperatives) together made up 75 per cent of the total earnings of household members. Social monetary incomes in the nature of pensions and child allowances constituted another 20 per cent. The social security system in Czechoslovakia includes medical care, health insurance and pension schemes. Health insurance covers benefits in kind, cash benefits, family allowances, sickness benefits, compensation from loss of earnings due to pregnancy and maternity, maternity benefits, birth grants and funeral grants.⁷ The family allowances in 1976 were 90 Kčs a month for one child, 430 Kčs a month for two children, 880 Kčs a month for three children, 1280 Kčs a month for four children and 240 Kčs a month for every additional child.⁸ Apart from the per capita distributions, a second set of Czech figures is available and gives the distribution of the full-time work force according to monthly wages in May for the socialist sector of the economy (excluding cooperative farms). If one includes cooperative farms, the socialist sector in Czechoslovakia employs more than 99.9 per cent of wage and salary earners.

In the G.D.R., no statistics on per capita distributions are available. Nor do we know about wage distributions. What is instead available, is a classification of workers' and employees' households according to net monthly income groups. Net income includes income from wages and salaries, premia, children and family allowances and social benefits. Taken together, these categories accounted for 94.9 per cent of net income in 1960, 91.9 per cent in 1970, 90.3 per cent in 1974, 90.8 per cent in 1978 and 91.0 per cent in 1980.⁹ Pensions, stipends etc., made up the rest of net income. The data for the G.D.R. also enable one to determine the role of household composition as a factor contributing to inequality. The data give the distribution according to net income groups for 1 person households, 2 per households, 3 person households, 4 person households and households with 5 or more persons. One can of course compare the levels of inequality in these different groups of the population, statistics for which are available for several years. But this comparison does not tell us how much one specific type

of household contributes to the generation of overall inequality. Nor does it tell us how interfamily (families classified according to size) inequality compares to intra-family inequality. What is the role of the size composition of households in generating inequality? To obtain an answer to this type of question, one would have to decompose overall inequality into interfamily inequality and intra-family inequality. And this requires information about the classification of the population into these several household types. This information is not available for all the years. But it is, for instance, available for 1971.¹⁰

For Hungary, one has two sets of statistics. The frequency of households (individuals) by per capita annual cash after-transfers income is given for worker and employee households and for peasant households. For earlier years, such as 1963, the distribution is given in terms of the percentage of households, whereas for later years, such as 1972 and 1977, the distribution is given in terms of the percentage of individuals.¹¹ Total annual cash after-transfers income includes components other than wages and bonuses. For worker and employee households, total gross income includes wages and bonuses, family allowances, aid, scholarships, sick pay, pensions, money income from state and cooperative agencies, money income from private parties, net income from auxiliary farms and other income in kind. Taxes are deducted.¹² For worker and employee households in Hungary in 1963, taxes formed 2.9 per cent of annual gross income.¹³ For peasant households and households of dually occupied persons, total gross income includes money income from the sale of goods to state and cooperative agencies, money income from the sale of goods to the population, money income from agricultural producers' cooperatives, wages, sick money, aid, family allowances, pensions, non-agricultural income from the population, the value of personal consumption and income in kind. Taxes and tax-like expenses are deducted.¹⁴ For peasant households and households of dually occupied persons in Hungary in 1963, taxes and tax-like expenses formed 3.5 per cent of annual gross income.¹⁵ One problem with the Hungarian data that are used in this study is that the data that were available were incomplete and fragmentary. There were a limited number of national statistical yearbooks that were available, consequently, the results of the household budget surveys were available only for a limited number of years. Nor were data from income surveys available. The second set of Hungarian figures that were available gives the frequency of full-time workers and employees in the state sector by monthly earnings for the month of September. The figure for pre-tax monthly earnings for full-time workers and employees include overtime, bonuses and premia. Since these are figures for full-time workers and employees, they exclude auxiliary workers, apprentices, home workers, gainfully occupied pensioners and others who are not on the full-time payroll. The state sector in Hungary does not employ as high a percentage of active earners as in some other socialist countries of East

Europe. The state sector in Hungary employed 57.8 per cent of active earners in 1960, 70.8 per cent in 1970 and 68.7 per cent in 1971.¹⁶ A problem in working with these Hungarian data, as opposed to data obtained from the income surveys, is that the formal figures of the category of people earning their living from wages and salaries underestimate the importance of earnings from other sources. Earnings from other activities, associated with the secondary, parallel, hidden or market economy, constitute a large bulk of actual earnings.¹⁷ The secondary economy does not of course necessarily mean an illegal economy. It includes perfectly legal activities like small scale private industry and retail trade and the cultivation of household plots. The unofficial hourly wages in the secondary economy are 5 to 10 times higher than those in the state sector. And three out of every four Hungarian families are said to be involved in some activity or other in the secondary economy.¹⁸ Andorika (1982) suggests that the secondary economy, specifically small-scale or owner-production, has improved the position of households with low levels of income in Hungarian society. Consequently, if this is a valid claim, inequality coefficients computed by excluding the secondary economy will tend to over-state the level of inequality in Hungary. Versztovesk and Enyedi (1982) also suggest that proceeds from self-produced goods, which have been constituting increasing shares of household incomes, have enabled the average income of dual-income and peasant households to catch up with the average income of worker households.

For Poland, the first set of data is the per capita distribution statistics. These give the distribution of households according to per capita annual after-transfers income. In recent years, figures are given separately for worker/employee households, worker/peasant households and peasant households. Those who earn income chiefly from the socialist sector are classified as worker/employees. Those who earn income from private non-socialist farming activity as well as employment in the socialist sector are classified as worker/peasants. Those who earn income chiefly from private farming are classified as peasants.¹⁹ Annual income includes primary incomes and transfers such as social security payments and family allowances. More specifically, income includes (i) labour income (net) : earnings from the main occupation, rewards from the enterprise fund, other rewards, money equivalents of allowances in kind; (ii) social benefits : family allowances, sick pays, maternity grants and benefits, pensions, scholarships, grants-in-aid; (iii) other incomes : sale of property, rents, payments for boarding and other services, lottery and competition prizes, the balance of savings drawn and deposited, the balance of contracted and paid off loans and credits, presents, the difference in the value of fuel and food stocks at the beginning and end of each year, the values of crops obtained from garden plots net of their costs of cultivation and maintenance.²⁰ In 1981, family allowances per month were

250 zlotys for the first child, 600 zlotys for two children, 1050 zlotys for three children and 500 zlotys for each subsequent dependent child. A dependent spouse warranted a family allowance of 250 zlotys per month. In 1971, for wage and salary earners, earned incomes accounted for 87.5 per cent of household cash incomes. Social benefits accounted for 8.7 per cent and other incomes contributed 3.8 per cent.²¹ A second type of distribution data for Poland is the frequency of full-time civilian wage and salary earners for the month of September. In Poland, full-time employees are defined to be those who receive earnings for the whole month. The data refer to the socialist sector, which in 1960 employed 95.4 per cent of all wage and salary earners and 96.1 per cent in 1970.²¹ Up to 1970, the distributions were given for gross earnings, whereas from 1972 onwards, the distributions are given for net earnings. Net earnings are obtained from gross earnings after deducting taxes, as well as contributions to pension funds.²²

No figures for per capita distributions are available for Romania. The only figures available are for the distribution of workers and total employees by groups of wages and salaries received. Personnel of public organizations, salaried army personnel or those assimilated to a rank in the army are not included. The distributions are given either for the month of March or for the month of June. In earlier years (1960 to 1972), the distributions were given for gross monthly wages and salaries. In recent years (1965 to 1980), the practice has been to publish distributions for net monthly remuneration.²³

The data on Yugoslavia available to us were rather meagre, although Yugoslavia does publish comprehensive data on the distribution of income. A distribution for employment in the socialist sector according to gross monthly income groups in 1970 was available. A second distribution was available for workers in the socialist sector according to net monthly personal income in March 1977. In 1967, almost 98 per cent of all employment was in the socialist sector of the economy.²⁴ If one excludes agriculture, wage income (personal income) accounted for 64.5 per cent of total income in 1956, 69.1 per cent in 1964, 71.0 per cent in 1966 and 72.7 per cent in 1967.²⁴ Non-wage incomes include travel and vacation allowances, pensions and disability payments, children's allowances, health allowances, war invalids' payments, etc. Other household receipts include receipts from abroad, receipts through the giro accounts of citizens, income from the sale of real estate, student credits and monetary rewards. Wachtel's (1973) figures exclude agriculture. If one includes agriculture, Janković's (1981) figures for example show that only about 55 per cent of total household resources available for personal consumption was due to personal incomes from employment in the socialist sector. A detailed breakdown of household receipts is given in Berković (1978). These show that personal income and other personal receipts of

producers as a percentage of total household receipts were 35.6 in 1952, 45.3 in 1957, 47.6 in 1962, 56.0 in 1967, 53.2 in 1972 and 53.0 in 1975. Since other household receipts are ignored, the distributions for personal monthly incomes are therefore not representative of the distributions of total earnings.

SECTION 2

MEASURING INEQUALITY AND PROBLEMS OF ESTIMATION

How does one go about measuring the inequality in the distribution of income? There can in principle be an infinite number of measures of the degree of income inequality. That there should be more than one measure of the degree of income inequality is probably logical, since the notion of inequality is at best an imprecise one and there are a large number of aspects to the question of inequality.²⁵ Some of the measures highlight one particular aspect of inequality, others highlight other aspects.²⁶ Several objective criteria have been suggested to compare between various measures of inequality.²⁷ It is however a hard fact of life that there does not exist one and only one measure of income inequality which satisfies all the objective criteria that have been suggested, to the exclusion of all other proposed measures of inequality. Let y_i stand for the income accruing to the i th individual, let m stand for the mean income of the distribution and let n be the number of individuals in society. The uni-dimensional measures of inequality that have generally been used are the following:

i) The relative mean absolute deviation

$$M = \frac{\sum |y_i - m|}{n \cdot m}$$
²⁸

ii) The coefficient of variation C given by the following expression.

$C^2 = \frac{\sum (y_i - m)^2}{nm}$. To ensure that this index lied between zero and unity, one can use instead the measure $V = C^2/(C^2+1)$.²⁹

iii) The variance of natural logarithms given by the following expression. $S^2 = \frac{\sum (\ln y_i - \ln m)^2}{n}$. This measure has the property that it attaches greater weight to income transfers that take place at the lower end of the spectrum.³⁰ To ensure that this index lies between zero and unity, one can use instead the measure $L = S^2/(S^2+1)$.³⁰

iv) The Gini index of inequality G .³¹

v) Atkinson's (1970) measure of income inequality. For grouped data this is written as

$$A = 1 - \left[\frac{\sum P_i (y_i/m)^{1-E}}{1-E} \right]^{1/(1-E)}$$
 if E is not equal to one and as

$$A = 1 - \left[\frac{\sum (y_i/m)^{1/n}}{n} \right]^{1/n}$$
 if E is equal to one.

As before, m continues to designate the mean income of the distribution and n the total number of individuals in society. y_i designates the mean income of the i th income bracket, P_i stands for the proportion of income earners in the i th income bracket and E is the relative inequality aversion parameter.

We need not discuss the properties of the above-mentioned measures of inequality, since such discussions are readily available in the literature.³² But it needs to be noted that the use of uni-dimensional measures of inequality leads to problems when Lorenz curves intersect. When two Lorenz curves do not intersect, one can conclude unanimously that inequality in one situation is greater than that in a second.³³ But when two Lorenz curves intersect, as they do in most practical situations, uni-dimensional measures of inequality often give conflicting answers.³⁴ In such cases, it might be better to consider a whole spectrum of uni-dimensional measures for analysing inequality. Reliance on any single measure of inequality is bound to be misleading. When Lorenz curves intersect, another alternative would be to reject uni-dimensional measures in favour of considering the entire Lorenz curve or Lorenz curve values in comparing distributions. Although in such cases, the Lorenz dominance principle would generate an incomplete ordering, the overall shapes of the distributions might be compared for different segments of the distributions. We do not calculate Lorenz curve values, we instead use centile ratios as measures of inequality.³⁵ The reason for choosing centile ratios instead of the Lorenz curve values is that centile ratios have already been used as measures of inequality in the East European context, and their use therefore facilitates comparisons. The centile ratios are defined as $P_i = p_i/p_{50}$, where p_i is the income at the i th cumulative frequency and p_{50} is the median income. The centile ratios have an advantage (like the Lorenz curve values) in that they do not obscure the overall shape of the distribution. Uni-dimensional measures of inequality give a summary measure of inequality for the entire distribution. Two distributions might have the same uni-dimensional level of inequality, but one might be more unequal than the other for the upper half of the distribution and less unequal than the other for the lower half of the distribution. The centile ratios enable us to identify such pockets of inequality. The greater the inequality in the upper half of the distribution, the more would the P_i s exceed one for i s over 50. The greater the inequality in the lower half of the distribution, the more would the P_i s be below one for i s below 50.

There are a number of complications involved in computing uni-dimensional measures of inequality.³⁶ A typical distribution for East Europe looks like the one given in Table 1. In general, the total income is not known. Nor are the mean incomes for any of the income brackets given. For closed income brackets, one can assume a uniform distribution of income within each bracket. That is to say, the

Table 1 : MANUAL AND WHITE-COLLAR-WORKERS' HOUSEHOLDS ACCORDING TO NET INCOME GROUPS, G.D.R. 1965.

Monthly Income in Marks	(Percentages)			
	(a)	(b)	(c)	(d)
Under 400	7.2	]24.9	]46.8	7.2
400 - 600	17.7			17.7
600 - 800	21.9			21.9
800 - 1000	25.5	25.5	25.5	25.5
1000 - 1200	15.8	15.8	15.8	15.8
1200 - 1400	]8.4	6.6	6.6	6.6
1400 - 1500		]2.8	]2.8	1.8
1500 - 1600	1.0			
1600 - 1800	]3.5	1.2	1.2	1.2
1800 - 2000		0.7	0.7	0.7
2000 - 2200		]0.6	0.3	0.3
Over 2200	0.3		0.3	
Estimated mean of lowest bracket	269.76	326.98	390.04	269.76
Estimated mean of highest bracket	1834.96	2316.01	2551.22	2551.22
Estimated mean of the distribution	842.59	813.77	761.56	840.04
M	.315	.359	.457	.314
V	.141	.171	.213	.141

mean for any income bracket can be equated to the mid-point of that particular income bracket. But the mean income of the income earners in the highest or in the lowest open-ended income bracket cannot be determined in this fashion. To compute any uni-dimensional measure of inequality, one has to compute the means in the open-ended income brackets. For the upper open-ended income bracket, the mean in this study has usually been estimated by using the Pareto law, that is, by using the relation $y = y_0 v / (v - 1)$. y is the mean income to be computed, y_0 is the known lower limit of the open-ended bracket and v is the Pareto coefficient.³⁷ v is computed from the relationship

$$v = (b - a) / (c - d), \text{ where,}$$

a = logarithm of frequency in the open-ended bracket,

b = logarithm of the sum of frequencies in the open-ended bracket and the previous bracket,

c = logarithm of the lower limit of the open-ended bracket,

d = logarithm of the lower limit of the previous bracket.

There is some scope for doubt as to whether the Pareto curve gives good fits for the upper tails of income and/or wage and salary distributions for the socialist countries of East Europe.³⁸ An incorrect estimation of v could lead to significant errors in the estimation of uni-dimensional measures of inequality. The computation of the means in the open-ended brackets is also susceptible to changes in the fineness of the classification system involved. With a large concentration in either open-ended bracket, the computation of uni-dimensional measures of inequality cannot really be trusted. Table 1 gives three different distributions for the G.D.R., for the same year, 1965. Column (a) is from p. 361 of *Statistisches Jahrbuch* (1972), Column (b) from p. 275 of *Statistisches Jahrbuch* (1980) and Column (c) from p. 273 of *Statistisches Jahrbuch* (1981). As Table 1 illustrates, the estimated means of the distribution differ greatly, as do estimates of the uni-dimensional measures of inequality M and V , depending on which column is used. Whenever such a situation crops up and more than one distribution is available for the same year, we use the finest classification that can be constructed, for example, the one given in column (d).³⁹

The computation of the centile ratios does not require an estimation of the means of the open-ended brackets. With a large concentration in either open-ended bracket, the centile ratios cannot simply be calculated. The fundamental problem is that one is working with grouped distributions. What sort of an assumption is to be made about the distribution of income within any bracket? One assumption that can be made (the one that is in fact made) is that the distribution of income within a bracket is perfectly equal. This assumes that the Lorenz curve consists of linear segments, and since the convexity of the Lorenz curves are ignored, this assumption leads to an under-estimation of actual inequality. Corrections for this under-estimation could have been tried out in principle, but in practice, such corrections were not feasible. Gastwirth's (1972) correction requires information about the limits (boundaries) for all the brackets, information that was not available for the two open-ended brackets. Mehran's (1975) correction involves the fitting of a Pareto law to all the brackets. As has been mentioned, the Pareto law gave remarkably bad fits when actual estimations were tried out. For instance, when a Pareto curve was fitted for data on Poland, the mean of the bracket, obtained as a result of such estimation, often lay outside the two limits of the bracket. This explains why the Pareto law was not used except in obtaining the means of the two open-ended brackets. For the other brackets, it was assumed that all earners within the bracket obtained an income equal to the mid-point of the bracket. In effect, a measure like the Gini coefficient was estimated by using the trapezoidal rule. Thus, all the uni-dimensional measures

of inequality that are obtained should be regarded as lower bounds rather than as actual values of inequality. The fitting of the Pareto curve to the two open-ended brackets led to problems (such as in the case of Romania) when there was a large concentration of earners in either open-ended bracket. In fact, the magnitude of the above-mentioned problems depends on the fineness of the classification into brackets. The lower the degree of concentration in specific brackets, the less is the magnitude of the problem associated with the grouping of data. In a large number of cases, the classification was not as fine as one would have liked it to be. Consequently, some caveats need to be attached to the values of the uni-dimensional measures of inequality that have been computed.

Broadly speaking, there are two ways in which any given distribution of income can be used. One can ignore the fact that it is based on a sample and compute uni-dimensional measures of inequality on the basis of the distribution that is given. The values of inequality thus obtained would be regarded as being representative of the population. An alternative would be to explicitly recognise the fact that the given distribution is based on a sample. One would then use data provided by the sample (such as the Lorenz curve values) to obtain population estimates through standard econometric techniques. One could for example use the data to fit well-known income distribution functions like the Pareto distribution, the sech square distribution or the lognormal distribution. Inequality estimates for the population could be worked out once such income distribution functions had been fitted. Unfortunately, such well-known density functions give extremely bad fits to the given data. The alternative approach of Kakwani and Podder avoids the necessity of fitting income distribution functions by postulating a direct functional form of the Lorenz curve.⁴⁰ The postulated equation of the Lorenz curve is estimated and measures of inequality are then obtained as functions of the parameters of the specified equation for the Lorenz curve. This approach did not seem to be particularly feasible for the purposes of our study. The efficacy of such econometric techniques depends for instance, on the number of observed points of the Lorenz curve that are given by the sample. With only a limited number of observed points available, as has been the case, the use of sophisticated techniques was both dubious and unwarranted. An additional point is that virtually nothing was known about the sample designs of the samples on which the data are based. We have therefore adopted the simpler approach of regarding the values of inequality obtained from the sample as being representative of the population. As a general principle, we compute centile ratios for both the wage and salary distributions and the per capita distributions. But uni-dimensional measures are not computed for the per capita distributions, since in our view there is even less justification for the assumption that the Pareto law holds, in the case of the per capita distributions, as compared to the wage and salary distributions.

Households differ in size and in their age and sex compositions. Any measure of inequality for total household income would be meaningless unless adjustments are made for differing age and sex compositions of the households. The per capita distributions correct for the differing sizes of households, but for differences in age and sex compositions. In effect, the per capita distributions attach equal weights of unity to all members of a household, irrespective of their age and sex. One possible way to take care of differences in the age and sex composition of households would be to construct adult equivalent scales and express the distributions in terms of per capita adult equivalent units.⁴¹ It is certainly worthwhile to recognise that it makes precious little sense to pool together and treat equally individuals who show great differences in age, burden of maintenance, hours of work and marital status. The construction of per capita adult equivalent unit distributions, if possible, would have been a worthwhile exercise. Quite apart from the theoretical problems involved, the statistical material available from national statistical yearbooks on East Europe, does not permit such computations to be carried out. In general, information about the age and sex compositions of specific households or types of households is just not available. One has to make do with per capita distributions.

The argument for the construction of equivalent scales is couched in terms of the varying needs of households with differing age and sex compositions. A distinct argument is couched in terms of the earning capacities of different individuals of varying ages. Boulding (1973) for example makes the point that cross-sectional measures of inequality at any one moment of time are extremely misleading. If young people are in general poor and old people are in general wealthy, society will tend to be very unequal *vis-a-vis* cross-sectional measures of inequality. But if entire life-time incomes are considered, individuals might be earning the same life-time incomes. Cross-sectional measures would tend to over-estimate inequality.⁴² There is also the accepted fact that the level of computed income inequality depends to a large extent on the time period that is being considered. Friedman (1957) maintains that income inequality for short-run incomes is likely to be higher than income inequality for normal or permanent incomes. One would of course have liked to have income figures for each individual or household for a series of years. One would also have liked to have data on life-time incomes. But the statistical material available rules out any consideration of life-time incomes. Since actual life-time income data are not available, one would have to generate hypothetical life-time income data for all individuals. And this has not been satisfactorily achieved even in countries where data problems are not as severe as they are in the case of East Europe.⁴³ The nature of the data available for East Europe has been outlined above. Wage and salary distributions are for a month and per capita

distributions are for annual income. These are the data that one has to work with. One cannot tailor the data and choose the time period to suit one's concepts.

SECTION 3 THE WAGE AND SALARY DISTRIBUTIONS

Table 2 gives the inequality coefficients for the wage and salary distributions of workers and employees in Bulgaria.⁴⁴ All the uni-dimensional measures of inequality indicate that from 1960 to 1965 and from 1971 to 1974 inequality decreased. They also agree that inequality increased from 1957 to 1960. For the other time periods, the uni-dimensional measures do not give an unique answer. Broadly speaking, there seems to have been an increase in inequality from 1957 to 1960, then a gradual decrease from 1960 to 1974. From 1974 to 1977 inequality increased, and

Table 2 : INEQUALITY COEFFICIENTS FOR WAGE AND SALARY DISTRIBUTIONS IN BULGARIA

	1957	1960	1965	1971	1974	1977	1980
M	.319	.343	.322	.305	.293	.317	.284
G	.232	.235	.214	.212	.199	.200	.207
V	.184	.186	.155	.138	.129	.148	.135
L	.153	.155	.130	.134	.115	.129	.111
A (E = 1.5)	.013	.106	.011	.011	.010	.009	.009
A (E = 2.5)	.190	.194	.162	.175	.144	.139	.139
P ₉₅	2.08	2.01	-	1.91	1.85	-	1.87
P ₉₀	1.63	1.78	1.63	1.64	1.64	1.69	1.62
P ₇₅	1.28	1.29	1.33	1.28	1.30	1.32	1.28
P ₂₅	.80	.78	.79	.79	.79	.78	.77
P ₁₀	-	-	.65	-	.66	.64	.65
P ₅	-	-	.59	-	.61	.59	.60

then decreased again from 1977 to 1980. The centile ratios show that from 1957 to 1960, although inequality increased for most of the distribution, in the extreme upper tail of the distribution, inequality decreased. From 1960 to 1965 inequality increased for incomes just above the median income, but decreased elsewhere. From 1965 to 1971 inequality decreased for incomes just above the median income (P₇₅), but increased further up the distribution. From 1971 to 1974, although inequality decreased at the extreme upper tail of the distribution (P₉₅), it increased for incomes just above the median income. The centile ratios show a clear increase in inequality throughout the range of the

distribution from 1974 to 1977. But from 1977 to 1980, although inequality in general decreased, it increased for incomes just below the median income. L attaches a high weight to lower ranges of the distribution. The minimum wage was raised twice in Bulgaria in the 1970s, from 60 to 80 leva in 1973 and from 80 to 100 leva in 1979.⁴⁵ Both instances are reflected in the sharp fall in L from 1971 to 1974 and from 1977 to 1980. Broadly speaking, inequality seems to have attained a peak in 1960 and the most equal distribution seems to have been that of 1974.

Table 3 : INEQUALITY COEFFICIENTS FOR THE WAGE AND SALARY DISTRIBUTIONS OF THE FULL-TIME WORK FORCE IN CZECHOSLOVAKIA

	1959	1962	1964	1966	1971	1973	1975
M	.283	.274	.271	.271	.308	.285	.254
G	.197	.191	.175	.188	.203	.195	.181
V	.120	.112	.109	.105	.124	.117	.101
L	.123	.109	.106	.105	.127	.117	.109
A (E = 1.5)	.092	.085	.082	.082	.114	.092	.089
A (E = 2.5)	.153	.138	.134	.134	.170	.149	.142
P ₉₅	1.78	1.72	1.71	1.72	1.84	1.78	1.73
P ₉₀	1.54	1.56	1.56	1.54	1.56	1.58	1.58
P ₇₅	1.26	1.25	1.25	1.25	1.34	1.28	1.25
P ₂₅	.78	.78	.78	.78	.78	.77	.76
P ₁₀	.62	.63	.63	.64	.60	.62	.62
P ₅	.53	.56	.57	.56	.54	.53	.53

Table 3 gives inequality coefficients for the wage and salary distributions of the full-time work force in Czechoslovakia (excluding cooperative farms).⁴⁶ The uni-dimensional measures show a gradual decline in inequality from 1959 to 1966, with the exception of G, which shows an increase from 1964 to 1966. They also show an increase in inequality from 1966 to 1971, followed by a decline in inequality from 1971 to 1975. A revision of the wage and salary system had been introduced in 1958-60 and a new wage system had been implemented.⁴⁷ This wage reform had envisaged an increase in the extent of wage differentiation and an increase in the inequality of earnings. In view of this, the decline in inequality from 1959 to 1966 is surprising. The centile ratios however show that from 1959 to 1962 inequality did increase towards the upper end of the distribution (P₉₀). The decline from 1962 to 1964 was concentrated exclusively at the two extreme tails of the distribution. From 1964 to 1966 inequality increased at the two extreme tails of the distribution, although it declined further away from the tails (P₉₀ and P₁₀). From 1966 to 1971 there was a clear increase in inequality throughout

the range of the distribution. From 1971 to 1973 inequality decreased for incomes just above the median income and at the extreme upper tail, but increased further away from the upper tail (P₉₀). But from 1971 to 1973 inequality increased for incomes just below the median income and at the extreme lower tail, although it decreased further away from the lower tail (P₁₀). From 1973 to 1975 inequality decreased in the upper half of the distribution, but increased for incomes just below the median income (P₂₅). Comparing the low level of inequality in 1966 to the low level of inequality in 1975, the centile ratios show that the distribution for 1966 was more equal than the distribution for 1975. This time trend of inequality agrees with Michal's (1973, 1974) findings that the equalization of earnings reached a peak in Czechoslovakia in the mid 1960s and thereafter inequality registered an increase. Michal's figures do not however extend beyond 1971, so that they do not indicate the decrease in inequality after 1971.

Table 4 give inequality coefficients for the net income distribution of manual and white-collar workers' households in the G.D.R.⁴⁸ For the period 1960-65, the uni-dimensional measures all show a decline in inequality in the G.D.R. The centile ratios reinforce the picture. From 1965 to 1970 the trend in the diminution of inequality continued, except for an increase in inequality at the lower end of the distribution (P₁₀). For the period 1970 to 1974, the uni-dimensional measures of inequality give conflicting answers. The centile ratios, when they can be

Table 4 : INEQUALITY COEFFICIENTS FOR THE NET INCOME DISTRIBUTIONS OF MANUAL AND WHITE-COLLAR WORKERS' HOUSEHOLDS IN THE G.D.R.

	1960	1965	1970	1974	1978	1980
M	.331	.314	.306	.298	.283	.296
G	.229	.218	.218	.213	.203	.215
V	.151	.141	.135	.131	.120	.132
L	.175	.166	.157	.166	.146	.183
A (E = 1.5)	.137	.129	.129	.128	.112	.140
A (E = 2.5)	.232	.223	.212	.227	.198	.252
P ₉₅	1.83	1.72	1.71	1.67	-	-
P ₉₀	1.60	1.52	1.49	1.47	1.45	1.46
P ₇₅	1.30	1.25	1.25	1.23	1.21	1.21
P ₂₅	.72	.73	.73	.75	.76	.77
P ₁₀	-	.52	.51	.52	.53	-
P ₅	-	-	.43	-	.44	-

calculated, show 1974 to have been more equal than 1970. This leads one to suspect that from 1970 to 1974 inequality must have increased in the extreme lower tail of the distribution. From 1974 to 1978 there was a clear decline in inequality. And from 1978 to 1980 there was an increase in inequality, except for incomes just below the median income (P₂₅). Since L increased rather sharply from 1978 to 1980, this increase in inequality must have been concentrated in the lower range of the distribution. Broadly speaking, the G.D.R. witnessed a diminution in inequality over the period 1960 to 1978, followed by an increase in inequality from 1978 to 1980. One notices a sharp drop in L from 1974 to 1978. This probably reflects the increase in minimum wages that came about in 1976, when minimum wages were raised to 400 marks per month.⁴⁹ The general trend agrees with Kocianová's (1978) findings, which showed that from the second half of the 1950s to the early 1970s the G.D.R. experienced a process of reduced income differentiation. But Kocianová (1978) also makes the point that because of historical, social and political reasons, the G.D.R. in the 1950s started off with quite a strongly differentiated wage system. The base on which the reduction in inequality operated was more unequal, relatively speaking, than that in comparable socialist countries.

Table 5 : INEQUALITY COEFFICIENTS FOR THE EARNINGS DISTRIBUTIONS OF WORKERS AND EMPLOYEES IN THE STATE SECTOR IN HUNGARY

	1951	1955	1960	1966	1970	1974	1978
M	.788	.373	.297	.288	.302	.333	.314
G	.451	.257	.202	.203	.213	.223	.215
V	.440	.192	.129	.131	.140	.159	.143
L	.521	.195	.123	.125	.138	.155	.149
A (E = 1.5)	.473	.157	.097	.098	.109	.123	.117
A (E = 2.5)	.601	.244	.156	.158	.178	.199	.199
P ₉₅	-	2.00	1.86	-	1.92	1.93	-
P ₉₀	-	1.74	1.62	1.58	1.69	1.67	1.61
P ₇₅	-	1.32	1.30	1.27	1.29	1.32	1.29
P ₂₅	-	-	.78	.77	.78	.76	.76
P ₁₀	-	-	.61	.61	.65	.52	.60
P ₅	-	-	.56	.54	.60	.44	.50

Table 5 gives inequality coefficients for the earnings (wages and salaries) distributions of workers and employees in the state sector in Hungary.⁵⁰ Because of a large concentration in the lower open-ended brackets, the uni-dimensional measures for 1951 and 1955 are very suspect. But from 1951 to 1960 there is a clear trend of declining inequality. The uni-dimensional measures do not agree about the trend in

inequality from 1960 to 1966. The centile ratios show that while the distribution had become more equal in the upper half, it had become more unequal in the lower half. 1966 to 1970 shows a complete reversal of this trend. Inequality in 1970 was greater than inequality in 1966 for the upper half of the distribution, but was lower for the lower half of the distribution. The uni-dimensional measures all show an increase in inequality from 1966 to 1970. Inequality continued to increase from 1970 to 1974 except for a section in the upper half of the distribution (P90). But inequality clearly declined from 1974 to 1978. Generally speaking, the earnings distribution in Hungary saw a decline in inequality from 1951 to 1960, followed by an increase from 1960 to 1974 and a decline again from 1974 to 1978. This agrees with Michal (1974) who found that the equalization in earnings reached a peak in Hungary in the early 1960s and that there was a widening in the dispersion thereafter. Michal (1974) does not of course report the levelling that came after 1974. But Hungarian sources, for example, Rácz (1979) or Szikra Falus (1980a, 1980b), support the trend of levelling in wages after 1974. Szikra Falus (1980a, 1980b) states that the differentials declined between 1970 and 1978. That is not evident from our figures, since the reduction in inequality from 1970 to 1974 is not clear and it is only from 1974 to 1978 that the decline in inequality becomes evident. The recent levelling is also reported in Kovács and Bodrogi (1982), Holtzer (1982) and Lökkös (1981). All of these talk of the disincentive effect of the recent levelling. A contributory factor to the reduction in inequality from 1974 to 1978 in the lower range of the distribution was the increase in minimum wages in industrial enterprises in January 1977 by 35-40 per cent. Minimum wage rates in all occupations were raised again in January 1981 by 8 per cent, but our figures do not capture the effects of this rise. The time trends in the Adam and Nosal (1982) study parallel, but do not entirely agree with, our time trends. Adam and Nosal (1982) found that the narrowing of differentials started after the war and peaked in the second half of the 1950s. Differentials widened during the new economic measures, attaining a peak in 1970-72.⁵¹ But since then, differentials have narrowed, although they were wider in 1978 than they had been in 1958.⁵²

Table 6 gives inequality coefficients for the wage distributions of manual and white-collar workers in the socialized sector in Poland.⁵³ The uni-dimensional measures give conflicting pictures of the direction of change in inequality from 1960 to 1965. The centile ratios suggest that inequality increased for the upper half of the distribution, but decreased for the lower half of the distribution. From 1965 to 1970 all uni-dimensional measures show an increase in inequality. The centile ratios show that while inequality increased for most of the distribution from 1965 to 1970, there was a decline in inequality at the extreme upper tail of the distribution. The comparison of years after 1972 with those that come before is not at all

Table 6 : INEQUALITY COEFFICIENTS FOR THE WAGE DISTRIBUTIONS OF MANUAL AND WHITE-COLLAR WORKERS IN THE SOCIALIZED SECTOR IN POLAND

	1960	1965	1970	1972	1976	1978
M	.356	.378	.396	.393	.355	.350
G	.259	.261	.267	.284	.244	.243
V	.209	.207	.213	.235	.184	.183
L	.196	.195	.204	.261	.175	.169
A (E = 1.5)	.159	.159	.166	.213	.141	.136
A (E = 2.5)	.251	.250	.261	.328	.225	.215
P ₉₅	2.29	2.38	2.19	2.00	2.10	2.12
P ₉₀	1.75	1.95	1.98	1.66	1.77	1.75
P ₇₅	1.33	1.34	1.36	1.28	1.33	1.33
P ₂₅	.73	.74	.73	-	.74	.75
P ₁₀	-	.55	.55	-	.57	.56
P ₅	-	-	.46	-	-	.48

legitimate because of the changes in definitions. All uni-dimensional measures except M show an increase in inequality from 1970 to 1972. The centile ratios show that inequality in the upper half of the distribution decreased from 1970 to 1972. This could be due to either a genuine decline in inequality, or as is more likely, could be merely an effect of the deduction of taxes. The centile ratios cannot be calculated for the lower half of the distribution in 1972. But since all uni-dimensional measures except M show an increase in inequality from 1970 to 1972, inequality in the lower half of the distribution must have increased from 1970 to 1972. (L shows a sharp rise from 1970 to 1972.) The uni-dimensional measures show a decline in inequality from 1972 to 1976 for the upper half of the distribution. Inequality in the lower half of the distribution must therefore have declined from 1972 to 1976. (L registers a sharp fall from 1972 to 1976.) All uni-dimensional measures suggest a decline in inequality from 1976 to 1978. The centile ratios however show a more complicated picture. Inequality increased at the extreme upper tail of the distribution and for a section of the lower half of the distribution (P₁₀) and decreased elsewhere. For Poland therefore, there does not seem to be any discernible trend in overall inequality. Michal (1974) reports that the equalization of earnings reached a peak in Poland in the early 1960s. Thereafter, there was a widening in the dispersion of earnings, almost exclusively in the upper half of the distribution. Our figures support this statement for the period 1960 to 1965, but not for the period 1965 to 1970. The minimum monthly wage was raised to 1400 zlotys in 1977 and 1600 zlotys in 1978.⁵⁴ This could have been a contributory factor to the reduction in inequality from 1976 to 1978.

Table 7 gives inequality coefficients for the distributions of total personnel by groups of net remuneration in Romania.⁵⁵ There is a problem in working with the Romanian distributions. With a large proportion of total personnel

Table 7 : INEQUALITY COEFFICIENTS FOR THE DISTRIBUTION OF TOTAL PERSONNEL BY GROUPS OF NET REMUNERATION IN ROMANIA

	1965	1970	1974	1978	1980
M	.195	.296	.240	.241	.251
G	.102	.175	.153	.162	.173
V	.082	.130	.096	.084	.094
L	.049	.092	.069	.079	.090
A (E = 1.5)	.041	.076	.056	.062	.071
A (E = 2.5)	.058	.110	.083	.099	.112
P ₉₅	-	-	1.87	-	-
P ₉₀	-	-	1.62	-	-
P ₇₅	-	-	1.26	1.22	1.21
P ₂₅	-	-	-	.84	.84
P ₁₀	-	-	-	.73	.72
P ₅	-	-	-	.68	.66

concentrated in the lower open-ended bracket, as in 1965, 1970 and 1974, the usual method of estimating the mean of the lower open-ended bracket by means of the Pareto law breaks down. We have therefore used an alternative procedure for Romania in 1965, 1970 and 1974. We have taken the known means of the distribution, plugged these in, assumed that the estimates of the means in the upper open-ended brackets are accurate, and then estimated the means in the lower open-ended brackets.⁵⁶ This works for 1965 and 1970. But the average net monthly remuneration is not known for 1974. Instead, an average gross monthly remuneration of 1963 lei is available for 1974.⁵⁷ The average gross monthly remuneration for 1970 was 1434 lei.⁵⁸ Assuming that the ratio of the average gross remuneration in 1970 to the average gross remuneration in 1974 was the same as the ratio of the average net remuneration in 1970 to the average net remuneration in 1974, the average net remuneration (monthly) for 1974 works out to be 1494.84 lei. This is assumed to be the mean of the distribution for 1974. The uni-dimensional measures show an increase in inequality from 1965 to 1970 and a decrease from 1970 to 1974. In the comparison between 1974 and 1978 the uni-dimensional measures give conflicting results. The centile ratios show that from 1974 to 1978 inequality decreased for incomes just above the median income. The uni-dimensional measures show an increase in inequality from 1978 to 1980. The centile ratios show that from 1978 to 1980 inequality

increased in the lower half of the distribution, but decreased for incomes just above the median income. Generally speaking, inequality increased from 1965 to 1970, declined from 1970 to 1974, remained more or less the same from 1974 to 1978, and increased from 1978 to 1980. Inequality in 1980 was greater than inequality in 1965, and inequality in 1978 was also greater than inequality in 1965. This does not agree with Totu's (1980) statement that from 1965 to 1978 inequality decreased in Romania. Nor does it agree with the statement made in President Ceausescu's speech at the Second Congress of the District Popular Councils on 13.9.1980 suggesting that inequality in Romania was lower in 1980 than it had been in 1965.⁵⁹ The increase in inequality, especially the one from 1978 to 1980, is natural since the Resolution of the Political Executive Council of the Romanian C.P.C.C. reported on 7.5.1977 had placed an emphasis on increased wage differentiation.⁶⁰ We should however reiterate that our conclusions about Romania are heavily qualified by the grouping problem that has been outlined above.

Our sole distribution figures for Yugoslavia are for 1970 and 1977.⁶¹ They are not comparable. The former distribution is for gross monthly incomes, the latter distribution is for net monthly incomes. The inequality coefficients are given in Table 8. Since our data on Yugoslavia do not permit conclusions on time trends, we report instead the findings of other studies. Wachtel (1973) examined inter-industry, inter-skill and inter-republic differentials in wages. His study shows that between 1956 and 1961 inter-skill differentials increased, and decreased after 1961. Inter-republic differentials increased between 1956 and 1963 and fell between 1963 and 1969. Inter-industry differentials kept on increasing, even after 1961. Although Wachtel found that inter-skill differentials decreased after

Table 8 : INEQUALITY COEFFICIENTS FOR INCOME DISTRIBUTIONS IN YUGOSLAVIA

	1970	1977
M	.353	.337
G	.244	.229
V	.189	.171
L	.165	.150
A (E = 1.5)	.134	.121
A (E = 2.5)	.208	.188
P ₉₅	2.12	
P ₉₀	1.78	1.75
P ₇₅	1.33	1.30
P ₂₅	.76	.76
P ₁₀	.57	.61
P ₅	.50	.55

1961, Horvat (1976) suggests that after the reform of 1965 income differences generally increased. It was felt that such an increase was desirable from the point of view of incentives.⁶² Michal (1974) also found that the equalization of earnings reached a peak in Yugoslavia in the early 1960s, to be followed by a subsequent widening in the dispersion.⁶³ The Comisso (1979) study also found that inequality in the distribution of income had been increasing in the post-1965-reform years. The spread of average incomes within the socialist sector did in fact decrease. But income differentials between the socialist sector and peasant agriculture had been increasing.

Inter-country comparisons of the level of inequality are beset by numerous problems.⁶⁴ The definition of income tends to vary from country to country, even within East Europe. The time period over which income is being defined is not identical. The nature of individuals or households included in the given distribution also tends to vary from

Table 9 : EAST EUROPE IN DECREASING ORDER OF INEQUALITY IN THE MID-1960s.⁶⁷

<i>Overall Inequality</i>	<i>Upper Half of the Distribution</i>	<i>Lower Half of the Distribution</i>
Poland	Poland	G.D.R.
G.D.R.	Bulgaria	Poland
Bulgaria	Hungary	Hungary
Hungary	Czechoslovakia, G.D.R.	Czechoslovakia
Czechoslovakia		Bulgaria
Romania		

Table 10 : EAST EUROPE IN DECREASING ORDER OF INEQUALITY IN THE MID-1970s.⁶⁸

<i>Overall Inequality</i>	<i>Upper Half of the Distribution</i>	<i>Lower Half of the Distribution</i>
Poland, Yugoslavia	Yugoslavia	G.D.R., Poland
Hungary	Poland	Hungary
G.D.R.	Hungary	Yugoslavia
Bulgaria	Bulgaria, Romania	Czechoslovakia
Czechoslovakia	Czechoslovakia	Bulgaria
Romania	G.D.R.	Romania

country to country. The sampling designs are different. Given these qualifications, inter-country comparisons are hardly meaningful. It is nevertheless tempting to compare

the inequality coefficients of the wage and salary distributions (net income distributions for the G.D.R.) for the socialist countries of East Europe. We do the comparison for the mid-1960s and the mid-1970s. Table 9 ranks the socialist countries of East Europe in decreasing order of inequality in the mid-1960s.⁶⁵ Table 10 ranks the socialist countries of East Europe in decreasing order of inequality in the mid-1970s.⁶⁶

SECTION 4

INTER-SECTOR AND INTRA-SECTOR INEQUALITY

Section 3 gives an idea of the levels of inequality for the wage and salary distributions in the entire socialist sector or state sector of the economy. But the socialist sector or state sector consists of several sub-sectors. Is overall inequality primarily due to inequality within the sectors or is it primarily due to inequality between the sectors? The answer would depend not only on the levels of inequality in the various sectors, but also on the relative importance of these sectors in the overall socialist sector or state sector. In other words, we would have to decompose inequality according to various sectors of the economy. Data are not available for the decomposition to be carried out for all the socialist countries of East Europe for all the years. We perform the decomposition for Bulgaria in 1980, Hungary in 1978, Poland in 1970 and Yugoslavia in 1977. Two measures of inequality are chosen for the purposes of the decomposition, the Gini coefficient G and Theil's (1967) second measure of inequality, designated T .

Let us suppose that the economy comprises of n individuals and that there are k sub-sectors in the economy (or in the socialist sector or state sector). $j = 1, \dots, k$. The number of individuals in the j^{th} sector is n_j , so that $n = \sum n_j$. Let $f_j = n_j/n$ be the population share of sector j and let $f_j^* = f_j m_j / m$ be the income share of sector j . m is the mean income (or wage/salary) for the entire economy and m_j is the mean income for the j^{th} sector.

Let G stand for the overall Gini coefficient and let G_j stand for the Gini coefficient within sector j . It can then be shown that the following relationship holds.⁶⁹

$$G = \sum_{j=1}^k f_j f_j^* G_j + \left[\frac{\sum_{i \neq j} f_i f_j^* |m_i - m_j|}{(m_i + m_j)} \right] + R.$$

The first term in the above expression is a measure of inequality within the sectors, while the second term in the above expression is a measure of inequality between the sectors. R is a residual or interaction term. A disadvantage of the Gini coefficient is that it is not additively decomposable into a within-group component and a between-group component. The Gini coefficient is additively

decomposable into a within-group component and an across-group component, the between-group component can only be extracted by introducing a residual or interaction term.⁷⁰ Consequently, for the purposes of the decomposition, we also use a measure of inequality that is directly decomposable additively into a within-group component and a between-group component. Either of Theil's (1967) two measures of inequality would have sufficed, the second measure is chosen simply because it makes the computational burden involved more tractable.⁷¹

Let T stand for the overall value of Theil's second measure of inequality and let T_j stand for the value of Theil's second measure of inequality for sector j . Then the following relationship holds.⁷²

By definition, $T = \sum (1/n) \log (m/y_j)$ where y_j is the income accruing to the i th individual and

$$T = \sum_j f_j T_j + \sum_j f_j \log (f_j / f_j^*)$$

The first term in the above expression is the within-group component and the second term in the above expression is the between-group component.

Table 11 gives details of the decomposition for Bulgaria in 1980, Table 12 for Hungary in 1978, Table 13 for Poland in 1970 and Table 14 for Yugoslavia in 1977.⁷³

Table 11 shows that in Bulgaria, rural economy was the most unequal sector. According to the Gini coefficient, industry came next, followed by the administrative sector. According to Theil's measure, the administrative sector came next, followed by science services. The Gini coefficient singles out "other branches of material production" as the most equal sector, while Theil's measure singles out communications as the most equal sector. In terms of within-sector contribution to overall inequality, both measures agree that industry, with 34.3 per cent of the population employed in industry, contributed the most. Apart from rural economy, which constituted 23.2 per cent of the population share, all other sectors were relatively unimportant in contributing to overall inequality. The Gini coefficient suggests that within-sector and between-sector inequality were more or less of equal importance, the contribution of between-sector inequality being marginally larger. The interaction term contributes sizeably to overall inequality. The decomposition of Theil's second measure unambiguously concludes that within-sector inequality in Bulgaria was far greater than between-sector inequality in contributing to overall inequality. Thus the two measures give conflicting results in the comparison between inter-sector and intra-sector inequality.

Table 11 : DECOMPOSITION ACCORDING TO SECTORS, BULGARIA, 1980

	$\frac{m_j}{m}$	f_j	f_j^*	G_j	T_j	Within-sector		Between-sector	
						G	T	G	T
Total	189.72	.999	1.004	.207	.029	.207	.029	-	-
Industry	202.79	.343	.367	.223	.026	.028	.009	.014	-.010
Construction	214.09	.085	.096	.181	.023	.001	.002	.005	-.004
Rural Economy	176.49	.232	.216	.227	.035	.011	.008	.012	.007
Forestry	138.80	.004	.003	.124	.013	.000	.000	.001	.000
Transport	212.79	.065	.073	.190	.026	.001	.002	.003	-.003
Communication	167.52	.010	.009	.126	.012	.000	.000	.001	.000
Trade & Supplies	165.64	.083	.072	.152	.018	.001	.001	.006	.005
Other Branches of Material Production	183.74	.007	.007	.114	.022	.000	.000	.000	.000
Housing & Communal Economy	166.73	.013	.011	.169	.021	.000	.000	.001	.001
Science Services	213.20	.016	.018	.199	.029	.000	.000	.001	-.001
Education, Art, Culture	173.14	.072	.066	.181	.024	.001	.002	.004	.003
Health, Social Insurance, Physiculture	169.71	.046	.041	.176	.023	.000	.001	.003	.002
Finance & Credit	170.44	.005	.004	.133	.020	.000	.000	.000	.000
Administration	213.57	.015	.017	.206	.030	.000	.000	.001	-.001
Other Non-productive Spheres	205.06	.004	.004	.190	.026	.000	.000	.000	.000
						.043	.025	.052	-.010
Interaction term for G = .112									

For Hungary (Table 12) the most unequal sector, according to both G and T, was "non-material branches." Both measures show that this was followed by trade, and then by industry. Again both measures agree that the most equal sector was agriculture. With 34.4 per cent of the population share, industry contributed the most to overall inequality, although the decomposition of T gives an equally large contribution for non-material branches. Unlike

Table 12 : DECOMPOSITION ACCORDING TO SECTORS, SOCIALIST SECTOR IN HUNGARY, 1978

	$\frac{m_j}{m}$	f_j	f_j^*	G_j	T_j	Within-sector		Between-sector	
						G	T	G	T
Total	3869.02	.999	.994	.215	.035	.215	.035	-	-
Industry	3959.50	.344	.352	.207	.032	.025	.011	.005	-.003
Agriculture	3746.91	.160	.155	.163	.021	.004	.003	.005	.002
Construction	4365.49	.078	.089	.198	.029	.001	.002	.001	-.004
Forestry	3536.54	.010	.009	.175	.024	.000	.000	.000	.000
Transport & Communication	4045.88	.080	.084	.186	.026	.001	.002	.002	-.002
Trade	3453.01	.098	.087	.209	.034	.002	.003	.001	.005
Water Management	3868.32	.015	.015	.186	.027	.000	.000	.000	.000
Non-material Branches	3679.90	.214	.203	.252	.050	.011	.011	.005	.005
						.044	.032	.019	.003
Interaction term for G = .152									

Bulgaria, in the case of Hungary, the decompositions of both measures agree that the between-sector component was fairly small compared to the within-sector component. Inequality within sectors was far more important than inequality between sectors in generating overall inequality.

In Poland (Table 13), education was the most unequal sector, followed by construction and then by culture and arts. Both measures agree that the most equal sector was trade and commerce. Industry, with 44.2 per cent of the population share, made the most contribution to overall inequality. The decompositions of G and T give conflicting answers about the relative magnitudes of inter-sector and intra-sector inequality. G concludes that the between-sector component was greater than the within-sector component and that inequality between sectors was more important than inequality within the sectors. But the decomposition of T concludes the reverse.

For Yugoslavia (Table 14) the most unequal sector, according to both measures, was social and political organization. The next most unequal sector was irrigation, although T concludes that the financial and other services sector was just as unequal as irrigation. Both measures agree that catering and tourism was the most equal sector. Manufacturing, mining and quarrying, with 33.6 per cent of the population share, made the largest contribution to over-

Table 13 : DECOMPOSITION ACCORDING TO SECTORS, SOCIALIST SECTOR IN POLAND, 1970

	$\frac{m_j}{m}$	f_j	f_j^*	$\frac{G_j}{G}$	$\frac{T_j}{T}$	Within-sector		Between-sector	
						G	T	G	T
Total	2583.31	.999	1.012	.267	.053	.267	.053	-	-
Industry	2863.14	.442	.490	.247	.045	.054	.020	.033	-.020
Construction	3241.99	.109	.137	.276	.058	.004	.006	.016	-.011
Farming	2137.30	.063	.052	.244	.044	.001	.003	.006	.005
Forestry	2073.85	.019	.016	.260	.049	.000	.001	.002	.001
Transport & Communication	2587.39	.101	.102	.232	.039	.002	.004	.007	.000
Trade & Commerce	2089.43	.096	.077	.228	.038	.002	.004	.009	.009
Housing & Communal Economy	2523.16	.039	.038	.246	.044	.000	.002	.007	.000
Science	3232.25	.008	.010	.242	.048	.000	.000	.001	-.001
Education	1908.50	.064	.047	.299	.083	.001	.005	.007	.009
Culture & Arts	2323.37	.009	.008	.269	.054	.000	.000	.001	.000
Health, Social Insurance, Physiculture	1843.02	.049	.035	.267	.051	.001	.003	.006	.007
						.065	.048	.095	-.001
Interaction term for G = .107									

all inequality. The decompositions of G and T again disagree. G concludes that the between-sector component was considerably larger than the within-sector component, while T concludes the reverse. It is thus only in the case of Hungary that the decompositions of G and T agree about the relative magnitudes of inter-sector and intra-sector inequality. In Hungary, it can be concluded that inequality within sectors was far more important than inequality between sectors in generating overall inequality. No such clear conclusions emerge for Bulgaria, Poland or Yugoslavia.

Table 14 : DECOMPOSITION ACCORDING TO SECTORS, YUGOSLAVIA, 1977

	$\frac{m_j}{m}$	f_j	f_j^*	G_j	T_j	Within-sector		Between-sector	
						G	T	G	T
Total	4036.64	1.000	1.000	.229	.038	.229	.038	-	-
Manufacturing, Mining & Quarrying	3812.17	.336	.303	.218	.035	.023	.012	.020	.015
Agriculture & Fisheries	3726.20	.023	.020	.225	.037	.000	.001	.001	.001
Forestry	3729.29	.006	.006	.210	.032	.000	.000	.000	.000
Irrigation	4302.96	.002	.002	.273	.053	.000	.000	.000	.000
Construction	3861.54	.088	.080	.229	.038	.002	.003	.004	.004
Transport & Communication	4036.85	.049	.047	.197	.029	.000	.001	.003	.001
Trade	4021.10	.113	.108	.229	.038	.003	.004	.005	.002
Catering & Tourism	3355.88	.018	.014	.187	.026	.000	.000	.002	.002
Arts & Crafts	4077.39	.027	.026	.200	.030	.000	.001	.001	.000
Housing & Public Utilities	3872.03	.008	.008	.209	.032	.000	.000	.000	.000
Financial & Other Services	5604.63	.076	.101	.269	.053	.002	.004	.011	-.009
Education & Culture	4420.78	.053	.056	.228	.039	.001	.002	.004	-.001
Public Health & Social Welfare	4487.65	.115	.122	.255	.047	.004	.005	.011	-.003
Social & Political Organisation	5223.18	.086	.106	.275	.054	.003	.005	.010	-.008
						.038	.038	.072	.004
Interaction term for G = .119									

SECTION 5

THE PER CAPITA DISTRIBUTIONS

Table 15 gives inequality coefficients for the per capita income distributions in Bulgaria.⁷⁴ The table shows that in 1965 farmer households exhibited the greatest inequality in the distribution of per capita incomes. Except for a small segment of the distribution (P90), worker households exhibited greater inequality than employee households. But for the extreme upper tail of the distribution, worker households were more equally distributed than all households taken together. In 1970, farmer households continued to possess the most unequal distribution. Employee households possessed a distribution that was more equal than the distribution of worker households and the distributions of worker households and all households taken together exhibited the same level of inequality. In 1975, the distribution for farmer households was more unequal than that for worker households and that for all households taken together. Worker households possessed a distribution that was more equal than that of all households taken together. In 1980 as well, the distribution for farmer households exhibited the greatest degree of inequality. Worker households had a more unequal distribution than that for employee households, and the distributions for worker households and all households taken together exhibited more or less the same degree of inequality. Generally speaking, farmer households therefore had the most unequal distribution, employee households the most equal, and the distributions for worker households and all households taken together exhibited the same degree of inequality. In talking about the time trends for per capita income inequality, one would have liked to have a larger number of observations. The figures available show that for all households taken together, inequality decreased from 1965 to 1975 and increased from 1975 to 1980. Inequality in 1980 was greater than inequality in 1965. This time trend is also true for the distribution of worker households and employee households and almost, but not entirely true (P25 in 1970 and 1975), for the distribution of farmer households. The overall time trend agrees with the time trend for the wage and salary distributions in Section 3. The inequality coefficients for worker and employee households in Table 15 can be compared to the inequality coefficients of the wage and salary distributions in Table 2. In 1965, the per capita distributions were more equal than the wage and salary distributions for the upper ranges, but were less equal at the extreme lower tail of the distribution. Greater inequality for the per capita distributions at the extreme lower tail is also evident in the comparison of the distribution of per capita income for worker households in 1975 with the wage and salary distribution for 1974. In 1980 however, the per capita distributions exhibited greater inequality than the wage and salary distributions even in the upper half of the distribution. Except for P25 for employee households, in 1980 the per capita distributions for worker and employee households were more unequal than the wage and salary distribution for 1980.

Table 15 : INEQUALITY COEFFICIENTS FOR PER CAPITA DISTRIBUTIONS IN BULGARIA

	P ₉₅	P ₉₀	P ₇₅	P ₂₅	P ₁₀	P ₅
1965						
All Households	1.83	1.60	1.29	.77	.57	.47
Worker Households	1.84	1.56	1.28	.79	.58	.47
Employee Households	1.76	1.57	1.24	.80	.65	.55
Farmer Households	1.84	1.63	1.33	.75	.56	.46
1970						
All Households	-	-	1.25	.78	.59	.49
Worker Households	-	-	1.25	.78	.59	-
Employee Households	-	-	-	.84	.68	.59
Farmer Households	-	-	1.28	.77	.58	.49
1975						
All Households	-	-	-	.79	.62	.54
Worker Households	-	-	-	.79	.63	.55
Employee Households	-	-	-	-	-	-
Farmer Households	-	-	-	.75	.59	.52
1980						
All Households	-	-	1.35	.73	.51	-
Worker Households	-	-	1.35	.73	.51	-
Employee Households	-	-	-	.78	.58	.47
Farmer Households	-	-	1.42	.69	-	-

Table 16 gives inequality coefficients for the per capita income distributions in Czechoslovakia.⁷⁵ In 1965, the per capita income distribution for farmer households was more unequal than the per capita income distributions for worker and employee households. Employee households had a distribution that was more equal than that for worker households. Except for incomes just above the median income, the per capita income of all households taken together was distributed more unequally than that of worker households or that of employee households. At the extreme upper tail of the distribution and for the lower half of the

Table 16 : INEQUALITY COEFFICIENTS FOR PER CAPITA DISTRIBUTIONS IN CZECHOSLOVAKIA

	P ₉₅	P ₉₀	P ₇₅	P ₂₅	P ₁₀	P ₅
1965						
All Households	1.92	1.68	1.07	.72	.52	.42
Worker Households	1.83	1.62	1.30	.75	.58	.50
Employee Households	1.75	1.56	1.26	.79	.62	.53
Farmer Households	1.92	1.69	1.33	.74	.56	.46
Pensioner Households	2.01	1.43	1.36	.72	.50	.39
1970						
All Households	1.96	1.70	1.33	.72	-	-
1973						
All Households	1.92	1.67	1.31	.74	.56	-
1976						
All Households	1.91	1.68	1.32	.75	.64	.50
1980						
All Households	-	1.72	1.34	.76	.59	-

distribution, the distribution for pensioner households exhibited the greatest degree of inequality. The time trend shows that from 1965 to 1970 the inequality in the distribution of per capita incomes increased, followed by a decrease from 1970 to 1973. From 1973 to 1976, inequality declined in the lower half of the distribution and at the extreme upper tail, but increased elsewhere. From 1976 to 1980, inequality increased in the upper half of the distribution and decreased for the lower half. The time trend is therefore somewhat different from the time trend of the wage and salary distributions in Section 3. The inequality coefficients for the per capita income distributions of worker and employee households can be compared with the inequality coefficients for the wage and salary distributions in Table 3, for either 1964 or 1966. The comparison shows that with the exception of P₂₅ for employee households, the per capita income distributions exhibit greater levels of inequality than do the wage and salary distributions. This was a finding also reported by Michal (1973, 1974).

Table 17 gives inequality coefficients for per capita income distributions in Hungary.⁷⁶ Unfortunately, because of concentrations in the open-ended brackets, quite a few of the centile ratios cannot be calculated. In 1963, for

Table 17 : INEQUALITY COEFFICIENTS FOR PER CAPITA DISTRIBUTIONS IN HUNGARY

	P_{95}	P_{90}	P_{75}	P_{25}	P_{10}	P_5
1963						
Worker & Employee Households	-	-	1.63	.95	.65	-
Peasant & Dual Income Households	-	1.59	1.29	.76	-	-
1972						
Worker Households	-	1.57	1.27	-	-	-
Cooperative Peasant Households	-	-	1.32	-	-	-
Dual Income Households	-	-	1.25	.80	-	-
Non-manual Worker Households	-	-	1.29	.79	-	-
1977						
Worker Households	-	-	1.27	.79	.61	-
Co-operative Peasant Households	-	-	1.31	.77	.59	-
Dual Income Households	-	-	1.22	.82	.67	.57
Non-manual Worker Households	-	-	-	.80	.67	.58

the lower half of the distribution, the distribution for peasant and dual income households exhibited a greater degree of inequality than the distribution for worker and employee households, but exhibited a lower degree of inequality than the distribution for worker and employee households for the upper half of the distribution. In 1972, peasants had the most unequal distribution, followed by that of non-manual workers and then followed by that of workers. Dual income households had the most equal per capita distribution.⁷⁷ In 1977, peasants still had the most unequal distribution, followed by that of workers and then by that of non-manual workers. Except at the extreme lower tail of the distribution, dual income households had the most equal per capita distribution. Since quite a few of the centile ratios cannot be calculated, nothing really should be said about time trends. The observations available are also

extremely few. For example, there is the obvious suggestion that inequality declined from 1963 to 1977. This can hardly be taken to imply a monotonic decline in inequality from 1963 to 1977, since there are no observations available from the period 1963 to 1972. The inequality coefficients for the distributions of workers and employees (non-manual workers) can be compared to the inequality coefficients for the earnings distributions in Table 5. If one disregards the high value of P75 for 1963, for roughly comparable years the per capita distributions exhibit lower levels of inequality than do the earnings distributions.

Table 18 gives inequality coefficients for the per capita income distributions in Poland.⁷⁸ In 1959, worker households possessed the most unequal distribution. Engineer and technician households had a distribution that was more equal than the distribution for administrative staff households for the upper half of the distribution, but less equal for the lower half of the distribution. In 1964, worker households had a distribution that was more equal than the distribution for employee households for the lower half of the distribution, but less equal for the upper half of the distribution. There are indications of a decline in inequality from 1959 to 1964. In 1969, worker households had a more unequal distribution than employee households. Except for part of the distribution for worker households (P10), inequality continued to decline from 1964 to 1969. In 1974, the distribution for peasant households exhibited the greatest degree of inequality, followed by that for worker/peasant households and then by that for worker/employee households. This was also true of 1979. Since the 1969 figures excluded agriculture and forestry, they ought to be compared with the inequality coefficients for the distributions for worker/employee households in 1974 and 1979. In this comparison, from 1969 to 1974, inequality seems to have decreased in the upper half of the distribution but increased in the lower half. For peasant households, the inequality in the distribution increased from 1974 to 1979. The inequality coefficients of Table 18 can be compared with those of Table 6. The 1959 figures for Table 18 are for industry alone. Consequently, the inequality coefficients of the per capita distribution for all households in 1959 can be compared with the inequality coefficients for 1960 in Table 6. The per capita distribution was more unequal than the wage and salary distribution for the upper half of the distribution, but less unequal for the lower half. However, the per capita distributions of all households for 1964 and 1969 were more equal than the wage and salary distributions for 1965 and 1970 respectively. The per capita distributions for worker/employee households in 1974 and 1979 were also more equal than the wage and salary distributions for 1976 and 1978 respectively.

It should be noted that the data in this section are solely for nominal incomes. Given that the measures of income inequality used in this study (and all reasonable

Table 18 : INEQUALITY COEFFICIENTS FOR PER CAPITA DISTRIBUTIONS IN POLAND

	<i>P</i> ₉₅	<i>P</i> ₉₀	<i>P</i> ₇₅	<i>P</i> ₂₅	<i>P</i> ₁₀	<i>P</i> ₅
1959						
All Households	-	-	1.41	.75	.58	.50
Worker Households	-	-	1.42	.75	.58	.50
Engineer & Technician Households	-	-	1.32	.77	.62	.55
Administrative Staff Households	-	-	1.37	.78	.62	-
1964						
All Households	-	1.79	1.34	.76	.59	-
Worker Households	-	1.84	1.35	.76	.61	-
Employee Households	-	-	1.31	.76	.60	.52
1969						
All Households	-	-	1.34	.77	.60	.51
Worker Households	-	1.71	1.32	.76	.59	.52
Employee Households	-	-	1.28	.77	.61	.54
1974						
All Households	-	1.76	1.36	.73	-	-
Worker/Employee Households	-	-	1.31	.75	.58	-
Worker/Peasant Households	2.00	1.74	1.33	.75	-	-
Peasant Households	-	2.01	1.43	.70	-	-
1979						
Worker/Employee Households	-	-	1.32	.76	.58	.51
Worker/Peasant Households	-	-	1.38	.76	.57	.47
Peasant Households	-	-	1.45	.69	.49	.41

measures of income inequality), are homogeneous of degree zero in all incomes, it does not matter whether nominal or real incomes are being considered, since if prices are neutral, they do not affect the inequality coefficients. The problem of course is that prices or price indices are not distributionally neutral. Even if prices were the same for everybody, the price indices for different fractiles or expenditure or income classes would in general be different because the commodity composition of consumption baskets varies across such fractiles or expenditure or income classes. The inequality coefficients for the distribution of real incomes would therefore be, in general, different from the inequality coefficients for the distribution of nominal incomes. The computation of inequality coefficients for the distribution of real incomes would require information about fractile specific or expenditure class or income class specific price indices. Such data are not available in published form for East Europe. Fractile specific and/or expenditure class or income class specific price indices could in principle have been constructed by using retail price indices for various commodities and the weights of different commodities in the consumption baskets of different fractiles or expenditure or income classes. Such data on the weights of different commodities in the consumption baskets of different fractiles or expenditure or income classes are available for some of the countries of East Europe, though not for all. The problem is that the published retail price indices for different commodities are not satisfactory either.⁷⁹ One would therefore first have to construct satisfactory retail price indices and then construct fractile specific and/or expenditure class or income class specific price indices. That would have extended the scope of the present study far beyond what was intended.⁸⁰ We have therefore been content with the computation of inequality coefficients for the distribution of nominal incomes alone. As a general point it might be noted that prices in East Europe are by and large pro-poor, that is to say, the prices of commodities which have large weights in the consumption baskets of the poorer income groups, are pegged at low levels through the system of administered pricing. To this extent, the inequality coefficients of the present study can be regarded as over-estimates of the real extent of inequality in the distribution of incomes in East Europe.

We have had occasion to compare inequalities in the distribution of wages and salaries and inequalities in the distribution of per capita income. The latter is obtained from the former through a series of transpositions. To income from labour (wages and salaries) must be added income from other sources, including income from social benefits. The total income of a household also depends on the number of earning members in the household. The total income of the household is then divided by the size of the household to obtain the per capita income of the household. Broadly speaking, it might therefore be said that the relative

magnitudes of inequality in the distribution of wages and salaries as compared to inequality in the distribution of per capita incomes, depend on two sets of factors. In the first place, one has to consider the demographic composition of households as manifested in the dependency ratios. In the second place, one has to consider the equalising or disequalising effects of sources of income other than labour income. In Czechoslovakia for example, we found that the per capita distributions exhibited greater levels of inequality than the wage and salary distributions. Was this due to the fact that there was a positive correlation between the total income of a household and the number of earning members in the household, or equivalently, a negative correlation between the total income of a household and the number of dependents in the household? To phrase the question somewhat differently, to what extent is inequality demographically induced? This is the sort of question to which the present study does not provide answers. No data were available on the demographic composition of households cross-classified by income class. Such data might of course be available in the income surveys, mentioned earlier, which were not available to us. Alternatively, in the case of multiple-earner households, the earnings of all such earning members might not be identical. In such cases, is the distribution according to the average earnings of households more or less equal than the distribution of individual earnings? Nor did we have the data to answer this sort of question. We concentrate instead on answering the following type of question. What sources of income have equalizing/disequalizing effects in the context of East Europe?

SECTION 6

SOURCES OF INCOME

Section 1 spelt out the nature of the data available for the socialist countries of East Europe. Total income consists of labour income (wages and salaries) plus various transfers, including social benefits. And the inequality in the distribution of total income depends on the contribution these various components of income make towards generating overall inequality. Are social benefits for example, equalizing, as one would a priori expect them to be?

An answer to this question calls for a decomposition of total income inequality according to sources of income. The measure of inequality that is chosen for this decomposition is G. As is evident, the results of this section might therefore be different if some other uni-dimensional measure of inequality were to be used for the decomposition instead. Since we are not interested in demographically induced aspects of inequality, it is also obvious that the distribution that one requires for the decompositions of this section to be carried out, is not the distribution of

households by per capita income, but the distribution of households by total household income. Such data were available only in a limited number of cases and the data available permitted the decomposition to be carried out only for three countries of East Europe - Czechoslovakia, Hungary and Poland. The general principle of the decomposition is as follows.⁶⁹

Let us suppose that total income y is the sum of incomes from k different sources ($i = 1, \dots, k$), y_i standing for the income from the i th source so that $y = \sum y_i$. m stands for total mean income and m_i stands for the mean income of the i th income source. The y_i can also be negative (taxes and tax-like expenses). $q_i = m_i/m$ is the income share of source i . The incomes from the i th source are rank-ordered $y_{i1} \leq \dots \leq y_{in}$. Let r_t be the rank-order in total income that income receiving unit number r according to income source i has. It can then be shown that the pseudo-Gini coefficient for income source i , written as G_i^* , is given by the following expression.

$$G_i^* = (2/n) \sum (r_t/n) (y_{is}/m_i) - (n+1)/n.$$

And that $G = \sum q_i G_i^* = \sum q_i E_i G_i$, where G_i is the ordinary Gini coefficient for the i th income source and $E_i = G_i^*/G_i$ is the disequalizing effect of income source i on total income inequality. One can define the factor inequality weight of income source i to be $q_i E_i = q_i G_i^*/G$. A positive value of E_i increases inequality and a negative value decreases inequality, assuming of course that $m_i/m > 0$.

Table 19 gives details of the decomposition for Czechoslovakia in 1965, Table 20 for worker and employee households in Hungary in 1963, Table 21 for peasant households and households of dually occupied persons in Hungary in 1963 and Table 22 for Poland in 1979.⁸¹ In Tables 19 through 22, a D against the source shows that the effect is disequalizing and an E against the source shows that the effect is equalizing.

Table 19 holds no surprises. The Gini coefficients show that earnings from employment had the most unequal distribution in Czechoslovakia. Income in kind was more unequally distributed than total income. Incomes from the other three sources had fairly equal distributions, with Gini coefficients lower than that for the distribution of total income. Incomes from employment, from agriculture, and "other incomes" had disequalizing effects in Czechoslovakia. But "other incomes" had such a low factor inequality weight that their effect was almost neutral. Income from employment had the largest factor inequality weight. Social insurance and income in kind had equalizing effects. These two sources of income contributed to reducing inequality in Czechoslovakia. As is to be expected *a priori*, the main contribution to inequality in Czechoslovakia was due to income from employment.

Table 19 : DECOMPOSITION OF G ACCORDING TO SOURCES OF INCOME, CZECHOSLOVAKIA, 1965, MEANS IN Kcs.

<i>i</i>	$\frac{m_i}{m}$	q_i	$\frac{G_i}{G}$	G_i^*	E_i	$q_i G_i^*/G$	Effect of Source
Employment Income	19289.59	.663	.243	.243	1.000	1.103	D
Income from Agriculture	2259.66	.078	.093	.080	.860	.043	D
Income from Social Insurance	5394.09	.185	.104	-.074	-.712	-.094	E
Other Income	491.13	.017	.093	.033	.355	.003	D
Income in Kind	1653.79	.057	.161	-.154	-.957	-.060	E
Total Income	29088.26	1.000	.146			.995	

Table 20 : DECOMPOSITION OF G ACCORDING TO SOURCES OF INCOME, WORKER AND EMPLOYEE HOUSEHOLDS IN HUNGARY, 1963, MEANS IN FORINTS

<i>i</i>	$\frac{m_i}{m}$	q_i	$\frac{G_i}{G}$	G_i^*	E_i	$q_i G_i^*/G$	Effect of Source
Wages, Bonus	31415.73	.820	.088	.088	1.000	1.061	D
Family Allowance, Aid, Scholarship	813.73	.021	.456	-.456	-1.000	-.141	E
Sick Pay	479.58	.013	.108	.076	.704	.015	D
Pensions	923.63	.024	.163	.038	.233	.013	D
Money Income from State & Cooperative Agencies	1896.58	.050	.118	.118	1.000	.087	D
Money Income from Private Parties	1987.58	.052	.096	.094	.979	.072	D
Net Income from Auxiliary Farms	1152.91	.030	.270	-.270	-1.000	-.119	E
Other Income in Kind	738.61	.019	.140	.131	.936	.037	D
Taxes	1097.49	-.029	.079	.079	1.000	-.034	E
Total Income	38310.98	1.000	.068			.991	

Table 21 : DECOMPOSITION OF G ACCORDING TO SOURCES OF INCOME, PEASANT HOUSEHOLDS AND HOUSEHOLDS OF DUALY OCCUPIED PERSONS IN HUNGARY, 1963, MEANS IN FORINTS

<i>i</i>	$\frac{m_i}{m}$	q_i	$\frac{G_i}{G}$	G_i^*	E_i	$q_i G_i^*/G$	Effect of Source
Money Income from Sale of Goods to State & Cooperative Agencies	2917.57	.082	.214	.214	1.000	.175	D
Money Income from Sale of Goods to the Population	4773.36	.135	.175	.175	1.000	.236	D
Money Income from Agricultural Producers' Cooperatives	7454.50	.211	.147	.147	1.000	.310	D
Wages	6116.28	.173	.102	.077	.755	.133	D
Sick Money, Aid, Family Allowances, Pensions	1082.00	.031	.152	-.152	-1.000	-.047	E
Non-agricultural Income from State & Cooperative Agencies	883.29	.025	.052	.020	.385	.005	D
Non-agricultural Income from the Population	889.18	.025	.209	.206	.986	.052	D
Value of Personal Consumption, Income in Kind	12484.55	.353	.049	.045	.918	.159	D
Taxes & Tax-like Expenses	1230.57	-.035	.064	.064	1.000	-.022	E
Total Income	35370.15	1.000	.100			1.001	

Comparing Tables 20 and 21, worker and employee households had a more equal distribution of total net incomes than peasant households and households of dually occupied persons. In Section 5 we found that for Hungary in 1963, for the lower half of the distribution, the per capita income distributions of peasant and dual income households exhibited greater inequality than those of worker and employee households, but lower inequality than those of worker and employee households for the upper half of the distribution. Since the G values are uni-dimensional

measures which ignore the specific features of the two halves of the distributions, it is inappropriate to speculate on the basis of these findings alone. But the suggestion is that for the lower half of the distribution, the role of household composition is unclear. Whereas, for the richer peasant households and households of dually occupied persons, the size of the households serves to reduce inequality of the distribution of per capita incomes, as compared to worker and employee households. For worker and employee households, Table 20 shows that the distribution of family allowance, aid and scholarship was the most unequal. The distribution of net income from auxiliary farms was also fairly unequal. Wages and bonuses had a low G value. There were three sources of income which had equalizing effects — family allowance, aid, scholarship; net income from auxiliary farms; and taxes. All other sources of income had disequalizing effects, including sick pay and pensions. That sick pay and pensions should have disequalizing effects is perhaps somewhat surprising. That taxes, and family allowance, aid, scholarship should have equalizing effects is to be expected *a priori*. But *a priori* one would not necessarily have expected net income from auxiliary farms to have equalizing effects, as turns out to be the case. This however substantiates the statement in Andorika (1982) and Versztovesk and Enyedi (1982) that small-scale or owner-production has improved the relative position of households with low levels of income in Hungarian society.⁸² For peasant households and households of dually occupied persons, Table 21 shows that money income from the sale of goods to the state and cooperative agencies had the most unequal distribution. The next most unequal distribution was that of non-agricultural income from the population. The distribution of the value of personal consumption and income in kind had the lowest G value. For peasant households and households of dually occupied persons, only two sources of income had equalizing effects — sick money, aid, family allowances, pensions; and taxes and tax-like expenses. All other sources of income had disequalizing effects, although the factor inequality weight of non-agricultural income from state and cooperative agencies was so low as to make this source of income almost neutral in effect.⁸³

Table 22 shows that in Poland in 1979, the distribution of total income was most unequal for peasants, followed by worker/peasants and then by worker/employees. Since this is identical to the ranking for the per capita distribution of Section 5, nothing can really be said about the role of household composition. For worker/employees, the distribution of labour income was the most unequal, and for this group of households, all three sources of income had disequalizing effects. The factor inequality weight of "other incomes" was however so low as to make it almost neutral in effect. Rather surprisingly, social benefits had disequalizing effects. For worker/peasants, the distribution of "other incomes" was the most unequal, followed by the distribution of incomes from private farming. "Other incomes"

Table 22 : DECOMPOSITION OF G ACCORDING TO SOURCES OF INCOME IN POLAND, 1979, MEANS IN ZLOTYS

<i>i</i>	$\frac{m_i}{m}$	q_i	G_i	G_i^*	E_i	$q_i G_i^*/G$	Effect of Source
<i>Worker/Employees</i>							
Labour Income	31196.18	.844	.221	.221	1.000	.952	D
Social Benefits	3408.10	.092	.099	.098	.990	.046	D
Other Incomes	2367.83	.064	.063	.012	.190	.004	D
Total Income	36972.12	1.000	.196			1.002	
<i>Worker/Peasants</i>							
Labour Income	16365.01	.532	.185	.184	.995	.435	D
Social Benefits	1887.25	.061	.074	.042	.568	.011	D
Other Incomes	671.56	.022	.383	-.120	-.313	-.012	E
Incomes from Private Farming	11840.36	.385	.333	.331	.994	.567	D
Total Income	30764.18	1.000	.225			1.001	
<i>Peasants</i>							
Labour Income	1382.38	.041	.121	-.008	-.066	-.001	E
Social Benefits	1605.16	.048	.128	.080	.625	.013	D
Other Incomes	786.94	.023	.561	-.539	-.961	-.043	E
Incomes from Private Farming	29871.12	.888	.332	.332	1.000	1.034	D
Total Income	33645.16	1.000	.285			1.003	

were the only source of income which had equalizing effects. All three other sources, including social benefits, were disequalizing. Since "other incomes" include the value of crops obtained from garden plots net of their costs of cultivation and maintenance, this parallels the finding for Hungary. For peasant households, the distribution of "other incomes" was the most unequal, followed by the distribution of incomes from private farming. "other incomes" and labour income had equalizing effects, although the factor inequality weight for labour income was so low that it was almost neutral in effect. Social benefits and incomes from private farming had disequalizing effects. The disequalizing effect of social benefits in Poland is a most remarkable finding and needs to be examined further. One should add that this finding is independent of the decompositional properties of the Gini coefficient. For example, the correlation coefficient between annual income in zlotys and the magnitude of social benefits in zlotys

was .969 for worker/employees, .284 for worker/peasants and .312 for peasants.⁸⁴ The data available to us do not permit a further examination of this remarkable finding. For example, how are social benefits calculated for the purposes of the published distributions? If aggregate social benefits are distributed (statistically speaking), amongst the various individuals on a pro-rata basis, that is, in proportion to annual income in zlotys, the finding would be explained by the statistical practice adopted. The dis-equalization phenomenon of social benefits would be apparent rather than real.

SECTION 7

THE ROLE OF HOUSEHOLD SIZE

Although the data available do not permit us to isolate the demographically induced aspects of inequality, the contribution of household size in contributing to the overall inequality of incomes can be deduced. The data available for the G.D.R., but not for any of the other countries of East Europe, permit one to decompose overall inequality into inter-household-size and intra-household-size inequality. For the G.D.R., the data give the distributions according to net income groups for 1 person households, 2 person households, 3 person households, 4 person households and households with 5 or more persons. We can now decompose the inequality in the distribution of net incomes for all households taken together in a way analogous to the decomposition of Section 4 to obtain a between-household-size component and an within-household-size component. The results of this decomposition of G are set out in Table 23.⁸⁵

Table 23 : DECOMPOSITION OF G ACCORDING TO TYPE OF HOUSEHOLD, G.D.R., 1972, MEANS IN MARKS

	$\frac{m_j}{m}$	f_j	f_j^*	$\frac{G_j}{G}$	Within-household-size Component	Between-household-size Component
All Households	1068.52	1.001	1.000	.210	-	-
1 Person Households	593.26	.265	.147	.163	.007	.076
2 Person Households	1024.60	.280	.268	.175	.013	.035
3 Person Households	1257.39	.203	.239	.164	.008	.022
4 Person Households	1379.13	.151	.195	.171	.006	.018
Households with 5 or more Persons	1577.67	.102	.151	.184	.003	.017
					.037	.168

Interaction term = .005

The Gini coefficients of Table 23 immediately show that within a specific type of household, inequality is much lower than it is for all household types taken together.⁸⁶ This leads one to suspect that inequality between household types must make a significant contribution to overall inequality. The within-household-size component and the between-household-size component show that this is indeed true. Inequality between household types makes a large contribution to overall inequality, inequality within household types is insignificant by comparison. What is true of the G.D.R., one might reasonably expect to be true of the other socialist countries of East Europe. This section however offers only a very incomplete insight into demographically induced aspects of inequality. We have only been able to use data classifying and segregating households according to household size. It would be much more interesting to classify and segregate households according to their age and sex compositions and then examine the extent to which such segregation determines overall inequality. But as has been explained earlier, such data were not available.

SECTION 8

INEQUALITY AND ECONOMIC DEVELOPMENT

The Kuznets-Oshima hypothesis states that there is a long-run inverse relationship between the level of economic development and inequality.⁸⁷ To be more precise, the hypothesis is that countries pass through four distinct stages of development — undeveloped, under-developed, semi-developed and developed. Inequality is low in the undeveloped stage, increases in the under-developed stage to reach a peak in the semi-developed stage, and then declines.⁸⁸ The Reynolds and Taft (1956) study discusses the dynamics of the wage structure and wage differentials.⁸⁹ Wage differentials reach a maximum during the early stages of industrialization and diminish gradually thereafter.

There have been several empirical studies to test whether the eventual inverse relationship between the level of economic development and inequality holds or does not hold.⁹⁰ All of these studies have however been restricted to the non-socialist countries of the world. In this connection, in this section we seek to test whether a significant inverse relationship does exist between the level of economic development and inequality for the socialist countries of East Europe. The inequality coefficients used are G , P_{95} and P_5 . Table 24 gives the values of these coefficients for East Europe.⁹¹

Since distributions of total income are not in general available for East Europe, in Table 24 we have used inequality coefficients for the wage and salary distributions in studying the relationship between the level of economic development and inequality. In the general form of the Kuznets-Oshima hypothesis, the relationship between the

level of economic development and inequality would be non-linear. The inequality coefficients of Table 24 date from the late 1950s and the early 1960s. The sole exception is Hungary, for which inequality coefficients are included for 1951 and 1955. In view of the time frame, there is no reason to suppose that any of these countries were undeveloped or under-developed. The relevant relationship between the level of economic development and the degree of inequality would therefore be a linear segment of the general non-linear curve.

The classification of these countries according to their level of economic development raises a few problems. An accepted criterion for measuring the level of economic development is the level of per capita income.⁹² Most of these countries publish index numbers of per capita income for several years. These index numbers are however quite useless if one is interested in making cross-country comparisons. One way to handle this problem would be to estimate the per capita net material product for the countries of East Europe. These could then be used to derive per capita figures in terms of some common currency by using exchange rates for conversion. There is however a lot of doubt as to whether such exchange rate conversions are at all satisfactory in the context of East Europe.⁹³ An alternative is to use a measure based on a number of physical indicators to derive an index of the level of economic development. This is the sort of attempt that is undertaken in *Economic Bulletin for Europe* (1980).⁹⁴ For 1960, this study gives physical indicator estimates of per capita gross domestic product for the countries of East Europe, with an index of 100 for the U.S.A. in 1960. These are the figures used in Table 24.⁹⁵ For years other than 1960, we derived estimates using the annual growth rates of per capita gross domestic product for different periods obtained by the physical indicator method.⁹⁶ These are indicated in Table 24.

In the first set of regressions, we ignore the specific features of the individual countries. We club them all together, excluding the G.D.R. and Romania.⁹⁷ Table 25 gives the results of this set of regressions.

Table 25 shows that there is a significant relationship between G and per capita GDP, but the effect of changes in per capita GDP on changes in G is very small.⁹⁹ There is also a significant relationship between P_{95} and per capita GDP, but here too, the effect of changes in per capita GDP on changes in P_{95} is very small. With an increase in per capita GDP, one would have expected P_5 to rise (a reduction in inequality). Table 25 however suggests an inverse relationship between per capita GDP and P_5 . With an increase in per capita GDP, the suggestion is that inequality at the extreme lower tail of the distribution increases. But the relationship between P_5 and per capita GDP is insignificant.

Table 24 : INEQUALITY COEFFICIENTS AND PER CAPITA GROSS DOMESTIC PRODUCT

	Year	G	P ₉₅	P ₅	Per Capita GDP (U.S. 1960=100)
Bulgaria	1957	.232	2.08	-	21.41
	1960	.235	2.01	-	26.90
	1965	.214	-	.59	38.62
	1971	.212	1.91	-	57.77
	1974	.199	1.85	.61	61.65
	1977	.200	-	.59	68.15
	1980	.207	1.87	.60	75.35
Czechoslovakia	1959	.197	1.78	.53	48.23
	1961	.193	1.73	.56	52.67
	1962	.191	1.72	.56	54.77
	1963	.186	1.70	.57	56.97
	1964	.175	1.71	.57	59.24
	1966	.188	1.72	.56	64.08
	1971	.203	1.84	.54	76.84
	1975	.181	1.73	.53	88.18
G.D.R.	1960	.229	1.83	-	55.80
	1963	.224	1.83	-	62.58
	1965	.218	1.72	-	67.04
	1967	.212	1.68	.45	71.61
	1970	.218	1.71	.43	78.70
	1972	.216	1.66	-	83.98
	1974	.213	1.67	-	89.79
	1976	.211	-	-	96.00
	1978	.203	-	.44	102.64
	1980	.215	-	-	109.74
Hungary	1951	.451	-	-	21.92
	1955	.257	-	-	26.95
	1960	.202	1.86	.56	33.20
	1966	.203	-	.54	44.28
	1968	.208	-	.54	48.82
	1970	.213	1.92	.60	53.82

(Contd..)

Table 24 (Contd..)

	Year	G	P ₉₅	P ₅	Per Capita GDP (U.S. 1960=100)
Hungary	1972	.217	1.92	.46	59.05
	1974	.223	1.93	.44	64.49
	1976	.209	1.85	.46	70.42
	1978	.215	-	.50	76.90
Poland	1960	.259	-	-	33.20
	1961	.257	2.33	-	34.60
	1962	.261	2.40	-	36.26
	1963	.260	2.41	-	38.00
	1964	.257	2.38	-	39.82
	1965	.261	-	-	41.74
	1967	.260	2.33	.48	45.79
	1970	.267	2.19	.46	52.56
	1972	.284	2.00	-	58.06
	1976	.244	-	-	71.92
1978	.243	2.12	.48	80.05	
Romania	1965	.102	-	-	30.12
	1970	.175	-	-	40.57
	1974	.153	1.87	-	50.83
	1977	.168	-	-	60.20
	1978	.162	-	.68	63.69
	1979	.161	-	.68	67.39
	1980	.173	-	.66	71.29

In the second set of regressions, we regress G, P₉₅ and P₅ on per capita GDP separately for the individual countries.¹⁰⁰

The results are set out in Table 26. Significant relationships between per capita GDP and G exist for Bulgaria and the G.D.R. For the other four countries, the relationship is insignificant. Although the relationship is an insignificant one, the suggestion for Romania is that of a positive relationship between per capita GDP and G. Even when significant relationships exist, as in the case

- Table 25 : REGRESSION OF INEQUALITY COEFFICIENTS ON PER CAPITA GDP
(EXCLUDING THE G.D.R. AND ROMANIA).⁹⁸

<i>Dependent Variable</i>	<i>Intercept</i>	<i>Slope</i>	R^2	\bar{R}^2	<i>Number of Observations</i>
G	.2832 (30.48)	-.0011 (-2.83)	.1864	.1632 (8.02)	37
P ₉₅	2.3586 (6.90)	-.0071 (-3.07)	.2742	.2451 (9.44)	27
P ₅	.5711 (41.62)	-.0006 (-.79)	.0275	-.0166 (.62)	24

Table 26 : REGRESSION OF INEQUALITY COEFFICIENTS ON PER CAPITA GDP

<i>Country</i>	<i>Dependent Variable</i>	<i>Intercept</i>	<i>Slope</i>	R^2	\bar{R}^2	<i>Number of Observations</i>
Bulgaria	G	.2448 (93.23)	-.0062 (-4.55)	.8056	.7667 (20.72)	7
Czechoslovakia	G	.1904 (62.78)	-.0000 (-.03)	.0001	-.1427 (.00)	9
	P ₉₅	1.6723 (98.76)	.0011 (1.00)	.1256	.0006 (1.01)	9
	P ₅	.5943 (115.62)	-.0068 (-1.79)	.3145	.2166 (3.21)	9
G.D.R.	G	.2411 (156.36)	-.0000 (-3.38)	.5878	.5363 (11.41)	10
	P ₉₅	2.1043 (117.50)	-.0052 (-3.79)	.7418	.6902 (14.37)	7
Hungary	G	.3580 (16.25)	-.0024 (-2.00)	.3330	.2497 (3.99)	10
	P ₅	.6531 (37.41)	-.0025 (-2.00)	.4003	.3004 (4.01)	8
Poland	G	.2709 (83.24)	-.0002 (-1.10)	.1190	.0211 (1.22)	11
	P ₉₅	2.6418 (38.05)	-.0077 (-3.13)	.6198	.5564 (9.78)	8
Romania	G	.0946 (12.33)	.0011 (2.05)	.4567	.3481 (4.20)	7

of Bulgaria and the G.D.R., the impact of changes in per capita GDP on changes in G is very small, the impact being greater for Bulgaria than for the G.D.R. For the G.D.R. and Poland, there is a significant relationship between per capita GDP and P₉₅ at the 95 per cent level, though not at the 99 per cent level. Inequality at the extreme

upper tail of the distribution decreased as per capita GDP increased. But the impact of changes in per capita GDP on changes in P_{95} is very small, the impact being greater for Poland than for the G.D.R. For Czechoslovakia, the relationship between per capita GDP and P_{95} is insignificant. But the suggested relationship is a direct one, implying that with an increase in per capita GDP, inequality at the extreme upper tail of the distribution increased. The relationship between per capita GDP and P_5 is an insignificant one for Czechoslovakia and Hungary. The expected relationship would be a direct one, since with an increase in per capita GDP, one would expect a reduction in inequality at the extreme lower tail of the distribution (an increase in P_5). But for both Czechoslovakia and Hungary, the suggested relationship is an inverse one implying that with an increase in per capita GDP, inequality at the extreme lower tail of the distribution increased.

There therefore seem to be variations in the nature of the relationship between economic development and inequality from country to country, even within East Europe. The wide inter-country variations and cyclical fluctuations in the level of inequality are also evident from Table 24. Czechoslovakia shows marked fluctuations in P_{95} and G . The G.D.R. also shows fluctuations in the level of P_{95} and G , as does Poland. After an initial decline, G does not show marked fluctuations for Hungary, although P_5 does exhibit fluctuations. An explanation for the wide inter-country variations and for the cyclical fluctuations can possibly be found in the fact that in socialist systems, political, economic and ideological factors are so intricately intermeshed with each other that any explanations for changes in an economic variable should be sought not in economic factors alone, but in terms of a combination of economic, political and ideological factors.¹⁰¹ Cyclical fluctuations in the level of income inequality have been discussed in the context of Western capitalist economies and there is a clearly established pattern of increasing inequality in recessions and evidence of reduced inequality during the periods of subsequent recovery.¹⁰² In the socialist context, the explanation for such fluctuations in the level of income inequality would run not so much in terms of variations in the level of economic activity, but in terms of policy cycles.

SECTION 9

CONCLUSIONS

Real fluctuations in the level of income inequality might conceivably be explained in terms of policy cycles. It is however unlikely that the year to year fluctuations manifest in Table 24 can be explained by policy cycles. The time periods of the fluctuations are too short for the phenomena of policy cycles to be relevant. We are rather inclined to suspect that the fluctuations are apparent

rather than real. They are fundamentally statistical in origin. We must remember that the data that we have been working with are grouped data. With ungrouped data, an equiproportionate increase in the incomes of all individuals or households would leave any measure of income inequality that was homogeneous of degree zero in all incomes unaltered. That however would not necessarily be true of grouped data.¹⁰³ An equiproportionate increase in all incomes would mean that, with income brackets unchanged, some income earners pass from one income bracket to the next higher one. The proportion of income earners within any specific income bracket is affected by entries from the preceding income bracket and exits to the next income bracket. The computation of the uni-dimensional measures of inequality is affected by such changes and consequently, there are changes in the level of income inequality, even when the level of income inequality should have stayed unaltered. It would have been desirable had corrections been made for such statistical fluctuations in the level of income inequality. Any such corrections however require assumptions that have to be made about the nature of the distribution within any particular income bracket and the well-known distributions that were tried out, gave remarkably bad fits in all such cases. Consequently, we have not been able to argue that the fluctuations in the level of income inequality that were evident were real, as opposed to their being statistical.

In fact, the grouping problem has been a fundamental problem in working with the data on East Europe. Nominal incomes have been increasing and individuals or households have been moving from lower income brackets to higher ones. The classification into income brackets has often not changed fast enough, so that the frequency distributions that we have had to work with have usually not been fine enough. This casts some doubts on the validity of the inequality coefficients that have been computed. Subject to these qualifications, the computed inequality coefficients show that there has not been a monotonic decline in the level of income inequality in East Europe. The level of income inequality has been marked by fluctuations. Broadly speaking, levels of income inequality were low in the late 1950s and early 1960s. They increased thereafter, but decreased again in the early and mid-1970s. In the late 1970s and early 1980s levels of income inequality have increased yet again. It would have been better had it been possible to supplement these trends in the level of inequality in the distribution of nominal incomes by trends in the level of inequality in the distribution of real incomes, but as has been mentioned, the required fractile specific or income class specific price indices were not available. The study has not been able to say very much about the determinants of income inequality, for example, very little has been said about demographically induced aspects of inequality. The transformation of the wage and salary distributions to the per capita income distributions, and hence the relative magnitudes of

the levels of inequality in the two types of distributions, need more detailed examination. We have simply concluded that the levels of income inequality exhibited by the per capita income distributions are not demonstrably lower as compared to the levels of inequality exhibited by the wage and salary distributions. The rather remarkable finding that social benefits have disequalizing effects in Poland also needs more detailed examination. One disadvantage of the present study is that it has concentrated on what might be called the static aspects of income inequality alone.¹⁰⁴ The dynamics of income inequality could not be examined on the basis of the data published in the national statistical yearbooks. As has been mentioned, the data collected in the course of the income surveys were not available to us. The logical conclusion would be to next obtain these data and use them to supplement the findings of this study.

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Foot-notes

1. Wiles and Markowski (1971) also compare Poland with the Soviet Union, the United States and the United Kingdom.
2. The Wiles and Markowski paper, however, studies the role of social services in Poland.
3. On the social consumption fund in Bulgaria, see Droumeshki and Karapetkov (1981).
4. Computed from *Statisticheski Godishnik* (1981), pp. 90-92.
5. See for example, *Statistická Ročenka* (1967), pp. 461-463.
6. Computed from Table 86 in *Statistical Survey* (1973).
7. For a historical survey of the social security system in Czechoslovakia up to the early 1950s, see Trend (1957).
8. See *Czechoslovak Social Policy* (1976).
9. *Statistisches Jahrbuch* (1972), p. 363 and *Statistisches Jahrbuch* (1981), p. 273.
10. See *Statistisches Jahrbuch* (1972), p. 353 and p. 367.
11. See *Statistical Yearbook* (1963), pp. 279 and 287 and *Statisztikai Évkönyv* (1978), p. 382.

12. See *Statistical Yearbook* (1963), pp. 279 and 287.
13. Computed from the income share derived in the decomposition given below.
14. See *Statistical Yearbook* (1963), pp. 279 and 287.
15. Computed from the income share derived in the decomposition given below.
16. Michal's (1974) figures.
17. On the secondary economy in Hungary, see Kemény (1982) and Héthy (1982).
18. For a detailed discussion, see Bossányi (1981).
19. These definitions are given in *Rocznik Statystyczny* (1980), p. 89.
20. For the definition of income, see *Concise Statistical Yearbook* (1969), p. 309. These definitions are also outlined in Debroy and Kulkarni (1984).
21. Michal's (1974) figures.
22. For the definition of net earnings, see *Rocznik Statystyczny* (1972), p. 558.
23. Compare *Anuarul Statistic* (1973), p. 123 and *Anuarul Statistic* (1981), p. 132.
24. Wachtel's (1973) figures.
25. For a discussion of the imprecise notion of inequality, see Sen (1973).
26. This point has been argued by Champernowne (1974).
27. We do not discuss these objective criteria here, as they have been comprehensively discussed in Nygard and Sandström (1981), Champernowne (1974), Sen (1973), Das (1982) and Kakwani (1980).
28. It can be shown that M equals Kuznets' (1976) total disparity measure. See Das (1982).
29. Suggested by Champernowne (1974).
30. This is discussed in Kakwani (1980). S^2 shares this property with Kakwani's (1980) measure of inequality and either of the two Theil (1967) measures.
31. Whenever we calculate G , we calculate it by the trapezoidal rule. Since this ignores the convexity of the Lorenz curves, the true value of G is under-estimated. G has the property that it attaches the greatest weight to transfers that take place near the mode of the distribution. See Kakwani (1980).

32. See Nygård and Sandström (1981), Champernowne (1974), Sen (1973), Das (1982), Kakwani (1980) and Atkinson (1970).

33. Justifications for evaluating income distributions on the basis of the Lorenz dominance principle are to be found in the theorems proved by Atkinson (1970), Dasgupta, Sen and Starrett (1973) and Rothschild and Stiglitz (1973). Atkinson's theorem relates to what are called situational comparisons, that is to situations where the sum total of income and the total number of individuals is given. It assumes that social welfare is the sum of individual utilities, each individual has the same utility function and that these utility functions are strictly concave functions of income. The theorem then shows that the ranking of income distributions on the basis of the Lorenz dominance principle is identical to the ranking of income distributions on the basis of social welfare. Dasgupta, Sen and Starrett (1973) and Rothschild and Stiglitz (1973) have generalized this result to situations where the social welfare function is symmetric and strictly quasi-concave, without requiring the utilitarian additive framework or strict concavity. The result can also be extended to what are called comprehensive comparisons involving variable populations, although its extension to comprehensive comparisons involving variable sum totals of income raises problems. See Sen (1973).

34. The problem seems to have been first recognised by Yntema (1933) and has been illustrated with Indian data by Ranadive (1965, 1968). In discussing Ranadive's findings, Atkinson (1970) argues that the ranks for alternative income distributions as determined by different uni-dimensional measures of inequality are often so contradictory that it is impossible to draw any meaningful conclusions about the relative degree of inequality when Lorenz curves intersect.

35. These were also used by Michal (1974).

36. Some of these are outlined by Michal (1974).

37. See Mehran (1975). We follow this method of estimation. For the lower open-ended bracket, an analogous procedure is followed.

38. See Michal (1974). This seems to be an appropriate point to explain why the data on income distributions in East Europe as given in Jain (1975) have not been used. In the first place, the data given in Jain (1975) are dated, they rarely extend beyond the mid-1960s. In the second place, these distributions also incorporate data on income distributions for East Europe as estimated by the Economic Commission for Europe. On methodological grounds, such estimates should not be spliced together with data on income distributions obtained from national statistical yearbooks. Cromwell's (1977) study is however based on data from Jain (1975).

39. The estimated mean of 840.04 marks for column (d) compares quite favourably with the given mean for 1965 of 843 marks, given in p. 273 of *Statistisches Jahrbuch* (1981).

40. See Kakwani and Podder (1973, 1976) and Kakwani (1980). The direct functional form of the Lorenz curve is specified after first postulating a new co-ordinate system for the Lorenz curve. Several such functional forms are tried out. Jain (1975) uses this approach to obtain computed values of the degree of income inequality.

41. On adult equivalent scales, see Wold (1952), Prais and Houthakker (1955), Woodbury (1944), Kleiman (1966), Fiegehen and Lansley (1976), Prest and Stark (1967) and Wiles and Markowski (1971).

42. Also see, Dich (1970), Stoikov (1975) and Paglin (1975). One can also disaggregate society into different age-groups and construct age-specific Lorenz curves. Paglin (1975) in effect, seeks to obtain the contribution made by age-specific Gini coefficients to overall inequality. A perfectly equal distribution of income is defined as one where all households in the same stage of the life-cycle have equal incomes. For the ensuing debate, see Danziger, Haveman and Smolensky (1977), Formby and Seaks (1980), Johnson (1977), Kurien (1977), Minarik (1977), Nelson (1977), Paglin (1977, 1979) and Wertz (1979).

43. See Lydall (1975a).

44. The original distributions for 1957, 1960 and 1965 are from Kiuranov (1974); those for 1971, 1974 and 1977 from p. 77 of *Statisticheski Godishnik* (1978); and that for 1980 from p. 77 of *Statisticheski Godishnik* (1981).

45. See Debroy (1984). This paper discusses income inequality in Bulgaria in the wider context of wages, earnings, living standards and changes in the price level.

46. Original distributions for 1959, 1962, 1964 and 1966 are from *Statistická Ročenka* (1967), p. 117; that for 1973 is from Cičmancová and Krajkovič (1974); those for 1971 and 1975 are from Kociánová (1978).

47. For a discussion of these changes, see Michal (1960).

48. Original distributions obtained by using the finest classification available from *Statistisches Jahrbuch* (1972), p. 361; *Statistisches Jahrbuch* (1977), p. 310; *Statistisches Jahrbuch* (1980), p. 275 and *Statistisches Jahrbuch* (1981), p. 273.

49. Minimum wages had earlier been raised in 1971 to 350 marks per month.

50. Original distributions for 1955, 1960 and 1966 are from *Statisticheski Ezhegodnik* (1967), p. 55; for 1951 from *Statisticheski Ezhegodnik* (1971), p. 106; for 1974 and 1978 from *Statistikai Evkönyv* (1978), p. 138; and for 1970 by combining *Statisticheski Ezhegodnik* (1971), p. 106 and *Statisticheski Ezhegodnik* (1977), p. 131.

51. Ferge (1982) also suggests that the economic reform had led to increased income differentiation.

52. In view of the recent levelling, it is pertinent to note that the Tenth Congress of the Hungarian Socialist Labour Party in 1970 had decided to adopt an appropriate differentiation for incentive reasons.

53. Original distributions for 1960 and 1965 are from *Rocznik Statystyczny* (1970), p. 523; for 1970 from *Rocznik Statystyczny* (1972), p. 559; for 1972, 1976 and 1978 from *Rocznik Statystyczny* (1980), p. 112. Figures for 1972 onwards are for net earnings, while those for earlier years are for gross earnings.

54. See Piotrowski (1979).
55. Original distributions are from *Anuarul Statistic* (1981), p. 132. Distributions for 1960, 1965, 1970 and 1972 are also given in terms of gross wages and salaries. See *Anuarul Statistic* (1973), p. 123. But these are for employees and workers separately, and not for total personnel taken together. The monthly net remuneration distributions are for March in 1965, 1974 and 1980 and June in 1970 and 1978.
56. Known means are from *Anuarul Statistic* (1981), p. 132, for 1965 and 1970. These are however yearly averages rather than for March in 1965 and June in 1970.
57. *Anuarul Statistic* (1975), p. 76.
58. *Anuarul Statistic* (1973), p. 121.
59. Reported in *Scînteia*, 13.9.80, pp. 1-5. Both Totu (1980) and Ceausescu use ratios of highest to lowest incomes as measures of income inequality.
60. *Scînteia*, 7.5.77, pp. 1-3.
61. Original distribution for 1970 is from a report in *Politika*, p. 70 on 19.7.70. The distribution for 1977 is from *Statistical Pocketbook* (1978), p. 40.
62. See Šefer (1968).
63. Michal (1974) however reports a slight equalization in 1972.
64. For a discussion, see Lydall (1975b) and Cromwell (1977).
65. Bulgaria (1965), Czechoslovakia (1964), G.D.R. (1965), Hungary (1966), Poland (1965) and Romania (1965).
66. Bulgaria (1974), Czechoslovakia (1975), G.D.R. (1974), Hungary (1974), Poland (1976), Romania (1974) and Yugoslavia (1970). The Yugoslav figures for 1970 instead of those for 1977 are chosen since the 1970 figures are for gross income.
67. The ranking for overall inequality is in terms of G. Countries in the same row cannot be compared *vis-a-vis* each other and hence are given the same rank.
68. Poland and Hungary are non-comparable in the lower half of the distribution. But since the G.D.R. and Poland are non-comparable and the G.D.R. was more unequal than Hungary in the lower half of the distribution, by transitivity, Poland has been placed above Hungary. For the lower half of the distribution, the Romanian centile ratios for 1978 have been used.
69. For the technical details of the decomposition, see Nygård and Sandström (1981).

70. There is a large literature on such decompositions according to groups or sectors of the economy. In a general framework, the issues involved are discussed in Bourguignon (1979), Cowell (1980), Nygård and Sandström (1981) and Shorrocks (1980). In particular, the decomposition of the Gini coefficient is due to Bhattacharya and Mahalanobis (1967), Koo, Quan and Rasche (1981), Rao (1969) and Soltow (1960).
71. In the notation used herein, Theil's first measure of income inequality would be written as $\sum (y_i/m) \log (y_i/m)$.
72. See Theil (1967). In the decomposition of Theil's second measure, the weights in the within-group component are the population shares. In the decomposition of Theil's first measure of income inequality, the weights in the within-group components would have been the income shares.
73. Original distributions for Bulgaria are from *Statisticheski Godishnik* (1981), p. 77. Mean incomes are in leva. Population shares are computed from *Statisticheski Godishnik* (1981), p. 106. Original distributions for Hungary are from *Statisztikai Évkönyv* (1978), p. 138. The figures for agriculture and forestry are only for the state sector. Mean incomes are in forints. Population shares are computed from *Statisztikai Évkönyv* (1978), pp. 130, 132. Original distributions for Poland are from *Rocznik Statystyczny* (1972), p. 559. Population shares are computed from *Rocznik Statystyczny* (1972), p. 109. Means are in zlotys. Original distributions for Yugoslavia are from *Statistical Pocketbook* (1978), p. 40. Population shares are computed from *Statistical Pocketbook* (1978), p. 36. Means are in dinars. In the tables, population and income shares sometimes do not add up to one because of rounding approximations. It also needs to be added that because of the logarithmic transformation involved in the between-group component of the decomposition of Theil's measure, any approximation made in rounding off population or income shares, gets blown up by a much larger magnitude.
74. Original distributions from *Statisticheski Godishnik* (1978), p. 91 and *Statisticheski Godishnik* (1981), p. 93.
75. Original distributions from *Statistická Ročenka* (1967), pp. 461-463 and *Statistická Ročenka* (1982), p. 558.
76. Original distributions from *Statistical Yearbook* (1963), pp. 279 and 287; and *Statisztikai Évkönyv* (1978), p. 382. The 1963 distributions are for percentages of households, the others are for percentages of individuals. These two types of distributions should not really be compared. *A priori* it is impossible to determine the inequalities in these two different types of distributions *vis-a-vis* each other. See Debroy (1985).
77. Subject to the severe qualification that a large number of the centile ratios cannot be calculated.
78. Original distributions from *Rocznik Statystyczny* (1960), pp. 410-413; *Rocznik Statystyczny* (1965), pp. 484-487; *Rocznik Statystyczny* (1970), p. 503; *Rocznik Statystyczny* (1975), p. 92; and *Rocznik Statystyczny* (1980), p. 89. The 1959 figures are for the industrial sector alone. The 1964 and 1969 figures exclude agriculture and forestry.

79. The official consumer price indices usually refer only to the prices of goods sold in state retail trade. They ignore the prices of goods sold in the cooperative markets or in the free markets. Compared to the relative stability of prices of goods sold in state retail trade, the prices of goods sold in cooperative markets and free markets have tended to increase. The official consumer price indices therefore give somewhat misleading trends. Alton, Bass, Badach and Lazarcik (1983) have worked out a combined price index by splicing together the price indices for state retail trade and cooperative markets. For a discussion in the context of Bulgaria, see Debroy (1984).

80. The required data on expenditure patterns would also not have been available for all the countries concerned.

81. The Czech data are for annual income, including the money value of earnings in kind. They are computed from the per capita figures and the average number of members in each bracket given in *Statistická Ročenka* (1967), p. 461. The Hungarian data are for annual income. They are computed from the per capita annual income of households and average membership of households given in *Statistical Yearbook* (1963), pp. 279, 287. The total income in Tables 20 and 21 refers to total net income, net of taxes and tax-like expenses. The Polish figures are also for annual income. They are computed from the per capita figures and the average number of members in each household, given in *Rocznik Statystyczny* (1980), pp. 89-91. The factor inequality weights in Tables 19 through 22 do not add up to one because of rounding approximations.

82. For a similar finding in the context of China, see Griffin and Saith (1981). In the Chinese context, the explanation for this finding runs in terms of differing demographic compositions of low income families as opposed to high income families.

83. Adam and Nosal (1982) used data on per capita household earnings differentials to conclude that transfer payments have a narrowing effect in Hungary. This does not disagree with our decomposition of Table 21. But it does disagree with our finding that for worker and employee households, sick pay and pensions have disequalizing effects.

84. One might say that the income variable is transformed into a new income variable. The nature of the transformation determines what happens to the level of inequality. Speaking in terms of the Lorenz curve, if the transformation is proportional, the Lorenz curve is left unaltered by the transformation and the level of income inequality is unchanged. If the transformation is monotonically increasing, the transformed Lorenz curve is further away from the egalitarian line than the original Lorenz curve and the level of income inequality increases. If the transformation is monotonically decreasing, the transformed Lorenz curve is closer to the egalitarian line than the original Lorenz curve and the level of income inequality is reduced. See Fellman (1976). The correlation coefficients, particularly for worker/employees, show that, on balance, the transformation was increasing, though not necessarily monotonically.

85. Original distributions are from *Statistisches Jahrbuch* (1973), pp. 340-341. These distributions are for 1972. Population shares were not available for 1972, but were available for 1971, whereas distributions were not available for 1971. We perform the decomposition for

1972 under the assumption that the population shares in 1972 were the same as those in 1971. The population shares for 1 person, 2 person and 3 person households in 1971 are from *Statistisches Jahrbuch* (1972), p. 367. The population shares for 4 person households and households with 5 or more persons are computed from the pie-diagram in *Statistisches Jahrbuch* (1972), p. 353. Income shares and population shares are accordingly somewhat approximate. It was stated earlier that the decomposition of Theil's measure blows up these approximations because of the logarithmic transformation involved. It was therefore decided to carry out the decomposition only for G. This is not as much of a problem in this case as in the earlier cases. The disadvantage of G is that it is not normally additively decomposable into a within-group component and a between-group component. An interaction term enters the picture, the magnitude of the interaction term depending on the extent to which the income intervals of the various groups overlap. If for example, the income intervals of the various groups do not overlap at all, the interaction term would be zero. See Nygård and Sandström (1981). In this particular case, the interaction term is quite small and the income intervals of the various groups overlap to a fairly small extent.

86. Households with 5 or more persons have a high Gini coefficient. This could be because this group is not as homogeneous as the others. If a finer classification according to the precise number of members in the household were available, the Gini coefficient might conceivably go down.

87. See Kuznets (1955, 1963) and Oshima (1962, 1970).

88. There is a detailed discussion in Paukert (1973) and Kravis (1960, 1973).

89. Wachtel (1973) discusses the Reynolds and Taft hypothesis in the context of Yugoslavia.

90. For surveys of the empirical literature, see Paukert (1973) and Cromwell (1977).

91. Table 24 gives inequality coefficients for a larger number of years than used in earlier sections. Additional distributions used here are from *Statistická Ročenka* (1967), p. 117; *Statistisches Jahrbuch* (1972), p. 361; *Statistisches Jahrbuch* (1977), p. 310; *Anuarul Statistic* (1981), p. 132; *Rocznik Statystyczny* (1970), p. 523; *Statisticheski Ezhegodnik* (1971), p. 106 and *Statisticheski Ezhegodnik* (1977), p. 131.

92. But see Morris (1979). The countries of East Europe all have PQLI indices in the neighbourhood of 90.

93. See *Economic Bulletin for Europe* (1980).

94. *Economic Bulletin for Europe* (1980).

95. One could have attempted to use alternately the results of the work done by I.B. Kravis et al in the International Comparison Project, but the Kravis figures are not as yet available for a sufficient number of years.

96. The annual growth rates are given in *Economic Bulletin for Europe* (1980). For 1951-55 they are Bulgaria (7.2), Czechoslovakia (3.7), the G.D.R. (5.2), Hungary (5.3), Poland (4.1), Romania (5.7). For 1956-60, Bulgaria (7.9), Czechoslovakia (4.5), the G.D.R. (4.7), Hungary (4.0), Poland (3.9), Romania (4.9). For 1961-65, Bulgaria (7.4), Czechoslovakia (4.0), the G.D.R. (3.5), Hungary (5.1), Poland (4.8), Romania (7.5). For 1966-70, Bulgaria (6.1), Czechoslovakia (3.7), the G.D.R. (3.2), Hungary (5.0), Poland (4.7), Romania (5.8). For 1971-73, Bulgaria (3.4), Czechoslovakia (3.5), the G.D.R. (3.4), Hungary (4.5), Poland (5.5), Romania (5.8). For post 1973 years, the annual rates of growth for 1971-73 are used.

97. The G.D.R. is excluded since the data are not comparable to that for the other countries. Romania is excluded since the estimation procedure for G is not the same as that for the other countries (vide Section 3).

98. t statistics and F ratios are given within parentheses.

99. Significance is tested at the 95 per cent and 99 per cent levels.

100. The regressions are only carried out when there are more than five observations. The choice of the figure five is of course arbitrary.

101. See Mesa-Lago (1973, 1975).

102. See Metcalf (1969), Budd (1970), Budd and Seiders (1971) and Budd and Whiteman (1978) for a sampling of the literature.

103. This point about growing incomes in the face of unchanged income brackets and the problems of inter-temporal comparability of inequality coefficients has also been made by Petersen (1979).

104. For a discussion of what is meant by the dynamics of income distributions, see Creedy (1985).

References

- Adam, J. and Nosal, M. (1982). "Earnings Differentials and Household-Income Differentials in Hungary - Policies and Practice", *Journal of Comparative Economics*, Vol. 6, No. 2, pp. 173-203.
- Alton, T.P., Bass, E.M., Badach, K. and Lazarcik, G. (1983). *Money Income of the Population and Standard of Living in Eastern Europe, 1970-1982*, Research Project on National Income in East Central Europe, Occasional Paper No. 78.
- Andorika, R. (1982). "Origins of Secondary Incomes in the Light of Statistics", *Marketing in Hungary*, No. 4, pp. 19-22.
- Anuarul Statistic Al Republicii Socialiste România (1973, 1975, 1981). Directia Centrală De Statistică.
- Atkinson, A.B. (1970). "On the Measurement of Inequality", *Journal of Economic Theory*, Vol. 2, pp. 23-43.

- Berković, E. (1978). "Development of the Standard of Living", *Yugoslav Survey*, Vol. 19, pp. 75-98.
- Battacharya, N. and Mahalanobis, B. (1967). "Regional Disparities in Household Consumption in India", *Journal of the American Statistical Association*, Vol. 62, pp. 143-161.
- Bossányi, K. (1981). "The Expansion of Small-Scale Enterprises - Possibilities and Limits", *Társadalmi Szemle*, No. 11.
- Boulding, K.E. (1973). "Equality and Conflict", *The Annals of the American Academy of Political and Social Science*, Vol. 409, pp. 1-8.
- Bourguignon, F. (1979). "Decomposable Inequality Measures", *Econometrica*, Vol. 47, pp. 901-920.
- Budd, E.C. (1970). "Postwar Changes in the Size Distribution of Income in the U.S.", *American Economic Review*, Vol. 60, pp. 247-260.
- Budd, E.C. and Seiders, D.F. (1971). "The Impact of Inflation on the Distribution of Income and Wealth", *American Economic Review*, Vol. 61, pp. 128-138.
- Budd, E.C. and Whiteman, T.C. (1978). "Macroeconomic Fluctuations and the Size Distribution of Income and Earnings in the United States", in Griliches, Z., Krupp, H.J. and Kyn, O. edited, *Income Distribution and Economic Inequality*, Campus Verlag, Frankfurt.
- Champernowne, D.G. (1974). "A Comparison of Measures of Inequality on Income Distribution", *Economic Journal*, Vol. 84, pp. 787-816.
- Comisso, E.T. (1979). *Workers' Control under Plan and Market, Implications of Yugoslav Self-Management*, Yale University Press.
- Concise Statistical Yearbook of Poland*. (1969). Warsaw.
- Cowell, F.A. (1980). "On the Structure of Additive Inequality Measures", *The Review of Economic Studies*, Vol. 47, pp. 521-531.
- Creedy, J. (1985). *Dynamics of Income Distribution*, Basil Blackwell, Oxford.
- Cromwell, J. (1977). "The Size Distribution of Income: An International Comparison", *The Review of Income and Wealth*, Series 23, No. 3, pp. 291-308.
- Czechoslovak Social Policy*. (1976). Orbis, Prague, Second Revised Edition.
- Danziger, S., Haveman, B. and Smolensky, E. (1977). "The Measurement and Trend of Inequality: Comment", *American Economic Review*, Vol. 67, pp. 505-512.
- Das, T.K. (1982). *Topics in Applied Econometrics, Vol. 1, Income Distribution and Demand Analysis*, Occasional Paper No. 1, Government of India, UNDP Transport Policy Planning Project.

- Dasgupta, P., Sen, A.K. and Starrett, D. (1973). "Notes on the Measurement of Inequality", *The Journal of Economic Theory*, Vol. 6, pp. 180-187.
- Debroy, B. (1984). "Earnings, Incomes and Living Standards in Bulgaria", *Artha Vijnana*, Vol. 26, pp. 341-368.
- Debroy, B. (1985). "Three Propositions on Income Inequality", *The Asian Economic Review*, Vol. 27, pp. 85-100.
- Debroy, B. and Kulkarni, C. (1984). "Inequality of Wage and Salary Distributions in Poland", *The Indian Journal of Economics*, No. 257, pp. 195-212.
- Dich, J.S. (1970). "On the Possibility of Measuring the Distribution of Personal Income", *The Review of Income and Wealth*, Vol. 16, pp. 265-272.
- Droumeshki, S. and Karapetkov, N. (1981). "A Social Policy in the Interest of the People", in *Modern Bulgaria : History, Policy, Economy, Culture*, Sofia Press.
- Economic Bulletin for Europe*. (1980), Vol. 31, No. 2.
- Fellman, J. (1976). "The Effect of Transformation on Lorenz Curves", *Econometrica*, Vol. 44, pp. 823-824.
- Ferge, Z. (1982). "Main Trends in Hungarian Social Policy", *The New Hungarian Quarterly*, Vol. 33, pp. 137-149.
- Fiegehen, G.C. and Lansley, P.S. (1976). "The Measurement of Poverty : A Note on Household Size and Income Units", *Journal of the Royal Statistical Association*, pp. 508-518.
- Formby, J.P. and Seaks, T.G. (1980). "Paglin's Gini Measure of Inequality : A Modification", *American Economic Review*, Vol. 70, pp. 479-482.
- Friedman, M. (1957). *A Theory of the Consumption Function*, Princeton University Press.
- Gastwirth, J.L. (1972). "The Estimation of the Lorenz Curve and the Gini Index", *The Review of Economics and Statistics*, Vol. 34, pp. 306-316.
- Griffin, K. and Saith, A. (1981). *Growth and Equality in Rural China*, Asian Employment Programme, International Labour Office.
- Héthy, L. (1982). "The Secondary Economy In Hungary : Its Impact on Industrial Work and Government Efforts to Control It", *Labour and Society*, Vol. 7, pp. 243-253.
- Hirše, M. (1981). "Relace sociálních a pracovních příjmu v různých typech domácnosti ČSSR", *Ekonomický časopis*, No. 2, pp. 129-141.
- Holtzer, L. (1982). "Education and Income", *Abstracts of Hungarian Economics Literature*, Vol. 12, pp. 77-88.

- Horvat, B. (1976). *The Yugoslav Economic System : The First Labor-Managed Economy in the Making*, M.E. Sharpe, New York.
- Jain, S. (1975). *Size Distribution of Income, A Compilation of Data*, The World Bank.
- Janković, N. (1981). "Personal Consumption, 1976-1980", *Yugoslav Survey*, Vol. 21, pp. 31-44.
- Johnson, W.R. (1977). "The Measurement and Trend of Inequality : Comment", *American Economic Review*, Vol. 67, pp. 502-504.
- Kakwani, N.C. (1980). *Income Inequality and Poverty, Methods of Estimation and Policy Applications*, The World Bank and Oxford University Press.
- Kakwani, N.C. and Podder, N. (1973). "On the Estimation of Lorenz Curves from Grouped Observations", *International Economic Review*, Vol. 14, pp. 278-291.
- Kakwani, N.C. and Podder, N. (1976). "Efficient Estimation of the Lorenz Curve and Associated Inequality Measures from Grouped Observations", *Econometrica*, Vol. 44, pp. 137-148.
- Kemeny, I. (1982). "The Unregistered Economy in Hungary", *Soviet Studies*, Vol. 34, pp. 349-366.
- Kiuranov, Ch. (1974). "Aspects of the Distribution of Personal Earnings and Earnings Stratification in Bulgaria", paper read at the First International Slavic Conference. Reprinted in Fallenbuchl, Z .M. edited, *Economic Development in the Soviet Union and Eastern Europe*, Vol. 1, Praeger, New York, 1975.
- Kleiman, E. (1966). "Age Composition, Size of Households, and the Interpretation of Per Capita Income", *Economic Development and Cultural Change*, Vol. 15, pp. 37-58.
- Kociánová, H. (1978). "Diferenciace příjmů a spotřeby v socialistických zemích (na příkladu ČSSR a NDR)", *Politická ekonomie*, No. 4, pp. 301-313.
- Koo, A.Y.C., Quan, N.T. and Rasche, R. (1981). "Identification of the Lorenz Curve by Lorenz Coefficients", *Weltwirtschaftliches Archiv*, Bd. 117, pp. 125-135.
- Kovács, G.J. and Bodrogi, J. (1982). "Salary and Earnings Conditions of the Economic Executives in Reflect of the Statistical Data, 1976-79", *Abstracts of Hungarian Economic Literature*, Vol. 12, pp. 49-50.
- Kravis, I.B. (1960). "International Differences in the Distribution of Income", *The Review of Economics and Statistics*, Vol. 42, pp. 408-416.
- Kravis, I.B. (1973). "A World of Unequal Incomes", *The Annals of the American Academy of Political and Social Science*, Vol. 409, pp. 61-80.

- Kurien, C.J. (1977). "The Measurement and Trend of Inequality : Comment", *American Economic Review*, Vol. 67, pp. 517-519.
- Kuznets, S. (1955). "Economic Growth and Income Inequality", *American Economic Review*, Vol. 45, pp. 1-28.
- Kuznets, S. (1963). "Quantitative Aspects of the Economic Growth of Nations : Distribution of Income by Size", *Economic Development and Cultural Change*, Vol. 11, pp. 1-80.
- Kuznets, S. (1976). "Demographic Aspects of the Size Distribution of Income : An Exploratory Essay", *Economic Development and Cultural Change*, Vol. 25, pp. 1-94.
- Lökkös, J. (1981). "Trends in Population Incomes and Consumption", *Abstracts of Hungarian Economic Literature*, Vol. 11, pp. 49-50.
- Lydall, H. (1975a). "The Economics of Inequality", *Lloyds Bank Review*, No. 117, pp. 32-47.
- Lydall, H. (1975b). Book Review of Schnitzer, M. (1974). *Income Distribution : A Comparative Study of the United States, Sweden, West Germany, East Germany, the United Kingdom, and Japan*, *Journal of Economic Literature*, Vol. 13, pp. 918-920.
- Mehran, F. (1975). "Dealing with Grouped Income Distribution Data", *Income Distribution and Employment Programme*, Working Paper No. 20, I.L.O., Geneva.
- Mesa-Lago, C. (1973). "A Continuum Model to Compare Socialist Systems Globally", *Economic Development and Cultural Change*, Vol. 21, pp. 573-590.
- Mesa-Lago, C. (1975). "A Continuum Model for Global Comparison", In Mesa-Lago, C. and Beck, C. edited, *Comparative Socialist Systems: Essays on Politics and Economics*, Center for International Studies, University of Pittsburgh.
- Metcalf, C.E. (1969). "The Size Distribution of Personal Income During the Business Cycle", *American Economic Review*, Vol. 59, pp. 657-668.
- Michal, J.M. (1960). *Central Planning in Czechoslovakia : Organisation for Growth in a Mature Economy*, Stanford University Press.
- Michal, J.M. (1973). "Size-Distribution of Earnings and Household Incomes in Small Socialist Countries", *The Review of Income and Wealth*, Vol. 19, pp. 407-427.
- Michal, J.M. (1974). "An Alternative Approach to Measuring Income Inequality in Eastern Europe", Paper read at the First International Slavic Conference. Reprinted in Fallenbuchl, Z.M. edited, *Economic Development in the Soviet Union and Eastern Europe*, Vol. 1, Praeger, New York, 1975.
- Minarik, J.J. (1977). "The Measurement and Trend of Inequality : Comment", *American Economic Review*, Vol. 67, pp. 513-516.

- Morris, M.D. (1979). *Measuring the Condition of the World's Poor, The Physical Quality of Life Index*, Pergamon Press.
- Nelson, E.R. (1977). "The Measurement and Trend of Inequality : Comment", *American Economic Review*, Vol. 67, pp. 497-501.
- Nygård, F. and Sandström, A. (1981). *Measuring Income Inequality*, Almqvist and Wiksell International, Stockholm.
- Oshima, H.T. (1962). "The International Comparison of Size Distribution of Income with Special Reference to Asia", *The Review of Economics and Statistics*, Vol. 44, pp. 439-445.
- Oshima, H.T. (1970). "Income Inequality and Economic Growth : The Postwar Experience of Asian Countries", *Malayan Economic Review*, Vol. 15, pp. 7-41.
- Paglin, M. (1975). "The Measurement and Trend of Inequality : A Basic Revision", *American Economic Review*, Vol. 65, pp. 598-609.
- Paglin, M. (1977). "The Measurement and Trend of Inequality : Reply", *American Economic Review*, Vol. 67, pp. 520-531.
- Paglin, M. (1979). "The Measurement of Inequality : Reply", *American Economic Review*, Vol. 69, pp. 673-677.
- Paukert, F. (1973). "Income Distribution of Different Levels of Development : A Survey of Evidence", *International Labour Review*, Vol. 108, pp. 97-125.
- Petersen, H.G. (1979). "Effects of Growing Incomes on Classified Income Distributions, the Derived Lorenz Curves, and Gini Indices", *Econometrica*, Vol. 47, pp. 183-198.
- Piotrowski, K. (1979). "Lohndifferenzierung und sozialistisches Leistungsprinzip (dargestellt anhand von-Beispielen aus der polnischen Industrie)", *Osteuropa Wirtschaft*, No.11, pp. 35-49.
- Prais, S.J. and Houthakker, H.S. (1955). *The Analysis of Family Budgets*, Cambridge University Press.
- Prest, A.H. and Stark, T. (1967). "Some Aspects of Income Distribution in the U.K. since World War II", *The Manchester School of Economic and Social Studies*, Vol. 35, pp. 217-243.
- Rácz, A. (1979). "Munka szerinti elosztás; Ösztönzés", *Társadalmi Szemle*, No. 9, pp. 9-21.
- Ranadive, K.R. (1965). "The Equality of Incomes in India", *Bulletin of the Oxford University Institute of Economics and Statistics*, Vol. 27, pp. 121-134.
- Ranadive, K.R. (1968). "Pattern of Income Distribution in India, 1953-54 to 1959-60", *Bulletin of the Oxford University Institute of Economics and Statistics*, Vol. 30, pp. 231-262.

- Rao, V.M. (1969). "Two Decompositions of the Concentration Ratio", *Journal of the Royal Statistical Society, Series A*, Vol. 132, pp. 418-425.
- Reynolds, L.G. and Taft, C.H. (1956). *The Evolution of Wage Structure*, Yale University Press.
- Rocznik Statystyczny. (1960, 1965, 1970, 1972, 1975, 1980). Główny Urząd Statystyczny, Warszawa.
- Rothschild, M. and Stiglitz, J.E. (1973). "Some Further Results on the Measurement of Inequality", *The Journal of Economic Theory*, Vol. 6, pp. 188-204.
- Šefer, B. (1968). "Income Distribution in Yugoslavia", *International Labour Review*, Vol. 97, pp. 371-389.
- Sen, A.K. (1973). *On Economic Inequality*, Oxford University Press.
- Shorrocks, A.F. (1980). "The Class of Additively Decomposable Inequality Measures", *Econometrica*, Vol. 48, pp. 613-625.
- Soltow, L. (1960). "The Distribution of Income Related to Changes in the Distribution of Education, Age and Occupation", *The Review of Economics and Statistics*, Vol. 42, pp. 450-453.
- Statistical Pocketbook of Yugoslavia*. (1978). Federal Statistical Office, Beograd.
- Statistical Survey of Czechoslovakia*. (1973). Orbis, Prague, 1974.
- Statistical Yearbook*. (1963). Hungarian Central Statistical Office, Budapest.
- Statisticheskii Ezhegodnik*. (1967, 1971, 1977). Tsentralnoe Statisticheskoe Upravlenie, Budapest, Hungary, Russian-English Edition.
- Statisticheskii Godishnik Na Naroda Republika Bŭlgariya*. (1976, 1978, 1981). Sofia.
- Statistická Ročenka ČSSR*. (1967, 1982). Státní Statistický Úřad, Praha.
- Statistisches Jahrbuch - der Deutschen Demokratischen Republik*. (1972, 1973, 1977, 1980, 1981). Staatsverlag, Berlin.
- Statisztikai Évkönyv*. (1978). Központi Statisztikai Hivatal, Budapest.
- Stoikov, V. (1975). "How Misleading are Income Distributions?", *The Review of Income and Wealth*, Vol. 21, pp. 239-250.
- Szikra Falus, K. (1980a). "A bérkiilönbsagek néhány kérdése", *Társadalmi Szemle*, No. 3, pp. 43-54.
- Szikra Falus, K. (1980b). "Wage Differentials in Hungary", *Acta Oeconomica*, Vol. 25, pp. 163-172.

- Theil, H. (1967). *Economics and Information Theory*, North Holland.
- Totu, I.V. (1980). "Dinamica dezvoltarii si calitatea vietii în socialism", *Revista economică*, No. 22, p. 16, No. 23, pp. 18-20, 25.
- Trend, H. (1957). "Public Health and Welfare", in Busck, V. and Spulber, N. edited, *Czechoslovakia*, Atlantic Books, Praeger, New York.
- Versztovesk, R. and Enyedl, J. (1982). "Differentiation of Consumption by Social Classes and Strata in Hungary", *Abstracts of Hungarian Economic Literature*, Vol. 12, pp. 156-161.
- Wachtel, H.M. (1973). *Workers' Management and Workers' Wages in Yugoslavia - The Theory and Practice of Participatory Socialism*, Cornell University Press.
- Wiles, P.J.D. and Markowski, S. (1971). "Income Distribution under Communism and Capitalism. Some Facts about Poland, the U.K., the U.S.A. and the USSR", *Soviet Studies*, Vol. 22, pp. 344-369, 487-511.
- Wold, H. (1952). *Demand Analysis*, Wiley, New York.
- Woodbury, R.M. (1944). "Economic Consumption Scales and Their Uses", *Journal of the American Statistical Association*, Vol. 39, pp. 455-468.
- Yntema, D.W. (1933). "Measures of the Inequality in the Personal Distribution of Wealth or Income", *Journal of the American Statistical Association*, Vol. 28, pp. 423-433.

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