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Amnon Levy & Khorshed Chowdhury

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WORLD LEVELS AND DECOMPOSITION
BETWEEN AND WITHIN GEOGRAPHICAL
CLUSTERS AND REGIONS**

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and
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5. INTRODUCTION

ABSTRACT

This paper analyses the issue of per capita income convergence and world level of intercountry income inequality within a geographical context. The evolution of the world level of intercountry income inequality and its decomposition between and within geographical clusters and regions between 1960 and 1990 are analysed by applying the income-weighted entropy measure into a new dataset of international comparisons of output and prices adjusted for purchasing power parity (PWT 5.5, 1993). The computation reveals that, in general, the period can be divided into three distinct phases of strong divergence (1960-1968), slow convergence (1969-1983) and stagnation (1984-1990).

1. INTRODUCTION

The convergence hypothesis suggests that spillovers from leader economies to followers, imitation, modernisation of social and economic institutions, as well as Maslowian processes of diverting productive energies into activities of self expression and fulfilment in advanced economies, tend to narrow the per capita income gaps between countries. Studies by Maddison (1982), Abramovitz (1986) and Dowrick and Nguyen (1989), that have been confined to the case of the most industrialised countries, lent support to the existence of a convergence process. In their seminal study on world-wide income inequality, Summers, Kravis and Heston (1984) indicated, however, that despite the sharp decline in income inequality among industrial countries, and the smaller decline in income inequality within the groups of the centrally planned economies and the middle income countries, the world level of income inequality remained approximately stagnant between 1950 and 1980. Correspondingly, Baumol (1986) suggested that there are several convergence-divergence clubs, that income levels converged within the groups of the centrally planned economies and the middle-income market economies but not within the group of the low-income countries, and that between groups income levels have generally diverged with the exception of the centrally planned economies which caught up with the advanced market economies to a slight extent.¹ By applying an augmented Solow growth model to Summers and Heston's (1988) database, Mankiw, Romer and Weil (1992) concluded that, holding population growth and capital accumulation constant, the standards of living across countries converge at about the rate predicted by the model.

While it is interesting to study the income differences and existence of convergence or divergence processes within and between general groups of countries characterised by similar economic development stage and economic system, it should be recognised that a considerable level of income inequality exists between and within regions and that the utmost adverse effects and expression of intercountry income inequality are likely to occur among neighbouring countries and regions. In a preliminary study of intercountry income inequality with Summers and Heston's (1988) PWT4 database we (Levy and Chowdhury, 1993) have found that the aggregate level of income inequality between and within regions overshadowed the inequality between clusters of countries of similar stage of development and market system. In analogy to income inequality among people, income inequality among countries may serve as an indicator of the international level of relative deprivation. The history of the humankind reveals that differences in economic welfare may have some adverse effects. There have been many cases in which rich countries have used their economic power to exert international hegemony and to exploit the natural resources of less developed countries. There have also been cases in which poor, but regionally large countries, have abused their military might against richer, but military weaker, neighbouring countries. Frequently, the rivalry between economic and military superpowers and the aggressiveness of poor but militarily strong countries have escalated into regional and global wars that have shaken world's stability and inflicted a substantial level of human suffering, loss of natural resources and environmental damage. In addition, substantial levels of intercountry income differences have generated a considerable legal and illegal migration from poor countries to richer ones that in periods of recession have aggravated the problem of

unemployment and fuelled ethnic and racial tension in the host countries. It is, therefore, sensible to measure the level of intercountry income inequality in a geographical context and to identify the major constituents of income inequality within and between geographical clusters.

By applying Theil (1967) index of income inequality and its decomposition properties to Pennsylvania World Table (1993) of international comparisons of real product and price levels, the present paper measures the levels of income inequality between and within geographical clusters and regions and their contribution to the world-wide level of intercountry inequality for the thirty-one year period between 1960 and 1990. The structure of the paper is as follows. Section 2 describes the data and the decomposition of Theil index of intercountry income inequality into geographical clusters and their regional constituents. Section 3 summarises the global levels of intercountry income inequality between a hundred and fifty-four countries and their decomposition between and within the geographical clusters of Africa, America, Asia and The Pacific, and Europe as well as between and within their fifteen distinct regions. Sections 4, 5, 6 and 7 describe the evolution of income inequality between and within the regions of African, American, Asian and the Pacific, and European clusters, respectively. Section 8 concludes the paper with a summary of the major findings.

2. DATA AND THE CONCEPTUAL FRAMEWORK

Our analysis of intercountry income inequality applies the information index of income inequality and its decomposition to income data adjusted for purchasing power parity for a hundred and fifty-four countries provided by Pennsylvania World Tables (PWT 5.5, 1993). The national income data are

computed by multiplying the population figure by real gross domestic product per capita (RGDPCH) in constant dollars (Chain Index, expressed in international prices, base 1985). The incomplete data for many developing countries and, in particular, those established after 1950, has restricted the analysis to the thirty-one year period between 1960 and 1990. The countries have been classified into fifteen regions of the four major continental clusters: North Africa, East Africa, Central and West Africa, and Southern Africa in the African cluster; North America, Central America, South America, and The Caribbean in the American Cluster; The Middle East and The Gulf, South Asia, and East Asia and the Pacific in the Asian cluster; and North Europe and The British Isles, Southern Europe, East Europe, and Scandinavia in the European cluster. The detailed classification of countries by clusters and regional groups is given in the Appendix.

Based on the notion of entropy in information theory, Theil (1967) has defined an income inequality measure, which is particularly useful for handling grouped data and for providing explanation for the degree of income inequality:

$$T = \sum_{i=1}^N y_i \log \frac{y_i}{x_i} \quad (1)$$

where y_i and x_i are the income and population shares of group i , respectively, and N is the number of groups. When income is equally distributed between the groups T is equal to zero and when all income is attained by one group, the index receives a value of $\log N$. This measure can be interpreted as the expected information of the indirect message that transforms the prior probabilities as represented by population shares of groups into the posterior probabilities as represented by the groups' income shares (Kakwani, 1980, pp. 88-89). When applied to cross-

country data, the Theil's inequality index suggests that the aggregate level of intercountry income inequality in any given year is equal to the weighted sum of the logarithms of the countries' income share-population share ratios, where the weights are the countries' income shares in the world income. Our choice of this index is based on its attractive decomposition properties. Theil's inequality index can be straightforwardly and conveniently decomposed between and within groups for any number of groupings specified. Moreover, the Theil's inequality index satisfies the Pigou-Dalton criterion of being adequately responsive to income transfer from rich to poor and, as has been proven by Bourguignon (1979), it is the only income-weighted decomposable inequality measure which is differentiable, symmetric, and homogeneous of degree zero in all incomes. Hence, it can be considered as a very satisfactory index for measuring income inequality between and within groups of countries.

Following Fishlow (1972), the computation of the world level of intercountry income inequality (WI) employs a decomposition formula of Theil's entropy coefficient that preserves and measures the contribution of the constituents of the aforementioned geographical classification -- the continental clusters and their fifteen regions -- whose sum is equal to the total income inequality between countries:

$$WL_{ijk} = \sum_{i=1}^4 y_i \log \frac{y_i}{x_i} + \sum_{i=1}^4 y_i \sum_j \frac{y_{ij}}{y_i} \log \frac{y_{ij}/y_i}{x_{ij}/x_i} + \sum_{i=1}^4 \sum_j \frac{y_{ij}}{y_i} \sum_k \frac{y_{ijk}}{y_{ij}} \log \frac{y_{ijk}/y_{ij}}{x_{ijk}/x_{ij}} \quad (2)$$

Here,

- i = a continental cluster index,
- j = a region index,

- k = a country index,
 y_i = the income share of cluster i in the world income,
 x_i = the population share of cluster i in the world population,
 y_{ij} = the income share of region j affiliated to cluster i in the world income,
 x_{ij} = the population share of region j affiliated to cluster i in the world population,
 y_{ijk} = the income share of country k affiliated to region i of the i -th cluster in the world income, and
 x_{ijk} = the population share of country k affiliated to region i of the i -th cluster in the world population.

While the first term on the right-hand-side of the equation indicates the level of income inequality between the continental clusters, the second term displays the weighted sum of income inequality levels between the regions of these clusters (i.e., aggregate *inter-regional* inequality), and the third term the weighted sum of income inequality levels within the regions (i.e., aggregate *intraregional* inequality).

3. WORLD-WIDE INTERCOUNTRY INCOME INEQUALITY AND ITS CONSTITUENTS

The application of Theil index of income inequality to Summers and Hestons' 1993 database of international comparison of income adjusted for purchasing power parity revealed that between 1960 to 1990 the aggregate level of intercountry income inequality rose by 16.52 per cent. However, a close inspection of Figure 1, Figure 2 and Figure 3 reveals three distinct phases in the time trajectory of the world-wide level of intercountry income inequality: 1960-1968, 1969-1983 and 1984-1990.

Figure 1: World-wide level of inter-country income inequality and its constituents

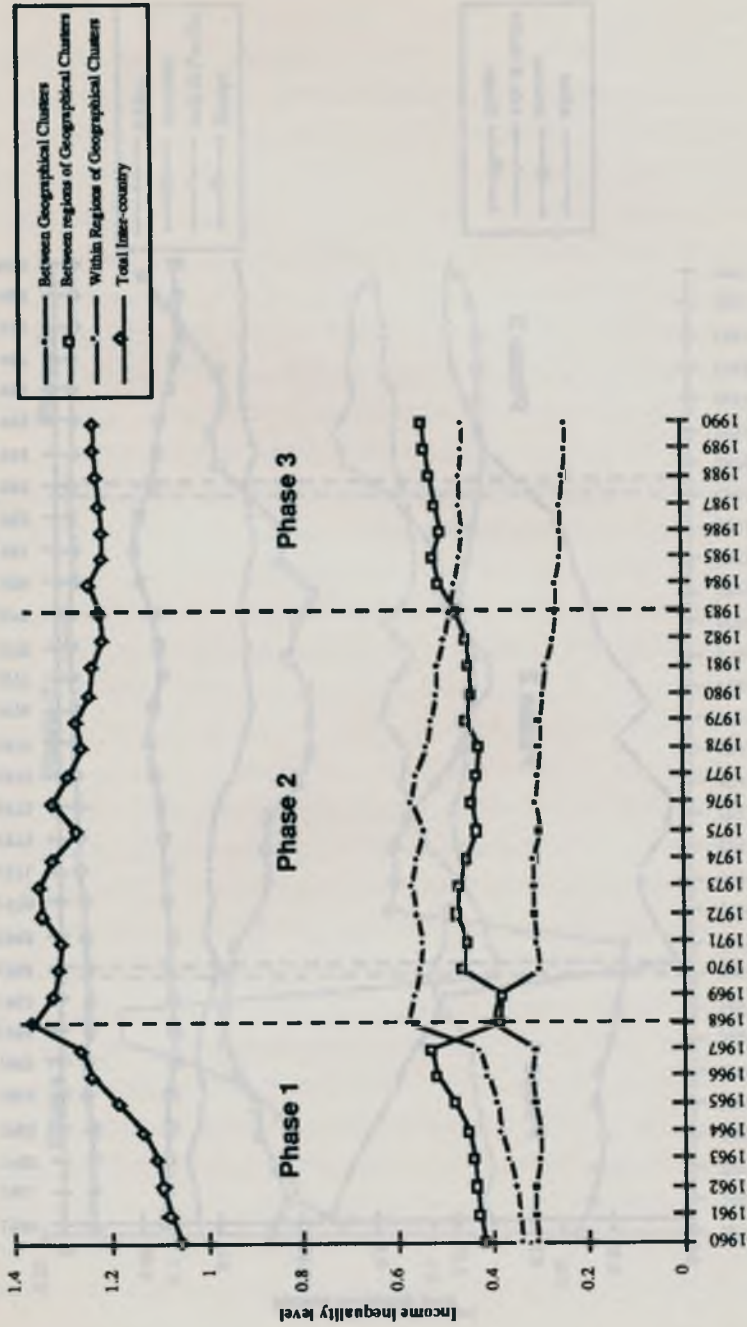


Figure 2: Income inequality within regions of the geographical clusters

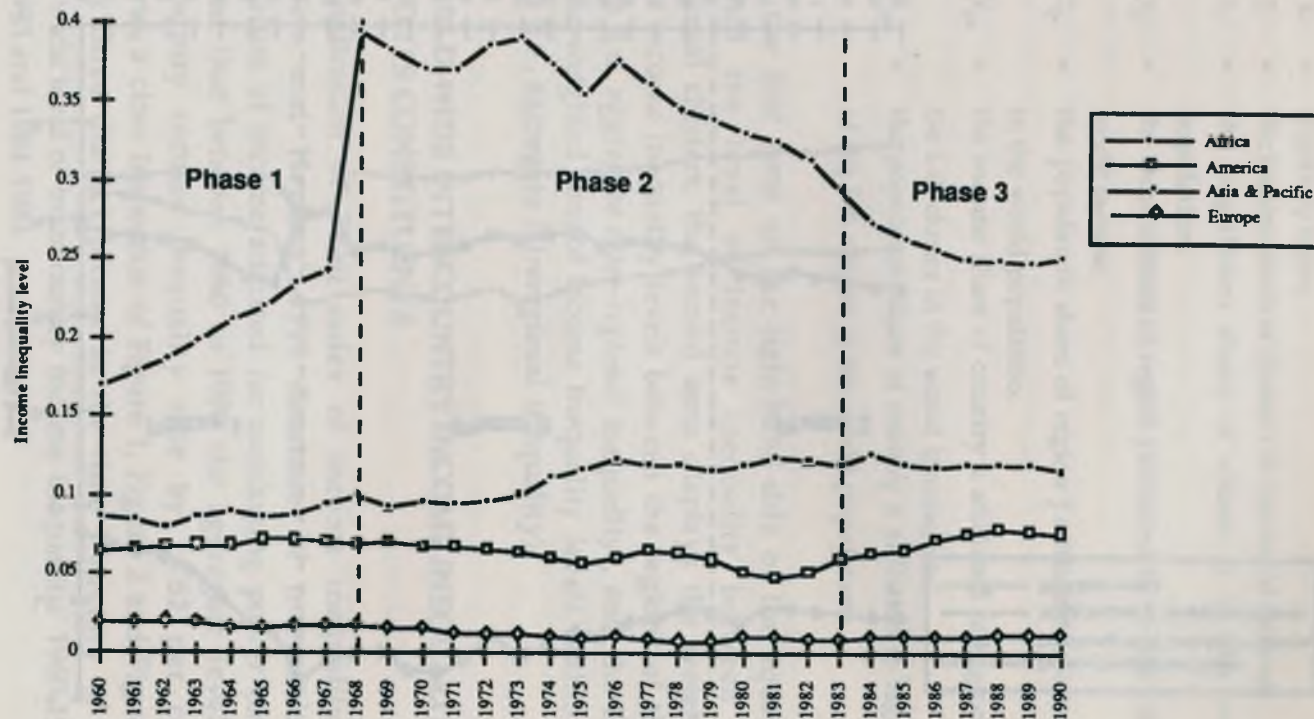
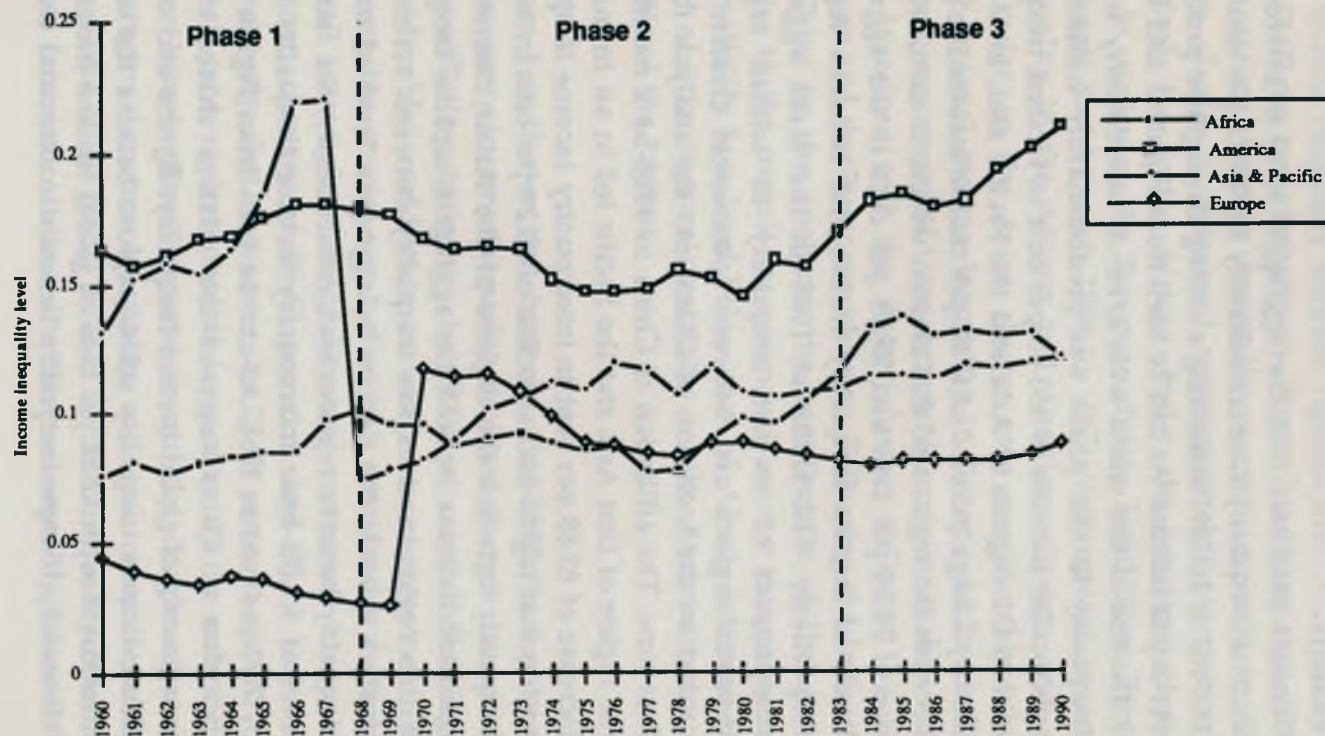


Figure 3: Income inequality between regions of the geographical clusters



Phase 1:

Between 1960 and 1968 the aggregate level of intercountry income inequality rose considerably by 28.92 per cent from 1.05413 to 1.35897 indicating a strong divergence process of per capita income. As can be seen from Figure 2 and Figure 3, the rise in the world-wide level of intercountry income inequality in this phase was predominantly fuelled by a spectacular increase of 133.62 per cent in income inequality within the regions of Asia and the Pacific and, until 1967, also by a large increase of 67.52 per cent in income inequality between the regions of that cluster, which, in turn, led to a rise of 72.04 per cent and 27.59 per cent in the aggregate levels of income inequality within and between regions, respectively. The shifts in 1968 in the three aggregate components of income inequality of within regions, between regions and between continental clusters were caused by the inclusion of China into the analysis for the first time. The affiliation of China in 1968 as a member of the region of East Asia and the Pacific led to an immediate increase of 62.88 per cent in intercountry income inequality within that region and a decline of 66.24 per cent in income inequality between the regions of the Asian cluster. The resultant increase in both the aggregate income inequality within regions and income inequality between continental clusters exceeds the decline in aggregate level of income inequality between regions, and, consequently, the recorded level of world-wide intercountry income inequality hiked by 7.90 per cent in 1968. As can be seen from Figure 1 the inclusion of China reversed the relative shares of the constituents of global income inequality. By the end of this phase, income inequality within regions became the largest constituent with 42.62 per cent of global income inequality, followed by income inequality between continental clusters

and income inequality between regions with 29.29 per cent and 28.09 per cent, respectively. Figure 2 indicates that while intraregional income inequality soared upwards in the Asian cluster it remained approximately stagnant and relatively low in the African cluster, the American cluster and, in particular, the European cluster. In addition, Figure 3 reveals that between 1960 to 1967 inter-regional income inequality in the African and American clusters and, in particular, in the Asian cluster rose considerably while inter-regional income inequality in Europe declined. The major components of inter-regional income inequality were the American and the Asian clusters followed by the African and the European clusters. Following the inclusion of China to the analysis, the contribution of the Asian cluster to the overall inter-regional income inequality fell dramatically to a level below that of Africa, whereas the level of inter-regional inequality in the American cluster remained the highest.

Phase 2:

Figure 1 indicates that between 1969-1983 the aggregate intercountry income inequality declined along a decreasing, but oscillating, trajectory by 10.58 per cent indicating a considerable world-wide convergence of income. This convergence process was fuelled by a considerable decline in overall *intraregional* inequality and in income inequality between clusters of 16.47 per cent and 35.13 per cent, respectively, that dominates the 23.93 per cent rise in the overall *inter-regional* income inequality. By the end of this phase inter-regional income inequality caught up with intraregional income inequality, and each comprises about 39 per cent of the global level of income inequality. The rest 21 per cent were attributed to income inequality between the

four continental clusters. As can be seen from Figure 2 the decline in the world-wide level of intraregional income inequality can be attributed to the large decline in intraregional income inequality in the Asian cluster of 25.13 per cent. Despite this considerable decline and the slight increase in intraregional income inequality in Africa, most of the world intraregional inequality still stemmed from the Asian cluster. Figure 3 reveals that during the second phase the differences in inter-regional income inequalities between the four clusters were significantly reduced. Inter-regional income inequality in America declined between 1969 and 1976 but thereafter gradually returned to the initial level. After the 1968 downward shift, inter-regional income inequality in the Asian cluster considerably rose. The upward shift in the level of inter-regional income inequality within the European cluster in 1970 is due to the inclusion of data on the centrally planned economies in East Europe for the first time. This shift was considerably moderated thereafter as the centrally planned economies caught up to a certain extent with the advanced market economies of Europe. Between 1969 to 1977 inter-regional income inequality in Africa declined and became the world's lowest one, but later quickly rose to become the world's second largest.

Phase 3:

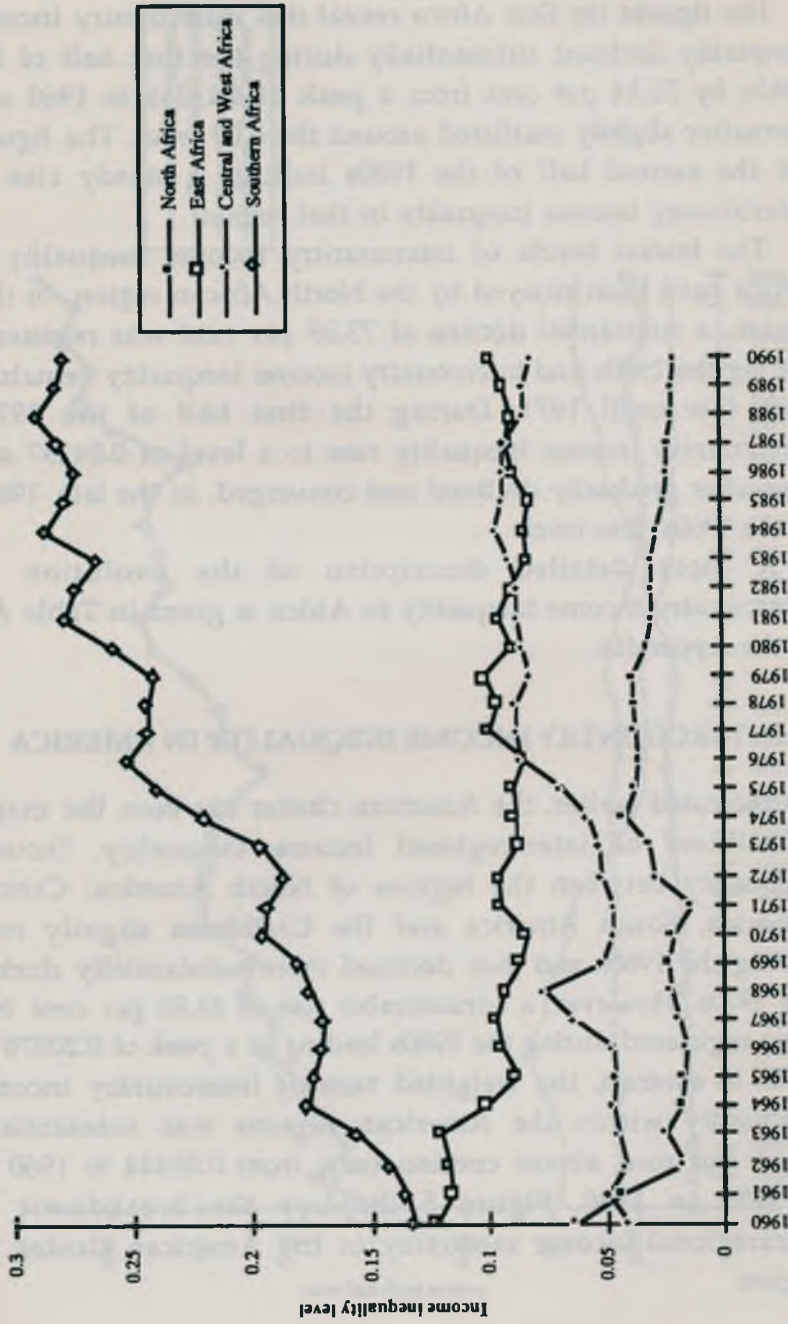
As can be seen from Figure 1, during this phase the aggregate intercountry income inequality remained approximately stagnant. The slight increase between 1985 and 1990 can be attributed to a rise in the aggregate level of inter-regional income inequality. The share of inter-regional income inequality in global income inequality continuously rose from 38.94 per cent in 1983 to 43.80 per

cent in 1990. Figure 3 reveals that the rise in the aggregate level of inter-regional income inequality was predominantly fuelled by the increase in inter-regional income inequality within the American cluster during the 1980s and, to a lesser extent, by the increase in inter-regional income inequality in Africa in 1984 and 1985 and by the slight and continuous increase in inter-regional income inequality in the Asian and the European clusters. However, much of the effect of the rise in the aggregate level of inter-regional income inequality on the global level of intercountry income inequality was moderated by the slight decline in both the aggregate intraregional income inequality and the inter-cluster income inequality. By 1990 the share of intraregional income inequality in the global income inequality level was reduced to 37.16 per cent and the share of inter-cluster income inequality to 19.04 per cent. Figure 2 indicates further that the decline in the aggregate level of intraregional income inequality was accommodated by the significant decline in intraregional income inequality in the Asian cluster that exceeded the rise in intraregional income inequality in the American cluster. This figure also indicates that intraregional income inequality in the African and European clusters remained stagnant. A possible explanation to the considerable rise in inter-regional and intraregional income inequality in the American cluster during this phase is the, non-uniform, economic slowdown in many of the debt-burdened countries of South America, Central America and the Caribbean.

4. INTERCOUNTRY INCOME INEQUALITY IN AFRICA

Our calculations reveal that during the 1960s and the first half of the 1970s income inequality between the regions of North Africa, East Africa, Southern Africa and Central and West Africa changed slightly. In contrast, since 1977 inter-regional income inequality in Africa substantially rose by 76.52 per cent to a peak level of 0.13640 in 1985 and later slightly declined to a level of 0.12070 in 1990. Furthermore, although the aggregate level of intraregional income inequality in Africa was moderate during the last three decades, it gradually rose by 35.51 per cent. As can be seen from Figure 4, this considerable rise was fuelled by the large increase of intercountry income inequality in Southern Africa and in Central and West Africa of 111.09 per cent and 96.94 per cent, respectively, over the entire period. While in Southern Africa the rise of intercountry income inequality was relatively steady, it was less so in Central and West Africa where much of the hike, 62.14 per cent, took place at the period of the first oil shock between 1973 and 1976 as some of the region's oil exporting countries (e.g. Nigeria) forged ahead while the others slowed down. It should be noted that also in the case of Southern Africa, the first oil crisis period was characterised by an accelerated rise in intercountry income inequality of 28.39 per cent as well as the initial period between 1960 to 1964 which saw a 34.50 per cent increase.

Figure 4: Inter-country income inequality in Africa



The figures for East Africa reveal that intercountry income inequality declined substantially during the first half of the 1960s by 28.14 per cent from a peak of 0.12316 in 1960 and thereafter slightly oscillated around the 0.09 level. The figures for the second half of the 1980s indicate a steady rise in intercountry income inequality in that region.

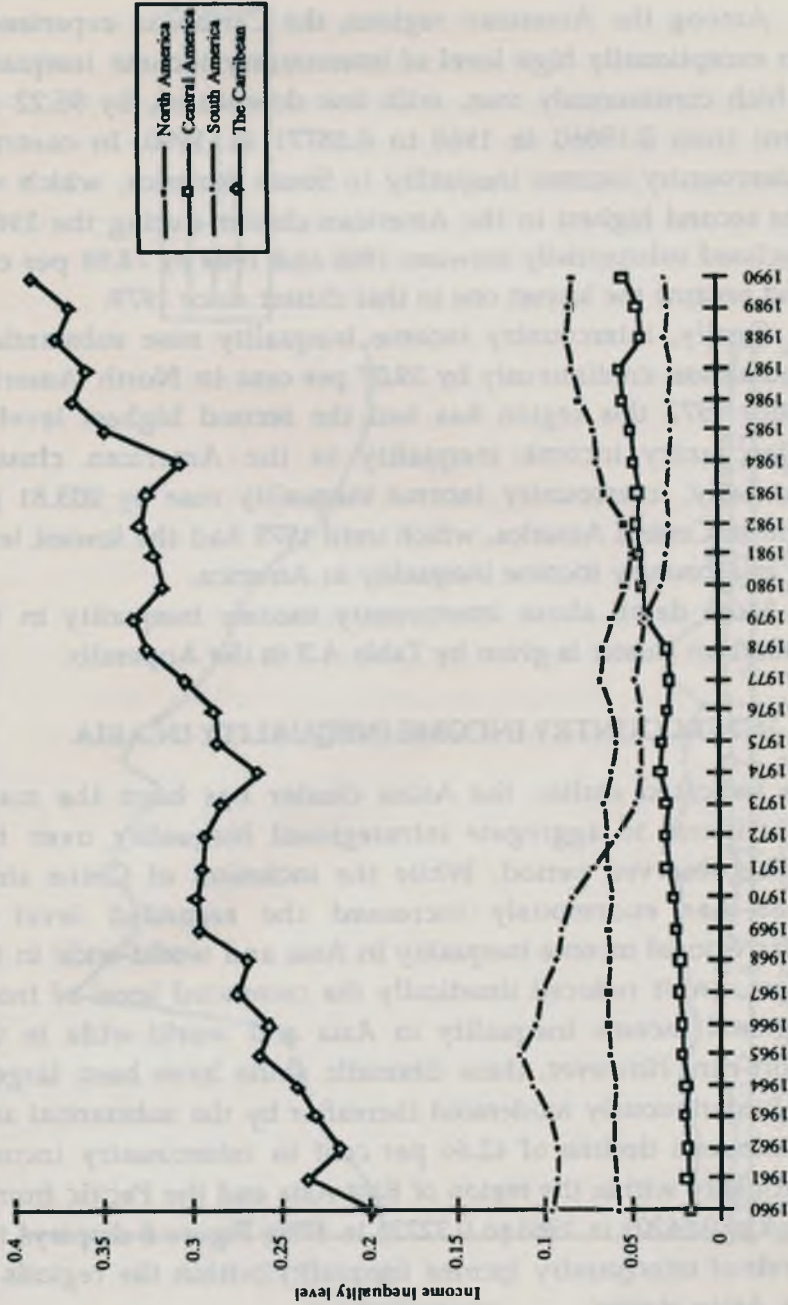
The lowest levels of intercountry income inequality in Africa have been enjoyed by the North African region. In this region, a substantial decline of 73.39 per cent was registered during the 1960s and intercountry income inequality remained very low until 1971. During the first half of the 1970s intercountry income inequality rose to a level of 0.04237 and thereafter gradually declined and converged, in the late 1980s, to the 1960s' low level.

A more detailed description of the evolution of intercountry income inequality in Africa is given in Table A.2 in the Appendix.

5. INTERCOUNTRY INCOME INEQUALITY IN AMERICA

As indicated earlier, the American cluster has been the major constituent of inter-regional income inequality. Income inequality between the regions of North America, Central America, South America and the Caribbean slightly rose during the 1960s and then declined more substantially during the 1970s. However, a considerable rise of 43.85 per cent has been registered during the 1980s leading to a peak of 0.20876 in 1990. In contrast, the weighted sum of intercountry income inequality within the American regions was substantially lower but rose, almost continuously, from 0.06444 in 1960 to 0.07555 in 1990. Figure 5 displays the breakdown of intraregional income inequality in the American cluster by region.

Figure 5: Inter-country income inequality in America



Among the American regions, the Caribbean experienced an exceptionally high level of intercountry income inequality which continuously rose, with few downturns, by 95.22 per cent from 0.19860 in 1960 to 0.38771 in 1990. In contrast, intercountry income inequality in South America, which was the second highest in the American cluster during the 1960s, declined substantially between 1966 and 1990 by 74.98 per cent and became the lowest one in that cluster since 1979.

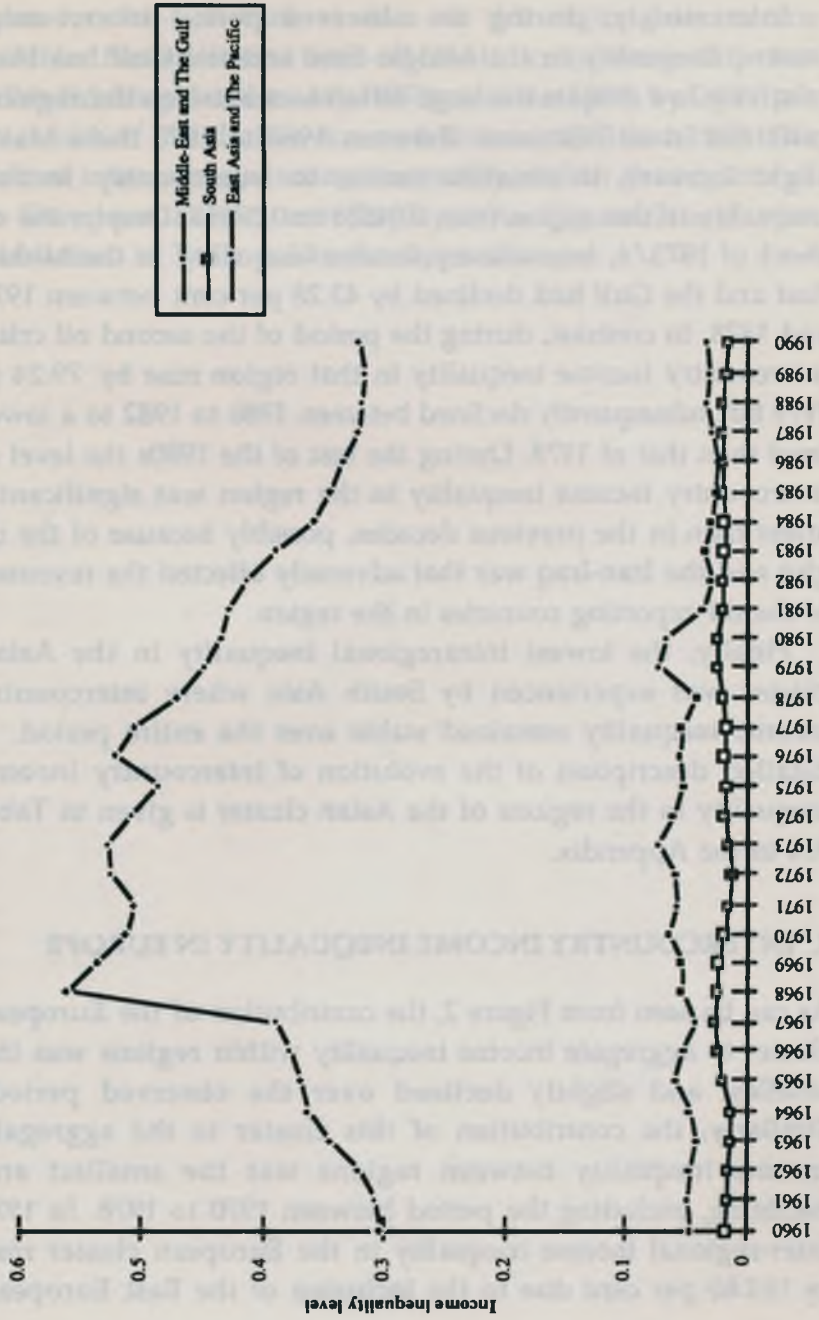
Finally, intercountry income inequality rose substantially and almost continuously by 39.07 per cent in North America. Since 1972 this region has had the second highest level of intercountry income inequality in the American cluster. Similarly, intercountry income inequality rose by 203.81 per cent in Central America, which until 1979 had the lowest level of intercountry income inequality in America.

More detail about intercountry income inequality in the American cluster is given by Table A.3 in the Appendix.

6. INTERCOUNTRY INCOME INEQUALITY IN ASIA

As indicated earlier, the Asian cluster has been the major contributor to aggregate intraregional inequality over the entire observed period. While the inclusion of China since 1968 has enormously increased the recorded level of intraregional income inequality in Asia and world-wide in the short-run, it reduced drastically the computed level of interregional income inequality in Asia and world-wide in the short-run. However, these dramatic shifts have been largely and continuously moderated thereafter by the substantial and continuous decline of 42.66 per cent in intercountry income inequality within the region of East Asia and the Pacific from a peak of 0.56203 in 1968 to 0.32226 in 1990. Figure 6 displays the levels of intercountry income inequality within the regions of the Asian cluster.

Figure 6: Inter-country income inequality in Asia and the Pacific



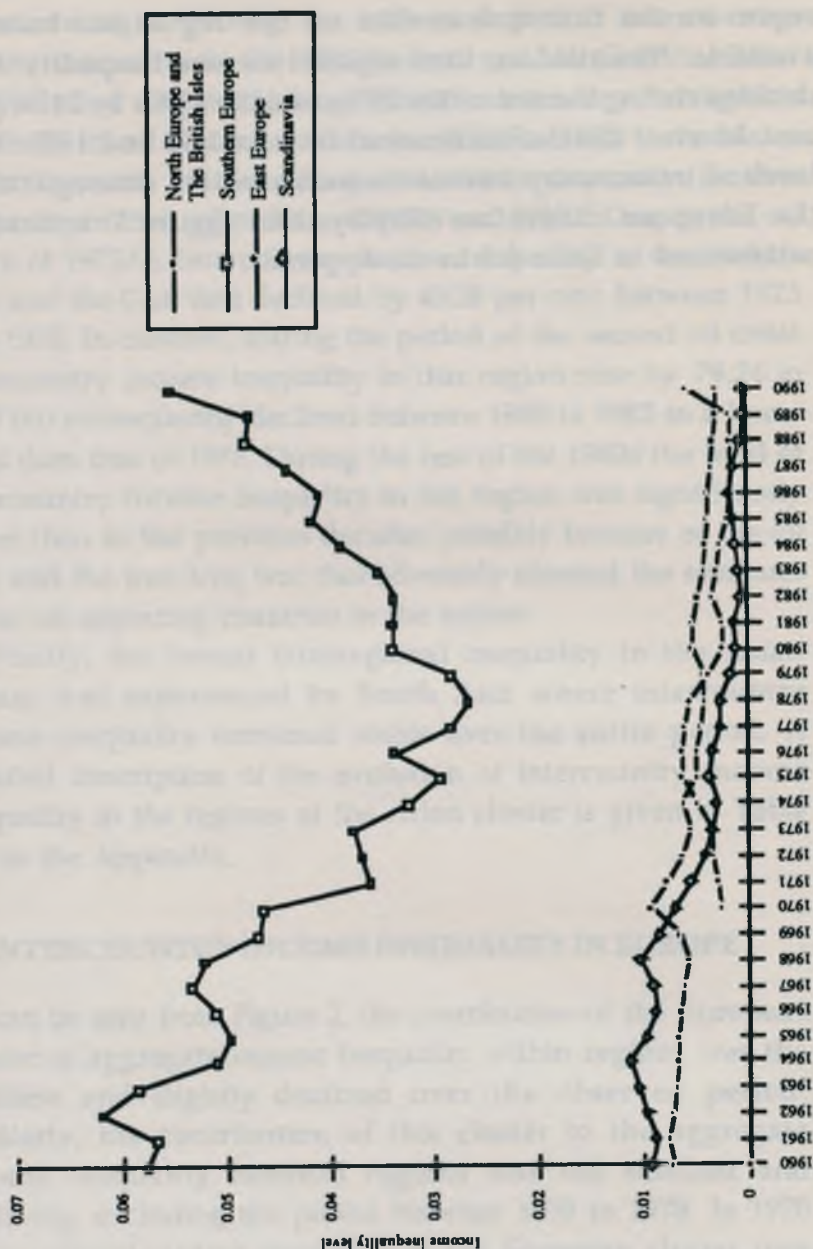
Interestingly, during the observed period intercountry income inequality in the Middle East and the Gulf has been relatively low despite the large differences between the region's countries in oil resources. Between 1960 to 1973 there was a slight increase, in absolute terms, in intercountry income inequality in that region from 0.04538 to 0.07151. Despite the oil shock of 1973/4, intercountry income inequality in the Middle East and the Gulf had declined by 43.28 per cent between 1973 and 1978. In contrast, during the period of the second oil crisis intercountry income inequality in that region rose by 79.24 in 1979 but subsequently declined between 1980 to 1982 to a lower level than that of 1978. During the rest of the 1980s the level of intercountry income inequality in the region was significantly lower than in the previous decades, possibly because of the oil glut and the Iran-Iraq war that adversely affected the revenues of the oil exporting countries in the region.

Finally, the lowest intraregional inequality in the Asian cluster was experienced by South Asia where intercountry income inequality remained stable over the entire period. A detailed description of the evolution of intercountry income inequality in the regions of the Asian cluster is given in Table A.4 in the Appendix.

7. INTERCOUNTRY INCOME INEQUALITY IN EUROPE

As can be seen from Figure 2, the contribution of the European cluster to aggregate income inequality within regions was the smallest and slightly declined over the observed period. Similarly, the contribution of this cluster to the aggregate income inequality between regions was the smallest and declining, excluding the period between 1970 to 1978. In 1970 inter-regional income inequality in the European cluster rose by 165.60 per cent due to the inclusion of the East European

Figure 7: Inter-country income inequality in Europe



Intercountry income inequality in the regions of the European cluster has been the lowest. However, there has been a significant difference between Southern Europe and the other European regions. While in the latter regions intercountry income inequality has been extremely low and generally declining, intercountry income inequality in the former was considerably larger and its trajectory conformed to a U-shaped curve reflecting a significant decline from 0.05773 in 1962 to 0.02661 in 1978 followed by a rapid increase in inequality and convergence to the initial level during the 1980s.

8. CONCLUSION

The application of Theil's index of income inequality and its decomposition between and within continental clusters and regions to the Pennsylvania World Table (1993) of international comparison of per capita income adjusted for purchasing power parity revealed that between 1960 to 1990 the aggregate level of intercountry income inequality rose by 16.52 per cent and that three distinct phases can be identified. The first phase encompasses the period between 1960 and 1968 in which a strong divergence process took place. Between 1960 and 1967 the aggregate level of intercountry income inequality rose considerably by 19.47 per cent from 1.05413 to 1.25936. This increase was fuelled by intensifying inter-regional and intraregional income inequality. Moreover, in 1968 the computed aggregate intercountry income inequality hiked by 7.91 per cent to a peak of 1.31945 as the computed intercountry income inequality for the region of East Asia and the Pacific rose dramatically by the inclusion of data on China for the first time. In the second phase, 1969-1983, aggregate intercountry income inequality trajectory exhibited a decreasing trend,

fuelled by a considerable decline in intraregional inequality, amounting to a 10.58 per cent decline indicating a significant and steady overall convergence process of per capita income. During the third phase, 1984-1990, the aggregate intercountry income inequality remained approximately stagnant, with a slight increase between 1985 to 1990 that can be attributed to an intensified inter-regional income inequality.

The decomposition of Theil's inequality index into the four continental clusters and their fifteen regions revealed that in general income inequality between the four clusters declined gradually and constituted only 19.03 per cent of the overall intercountry income inequality in 1990 *vis a vis* 28.89 per cent in 1960. In contrast, inter-regional income inequality, with the exclusion of the 1968 shift, rose gradually and kept pace with the general increase in total intercountry income inequality. In 1990 inter-regional income inequality constituted 43.80 per cent of the total intercountry income inequality *vis a vis* 39.17 in 1960. In 1960 intraregional income inequality constituted 31.94 per cent of the total level of intercountry income inequality. The increase in this factor between 1960 and 1968 made it the largest constituent of income inequality between 1968 and 1982 and responsible to as much as 42.62 per cent of the total intercountry income inequality level in 1968. However, the gradual decline in this constituent thereafter reduced its share in total intercountry inequality to 37.16 per cent in 1990.

Since 1990 the world has seen dramatic changes in the centrally planned economies. The transformation of the Chinese economy into a quasi-market economy as well as the collapse of the communist regimes and the Comecon in East Europe, the unification of Germany and the fragmentation of the former Soviet Union and Yugoslavia might affect the global level of intercountry income inequality in the recent years considerably. The effects of these events and the

formation of special trade zones in East Asia and North America are likely to be substantial and deeply extended into the twenty-first century.

FOOTNOTE

1. See also Baumol and Wolff (1988).

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APPENDIX

Countries Affiliation by Cluster and Region

The African Cluster

North Africa: Algeria, Egypt, Morocco, Tunisia, and Malta.

East Africa: Burundi, Comoros, Ethiopia, Kenya, Seychelles, Somalia, Sudan*, Tanzania, and Uganda.

Central and West Africa: Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Mauritania, Niger, Nigeria, Senegal, Sierra Leone*, Togo, and Zaire.

Southern Africa: Angola, Botswana, Lesotho, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Reunion, Rwanda, South Africa, Swaziland, Zambia, and Zimbabwe.

The American Cluster

North America: Canada, United States of America, and Mexico.

Central America: Guatemala, Belize*, Honduras, El Salvador, Nicaragua, Costa Rica, and Panama.

The Caribbean: Bahamas*, Barbados, Dominica*, Dominican republic, Grenada*, Haiti, Jamaica, Puerto Rico, Lucia*, St. Vincent and Gre.*, Trinidad and Tobago.

South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Surinam, Uruguay, and Venezuela.

The Asian Cluster

The Middle East and The Gulf: Afghanistan, Bahrain*, Cyprus, Iran, Iraq, Israel, Jordan, Kuwait*, Oman*, Qatar*, Saudi Arabia*, Turkey, Syria, United Arab Emirates*, and Yemen*.

South-Central Asia: Bangladesh, Bhutan*, India, Myannar, Nepal, Pakistan, and Sri Lanka.

East Asia and The Pacific: Australia, China*, Fiji, Hong Kong, Indonesia, Japan, Korea (Rep. of), Laos*, Malaysia, Mongolia*, New Zealand, Papua New Guinea, Philippines, Singapore, Solomon Islands*, Taiwan, Thailand, Tonga*, Vanuatu*, and Western Samoa*.

The European Cluster

North Europe and The British Isles: Austria, Belgium, France, Germany, Ireland, Luxembourg, Netherlands, Switzerland, and United Kingdom.

Southern Europe: Greece, Italy, Portugal, Spain, and Yugoslavia.

East Europe: Bulgaria*, Czechoslovakia, Germany (Democratic Republic), Hungary*, Poland*, Romania*, and USSR*.

Scandinavia: Denmark, Finland, Iceland, Norway, and Sweden.

*Early observations are not available.

Table A.1: World-wide level of intercountry income inequality and its constituents

Year	Income Inequality between Geographical Clusters	Income Inequality between regions of Geographical Clusters	Income Inequality within Regions of Geographical Clusters	Total Level of Intercountry Income Inequality
1960	0.30454	0.41293	0.33666	1.05413
1961	0.30590	0.42849	0.34442	1.07882
1962	0.30780	0.43136	0.35002	1.08918
1963	0.30114	0.43521	0.36852	1.10488
1964	0.29848	0.45121	0.38277	1.13246
1965	0.30851	0.47890	0.39264	1.18004
1966	0.31467	0.51516	0.40874	1.23857
1967	0.30881	0.52684	0.42371	1.25936
1968	0.39802	0.38176	0.57919	1.35897
1969	0.38284	0.37581	0.56080	1.31945
1970	0.29807	0.46064	0.54878	1.30748
1971	0.30173	0.45356	0.54166	1.29695
1972	0.30779	0.47118	0.55937	1.33833
1973	0.30905	0.46857	0.56672	1.34434
1974	0.30929	0.45005	0.55639	1.31573
1975	0.29497	0.42990	0.53855	1.26342
1976	0.30452	0.44118	0.56978	1.31548
1977	0.30004	0.42662	0.55580	1.28246
1978	0.29748	0.42223	0.53690	1.25660
1979	0.29477	0.44897	0.52443	1.26817
1980	0.28659	0.43837	0.51121	1.23617
1981	0.28036	0.44402	0.50878	1.23326
1982	0.26639	0.44871	0.49610	1.21120
1983	0.25818	0.47313	0.48381	1.21513
1984	0.25606	0.50669	0.47355	1.23630
1985	0.25135	0.51465	0.45969	1.20952
1986	0.25143	0.50118	0.45692	1.20952
1987	0.24858	0.51066	0.45757	1.21680
1988	0.24343	0.51949	0.45927	1.22219
1989	0.24037	0.53247	0.45556	1.22840
1990	0.23382	0.53797	0.45646	1.22825

Table A.2: Intercountry income inequality in Africa

Year	North Africa	East Africa	Central and West Africa	Southern Africa	Total Inequality Within Regions	Total Inequality Between Regions
1960	0.06317	0.12316	0.04056	0.13170	0.08524	0.07543
1961	0.04437	0.11698	0.04899	0.13493	0.08379	0.08124
1962	0.01681	0.11755	0.04186	0.14270	0.07781	0.07700
1963	0.02513	0.12026	0.04518	0.15664	0.08487	0.08056
1964	0.01816	0.10203	0.04801	0.17713	0.08847	0.08375
1965	0.01715	0.08850	0.04602	0.17391	0.08577	0.08508
1966	0.01638	0.09431	0.04733	0.17103	0.08665	0.08502
1967	0.01919	0.09688	0.06376	0.17042	0.09389	0.09784
1968	0.02275	0.09328	0.07680	0.17612	0.09918	0.10123
1969	0.02396	0.08655	0.05174	0.18091	0.09251	0.09541
1970	0.02206	0.08311	0.04679	0.19521	0.09468	0.09525
1971	0.01328	0.09462	0.04665	0.19335	0.09316	0.08714
1972	0.02910	0.09586	0.05206	0.18622	0.09564	0.09078
1973	0.03164	0.08767	0.05274	0.19620	0.09952	0.09164
1974	0.04237	0.08855	0.05767	0.21947	0.11069	0.08863
1975	0.03744	0.08893	0.06914	0.23918	0.11658	0.08532
1976	0.03527	0.08498	0.08551	0.25190	0.12229	0.08788
1977	0.03742	0.09916	0.08716	0.24315	0.11901	0.07727
1978	0.03790	0.09646	0.08801	0.24374	0.11860	0.07810
1979	0.03727	0.10093	0.08199	0.24088	0.11630	0.09037
1980	0.03145	0.08906	0.08460	0.25793	0.11825	0.09748
1981	0.02996	0.09433	0.08709	0.27712	0.12507	0.09520
1982	0.02948	0.08960	0.08685	0.27327	0.12227	0.10290
1983	0.02971	0.08246	0.09053	0.26396	0.11860	0.11519
1984	0.02722	0.08344	0.09660	0.28480	0.12569	0.13241
1985	0.02443	0.08061	0.09311	0.27729	0.11909	0.13640
1986	0.02288	0.08784	0.09309	0.27291	0.11713	0.12949
1987	0.02227	0.09153	0.09224	0.28039	0.12039	0.13103
1988	0.01999	0.08958	0.08315	0.28947	0.12008	0.12937
1989	0.02114	0.09259	0.08401	0.28131	0.11850	0.13029
1990	0.01941	0.09872	0.07988	0.27801	0.11551	0.12070

Table A.3: Intercountry income inequality in America

Year	North America	Central America	South America	The Caribbean	Total Inequality Within Regions	Total Inequality Within Regions
1960	0.05826	0.01732	0.09529	0.19860	0.06444	0.16215
1961	0.05880	0.01882	0.09275	0.23554	0.06511	0.15667
1962	0.06122	0.01768	0.09215	0.21717	0.06685	0.16041
1963	0.06102	0.01975	0.09708	0.23086	0.06746	0.16703
1964	0.05934	0.01939	0.10657	0.24099	0.06753	0.16793
1965	0.06170	0.02124	0.11410	0.26189	0.07057	0.17505
1966	0.06324	0.02165	0.10544	0.25641	0.07056	0.17997
1967	0.06291	0.02323	0.10238	0.27404	0.07010	0.17986
1968	0.06266	0.02191	0.09246	0.26911	0.06850	0.17898
1969	0.06341	0.02447	0.09064	0.29536	0.06938	0.17629
1970	0.06109	0.02682	0.08333	0.29735	0.06666	0.16675
1971	0.06316	0.03030	0.07077	0.29481	0.06656	0.16256
1972	0.06432	0.03083	0.05810	0.29221	0.06553	0.16391
1973	0.06514	0.03000	0.04705	0.28405	0.06419	0.16282
1974	0.06139	0.03330	0.04498	0.26271	0.06042	0.15121
1975	0.05735	0.03229	0.04480	0.28512	0.05738	0.14717
1976	0.06102	0.02870	0.04478	0.28693	0.06025	0.14713
1977	0.06624	0.02798	0.04697	0.30316	0.06497	0.14770
1978	0.06548	0.02923	0.04548	0.32422	0.06442	0.15490
1979	0.06024	0.04097	0.04161	0.33066	0.05961	0.15210
1980	0.05276	0.04301	0.03228	0.31505	0.05174	0.14512
1981	0.04905	0.04363	0.02916	0.32027	0.04838	0.15831
1982	0.05254	0.04551	0.02755	0.32795	0.05098	0.15548
1983	0.06398	0.04493	0.02928	0.32371	0.06068	0.16853
1984	0.06891	0.04699	0.02815	0.30501	0.06423	0.18081
1985	0.07019	0.04907	0.02719	0.34699	0.06562	0.18392
1986	0.07834	0.05408	0.02816	0.36545	0.07236	0.17784
1987	0.08226	0.05499	0.02721	0.35671	0.07530	0.18074
1988	0.08447	0.04259	0.03002	0.37436	0.07793	0.19223
1989	0.08392	0.04494	0.02800	0.36678	0.07739	0.20072
1990	0.08102	0.05262	0.02855	0.38771	0.07555	0.20876

Table A.4: Intercountry income inequality in Asia and The Pacific

Year	Middle-East and The Gulf	South-Asia	East Asia and The Pacific	Total Inequality Within Regions	Total Inequality Between Regions
1960	0.04538	0.01515	0.30367	0.16872	0.13154
1961	0.04813	0.01461	0.30712	0.17691	0.15172
1962	0.04649	0.01426	0.32119	0.18544	0.15775
1963	0.03949	0.01289	0.34491	0.19705	0.15385
1964	0.04583	0.01184	0.36350	0.20984	0.16256
1965	0.05738	0.01942	0.36806	0.21966	0.18270
1966	0.05029	0.02424	0.37849	0.23450	0.21898
1967	0.04166	0.02531	0.39007	0.24200	0.22036
1968	0.05336	0.02310	0.56203	0.39417	0.07440
1969	0.05296	0.02213	0.53510	0.38225	0.07882
1970	0.06267	0.01714	0.51310	0.37145	0.08227
1971	0.05651	0.01322	0.50739	0.36925	0.08997
1972	0.05685	0.01117	0.52668	0.38645	0.10211
1973	0.07151	0.01446	0.52855	0.39159	0.10620
1974	0.05917	0.01749	0.50820	0.37452	0.11167
1975	0.05075	0.01562	0.48675	0.35496	0.10912
1976	0.05368	0.01747	0.52216	0.37672	0.11936
1977	0.05261	0.01634	0.50483	0.36286	0.11737
1978	0.04056	0.01900	0.47185	0.34553	0.10654
1979	0.07270	0.02360	0.44960	0.34002	0.11818
1980	0.06597	0.02342	0.43463	0.33119	0.10733
1981	0.03421	0.01831	0.42875	0.32534	0.10587
1982	0.02882	0.01891	0.41302	0.31336	0.10727
1983	0.03362	0.01777	0.38942	0.29513	0.10893
1984	0.02838	0.01686	0.35714	0.27354	0.11394
1985	0.02541	0.01846	0.34386	0.26440	0.11380
1986	0.02197	0.01875	0.33275	0.25685	0.11321
1987	0.02640	0.01833	0.32195	0.25099	0.11764
1988	0.03144	0.01963	0.31812	0.24988	0.11690
1989	0.03079	0.01535	0.31636	0.24847	0.11850
1990	0.03137	0.01399	0.32226	0.25254	0.12111

Table A.5: Intercountry income inequality in Europe

Year	North Europe and The British Isles	Southern Europe	East Europe	Scandinavi a	Total Inequality Within Regions	Total Inequality Between Regions
1960	0.00744	0.05773	NA	0.00950	0.01827	0.04381
1961	0.00772	0.05681	NA	0.00899	0.01861	0.03885
1962	0.00744	0.06205	NA	0.00979	0.01992	0.03620
1963	0.00701	0.05855	NA	0.01045	0.01914	0.03377
1964	0.00672	0.05097	NA	0.01124	0.01692	0.03698
1965	0.00680	0.04967	NA	0.00974	0.01663	0.03606
1966	0.00654	0.05110	NA	0.00894	0.01703	0.03119
1967	0.00619	0.05347	NA	0.00912	0.01772	0.02878
1968	0.00584	0.05223	NA	0.01036	0.01734	0.02715
1969	0.00664	0.04701	NA	0.00856	0.01667	0.02528
1970	0.00949	0.04637	0.00257	0.00688	0.01598	0.11636
1971	0.00782	0.03621	0.00283	0.00548	0.01269	0.11390
1972	0.00631	0.03690	0.00332	0.00419	0.01174	0.11437
1973	0.00548	0.03782	0.00350	0.00350	0.01142	0.10792
1974	0.00619	0.03233	0.00489	0.00302	0.01076	0.09854
1975	0.00489	0.02932	0.00637	0.00368	0.00963	0.08829
1976	0.00497	0.03385	0.00631	0.00341	0.01052	0.08681
1977	0.00455	0.02827	0.00603	0.00255	0.00896	0.08427
1978	0.00406	0.02661	0.00560	0.00255	0.00835	0.08270
1979	0.00426	0.02825	0.00371	0.00160	0.00850	0.08831
1980	0.00530	0.03396	0.00242	0.00123	0.01003	0.08843
1981	0.00531	0.03395	0.00235	0.00132	0.01000	0.08463
1982	0.00467	0.03376	0.00340	0.00072	0.00949	0.08306
1983	0.00406	0.03529	0.00293	0.00081	0.00939	0.08048
1984	0.00392	0.03900	0.00256	0.00114	0.01009	0.07954
1985	0.00374	0.04179	0.00188	0.00137	0.01059	0.08053
1986	0.00379	0.04101	0.00168	0.00177	0.01057	0.08064
1987	0.00332	0.04411	0.00170	0.00135	0.01090	0.08124
1988	0.00316	0.04793	0.00156	0.00068	0.01138	0.08099
1989	0.00288	0.04775	0.00178	0.00043	0.01120	0.08296
1990	0.00286	0.05515	0.00575	0.00037	0.01286	0.08739

(NA=Data are not available.)

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