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ABSTRACT

Continental and Sub-Continental Income Inequality*

Income inequality can be measured at different levels of aggregation such as global, continental, international and national levels. Here we consider income inequality at regions defined as equivalent of continental and sub-continental levels. We investigate the economic disparity between regions of the world and among countries within each continent or sub-continent. The empirical results for data availability reasons are mainly based on the second half of the 20th century. The review covers a whole range of measures and methods frequently employed in empirical analysis of the global and regional income inequality and income distribution. Different determinant factors along with quantification of their impacts are presented and empirical results from different case studies are discussed. Finally, these results are contrasted to those obtained based on the WIID covering the same period and group of countries.

JEL Classification: C10, D31, D63, I30, N30

Keywords: income inequality, inequality indices, income distribution, continents, regions

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1. INTRODUCTION

It is well known that inequality is multidimensional. Economists are concerned specifically with the economic or monetarily measurable dimension related to incomes. Inequality can be linked to for instance skills, education, opportunities, happiness, health, life expectancy, welfare, assets and social mobility.¹ This paper focuses on income inequality referring to the inequality of the distribution of individuals, household or some per capita measure of income. Lorenz Curve is used for analysing the size distribution of income. It plots the cumulative share of total income against the cumulative proportion of income receiving units. The divergence of a Lorenz curve for a given income distribution to Lorenz curve for perfect equality is measured by some index of inequality. The most widely used index of inequality is the Gini coefficient. Among the other measures of inequality are: the range, the variance, the squared coefficient of variation, the variance of log incomes, the absolute and relative mean deviations, and Theil's two inequality indices. For reviews of inequality see Subramanian (1997), Cowell (2000) and Heshmati (2004a).

The empirical literature on economic inequality is growing as a result of increasing interest in measuring and understanding the level, causes and development of income inequality and poverty and availability of income distribution data. In 1990s there was a shift in research previously focused on economic growth, determinants of economic growth and convergence in per capita incomes across countries to analysis of distribution of income, its development over time and identification of factors determining the distribution of income and poverty reductions.² Empirical results shows tendency for income per capita to converge, and an increase in inequality in the distribution of personal income in particular in many developing and transition countries. Availability of household surveys has been improved and several standardized databases have been created. These allow analysis of income distribution at the most disaggregate individual or per capita household levels. Income distribution is otherwise often analyzed at three levels of aggregation, namely global, international and national³. Income inequality can also be measured at a within-country regional

¹ Heshmati (2004b) reviews the recent advances in the measurement of inequality and gives attention to the relationship between income and non-income dimensions of inequality.

² Quah (2002), Ravallion (2003), Sala-i-Martin (2002a) analysed convergence in income inequality, while Acemoglu and Ventura (2002), Atkinson (1997), Bourguignon and Morrisson (2002), Gottschalk and Smeeding (1997) and Milanovic (2002) focus on the distribution of income. Acemoglu (2002), Caminada and Goudswaard (2001), Cornia and Kiiski (2001), Gottschalk and Smeeding (2000), Milanovic (2002), O'Rourke (2001), Park (2001), Sala-i-Martin (2002b) and Schultz (1998) studied trends in income inequality.

³ Global or world income inequality refers to inequality differences between all individuals in the world (Milanovic 2002; Schultz 1998; Quah 1999; Bourguignon and Morrisson 2002; Sala-i-Martin 2002a), while international income inequality refers to the economic disparity between countries (Acemoglu 2002; Cornia and Kiiski 2001; Gottschalk and Smeeding 1997; and Milanovic 2001). At the intra-national level inequality refers to the distribution of income among people within individual countries (Cameron 2000a; Cowell, Ferreira and Lichtfield 1998; Gustafsson and Shi 2002; Liebbrandt, Woolard and Woolard 2000). Studies of continents or regions include: transition economies (Ivaschenko 2002, Wan 2002), East Asian countries (Kakwani and Krogkaew 2000 and You 1998), the European Union (Belbo and Knaus 2001, Gottschalk and Smeeding 2000), Latin American countries (LondoNo and Szekely 2000, Wood 1997) and sub-Saharan African countries (Milanovic and Yitzhaki 2001, Svedborg 2002).

level⁴. The international and national income inequality is beyond the scope of this paper. This issue is reviewed in Heshmati (2004c).

Different parametric and non-parametric methods have been developed to decompose inequality and changes in poverty. Inequality is decomposed by sub-groups, income sources, causal factors and by other income unit characteristics. Inequality can also be decomposed at different levels of aggregation. For instance at the national level it can be decomposed into within-subgroup and between-subgroups. In similar way at the international level inequality can be decomposed into within-country and between-country components.⁵ Income inequality, in addition to the levels mentioned above it can be measured at the continental and sub-continental levels where one examines both between and within economic or geographic regions. There is evidence that poverty and inequality has developed differently between and within regions. Here the focus is on inequality in income distribution within and between geographic and economic regions. Such analysis can reveal effects of openness, convergence due to factor mobility, and may also indicate regional polarization, or disintegration and widening inequality driven by structural differences between regions. Furthermore it is important to consider heterogeneity in income inequality in both level and development over time among the countries within a region.

Data availability of household surveys has improved in the regions such as former Soviet Union, Eastern Europe and Africa. Several standardized databases have been created. These data cover mainly the second half of the twentieth century. This review aims to cover empirical analysis of continental or regional income inequality and income distribution. We discuss the benefit and limitations of this approach compared to the global and international levels and present empirical results found in the literature and those obtained based on the World Income Inequality Database (WIID) covering almost the same period and group of countries. Research on the world income inequality increase awareness of the problem, its measurement and quantification, identification of causal factors and of policy measures to reduce the within and between continents income inequality.

Rest of the paper is organised as follows. In section 2 the WIID database is described. Section 3 and 4 are on inter-regional and intra-regional income inequalities. The regions based on available studies include Eastern Europe and former USSR, Scandinavian, Western Europe, OECD countries, small and medium sized developing countries, sub-Saharan Africa, Latin America, East Asia, South Asia, South-East Asia and Pacific. The final Section summarises the reviews and empirical results.

2. THE DATA

The data used here are obtained from the WIDER World Income Inequality Database (WIID) which is an expanded version of the Deininger and Squire (1996) database. WIID contains information on income inequality, income shares, and a number of

⁴ Recent such studies focus on large countries like China (Xu and Zou 2000; Gustafsson and Shi 2002), Russia (Luttmer 2001; Fedorov 2002), India (Jha 2000; Datt and Ravallion 1992) and the USA (Patridge, Rickman and Levernier 1996; Moffitt and Gothschalk 2002). For a recent review see Heshmati (2004d).

⁵ The measurement and decomposition of inequalities is beyond the scope of this paper. For recent reviews see Shorrocks and Wan (2003) and Heshmati (2004a and 2004b).

variables indicating the source of data, and the quality classification for 146 existing industrialized, developing and transition countries⁶. The countries are observed on an irregular basis mainly covering the period post 1950 until 1998. To avoid distortions for graphing the trend in global and regional inequality over time we have truncated the data at 1950. The number of the excluded observations covering 1867-1949 is only 25 or 1.5% of the sample.

The Gini coefficient is measured in percentage points. It is the mean of multiple observations for a country in a given year. The multiplicity of observations is due to differences in income definitions, data sources, reference units, and the population coverage. The population adjusted Gini coefficient is also reported. However, the population adjusted Gini measure is very sensitive to the exit and entry of countries with large populations like China and India.

To provide a better picture of the distribution of inequality we report the first, the last, the period range and the number of years a country is observed. In addition to the mean Gini coefficient, the median minimum, the maximum, the standard deviation, the range and the annual changes in Gini coefficient are provided for individual countries grouped by the regional location in Table 3. In Table 4 we report the Gini coefficient and the population weighted Gini coefficient together with the distribution of income. The decile observations are transformed to quintile income shares to make the income distribution comparable across countries and over time. As a second measure of inequality the ratio of the highest to the lowest quintiles are calculated and reported in Table 4.

3. INTER-REGIONAL INCOME INEQUALITY

The relative high degree of homogeneity in the economic development within regions combined with a high degree of heterogeneity between regions makes analysis of the inter-regional inequality an interesting dimension to be explored. Maddison (2001) using data on GDP across countries and over time reports a steady increase in the inter-regional inequalities since 1870. As a measure of the regional dispersion the ratio of income per head of the richest to the poorest region of the world is used. The ratio has increased from 5:1 in 1870 to 19:1 in 1998. There is, however, evidence of substantial convergence and divergence patterns across regions. In addition to income ratios Maddison uses income share as a second measure to compare regions of the world. The global GDP share of the Western off-shoots (US, Canada, Australia and New Zealand) increased from 10.2 per cent in 1870 to 30.6 per cent in 1950. It declined to 25.1 per cent in 1998. The Western Europe share of the global GDP decreased from 33.6 per cent to 20 per cent during the same period. Similar decrease was observed in the case of Latin America from 8.7 per cent to 2.5 per cent, while the Africa's share remained constant at around 3.0-3.5 per cent. The Asia's share declined prior to 1952 but it increased from 18.5 per cent in 1973 to 37.2 per cent in 1998. The Eastern Europe and the former USSR enjoyed a constant share of the world GDP in the range of 11-13 per cent until 1973. Thereafter this region experienced a decline from 12.9 per cent in 1973 to 5.3 per cent in 1998. It is to be noted that in the case of the GDP shares no correction for changes in the population size or the purchasing power parity is made. The decline

⁶ The WIID data originally contains 151 countries. The number of countries in our analysis differs due to the disintegration of the Soviet Union, Czechoslovakia and Yugoslavia, and reunification of Germany.

in the shares is reflecting negative relative changes in the shares in total and not necessarily declines in the absolute Global GDP levels.

Maddison's two measures only account for the level differences between regions. They neglect the distributional inequality within regions. Milanovic (2002) derives the world income or the expenditure distribution of individuals for 1988 and 1993 based on the household data from 91 countries and adjusted for PPP between countries. The data has a high coverage. It covers 84 per cent of the world population and 93 per cent of the world GDP. Inequality measured by Gini coefficient increased from 0.63 in 1988 to 0.66 in 1993⁷. The increase is attributed by 75-88 per cent to inter-country rather than intra-country differences in the mean income. The main contributors were from the rising urban-rural differences in China, the slow growth in the rural South Asia and the declining income in the transition countries. The estimated Gini coefficients in 1988 and 1993 by regions are: Africa 0.43 and 0.47, Asia 0.56 and 0.62, Latin America and Caribbean 0.57 and 0.56, Eastern Europe and USSR 0.26 and 0.46 and Western Europe, North America and Oceania 0.37 and 0.37, respectively. Despite the benefits concerning the high coverage and the disaggregation level of data, the period is short covering only late 80s and early 90s. Thus, the direction of changes might not be representative for the true long-run changes in the regional income inequality, but extreme observations, measurement errors, or differences in definitions and sources of income.

The data described above is extended in Milanovic (2001) to 126 countries over the last 50 years. Three different concepts of the world or international inequality are defined: the unweighted countries' GDP per capita, the population weighted GDPs per capita, and a combination of the international and internal country income distributions. Using the above concepts and based on income or expenditures calculated from household surveys, the world income distribution is derived. The unweighted measure shows an increasing global inequality over time driven by the development in Latin America, Eastern Europe and Africa. The population-weighted measure indicates a declining inequality driven mostly by China's fast growth during the last two decades. The increasing inequality by the third combined concept is attributed to the fast growth and the rising urban/rural differences in China, the slower growth in the rural Asia and the declining income in transition economies. The longer time period and better country coverage together with the adjustment for population by Milanovic improves the quality of analysis significantly.

Dikhanov and Ward (2002) using data from a sample of 46 countries for the period 1970 to 1999 find that the absolute number of the poor, broadly defined, increased and the global income distribution became less equal. The regional structure has undergone major changes during the period of the study reflecting the unprecedented economic performance of China and the economic progress in India. Despite the sample contains large countries like India and China and cover a period of significant development in those two countries, it is too small to serve as a basis for making an inference about the development of income distribution at the global level. The picture provided is partial rather than global.

Deininger and Squire (1998) used country data for 108 countries during 1960-1992 on distributions of income and land. Similar to Milanovic (2002) it is recommended that inequality analysis should preferably be based on the household data with a

⁷ The two periods of 1988 and 1993 are not exact. They cover surveys collected around those two periods.

comprehensive coverage of sources of income and being representative of population. Deininger and Squire showed that: there is a strong negative relationship between the initial inequality in land and the long-term growth. Inequality reduces income growth for the poor, and there is little support for the Kuznets hypothesis. Growth and inequality are affected by the redistribution of assets and the increased aggregate investment. A comparison of decadal medians of the Gini coefficient for the income distributions by regions during the period 1960-1990 demonstrates a large variation in inequality between regions. It is the highest in Latin America (0.50-0.53) and the sub-Saharan Africa (0.40-0.50) and lowest in Eastern Europe (0.22-0.29), but increasing over time during the transition period in the latter case.

Parker and Gardner (2002) used seven different approaches⁸ including three transition matrices and measures, three changes in raw incomes and one inequality reduction principle to measure the international income mobility. Income mobility analysis is concerned with measuring changes in the economic status of individuals and movements of their incomes over time. The measure based on the income inequality principle proposed by Shorrocks (1978b) uses the arithmetic mean incomes corresponding to two different periods. The results using GDP per capita from 106 countries divided into five regions⁹ for the years 1972, 1982 and 1992 indicate that 1982-1992 period to be more mobile than the 1972-1982 period. An increase in mobility counteracts the rise in the international income inequality. Mobility is characterised as small transitory movements and takes place in the middle deciles of the distribution. Tropical Africa is the next mobile region, but unlike the North region most of the observed income changes there were negative.

The interregional income inequality derived from the WIID where the sample countries (146) are divided into 9 regions is reported in Table 1 and the distribution of income by quintiles in Table 2. The results show a significant interregional heterogeneity. Here we define heterogeneity as the standard deviation of the Gini coefficient. The highest rate is found to be associated with the sub-Saharan Africa (10.05 per cent) and Middle East and North Africa (8.23 per cent), while a low dispersion is observed in South East Asia (5.87 per cent), South Asia (5.375), and Eastern Europe (5.06 per cent). The variation despite the comprehensive redistribution systems is unexpectedly high in the industrialised countries (7.90 per cent). The dispersion and ranges between minimum and maximum Gini values are highly correlated. Sub-Saharan Africa and Latin America again display the lowest levels of income (0.06 and 0.04) allocated to the first quintile of the population and the highest share to the highest quintile (0.52 and 0.54), respectively. With the exception of Eastern Europe and the former Soviet Republics, the variation in inequality within regions is stable or declining over time. South East Asia and South Asia show the least dispersion within region (see Figures 1-9). However, the development of inequality in Latin America, Eastern Europe and the former Soviet Republics show increasing trends post 1970s (see Figure 10).

⁸ The transition matrices and measures include Bartholomew (1982), Shorrocks (1978a) and Parker and Rougier (2001). The measures based on changes in raw incomes include King (1983), Fields and Ok (1996 and 1999). Finally the measure based on the inequality reduction principle is based on Shorrocks (1978b). For alternative mobility measures see also Zandvakili (1999).

⁹ The five regions are North (23), South (9), Tropical America (23), Tropical Asia (18) and Tropical Africa (33). The numbers in parenthesis are number of countries in each region.

To sum up there are a number of measures traditionally used in studies of the inter-regional income inequality. The ratio of income per head of the richest to the poorest region of the world is one such measure. The ratio has increased over time and results show evidence of both convergence and divergence among the regions. A second measure is the regions' GDP share of the global income. Different regions' share has developed differently over time. A third, measure is based on the Gini coefficient of income inequality. The focus is on its variations across regions and its regional development over time. Several studies indicate that the Gini coefficient has increased. A fourth measure is based on the development of the absolute number of poor. The number of poor has declined but its regional concentration has increased. Land distribution and redistribution of assets are a fifth measure of inequality. A sixth measure is based on income mobility that counteracts increasing income inequality. A seventh measure is computed based on the ratio of the regions highest to lowest quintile share of income.

Regardless of the chosen measure when applicable the transformation of income to PPP and its adjustment for the population size, the coverage in terms of the number of countries and their populations share are important factors affecting the development of the inter-regional inequality in the world. Several studies prefer the use of the household data with comprehensive coverage of income sources and representative population. Results based on WIID database show a large interregional heterogeneity in both the level and the development of income distribution and income inequality over time. The inequality in Latin America, Eastern Europe and the former Soviet Republics show increasing trends post 1970s.

4. INTRA-REGIONAL INCOME INEQUALITY

Intra-regional inequality refers to disparity in the income distribution within a geographical region consisting of a number of countries which may or may not be members of an economic union. Here we review a few recent studies on each geographical region. The regional classification differs from that used to group countries based on the WIID database or the classifications found in international data sources. Thus, the review here is based on a less standardized classification employed by individual researchers in the inequality literature to group countries into different regions. In many cases regions overlap or countries across two or more regions are compared to each other. We use the concepts of region, continent and sub-continent interchangeably. The regional income inequality within a selection of large countries is reviewed in Heshmati (2004d).

4.1 Eastern Europe and the former USSR

The transformation process of Eastern Europe from planned economies to market economies has been the focus of attention of many researchers. Milanovic (1998) is concerned with the social dimensions of the transition to market economies in the Central and the Eastern Europe and the former Soviet Union. The main emphasis is on the incidence of poverty in the transition economies. Here GDP per capita and the income inequality across the region are used as a backdrop to the poverty analysis. The state of inequality and poverty during the period before transition 1987-1993 is compared with the transition period during 1993-1996. Using data including 18 of the region's 27 countries it is shown that poverty has increased greatly across the region as

a result of the combined decline in real incomes and the increased income inequality. Nine countries were excluded because of the effects of shocks due to the internal and external military conflicts. Empirical results show that while the real incomes have declined across the region, inequality has not increased everywhere and homogeneously. The wage distribution and the failure in the welfare transfer system might have caused the increase in the income inequality. Milanovic and Yitzhaki (2001) using data from 22 transition economies for 1988 and 1999 found that 61 per cent of the overall inequality is associated with the within country inequality. The high and increasing within country inequality contrary to many studies, which expect a positive relationship between democracy and equality contradicts the existence of such relationship (Gradstein and Milanovic 2002). The WIID data show significant variations in the mean inequality over the region. The Russian Federation, Georgia and Kyrgyz Republics, Estonia and the republics that engaged in conflicts experienced a high inequality (see Table 3, Section 7).

A combination of a number of existing linear, log linear and reciprocal models to an exponential model proposed by Ram (1995) is used by Wan (2002) to analyse the relationship between income inequality and the growth in transition economies:

$$(1) \quad INEQ = (1 - \exp(-\beta_1 Y)) \exp(-\beta_2 Y) + \beta_3 Z + \beta_4 Z^2 + \varepsilon$$

where *INEQ* is measured by an indicator like the Gini coefficient, *Y* is level of development like *GDP* per capita, *Z* is some transformation variable (linear, logarithmic, or reciprocal) of the development, and ε a random error term. Using data on 24 transition economies Wan finds a positive inequality growth relationship. However, the results indicate that rising inequality is neither a part of the inevitable Kuznets curve, nor a part of the empirical regularity found by Barro (2000). Barro finds little overall relation between income inequality and the rates of growth and investment. Higher inequality tends to retard the growth in poor countries and encourages the growth in richer countries. In parallel to the rising inequality and the variation in the observed inequality levels in the transition economies spending on education has declined. Aghion and Commander (1999) simulate the effects of such education policy choices on the path of inequality over the transition. The Kuznets curve representation does not apply. They show how trade liberalization and technological and organizational changes affect the relative demand for types of labour resulting in an increase in inequality. Persistent of inequality is expected to depend on the pace of skill acquisition and on the evolution of the educational system. Policies raising the quality of education dampen the increase in wage inequality. For explanations of the observed increase in the between-group and the within-group wage inequality in the developed countries over the past thirty years in association with the transition to the new technological paradigm and the application of growth enhancing policies (in education and training) see Aghion (2002).

Ivaschenko (2002) investigates the causes of the unprecedented changes in the income distribution and the dramatic increase in the income inequality facing the transitional economies of Eastern Europe and the former Soviet Union in the 1990s. Panel data from 24 transitional countries for the period 1989-1998 is used in a regression analysis:

$$(2) \quad GINI_{it} = \beta_i + \sum_{j=1} X_{jit} + \varepsilon_{it}$$

The subscripts i , t , and j denote country, period and inequality determinant (X) variables. The aim is to identify and to estimate the impacts of a number of potential determinants of the rising inequality. These determinants are per capita GDP, economic liberalisation, privatisation and deindustrialization, hyperinflation, unemployment and the size of government consumption, civil conflict, political rights and civil liberties. Inequality is measured by the Gini coefficient obtained from the WIID. In the base model specification variations in the Gini coefficient is explained by its determinants including per capita GDP, its square, inflation rate, unemployment rate, the general government consumption, industry value added as percentage of GDP, and the private sector share of GDP. The results support a U-shaped relationship between income inequality and per capita GDP. The relationship between income inequality and growth is positive for the Eastern Europe and negative for the former Soviet Union republics. Hyperinflation, civil conflict and unemployment increase inequality. Economic liberalisation, privatisation and deindustrialization have also contributed to the rise in income inequality. Alexeev and Leitzel (2001) demonstrate that the state-sector queue rationing and price controls are preferable to the imperfectly targeted income subsidies in providing a social-safety net to counteract the rapid changes in the relative well being during transition.

In examining the problem of ensuring health-care coverage to rural and poor areas of the developing countries Luttmer (2001) decomposes the total income into transitory and persistent components. Luttmer measured income as a monthly consumption expenditure or an income adjusted for the household size using an equivalent scale. The aim is to distinguish the underlying income inequality and changes in poverty from the effects due to measurement error or transitory shocks:

$$(3) \quad C_{it} = C_{it}^* + \varepsilon_{it} = (C_{i,t-1}^* + \alpha_t + \eta_{it}) + \varepsilon_{it}$$

where the log consumption expenditure (C) of individuals over time is function of the underlying level of consumption (C^*), a transitory shock possibly including measurement error (ε), a time-specific trend (α), a term representing persistent shocks (η), and i is individual and t time period. The empirical analysis is based on the household level data from Poland 1993-1996 and Russia 1994-1998. The results show that accounting for noise in the data reduces the inequality measured as Gini coefficient by 10-15 per cent. About half of the median absolute annual changes in income or spending in Poland (20 per cent) and in Russia (50 per cent) reflect measurement error or transitory shocks. Thus suggesting that the underlying levels of income and spending are more stable than the data suggests. The high levels of economic mobility were found to be largely driven by transitory events and noisy data. Around 80 per cent of the poor in these two countries remain in poverty for at least one year. One possible way of reducing the negative role of the transitory events and measurement error, which get averaged out over the year is to examine the inequality in average incomes¹⁰.

Results based on the WIID database suggest that the dynamics of inequality in the transition economies is characterised by an increasing inequality and a large variation in inequality levels across transition countries. Prior to 1985 the range of inequality was quite small. Both the mean and the range between countries increased substantially (see Figures 7 and 8). The increase and dispersion is much higher for the former Soviet

¹⁰ Here average incomes are based on the current month, and the last 12, 24 and 36 months ago.

republics (7.06 and 34.70) than the Eastern Europe (5.06 and 28.91). The dispersion numbers in parenthesis are the standard deviation and ranges of income inequality measured as the Gini coefficient. The standard deviation and ranges of inequality over time is the highest for the Russian Federation (7.64 and 19.71) among the East European countries and the lowest for Macedonian (1.68 and 4.55). In the case of the former Soviet republics the highest dispersion is associated with Georgia (12.87 and 32.80) and the lowest to Tajikistan (3.34 and 8.20). For more details on individual countries see Table 3, Sections 7 and 8.

The discussion above can be summarized as the path of inequality over the transition is explained by the differences in the initial conditions, the countries subsequent policy choices and key variables like ownership and restructuring programmes. Empirical result does not support the Kuznets curve for the transition economies, but confirms the association between inequality and growth. The analysis is extended to look at how trade liberalisation, technological and organisational change affects the relative demand for labour resulting in the rising inequality. Labour market policies, improved institutional capacities for taxation and redistribution and policies aimed at rising quality of education by rising adaptability are expected to dampen the increase in income inequality.

4.2 Scandinavian

The high quality, comparable and comprehensive household surveys and various public service registers in Scandinavia have been accessible to researchers. The excellent data situation together with the need for the evaluation of impacts of decades of tax and benefit reforms on labour supply, welfare and the inequality between and within different income groups have resulted in many single or cross-Scandinavian income distribution studies (e.g. Aronsson and Palme 1998, Fellman, Jäntti and Lambert 1999, and Maasoumi and Heshmati 2000). A few of such recent studies will be reviewed below.

A two-way causal relationship between income mobility and income inequality can be expected. Shorrocks (1978a) introduced as an alternative to the transition matrix approach a family of mobility measures that incorporates the relationship between mobility and inequality. Mobility is measured as the relative reduction in the weighted average of a single-year inequality when the accounting period is extended. The opposite state of no mobility is defined to occur when the relative income or rankings of individuals are constant over time. Aaberge et al. (2002) compare the income inequality and the income mobility based on household data in the Scandinavian (Denmark, Norway and Sweden) countries and the US during 1980s. In a somewhat modified version of the approach proposed by Shorrocks income mobility (M) is defined as function of the Gini coefficient and the overall mean (μ) and the means of the distribution of income in different years (μ_t):

$$(4) \quad M = 1 - \frac{GINI}{\sum_{t=1}^T (\mu_t / \mu) GINI_t}$$

Income is measured as earnings, market income and disposable income. The results demonstrate that inequality is greater in the US and that the ranking of the countries by degree of inequality remains stable when the comparison period is extended to up to 11

years, 1980-1990. The period average income inequality is for Denmark 0.22, Norway 0.26, Sweden 0.23 and the US 0.34. The US has the highest mobility for earnings and disposable income, while Sweden seems to be the most income mobile country for market income in the sample. However, the results suggest that there is no evidence of a positive relationship between inequality and mobility.

Several country studies focus on the distributional impacts of various policies on the welfare of sub-groups. Björklund and Palme (1997) decomposed the overall income inequality over 18 years into two parts: one showing the inequality of long-run (permanent) income, and a second showing the variability of individual income over time. A welfare state affects both components, but the equalising impact on income of the group with a low long-run income is higher. Fellman, Jäntti and Lambert (1999) by decomposition techniques use inequality impact of optimal policy as a yardstick to gauge the effectiveness of tax and benefit policies in reducing inequality in Finland 1971-1990. In comparison with the distribution of incomes of single immigrants and Swedes by various attributes Maasoumi and Heshmati (2000) find that welfare policies favour the elderly, females, larger families, and immigrants with longer periods of residency. The higher the educational credentials, the higher is the burden of these equalisation policies.

The evolution of the income distribution of a small number of developed countries during two centuries is analysed by Morrisson (2000). The use of long time series data rather than cross sections is preferred to test the Kuznets inverse U-curve hypothesis. Data from the Scandinavian countries (Denmark, Sweden, Finland and Norway), Netherlands, Germany and France is used for the purpose. The inverse U-curve hypothesis is verified in four (France, Sweden, Germany, and Finland) cases. Using the Theil inequality indicator:

$$(5) \quad T = T_B + T_W = T_B + s_1 T_1 + s_2 T_2$$

is decomposed into between (T_B) and within (T_W) agricultural (T_1) and non-agricultural (T_2) sectors in each country. The variable s indicates the shares of two sectors in the total income. Political (the two World Wars and French revolution) and economic (taxes and transfers and government interventions) factors explaining the long-term evolution of distribution are discussed. The economic factors playing a key role to the evolution of the income distribution are found to be the market structures, the diffusion of education and saving, and dualism.

The concept of convergence in inequality (Benabou 1996) follows the conditional convergence of per capita incomes (Mankiew, Romer and Weil 1992). Iacoviello (1998) using LIS data including Denmark, Finland, Norway and Sweden investigates whether inequality converge to a steady state level of inequality during the process of income growth. In addition Iacoviello studies the linkage between the income and inequality movements, the factor influencing this growth process, as well as the reverse causation from the Gini income inequality to growth. The post-tax Gini coefficient during the country specific periods covering 1965-1993 is used to measure income inequality. Results show that the shocks to income can yield short run effects on the income distribution. However, a reversal link from inequality to income was not observed.

The pre tax and transfer income inequality among the Scandinavian countries is increasing. Analysis of the WIID data shows that the mean inequality is highest in

Sweden (38.14 per cent) and the lowest in Finland (29.33 per cent). The corresponding for Denmark and Norway are 34.04 per cent and 30.74 per cent, respectively. The dispersion measured as standard deviation and range is the highest for Sweden (12.36 and 35.63) and the lowest for Norway (5.07 and 16.47). The distribution at the tails is however different and more equal in Finland and Sweden (see Section 9 of Tables 3 and 4).

4.3 Western Europe

The West European region is the single region most intensely studied at different levels of aggregation when income distribution is concerned. Ritakallio (2001) studies the trends in the income inequality and poverty and the effectiveness of income transfer systems between 1980 and 1995 in nine countries in Western Europe, US and Canada. These countries represent three¹¹ different ideal types of social policy or welfare state models: mean testing (UK, Canada and USA), corporatist (Netherlands, France and Germany) and institutional models (Norway, Finland and Sweden). The empirical analysis is based on LIS database containing the national household annual income (earnings, transfers and income from capital and employment) survey data. The LIS data is found to be a reliable starting point for the comparison of welfare states and their social policy. Comparisons by Rotakallio are made at three levels: between the population sub-groups, between points of time, and between the countries or the welfare state models. The analysis of inequality and poverty produced similar picture of the differences across the countries and the models of social policy. Income inequality measured as the Gini coefficient for earnings is increasing over time. However, the income inequality for disposable income in the Nordic countries and Canada has not increased over time, while the USA and the UK represent the opposite developments of disposable income. The countries are found to be different in their effectiveness in reducing poverty and income inequality using income transfer measures. Here poverty is defined using the relative income method where poverty line is both country and time specific. Poverty line is defined as half of the per capita median annual income. Poverty rates (share of the poor in the whole population) and poverty profiles (share of the poor in each population category) for the total population and disaggregated by household type, number of children, age and labour participation show a large heterogeneity among the population sub-groups and the countries.

Belbo and Knaus (2001) propose an aggregate measure of inequality for the founding¹² countries of the European Monetary Union. The comparison is based on the distribution of the total annual household income after taxes and transfer payments from the European Community Household Panel and LIS in 1994. The Theil inequality index (T1) is used here and inequality is decomposed into the between and the within components for different household types within Euroland:

$$(6) \quad T = T_W + T_B = \sum_{k=1}^K s_k \left(\frac{1}{N} \sum_{i=1}^N (y_i / \mu) \ln(y_i / \mu) \right) + \sum_{k=1}^K s_k \ln(\mu_k / \mu)$$

¹¹ A fourth type of social policy or welfare state model is the basic security model.

¹² The founding countries of the European Monetary Union are: Austria, Belgium, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain.

where y_i is income of individual i , s_k is the share of total income of sub-group k , μ and μ_k are the mean income of the population (N) and sub-group k . The population sub-groups are defined based on age and the number of children in each household. Using sub-group shares of the total income determine each country's as well as each group's contribution to the overall income inequality. Results show that the between country differences make up 9 per cent of the overall inequality indicating large differences in mean income levels across Euro countries. Social transfer payments contribute positively to the between country inequality differences and the between-household differences make up 2 per cent of the total inequality indicating a homogenous distribution of income across demographic groups.

The overall changes that result when integrating new countries into the existing entity is decomposed by Belbo and Knaus into four effects: the direct inequality effect, the between group or the mean income effect, and the re-weighting the within and between inequality effects. The decomposition in above allows the assessment of the contribution of each member states or demographic groups to the overall inequality. The results show that the Theil inequality ranges from a minimum of 0.15 (the Netherlands) to a maximum of 0.24 (Portugal) and the average for Euroland has a value of 0.18. The between country post (pre) social transfer payments make up a 9 (3) percent of the overall inequality and responsible for the overall inequality than the differences between household types. They find great disparities within and between the economic situations of the different demographic groups across the countries. A common social policy should target to reduce the within specific household inequality. An expansion of the Union to other members (Greece, the UK and Denmark) increases inequality from 0.18 to 0.19.

Heady, Mitrakos and Tsakloglou (2001) in their analysis of the comparative effects of social policy on inequality using the European Community household data found increasing distributional impacts of transfers and their share of GDP. The extent of means testing, the distribution of different funds and the degree of targeting for each transfer also affect their effectiveness.

Economic globalization, domestic politics and income inequality in 14 developed countries using LIS data is studied by Mahler (2001). The results show little evidence of a systematic relationship between economic globalization and either of the distribution of disposable income or the earnings of households. Integration into the world economy does not systematically lead to an inegalitarian distribution of income or earnings across the entire economies. Politics continues to play a critical role in determining distributive outcomes in these countries. Economic globalization is found to be compatible with a wide variety of political interactions leading to a wide range of distributive outcomes.

As mentioned previously Iacoviello (1998) using the LIS data from eight continental European countries investigates whether inequality converges to a steady state level of inequality during the process of economic growth, the linkage between income and inequality movements, factors influencing this growth process, reverse causation from Gini coefficient to growth and its consequences concerning the simultaneity bias. Results show that shocks to income can yield short run dynamics in the income distribution, while the reverse link is not well supported by the LIS data. Quah (1996) argue that physical location and geographical spillovers matter more than national

macro factors to the observed distribution dynamics across the European regions. However, both factors are important for explaining the inequality dynamics.

In sum several studies analysing the distribution of income among the West European countries are based on LIS database. In comparison with other data sources LIS is a reliable database for the comparison of welfare states and their social policy. It allows comparison at different levels like between and within population sub-groups, between and within countries and also over time. Differences in welfare models make the countries to differ in their effectiveness in reducing poverty and inequality using taxes and income transfer measures. Therefore despite a high degree of homogeneity there are still significant variations in the levels of the inequality within and between the different population sub-groups and across the West European countries.

Our results based on the WIID database show that the between country inequality in the industrialised countries region is relatively high but the patterns of inequality over time is relatively stable. However, there is a negative trend in the mean inequality between 1955 and 1985 followed by a positive trend post 1985 (see Figure 9). This is valid when both population-weighted and unweighted averages are considered. During post 1975 the inequality is converging in the West European region. The countries differ mainly in the distribution where the US tops the list among industrialised countries with a Q5/Q1 ratio of 9.17, compared to for instance Luxembourg with a low ratio of 2.98 (see Section 9 of Tables 3 and 4).

4.4 OECD countries

Most of the OECD countries are already covered in previous 3 sections. The inclusion of a separate section for the OECD countries and label it as a region is simply due to the fact that several empirical studies investigate the income distribution among the OECD countries a group. Despite the risk of certain level of overlapping a short review of the findings in the literature follows.

Gottschalk and Smeeding (2000) study the income inequality in the OECD. Availability of the LIS-data and the improved cross-national comparability has made it possible to produce some consistent patterns and provide answers to concerns about the growing inequality in income, earnings and wealth amongst the OECD countries. The range of income inequality is very wide. Absolute and relative comparisons show a higher level of inequality in the US. Income inequality has been steadily increasing in the mid-1980s through mid-1990s. The increased inequality in several countries offset the equality gains made in the 1960s and 1970s.

Duro and Esteban (EL 1998) present a decomposition of the Theil index of inequality into four components:

$$(7) \quad T = T^y + T^e + T^a + T^w = \sum_{i=1}^N s_i \ln \left(\frac{\mu^4}{x_i^y \times x_i^e \times x_i^a \times x_i^w} \right) = \sum_{i=1}^N s_i \ln(\mu / x_i)$$

where the components are productivity per employee worker (y), the employment rate (e), the active over working age population rate (a), and the active over total population rate (w). It is applied to 23 OECD country's data. The s_i is the share of country i in the world population and x_i per capita income of sub-groups. The results suggest that there is a rise in the international inequality between 1960 and 1975 and a decline thereafter

until 1989. About one third of the inequality is attributed to factors other than productivity differentials. Inequalities in unemployment rates play an increasing role indicating a high degree of sensitivity of the local economies to sector-specific shocks. The results based on the Penn World Tables and OECD Labour Force Statistics give a somewhat different picture than those of Gottschalk and Smeeding. Data sources and decomposition of inequality may explain the differences. The factorial decomposition proposed by Duro and Esteban is extended by Georlich-Gisbert (2001) and is applied to a set of 23 OECD countries for the period 1962-1993. Here instead of population share income share is used. All factors are found to contribute significantly to the income inequality.

Real wages and living standards have converged among the OECD countries between 1850 and 1910. Part of this convergence in real wages and GDP per worker or GDP per capita has been due to the mass migration. The mass migration from countries with low real wages and low GDP per worker to receiving countries with a higher wages and GDP per capita were an important equalising effect on world incomes (Lindert and Williamson 2001). Migration barriers, new barriers to trade and capital flow post 1929 have widened the international income gap. The differences in activity rates, unemployment, the working age population and the inequality in productivities affect the overall inequality. The overall cross-country inequality is lower within the 23 OECD countries compared with the worldwide level.

As mentioned in Duro and Esteban (1998) inequalities in unemployment rates play an increasing role indicating a high degree of sensitivity of the local economies to specialization in production and the effects of sector-specific shocks. For example the negative relationship between wages and unemployment at the regional level within Germany is discussed in Pannenberg and Schwarze (2000). The aim is to link inequality with the difference in the level of unemployment in the East and West regions of Germany. Parikh (2002) examines the interregional labour mobility, inequality and wage convergence after the reunification between 16 regions of the East and West Germany for the period 1992-1995. The relationship between income inequality and the migration of skilled workers did not turn out to be strong.

The median voter¹³ will in the more unequal societies relatively be poorer because his/her factor gross and disposable incomes are lower in relation to the mean income. The more unequal the distribution of income is, if net transfer is positive, the more a median voter gains through tax and transfer policy, the more probable he/she votes for higher taxes and transfers, and the more unequal societies choose a greater redistribution. Given the expectations above Milanovic (2000) study the median voter hypothesis, income inequality and income distribution based on the LIS household budget survey data. The data covers 24 democracies observed 1 to 7 years in 1980s and 1990s. The results strongly support the conclusion that countries with a greater inequality of the factor income redistribute more to the poor, but it only weakly describes the collective choice mechanism. The bottom half receives 19.4 per cent of the factor income, while it receives 32.1 per cent of the post taxes and the transfers income. The gain of the bottom quintile and bottom half of the factor income distribution are 9.75 per cent and 12.44 per cent, respectively. The average Gini

¹³ Median voter is defined as an individual with the median level of income. For further discussion of inequality, median voter hypothesis and redistribution see also Lee and Roemer (1999).

coefficient among the 24 countries reduces from 0.46 to 0.32. The reduction in Gini coefficient differs by income definition, country and over time. The largest inequality reduction is in Belgium (23-28 per cent) and Sweden (20-24 per cent) and the lowest in Taiwan (less than 1 per cent). Riphahn (2001) in studying the social assistance take-up in Germany shows that more than half of all households eligible for transfers under the German social assistance program did not claim their benefits. It seems as in the case of the natural rate of unemployment there is a natural rate of poverty that can't be eliminated using transfers. Therefore the possible reductions in the Gini coefficient by accounting for non-claimed benefit transfers could be much larger.

Jäntti (1997) also uses the LIS data to examine levels and trends in the income inequality in five OECD countries¹⁴ in the 1980s. A number of decomposition methods are discussed to decompose the level of income inequality and the changes in the income inequality into between and within components by nine income sources¹⁵ and a number of population groups¹⁶. Two methods, the squared coefficient of variation (CV^2) and the mean logarithmic deviation (MLD), are chosen to estimate each component's share in their contribution to the overall inequality, and compare the changes across years:

$$(8) \quad CV^2 = \sum_k \rho_k CV_k CV(\mu_k / \mu)$$

$$(9) \quad MLD = \sum_j v_j MLD_j + v_j \log(1 / \lambda_j)$$

where CV is the coefficient of variation, ρ_k is the correlation coefficient between population and sub-group income, y and y_k , $v_j = N_j / N$ is the population share and $\lambda_j = \mu_j / \mu$ is the relative income for j th sub-group, j and k are sub-group and income components. The annualised changes in terms of the percentage changes in each component's contribution calculated. Results show that inequality increased in Sweden, the UK and US, but it did not increase in Canada and the Netherlands. Changes are mainly associated with the changes in the labour earnings. Increased the inequality of head of the household's earning and the increased share of spouse's earnings in the family income account for much of the observed income inequality. Demographic shifts are given a minor role in increasing inequality, while taxes and transfers are responsible for a decreasing effect on income inequality. The marginal impacts of various income sources on the overall income inequality applied to the US income distribution is also analysed by Lerman and Yitzhaki (1985):

$$(10) \quad G = \sum_{k=1}^K \rho_k G_k S_k$$

¹⁴ The countries and periods include Canada 1981 and 1987, Netherlands 1983 and 1987, Sweden 1981 and 1987, UK 1979 and 1986 and USA 1979 and 1986. Income is measured as household disposable equivalent income.

¹⁵ The nine income sources are: earnings of head, earnings of spouse, self-employment, property income, other private, social insurance, means-tested, income taxes, and payroll taxes.

¹⁶ The population groups are: partitions by family structure (single person, married couple with no children, single parent, and married couple with children), by age groups (less than 20, 20-24, 25-29, and so on), and by the number of income earners (0, 1, 2, and 3 earners).

where each source's (k) contribution is viewed as the product of the source's own within-group Gini coefficient (G_k), its share of the total income (s_k), and its correlation with the rank of the total income (ρ_k). The results indicate that the marginal effect of the spouse's earnings exceeded the marginal effects of the capital income.

Atkinson (2000) has examined the redistributive impacts of the government budget in six OECD countries (the UK, Canada, West Germany, Finland, Sweden and the US) over the period from 1980 to the mid-1990s. All countries experienced rise in inequality of market income but differed both across countries and over time with regards to the distribution of the disposable income. In reviewing the actual government policy responses by taking unemployment benefits and personal income taxation as case studies, the changes to policy parameters differed in extent and even in direction. However, no clear pattern was found in the nature of the relationship between inequality and redistribution. Atkinson and Brandolini (2001) compare four secondary data sets on income distribution covering the 40s until 70s. A number of OECD countries are used to illustrate the impacts of various factors on the outcome of inequality comparison. They suggest alternative ways to deal with the differences in the definition across countries or across time.

Results based on the LIS-data with improved cross-national comparability show growing income inequality amongst the OECD countries since mid-1980s. The range is wide indicating a significant inequality between countries. The redistributive policies in form of taxes and transfers have reduced the negative impacts of high unemployment, the wage inequality and the within country market income inequality resulting in a more equal distribution of the disposable income. Integration of economies, local specialization and sector-specific shocks if resulting in persistent unemployment increase the inequality among countries and the population sub-groups.

As previously mentioned results based on the WIID database show that the between country inequality in the OECD (labelled as industrialised) countries is relatively high but the patterns of inequality over time compared to other regions is less volatile. Many studies point to a positive relationship between democracy and equality, but the transition experience of the East European countries seems to go against this conclusion (Gradstein and Milanovic 2002). There is a negative trend in the mean inequality between 1955 and 1985 followed by a positive trend post 1985 (see Figure 9). During post 1975 the inequality is converging in the West European region. For detailed information on individual countries see Section 9 of Tables 3 and 4.

4.5 Small and medium sized developing countries

The relationship between inequality and growth or inequality and development is studied extensively to quantify the impacts of macroeconomic variables (see Alesina and Rodrik 1994; Person and Tabellini 1994). Bourguignon and Morrisson (1998) suggest an empirical approach to the relationship between inequality, as observed in microeconomic data, and development-related macroeconomic variables. Major determinants of country differences in income distribution previously ignored in the literature concerning the dualistic nature of developing countries and the nature of the agricultural sector. Data from 38 developing countries around 1970s is used by Bourguignon and Morrisson for this purpose. Income distribution data comprises various combinations of income shares and the determinant variables are GDP per

capita, GDP share of agriculture, schooling, exports, income source, cultivated land, and the relative labour productivity of agriculture/non-agriculture. The result is robust with respect to the composition of the sample, the observation period and the inclusion of country-specific fixed effects. The results suggest that the increasing level of productivity in agriculture can serve as an important measure to reduce inequality and poverty in the developing countries. However, the important role of the growing service sector at the cost of agriculture and manufacturing as a source of employment and infrastructure for development and equality should not be ignored.

4.6 Sub-Saharan Africa

Several studies based on income or expenditures calculated from household surveys studying the world income distribution show increasing global inequality over time driven by the development in Latin America, Eastern Europe and Africa. Africa has been a single diverging region when growth, equality and poverty reduction is concerned. Svedborg (2002) in his survey of the measurement and results from the cross-country income distribution studies points to a number of limitations with Gini coefficient and similar measurements. He concludes that the relative differences in income between the richest and the poorest countries (located in Africa) have increased since the 1960s, but the distribution of income across countries has remained unchanged. The initially poorest (African) countries have continued to become more impoverished relative to other countries. Their future development will depend on economic growth and the relative population growth in the region. Despite its importance to the global distribution, it has not been possible to trace relevant studies based on household data comparing the income inequality among multiple African countries and over time.¹⁷ In the absence of such multi-country studies in the following briefly we review a number of single country studies.

The average income per capita in Africa is the lowest among the continents. Milanovic and Yitzhaki (2001) find the overall inequality quite high, with the average Gini coefficient equal to 52.1 per cent in around 1988 and 1993. The between and within country inequality components of the world inequality are 20.3 (39 per cent) and 33.3 (61 per cent), respectively. The numbers in parentheses are the components' shares of the overall inequality. Unlike the global level and despite the significant heterogeneity at the continent level among the 27 African countries studied by Milanovic and Yitzhaki, the between country component is relatively low.

Turning to the individual country level, the extremely high inequality of South Africa has often been explained by the racial legacy. Leibbrandt and Woolard (2001) present evidence that the between race contribution to inequality has declined from a contribution of 62 per cent in 1975 to 33 per cent in 1996, although the within each race group inequality widened from 38 per cent in 1975 to 67 per cent in 1996. As shown, the empirical results suggest trade off between the between race and the within race inequality components. In the decomposition of inequality by income source (Liebrandt, Woolard and Woolard 2000) using data from the rural former homelands of South

¹⁷ For a comprehensive study of poverty comparisons over time and across countries in Africa, see Sahn and Stifel (2000). For empirical analysis various household attributes using demographic and health surveys conducted during 1986-1998 covering 12 countries are used in factor analysis to compute a wealth index based on assets. The index is used to compare intertemporal and intraregional poverty. The results show declines in poverty in the previous decade in rural areas. The improvements are largely due to the increased economic openness and removal of distortions that discriminate against rural areas.

Africa reveals that wage income is both the most important income component and also the most important source of inequality. Policy induced changes to wage income will have major impacts on inequality in the rural areas.

Another empirical picture of the changing racial dimensions of income inequality and the changing inequality patterns in South Africa linked to labour market is provided by Whiteford and Seventer (2000). They used the Theil index decomposition method to decompose the overall inequality into (urban and rural) sectors, different sub-groups, and income sources. The racially rigged labour market is the underlying key force changing the inequality patterns across and within racial groups. The link between the labour market access, the market wage variation and the household inequality is investigated. The results suggest the existence of complex patterns of inequality generation. It confirms the dominance of labour market in deriving the total inequality but finds the contribution of the wage income low and uneven.

Despite the important role of the labour market and wages, Whiteford and Seventer find evidence of a less income mobility between 1993 and 1998 at the top and the bottom of the distribution than in the middle for sample of African households in Kwazulu-Natal. They attempt to identify the key determinants of this mobility using a series of profiles and also a multivariate model of the real income changes. The proposed model explains changes in the log household income adjusted for adult equivalent household size by asset and the set of characteristics of the economic environment in which households are operating. Unemployment and demographic changes are other important variables explaining changes in income per adult equivalent. Leibbrandt, Woolard and Woolard (2000) find that wage income is an important source driving the inter-household inequality and the poverty in the rural former homelands of South Africa. For other similar studies decomposing the income inequality by income sources see Lerman and Yitzhaki (1985), Haddad and Kanbur (1997), and Jänttio (1997).

The distribution of earnings in the rural Ghana and Uganda examined by Caragarajah, Newman and Bhattamishra (2001) show major differences by gender and types of income. The non-farm earnings mainly in form of self-employment income contributes to the inequality, but also affects positively the lower income groups earnings. Wage income reduces inequality. The inequality impact of self-employment is higher among households headed by female. The non-farm sector is an alternative activity to agriculture and determinants of the non-farm income are related to location, education, age, and the regional characteristics like distance to market. The rural economy in both countries is lacking in many basic functional capacities, most notably infrastructure, which limits the degree and returns to the rural diversification.

In sum very few comprehensive multi-country studies of income inequality among the sub-Saharan African countries can be found in the inequality literature. The existing studies show different patterns in the within and between country inequality components compared to those of the global levels. Despite the heterogeneous income levels and development among African countries, the within country inequality is much higher than the between country component. Even though extreme observations probably due to data problem cause a large dispersion in inequality among the countries and over time. Several country-level studies point to the importance of racial factor, labour market, gender, sectoral and infrastructure to the within country income

inequality. In particular the heterogeneous contribution of the different income sources to the overall income inequality is emphasized.

Analysis of the WIID data shows an increasing income inequality among the sub-Saharan countries. The mean inequality is the highest in Kenya (60.69 per cent) and Swaziland (62.30 per cent) and the lowest in Rwanda (28.90 per cent) and Togo (33.80 per cent). However, these inequality numbers represent extreme cases which are based on only 1 or 2 observations. Most African countries are observed only few periods. The mean inequality based on more than 10 observations lie in the interval 43.20-60.69 per cent indicating a relatively high and stable inequality. The overall mean is 49.26 per cent with standard deviation of 10.05 per cent together with a range of inequality up to 35.99 per cent (Zambia) indicate a relatively high and persistent level of income inequality in the region. This is confirmed by the high $Q5/Q1$ ratio as well. The sample mean $Q5/Q1$ ratio is 8.21. It varies in the interval 4.53 (Niger) and 25.89 (Sierra Leone). For more details see Section 6 of Tables 3 and 4 and Figure 6.

4.7 Latin America

In analysing poverty and inequality in Latin America and the Caribbean LondoNo and Szekely (2000) divide the period 1970-1995 into three stages. The 70s is characterized by macroeconomic stability and high growth rates, the 80s by volatility and stagnation, while the first half of 90s as a return to more stable environment and positive growth rates. Using data covering 13 countries LondoNo and Szekely show that poverty and inequality have not declined in the spite of recovery in 1990s. There are differences in levels between countries, but inequality and poverty follow similar trends. The aggregate inequality and poverty reduced in 70s, deteriorated during the 80s but remained high in 90s. The lower tail of the distribution has not benefited from growth indicating lack of a distributive progress. The within country inequality has not been stable. The analysis of inequality at the individual level in the region indicates 25% excess inequality. Inequality is found to be the source of the lack of progress in poverty reduction in the region. Wood (1997) argues that unlike the experience in the East Asia, openness to trade has widened the wage inequality in Latin America. Wood suggests that the conflict of evidence is probably the result of differences between the 1960s and the 1980 (the entry of China into the world market) and the advent of new technology biased against unskilled workers, rather than differences between the two regions. Wood and Ridao-Caso (1999) analysis of data on 90 countries during 1960-1990 indicate that a greater openness tends to cause the divergence of level of education and enrolment rate between countries.

Milanovic and Yitzhaki (2001) find the overall global inequality high, with the average Gini coefficient equal to 0.555 in around 1988 and 1993. The between and the within country inequality components are 0.041 (7 per cent) and 0.514 (93 per cent), respectively. Due to the high level of homogeneity among the Latin American countries at the continental level, the 19 Latin American countries are distinguished by a very high within country inequality. Several countries are identified as potentially unstable countries (Gini coefficient exceeding 0.50).

Since there are not many empirical studies covering multiple of the Latin American countries, we rely to a larger extent on single country studies to review the literature on the income inequality across Latin America and over time. One such study is by Birchenall (2001) who used the Colombian data from 1983 to 1990 to show that the

polarisation of income is the variable most strongly and dynamically correlated with income inequality and GDP growth. In another study, changes in the shape of the Brazilian income distribution during 1981 to 1990 using micro data is examined by Cowell, Ferreira and Litchfield (1998). It is shown that the income inequality and the average real incomes increased. They examine the difficulties in modelling the shape of the income distribution due to the highly skewed nature of the distribution of Brazilian income. The results show that inequality in general and amongst the very rich in particular increased during the 1980s. A logarithmic transformation of income gave satisfactory result. The inequality in Brazil is explained by the differences between households of different types, different levels of education, and other spatial differences. Changes in inequality over time can be explained by the high rate of inflation.

In similarity with the sub-Saharan African countries, the Latin American countries also are distinguished by a higher within country inequality than the between country inequality. The polarisation of income and the high rate of inflation explain the high level and the undesirable development of inequality over time in the region. Nine out of the 26 Latin American countries included in the WIID database have an average inequality rate higher than 50 per cent (see Section 5 of Table 3). The mean income inequality in the region is 47.39 and a small standard deviation of 7.47. The range is quite high, 40.83. Honduras is the most unequal (55.57), while Cuba is the most equal (35.06) country in the region. The inequality has increased fastest in Paraguay and the $Q1/Q1$ ratio is after Brazil (21.88) the second highest (20.80) ratio. For more details see also Section 5 of Table 4. The dispersion in inequality is declining over time indicating a process of convergence in inequality. However the convergence is towards a higher level of inequality (see Figure 5).

4.8 East Asia, South Asia, South-East Asia and Pacific

As in the case of the African and the Latin American countries, it has not been possible to trace studies based on household data comparing income inequality among multiple of the East and the South-East Asian countries. In the following we briefly review available mainly single country studies.

Warr (2001) has studied the incidence of poverty and inequality in Thailand using household and population data for the period of 1988-1999. The poverty and inequality results in a regional perspective indicate that inequality is increased post 1997. There was a 21.4 per cent decline in the percentage of poor, from 32.6 per cent to 11.2 per cent, prior to the economic crisis of 1997, but the poverty rate again increased during the post crisis period to 15.9 per cent in 1999. Inequality is measured by the Gini coefficient and the ratio of the highest to the lowest quintile income shares using both household and individual as the unit of observation. In the later case Warr accounts for the gender and ages of household members to reflect their needs. In comparison with the need-based measure, the unweighted household measure underestimates the inequality, but the two measures move closely together over time.

Despite the major reduction in poverty rate, Thailand has failed to reduce the widening gaps between individuals, areas and regions predominately the Northern region. Droughts in the dry season, the floods in the wet season, lack of support from the central government, large sized household, employment patterns, low educational attainment, limited access to credit, and inadequate rural-urban linkage are among the underlying causes of poverty (Hossain 2001). Hossain focuses on the income poverty

and inequality in the Northern region and suggests some employment, income and equality policy measures to mitigate regional as well as rural-urban disparities in Thailand. Cameron (2000b) also finds changes in the income distribution in Java being related to the ageing of population, educational attainment and agricultural/industrial structure. Unexpectedly, there is little evidence that economic crisis has had a large, systematic and negative impact on the well-being of children in Indonesia (Cameron 2000b).

Several East Asian economies tried to couple economic growth with reductions in poverty and income disparity. The economic crisis of 1997 has deteriorated these prospects. Analysis of the relationship between growth, inequality and poverty in nine countries in the East Asia and the Pacific region¹⁸ is summarised by Kakwani and Krongkaew (2000). The individual study results are published in a special issue of the *Journal of the Asia Pacific Economy* 2000, Volume 5(1/2). In the Australian case the focus on the taxes and transfers and on the growth rates of the various income components rather than on the growth rate of the total income as of the other countries. The distribution of income has remained relatively equal in Japan despite the changes in the welfare post the World War II. The regional income distribution in Korea has been very egalitarian and affected by the domination of the political and the military leaders. The increasing development of the income disparity in Taiwan is related to the industrial transformation and changes in the factor intensity of production.

It is widely believed that the East Asian economies performed exceptionally well both in generating growth and in keeping income inequality low. You (1998) investigated the income distribution in East Asia and found that only Japan, Korea and Taiwan enjoy low inequality. However, in general the East Asian countries have been successful in translating high profit shares into high savings and investment rates. The high profits and the low inequality have resulted in an even distribution of wealth. Bourguignon, Fournier and Gurgand (2001) applied a decomposition method to isolate the impact of the changes in earnings structure, labour-force participation behaviour, and the socio-demographic structure of the population on stability of the income distribution in Taiwan during 1979-1994. Wage structure, changes in female labour force participation, educational structure and changes in composition of household have in different ways served both as deriving and off-setting forces to the inequality changes.

Based on the WIID database, the mean income inequality in the East Asian region is quite low, 33.67. It is the highest in Hongkong (44.65) but the lowest in China (29.35). Inequality has declined in Mongolia, but it increased in China over time. The mean income inequality in the South Asian region is higher than East Asia, 36.94. Inequality is the highest in Iran (45.59) but the lowest in Pakistan (34.26). Changes in the inequality over time has been the highest in Nepal.

The mean income inequality in South East Asia and Pacific is much higher than the East and the South Asian regions, 43.17, but not when the dispersion in inequality is concerned. Inequality is the highest in Malaysia (47.71) and Philippines (46.94). The ranking here is based on more than one survey observation and less influenced by outliers or measurement errors. The increase in inequality has been the highest in

¹⁸ The countries include are advanced industrialised countries (Australia and Japan), newly industrialised countries (Korea and Taiwan), low- to middle-income developing countries (China, Indonesia, Malaysia, The Philippines and Thailand).

Indonesia. The ratio of the highest to the lowest quintiles with the exception of Hongkong (9.99) is below 7 in the East and the South Asian countries. However, it exceeds 10 in several of the South East Asian and the Pacific countries including Fiji, Malaysia and Philippines. For more details on the level and variations in inequality across the three regions see Sections 2 to 4 of Table 3 and 4. Inequality in East Asia declined prior to 1975 but it increased post 1980, while it declined over time in South Asia and South East Asia and Pacific. There is a positive association between the level and the variation in inequality. In general dispersion in inequality is declining over time indicating a convergence in inequality but to a higher level (see Figures 2 to 5).

5. SUMMARY

Intra-regional inequality refers to disparity in the income distribution within a region consisting of a number of countries possibly members of an economic union. The poverty and inequality has increased in the transition economies of Central and Eastern Europe and the former Soviet Union. The increasing rate is inhomogeneous and might be even higher in countries involved in military conflicts. This is in conflict with the expected positive relationship between democracy and inequality. Several market related determinants of inequality are identified some of which are country specific. The role of transitory events and measurement error in the rising inequality should not be neglected. The inequality in the Scandinavian countries is low and has been relatively stable over time. The Western European countries differ by type of social policy and in their effectiveness in reducing poverty and inequality. The high quality data indicates opposite development for gross and disposable incomes.

The between demographic groups within each member country's inequality is significant. The range of income inequality is wide within the OECD. Its development has been affected greatly by changes in households, demographic shifts and the labour market situation. Individual studies show that inequality is high among the African countries. The rate varies among countries by various sub-groups, regional location, income sources and over time. The inequality among the Latin American countries also is large and increasing over time. The level and patterns has been affected by labour market, trade and inflation factors. The East Asian countries have been successful in coupling growth and equality. However, the 1997 economic crisis deteriorated these prospects. The conflicting results from the two regions are explained by the entry of China into the world market and the advent of new technology biased against unskilled workers.

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Table 1. Mean Gini coefficient by country, based on WIID.

Region	Min	Max	Nyear	Range	Min	Mean	Median	Maximum	StdDev	Range	wgini
MENA	1944	1997	57	53	23.36	39.97	37.08	59.92	8.23	36.56	41.31
East Asia	1953	1998	93	45	18.60	33.67	31.20	55.80	7.65	37.20	28.81
SEASia & Pacific	1956	1998	87	42	30.40	43.17	43.90	57.16	5.87	26.76	39.80
South Asia	1950	1997	106	47	28.86	36.94	35.75	53.00	5.37	24.14	34.49
Latin America	1948	1998	320	50	27.00	47.39	47.25	67.83	7.47	40.83	51.79
sub-Saharan Afr.	1914	1999	157	85	28.90	49.26	50.00	79.50	10.05	50.60	46.53

East Europe	1955	1998	191	43	15.90	25.14	25.04	44.81	5.06	28.91	31.57
Former Soviet Rep	1972	1998	125	26	22.90	31.56	29.60	57.60	7.06	34.70	33.99
Industrialized	1867	1998	495	131	19.87	34.79	33.83	67.20	7.90	47.33	36.08
All regions	1867	1999	1631	132	15.90	41.12	40.24	79.50	9.61	27.91	35.65

Min First year of observation
 Max Last year of observation
 Nyear Number of years observed
 Range The difference between the last and first years of observation
 Minimum Minimum Gini value
 Mean Mean Gini value
 Median Median Gini value
 Maximum Maximum Gini value
 StdDev Standard deviation of the Gini
 Range The difference between maximum and minimum Gini values
 wgini Population weighted mean Gini

Table 2. Mean Gini coefficient and quintile share by country, based on WIID.

Region	Min	Max	Nyear	Range	Gini	WGini	Q1	Q2	Q3	Q4	Q5	Q5/Q1
MENA	1944	1997	57	53	39.01	41.31	0.07	0.10	0.15	0.21	0.47	7.09
East Asia	1953	1998	93	45	33.67	28.81	0.07	0.12	0.16	0.23	0.41	5.55
SEAsia & Pacific	1956	1998	87	42	43.17	39.80	0.07	0.10	0.14	0.21	0.49	7.39
South Asia	1950	1997	106	47	36.94	34.49	0.08	0.12	0.16	0.21	0.42	5.13
Latin America	1948	1998	320	50	47.39	51.79	0.04	0.08	0.13	0.21	0.54	12.50
sub-Saharan Afr.	1914	1999	157	85	49.26	46.53	0.06	0.09	0.13	0.20	0.52	8.21
East Europe	1955	1998	191	43	26.14	31.57	0.10	0.14	0.18	0.22	0.35	3.54
Former Soviet Rep	1972	1998	125	26	31.56	33.99	0.09	0.12	0.16	0.22	0.42	4.78
Industrialized	1867	1998	495	131	34.79	36.08	0.07	0.12	0.17	0.24	0.40	5.72
All regions	1867	1999	1392	132	38.06	38.26	0.07	0.11	0.16	0.22	0.44	6.88

Min First year of observation
 Max Last year of observation
 Nyear Number of years observed
 Range The difference between the last and first years of observation
 Gini Mean Gini value
 WGini Population weighted mean Gini value
 Q1-Q5 Income share of the first-fifth quintiles of population
 Q5/Q1 the ration of the fifth quintile share to the first quintile income share

Maximum	Maximum Gini value
StdDev	Standard deviation of the Gini
Range	The difference between maximum and minimum Gini values
wgini	Population weighted mean Gini
Dgini	Average percentage change in Gini

76	Morocco	93	6	1955	1999	12	44	45.81	.	0.08	0.10	0.14	0.19	0.48	6.02
77	Niger	99	6	1960	1995	3	35	39.40	41.88	0.09	0.11	0.15	0.21	0.43	4.53
78	Nigeria	100	6	1959	1997	13	38	43.20	42.73	0.06	0.09	0.13	0.20	0.51	8.43
79	Rwanda	114	6	1983	1984	2	1	28.90	28.90	0.12	0.13	0.16	0.21	0.38	3.33
80	Senegal	115	6	1959	1995	6	36	49.96	48.47	0.05	0.08	0.12	0.18	0.56	10.87
81	SierraLe	117	6	1967	1989	5	22	57.73	.	0.02	0.03	0.10	0.21	0.63	25.89
82	SouthAfr	121	6	1959	1995	12	36	54.89	55.53	0.03	0.05	0.10	0.21	0.62	23.65
83	Swazilan	126	6	1974	1994	2	20	62.30	.	0.04	0.06	0.10	0.17	0.64	17.41
84	Tanzania	131	6	1964	1993	8	29	49.12	48.96	0.05	0.08	0.12	0.19	0.57	11.50
85	Uganda	141	6	1970	1993	4	23	37.19	37.59	0.08	0.11	0.15	0.21	0.45	5.57
86	Zambia	150	6	1959	1996	9	37	54.57	53.02	0.05	0.09	0.13	0.20	0.53	10.04
87	Zimbabwe	151	6	1945	1990	4	45	57.85	60.59	0.05	0.06	0.10	0.17	0.62	12.77
	Mean region	6	6	1914	1999	157	85	49.26	46.53	0.06	0.09	0.13	0.20	0.52	8.21

7. East Europe:

88	Bulgaria	16	7	1957	1997	36	40	23.88	31.08	0.10	0.14	0.19	0.23	0.33	3.20
89	Croatia	30	7	1987	1998	6	11	25.68	25.84	0.10	0.13	0.17	0.22	0.39	4.04
90	CzechRep	33	7	1958	1997	12	39	23.22	24.36	0.12	0.14	0.17	0.21	0.37	3.17
91	Hungary	61	7	1955	1998	28	43	24.61	25.00	0.10	0.14	0.18	0.23	0.35	3.39
92	Poland	107	7	1956	1998	29	42	26.60	26.66	0.09	0.14	0.18	0.23	0.36	3.88
93	Romania	112	7	1988	1997	10	9	26.38	26.34	0.10	0.14	0.18	0.23	0.35	3.33
94	RussianF	113	7	1981	1998	13	17	34.14	39.35	0.09	0.12	0.16	0.22	0.41	4.56
95	SlovakRe	119	7	1958	1997	11	39	21.99	21.14	0.11	0.15	0.18	0.22	0.33	2.94
96	Slovenia	120	7	1987	1997	11	10	25.66	26.98	0.11	0.14	0.17	0.22	0.36	3.32
97	Ukraine	142	7	1968	1997	17	29	28.43	30.01	0.09	0.13	0.16	0.22	0.39	4.17
	Mean region	7	7	1955	1998	191	43	26.14	31.57	0.10	0.14	0.18	0.22	0.35	3.54

8. Former Soviet Republics:

98	Armenia	3	8	1986	1997	11	11	33.77	37.96	0.03	0.09	0.15	0.23	0.50	19.24
99	Belarus	10	8	1981	1998	12	17	26.50	27.79	0.14	0.14	0.17	0.21	0.33	2.44
100	Estonia	42	8	1981	1998	12	17	32.15	36.70	0.07	0.11	0.16	0.22	0.45	6.34
101	Georgia	49	8	1981	1997	11	16	39.93	53.70	0.02	0.07	0.12	0.20	0.59	26.95
102	Kazakhst	72	8	1981	1996	8	15	30.14	34.19	0.10	0.12	0.16	0.22	0.40	4.14
103	KyrgyzRe	75	8	1981	1997	11	16	34.39	41.61	0.09	0.11	0.15	0.22	0.44	4.88
104	Latvia	77	8	1981	1998	13	17	28.86	30.49	0.10	0.13	0.17	0.22	0.38	3.78
105	Lithuani	81	8	1981	1997	11	16	30.82	35.79	0.10	0.12	0.16	0.21	0.41	4.28
106	Moldova	91	8	1981	1995	9	14	30.86	38.08	0.09	0.12	0.16	0.22	0.40	4.33
107	Turkmeni	137	8	1981	1998	7	17	31.30	.	0.08	0.11	0.15	0.22	0.45	5.62
108	Uzbekist	144	8	1981	1994	7	13	29.48	33.00	0.10	0.12	0.16	0.22	0.40	3.90
	Mean region	8	8	1972	1998	125	26	31.56	33.99	0.09	0.12	0.16	0.22	0.42	4.78

9. Industrialized countries:

109	Australia	4	9	1962	1998	18	36	37.68	38.08	0.05	0.11	0.17	0.24	0.43	8.07
110	Austria	5	9	1970	1991	21	21	25.91	25.90	0.07	0.14	0.18	0.23	0.37	5.02
111	Belgium	11	9	1969	1994	11	25	33.50	33.46	0.09	0.14	0.19	0.23	0.35	3.91
112	Canada	21	9	1951	1994	26	43	30.83	30.63	0.07	0.13	0.18	0.24	0.38	5.48
113	Denmark	36	9	1939	1995	29	56	34.04	32.92	0.06	0.12	0.18	0.25	0.40	6.72
114	Finland	45	9	1952	1998	27	46	29.33	29.16	0.09	0.13	0.18	0.23	0.37	4.30
115	France	46	9	1956	1995	11	39	38.14	37.58	0.07	0.12	0.16	0.23	0.43	6.25
116	Germany	50	9	1950	1997	28	47	31.67	.	0.09	0.13	0.17	0.22	0.39	4.44
117	Greece	54	9	1957	1993	19	36	41.56	41.39	0.08	0.12	0.15	0.23	0.42	5.54
118	Ireland	66	9	1973	1987	3	14	36.80	36.77	0.05	0.11	0.17	0.24	0.43	8.26
119	Italy	68	9	1948	1995	25	47	35.68	35.45	0.08	0.13	0.17	0.23	0.39	4.87
120	Japan	70	9	1890	1993	33	103	35.53	33.98	0.07	0.12	0.17	0.23	0.42	6.39
121	Luxembo	82	9	1985	1994	3	9	25.89	25.86	0.12	0.13	0.17	0.22	0.35	2.98
122	Netherla	96	9	1950	1997	24	47	32.10	31.72	0.08	0.13	0.18	0.23	0.38	4.77
123	NewZeala	97	9	1954	1997	31	43	45.61	44.20	0.06	0.12	0.17	0.25	0.40	7.03
124	Norway	101	9	1957	1996	23	39	30.74	30.56	0.06	0.12	0.18	0.24	0.40	6.80
125	Portugal	109	9	1973	1995	5	22	36.26	36.15	0.07	0.12	0.16	0.23	0.42	5.94
126	Spain	122	9	1965	1996	15	31	30.93	30.79	0.08	0.14	0.18	0.23	0.37	4.46
127	Sweden	127	9	1948	1996	45	48	38.14	37.47	0.07	0.14	0.18	0.24	0.37	5.12
128	Switzerl	128	9	1978	1992	4	14	33.20	33.21	0.08	0.12	0.17	0.22	0.41	4.96
129	UK	138	9	1867	1996	41	129	30.87	30.19	0.09	0.13	0.17	0.23	0.38	4.17
130	US	139	9	1944	1997	53	53	38.65	38.85	0.05	0.11	0.17	0.24	0.43	9.17
	Mean region	9	9	1867	1998	495	131	34.79	36.08	0.07	0.12	0.17	0.24	0.40	5.72

Mean all regions 1867 1999 1392 132 38.06 38.26 0.07 0.11 0.16 0.22 0.44 6.88

Note: USSR, Yugoslavia and Czechoslovakia are excluded and East and West Germany are averaged.

Obs Observation number

Country Country

Idnr Country ID number

Region Regional location

Min First year of observation

Max Last year of observation

Nyear Number of years observed

Range The difference between the last and first years of observation

Gini Mean Gini value

wGini Population weighted mean Gini value

Q1-Q5 Income share of the first-fifth quintiles of population

Q5/Q1 the ration of the fifth quintile share to the first quintile income share

Figure 1. Development of Gini coefficient, Middle East and North Africa.

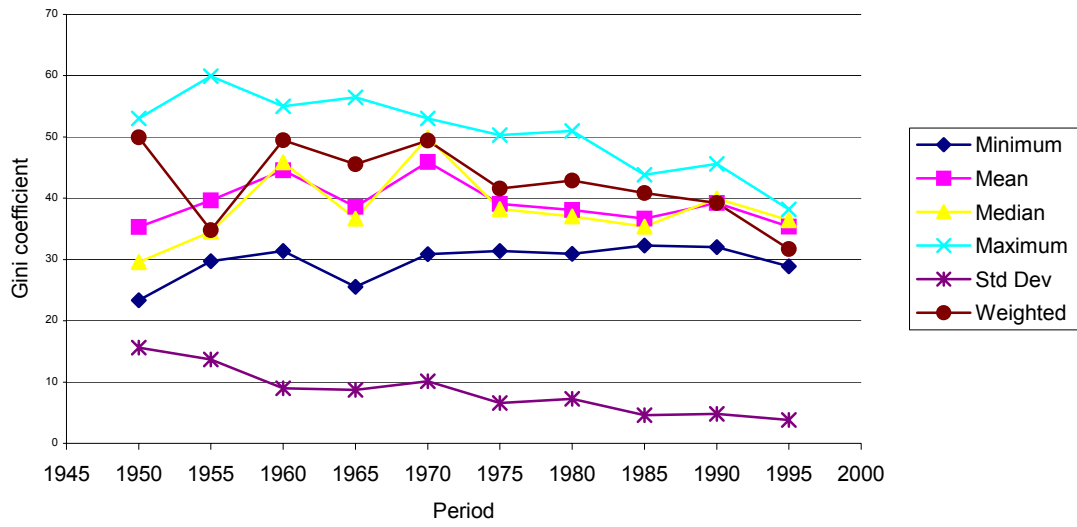


Figure 2. Development of Gini coefficient, East Asia.

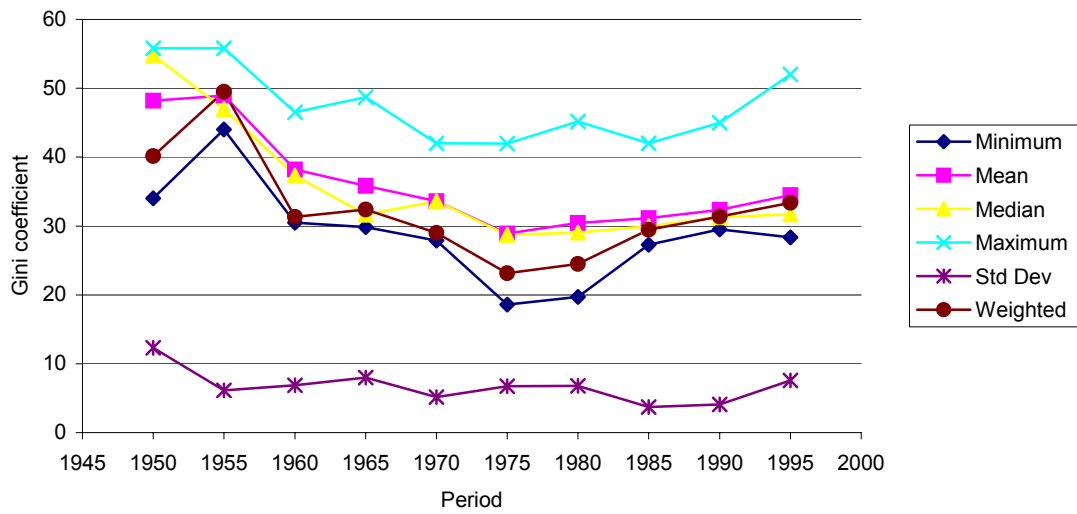


Figure 3. Development of Gini coefficient, South East Asia and Pacific.

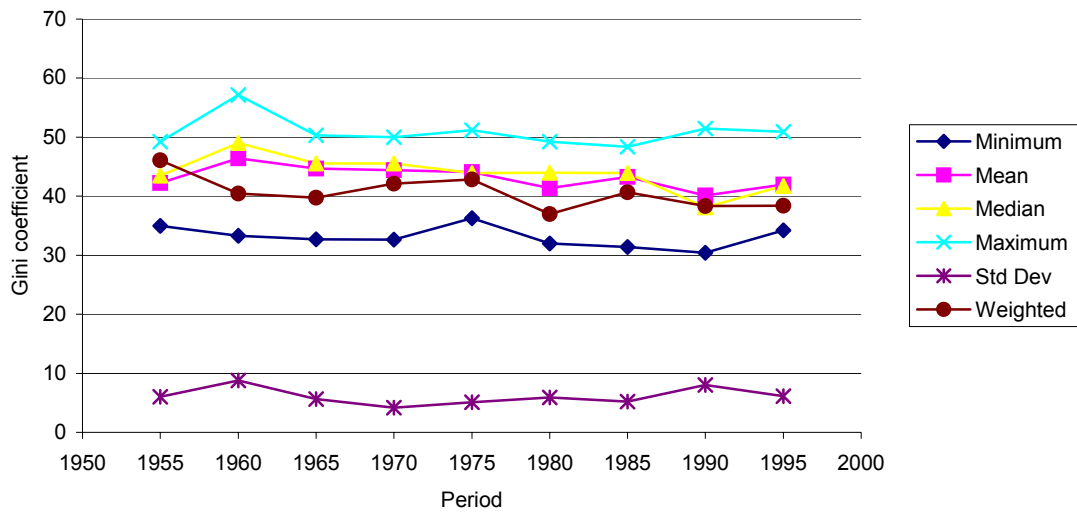


Figure 4. Development of Gini coefficient, South Asia.

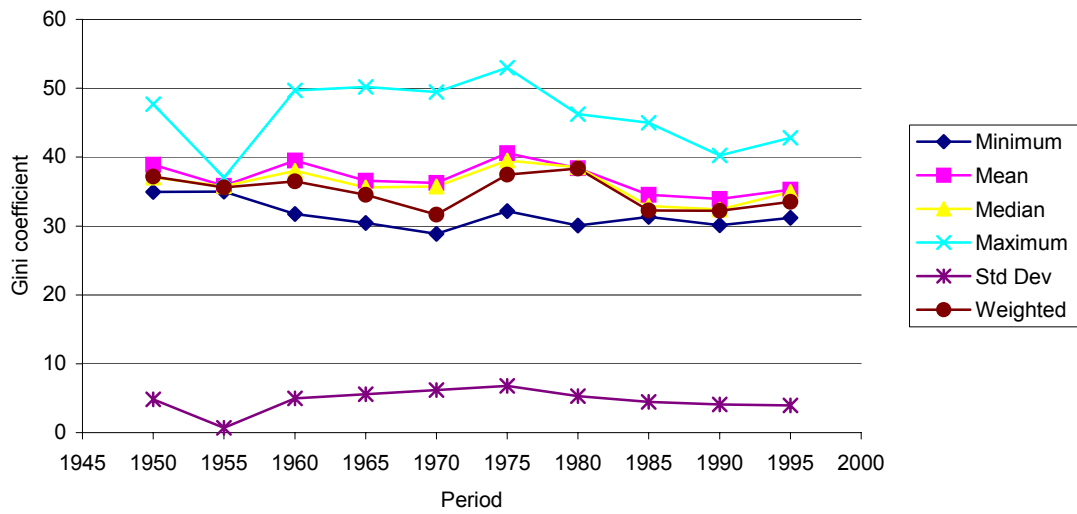


Figure 5. Development of Gini coefficient, Latin America.

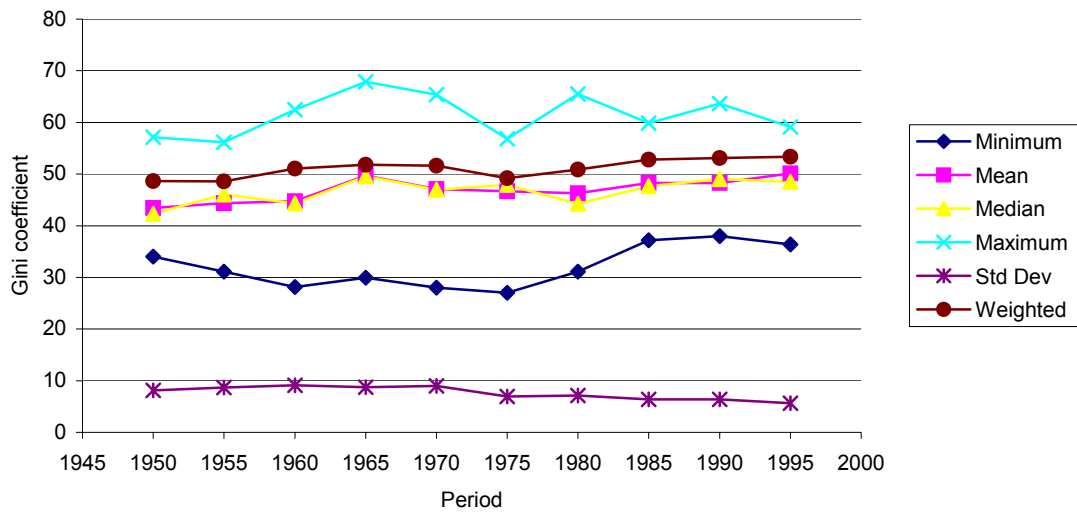


Figure 6. Development of Gini coefficient, Sub-Saharan Africa.

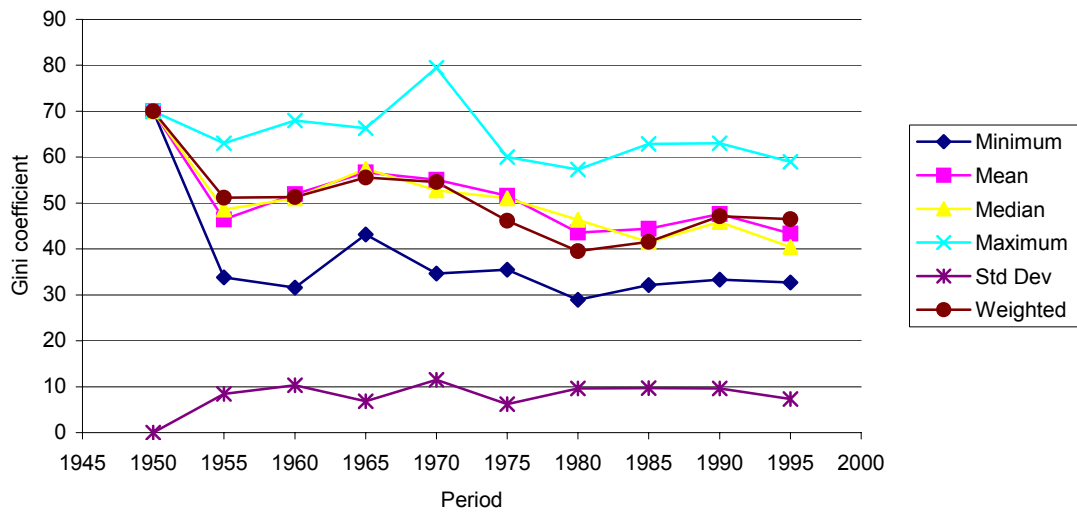


Figure 7. Development of gini coefficient, East Europe.

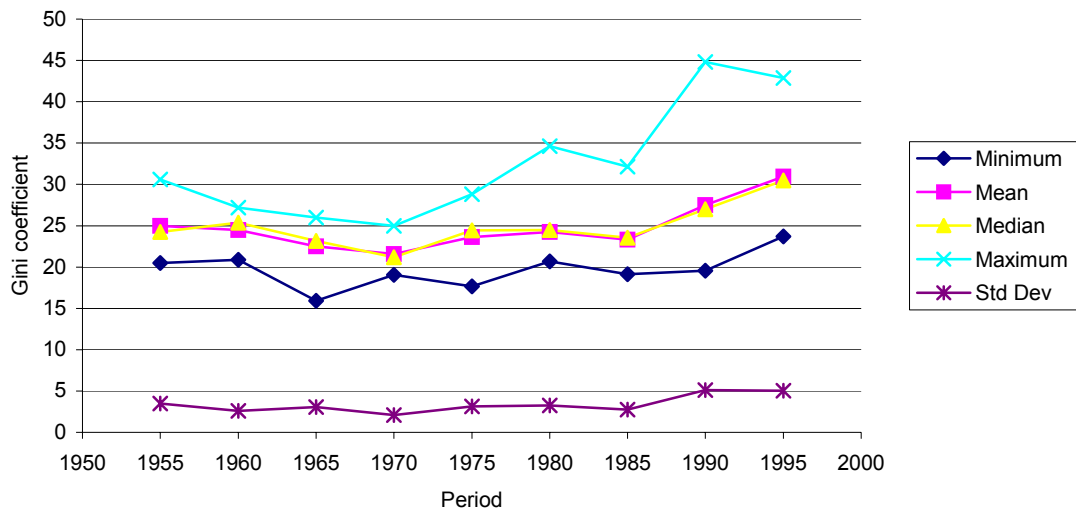


Figure 8. Development of Gini coefficient, Former Soviet Republics.

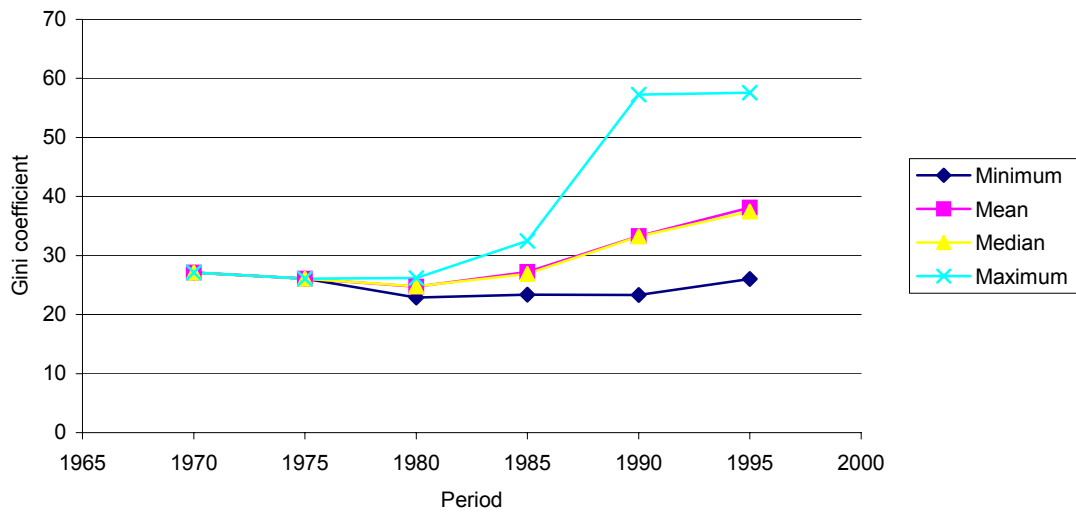


Figure 9. Development of Gini coefficient, Industrialized countries.

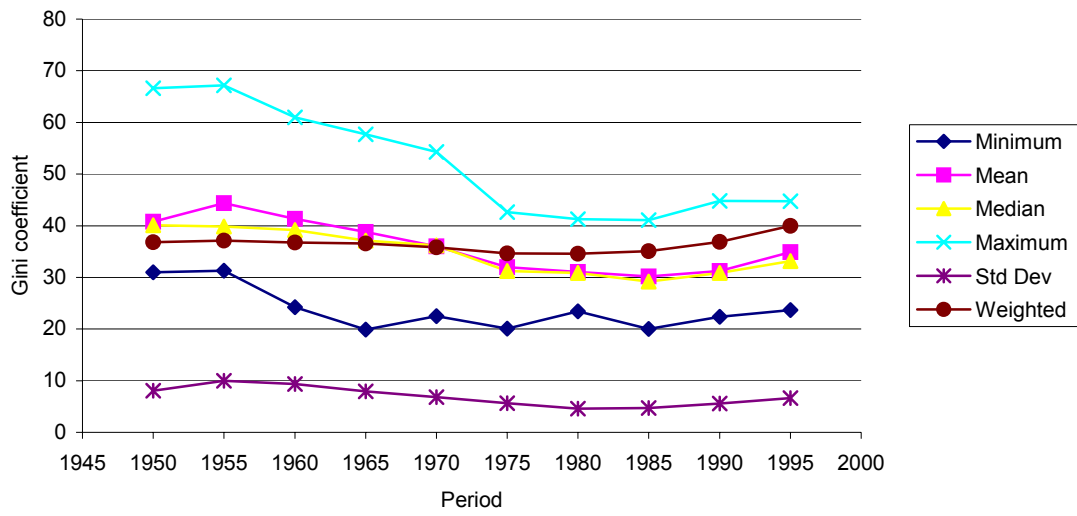


Figure 10. Trend in mean unweighted gini coefficient by region.

